Volume 9. Chemistry and Microbiology

Principal Investigators' Reports for the Year Ending March 1976

U. S. DEPARTMENT OF COMMERCE National Oceanic and Almospheric Administration

April 1976

Annual Reports from Principal Investigators

Volume: 1. Marine Mammals

- 2. Marine Birds
- 3. Marine Birds
- 4. Marine Birds
- 5. Fish, Plankton, Benthos, Littoral
- 6. Fish, Plankton, Benthos, Littoral
- 7. Fish, Plankton, Benthos, Littoral
- 8. Effects of Contaminants
- 9. Chemistry and Microbiology
- 10. Chemistry and Microbiology
- 11. Physical Oceanography and Meteorology
- 12. Geology
- 13. Geology
- 14. Ice

Environmental Assessment of the Alaskan Continental Shelf

Volume 9. Chemistry and Microbiology

Fourth quarter and annual reports for the reporting period ending March 1976, from Principal Investigators participating in a multi-year program of environmental assessment related to petroleum development on the Alaskan Continental Shelf. The program is directed by the National Oceanic and Atmospheric Administration under the sponsorship of the Bureau of Land Management.

ENVIRONMENTAL RESEARCH LABORATORIES / Boulder, Colorado / 1976

CONTENTS

-- --

| Research Unit | Proposer | Title | Page |
|------------------|--|---|------|
| 29 | Ronald M. Atlas Dept. of Biology U. of Louisville | Assessment of Potential Interactions of Microorganisms and Pollutants Resulting from Petroleum Development on the Outer Continental Shelf in the Beaufort Sea | 1 |
| 30 | Ronald M. Atlas Dept. of Biology U. of Louisville | Assessment of Potential Interactions of Microorganisms and Pollutants Resulting from Petroleum Development on the Outer Continental Shelf in the Gulf of Alaska | 287 |
| 43/ 44/ 45 | Stephen N. Chesler Barry H. Gump Harry S. Hertz Willie E. May Bioorganic Stds Sec NBS | Trace Hydrocarbon Analysis in Pre- viously Studies Matrices and Methods Development for: (A) Trace Hydrocar- bon Analysis in Sea Ice and at the Sea Ice-Water Interface, (B) Analysis of Individual High Molecular Weight Aromatic Hydrocarbons | 345 |
| 47 | Philip LaFleur Analytical Chem Div NBS | Environmental Assessment of Alaskan Waters – Trace Element Methodology – Inorganic Elements | 379 |
| 153/ 155 | Joel Cline Richard Feely PMEL | Distribution of Light Hydrocarbons, C _l -C4, in the Gulf of Alaska and Southeastern Bering Shelf | 443 |

ANNUAL REPORT

~---

Assessment of Potential Interactions of Microorganisms and Pollutants Resulting from Petroleum Development on the Outer Continental Shelf in the Beaufort Sea

April 1, 1976

| Submitted by: | Ronald M. Atlas Principal Investigator Department of Biology University of Louisville |
|---------------|--|
| | Louisville, Kentucky 40208 |

| Prepared for: | Outer Continental Shelf Energy Assessment Progam National Atmospheric and Oceanographic Administration Fairbanks Project Office |
|---------------|---|
| | Fairbanks, Alaska |

PERSONNEL

Dr. Ronald M. Atlas, Principal Investigator Project Coordinator - Hydrocarbon biodegradation

Dr. Tatsuo Kaneko, Postdoctoral Research Associate

Mr. George Roubal, Research Assistant - Hydrocarbon degradation

Dr. Lois Cronholm, Co-principal Investigator - Potential human pathogens

Two parttime technicians

INTRODUCTION

Microorganisms are essential components of all ecosystems. Changes in microbial populations may greatly alter the characteristics of an ecosystem. Human activities often modify the environment for microorganisms. In some cases microorganisms respond to such changes in a way that lessens the human impact. For example, microorganisms are capable of biodegrading many pollutants that man adds to various ecosystems, often maintaining environmental quality in such situations. In some cases, microorganisms are unable to biodegrade polluting materials and undesirable accumulations of the pollutants occur. In still other situations, mciroorganisms carry out transformations of the pollutants that produce undesirable toxic products. Microorganisms also carry out metabolic activities essential for ecologic balance. Human modification of an environment may alter the ability of microorganisms to carry out key elemental cycling activities. Some microorganisms cause disease in man or other organisms. Human activities may change the populations of such pathogenic microorganisms, altering the incidence of a particular disease.

This project was designed to investigate the potential interactions of microorganisms and pollutants that may result from development of petroleum resources in the outer continental shelf of the Beaufort Sea. Knowledge about the naturally occurring microorganisms is essential for such an assessment. Studies have been begun on establishing a baseline description of microbial communities in the Beaufort Sea. This baseline description includes quantitative information on the occurrence of different physiological groups of microorganisms and on the qualitative taxonomic

characteristics of dominant species of microorganisms. It includes information on the ability of the indigenous microorganisms to transform petroleum hydrocarbons that might enter the ecosystem from outer continental shelf petroleum development.

MATERIALS AND METHODS

Literature Review

A review of existing literature on microorganisms in the Beaufort Sea including microorganisms related to petroleum pollutants was conducted using the computer search facilities OASIS and of the Lockheed data base. Data bases searched include National Technical Information Service, Biological Abstracts, Bioresearch Index, Oceanic Index, Selected Water Research Abstracts and Chemical Titles. Abstracts were reviewed and appropriate articles obtained form NTIS or the original source.

Sample Collection

Water and sediment samples were collected during August and September in the Beaufort Sea. Samples were collected from the USGS <u>Beaver</u> aircraft and with small carft. Due to adverse ice conditions sampling was done nearshore, including within Elson Lagoon and Prudhoe Bay. Water samples were collected with a Niskin sterile water sampler. Sediment samples were collected with a mud snapper. Surface ice samples were collected with aseptically with a spatula. A total of 3 ice, 39 water, and 33 sediment samples were collected (Table I). The locations of sample collections are shown in Table II and Figure I.

Abiotic Sample Parameters

Salinity and temperature, determinations were made with a Yellow Springs Instrument Salinometer. Aliquots of samples were filtered through glass filters, placed in acid-washed bottles, rapidly frozen with dry ice

and sent to Dr. Vera Alexander for analysis of phosphate, ammonium, nitrate and silicate concentrations.

Enumeration of Microbial Populations

Direct counts from water and sediment. Aliquots of water samples were immediately preserved upon collection by addition of formaldehyde l:l v/v. For sediment samples an aliquot was weighed and dried for determination of wet wt./dry wt. conversion factors. A second aliquot was diluted with sterile water and preserved with formaldehyde.

One-tenth to five-tenth milliliters of sample was mixed with one milliliter of 0.1% acridine orange in sterile tris buffer pH 7. One minute after mixing, the stained sample was filtered through a 0.22 µm Sartorius black filter. The filters were immediately viewed with an Olympus epifluorescence microscope, with a BG 12 plus blue exciter filter and a 480 nm blue barrier filter. Cells fluorescing orange or green were counted. Ten fields were counted for each aliquot filtered. Two aliquots from each sample were counted. Counts were converted to number per ml for water samples and to number per gram dry wt. for sediment samples.

Indirect plate counts from water and sediment. Viable microorganisms were enumerated as different physiological groups using different microbiological media and incubation conditions. Two non-selective media, marine agar 2216 and MSWYE, were used for enumeration of total viable microorganisms. Several selective media were also used for enumeration of different groups of microorganisms. TCBS agar was used for enumeration of <u>Vibrio</u> species. Pseudosel agar was used for enumeration of Pseudomonas species.

SS agar was used for presumptive enumeration of <u>Salmonella-Shigella</u> species. Saboraud dextrose agar was used for enumeration of fungi. Oil agar (Bushnell Haas Agar plus 0.5% Prudhoe crude oil plus marine salts) was used for enumeration of oil-utilizing microorganisms. Counts of oildegrading microorganisms were corrected for organisms that could grow on Bushnell Haas agar without added oil. These media were either incubated at 5C for enumeration of viable psychrophilic and psychrotrophic microorganisms or at 20C for enumeration of viable mesophilic microorganisms.

Depending on the concentrations of microorganisms in the samples counts were either from surface-spread plates of serial dilutions or from Millipore-filtered (0.45 µm) samples. Counts for 20C plates were done after 10 days of incubation; counts for 5C plates were done after 21 days of incubation. Triplicate plates were used for all counts.

Qualitative Characterization and Identification of Microorganisms from Water and Sediment Samples

Colonies that developed on marine agar 2216 were restreaked for purification. Colonies isolated at 4C and 20C from different samples were selected at random for taxonomic studies. Colonies were also selected at random from 4C and 20C oil agar plates for characterization of range of hydrocarbon metabolism.

For taxonomic characterization an extensive series of tests were run on each organism. A complete list of tests being used is shown in Table III. Not all organisms are characterized with every test. The tests examine three broad areas: morphology, physiology and biochemistry, and nutritional. Tests from each broad area are needed to characterize and

*7

classify a microorganism. Morphological tests include size, shape and specific morphological features. Some of these specific features are shown by staining reactions, the key taxonomic staining test being the gram stain. Other specific features, such as motility, presence of endospores, acid-fast stain reaction, arrangement of cells, etc., are keyed to classical bacterial taxonomy. Physiological and biochemical tests include realtions to oxygen, temperature, growth range, salt tolerance, presence of specific enzymes, sensitivity to antibiotics, presence of specific metabolic pathways, etc. These tests can be used both in taxonomic identification of the organisms and in understanding the ecological distribution and role within the ecosystem of these organisms. Nutritional tests included the ability to utilize many different substrates including the ability to metabolize different classes of compounds such as amino acids, carbohydrates, amines, carboxylic acids, alcohols, nucleic acids, and hydrocarbons. Extensive hydrocarbon utilization tests were run for organisms isolated from oil agar.

Analysis of data. In order to analyse the data generated from taxonomic testing, an agreement was made with Dr. Micah Krichevsky, National Institute of Health, for use of the NIH computer programs and facilities. The data is arranged in a searable form so that organisms with any tested characteristic of interest, e.g. ability to metabolize hydrocarbons, can be identified by source of isolation. When testing of organisms is completed, the programs allow for comparison to other organisms including known organisms with generation of similarity coefficients.

RESULTS AND DISCUSSION

Literature Review

A review of the literature showed that while a large number of studies have been reported on distribution of microorganisms in marine environments and on the microbial degradation of petroleum hydrocarbons, only a limited number of such studies have been conducted in or near the Beaufort Sea. A bibliographic listing of those reports directly applicably to the Beaufort Sea is shown in Table IV. Included in this listing are some reports on hydrocarbon biodegradation in soil under Arctic conditions which are relevant for studies on the Beaufort Sea. Table IV also includes a listing of major reviews of the fields of marine microbiology and petroleum microbiology.

An analysis of the literature shows that little is known about the offshore microbial communities in the Beaufort Sea. Studies that have been conducted have been restricted to nearshore regions. This is also true for studies on petroleum biodegradation in the Beaufort Sea.

Abiotic Sample Parameters

The temperatures and salinities of collected samples is shown in Table I. Most salinities were between 15 and 25%, indicating the influence of terrestrial runoff and melting ice on the samples. The temperatures of all samples collected were less than 3C and generally less than 1C.

Nurtient analyses of the samples are shown in Table V. Phosphate levels in water samples collected near Barrow were significantly higher than those

from Prudhoe Bay. Most samples from near Barrow had greater than 4 μ g at PO₄-P/1. Ammonium nitrogen was low in almost all samples, less than 1 μ g at, NH₃-N/1. Nitrate-N concentrations were higher than ammonium concentrations. Levels of nitrate nitrogen were similar in most samples, approximately 1.5 μ g at.NO₃-N/1. There were no major differences in nitrogen levels between Prudhoe Bay and Barrow samples. Levels of silicate were generally higher however in Prudhoe Bay samples, greater than 10 μ g at.SiO₃-Si/1, than in Barrow samples, generally less than 10 μ g at.SiO₃-Si/1. Water samples 9, 10, and 41 from Elson Lagoon showed higher levels of silicate and nitrate than other samples from that area.

Enumeration of Microorganisms

<u>Direct counts</u>. Direct counts of total microorganisms in ice samples showed about 10^6 organisms/ml (Table VI). Water samples showed similar counts to ice samples, 10^5 - 10^6 organisms/ml. There were no significant differences in direct counts of total microorganisms in water samples collected near Barrow or in Prudhoe Bay. Direct counts from sediment samples were higher than from water samples, of the order 10^7 /gm dry wt. As with the water samples there was no significant difference between direct counts of Prudhoe Bay and Barrow sediment samples.

Indirect plate counts. Enumeration of total viable aerobic heterotrophic microorganisms showed higher counts on marine agar 2216 (Tables VII, VIII) than on modified sea water yeast extract medium (Tables IX, X). In ice samples, counts of mesophilic heterotrophic microorganisms (Table VII) were lower than counts of psychrotrophic-psychrophilic organisms. In water and sediment samples counts of heterotrophic mesophiles and psychrophiles-

psychrotrophs were not significantly different. Counts in ice and water samples from comparable areas were not significantly different. Counts from sediment samples were generally one order of magnitude higher than from water samples. Counts from water collected in Prudhoe Bay were higher than from water. This difference was most pronounced in the mesophilic counts.

Counts of viable "fungi" (Table XI, XII) were much lower than counts of total heterotrophs. Fungal counts from ice samples were higher than from water samples and were of the same magnitude as fungal counts from sediment samples. Counts of psychrophilic-psychrotrophic fungi from ice samples were higher than comparable mesophilic counts. Fungal counts in water were generally 1-2/ml. Sediment samples generally showed counts of 10-100/gm dry wt. It should be noted that some bacteria are able to grow on the media used to select for fungi and that some bacteria may be included in the "fungal" counts.

Counts of <u>Pseudomonas</u> spp. from ice and water samples were low, less than 10/ml except from one ice sample (Table XIII). Counts of <u>Pseudomonas</u> spp. from sediment samples were all less than 1/10 ml. Counts of "<u>Salmonella-Shigella</u>" species (Table XIV) showed similar patterns as the <u>Pseudomonas</u>. Only one ice sample showed high counts of "<u>Salmonella-Shigella</u>" species. Counts of <u>Vibrio</u> spp. on the other hand were in excess of 100/ml from most ice and water samples. <u>Vibrio</u> counts were very low in the ice sample that had the high"<u>Salmonella-Shigella</u>" and Pseudomonas counts. Counts of psychrophilicpsychrotrophic <u>Vibrio</u> were significantly higher than counts of mesophilic Vibrio.

Counts of oil-utilizing psychrophiles-psychrotrophs were higher in sediment

samples than in water samples (Table XVII). In water concentrations of psychrophilic-psychrotrophic oil-utilizing microorganisms were generally less than 1/10 ml. Counts from Prudhoe Bay water samples were higher on the average than from water samples collected near Barrow. Counts of mesophilic oil-utilizing microorganisms (Table XVIII) were higher than counts of psychrophilic-psychrotrophic oil-utilizing microorganisms. There was no significant difference in mesophilic oil-utilizing counts between samples collected in Prudhoe Bay and near Barrow. Except for one water and one ice sample oil-utilizing microorganisms were isolated from every 10 ml water or ice and l g sediment sample.

Qualitative Characterization of Microbial Isolants

A total of 552 microbial isolants have been characterized with respect to their nutritional and physiological characteristics. Most morphological characteristics of these isolants have not yet been examined. The sources of isolation for these organisms are shown in Tables XIX and XX. The sources of the isolants were closer to include stations near Barrow, in Prudhoe Bay, and from an intermediate location.

Summaries of some key characteristics of these organisms are shown in Tables XXI-XXIII. These tables show the total number of strains by type of sample and incubation temperature which had a particular characteristic. With respect to the morphological characteristic of pigment color, an easily recognized characteristic, only a low percentage of all organisms produced diffusible pigments. About half of the isolants produced pigments that were not diffusible and about half produced non-pigmented gray colonies.

Physiological characterization showed the ability of the isolants to

tolerate various temperatures, salinities, and pH levels. Greater than 95% of all isolants were able to grow at temperatures of 10 and 15C. Ninety-five percent of the 20C isolants could grow at 5C, making them psychrotrophs. Thirty-two percent of the 4C isolants could not grow at 20C, indicating that they were psychrophiles. Only 3% of all isolants were able to grow at 37C, the temperature of warm-blooded animals. Such information should be valuable in predicting and detecting effects of heated pipelines. While 91% of all isolants could tolerate 3% NaCl, only 73% were tolerant to 5% NaCl and only 35% to 7.5% NaCl. Sediment isolants were more sensitive than water isolants. Brine influx from drilling operations would thus be deletorious to many of the indigenous microorganisms. Tests on the ability to tolerate different pH levels showed that most organisms could tolerate a decrease in pH from the normal 8.3 of seawater to an acidic pH of 6 but not to more acid conditions.

Examination of the nutritional characteristics of the isolants showed that 84% required growth factors. Vitamins were required by 56% of the isolants. Twenty-eight percent had more complex growth factors and 6% could only be cultured on complex media. Almost twice as many sediment isolants required yeast extract and amino acids as water isolants.

Carbohydrates were the most readily utilized class of components followed by amino acids, dicarboxylic TCA cycle intermediates, alcohols, and fatty acids. More water isolants were capable of utilizing these compounds than sediment isolants.

Only 2% of all isolants were able to utilize hydrocarbons. All but one of these isolants should be capable of metabolizing hydrocarbons at 5C in the presence of 3% NaCl. Forty-three percent of all isolants were capable of

utilizing fatty acids which are intermediary metabolites of hydrocarbon biodegradation. Thus, following primary attack on the hydrocarbon, these organisms would be capable of utilizing the fatty acids formed. Thirty-four percent of the isolants could grow on acetate, a breakdown product of fatty acid metabolism. Less than 2% of all isolants were capable of utilizing benzoic and or phenol which may be intermediary metabolites of aromatic hydrocarbon metabolism.

Tables XXIV-XLIV show further summary data analysis by station. The general trends discussed above held for all stations, but on some specific tests at a given station, there was great variability. For example, organisms from near Barrow within Elson Lagoon (Station 2) were less tolerant of high NaCl concentration and low pH levels than organisms from offshore in that area (Station 10). In contrast, organisms offshore at Prudhoe Bay (Station 71) were less tolerant to high NaCl concentrations than organisms from nearshore (Station 55). Station 70 which was located between Stations 55 and 71 showed similar physiological characteristics as the nearshore location but intermediate nutritional characteristics compared to Stations 55 and 71.

With respect to hydrocarbon metabolism the highest percentage of hydrocarbon utilizers were found at Station 10, 7% of the total population. At several stations less than 20% of the total population was capable of hydrocarbon metabolism. The distribution of hydrocarbon-utilizing microorganisms was equally distributed between sediment and water.

Much more detailed tables showing which organisms had specific characteristics are included in an appendix to this report.

Future Work

During the remainder of the contract two more samplings are scheduled, one using helicopters and the other aboard an icebreaker. One of the samplings will begin April 1. Additionally, beach samples are being collected. These samples will be processed for enumeration of microorganisms and compared to the previous samples. Microorganisms will be isolated from these samples for taxonomic characterization. It is anticipated that taxonomic characterization should be completed on microorganisms isolated from the August-September samples as well as the April sampling by October 1, 1976. Isolants from the August 1976 cruise will not be completed by that date.

As planned, assays will be made during the forthcoming samplings for rates of hydrocarbon biodegradation and bioemulsification. Assay should be completed by October. A complete proposal for future work during a secondyear contract is being prepared. Fig. la. Locations of sampling sites in the Barrow area.

.

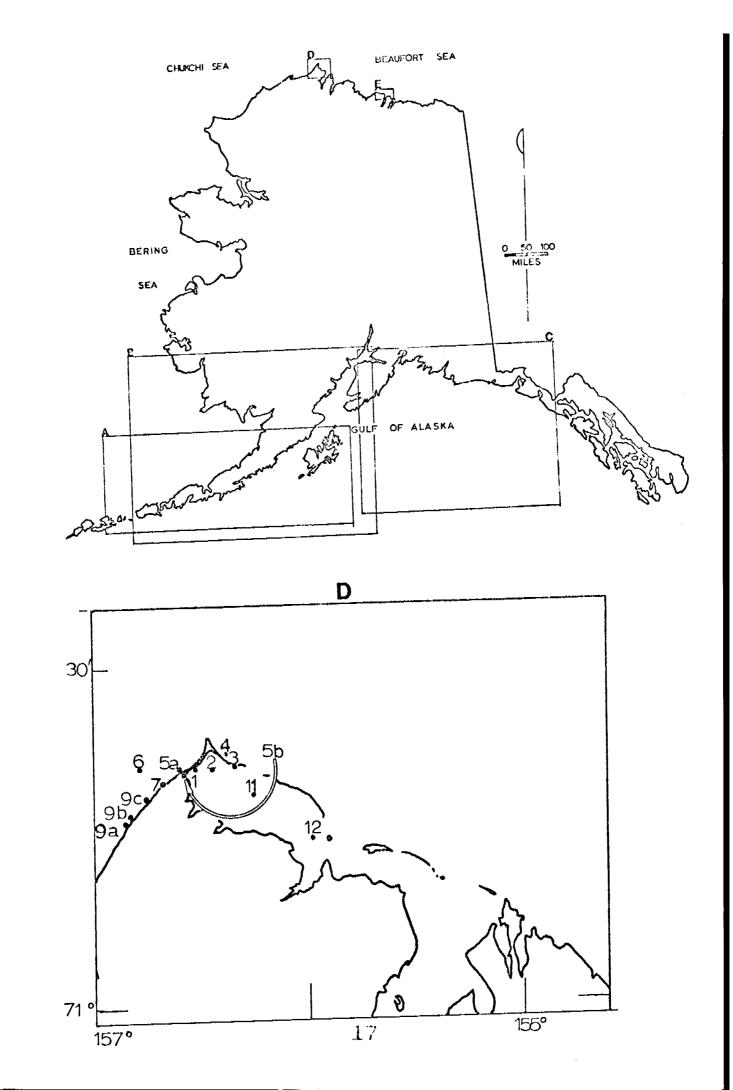
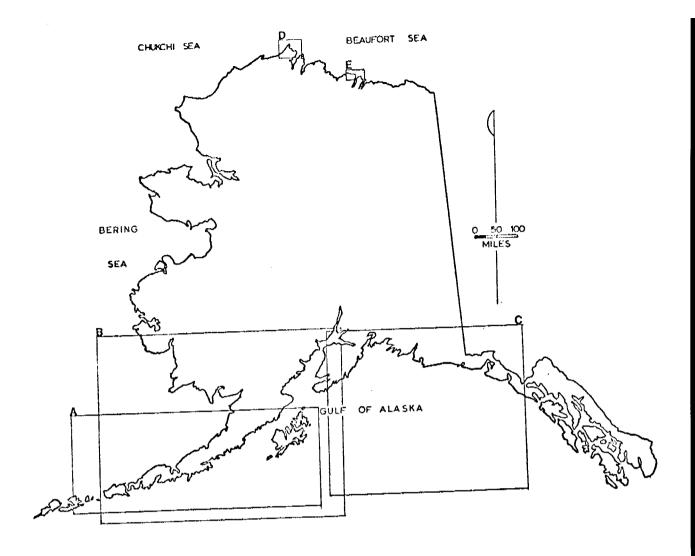


Fig. lb. Locations of sampling sites near Prudhoe Bay.



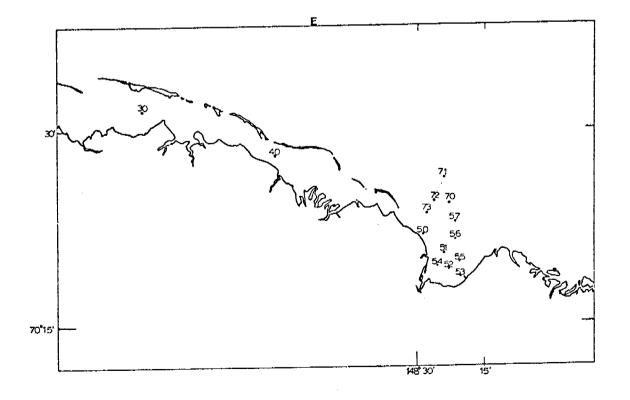


Table I

SAMPLE DESCRIPTION

| SAMPLE NU. | Dav | MoYr | Tor | ation | Station | Type |
|--------------------------|------|------------------|-------------------------------|---|--|-------|
| ICE | Lay | | Sea | Area | Juiton | TAPC |
| *8WJ035231 | 3.0 | JH75CH | HUKCH1 | BARROW | STATION05B | ICE |
| *8WUU36?U1 | 23 | J975CH | | PARRUN | STATIONU9A | |
| *BMOO3 3301 | | C975CF | | BARROW | STATION098 | |
| *8₩0040?01 | 23 | 3975CH | | BARROW | STATIONO9C | |
| | | | | | 5774 CI (270 9C | 10 0 |
| WATER | | | | · · · · · · · · · · · · · · · · · · · | | |
| *BWJU42?U1 | בל | 0975CH | | () A . 515 (. 1.1 | | |
| *BW0003301 | | 0875CF | | BARROW | STATION05B | WATER |
| *BW0043?01 | | 0975CF | | BARROW | STATION06 | WATER |
| *8800331?31 | | | FAUFURT | BARROW | STATION08 | WATER |
| *8#0002701 | | | | | ON STATIONO1 | WATER |
| ≫8WuJu3?01 | | | AUFORT | | ON STATIONO1 | WATER |
| *Bwuu19?u1 | | | AUFORT | | ON STATIONIO | WATER |
| *BW0035?01 | | | AUFORT | | ON STATIONO1 | MATER |
| *BW0020?01 | | | AUFORT | | ON STATIONO1 | WATER |
| ≈BW0020701 ≆BW0036?∪1 | | | AUFORT | | IN STATIONO2 | WATER |
| *8W0009301 | | | AUFORT | | | WATER |
| | | | AUFORT | | | WATER |
| *BW0021?J1 | | | AUFORT | | | WATER |
| *8W0037?01 | | | AUFORT | | IN STATIONO3 | WATER |
| | | | AUFORT | | STATION04 | WATER |
| *8#JJ22?J1 | | | AUFURT | | | WATER |
| *Ba0041?01 | | | AUFORT | | IN STATIONOSA | WATER |
| *BW0006701 | | 0875BE | AUFORT | ELSCN LAGOD | N STATION11 | WATER |
| *BNJJJJ4?J1 | | | AUFORT | POINT BARRO | W STATION12 | WATER |
| *8w0007?01 | | | AUFORT | PEINT BARRO | | WATER |
| *B #0011?J1 | | | AUFORT | OLIGTOK PT. | | WATER |
| *BWU012201 | 05 . |)975RE | AUFORŤ | PRUDHOE BAY | STATION40 | WATER |
| *BMUU28701 | 13 (| 0975BE | AUFORT | PRUDHOE BAY | | WATER |
| *8W0017?01 | 08 | 39758E | AUFCRT | PRUCHOE BAY | | WATER |
| *BW0013?01 | 05 0 | 0975BE | AUFORT | PRUDHOE BAY | | WATER |
| *9M0058501 | | | AUFORT | PRUDHUE BAY | | WATER |
| *3WJU14?01 | | | AUFORT | PRUDHOE BAY | | WATER |
| *B₩0023?01 | | | A second second second second | PRUDHOE BAY | | WATER |
| ≭8W0018?01 | | | | PRUDHUE BAY | | WATER |
| *BW0015?01 | |)975BE | AUFORT | PRUDHOE BAY | · · · · · · · · · · · · · · · · · · · | WATER |
| *BM0010501 | | 9758E | | PRUDHOE BAY | | |
| *BW0024?01 | | 975BE/ | | PRUDHUE BAY | | WATER |
| *BW0025?01 | | 975BE | | PPUDHOE BAY | | WATER |
| *80030?01 | | 975BE/ | | PRUDHOE BAY | and the second | WATER |
| *8WUU25?J1 | | 975BE/ | | PRUDHUE BAY | | WATER |
| *B*0031?01 | | 975BEA | | | - | WATEP |
| *BWC027201 | | 1975BE/ | | . | | WATER |
| *BNUU32?01 | | 9756F4 | | The second | | WATER |
| *8W0033?J1 | | 9738E4 9758E4 | | PRUDHOE BAY | | WATER |
| *8W0034?01 | | | | PRUDHOE BAY | · · · · · · · · · · · · · · · · · · | WATER |
| | 14) | 975884 | OFURT | PRUDHOE BAY | STATION73 1 | WATER |

20

•

Table I (cont'd)

| SEDIMENT | | ELSEN LAGOON | STATION01 | SEDIMENT |
|-------------------|------------------------|---|-----------|----------|
| *880001?01 | | ELSON LAGOON | - | SEDIMENT |
| *BB0002?01 | | | STATIONUL | SEDIMENT |
| #BBU015?U1 | 11 09758FAUFORT | | STATIONO1 | SEDIMENT |
| <u>≄BB0001?01</u> | <u>17 0975BEAUFORT</u> | and a second | STATIONO2 | SEDIMENT |
| *BB0016?01 | 11 0975BEAUFORT | ELSCN LAGOON | | |
| *880032?01 | 17 0975 BEAUFCRT | | STATION02 | SEDIMENT |
| *880007?01 | 05 0975BEAUFORT | ELSON LAGOON | STATION03 | SEDIMENT |
| #880017201 | 11 0975BEAUFORT | ELSCN LAGOON | STATION03 | SEDIMENT |
| *880008?01 | US 0975BEAUFORT | PLOVER PT | STATION04 | SEDIMENT |
| *BBJU18?01 | 11 U975BEAUEORT | (a) A second se second second sec | STATION04 | SEDIMENT |
| *8800333?01 | 17 0975BEAUEORT | | STATIONU3 | SEDIMENT |
| *8800095601 | 28 CH75BEAUFORT | ELSCN LAGGON | STATION10 | SEDIMENT |
| *BBJJJJ5?01 | 31 0875BEAUFORT | ELSCN LAGOGN | STATION11 | SEDIMENT |
| *BBJJJ4?J1 | 28 JE75BEAUECRT | PT BARROW | STATION12 | SEDIMENT |
| *B30306?01 | 31 DE75HEAUFERT | PT BARROW | STATION12 | SEDIMENT |
| *BBJUJ9?01 | 05 CS75BEAUFURT | DLIGTOK PT | STATION30 | SEDIMENT |
| *880010301 | D5 0975BEAUFORT | PPUDHƏE BAY | STATION40 | SEDIMENT |
| *BB0023?J1 | 13 0975BEAUECRT | PRUDHOF BAY | STATION50 | SEDIMENT |
| *880013201 | 18 JS 75BEAUEORT | | STATION51 | SEDIMENT |
| *BBJJ24?01 | 13 0975BEAUFORT | PRUDHJE BAY | STATION51 | SEDIMENT |
| *B33322211 | 13 C975PFAUFORT | | STATION52 | SEDIMENT |
| ≪B8JJ11?J1 | UB D975BEAUEORT | | STATION53 | SEDIMENT |
| *880019?J1 | 12 09758EAUECRT | PRUDHOE BAY | STATION53 | SEDIMENT |
| ×B80014?01 | 08 0975BEAUEDRT | PRUCHDE BAY | STATION54 | SEDIMENT |
| *BB0012?J1 | 08 6975BEAUEORT | PRUDHDE BAY | STATION55 | SEDIMENT |
| *880020?J1 | 12 COTSBEAUEERT | PRUDHOF BAY | STATION55 | SEDIMENT |
| *B00026?01 | 13 05758EAUFORT | PRUDHOE PAY | STATION57 | SEDIMENT |
| *B30021301 | 12 J975BEAJECRT | | STATION70 | SEDIMENT |
| *880027?01 | 13 0975BEAUECRT | PRUDHUE BAY | STATION70 | SEDIMENT |
| ¥630∪22?∪1 | 12 0975BEAUFORT | 1 A 1 M 1 A 1 A 1 A 1 A 1 A 1 A 1 A 1 A | STATION71 | SEDIMENT |
| *580028?01 | 13 0975BEAUEORT | PRUDHOE BAY | STATION71 | SEDIMENT |
| *BBJJ29?J1 | 14 0975BEAUFORT | PRUDHOE BAY | STATION72 | SEDIMENT |
| *880030?01 | 14 C975BEAUFORT | PRUDHOE BAY | STATION73 | SEDIMENT |

.

Table II

SAMPLE LOCATION

.

| | SAMPLE | LOCATION | | | |
|---|--|------------|--|----------------|---------|
| | | | Sali- | Потто | |
| SAMPLE NO. | Latitude | Iongitude | Depth nity (m)_(⁰ /∞) | Temp. (C) | |
| ICE | | | | | |
| ×8₩0005202 | | 156-35.17W | <u> </u> | - | |
| *8WJUJ8?02 | | 156-48.48W | - 00.0 | - | |
| *BWJ039?02 | | 156-46.30W | <u> </u> | ··· ·· ·· ·· · | |
| *8W0040?02 | 71-18.85% | 156-43.37W | - 60.0 | | |
| WATER | | | | | |
| +BAU042?02 | 71-20.81% | 156-35.17W | 60.0 25.5 | -1.0 | |
| *BW0008?02 | | 156-42.18W | 01.0 25.5 | +2.0 | |
| *BW0043?02 | | 156-29.24W | 00.0 26.0 | -1.2 | |
| *8w0001?02 | | 156-32.17% | C1.0 26.0 | +3.0 | |
| *BWU002?02 | THE REPORT OF A DESCRIPTION OF A DESCRIP | 156-32.17W | 01.7 26.5 | +3.2 | |
| *8₩0005202 | | 155-2J.00W | 01.0 23.8 | -0.5 | |
| *8W0019?02 | • * *** *** *** *** *** *** *** **** | 156-32.17W | 01.0 18.3 | -0.5 | |
| *BW0035702 | | 156-32.17W | 01.0 22.0 | | |
| *BW0020?02 | 71-21.49N | | 61.0 18.2 | <0.0 | |
| *BWUUJ6?u2 | | 156-26.19W | 01.0 22.2 | -0.5 | |
| *BWJ0J9302 | | 156-21.03w | 01.0 20.0 | -0.2 | |
| *8WJU21?32 | | 155-21.08W | 01.0 18.5 | <0.u | |
| *BWUU37?JZ | | 156-21.Jow | 01.0 22.2 | -0.5 | <u></u> |
| *BWJJ10?02 | | 156-21.74W | 01.0 20.5 | -0.2 | |
| *BWU022?J2 | | 156-21.74W | 01.0 18.8 | <0.0 | |
| *3w0041?02 | | 156-35.22W | 00.J 27.0 | -1.0 | |
| ≠8w0005?02 | | 156-15.79W | 01.0 17.0 | +2.0 | |
| *Bw0004?02 | | 156-00.000 | 01.0 22.5 | +2.0 | |
| | | 156-00.00W | J1.0 21.0 | +1.5 | |
| *Bw00011?02 | | 149-34.21W | 01.0 12.1 | +1.9 | 5 |
| *8w0J12?J2 | | 149-03.15W | 01.0 18.8 | +1.8 | |
| *3WUUZ8?U2 | | 148-27.53w | 01.0 17.8 | +2.5 | |
| *8WJ017?J2 | | 148-23.95W | 01.0 11.4 | -0.5 | |
| *BWUU13?U2 | | 148-22.06W | 01.0 20.0 | +1.5 | |
| *B#0029?02 | | 148-22.06W | $\frac{01.0}{01.0}$ 18.1 | +1.9 | |
| *BWU014?02 | | 148-19.35W | | | |
| *BW0023?02 | | 148-19.35% | | | |
| *BW0018?02 | | 148-26.05W | | -0.4 | |
| *8WUJ15?02 | | 148-2J.02W | 01.0 	0.01 | | |
| *8WJU16?02 | | 148-20.02W | | -0.4 | |
| *BWJJ24?J2 | A second s | 148-20.02W | ALCOME IN MERICAN COMPANY OF THE CARD CARD CARD CARD CARD. A 1999 AND 1999 | +1.5 | ····· |
| *8WJU25?U2 | | 148-23.84W | | +1.5 | |
| *BW0030?02 | | 148-21.45% | C1.0 16.2 | +2.2 | |
| | | 148-22.29W | 01.0 20.0 | +1.0 | |
| *BW0J31?02 | | 148-22.29W | 01.0 18.5 | +1.5 | |
| | | 148-23.47W | Cl.C 21.5 | +0.5 | |
| An and the second se | | 148-23.47 | J1.0 20.2 | +0.3 | |
| | | 148-25.96W | 01.0 16.0 | +1.9 | |
| *840034?02 | | 148-27.26w | 01.0 15.8 | +2.3 | |
| 2.1003 1102 | tas ar # -* / ? | | 0140 1240 | | |

Table II (cont'd)

| ······ | | | · · · · | | | |
|---------------------|-------------------|------------|---------|------|---------------|--|
| SEDIMENT | | | | | | |
| *BBJJ001?J2 | 71-21.221 | 156-32.17W | 03.7 | | +3.0 | |
| *BBJJJJ2?02 | 71-21.220 | | 02.3 | | +3.2 | |
| #BBJJ015?02 | 71-21.224 | | 02.3 | ••• | | · · · · · · · · · · · · · · · · · · · |
| *BB0031?02 | 71-21.221 | | 02.0 | - | -0.5 | |
| *BBJJ16?02 | 71-21.49N | 156-26.19W | J2.0 | | | |
| *BB0032?02 | 71-21.49N | 156-26.19W | 02.3 | | -0 . 5 | |
| *8BUJJ7?UZ | 71-21.55N | 156-21.J8W | 11.3 | | | |
| *BBJJ177J2 | 71-21.55N | | 11.3 | | | |
| *BBJJ08202 | 71-22.13N | 156-21.74W | 08.6 | | | |
| *880018?02 | 71-22.13N | 156-21.74W | 0.81 | | | |
| *680033 ? 02 | 71-21.55N | | C2 • 3 | - | -0.5 | |
| <u>*88∪003?u2</u> | | 156-20.00W | 39.3 | — | | |
| *880005?02 | | 156-15.79W | 03.5 | 17.C | +2.0 | |
| #BB0004?02 | 71-15.70M | | 32.0 | 22.8 | | |
| *BB0006?02 | 71-15.70N | | 03.3 | - | +1.5 | |
| *880009?02 | 70-30.6CN | | 02.0 | | +2.9 | |
| *BBU010?02 | 70-26.50N | | 62.6 | | +1.8 | |
| *B80023?02 | | 148-27.53W | 31.7 | 17.5 | +2.3 | |
| *B30013?02 | | 148-23.95W | 02.7 | 19.8 | -0.2 | |
| *BBJJJ24?02 | | 148-23.95W | 02+3 | 19.3 | +2.2 | |
| *89002 5? 02 | 70-20.00N | 149-22.06W | 02.7 | 18.5 | +2.2 | |
| *BB0011302 | | 148-19.35 | 02.C | 19.2 | -0.8 | |
| *880019?02 | 70-19.14N | 148-19.35₩ | J2.7 | 19.5 | +1.0 | |
| #ઇઝŲ014?02 | 70-20.11% | 143-26.05w | 61.7 | 17.5 | -0.2 | |
| *383312?32 | 70-20.314 | | 02.3 | 19.8 | -0.4 | |
| #BBJJ2J?J2 | 76-20.314 | 148-20.02W | 03.3 | 20.0 | +1.5 | |
| *630026?02 | 70-22.901 | 148-21.454 | 01.7 | 15.2 | +1.8 | |
| *B80021302 | 70-24.53N | | 03.0 | 21.0 | +1.0 | |
| #BBJJ27?02 | 70-24.531 | | 06.7 | 21.5 | +0.3 | |
| *830022?02 | 70-26.57% | 148-23.47% | (7.7 | 22.5 | 0.0 | |
| *550025?02 | 70-26.57N | 148-23.471 | 06.3 | 21.3 | 0.0 | |
| *383029202 | 7 0-24.64M | 148-25.96₩ | 05.0 | 19.2 | +0.6 | |
| *630030?02 | 70-23.50% | 148-27.26W | 02.3 | 20.2 | +1.5 | ······································ |
| | | | | | | |

```
ATLAS OUESTION SET SEQUENTIAL
003001: Cells are spherical.
003005: Cells are pear-shaped.
003008; Cells are rod-shaped.
003011: Rod axis is curved in one plane.
003013: Rod axis is helical (spiral).
003016: Rods have tapered ends.
003017: Rods have rounded ends.
003018: Rods have square ends.
003023: Pleomorphic cells are characteristic.
003026: Longer axis of rod is less than twice the shorter
        axis (cocco-bacillary).
004031: Longest axis of each cell is less than 9.5 micrometer.
004002: Longest axis of each cell is 0.5 - 1 micrometer.
004003: Longest axis of each cell is 1.1 - 2.0 micrometers.
004004: Longest axis of each cell is 2.1 - 3.0 micrometers.
004005: Longest axis of each cell is 3.1 - 4.0 micrometers.
004006: Longest axis of each cell is 4.1 - 5.0 micrometers.
004007: Longest axis of each cell is 5.1 - 10 micrometers.
004008: Longest axis of each cell is 11 - 15 micrometers.
004009: Longest axis of each cell is 16 - 100 micrometers.
004011: Shortest axis of each cell is less than 0.5 micrometer.
004012: Shortest axis of each cell is 0.5 - 1 micrometer.
004013: Shortest axis of each cell is 1.1 - 2.0 micrometers.
004014: Shortest axis of each cell is 2.1 - 3.0 micrometers.
004015: Shortest axis of each cell is 3.1 - 4.0 micrometers.
004016: Shortest axis of each cell is 4.1 - 5.0 micrometers.
005004: Poly beta-hydroxybutyric acid inclusions in the cell.
005006: Poly metaphosphate inclusions (volutin) in the cell.
006001: Endospores produced (any refractile intracellular body capable
        of germination into a new vegetative cell).
006007: Endospore(s) central in sporangium.
006008: Endospore(s) terminal.
006014: Endospores wider than the vegetative cell (sporangium swollen).
008001: Cells branch.
011001: Capsule is present.
012009: Cells are acid fast by Ziehl-Neelsen method.
012014: Sudan black B reveals intracellular lipids (fat bodies) (also
        see Sections 5 and 21).
012021: Gram positive.
012022: Gram negative.
012023: Gram variable.
013001: Cells motile.
013004: Cells demonstrate creeping or gliding motility on a
        solid surface.
013009: Cells have flagella.
013010: Flagella polar.
013022: Flagella peritrichous.
013023: Two or more flagella of distinctly different appearance in
        different locations on the cell.
015001: Cells occur singly.
015002: Cells occur in pairs.
015003: Cells arranged in angular fashion after division (snapping).
015004: Cells occur in chains.
015005: Cells arranged in irregular aggregates.
```

Table III (cont'd)

015006: Cells arranged in two-dimensional tetrads. 015007: Cells arranged in cubical packets (three-dimensional). 015017: Organisms filamentous, greater than 10 micrometers, if multicellular the organism has lit+le or no indentation at each septum (For branched filaments also see Section 8). 016005: Agar macro-colonies are translucent. 016006: Agar macro-colonies are transparent. 016007: Agar macro-colonies are opaque. 016008: Agar macro-colony margin is entire. 016009: Agar macro-colony margin is crose. 016010: Agar macro-colony margin is filamentous (rhizoid). 016015: Agar macro-colony is convoluted. 016015: Agar macro-colony is flat (membranous). 016017: Agar macro-colony is raised but not convex. 016018; Agar macro-colonv is umbonate. 016019: Colony swarming is exhibited on agar (dispersion of individual members of a population due to active motility). 016023: Colony consistency is viscid (mucoid). 016027: Colony surface is glistening. 016028: Colony surface is dull (matte). 016030: Colony surface is smooth. 016031: Colony surface is rough. 016043: Floccular growth in liquid culture. 016044: Ring growth on the wall of the tube in liquid culture. 016046: Pellicle in liquid culture. 016053: Growth takes place at an initial pH of 9.0. 016054: Growth takes place at an initial pH of 7.0. 016055: Growth takes place at an initial pH of 6.0. 016056: Growth takes place at an initial pH of 5.0. 016057: Growth takes place at an initial pH of 4.0. 016060: In 1.5-2.0% previously solidified agar, inoculated by stab, growth is confined to the surface or a depth from the surface of approximately no greater than 1 mm. (i.e., an obligate aerobe) 016062: In 1.5-2.0% previously solidified agar, inoculated by stab, growth begins BELOW THE SURFACE when incubated in air. 016063: In 1.5-2.0% previously solidified agar, inoculated by seeding or by stab, incubated in air, growth is largely confined to a linear dimension of approximately 5 cm from the bottom of the tube in a 16 x 150 mm tube filled with medium to a depth of 9-10 cm. (i.e., obligate anaerobe) 016136: Molecular nitrogen can be used as the sole source of nitrogen. 016137: Ammonium salts can serve as the sole source of nitrogen for growth. 016138: Nitrate can serve as the sole source of nitrogen for growth. 016139: Ni+rite can serve as the sole source of nitrogen for growth. 016187: Growth takes place at an initial pH of 8.0. 016189: Agar macro-colony is convex. 016190: Turbidity of liquid culture is evenly dispersed. 016194: Growth takes place at an initial pH of 10.0. 016206; Maximum turbidity in liquid cultures is slight. 016207: Maximum turbidity in liquid cultures is moderate. 016208: Maximum turbidity in liquid cultures is heavy. 016212: At least one vitamin (growth factor) is required for growth. 016249: Urea can be used as the sole source of nitrogen. 016347: Urea can be used as the sole source of carbon and nitrogen. 016357: Isolated agar colonies are less than 1 mm. diameter within ten days. 016358: Isolated agar colonies are 1-2 mm diameter within ten days. 016359: Isolated agar colonies are 2-6 mm diameter within ten days. 016361: Agar macro-colony margin is lobate.

TOOLG TIT (COLL O)

016362: Agar macro-colony margin is undulate. 016363: Colony spreading is exhibited on agar (growth extends several millimeters or more beyond the point of innoculation). C16369: Golling agent (eq., agar) is required for growth. 017011: Growth at C C. 017012: Growth at 10 C. 017013: Growth at 15 C. 017014: Growth at 25 C. 017015: Growth at 37 C. 017032: Growth at 5 C. 017037: Growth at 20 C. 017045: Growth at 43 C. 018003: Growth in the presence of 0.5% NaCl. 018004: Growth in the presence of 3% NaCl. 018006: Growth in the presence of 5% NaCl. 018008: Growth in the presence of 10% NaCl. 018009: Growth in the presence of 15% NaCl. 018022: Growth in the presence of 7.5% NaCl. 018028: Added NaCl is required for growth. 019001: Sensitive to ampicillin concentration (disc) 2 ugm. 019021: Sensitive to bacitracin concentration (disc) 2 units. 019043: Sensitive to chloromycetin (chloramphenicol) concentration (disc) 5 ugm. 019044: Sensitive to chloromycetin (chloramphenicol) concentration (disc) 30 ugm. 019063: Sensitive to chlortetracycline (aureomycin) concentration (disc) 30 ugm. 019064: Sensitive to colistin concentration (disc) 2 ugm. 019065: Sensitive to colistic concentration (disc) 10 ugm. 019084: Sensitive to 2,4-diamino-6,7-diisopropylpteridine (0/129 vibriostat) crystals on agar. 019085: Sensitive to ervthromycin (ilotycin) concentration (disc) 2 ugm. 019086: Sensitive to erythromycin (ilotycin) concentration (disc) 15 u.am. 019105: Sensitive to kanamycin concentration (disc) 5 ugm. 019106: Sensitive to kanagycin concentration (disc) 30 ugm. 019129: Sensitive to nalidixic acid concentration (disc) 30 ugm. 019148: Sensitive to neomycin (mycifradin) concentration (disc) 5 ugm. 019149: Sensitive to neomycin (mycifradin) concentration (disc) 30 ugm. 019168: Sensitive to nitrofurantoin concentration (disc) 100 ugm. 019169: Sensitive to nitrofurantoin concentration (disc) 300 ugm. 019188: Sensitive to novobiocin (albanycin) concentration (disc) 30 ugm. 019208: Sensitive to oxytetracycline (tetramycin, terramycin) concentration (disc) 30 ugm. 019210: Sensitive to penicillin G concentration (disc) 2 units. 019211: Sensitive to penicillin G concentration (disc) 10 units. 019230: Sensitive to polymyxin B (aerosporin) concentration (disc) 50 units. 019231: Sensitive to polymyxin B (aerosporin) concentration (disc) 300 units. 019233: Sensitive to streptomycin concentration (disc) 2.0 ugm. 019235: Sensitive to streptomycin concentration (disc) 10 ugm. 019274: Sensitive to tetracycline (achromycin) concentration (disc) 5 u gm. 019275: Sensitive to tetracycline (achromycin) concentration (disc) 30 ugm. 019294: Sensitive to triple sulfa (sulfadiazine/sulfamethazine/ sulfamerazine) concentration (disc) 1 mgm. 019297: Sensitive to vancocyn (vancomycin) concentration (disc) 30.0 ugm. 019374: Sensitive to gentamicin concentration (disc) 10 ugm. 26

Table III (cont'd)

019430: Sensitive to ampicillin concentration (disc) 10 ugm. 019484: Sensitive to chlortetracycline (aureomycin) concentration (disc) 5 ugm. 019486: Sensitive to novobiocin (albamycin) concentration (disc) 5 ugm. 020001: Colonies are pure (paper) white on solid medium. 020002: Colonies are gray on solid medium. 020007: Colonies luminescent in the dark. 020019: Diffusible (water-soluble) pigments are produced. 020020: Diffusible blue pigments are produced. 020021: Diffusible yellow pigments are produced. 020022: Diffusible green pigments are produced. 020023: Diffusible red pigments are produced. 020024: Diffusible orange pigments are produced. 020025: Diffusible violet (purple) pigments are produced. 020026: Diffusible brown pigments are produced. 020027: Diffusible black pigments are produced. 020038: Non-diffusible red pigments are produced. 020039: Non-diffusible brown pigments are produced. 020040: Non-diffusible green pigments are produced. 020041: Non-diffusible violet (purple) pigments are produced. 020042: Non-diffusible blue pigments are produced. 020043: Non-diffusible golden (yellow) pigments are produced. 020044: Non-diffusible orange pigments are produced. 020057: Non-diffusible black pigments are produced. 020058: Colonies fluoresce with short wavelength ultraviolet light (ca. 260 nm.). 020060: Fluorescent pigment observable with short wavelength ultraviolet light (ca. 260 nm.). 020080: Non-diffusible pigment occurs only in the center of the colony. 020081: Non-diffusible pigment occurs in concentric rings within the colonv. 024004: Agar is hydrolyzed (liquefied). 024005: Carrageenin is degraded. 024007: Casein is hydrolyzed (peptonized). 024009: Gelatin is hydrolyzed (liquefied). 024011: Pectin is hydrolyzed. 024014: D-Glucose catabolized aerobically. 024015: D-Glucose catabolized anaerobically. 024114: Tryptophan yields indole. 024135: Ammonia is produced. 024138: Nitrate is reduced. 024139: Nitrate is reduced to nitrite. 024140: Nitrite is reduced to nitrogen gas. 024149: Thiosulfate is reduced to hydrogen sulfide. 024154: Hydrogen sulfide is produced from cysteine. 024164: Hydrogen peroxide is decomposed. 024185: Methyl red test is positive. 024191: Voges-Proskauer test positive (also see question 35). 024199: Sheep blood hemolysis is beta. 024210: Nitrite is reduced. 024212: L-Arginine utilization results in basic endproducts (medium becomes alkaline). 024248: Kovacs' oxidase test positive (smear from colony turns dark purple with tetramethylparaphenylenediamine dihydrochloride). 024251: Hydrogen sulfide is produced from peptones. 024448: Nitrite is reduced to nitrous oxide. 024449: Nitrate is reduced to nitric oxide. 025007: L-Arabinose is utilized. 025010: D-Ribose is utilized. 025012: D-Xylose is utilized. 025017: L-Phamnose is utilized.

025019: D-Fructose is utilized. 025020: D-Galactose is utilized. 025021: D-Glucose is utilized (also see Section 24). 025022: D-Mannose is utilized. 0.250.23: L-Sorbose is utilized. 025036: Salicin is utilized. 025037: Cellobiose is utilized. 025038: Lactose is utilized. 025039: Maltose is utilized. 025041: Sucrose is utilized. 025042: Trehalose is utilized. 025044: Raffinose is utilized. 025053: Alginic Acid is utilized. 0 25 184: Acid produced from D-Ribose. 025193: Acid produced from D-Fructose. 025194: Acid produced from D-Galactose. 025195: Acid produced from D-Glucose (also see Section 24). 025196: Acid produced from D-Mannose. 025211: Acid produced from Cellobiose. 025212: Acid produced from Lactose. 025213: Acid produced from Maltose. 025215: Acid produced from Sucrose. 025216: Acid produced from Trehalose. 025242: Gas produced from D-Ribose. 025251: Gas produced from D-Fructose. 025252: Gas produced from D-Galactose. 025253: Gas produced from D-Glucose (also see Section 24). 025254: Gas produced from D-Mannose. 025269: Gas produced from Cellobiose. 025270: Gas produced from Lactose. 025271: Gas produced from Maltose. 025273: Gas produced from Sucrose. 025274: Gas produced from Trehalose. 025300: D-Fibose can be used as the sole source of carbon. 025309: D-Fructose can be used as the sole source of carbon. 025311: D-Glucose can be used as the sole source of carbon (also 025312: Mannose can serve as the sole source of carbon. see Section 24). 0253 41: Cellulose is.hydrolyzed. 025352: Chitin is hydrolyzed. 025357: Starch is hydrolyzed. 026002: Allv1 Alcohol is utilized. 026003: 1-Butanol is utilized. 026005: Ethanol is utilized. 026014: 1-Propanol is utilized. 026015: 2-Propanol is utilized. 026039: D(-) 1, 2-Propanediol is utilized. 026045: 1,2,3-Propanetriol (Glycerol) is utilized. 026052: D-Arabitol is utilized. 026057: Dulcitol is utilized. 026065: D-Mannitol is utilized. 026068: D-Sorbitol is utilized. 026075: Cyclohexanol is utilized. 026079: Meso-Inositol is utilized. 026089: Phenol is utilized. 026351: Acid is produced from 1,2,3-Propanetriol (Glycerol). 026363: Acid is produced from Dulcitol. 026371: Acid is produced from D-Mannitol. 026453: Gas is produced from 1,2,3-Propanetriol (Glycerol). 026465: Gas is produced from Dulcitol. 026473: Gas is produced from D-Mannitol. 28

026555: 1,2,3-Propanetriol (Glycerol) can be used as the sole source of carbon. 026625: 2-Phenylethanol is utilized. 026631: 1-Hexadecanol is utilized. 028002: Acetic acid is utilized. 028003: Butyric acid is utilized. 028004: Caproic acid is utilized. 028005: Caprylic acid is utilized. 028008: Isovaleric acid is utilized. 028009: Lauric acid is utilized. 028011: Palmitic acid is utilized. 028013: Propionic acid is utilized. 028016: Valeric acid (pentanoic acid) is utilized. 028021: Glutaric acid is utilized. 028022: Malonic acid is utilized. 028027: Succinic acid is utilized. 028037: Oleic acid is utilized. 028045: Fumaric acid is utilized. 028046: Itaconic acid is utilized. 028047: Maleic acid is utilized. 028052: DL-Glyceric acid is utilized. 028054: Beta-hydroxybutyric acid is utilized. 028057: DL-Lactic acid is utilized. 028061: Mucic acid is utilized. 028064: L(+) Tartaric acid is utilized. 028066: Citric acid is utilized. 028068: 2-Ketogluconic acid is utilized. 028071: Pyruvic acid is utilized. 028072: Alpha-ketoglutaric acid is utilized. 028078: Benzoic acid is utilized. 028079: Meta-Hydroxybenzoic acid is utilized. 028080: Para-Hydroxybenzoic acid is utilized. 028097: Ascorbic acid is utilized. 028099: Galacturonic acid is utilized. 028101: D-Gluconic acid is utilized. 028105: Ortho-Hydroxybenzoic acid is utilized. 028107: Saccharic acid acid is utilized. 028109: Acetic acid can be used as the sole source of carbon. 028134: Succinic acid can be used as the sole source of carbon. 028152: Fumaric acid can be used as the sole source of carbon. 028161: Beta-hydroxybutyric acid can be used as the sole source of carbon. 028164: DL-Lactic acid can be used as the sole source of carbon. 028178: Pyruvic acid can be used as the sole source of carbon. 028179: Alpha-ketoglutaric acid can be used as the sole source of carbon. 028208: D-Gluconic acid can be used as the sole source of carbon. 028662: Stearic acid is utilized. 028668: Cyclohexane carboxylic acid is utilized. 029003: L-Alanine is utilized. 029004: Beta-Alanine is utilized. 029008: Gamma-Aminobutyric Acid is utilized. 029013: L-Arginine is utilized. 029015: L-Asparagine is utilized. 029016: L-Aspartic Acid is utilized. 029017: Betaine is utilized. 029020: L-Cysteine is utilized. 029021: L-Cystine is utilized. 029023: L-Glutamic Acid is utilized. 029024: Glycine is utilized. 029025: Hippurate is utilized.

029026: L-Mistidine is utilized. 029030: L-Leucine is utilized. 029032: L-Iso-Leucine is utilized. 029035: L-Lysine is utilized. 029036: L-Methionine is utilized. 029037: L-Ornithine is utilized. 029039: L-Phenylalanine is utilized. 029041: L-Proline is utilized. 029042: Sarcosine is utilized. 029044: L-Serine is utilized. 029045: L-Threonine is utilized. 029047: L-Tryptophan is utilized. 029049: L-Tyrosine is utilized. 029051: L-Valine is utilized. 029118: L-Aspartic Acid can be used as the sole source of carbon. 029125: L-Glutamic Acid can be used as the sole source of carbon. 029137: L-Lysine can be used as the sole source of carbon. 029149: L-Tryptophan can be used as the sole source of carbon. 029156: L-Alanine can be used as the sole source of nitrogen. 029166: L-Arginine can be used as the sole source of nitrogen. 029168: L-Asparagine can be used as the sole source of nitrogen. 029169: L-Aspartic Acid can be used as the sole source of nitrogen. 029173: L-Cysteine can be used as the sole source of nitrogen. 029174: L-Cystine can be used as the sole source of nitrogen. 029176: L-Glutamic Acid can be used as the sole source of nitrogen. 029177: Glycine can be used as the sole source of nitrogen. 029179: L-Histidine can be used as the sole source of nitrogen. 029183: L-Leucine can be used as the sole source of nitrogen. 029185: L-Iso-Leucine can be used as the sole source of nitrogen. 029188: L-Lysine can be used as the sole source of nitrogen. 029189: L-Methionine can be used as the sole source of nitrogen. 029192: L-Phenvlalanine can be used as the sole source of nitrogen. 029194: L-Proline can be used as the sole source of nitrogen. 029197: L-Serine can be used as the sole source of nitrogen. 029198: L-Threonine can be used as the sole source of nitrogen. 029200: L-Tryptophan can be used as the sole source of nitrogen. 029202: L-Tyrosine can be used as the sole source of nitrogen. 029204: L-Valine can be used as the sole source of nitrogen. 029294: L-Phenylalanine is deaminated. 029302: L-Tryptophan is dearinated. 029319: L-Arginine is decarboxylated. 029341: L-Lysine is decarboxylated. 029343: L-Ornithine is decarboxylated. 029620: DL-Carnitine is utilized. 030003: Alpha-Amylamine is utilized. 030012: Ethanolamine is utilized. 030015: Histamine is utilized. 030025: Putrescine is utilized. 030028: Tryptamine is utilized. 030031: Allantoin is utilized. 030144: Ethanolamine can be used as the sole source of nitrogen. 030147: Histamine can be used as the sole source of nitrogen. 030162: Allantoin can be used as the sole source of nitrogen. 030377: N-Acetylglucoseamine is utilized. 030399: Guanine is utilized. 030401: Guanine can be used as the sole source of nitrogen. 030413: Thymine is utilized. 030415: Thymine can be used as the sole source of nitrogen. 030474: Taurine is utilized. 031093: Cyclohexanone can be used as the sole source of carbon. 031101: N-Decane is utilized.

031102: N-Docosane is utilized. 031103: N-Podecane is utilized. 031104: N-Ficosane is utilized. 031106: N-Neptadecane is utilized. 031107: N-Hoptane is utilized. 031108: N-Hexadecane is utilized. 031111: N-Nonadecane is utilized. 031112: N-Monane is utilized. 031113: N-Octadecane is utilized. 031114: N-Octane is utilized. 031115: N-Pentadecane is utilized. 031118: N-Tetradecane is utilized. 031119: N-Tridecane is utilized. 031120: N-Undecane is utilized. 031127: 3-Methyl Hexane is utilized. 031136: Cyclohexane is utilized. 031137: Cis-Decalin is utilized. 031144: 1-Octadecene is utilized. 031158: Anthracene is utilized. 031160: N-Butylbenzene is utilized. 031161: P-Cymene is utilized. 031162: N-Dodecylbenzene is utilized. C31163: Ethylbenzene is utilized. 031165: 2-Methylnapththalene is utilized. 031166: 1-Methylnapththalene is utilized. 031169: Naphthalene is utilized. 031171: Phenanthrene is utilized. 031172: Omega-Phenyldecane is utilized. 031174: 3-Phenyleicosane is utilized. 031175: Omega-Phenyloctadecane is utilized. 031176: Pseudocumeno is utilized. 031178: Toluene is utilized. 031179: Xylene is utilized. 031590: Pristane (2,6,10,14-Tetra-methylpentadecane) is utilized. 031602: Pentadecylcyclohexane is utilized. 031608: N-Triacontane is utilized. 031614: N-Dotriacontane is utilized. 031620: N-Hexatriacontane is utilized. 031626: 2-Methylbutane is utilized. 031632: 2,2,4-Trimethylpentane is utilized. 031638: 2,2,4,4,6,8,8-Heptamethylnonane is utilized. 031644: 2-Methylundecane is utilized. 031650: Methylcyclohexane is utilized. 031656: Methylcyclopentane is utilized. 031662: 1,2-Dimethylcyclohexane is utilized. 031669: 1,4-Dimethylcyclohexane is utilized. 031674: Ethylcyclohexane is utilized. 031680: Octylcyclohexane is utilized. 031686: Dicyclohexyl is utilized. 031692: 4-Tert Butylbenzene is utilized. 031698: 1,2,3,4-Tetramethylbenzene (prehnitene) is utilized. 031704: 1-Phonyltridecane is utilized. 031710: Diphenylmethane is utilized. 031716: 1,3,5-Triphenylbenzene is utilized. 031722: 2-Ethylnaphthalene is utilized. 031728: 2,3-Dimethylnaphthalene is utilized. 031734: 2,6-Dimethylnaphthalene is utilized. 031740: 1,2,3,4-Tetrahydronaphthalene is utilized. 031746: Acenaphthalene is utilized. 031752: 9-Methylanthracene is utilized. 031758: 1-Methylphenanthrene is utilized.

031764: N-Tetracosane is utilized. 031770: 1-Pentadecene is utilized. 031776: 2,2,4,6,6-Pentamethylheptane is utilized. 031782: 1-Phonylheptane is utilized. 031788: N-Octocosane is utilized. 031794: 2,2,4,6,6-Pentamothyl-3-heptene is utilized. 031800: 1-Phenyl-3,4 dihydronaphthalene is utilized. 031806: 1-Phenylnaphthalene is utilized. 031812: 1-Phenyl-1-cyclohexene is utilized. 031819; Chrysene (1,2-Benzphenanthrene) is utilized. 031824: Pyrene (Benzo-phenanthrene) is utilized. 031830: Triphenylene (9,10 Benzphenanthrene) is utilized. 031836: Isopropylcyclohexane is utilized. 032020: Tween 20 is hydrolyzed. 032023: Tween 80 is hydrolyzed. 034137: Alkaline phosphatase (3.1.3.1) is produced. 034143: Urease (3.5.1.5) is produced. 040331: Sensitive to oxytetracycline (tetramycin, terramycin) concentration (disc) 5 ugm. 098001: Non-diffusible pink pigments are produced. 098002: D-Ribose is utilized when yeast extract and amino acids are added. 098003: D-Glucose is utilized when yeast extract and amino acids are added. 098004: D-Fructose is utilized when yeast extract and amino acids are added. 098005: D-Gluconate is utilized when yeast extract and amino acids are added. 098006: Pyruvate is utilized when yeast extract and amino acids are added. 098007: Acetate is utilized when yeast extract and amino acids are added. 098008: Succinate is utilized when yeast extract and amino acids are added. 098009: Lactate is utilized when yeast extract and amino acids added. 098010: Alpha-Ketoglutarate is utilized when yeast extract and amino acids are added. 098011: Glycerol is utilized when yeast extract and amino acids are added. 098012: Beta-Hydroxybutyrate is utilized when yeast extract and amino acids are added. 098013: L-Aspartate is utilized when yeast extract and amino acids are added. 098014: L-Glutamate is utilized when yeast extract and amino acids ARE ADDED. 098015: L-Tryptophan is utilized when yeast extract and amino acids are utilized. 098016: L-Lysine is utilized when yeast extract and amino acids are utilized. 098017: Peptone is utilized. 098018: Proteose peptone #3 is utilized. 098019: Tryptone is utilized. 098020: Phytone is utilized. 098021: Peptone is utilized when yeast extract and amino acids are added. 098022: Proteose peptone #3 is utilized when yeast extract and amino acids are added. 098023: Tryptone is utilized when yeast extract and amino acids are utilized.

098024: Peptone can serve as sole source of carbon.

Table III (cont'd)

098025: Proteose peptone #3 can serve as sole source of carbon. 098026: Tryptone can sere as sole source of carbon. 098027: Unknown growth factors are required.

098028: Yeast extract plus amino acids plus vitamins serve as growth factors.

098029: Vitamins can serve as growth factor.

Table IV

LITERATURE REVIEW

Marine Microorganisms - General

Colwell, R.R. 1974. Effect of the Ocean Environment on Microbial Activities. University Park Press, University Park, Pa.

Symposium on Marine Microbiology. 1963. Carl H. Oppenheimer [ed.] Charles C. Thomas, Publisher, Springfield, Ill.

Wood, F.E. 1967. Microbiology of Oceans and Estuaries. Oceanography Series, Vol.3. American Elsevier, New York.

Microorganisms - Beaufort Sea

Boyd, W.L., and J.W. Boyd. 1963. Enumeration of marine bacteria of the Chukchi Sea. Limnol. Oceanogr. 8:343-348.

Bursa, A. 1963. Phytoplankton in coastal waters of the Arctic Ocean at Point Barrow, Alaska. Arctic 16:239-262.

George, R.Y., and A.Z. Paul. 1970. USC-FSU biological investigations from the Fletcher's Ice Island T-3 on deep-sea and under-ice benthos of the Arctic Ocean. Univ. S. Calif. Tech. Rep. 1:1-69.

Horner, R.A. 1972. Ecological studies on Arctic sea ice organisms. NTIS Report AD-767-939-2. 182 p.

Horner, Rita, and V. Alexander. 1972. Algal populations in Arctic sea ice: an investigation of heterotrophy. Limnol. and Oceanogr. 17:454-458.

Petroleum Biodegradation - General

Atlas, R.M., and R. Bartha. 1973. Fate and effects of polluting petroleum on the marine enviormment. Residue Reviews 49:49-85.

Beerstecher, E. 1954. Petroleum Microbiology. Elsevier Press, Inc., New York.

Davis, J.B. 1967. Petroleum Microbiology. Elsevier Publ. Co., New York.

Forster, J.W. 1962. Hydrocarbons as substrates for microorganisms. Antonie von Leeuwenhoek 28:251-274.

McKenna, E.J., and R.E. Kallio. 1965. Biology of hydrocarbons. Ann. Rev. Microbiol. 19:183-206.

National Academy of Science. 1975. Petroleum on the Marine Environment. Workshop on Inputs, Fates and the Effects of Petroleum on the Marine Environment, May 21-25, 1975, under the auspices of the Ocean Affairs Board, Commission on Natural Resources, National Research Council, National Academy of Science, Washington, D.C.

ZoBell, C.E. 1946. Action of microorganisms on hydrocarbons. Bacteriol. Reviews 10:1-49.

ZoBell, C.E. 1973. Microbial degradation of oil: present status, problems, and perspectives. In The Microbial Degradation of Oil Pollutants, D.G. Ahearn and S.P. Meyers [eds.]. Louisiana State University, Center for Wetland Resources, Publication No. LSU-SG-73-01. Baton Rouge, La. p. 3-60. Petroleum Biodegradation - Beaufort Sea

- Arhelger, S., and D.K. Button. 1962. Hydrocarbon biodegradation the Arctic. In Baseline Data Study of the Alaskan Arctic Aquatic Environment, P.J. Kinney, D.M. Schell, V. Alexander, D.C. Burrell, R. Cooney, and A.S. Naidu [eds.]. Institute of Marine Science Report R72-3. University of Alaska, Fairbanks, p.231-244.
- Atlas, R.M. 1975. Microbial degradation of petroleum pollutants in marine environments. Proceedings of the First International Congress of IAMS, Vol.2. p.527-531.
- Atlas, R.M., and M. Busdosh. 1975. Microbial degradation of petroleum of petroleum in the Arctic. Paper presented: Third International Biodegradation Symposium, August 17-23, 1975. Univ. of Rhode Island, Kingston, R.I.
- Atlas, R.M., and Schofield, E.A. 1975. Petroleum biodegradation in the Arctic. In Impact of the Use of Microorganisms on the Aquatic Environment. Ecological Research Series, EPA-660/3-75-001. Environmental Protection Agency, Corvallis, Ore. pp.183-198.
- Atlas, R.M., E.A. Schofield, F.A. Morelli, and R.E. Cameron. 1976. Effects of petroleum pollutants on Arctic microbial populations. Environ. Pollut. 10:35-43.
- Cook, F.D., and D.W.S. Westlake. 1974. Microbiological degradation of northern cruide oils. Task Force on Northern Oil Development Report 74-1. Information Canada Catalog R72-12774.
- Cundell, A.M., and R.W. Traxler. 1974. Hydrocarbon degrading bacteria associated with Arctic oil seeps. Dev. Ind. Microbiol. 15:250-255.
- Westlake, D.W.S., A. Jobson, R. Phillippe, and F.D. Cook. 1974. Biodegradability and crude oil composition. Can. J. Microbiol. 20: 915-928.
- ZoBell, C.E. 1973. Bacterial degradation of mineral oils at low temperatures. In The Microbial Degradation of Oil Pollutants, D.G. Ahearn and S.P. Meyers [eds.]. Louisiana State University, Center for Wetland Resources Publication LSU-SG-73-01. Baton Rouge, La. p.153-161.

Table V

NUTRIENT ANALYSES

| SAMPLE NO. | PO4-P | NH3-N | NO3-N | SIQ2-SI | |
|-------------|-----------------|---------------|---------------|---|---------------------------------------|
| WATER | - | | | | |
| 3800042205 | 05.92 |)). 6 | 01.5 | 010.0 | |
| 3400008203 | 64.85 | CÜ.6 | Cl.1 | 307.0 | |
| 3000043203 | 05.49 | (β.5 | 60.9 | 009.0 | |
| 3000012?03 | 39.16 | 03.3 | 02.0 | 007.0 | |
| 505000WB | 00.64 | JJ.4 | 01.2 | 007.0 | |
| 3000019303 | -28 - 36 | 01.8 | C1.3 | 013.0 | |
| 3₩00035203 | 03.54 | 60.4 | Cu.6 | 005.0 | |
| 3800023203 | 94.12 | J.5 | 01.5 | 0.830 | |
| 3400036203 | 04.00 | 0).4 | 00.6 | CO6.Ŭ | |
| 3400009303 | J1.32 | 00.5 | 13.0 | 040.0 | |
| BWQUO21?03 | .2.74 | 4 | | <u> </u> | |
| 50515000B | 05.63 | J.N | 01.9 | 0 09. 0 | |
| 300010?03 | 03.05 | LU.5 | 03.2 | 015.0 | |
| 3800022200 | 34.81 | JJ . 3 | 01.0 | 667.0 | |
| 3₩00041203 | 04.29 | 00.3 | 64.6 | 015.0 | |
| 64JUJU262U3 | J4 • 76 | 52.3 | C1.5 | CC6.0 | |
| 80000 4203 | 7 • 42 | 3.9 | 1.2 | 5.5 | |
| 38000 7203 | 3.20 | 0.8 | 1.1 | 6.5 | |
| BWJCJ11703 | 01.70 | 00.4 | 01.4 | _010.0 J | |
| 3444426363 | 00.49 | 05.2 | 01.3 | 011.0 | |
| 3000017203 | JÛ.35 | 66.6 | € 1 •6 | 019.0 | |
| 5055100kE | 00.35 |) (O | 92 .7 | C17.0 | |
| BW60029203 |) 0.7 8 | 02•2 | 00.6 | 012.0 | |
| 3000014203 | 0 0.5 3 | ().2 | 01.1 | 017.0 | |
| 3W00U23?U3 | 00.63 | J _ _4 | 01-1 | 615.6 | |
| 2400010202 | ∪ €.43 | C0.4 | C1.2 | C18.0 | |
| 3000015203 | 01.12 | CJ.5 | Ú1.1 | 610.0 | · · · · · · · · · |
| BUDDUL6203 | 16.43 | 00.6 | 01.7 | 619.0 | |
| 3000024?03 | 00.33 | C0.4 | <u>c1.1</u> | <u>ــــــــــــــــــــــــــــــــــــ</u> | · · · · · · · · · · · · · · · · · · · |
| 300025703 | 01.39 | 03.1 | 00.6 | 011.0 | |
| 1400030503 | 01.19 | 00.2 | 31.2 | 612.0 | |
| 3W00026203 | J1.63 | C0.6 | 61.6 | ୦ 12.ି | |
| BMOOOBISOS | 02.00 | 00.6 | 01.3 | 012.0 | |
| | 02.32 | 00.2 | 00.8 | 011.0 | |
| 3WJJJJ32203 | 01.55 | 30.6 | C1.4 | 611.0 | |
| BWJJJ33?JJ | 00.69 | 03.2 | J1.1 | 013.0 | |
| 3000034203 | 33.46 | 33.5 | 01.2 | 612.0 | |
| | | · · · · | | | · · · · · · · · · · · · · · · · · · · |
| | | | | | |
| SEDIMENT | | | | | |
| 8800001203 | 33.31 | 00.5 | 01.1 | 004.0 | |
| 3300010203 | 01.38 | 33.8 | 01.5 | € 11 .0 | · · · |
| | | | | | |

Table VI

DIRECT COUNT

| SAMPLE NO. | CUUNT | CENDITIONS |
|----------------------------------|----------------|---|
| ICE | | |
| *8WJ005204 | - | |
| *BWJ 338?U4 | 8.1F5 | |
| *BWU039?04 | 1.356 | |
| *BWUU40704 | 1.256 | |
| | | |
| | | |
| WATER | | |
| *8W0342?u+ | 7.2:5 | |
| *B₩0508?04 | | |
| *BWU043?J4 | | |
| *BWUUU1?04 | | · · · · · · · · · · · · · · · · · · · |
| *BWJJJJ2?J4 | | |
| *BW0003?04 | | ana an |
| *800019204 | 7.5ES | |
| *BWJJ35?04 | 3.155 | |
| *Bw0020?04 | 5.8E5 4.1E5 | |
| <u>*8₩JJJ6?04</u> *8₩JUJJ9?04 | 5,465 | ······································ |
| ×8₩0021?04 | 2.45 | |
| *BWJJ37?04 | 3.45 | ,, • • · · · · · · · · · · · · · · · · · |
| *8W0010?04 | 1.4±6 | |
| *3W0022?04 | 2.155 | an a |
| *8W0J41?04 | 1.186 | |
| *8w0005?04 | | · · · · · · · · · · · · · · · · · · · |
| *8W0004?04 | | |
| *BWJJU72J4 | | , and a set of a set |
| *BW0011204 | 2.356 | |
| *BWJJ12?04 | 1.4£6 | |
| #8₩J028?04 | 4.985 | |
| *Bw0017?04 | 1.056 | |
| *BWUU13?04 | 5.625 | |
| ¥8WJ029?04 | 2.365 | |
| *BWUU14?u4 | 7.655 | |
| *BWUU23?04 | 6.855 | |
| * ₿₩0018?04 | 7.155 | and the second |
| *8WJ015?J4 | 4.126 | |
| *3WU016?U4 | 8.785 | <u>.</u> . |
| ≭3₩0024?04 | 4.2E5 | |
| *JWJJ25?J4 | 5.955 | ······································ |
| ×8WUJ3J?J4 | 6.7F5 | |
| *BNU026704 | 4.1E5 | |
| #BWU031?04 | 2.465 | |
| *3W0027204 | 3.855 | · · · · · · · · · · · · · · · · · · · |
| ¥8₩0032704 #₩₩93634904 | 4.305 7.405 | |
| *BW0033?04 | 7.485 1.266 | |
| *Bw0634?04 | Fe Sp c | |

Table VI (cont'd)

| SEDIMENT | |
|------------------------|-----------------|
| *880001204 | |
| *B30002204 | |
| *380015704 | 5.556 |
| *835331?04 | 2.5E7 |
| ¥BBDJ1o?J4 | 4.353 |
| *630632?04 | 9.3E7 |
| ¥₿₫ŬŪŪ7?Э4 | |
| ≪88J017?U4 | 5.957 |
| *880603204 | |
| *BBJJ13?04 | 3.258 |
| *68JQ33?Q4 | 1.987 |
| #BBDDD 3?0 4 | — |
| *BBJJJ5?J4 | |
| *B50004204 | |
| *880000704 | |
| ₹68000920 <u>4</u> | |
| *380010204 | |
| ₩BBJJZ3?04 | 9.257 |
| *880013304 | 1.4月7 |
| <u>+830024?04</u> | 5.257 |
| *BBJJ25?04 | 2 • 6£ 7 |
| *800011204 | 5.756 |
| # 850019?04 | 3.1E7 |
| *HdUJ14?J4 | 5.156 |
| ×83J(12?)4 | 9.756 |
| *830020204 | 7. 3E 6 |
| *885.20204 | 4.187 |
| <u>≉885021204</u> | 3.7F7 |
| *885527?54 | 1.7E7 |
| *865022?04 | 9.257 |
| *880028 2 04 | 2.3∈6 |
| *33322979+ | $1 \cdot 1 [7]$ |
| *88000020+ | 1.787 |

| and the second | |
|--|--|
| | |
| | |
| | |
| | |
| | |
| a a construction and the state of the second state of the second state of the second state of the second state | |
| | |
| | |
| | |

Table VII

AEROBIC HETEROTROPHIC PSYCHROPHILES AND PSYCHROTROPHS

| | | | | | 4 | | ····· |
|----------------------------|--------------------|------------|--------------------|----------|--|-----------------------------------|---|
| SAMPLE NO. | COUNT | ſ | CONCITION | .s | | | |
| ICE | | | | | | | ····, |
| *3&JJJ52U5 | 6.JF2 | 40 | AERCHIC | S | MARINE | 2216 | |
| | 3.363 | | AFFCHIU | | | | · · · · · · · · · · · · · · · · · · · |
| «3x0039?)5 | 2.384 | | AFREDIC | | | 2216 | |
| #BWUU40?U5 | 3.192 | | ALRENIC | | | | |
| | | | | | | | |
| <u></u> | | | | | | | |
| WATER | | | | | | | · |
| ¥3W0042?05 | 9.8FZ | U40 | AFRERIC | S | MARINE | 2216 | |
| *8WJJUJ8?05 | 7.782 | 040 | AFREDIC | 5 | MARINE | 2216 | |
| *3W0043205 | 1.753 | .)4C | AERCBIC | S | MARINE | 2216 | |
| *8wJJJ1?J> | 1.962 | .∋4C | AFRENIC | S | NAPINE | 2216 | |
| *8wuCu2?05 | 7.Jel | 40 | AERCAIC | S | MARINE | 2216 | |
| *8WUUU3?US | 4.853 | -4C | AEREGIC | | | 2216 | |
| *owJ019?05 | 6.163 | 646 | AEPEBIC | S | MARINE | 2216 | |
| *840035205 | 3.5F3 | -4C | AFREPIC | | NVEIVE | 2216 | |
| *BWJJ2U?US | 3.1E3 | 54C | AERCOIC | S | MARINE | 2216 | |
| *6ਗ਼ਗ਼ਗ਼36?05 | 1.453 | U40 | AFECAIC | - | MAPINE | 2216 | |
| *BWJ 309?JS | 3.4F2 | | AEFCBIC | | MARINE | 2216 | |
| *3WJJ21205 | 5.1E3 | | AFREBIC | | MARINE | 2216 | |
| *8w0037?05 | 7.122 | | AFREBIC | | MARINE | 2216 | |
| ≉เหพ≎ว1ว?บุวี | 1.5E3 | | АЕк⊂ЗІС | | MARINE | 2216 | |
| #3NUUZ2?05 | 1.3F3 | | 4+8C51C | | MARINE | 2216 | |
| *BaJ041?05 | 2.3E3 | | AERCHIC | | | 2216 | |
| ‴⇒ชพปปปร?ปร | 4.083 | ::4C | | | MARINE | | |
| *3WJJJJ4?J5 | 1.384 | | AFRCHIC | | MARINE | _ · · · · · · · · · · · · · · · · | · / · · · · · · · · · · · · · · · · · · |
| *8W0017205 | 2.483 | | AFROBIC | | MARINE | 2216 | |
| *3W0011205 | 1.0=4 | | AFRCBIC | | MARINE | | |
| *3*001550p | 6.783 | | AFRENIC | | MARINE | | |
| #3x)u20?05 | 2.584 | | AERESIC | | MARINE | 2216 | |
| *3w0017205 | 2.6F4 | | AFREBIC | | MAFINE | 2216 | |
| ±00013205 | <u>1.0E4</u> | | AERCHIC | | MARINE | | |
| *BWJJ29915 | 2.984 | | AERCBIC | | MARINE | | |
| *3WJJ14?J5 | 1.3E4 | | AFROBIC AFROBIC | | | 2216 2216 | |
| | 2.784 | | AFEFRIC | | MARINE | | |
| <pre>%30010303</pre> | | | AFREBIC | | | | |
| ≠3₩0015?05 | | | AFRESIC | | | | |
| *Bwuu16?u5 | | 540 340 | AERCHIC Aerchic | <u> </u> | MAGINE | 2216 | |
| *8WUU24?U5 | | | AESCOIC | | | | |
| *890025905 | 1.4日年 1.9月4日。 | | | | | | |
| *8WJJJJJ205 | , 1•904 . 9∎0€3 | 34.C | AFRERIE AFRERIE | ् ऽ | MARINE | 2216 | |
| | | | AFRENIC | | | | |
| *BW0031705 *BW0027705 | 9.2ED 9.7E3 | | AFRESIC | | | | |
| *BWJJJ27:JJ *BWJJJ32?J5 | | | AFRUATC | | and the second | | |
| *B#0033?u5 | | | | | | | |
| *B%UJ3+?U5 | | | AFPUNIC | | | | |
| | | | a na sanga | · · · · | | | |

-. .

_ _ . .

۰.

| SEDIMENT | | |
|------------------------------|-------|---------------------------|
| *BB0J01?05 | 1.084 | DAC AFROBIC S MAPINE 2216 |
| ¥880002205 | 5.4E4 | 04C AERCEIC S MARINE 2216 |
| *BBJ015?J5 | 2.265 | 04C AEROBIC S MARINE 2216 |
| *BB0031?05 | 1.JE5 | J4C AEPEBIC S MARINE 2216 |
| *BBy016?05 | 1.3E5 | D4C AFREBIC S MARINE 2216 |
| ≭ Вв∂ 0∋2 ? 05 | 1.1E5 | 040 AEROBIC S MARINE 2216 |
| *BB0007205 | 1.9F5 | 040 AFROBIC S MARINE 2216 |
| *88U01 7 ?05 | | DAC AEPOBIC S MARINE 2216 |
| *B60003?05 | 7.8E5 | J4C AERCHIC S MARINE 2216 |
| ≭880018? 05 | 2.4E5 | C4C AFRCBIC S MARINE 2216 |
| *880033205 | 6.5E3 | J4C AEPCBIC S MARINE 2216 |
| *830003?05 | 5.3E4 | C4C AERCHIC S MARINE 2216 |
| *BBJ005?05 | 4.5E4 | C4C AEROBIC S MARINE 2216 |
| *B6JJJ4?05 | 6.885 | G4C AERCBIC S MARINE 2216 |
| *BH0006205 | 3.1E4 | LAC AERCHIC S MARINE 2216 |
| ≉830009?05 | 8.7E4 | 04C AEROBIC S MARINE 2216 |
| #BB0010705 | 5.484 | J4C AEROBIC S MARINE 2216 |
| #BB0023?05 | 1.8E6 | 04C AEROBIC S MARINE 2216 |
| *830013?05 | 3.4E4 | 04C AFRENIC S MAFINE 2216 |
| ≉880024?05 | 6.864 | 04C AERCBIC S MARINE 2216 |
| *830.25?05 | 1.3E5 | CAC AEROBIC S MARINE 2216 |
| *8B0011?05 | 6.284 | DAC AERCHIC S MARINE 2216 |
| *BB0C19?05 | 2.765 | LAC AERCHIC S MARINE 2216 |
| ¥880014?05 | 1.2E5 | C4C AEROBIC S MARINE 2216 |
| ≭83J012? J5 | 4•4E4 | J4C AEROBIC S MARINE 2216 |
| *B30020?05 | 2.385 | C4C AERCOIC S MAPINE 2216 |
| ₹\$80026?05 | 4.325 | AC ALREBIC S MARINE 2216 |
| ≭B300∠1?05 | 4.184 | J4C AERCBIC S MARINE 2216 |
| *880027?05 | 6.3E4 | 040 AEROBIC S MARINE 2216 |
| ≭dd0J22?05 | 3.284 | LAC AERCHIC S MARINE 2216 |
| *B80028?05 | 9.7E4 | 04C AERCHIC S MARINE 2216 |
| <u>≠830029?05</u> | 1.1E5 | LAC AERCBIC S MARINE 2216 |
| *B30,030?05 | 2.965 | AC AERCHIC S MARINE 2216 |

Table VIII

AEROBIC HETEROTROPHIC MESOPHILES

| SAMPLE NU. | COUNT | CUNDITIONS |
|--------------------------|--|--|
| ICE | and the second | |
| *BW0005?06 | 1.752 | 200 AERCHIC S MARINE 2216 |
| #BW0038?06 | 1.683 | 2DC AEROBIC S MARINE 2216 |
| *BW0039?06 | 1.483 | 20C AERCHIC S MARINE 2216 |
| *BW0040?06 | 2.051 | 200 AEROBIC S MARINE 2216 |
| 2 | | |
| | ***** | |
| WATER | | |
| *BW0042?06 | 4.1E2 | 200 AEPCHIC S MARINE 2216 |
| ₩8₩0008?0 0 | 3.752 | 20C AFREGIC S MARINE 2216 |
| ™ * Ճ₩ŨŨ43?ŨO | 3.1E2 | 200 AFREBIC S MARINE 2216 |
| *BWUJU1?U6 | 6.3[3 | 20C AERCEIC S MARINE 2216 |
| *BW0002?00 | 1.5E3 | 20C AFECBIC S MARINE 2216 |
| *BW0003?05 | 4.452 | 200 AFROBIC S MARINE 2216 |
| *BWJ019?06 | 6.7E3 | 200 AEROBIC S MARINE 2216 |
| #BW0035706 | 3.983 | 20C AERCBIC S MARINE 2216 |
| *BWU020?05 | 2.253 | 200 AEROBIC S MARINE 2216 200 AEROBIC S MARINE 2216 |
| *BW0336?U6 | 5.7E2 | |
| *8M0098500 | 3.352 | |
| *BW0021?06 | <u>1.0E3</u> | |
| *8W0037?06 | 7.482 | |
| *BW0010?06 | 3.7F2 | |
| *BWUU22?U6 | 1.952 | 20C AERCBIC S MARINE 2216 20C AERCBIC S MARINE 2216 |
| *8W0041?06 | <u>8.6E2</u> | 200 AEROBIC S MARINE 2216 |
| *840006200 | 3.2E3 | 200 AERCHIC S MARINE 2216 |
| <u>*B₩ΰ∂∂4?∂5</u> | <u>1.2F4</u> | 200 AERCETC S MARINE 2216 |
| *BW0007?06 | 8.062 | 200 AEROBIC S MARINE 2216 |
| *BW0011?06 | 8.583 | 200 AFFCBIC S MARINE 2216 |
| *BW0012?06 | 1.624 | 200 AFRESIC S MARINE 2216 |
| +BW0028?06 | <u>9.4E3</u> 1.2E4 | 200 AEROBIC S MARINE 2216 |
| *BWJ017?J6 | | 200 AEROBIC S MARINE 2216 |
| *BW0013206 *3W0C29206 | 2.3E4 8.8E3 | ZUC AERCUIC S MARINE 2216 |
| | 1.754 | 200 AFREBIC S MARINE 2216 |
| #8WUU14206 | 2.754 | 200 AERCBIC S MARINE 2216 |
| *BWJU23?J6 | 1.164 | 2GC AEROBIC S MARINE 2216 |
| *8WJJ18?J6 *8WJJ18?J6 | 1.3E4 | 200 AEROBIC S MARINE 2216 |
| *8W0015708 *8W0016?06 | 1.264 | 200 AFROBIC S MARINE 2216 |
| *BW0018:00 | 1.9E4 | 200 AEPEBIC S MARINE 2216 |
| *8x0025?00 | 1.654 | 200 AERCBIC S MAPINE 2216 |
| *Bw0020?06 | 1.5E4 | ZOC AEROBIC S MARINE 2216 |
| *Bw0026206 | 1.384 | 200 AFROBIC S MARINE 2216 |
| *BWUU31?U6 | 6.9F3 | 200 AERCRIC S MARINE 2216 |
| *BW0051:00 *BW0027?05 | 9.6E3 | 200 AERCEIC S MARINE 2216 |
| 46WU032200 | 3.383 | ZUC AERCOIC S MARINE 2216 |
| *8w0033?06 | 1.0E4 | 200 AERCBIC S MARINE 2216 |
| | 1.4E4 | 200 AEROBIL S MARINE 2216 |
| ~000T100 | | |

Table VIII (cont'd)

| | | ······································ |
|---------------------|-------|--|
| SÉDIMENT | | |
| *830001?06 | 3.0E3 | 20C AEPCBIC S MARINE 2216 |
| *830002208 | 5.9E4 | 200 AERCBIC S MARINE 2216 |
| ¥B3J015?J6 | 2.5E5 | 20C AEROBIC S MARINE 2216 |
| *880031?06 | 8.154 | 200 AERUBIC S MARINE 2216 |
| *880016?05 | 5.784 | 200 AERUBIC S MARINE 2216 |
| *BBUU32?06 | 1.165 | 200 AERCHIC S MARINE 2216 |
| *B30007?06 | 1.485 | 200 AFREBIC S MARINE 2216 |
| *BB0C17206- | 1.6F4 | 200 AERCHIG S MARINE 2216 |
| *BBJJJ3?06 | 5.9E5 | 200 AFROBIC S MARINE 2216 |
| ≭BB0018?06 | 7.785 | 200 AEREBIC S MARINE 2216 |
| *BB0033?06 | 2.9E3 | 200 AERCHIC S MARINE 2216 |
| *BBJJJJ3?J 5 | 1.3E4 | 200 AERCHIC S'MARINE 2216 |
| *BBJJJJ5?J6 | 1.865 | 200 AFFOBIC S MAPINE 2216 |
| *BBD004?05 | 7.785 | 20C AFPOBIC S MARINE 2216 |
| *880006?06 | 1.955 | 20C AERCBIC S MAPINE 2216 |
| *BB0009 ? 06 | 2.585 | 200 AERCHIC S MARINE 2216 |
| *BB0010?00 | 4.1E4 | 2CC AERCHIC S MARINE 2216 |
| *BBJU23?J6 | 1.5E6 | 200 AEROBIC S MARINE 2216 |
| *BB0013?06 | 2.784 | 200 AFREBIC S MARINE 2216 |
| *BB0U24?U6 | 3.265 | 200 AEROBIC S MARINE 2216 |
| *BBJJ25?06 | 5.3E4 | 200 AEPCHIC S MARINE 2216 |
| *BBU011?06 | 4.5E4 | 200 AEPCRIC S MARINE 2216 |
| *BB0019?06 | 1.456 | 200 AFRESIC S MARINE 2216 |
| *B80014?06 | 1.685 | 200 AEROBIC S MARINE 2216 |
| *BB0012?06 | 3.2E4 | 200 AEPOBIC S MARINE 2216 |
| *BBU02U?06 | 3.6E5 | 200 AERCHIC S MARINE 2216 |
| *880026?06 | 1.3E5 | 200 AEPCBIC S MARINE 2216 |
| *880021206 | 4.184 | 200 AFREBIC S MARINE 2216 |
| *BBUJ27?06 | 1.8E5 | 200 AEREBIC S MARINE 2216 |
| *B30022?06 | 5.2E4 | 200 AFFEBIC S MARINE 2216 |
| ×830028706 | 1.665 | 2.C AERCHIC S NARINE 2216 |
| *BBUC29?06 | 2.7E5 | 200 AERCHIC S MARINE 2216 |
| *BBJJ3J30 | 7.JE5 | 200 AEPOBIC S MARINE 2216 |

_

Table IX

AEROBIC HETEROTROPHIC PSYCHROPHILES AND PSYCHROTROPHS

.

| SAMPLE NO. | COUNT | CONDITION |) | |
|---|--------|---|--------|--|
| ICE | | | | |
| *3W0005?07 | 3.752 | U4C 4ERCBIC | S MSin | iΥĒ |
| *8WUU38?07 | 4.5E3 | Ü4C ≙EKCBIC | MSW | IYE |
| *8WJ039207 | 1.684 | 34C AEROBIC | 5 MSh | YE |
| *8w0040?07 | 2.961 | U4C AFRESIC | S MSW | YE |
| | | | | |
| ter any fight and the statement of the stat | | ngan menantan ang kang sa sa sa kang sa | | |
| WATER | | | | · · · · · · · · · · · · · · · · · · · |
| *8*0042?07 | 2.483 | U4C AERCBIC | 5 M.SV | a¥€ |
| *BWJJJJ8?J7 | 2.4E2 | J4C AFREBIC | S MSV | Ϋ́́ |
| *BWJU43?J7 | 5.182 | DAC AERCOIC | S MSV | NYE |
| ★3₩ŬŨŬ1?07 | 1.1E2 | C4C AFPOBIC | S MSV | YE |
| *BWJJJJ2?J7 | 3.7E1 | 34C AERCHIC | 5 MSV | 1YE |
| #BW0003?07 | 1.483 | CAC AERCHIC | S MSV | YE |
| *BWUC19207 | 1.884 | 04C AERCHIC | S MSV | νΥE |
| *8x0035?07 | 8.683 | J4C AFREBIC | S MSV | YE |
| ¥8₩0020?07 | 8.153 | 04C AFFOBIC | | |
| *8W0036?∪7 | 5.4E3 | C4C AFPEBIC | S MSV | YE |
| *3W0009?07 | 2.5E2 | J4C AERCBIC | S MSV | νΥĒ |
| *3W0021207 | 8.2E3 | C4C AERCBIC | S MSI | YF |
| *BNJJ37?J7 | 4.053 | JAC AFPERIC | S MSV | NYE |
| *BWJ010207 | 4.652 | CAC AFROBIC | S MSI | VYE |
| ≭3₩0022?07 | 1.763 | CAC AERCHIC | S MSI | NY E |
| *8w0041?07 | 8.0113 | J4C AEROBIC | S MSV | NYE |
| #BNUUU62U7 | 9.552 | JAC AERCHIC | S MS↓ | 4¥₩ |
| ☆3₩0004? 07 | 1.7:3 | 04C AERCBIC | S MSI | NYE |
| *BW2001?07 | 8.182 | 04C AERLOIC | S MSV | łΥE |
| *BWU011207 | 8.2E3 | 04C AFREBIC | S MSI | 4YΞ |
| *840012?07 | 8.7E3 | CAC AERCHIC | S MSI | NYE |
| *8auu28?07 | 3.1E4 | 64C AEREBIC | s Msi | |
| *BN0017207 | 2.284 | 64C AFRENIC | | |
| *3WUU13?07 | 1.3E4 | 04C AEROBIC | • • • | |
| *BWJJ29?J7 | 3.084 | G4C AERCBIC | | |
| *3,40014?07 | 2.354 | GAC AFROBIC | S_MSì | NYC |
| *8W0023207 | 5.9E2 | 24C AERCOIC | S MSI | NYE |
| ≭3₩0018207 | 1.684 | CAC AEFEBIC | | wYE |
| 48W0015?07 | 3.0E4 | TO4C ALPOSIC | | W Y E |
| ∦ ₿₩₩₩₩162₩7 | 1.884 | LAC AERCHIC | | WY [] |
| *3NJJ24?U7 | 6.9E2 | U4C AFFCBIC | S MS | wYE |
| *BWU025?07 | 2.2E3 | Q4C AERCHIC | S MS | |
| 10.5050 HK | 1.9E4 | 04C AERCBIC | S MS | WYE |
| *BW0026?07 | 1.3E2 | J4C AERCBIC | | WYE CONTRACTOR OF A CONTRACTOR |
| #8WJJ312J7 | 6.5E3 | JAC AEPEBIC | | WYE |
| *8wJu27?07 | 1.8E2 | 040 AERCAIC | | |
| 7C25CCW6* | 2.9E3 | J4C AEROBIC | | WYF |
| *8WU033?J7 | 2.3E4 | 040 AERCBIC | | WYE share a second second second |
| ≠ ₿₩0€34?07 | 3.054 | CAC AERCEIC | S MS | ₩YE |
| | | | | |

Table IX (cont'd)

| SEDIMENT | | |
|--------------------|-------|---------------------|
| *BB3001?07 | 7.483 | U4C AERCBIC S MSWYE |
| *BBJUJ2?U7 | 9.2F3 | J4C AERCBIC S MSWYE |
| *830015?07 | 2.085 | C4C AERCRIC S MSWYF |
| #BB3031?07 | 1.0E5 | S4C AERODIC S MSWYE |
| *B8JU16?U7 | 1.155 | U40 AERCBIC S MSWYE |
| ≭B30032 ?07 | 7.5E4 | C4C AFREBIC S MSWYE |
| *880007?07 | 1.2E5 | C4C AEROBIC S MSWYE |
| *BB0017?07 | 2.1:4 | 040 AERCHIC S MSWYE |
| *880008?07 | 3.1E4 | G4C AFPERIC S MSWYE |
| *BBJ018?07 | 7.765 | U4C AERCHIC S MSWYE |
| *BBU055207 | 9.5E3 | 04C AERCHIC S MSWYE |
| ≫BB0003?∪7 | 6.6E4 | O4C AEROBIC S MSWYE |
| *880009207 | 5.484 | U4C AFPEBIC S MSWYE |
| *BB0004?07 | 3.985 | 04C AEREBIC S MSWYE |
| *BBJ0J6?J7 | 1.984 | JAC AERCBIC S MSWYE |
| ≭BB JCJ9?u7 | 3.464 | O4C AERCHIC S MSWYE |
| *B50010?07 | 2.764 | 04C AEROBIC S MSWYE |
| <u>*880023?07</u> | 1.1E6 | U4C AERCHIC S MSWYE |
| *830013?07 | 6.7E4 | J4C AEROBIC S MSWYE |
| *BB0C24?07 | 4.565 | O4C AERCBIC S MSWYE |
| *880025?07 | 3.085 | U4C AERCBIC S MSWYE |
| *BB0011207 | 4.9E4 | O4C AERCHIC S MSWYF |
| *680019?07 | 1.965 | 34C AFROBIC S MSWYE |
| <u>*880014?07</u> | 5.6E4 | C4C AERCBIC S MSWYE |
| *B3J012?U7 | 6.1E4 | O4C AERCHIC S MSWYE |
| *BBUJ2U?J7 | 9.8E4 | D4C AEPOBIC S MSWYE |
| *88JJ26?07 | 1.165 | C4C AERCHIC S MSWYE |
| *860021707 | 2.0E4 | LAC AEROBIC S MSWYF |
| #BB0027?07 | 1.1E5 | U4C AEROBIC S MSWYE |
| *B80922?07 | 4.1E4 | U4C AERCHIC S MSWYE |
| *B0028301 | 9.7E4 | U4C AFRERIC S MSWYF |
| ≭880629?⊎7 | 8.3E4 | 040 AERCBIC S MSWYE |
| *880030707 | 1.965 | J4C AERCUIC S MSWYE |
| | | |

Table X

. ____

AEROBIC HETEPOTROPHIC MESOPHILES

| SAMPLE NU. | COUNT | CENDITIENS |
|-------------------|-------|----------------------|
| ICE | | 20C AERCBIC S MSWYE |
| *BN0005?J8 | 1.252 | |
| EC.SECOME* | 1.5E3 | |
| *BW0039?08 | 1.263 | 20C AERCHIC S MSWYE |
| *BW0040?08 | 2.01 | |
| WATER | | ZOC AFREBIC S MSWYE |
| *BW0042?03 | 7.0E2 | |
| \$00008208 | 2.6E2 | |
| *8W0343208 | 2.7E2 | |
| *BW0001208 | 2.5E3 | 20C AERCBIC S MSWYE |
| *BWU002?08 | 7.8E2 | 20C AERCBIC S MSWYE |
| *BW00003?08 | 4.3E2 | 20C AERCBIC S MSWYE |
| *BWJJ197J8 | 6.0E3 | 20C AERCHIC S MSWYE |
| *8WUU35?08 | 3.653 | 200 AERCHIC S MSWYE |
| *BWUU2U?U8 | 2.4E3 | 20C AERCHIC S MSWYE |
| *Bw0036?08 | 6.5E2 | 20C AFFCBIC S MSWYE |
| *BW0009708 | 3.0E2 | 2DC AEROBIC S MSWYE |
| *BW0021208 | 1.0E3 | 20C AERCBIC S MSWYE |
| *BM0037?08 | 7.3F2 | ZOC AEROBIC S MSWYE |
| *8M0010308 | 2.2E2 | 2 JC AEROBIC S'MSWYE |
| ≭BW0022?08 | 2.8E2 | 20C AEROBIC S MSWYE |
| *8W0041?08 | 1.183 | 200 AERCHIC S MSWYE |
| *8WU006?08 | 8.8E2 | 20C AERCHIC S MSWYE |
| *8W0004?08 | 5.8E3 | 20C AEPEBIC S MSWYE |
| *BW0007?08 | 4.752 | 200 AERCHIC S MSWYE |
| *BWU011?U8 _ | 1.513 | 200 AERCBIC S MSWYE |
| *8W0012?08 | 1.023 | 200 AERCBIC S MSWYE |
| *BW0028?J8 | 1.2E4 | 200 AERCBIC S MSWYE |
| *BW0017?U8 | 1.3E4 | 20C AERCHIC S MSWYE |
| *BW0013?08 | 1.6E4 | 2CC AEPCBIC S MSWYE |
| *3W0029?J8 | 1.1E4 | ZUC AERCHIC S MSWYE |
| *BNUU14?U8 | 1.0E4 | 20C AFFCBIC S MSWYE |
| *5W0023?08 | 5.8E3 | 200 AEPOBIC S MSWYE |
| *BW0018?08 | 1.184 | 2CC AFREBIC S MSWYE |
| *BW0015708 | 1.7E4 | 20C AEROBIC S MSWYE |
| *BWJ016?J8 | 1.164 | 20C AERCBIC S MSWYE |
| *800024208 | 3.8F3 | 20C AFRCBIC S MSWYE |
| *BW0025208 | 2.263 | 20C AERCBIC S MSWYE |
| *BW0030?08 | 8.8E3 | 20C AERCBIC S MSWYE |
| *BW0026700 | 1.453 | 20C AERCHIC S NSWYE |
| #BW0031?08 | 8.153 | 20C AERUBIC S MSWYE |
| *BW0027?J8 | 1.253 | 2 JC AERCOIC S MSWYE |
| ¥BWJ032208 | 4.9E3 | 20C AERCHIC S MSWYE |
| *BW0033?08 | 1.084 | 25C AFFCBIC S MENTE |
| *BW0034708 | 1.454 | |

Table X (cont'd)

and the second second

-- --

......

.

| SEDIMENT | | |
|---------------------------------|-------|-----------------------|
| *BB0001?08 | 1.424 | 200. AERCHIC S MSWYE |
| *BB0002?08 | 6.354 | 200 AFPEBIC S NSWYE |
| *BBUU157U8 | 4.3E5 | 200 AFROBIC S MSWYE |
| *B30031?08 | 7.8E4 | 200 ALNOBIC S MSWYE |
| *883016208 | 3.6E4 | T 200 AEROBIC S MSWYE |
| ¥380032?03 | 1.265 | 200 AEROBIC S MSWYF |
| *BB0007?05 | 5.084 | 260 AERCRIC S MSWYE |
| ≭BBU017? 08 | 1.JE4 | 200 AERCBIC S MSWYE |
| #880008703 | 8.1F4 | ZÚC AEFCBIC S MSWYE |
| ¥BBJJ18?08 | 9.4E5 | 200 AFROBIC S MSNYE |
| * <u>BBJJ33</u> ?J8 | 3.8€3 | 200 AFRENIC S MSWYE |
| 468000330 8 | 1.884 | 200 AERCOIC S MSWYE |
| ×830035?38 | 2.354 | ZOC AERCHIC S MSWYE |
| *880004 ? JB | 8.655 | 2UC AERCHIC S MSWYE |
| *830000333 | 1.654 | 200 AFREBIC S MSWYE |
| ≭BBJŪJ9?J 3 [⊂] | 3.3E4 | 200 AEROBIC S MSWYE |
| ≠880010?08 | 2.6E4 | 20C AEFORIC S MSWYE |
| *BBJJ23?08 | 1.7E6 | 200 AEROBIC S MSWYE |
| *BBJU13?J8 | 3.664 | ZOC AERCHIC S MSWYE |
| ¥880024?J8 | 4.055 | 200 AFREBIC S MSWYE |
| *BBJJ25?JB | 1.565 | 200 AERCAIC S MSWYE |
| ≈880011308 | 6.2F4 | 200 AFREBIC S MSWYE |
| *BB0019?03 | 2.565 | ZUC AFREBIC S MSWYE |
| ¥₿₿₩ŨŨ 14? ₩₫ | 3.484 | 200 AERCALO S MSWYE |
| *880012703 | 4.124 | ZOC AERCHIC S MSWYE |
| ≠3B002∪?03 | 4.785 | 200 AERCHIC S MSWYE |
| *BBUJZ5?J8 | 7.3E5 | 200 AEPOBIC S NSWYE |
| *880021308 | 8.1E4 | 200 AERODIC S MSWYE |
| *880027203 | 1.355 | 200 AEREBIC S MSWYE |
| *B800222J3 | 5.3E4 | 20C AERCHIC S MSWYE |
| ¥830023?38 | 8.854 | 20C AFREBIC S MSWYE |
| *BBJJ29?JJ | 2.JE5 | 200 AERCHIC S MSWYE |
| *₿გეევევივ | 5.355 | 200 AERCHIC S MSWYE |
| | | |

Table XI

PSYCHROPHILIC AND PSYCHROTROPHIC "FUNGI"

| SAMPLE NO. | COUNT | CONDITIONS |
|---------------------------------|------------------|--|
| ICE | | |
| <u>+8,40005215</u> | 6.4E2 | O4C AFREBIC S SEA |
| *BWJJ38?15 | 6.5EJ | U4C AERGUIC S SDA |
| *8WJ039?15 | 2.062 | 040 AFREBIC S SEA |
| *8W0040215 | 2.0E1 | U4C AERCBIC S SDA |
| ••••••• | | ······ |
| WATER | | |
| *8W0042?15 | 1.5E0 | U4C AFREBIC S SDA |
| *BW0008?15 | 1.180 | C4C AERCBIC S SDA |
| ¥B₩0043?15 | 1.650 | D4C AERCBIC S SCA |
| *BW0001?15 | 3.6E1 | U4C AFROBIC S SDA |
| *BWJJJ2?15 | 3.651 | D4C AERCHIC S SDA |
| *BNJUJ3?15 | <1.061 | DAC AFROBIC S SDA |
| *BWJU19?15 | 4.1EU | J4C AFRÜBIC S SCA |
| <u>*8x0035?15</u> | 1.0E2 | JAC AERCHIC S SDA |
| ¥BWJJ2J?15 | 1.051 | J4C AERGRIC S SUA |
| *BWJJ36?15 | 2.480 | GAC AFROBIC S SCA |
| *BN0009?15 | 5.0E0 | 04C AFREBIC S SDA |
| *BW0021?15 | 9.9 50 | J4C AERCHIC S SDA |
| *8WJUJ7?15 | 3.3F) | JAC AERCHIC S SEA |
| ×3W0010?15 | 3.0EC | C4C AFROBIC S SDA |
| *BN0022?15 | 3.3E3 | 94C AERCHIC S SCA |
| #BW0041?15 | 0.6E0 | U4C AERCHIC S SCA |
| *BWJJJ6?15 | 1.021 | JAC AEROBIC S SCA |
| *8WJJJU4?15 | <1.001 | JAC AEROBIC S SEA |
| *3W0007?15 | C.4EC | 04C AEPCRIC'S SDA |
| *Bwu011?15 | 5.2E0 | 04C AERCBIC S SDA |
| *3WJU12?15 | 1.100 | CAC AERCHIC S SCA |
| *8w0028?15 | 0.160 | C4C AFPEBIC S SDA |
| *BwJJ17?15 | 1.3E0 | 04C AEFOBIC S SDA |
| *8wJ013?15 | 1.0F0 | D4C AFREBIC S SEA |
| *3WU029715 | C.180 | 04C AERCOIC S SCA |
| *BWJJJ4?15 *BWJJJ23?15 | 1.450 | 04C AFRCBIC S SCA |
| | 6.1 E0 | J4C AFRCBIC S SCA |
| *8₩0018?15 *8₩0015?15 | <u>2.080</u> | U4C AERCHIC S SDA |
| *3₩0019719 *3₩0016?15 | 1.780 | CAC AFFORIC S SCA |
| *8W0024?15 | 2.480 | C4C AFREBIC S SEA |
| #8w0024115 #8w0025?15 | 1.250 | LAC AEFOBIC S SCA |
| *8×0020?15 | C.9FJ <1.0E-1 | 34C AFRENIC S SEA |
| *BWJ026?15 | 1.480 | C4C AFRENIC S SDA |
| *8wJU31?15 | 1.42J C.3ED | 040 AEROBIC S SDA |
| *BW0027?15 | L.3EU | 94C AERCBIC S SEA |
| *3#0027115 | 4.6EU | U4C AERCHIC S SDA |
| *8W00333?15 | 0.280 | U4C AERCBIC S SDA U4C AERCBIC S SDA |
| ÷8x00334?15 | 0.2EU | OAC AFRENIC S SEA |
| المريق بها المراجب ميد ميدود مد | | 070 MCNU110 0 004 |

Table XI (cont'd)

| SEDIMENT | | 1940 AERCHIC S SDA |
|-------------------|--------------|--------------------|
| *BBJJJ1?15 | 1.481 | |
| *BBJ0J2?15 | 1.151 | |
| #880015?15 | 1.0E1 | D4C AERCHIC S SDA |
| *830031?15 | 1.4E1 | 04C AERCBIC S SDA |
| *830016?15 | 1.2 52 | DAC AFREBIC'S SEA |
| *BB0032?15 | 1.052 | O4C AERCBIC S SDA |
| *HBUUU7715 | 9.0E1 | J4C AERCHIC S SCA |
| *BBJ017?15 | 2.7F2 | J4C AERCHIC S SEA |
| *830008?15 | 6.7E2 | 04C AERCBIC S SDA |
| *B30018?15 | 2.4=3 | C4C AFREBIC S SEA |
| *680033715 | 2.6E1 | U4C AFRCBIC S SDA |
| *880003?15 | 4.4E0 | 04C AFREBIC S SDA |
| *880305?15 | 4.5ED | 04C AEBOBIC S SEA |
| ¥8B0004?15 | <u>4.4E0</u> | O4C AEKCRIC S SDA |
| *880006?15 | 3.7EC | J4C AERCHIC S SDA |
| *380009215 | 3.351 | J4C AERCBIC S SCA |
| *660010?15 | 5.8F1 | 04C AFREDIC S SDA |
| *BB0023?15 | 1.652 | 04C AERCBIC S SDA |
| *880013?15 | 1.1月2 | DAC AFRCHIC S SEA |
| *BBJJ24?15 | 5.0E1 | D4C AERCETC S SDA |
| *BB0025?15 | 2.871 | U4C AERCBIC S SCA |
| *BBJJJ11?15 | 6.583 | 04C AERCBIC S SCA |
| ≠BB0019?15 | 1.362 | JAC AFREBIC S SDA |
| *BBJJJ4715 | 3.461 | D4C AERCHIC S SCA |
| *BB0012?15 | 1.362 | C4C AERCOIC S SDA |
| ≭BB0020?15 | 9.5E1 | J4C AERCBIC S SCA |
| *880026715 | 6.4F1 | G4C AEPCHIC S SDA |
| *BBUJ21?15 | 4.6E1 | D4C AFREBIC S SDA |
| *BBJJ27?13 | 3.181 | J4C AERCOTC S SEA |
| *330022?15 | 1.652 | C4C AERCLIC S SDA |
| #BB0028?15 | 5.4E1 | LAC AERCOIC S SDA |
| #880029?15 | 1.052 | 040 AEROBIC S SCA |
| *BB0030?15 | 3.3E1 | C4C AFRCBIC S SDA |
| | | |

Table XII

MESOPHILIC "FUNGI"

| | | | | | | ··· | | | |
|--------------------|--------------|--|-------|----|------------|---|--|--------------------------------------|-----------------------------------|
| SAMPLE NO. | COUNT | COM | CITIC | ١S | | | | | |
| ICE | | | | | | | | | |
| *BW0005?16 | <u>1.JE2</u> | | RCBIC | S | SDA | | | | |
| *BW0038?16 | 1.051 | 20C AL | RCBIC | S | SCA | | | | |
| <u>*9₩0039?16</u> | 5.0E1 | | RCBIC | S | SCA | | | | |
| *34JU4J?10 | 3.6E0 | ÉŻUĆ AR | REBIC | S | SCA | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| WATER | | | | | | ····· | | | <u> </u> |
| *BW0042?16 | 0.8E0 | 200 48 | RCBIC | S | SCA | | | | |
| *8W00J8?16 | 6.0E0 | | PCBIC | ŝ | SDA | | | | - service of the same of the same |
| *8WUU43?16 | 0.3E0 | | RCBIC | ŝ | SEA | | | | |
| *8W0001?16 | 5.9E1 | | RCBIC | Š | SCA | | | ge poster e gates er carrantes a re- | |
| *BW0002?16 | | | RCBIC | Š | SCA | | | | |
| *BW0003716 | <1.9E1 | The second se | RCBIC | Š | SDA | | | · | <u> </u> |
| *BW0019?16 | 4.1E1 | | PCBIC | ŝ | SDA | | | | |
| *BW0035716 | 7.0E0 | | RCBIC | S | SCA | Waania a A | | | |
| *8W0020?16 | 2.4E1 | | FCBIC | ŝ | SCA | | | | |
| *5w0J36?16 | 1.JE1 | | RCBIC | S | SDA | 4.1.5.0 · • • • • • • • • • • • • • • • • • • | | | |
| *BWU0J9?15 | 3.5E1 | 20C AF | | - | SCA | | | | |
| *BW0021?16 | 1.981 | and a second second second second second | RCBIC | Š | SDA | | | | |
| ≭8W0037?16 | 1.1E0 | | RCBIC | S | SDA | | | | |
| *8W0010216 | 1.JE1 | the second s | RCBIC | Š | SDA | | Martin de la forma de manadada encon | | |
| ≭8₩0022?16 | 3.0E0 | | FCBIC | ŝ | SDA | | | | |
| *BW0041716 | 0.5E0 | (a.a | RCBIC | S | SUA | | | | |
| #8W0006716 | 1.0E2 | 20C AE | RCBIC | S | SCA | | | | |
| *BW0004716 | | 20C AF | RCBIC | S | SCA | | | | |
| *BWJO07716 | 1.262 | 20C AE | RCBIC | S | SCA | | | | |
| *3WU011?16 | 2.0E1 | 20C AE | RCBIC | S | SCA | ****** | | | * |
| #BWJ012?15 | 1.261 | 200 AE | RCBIC | S | SDA | | | | |
| #BWJJ28?16 | 1-4E0 | 20C AE | RCBIC | S | SCA | | · · · · · · · · · · · · · · · · · · · | | |
| ≭B₩ƏIJ17?16 | 1.6E1 | 20C AE | RCBIC | S | SDA | | | | |
| *BW0013?16 | 5.081 | 20C AF | REBIC | 5 | SEA | | | | |
| *BW0029?16 | 3.1E0 | 200 AE | RCBIC | S | SCA | | | | |
| *8W0014?16 | 1.2E1 | 20C AE | RCBIC | S | SDA | | | ····· | |
| *BWJ023?16 | 2.0EU | 20C AF | RCBIC | S | SDA | | | | |
| *8W0018716 | 5.180 | 200 AF | RCBIC | Ŝ | SCA | | ••••••••••••••••••••••••••••••••••••••• | | |
| *BW0015?16 | 1.081 | 200 AE | RCBIC | Ŝ | SDA | | | | |
| *BW0016?16 | 5.651 | 200 AF | REBIC | S | SCA | | | | |
| *BW0024?16 | 1.050 | | RCBIC | S | SDA | | | | |
| *8WUU25?16 | 4.0E0 | 20C AE | REBIC | S | SEA | | | | |
| *3W0030716 | 0.3EJ | and the second | bCS1C | | SCA | | | | |
| *BW0026?16 | <1.0E0 | | PCSIC | S | SCA | | | | • • • • |
| *5WUU31?16 | 0.6F0 | | RCHIC | S | SCA | | | | |
| *BWJ027?16 | 1.0E0 | 200 AE | | S | SEA | | | · | |
| *3W0032?16 | 1.2E1 | and the second | RCPIC | | <u>SDA</u> | | | | |
| *BWUJ33?10 | 0.4F0 | | | | SCA | | | | |
| 48x0034716 | C.3E0 | 200 AE | RCBIC | S | SDA | | | | |
| | | | | | | | | | |

| SED IMENT | | | | | | | a second and a second second second second |
|-----------------------------|-------|--|----------|----|------|--|--|
| *885301?15 | 1.4E1 | 236 | AFRUSIC | S | SDA | | |
| *580002210 | 1.101 | | AERCBIC | S | SEA | | · · · · · · · · · · · · · · · · · · · |
| * B80015?16 | 1.0E3 | | AERCOIC | ŝ | SCA | | |
| *880031716 | 3.482 | | AERCHIC | Ŝ | SDA | | · · · · · · · · · · · · · · · · · · · |
| *8BJJ16?16 | 7.251 | 200 | AERCBIC | S | SEA | | |
| *530032?16 | 2.6E2 | 200 / | AERCHIC | S | SCA | n an | e en e characharacharacharacharacharacharachar |
| * 883307 ?1 6 | 8.7E1 | 200 | AFREBIC | S | SDA | | |
| *880017216 | 2.3E2 | 200 | AEPCRIC | S | SCA | | |
| *B80008?16 | 6.5E1 | 200 | AERCBIC | \$ | SDA | | |
| *BBUU18?16 | 4.7E2 | 200 / | AERCBIC | S | SE A | | |
| *B80033?16 | 8.6F1 | 20C / | AFRCHIC | S | SEA | | |
| *B80003?16 | 4.4E0 | 200 / | AERCBIC | S | SDA | | |
| *880005716 | 9.0E1 | 200 / | AFREBIC | S | SDA | | |
| *BB0004?16 | 4.2E2 | 200 / | AERCHIC | S | SCA | e . bo i i i i i i i i i i i i i i i i i i | |
| *380006716 | 3.751 | 20C / | AERCBIC | S | SDA | | |
| *BBUUU9?16 | 6.051 | 200 / | AERCHIC | S | SEA | | · · · · · · · · · · · · · · · · · · · |
| #B80010216 | 5.481 | 206 / | AEPCHIC | S | SDA | | |
| *BBJJ23?16 | 1.152 | 200 / | AERCRIC | S | SDA | | |
| *830013?1 8 | 7.1E1 | 205 / | AEPCBIC | S | SC 4 | | |
| *BB0024?16 | 1.2E2 | 200 / | AFREBIC | S | SDA | | |
| *B80025?16 | 6.JE1 | 2⊝C 4 | A ERCBIC | S | SEA | | |
| *B30011?15 | 1.464 | 200 / | AERCÓIC | S | SCA | | ······ |
| *830019?15 | 2.1E2 | 200 4 | AERCBIC | S | SDÁ | | |
| *880014216 | 6.281 | 200 4 | AERCBIC | S | SC A | | · · · · · · · · · · · · · · · · · · · |
| <u>≭880012216</u> | 1.752 | 200 4 | AERCBIC | S | SEA | | |
| *BBJ02J?16 | 3.8E2 | 200-4 | AERCAIC | S | SDA | | ······ |
| ¥BBUJ25?16 | 1.4E2 | 20C4 | AERCHIC | S | SDA | | |
| ≉ 830021?15 | 9.351 | | AERCHIC | S | SDA | | · · · · · · · · |
| #BB0027?15 | 6.2E1 | -200 A | AERCHIC | S | SDA | | |
| *850022?16 | 4.4日1 | | VERCRIC. | S | SEA | | · · · · · · · |
| <u>*880028?16</u> | 7.281 | An example the second s | AFREBIC | | SDA | | |
| *880027?16 | 6.8E1 | 20C A | AERCOIC | S | SCA | | |
| #BB0J3J?16 | 2.052 | 200 / | AFRCBIC | S | SDA | | |
| | | | | | | | |

Table XIII

PSEUDOMONADS

| SAMPLE NO. | COUNT | CENCITICNS |
|--------------------|--------------|--|
| ICE | | |
| *8WJUU5?12 | 2.983 | 200 AERCAIC M PSEUDOSEL |
| *BWJJ38?12 | <1.0E-1 | ZUC AFREBIC M PSEUDUSEL |
| *3W0C39?12 | <1.08-1 | ZUC AERCHIC M PSFUDOSEL |
| *800040?12 | <1.JE+1 | 200 AERCHIC M PSEUDOSEL |
| | | · · · · · · · · · · · · · · · · · · · |
| | | |
| WATER | | ······································ |
| *BWJ042?12 | 6.9E0 | 200 AFROBIC M PSEUDOSEL |
| ≠BW0008?1∠ | <1.0E-1 | 200 AFRCBIC M PSFUDDSEL |
| #8到0043?12 | <1.0E-1 | 200 AERCHIC M PSEUDOSEL |
| *BW0001?12 | 1.681 | 20C AFREBIC M PSEUDOSEL |
| *HW0002?12 | 2.0E1 | 20C AFROBIC M PSEUDOSEL |
| *BWJJJJ3?12 | <1.0E-1 | 200 AERCOIC M PSEUDOSEL |
| *BW0019?12 | <1.0E-1 | 200 AEROBIC M PSEUDOSEL |
| <u>*8₩0035712</u> | 1.0 | 200 AEROBIC M PSEUDOSEL |
| *880020212 | <1.JE-1 | 200 AERCOIC M PSEUDOSEL |
| <u> #8₩0036?12</u> | <1.05-1 | 20C AFRCBIC M PSEUDOSEL |
| *BWJJJ9?12 | 4.UEJ | 20C AFREBIC M PSEUDOSEL |
| #BW0021?12 | <1.0=-1 | 20C AERCHIC M PSEUDOSEL |
| *BW0037?12 | <1.0E-1 | 20C AERCHIC M PSEUDOSEL |
| *BW0010?12 | <u>1.0EJ</u> | 20C AEROBIC M PSEUDUSEL |
| *BW0322?12 | 1.0E0 | 20C AFREBIC M PSFUROSEL |
| <u></u> ¥8₩0041?12 | <1.02-1 | 20C AFREBIC M PSEUDOSEL |
| *840006312 | <1.0E-1 | 20C AEPEBIC M PSEUCOSEL |
| <u>+8₩3004?12</u> | 1.7E1 | 200 AFROBIC M PSFUDOSEL |
| *BWJJ07?12 | 3.0EJ | 2CC AERCBIC M PSEUDOSEL |
| *BN0011?12 | 3.080 | 200 AFROBIC M PSEUDOSEL |
| *BW0012?12 | 1.050 | 20C AERCHIC M PSEUDOSEL |
| ×8wJUZ8?12 | <1.06-1 | 200 AEROBIC M PSEUDOSEL |
| *8N0017?12 | 3.080 | 200 AFFEBIC M PSEUDOSFL |
| *8#0013?12 | 1.0E0 | 20C AEPCHIC M PSEUDOSEL |
| *BWUU29?12 | <1.JE-1 | 200 AERCETC M PSEUDOSEL |
| ≭BW)014?1 2 | 7.080 | 20C AERCHIC M PSFUDOSEL |
| *BWJJ23?12 | 2.050 | 20C AFROBIC M PSEUDOSEL |
| *8¥0015?12 | 3.050 | 20C AEREBIC M PSEUEOSEL |
| *BW0015?12 | 6.5E1 | ZUC AERCHIC M PSEUDOSEL |
| *BWJ016?12 | 1.3E0 | 200 AERCHIC M PSEUDOSEL |
| *BW0024?12 | 1.JEJ | 200 AFRCHIC M PSFUDUSEL |
| <u></u> *3₩0025?12 | <1.0E-1 | 200 AERCBIC M PSEUDOSEL |
| *BWUU3U?12 | 1.080 | 200 AERCBIC M PSEUDOSEL |
| *BW0026712 | <1.0E-1 | 20C AFRENIC M PSEUDOSFL |
| *BWJU31?12 | 3.0E0 | 200 AFROBIC M PSEUCOSEL |
| *8W0027?12 | <1.0E-1 | 20C AFPUBIC M PSEUDOSEL |
| *BW0032?12 | 3.482 | 200 AFRCOIC M PSELDOSEL |
| ×84JU33?12 | <1.0E-1 | 200 AFRCBIC M PSEUDOSEL |
| *3WJ034?12 | 3.0 | 200 AFROHID M PSEUDOSEL |
| | | |

Table XIII (cont'd)

| SEDIMENT | 200 AFRENIC M PSEUDOSEL | |
|-------------------|--|--|
| #880001?12 | 200 AERCHIC M PSEUDUSEL | |
| *BB0002212 | - COURTERING M DEFUEDSEL | |
| *830015?12 | | a and a sub-state state where the state of the |
| *380951?12 | | |
| *6:3JJ16?12 | | <u>.</u> |
| *BBU032?12 | | |
| *BB0007712 | CLOUT 200 ACTIONSEL | |
| *B80017?12 | KI.UETI ZUG ACTURATO N COLUDDSEL | |
| *B80008?12 | <1. ULTI 200 AND DITO A DECEMPOSEI | |
| *830018712 | <1.0E-1 200 A DECUPDSEL | |
| *BBJ033?12 | | |
| *830003?12 | | |
| *BB0005?12 | | |
| *8B9004?12 | | |
| ×B30006?12 | | |
| *BBJ009?12 | <1.0P=1 200 BEELEUSEL | |
| *BBU010?12 | | |
| *BBU023?12 | | |
| *BB0013?12 | <1. JET L ZUU MITTO M DESL DOSEL | |
| *BBJJ24?12 | SI JET I SANG TANA AND CENTRESE | |
| *880025712 | | |
| \$BB0011212 | | |
| *880019212 | | |
| *830014?12 | <1.0E-1 200 | |
| *BBJJ12?12 | | |
| *BB0020712 | | |
| *680026?12 | <i.jeti a="" an="" decheosei<="" td="" unite="" zou=""><td></td></i.jeti> | |
| *880JZ1?12 | <pre><li< td=""><td>· · ·</td></li<></pre> | · · · |
| *880027?12 | | |
| *B30022?12 | <1. Jt-1 200 And Archive of the of th | and the second sec |
| *BBJJ28?12 | | |
| ≭B60029?12 | | |
| *850030?12 | KINE-1 210 AFREBIC M PSECOUSEL | |
| | | |

Table XIV

SALMONELLA-SHIGELLA

| SAMPLE NO. | COUNT | CONDITIONS |
|--------------------------|--|--------------------------------------|
| ICE | | |
| *BW0005?11 | 4.5E2 | 20C AERCBIC M SS |
| ≠3W0033711 | <1.0E-1 | 20C AERCUIC M SS |
| *BW0039?11 | <1.0E-1 | ZOC AERCHIC M SS |
| *BWJ040?11 | <1.0E-1 | 20C AERCHIC M SS |
| | | |
| | <u>,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,</u> | |
| WATER | | 20C AERCAIC M SS |
| *BW0042?11 | 2.0E0 | |
| *BW0008?11 | <1.0E-1 | 20C AERCBIC M SS |
| *BW0043711 | <1.0E-1 | |
| *BW0001?11 | <1.0E-1 | |
| *BW0002?11 | <1.0E-1 | |
| *BW0003?11 | <1.0E-1 | |
| *BW0019?11 | <1.0E-1 | |
| *BW0035?11 | 3.0E0 | 20C AERCBIC M SS |
| *Bw0020?11 | <1.0E-1 | 20C AFREBIC M SS |
| *BW0036?11 | <1.0E-1 | 20C AERCBIC M SS |
| *BM0009711 | <1.0E-1 | 20C AEREBIC M SS |
| *BW0021711 | <1.0E-1 | 20C AERCHIC M SS |
| *BW0037?11 | <1.0E-1 | |
| *BW0010711 | 2.0E0 | 20C AFRCHIC M SS 20C AFRCHIC M SS |
| *BW0022?11 | <1.0E-1 | |
| *BW0041?11 | 5.JEU | |
| ≠8WJJU6?11 | <1.0E-1 | ZOC AERCHIC M SS 200 AERCHIC M SS |
| *HW0004?11 | 2.961 | ZUC AERCBIC M SS |
| ★BWU007?11 | <1.0E-1 | 20C AERÓBIC M SS |
| *BW0011711 | 3.0E0 | 2GC AERCHIC M SS |
| *BW0012?11 | 5.050 | 20C AERCBIC M SS |
| *8W0028?11 | 1.0E0 | ZGC AFFCBIC M SS |
| *BWU017?11 | <1.0E-1 | 200 AERCHIC M SS |
| *BWJJ13?11 | 1.0E0 <1.0E-1 | 2UC AERCBIC M SS |
| *BW0029?11 | <1.0E-1 | 200 AERCBIG M SS |
| *BW0014?11 | <1.0E-1 <1.0E-1 | ZUC AERCBIC M SS |
| *8wJ023?11 | <1.0E-1 | 20C AERCBIC M SS |
| *BWJ018711 | <1.0E-1 | |
| *8W0015?11 | <1.08-1 | 200 AEREBIC M SS |
| *BWJJ16711 *BWJJ24711 | <1.UE-1 | |
| *8₩0024711 *8₩0025?11 | <1.0E-1 | ZUC AERCHIC M SS |
| | <1.0E-1 | ZUC AERCBIC M SS |
| *8w0030?11 *8w0026?11 | 1.0E0 | 20C AERCHIC M SS |
| *BW0020711 *BW0020711 | <1.0E-1 | |
| *8WJJ27711 | <1.02-1 | 200 AEREBIC M SS |
| ≠BWJ027711 ≠BWJ032?11 | <u> </u> | ZCC AFROBIC M SS |
| *BW0052711 *BW0033?11 | <1.08-1 | |
| *BWJ0334?11 | <1.05-1 | |
| TITECOONG | ATAAC T | |

| SEDIMENT | | | | | |
|--------------------|-----------|-------------|---|------------|---------------------------------------|
| *880001211 | ····· | 200 AEPCBIC | М | SS | |
| #BB0002711 | | 200 AEROBIC | М | SS | |
| *BBJ015?11 | <1.0E-1 | 20C AERCBIC | Μ | SS | |
| ¥830031?11 | <1.JE-1 | 200 AERCHIC | М | SS | |
| *880010?11 | <1.)8-1 | 20C AERCBIC | М | 55 | |
| *B30032?11 | <1.0E-1 | 200 AERCBIC | М | SS | |
| *880007?11 | 0.6E0 | 20C AFRCBIC | М | S S | |
| *880017?11 | <1.08-1 | 200 AERCBIC | М | SS | |
| *BB0008?11 | <1.0E-1 | 20C AERCBIC | М | S S | |
| ¥B8Ù018?11 | <1.JE-1 | 20C AERCBIC | М | SS | |
| *850033?11 | <1.0F-1 | 20C AERCHIC | Μ | SS | |
| *830003?11 | - | 2JC AFREBIC | М | SS | |
| *880005?11 | | 20C AERCBIC | М | S S | |
| *680004?11 | - | 20C AERCBIC | М | SS | |
| *BBJ0U6?11 | | 200 AERCBIC | м | SS | |
| *BB00u9?11 | 1.3E0 | | М | SS | · · · |
| *BB0010?11 | 1.3E0 | 200 AERCHIC | М | SS | |
| *BB0023?11 | <1.0E-1 | 200 AERCBIC | | S S | |
| ×BB0013?11 | <1.08-1 | 20C AERCBIC | Μ | SS | |
| *BB0024?11 | <1.0E-1 | 20C AERCRIC | | SS | |
| *880025?11 | <1.05-1 | | | SS | |
| *BB0011?11 | <1.0E-1 | 20C AERCBIC | | S S | |
| * BB0019?11 | <1.0E-1 | | | SS | |
| *BB0014?11 | <1.0E-1 | 20C AERCBIC | _ | <u>SS</u> | |
| *BB0012?11 | <1.06-1 | | | SS | |
| <u>*BB0020?11</u> | <1.0E-1 | 20C AERCRIC | | \$5 | · · · · · · · · · · · · · · · · · · · |
| *BB0026?11 | <1.0E-1 | | м | SS | |
| <u>*880021?11</u> | <1.0E-1 | 20C AEPCBIC | м | SS | |
| *BB0027?11 | <1.08-1 | | | SS | |
| *BBJ022?11 | <1.0E-1 | | | SS | |
| *880028?11 | <1.0E-1 | | | 55 | |
| <u>*880029?11</u> | <1.75-1 | | | SS. | |
| *B99020511 | <1.0E-1 | 200 AFROBIC | м | SS | |
| | | | | | |

Table XV

PSYCHROPHILIC AND PSYCHROTROPHIC "VIBRIO"

| ICE | | | |
|--------------------|--------|--------------------|---------------------------------------|
| *BWU005?09 | <1.0E1 | O4C AERCBIC M TCES | () |
| *BM0038304 | 3.5E1 | C4C AEREBIC M TCBS | |
| *8M0033505 | 2.5E2 | DAC AERCBIC S TCBS | |
| *BW0040?09 | 3.5E2 | U4C AFREBIC S TCHS | |
| | | | |
| WATER | | | |
| <u>*8₩0042?09</u> | 4.3E2 | J4C AEROBIC S TCBS | |
| *8W0098309 | 1.3E2 | O4C AFREBIC S TCBS | |
| *BW0043?J9 | 2.3E2 | DAC AEROBIC S TOBS | |
| *BW0001?09 | 3.3E2 | O4C AFRCBIC S TCBS | |
| *8W0002?09 | 5.6E2 | DAC AEPCBIC S TOBS | |
| *8WUUJ3?39 | 8.5E1 | O4C AERCBIC S TCPS | A7 |
| *BM00T8508 | 2.6E2 | JAC AEPEBIG S TORS | |
| *BWJJ35?09 | 4.4E2 | 04C AEROBIC S TCBS | <u></u> |
| ₹8₩UJ2J?J9 | 1.3E2 | GAC AERCBIC S TCBS | |
| ≭BW0036?09 | 1.752 | DAC AERCHIC S TCHS | |
| *BWUUU9?J9 | 1.2E2 | 04C AEFCBIC S TCES | |
| *BW0021?09 | 1.762 | O4C AFREBIC S TCFS | |
| *BWJJ37209 | 2.482 | U4C AEROBIC S TCBS | |
| *BWUU10?09 | 1.6E2 | C4C AERCHIC S TCHS | |
| *8W0022?09 | 1.162 | 04C AERCHIC S TOBS | |
| *BWJ041?J9 | 3.6E2 | G4C AFRCBIC S TCBS | · · · · · · · · · · · · · · · · · · · |
| ≭8₩JC06?09 | 2.0E2 | 04C AFREBIC S TEES | |
| *BWUU04?09 | 5.0E1 | 04C AERCHIC S TCBS | |
| *BWJ0073J9 | 2.7E2 | O4C AERCBIC S TCBS | Ę |
| *BW0011?09 | 1.6E1 | 04C AEROBIC S TCBS | · · · · · · · · · · · · · · · · · · · |
| #BW0012?09 | 1.5E2 | C4C AERCBIC S TCBS | |
| *BWUU282U9 | 4.3E1 | 04C AERCBIC S TCBS | |
| ≠B₩0017?09 | 1.5E1 | G4C AERCBIC S TCBS | |
| ≉BW0013? 09 | 1.5F1 | 04C AEROBIC S TOBS | |
| *BWU329?09 | 5.0E0 | U4C AEKCBIC M TCBS | |
| *8W0014209 | 7.5FÜ | 04C AERCBIC M TCBS | |
| *BWU023?09 | 5.3E1 | 04C AERCBIC S TCBS | |
| *BW0018209 | 1.5E1 | 04C AFRCBIC S TCBS | 1 |
| *BW0015?09 | 4.3E1 | 04C AERCBIC S TCBS | |
| *8W0016?09 | 3.081 | 04C AERCBIC S TCBS | · · · · · · · · · · · · · · · · · · · |
| *BWUU24?U9 | 6.JE1 | 04C AFREBIC S TEES | |
| *BW0025709 | 2.3E1 | C4C AFREBIC S TCBS | |
| *BWJJJU?09 | 2.3E1 | U4C AERCUIC S TOBS | |
| *Bx0026709 | <1.0E1 | CAC AERCBIC M TCBS | |
| *BWUU31?J9 | <1.0E1 | 04C AERCBIC M TCBS | |
| *BWJ027?09 | 2.081 | 04C AERCBIC S TCBS | · · · · · · · · · · · · · · · · · · · |
| *BW0032?09 | 5.0EC | O4C AERCBIC M TCBS | |
| *BWU033?09 | 1.0E2 | 04C AEROBIC S TOBS | |
| #BWJU34?09 | 5.0E1 | 04C AERCBIC S TCBS | |
| | | | |

Table XV (cont'd)

| SEDIMENT | | |
|--------------------|--------------|--------------------|
| *883001?09 | <1.051 | C4C AERCBIC S TCBS |
| *BB0002?09 | <1.JE1 | C4C AERCBIC S TCBS |
| ¥B80015?09 | 1.4E2 | C4C AFRCBIC S TCBS |
| *880031709 | 3.2EB | J4C AERCHIC S TCBS |
| *880016209 | 2.383 | JAC AEPCBIC S TCBS |
| *880032?09 | 3.863 | J4C AERCBIC S TCBS |
| *660007?09 | 1.6E3 | D4C AFREBIC S TCBS |
| *880017209 | 6.0E1 | DAC AEROBIC S TOBS |
| #BB06∪8?09 | <1.061 | J4C AERCBIC S TCBS |
| *680013?09 | 2.3E3 | 04C AFROBIC S TOBS |
| *BB0U33?09 | 1.183 | J4C AERCHIC S TCHS |
| *BB0005?09 | 1.352 | DAC AERCHIC S TCHS |
| *BBUCU5209 | 1.483 | D4C AERCHIC S TCBS |
| *BBJ004?09 | 4.252 | U4C AERCBIC S TCBS |
| *BB0006?09 | 1.6E3 | O4C AERCHIC S TCBS |
| *BB3039?09 | 3.7E2 | 34C AERCBIC S TOBS |
| *88uúlú? 09 | 1.0E2 | J4C AERCBIC S TCBS |
| *880023?09 | 1.2E2 | O4C AERCHIC S TCHS |
| *BRU013?09 | 1.JE1 | 04C AFRCBIC S TCBS |
| *BB0024?09 | 1.952 | DAC AERCHIC S TCBS |
| *BB0025?09 | 1.4E2 | O4C AERCBIC S TCBS |
| *BB0011209 | <u>4.5E1</u> | D4C AERCBIC S TCBS |
| *880019209 | 6.0E1 | U4C AFRCBIC S TCBS |
| *BB0014?09 | 3.0E1 | O4C AEROBIC S TOBS |
| *880012709 | 1.162 | 04C AFRCBIC S TCHS |
| *BB0020709 | 7.0E1 | O4C AEROBIC S TCBS |
| *BB0026?09 | 5.JE1 | 04C AERCHIC S TCHS |
| *8B0021?09 | 3.8E1 | 04C AERCEIC S TCBS |
| *BBU027?J9 | 1.5E2 | U4C AERCHIC S TCHS |
| *880022709 | 4.2E2 | JAC AERCHIC S TCES |
| *BH0028?09 | 1.252 | DAC AERCHIC S TCRS |
| *880029?09 | 4.6E2 | U4C AERCHIC S TCBS |
| *BB0030709 | 1.352 | O4C AERCBIC S TCBS |

Table XVI

MESOPHILIC "VIBRIO"

| | | • • | | |
|--|-------------------|--------|--|--|
| | SAMPLE NO. | COUNT | CONCITIONS | |
| | ICE | | | ······································ |
| | *BW0005?10 | <1.0E0 | | TCBS |
| | *BW0338?10 | 2.0E1 | 20C AERCBIC M | |
| | *8w0039?10 | 5.8E1 | 200 AERCHIC M | |
| | *3W0040?10 | 1.0E1 | 20C AERCBIC M | TCBS |
| | | | | |
| | | | | |
| | WATER | | | |
| . | *BW0042?10 | 1.8E1 | 20C AEROBIC M | TCBS |
| | *BWJOU8?10 | <1.0E0 | 20C AEROBIC M | the second s |
| | *BW0043710 | 2.5EC | ZOC AERCBIC M | I TCBS |
| | *RW0001710 | <1.0EJ | 200 AEROBIC M | |
| 1 | *BWUUU2?10 | <1.0E0 | ZOC AERCHIC M | TCBS |
| | *8W0003?10 | 9.0E0 | 200 AERCBIC M | TCBS |
| | *BW0019?10 | <1.JED | | L TCBS |
| | *BW0035?10 | 2.051 | | TCBS |
| | *3#3023?13 | <1.0E0 | | TCBS |
| | *8W0036?10 | 2.5E0 | | TCBS |
| | *BW0009?10 | 2.050 | •• | TCBS |
| | *8w0021710 | <1.0E0 | the state of the s | TCBS |
| | *BWU037710 | 1.0E1 | | TCBS |
| | *BW0010?10 | 1.0F0 | | TCBS |
| , | *BWJ022?10 | 2.5E0 | | TCBS |
| - | *BW0041?10 | 5.0EU | | TCES |
| · · · | *BW0006710 | 1.0E0 | | TCBS |
| | *BW0J04?10 | 5.0E2 | - A second se | I TCBS |
| | *BW0007?10 | <1.0E0 | | TCBS |
| | *8W0011310 | 1.060 | | TCBS |
| | *BW0012?10 | 5.0E0 | | TCBS |
| | *BW0028?10 | 2.5E0 | | TCPS |
| | *BW0017?10 | <1.0E0 | | TCBS |
| | <u>*8WU013?10</u> | 2.050 | 200 AERCHIC M | the second second state of the second s |
| | *Bw0029?10 | <1.0E0 | | I TCBS |
| | #BW0014?10 | <1.0E0 | | TCBS |
| | *BW0023710 | <1.0E0 | | TCBS |
| | <u> </u> | 2.5E0 | 2CC AERCHIC M | |
| | *BW0015?10 | 1.361 | 20C AERCHIC M | |
| | *BW0016?10 | 1.0E1 | | TCBS |
| | *BW0024?10 | <1.0E0 | 20C AERCBIC M | |
| | *BWJ025?10 | 7.5E0 | 20C AERCHIC M | |
| | *8W0030?10 | 2.5E0 | | TCBS |
| | *BW0026710 | <1.0E0 | | TCBS |
| | *BW0031?10 | 2.5E0 | | I TCBS |
| ,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,, | *BW0027710 | <1.0E0 | | TCBS |
| | *8W0032210 | 5.8F1 | 200 AEROBIC M | |
| | *BW0033710 | <1.UE0 | | TCBS |
| | *BWJJ34?10 | 5.0E0 | 20C AERCHIC M | 1032 |

Table XVI (cont'd)

| SED IMENT | | |
|--------------------|--------|--------------------|
| *B80301710 | <1.0E0 | 20C AERCBIC M TCBS |
| * BB0002?10 | <1,0E0 | 200 AFROBIC M TOBS |
| *BB0015?10 | 2.0E0 | 2CC AERCBIC M TCBS |
| *BB0031?10 | 4.8E1 | 20C AERCBIC S TCBS |
| *BB0016?10 | <1.0E0 | 20C AERCBIC M TCBS |
| *BB0J32?10 | 4.8E1 | 20C AEROBIC S TOBS |
| *BB0007?10 | 5.4E0 | 20C AERCBIC M TCBS |
| *BB0017?10 | 1.281 | 20C AERCUIC S TOBS |
| *880008?10 | 1.3E0 | 20C AERCBIC M TCBS |
| *BB0018?10 | 1.1E2 | 200 AEROBIC S TOBS |
| *BB0033710 | 5.550 | 20C AERCBIC M TCBS |
| *880003?10 | 2.0F1 | 20C AERCHIC S TCBS |
| *BB0005?10 | <1.0E0 | 200 AFROBIC M TOBS |
| *830004?10 | 2.6E2 | 200 AERCHIC S TOBS |
| *BBJJJJ6?10 | <1.0E0 | 20C AFREDIC M TCBS |
| ≭BB0009?10 | 4.2E1 | 20C AFREBIC S TEBS |
| *88JJ10?13 | 2.5E0 | 20C AERCHIC M TCBS |
| *BB0023710 | 2.8E1 | 20C AERCHIC S TCHS |
| *880013?10 | <1.0E0 | 20C AERCBIC M TCBS |
| #BB0024?10 | <1.050 | 20C AERCBIC M TCBS |
| *BB0025710 | 7.0E0 | 20C AERCHIC M TCHS |
| *BB0011?10 | 7.5E2 | 20C AFREBIC S TEBS |
| *BBJJ19?1J | <1.0E0 | 20C AERCBIC M TCBS |
| *B80014?10 | 9.5E0 | 20C AERCHIC M TCBS |
| *B80012?10 | 3.8E) | 2CC AERCBIC M TCBS |
| *BBUU2U?10 | <1.0F0 | 20C AERCBIC M TCBS |
| *880026710 | 4.0E1 | 20C AERCHIC S TCBS |
| *BB0021?10 | <1.0E0 | 20C AERCBIC M TCBS |
| ≯880027?1 0 | <1.JE0 | 200 AFREBIC M TEBS |
| *BB0022?10 | <1.0E0 | 20C AERCBIC M TCBS |
| *B80028?10 | <1.0E0 | 20C AERCBIC M TCBS |
| *B80029?10 | <1.0E0 | 20C AFREBIC M TEBS |
| *B80030?10 | <1.JEU | 2JC AERCHIC M TCBS |

Table XVII

OIL-UTILIZING PSYCHROPHILES AND PSYCHROTROPHS

| 5.4.4475.4.5 ¹ - 647.3 | COUNT | CONDITIONS |
|-----------------------------------|--------------|----------------------|
| SAMPLE NO. | CUUNT | |
| ICE | <1.0E0 | O4C AERCBIC M CIL |
| #BW0JJ5?13 | 7.6E1 | O4C AFREBIC M CIL |
| *8W0033713 | 7.2E0 | C4C AFFCBIC M CIL |
| *8W0039?13 | | CAC AERCEIC M CIL |
| *8W0040?13 | 1.0E1 | |
| | | |
| WATER | | |
| *BW0042?13 | C.8E0 | C4C AERCHIC M CIL |
| *BW00042113 | <1.050 | DAC AERCBIC M CIL |
| *3WJ043?13 | C.8E0 | C4C AERCBIC M CIL |
| *BW0001713 | <2.0E1 | DAC AERCBIC M CIL |
| +BW0002?13 | 3.161 | C4C AERCBIC M CIL |
| *BW0003713 | 2.6E1 | O4C AERCBIC M CIL |
| +BW0019?13 | <1.050 | 04C AEREBIC M CIL |
| ≠8W0035?13 | <1.0E0 | C4C AFREDIC M CIL |
| +5W0030713 | <1.UE0 | 04C AEREBIC M CIL |
| +8₩0020113 +8₩0036?13 | <1.0E0 | 04C AERCHIC M CIL |
| *BW0009?13 | 2.5E1 | C4C AERCBIC M CIL |
| *BW0021?13_ | <1.JE0 | C4C AFRCHIC M CIL |
| +8W0021113 | <1.0E0 | 04C AERCHIC M CIL |
| *BW0010?13 | <1.0E0 | 04C AERCBIC M CIL |
| *8WU022?13 | <1.0E0 | 04C AERCHIC M CIL |
| *BW0041?13 | <1.0E0 | O4C AERCBIC M CIL |
| *BWUUU6?13 | <1.0E0 | C4C AERCBIC M CIL |
| *BW0U04713 | 1.381 | 04C AERCBIC M CIL |
| *8W0007?13 | <1.0E0 | CAC AERCHIC M CIL |
| *8w0011?13 | <1.0E0 | J4C AFREBIC M CIL |
| *8W0012713 | <1.0EC | 04C AERCHIC M CIL |
| *BW0028?13 | 0.1E0 | JAC AERCHIC M CIL |
| *BW0017?13 | 1.1E1 | 04C AERCHIC M CIL |
| ≠BW0013?13 | 2.9E1 | O4C AERCHIC M CIL |
| *BW0029?13 | 6.2E0 | G4C AERCBIC M DIL |
| *BW0014?13 | <1.0EC | O4C AEREBIC M CIL |
| *BW0023?13 | 2.250 | 34C AERCUIC M CIL |
| *9W0018?13 | <1.0E0 | J4C AFREBIC M CIL |
| *BWJU15?13 | 6.7E1 | U4C AFREBIC M CIL |
| *BWD016?13 | 4.5E1 | C4C AERCBIC M CIL |
| *BW0024?13 | 2.0E0 | U4C AFREBIC M GIL |
| *BW0025?13 | 1.1E1 | OAC AEFCBIC M CIL |
| *BW0030?13 | 0.1EC | O4C AEROBIC M CIL |
| *BWJ026?13 | 2.7E0 | G4C AERCBIC M CIL |
| *BW0031?13 | C.4E0 | GAC AERCBIC M CIL |
| *RW0027?13 | <u>3.4E0</u> | CAC AERCEIC M CIL |
| *BW0032?13 | 3.2EC | CAC AERCAIC M CIL |
| *BW0033?13 | <1.0E0 | 34C AERCOIC P CIL |
| *8W0034?13 | L.3E) | STO ADDIDUCTORE CARE |

Table XVII (cont'd)

| SEDIMENT | | | |
|-----------------------------|--------------|-------------------|--|
| *BB0001?13 | 1.4E1 | 04C AERCBIC M CIL | · · · · · · · · · · · · · · · · · · · |
| *BB0002?13 | 1.0E1 | 040 AEROBIC M CIL | |
| *BB0015713 | 1.1E2 | J4C AERCHIC M CIL | |
| *BB0031713 | <1.0E0 | 040 AERCAIC M CIL | |
| *B80016?13 | 1.483 | C4C AERCHIC M CIL | ····· |
| *880032713 | 3.5E1 | 04C AFREBIC M GIL | |
| *880007?13 | 1.5E3 | C4C AERCBIC M CIL | |
| *880017?13 | 1.0E2 | D4C AERCBIC M CIL | |
| *BBU008?13 | 3.CE2 | U4C AFREBIC M CIL | · · · · · · · · · · · · · · · · · · · |
| *BB0018713 | 1.0E2 | 04C AFREBIC M CIL | |
| *880033713 | 1.751 | J4C AFROBIC M CIL | ······ |
| <u>*BB0003713</u> | 9.JE1 | 04C AERCBIC M CIL | |
| *B80005?13 | 4.1EC | 046 AERCHIC M CIL | |
| *BB0004?13 | 5.0E3 | 04C AERCBIC M GIL | |
| #BBJJJ0 6?13 | 3.4E0 | 04C AEPCBIC M CIL | and a second |
| <u>*BB0009?13</u> | 1.3E3 | 24C AEROBIC M CIL | |
| *88JU10?13 | 6.1E2 | 04C AERCHIC M CIL | ······································ |
| * BB0023 ? 13 | 7.3E1 | O4C AEROBIC M CIL | |
| *BB0013?13 | 4.0E3 | 04C AERCBIC M CIL | ······································ |
| *8B0024?13 | 2.5E2 | 04C AEROBIC M CIL | |
| *B80025?13 | <1.0E0 | 04C AERCEIC M CIL | |
| *BB0011713 | <u>4.1E3</u> | D4C AEROBIC M CIL | |
| *BB0019?13 | 9.2F2 | 04C AFREBIC M GIL | |
| *BB0014?13 | 1.3E3 | D4C AFREBIC M CIL | |
| *BBJJ12?13 | 7.0E3 | 64C AERCEIC M CIL | |
| #BB0020713 | <u>3.8E1</u> | 040 AFREBIC M CIL | |
| *B80026?13 | <1.0E0 | 04C AERCBIC M CIL | |
| *BB0021?13 | 2.4E2 | Q4C AEPCRIC M CIL | |
| *880027?13 | <1.0E0 | 04C AFREBIC M CIL | |
| *880022213 | 1.182 | U4C AFREBIC M CIL | |
| *880028?13 | <1.0E0 | J4C AERCHIC M CIL | a na ann an Anna ann an Anna ann ann ann |
| *830029713 | <1.0EC | C4C AFREBIC M CIL | |
| *BB0030?13 | 1.JE2 | U4C AERCBIC M CIL | an ta |

Table XVIII

OIL-UTILIZING MESOPHILES

| SAMPLE NJ. | COUNT | CENEITIENS |
|--|------------------|--------------------|
| ICE | | |
| *BW00005?14 | <1.0E0 | 20C AERCHIC M CIL |
| *BW00038?14 | 2.3F0 | ZCC AEPCHIC M CIL |
| *8W0039?14 | 2.050 | 20C AERCBIC M CIL |
| *BW0039914 | 5.2E1 | ZUC AERCHIC M CIL |
| ~DWUU+0:1+ | | |
| WATER | | |
| *8WJ042?14 | 2.8E0 | 20C AFREBIC M CIL |
| *8₩00042114 *8₩0008?14 | 6.1E1 | 200 AERCHIC M CIL |
| *BWU043214 | 0.7E0 | ZUC AERCBIC M OIL |
| *BW0001?14 | 2.080 | 2CC AFPEBIC M CIL |
| <u><i>*</i>8₩0002?14</u> <i>*</i> 3₩0002?14 | 3.051 | ZOC AFREBIC M CIL |
| ≠8₩0002114 *8₩0003214 | 2.0E1 | 200 AERCHIC M CIL |
| *BN00003114 | 6.2E0 | ZUC AERCBIC M CIL |
| *8w0019714 *8w0035?14 | 8.1E0 | 20C AERCHIC M CIL |
| | 3.050 | ZUC AERCHIC M CIL |
| *BW0036?14 | 0.5E0 | 20C AEPCHIC M CIL |
| <u></u> | 1.3E1 | 200 AERCHIC M CIL |
| *BW0021?14 | 1.300 | 200 AERCHIC M CIL |
| *BW0027?14 | 0.5E0 | 200 AFROBIC M CIL |
| +8₩00010?14 ≠8₩0010?14 | 6.3E0 | 200 AERCHIC M CIL |
| *BWJ022?14 | 0.8E0 | 200 AERCHIC M CIL |
| *Bw0041?14 | 2.1E0 | 20C AERCHIC M CIL |
| *8W0005714 | 1.0E2 | 20C AERCHIC M CIL |
| *BWUUU4?14 | 1.7E1 | 20C AFREBIC M CIL |
| *BW0007?14 | 1.0E2 | 20C AERCBIC M CIL |
| *BW0011?14 | 4.8E0 | 200 AFRCHIC M CIL |
| *BW0012?14 | 4.0E0 | 20C AERCBIC M CIL |
| *8W0028?14 | 1.1E0 | 200 AERCBIC M CIL |
| *BWJ017?14 | 1.050 | 20C AFREBIC M CIL |
| *8W0013?14 | 5.0E0 | 2CC AERCBIC M CIL |
| *BW0029714 | 0.6E0 | 200 AEROBIC M CIL |
| *BW0014714 | 2.5F0 | 200 AFRCHIC M CIL |
| *8w0023?14 | 1.0E0 | 200 AERCHIC M CIL |
| *BWUU18?14 | 5.2E0 | 20C AERCHIC M CIL |
| *BW0015?14 | 1.1E1 | 200 AFREBIC M CIL |
| ≉ 8₩0016?14 | 3.5E0 | 20C AERCHIC M CIL |
| #BW0024?14 | 1.0E0 | 20C AERCBIC M GIL |
| ≭8₩0025?1 4 | 2.0F0 | 200 AERCHIC M CIL |
| *BW0030?14 | 0.160 | 200 AERCHIC M CIL |
| *BW0026?14 | 7.0E0 | ZOC AERCBIC M CIL |
| *5W0031?14 | C.250 | 20C AFREBIC M OIL |
| *8W0027?14 | <u><1.0E3</u> | 2GC AERCBIC M CIL |
| *BWJJJ2714 | 1.0F0 | 2GC AERCBIC M CIL |
| *8W0033714 | 0.2EC | 2 CC AFREBIC M CIL |
| *BWUJ34?14 | 0.7E0 | 200 AERCBIC M CIL |

| SEDIMENT | | |
|--------------------|-------|-------------------|
| *BB0001214 | 1.4E1 | ZCC AERCHIC M CIL |
| *BB0002214 | 1.081 | 200 AEROBIC M CIL |
| ₩BBUU15?14 | 1.253 | 200 AERCOIC M CIL |
| *BB0031?14 | 2.052 | 200 AFREBIC M FIL |
| *BBUJ16?14 | 7.7E2 | 20C AEFEBIC M CIL |
| *BB0032?14 | 7.0E1 | 200 AFROBIC M GIL |
| *BB0007?14 | 2.0E2 | 200 AERCHIC M CIL |
| ¥BBUJ17?14 | 1.4E2 | SOC VERCHIC W CIL |
| *BB0008?14 | 1.582 | 20C AERCHIC M CIL |
| *830018?14 | 2.782 | 200 AFROBIC M CIL |
| *BBU033?14 | 4.5E1 | 20C AFREBIC M CIL |
| ¥880003?14 | 1.3E2 | 200 AFREBIC M DIL |
| *BBJJJ5?14 | 4.1E1 | 200 AFROBIC M CIL |
| *BB0004?14 | 3.482 | 200 AFROBIC M CIL |
| *BBU006?14 | 2.1E2 | 20C AFREBIC M CIL |
| *BB0009?14 | 1.162 | 200 AEROBIC M CIL |
| *BB0010?14 | 6.5E1 | 20C AEPCBIC M CIL |
| *BB0023?14 | 3.2E2 | 200 AFROBIC M CIL |
| * BB0013?14 | 2.5E2 | 20C AERCBIC M CIL |
| *B80024?14 | 2.6E2 | 200 AERCBIC M CIL |
| *BB0025?14 | 2.4E2 | 20C AERCBIC M CIL |
| *BB0011?14 | 8.3E3 | 20C AERCBIC M CIL |
| *BBJ019?14 | 4.2E1 | 20C AFREBIC M CIL |
| *BB0014?14 | 1.5E2 | 200 AEPOBIC M CIL |
| *BBU012?14 | 7.0E3 | 20C AFREBIC M CIL |
| <u>*880020?14</u> | 7.661 | 200 AEROBIC M CIL |
| *B80026?14 | 8.JE1 | 200 AEROBIC M CIL |
| *BBU021?14 | 6.4E1 | 200 AEROBIC M CIL |
| *BB0027?14 | 6.2E1 | 200 AFREBIC M FIL |
| *BBJU22?14 | 1.2E1 | 200 AERCHIC M CIL |
| *BB0028?14 | 5.4E1 | 200 AEPCHIC M CIL |
| *BB0029?14 | 8.4E1 | 200 AFROBIC M CIL |
| *BB0030714 | 2.7E2 | 200 AERCHIC M DIL |

Table XIX

| T.T.a.L. and | | | |
|--------------------------|---------------------------------|--|--|
| Water | Sediment | Water | Sediment |
| 4 28 13 2 23 | 5 29 24 24 24 25 | 24 24 25 19 | 24 22 24 24 24 25 |
| 25 | 24 | 21 | 24 |
| | 4 28 13 2 23 25 | 4 5 28 29 13 24 2 24 23 25 25 25 | $\begin{array}{c cccccc} 4 & 5 & \\ 28 & 29 & 24 \\ 13 & 24 & 24 \\ 2 & 24 & 25 \\ 23 & 25 & 19 \\ 25 & 25 & 20 \end{array}$ |

NUMBER OF ISOLANTS BY LOCATION

Table XX

.

| Station | 4C | 20C | Water | Sediment | Total |
|---------|----|-----|-------|----------|-------|
| 1 | 9 | 0 | 4 | 5 | 9 |
| 2 | 57 | 48 | 52 | 53 | 105 |
| 10 | 37 | 46 | 37 | 46 | 83 |
| 30 | 26 | 49 | 27 | 48 | 75 |
| 55 | 48 | 43 | 42 | 49 | 91 |
| 70 | 50 | 45 | 45 | 50 | 95 |
| 71 | 49 | 45 | 46 | 48 | 94 |

NUMBER OF ISOLANTS BY LOCATION

| NO. | OF ORGANISMS TESTED | 4C Water Isolants 120 | 4C Sediment Isolants 156 | 20C Water Isolants 133 | 20C Sediment Isolants 143 |
|---------------------|--|--------------------------------|-----------------------------------|---------------------------------|------------------------------------|
| MORE | PHOLOGY | | | | |
| | Non-pigmented (gray) colonies | 18 | 70 | 83 | 45 |
| | Produce non-diffusible pigment | 79 | 58 | 37 | 65 |
| | Produce diffusible pigment | 0 | 4 | 0 | 1 |
| | Pigment not recorded | 23 | 24 | 13 | 32 |
| PHY | SIOLOGY | | | | |
| | Capable of growth at 5C | | | 127 | 136 |
| | Capable of growth at 10C | 116 | 152 | 127 | 140 |
| | Capable of growth at 15C | 115 | 151 | 128 | 138 |
| | Capable of growth at 20C | 104 | 85 | | - |
| | Capable of growth at 37C | 1 | 0 | 10 | 6 |
| - | Capable of growth in presence of 3% NaCl | 98 | 142 | 126 | 137 |
| ဂ | Capable of growth in presence of 5% NaCl | 84 | 106 | 120 | 91 |
| $\mathbf{\nabla}$: | Capable of growth in presence of 7.5% NaCl | 32 | 31 | 81 | 43 |
| | Capable of growth at pH 4 or pH 5 | 53 | 115 | 68 | 105 |
| | Capable of growth at pH 6 | | 135 | 128 | 141 |
| | Capable of growth at pH 7 | 94 102 | 137 | 128 | 137 |
| | Capable of growth at pH 8 or pH 9 | 11.0 | 146 | 128 | 139 |
| राह होत | RITIONAL | | | | ļ |
| NOT | Capable of utilizing carbohydrates | 84 | 99 | 115 | 73 |
| | Capable of utilizing amino acids | 56 | 84 | 103 | 61 |
| | Capable of utilizing alcohols | 34 | 58 | 108 | 51 |
| | Capable of utilizing phenol | 0 | 1 | 1 | 0 |
| | Capable of utilizing carboxylic acids (TCA cycle) | 41 | 76 | 109 | 62 |
| | Capable of utilizing fatty acids | 31 | 42 | 107 | 56 |
| | Capable of utilizing pyruvic acid | 36 | 77 | 97 | 55 |
| | Capable of utilizing acetic acid | 24 | 26 | 99 | 40 |
| | Capable of utilizing benzoic acid | 0 | 0 | 6 | 5 |
| | Capable of utilizing hydrocarbons | 1 | 2 | 6 | 3 |
| | Capable of utilizing hydrocarbons at 5C in presence of 3% NaCl | 1 | 2 | 5 | 3 |
| | Require growth factors (vitamins, amino acids or unknown) | 115 | 118 | 110 | 123 |
| | Amino acids and yeast extract serve as growth factors | | | | |
| | (vitamins alone insufficient) | 30 | 29 | 8 | 53 |
| | Require unknown growth factors | 6 | 8 | 5 | 15 |
| | Vitamins serve as growth factors | 79 | 81 | 97 | 55 |

TABLE XXI

| TABLE | XXII |
|-------|------|
|-------|------|

| | | 4C | 20C | Water | Sediment | Total |
|-----|--|-------------------|-------------------|----------------|----------------|------------|
| NO. | OF ORGANISMS TESTED | Isolants | Isolants | | Isolants | |
| | | 276 | 276 | 253 | 299 | 552 |
| MOR | PHOLOGY | | | | | |
| | Non-pigmented (gray) colonies | 88 | 100 | 101 | 110 | 01.6 |
| | Produce non-diffusible pigment | 137 | <u>128</u> 102 | 101 | 115 | 216 |
| | Produce diffusible pigment | 4 | 102 | 116 | 123 | 239 |
| | Pigment not recorded | 47 | 45 | <u>0</u> 36 | <u>5</u> 56 | <u>5</u> |
| PHY | SIOLOGY | <i>71</i> | | 0 | 50 | 92 |
| | Capable of growth at 5C | | 262 | | | |
| | Capable of growth at 10C | | 263 | | | |
| | Capable of growth at 15C | 268 266 | <u>267</u> 266 | 243 | 292 | 535 |
| | Capable of growth at 20C | | | 243 | 289 | 532 |
| | Capable of growth at 37C | 189 | 16 | | | |
| | Capable of growth in presence of 3% NaCl | | | 11 | 6 | 17 |
| 2 | Capable of growth in presence of 5% NaCl | <u>240</u> 190 | 263 | 224 | 279 | 503 |
| | Capable of growth in presence of 7.5% NaCl | | <u>211</u> 129 | 204 | 197 | 401 |
| | Capable of growth at pH 4 or pH 5 | <u>63</u> 168 | 129 | 113 121 | 79 | 192 |
| | Capable of growth at pH 6 | 229 | 269 | 222 | 220 | 341 |
| | Capable of growth at pH 7 | 239 | | 222 | 276 274 | 498 |
| | Capable of growth at pH 8 or pH 9 | 255 | <u>265</u> 267 | 230 | 274 | 504 523 |
| NIT | RITIONAL | | | 2.50 | 205 | 323 |
| | Capable of utilizing carbohydrates | | | | | |
| | Capable of utilizing amino acids | 183 | 188 | 199 | 172 | 371 |
| | Capable of utilizing alcohols | 140 | 169 | 164 | 145 | 309 |
| | Capable of utilizing phenol | 92 | 159 | 142 | 109 | 251 |
| | Capable of utilizing carboxylic acids (TCA cycle) | 1 117 | <u>_</u> | 1 | 1 | |
| | Capable of utilizing fatty acids | 73 | 171 | 150 | 138 | 288 |
| | Capable of utilizing pyruvic acid | 113 | , 163 | 133 | 98 | 236 |
| | Capable of utilizing acetic acid | | 152 | 133 | 132 | 265 |
| | Capable of utilizing benzoic acid | 50 | 152 | 133 | 132 | 265 |
| | Capable of utilizing hydrocarbons | 0 | 139 | 123 | 66 | 189 |
| | Capable of utilizing hydrogarbons at 5C in proceeded of 28 North | 3 | 11 | 66 | 5 | 11 |
| | Negure growth ractors (Vitamins, amino acide or unknown) | <u>3</u> 233 | 9 | 7 | 5 | 12 |
| | Amino acids and yeast extract serve as growth factors | 233 | 8 | 6 | 5 | 11 |
| | (Vitaming alone insufficient) | 59 | 61 | 38 | 82 | 100 |
| | Require unknown growth factors | | 20 | 38 | | 120 |
| | Vitamins serve as growth factors | 160 | | | 23 | 34 |
| | | TOO | 152 | 176 | 136 | 312 |

TABLE XXIII

| | | % ISOLANTS | | | | |
|----------|--|------------|-----|---------------|----------|-------|
| | | 4C | 20C | Water | Sediment | Total |
| | | | | | | |
| MORE | PHOLOGY | | ļ | | | . 1 |
| | | | | | | |
| | Non-pigmented (gray) colonies | 32 | 46 | 40 | 38 | 39 |
| | Produce non-diffusible pigment | 50 | 37 | 46 | 41 | 43 |
| | Produce diffusible pigment | 1 | 0.3 | 0 | 2 | 1 |
| | Pigment not recorded | 2 | 16 | 14 | 19 | 17 |
| | | | | | | l l |
| PHYS | SIOLOGY | | | | | İ I |
| | | | | | | |
| | Capable of growth at 5C | | 95 | | | |
| | Capable of growth at 10C | 97 | 97 | 96 | 98 | 97 |
| | Capable of growth at 15C | 96 | 96 | 96 | 97 | 96 |
| | Capable of growth at 20C | 68 | | | | |
| | Capable of growth at 37C | 0.3 | 6 | 4 | 2 | 3 |
| | Capable of growth in presence of 3% NaCl | 87 | 95 | 88 | 93 | 91 |
| <u> </u> | Capable of growth in presence of 5% NaCl | 69 | 76 | 81 | 66 | 73 |
| • | Capable of growth in presence of 7.5% NaCl | 23 | 47 | 45 | 26 | 35 |
| | Capable of growth at pH 4 or pH 5 | 61 | 63 | 48 | 74 | 62 |
| | Capable of growth at pH 6 | 83 | 97 | 88 | 92 | 90 |
| | Capable of growth at pH 7 | 87 | 96 | 91 | 92 | 91 |
| | Capable of growth at pH 8 or pH 9 | 93 | 37 | 94 | 95 | 95 |
| | | | | | | |
| NUT | RITIONAL | I | | 1 | 1 | 1 1 |
| | Capable of utilizing carbohydrates | 66 | 68 | 79 | 58 | 67 |
| | Capable of utilizing amino acids | 51 | 61 | 65 | 48 | 56 |
| | Capable of utilizing alcohols | 33 | 58 | 56 | 36 | 45 |
| | Capable of utilizing phenol | 0.3 | 0.3 | 0.3 | 3 0.3 | 0.3 |
| | Capable of utilizing carboxylic acids (TCA cycle) | 42 | 62 | 60 | 46 | 52 |
| | Capable of utilizing fatty acids | 26 | 50 | 55 | 32 | 43 |
| | | 1 | 1 | 1 | 1 | |
| | Capable of utilizing pyruvic acid | 47 | 55 | 53 | 44 | 48 |
| | Capable of utilizing acetic acid | 18 | 50 | 49 | 22 | 34 |
| | Capable of utilizing benzoic acid | . 0 | 4 | 2 | 2 | 2 |
| | Capable of utilizing hydrocarbons | 1 | 3 | 3 | 2 | 2 |
| | Capable of utilizing hydrocarbons at 5C in presence of 3% NaCl | 1 | 3 | $\frac{2}{1}$ | 2 | 2 |
| | Require growth factors (vitamins, amino acids or unknown) | 84 | 84 | 89 | 81 | 84 |
| | Amino acids and yeast extract serve as growth factors | | | 1 3- | | |
| | (vitamins alone insufficient) | 21 | 22 | 15 | 27 | 2 |
| | Require unknown growth factors | 5 | 1 | 4 | 8 | 6 |

| | Table XXIV - STATION 1 | 40 | | 20 | IC |
|--------------|--|-------------------|----------|-------|----------|
| | | Water | Sediment | Water | Sediment |
| <u>NO. (</u> | OF ORGANISMS TESTED | 4 | 5 | 0 | 0 |
| | | | | | |
| MORPH | FOLOGY | | | | |
| | | | _ | | |
| | Non-pigmented (gray) colonies | .0 | 1 | | |
| | Produce non-diffusible pigment | 2 | 4 | | |
| | Produce diffusible pigment | 0 | <u> </u> | | |
| | Pigment not recorded | 2 | l0 | | |
| TO 1 15 775 | | | | | |
| PHIS | IOLOGY | | | | |
| | Comphie of month at 50 | 1 | | | |
| | Capable of growth at 5C | | <u> </u> | | |
| | Capable of growth at 10C | 4 | 5 | | |
| | Capable of growth at 15C | 4 | 5 | | |
| | Capable of growth at 20C Capable of growth at 37C | 2 | 5 | | |
| | | 0 | 0 | | |
| _ | Capable of growth in presence of 3% NaCl | 4 | 5 | | |
| 6 6 8 | Capable of growth in presence of 5% NaCl | 4 | 2 | | |
| | Capable of growth in presence of 7.5% NaCl | <u> l </u> | 11 | | |
| | Capable of growth at pH 4 or pH 5 Capable of growth at pH 6 | 3 | 44 | | |
| | Capable of growth at pH 7 | 4 | 5 | | |
| | Capable of growth at pH 8 or pH 9 | 4 | 5 | | |
| | capable of growth at ph 8 of ph 9 | 44 | 5 | | |
| NTTR | ITIONAL | ļ | | | |
| | | | | | |
| | Capable of utilizing carbohydrates | 3 | 5 | | |
| | Capable of utilizing amino acids | 3 | 4 | | |
| | Capable of utilizing alcohols | <u></u> | 2 | | |
| | Capable of utilizing phenol | | 0 | | |
| | Capable of utilizing carboxylic acids (TCA cycle) | $\frac{1}{1}$ | 1 | | |
| | Capable of utilizing fatty acids | $\frac{1}{1}$ | 2 | | |
| 10.00 | Capable of utilizing pyruvic acid | 2 | 2 | | |
| | Capable of utilizing acetic acid | | | | |
| | Capable of utilizing benzoic acid | 1 | 1 | | |
| | Capable of utilizing hydrocarbons | 0 | 0 | | |
| | Capable of utilizing hydrocarbons at 5C in presence of 3% NaCl | 0 | 0 | | |
| | Require growth factors (vitamins, amino acids or unknown) | <u> </u> | <u> </u> | | - |
| | Amino acids and yeast extract serve as growth factors | 3 | 5 | | |
| | (vitamins alone insufficient) | 1 1 | | | |
| | Require unknown growth factors | | 0 | — — | |
| | Vitamins serve as growth factors | 2 | 5 | | |
| | | <u> </u> | 5 | _ | 1 - |

| | Table XXV - Station 1 | 4C | 20C | Water | Sediment | Total |
|-------|--|----------|----------|-------|--|-------|
| NO. (| OF ORGANISMS TESTED | 9 | 0 | 4 | 5 | 9 |
| | | | | | | |
| MDRP. | HOLOGY | | | | | |
| | | | | | | |
| | Non-pigmented (gray) colonies | 1. | | 0 | 1 | 1 |
| | Produce non-diffusible pigment | 6 | | 2. | 4 | б |
| | Produce diffusible pigment | 0 | | 0 | 0 | 0 |
| | Piqment not recorded | 2 | | 2 | 0 | 2 |
| | | | | | | |
| PHYS | IOLOGY | | i | | | |
| | | | | | | |
| | Capable of growth at 5C | | | | | |
| | Capable of growth at 10C | 9 | - | 4 | 5 | 9 |
| | Capable of growth at 15C | 9 | | 4 | 5 | 9 |
| | Capable of growth at 20C | 7 | | 2 | 5 | 7 |
| | Capable of growth at 37C | 0 | - | 0 | 0 | 0 |
| | Capable of growth in presence of 3% NaCl | 0 | - | 4 | 5 | 9 |
| | Capable of growth in presence of 5% NaCl | 6 | <u> </u> | 4 | 2 | 6 |
| | Capable of growth in presence of 7.5% NaCl | 2 | - | 1 | 1 | 2 |
| Ο, | Capable of growth at pH 4 or pH 5 | 7 | - | 3 | 4 | 7 |
| G | Capable of growth at pH 6 | 9 | | 4 | 5 | 9 |
| | Capable of growth at pH 7 | 9 | | 4 | 5 | 9 |
| | Capable of growth at pH 8 or pH 9 | 9 | - | 4 | 5 | 9 |
| | | | | | | |
| NUTF | ITIONAL | | | | | |
| | | | | | | |
| | Capable of utilizing carbohydrates | 8 | - | 3 | 5 | 8 |
| | Capable of utilizing amino acids | 7 | - | 3 | 4 | 7 |
| | Capable of utilizing alcohols | 3 | - | 1 | 2 | 3 |
| | Capable of utilizing phenol | 0 | | 0 | 0 | 0 |
| | Capable of utilizing carboxylic acids (TCA cycle) | 2 | | 1 | 1 | 2 |
| | Capable of utilizing fatty acids | 3 | <u> </u> | 1 | 2 | 3 |
| | Capable of utilizing pyruvic acid | 4 | | 2 | 2 | 4 |
| | Capable of utilizing acetic acid | 2 | - | 1 | 1 | |
| | Capable of utilizing benzoic acid | 0 | <u> </u> | 0 | | |
| | Capable of utilizing hydrocarbons | 0 | | 0 | 0 | |
| | Capable of utilizing hydrocarbons at 5C in presence of 3% NaCl | Ŏ | <u> </u> | 0 | 0 | 0 |
| | Require growth factors (vitamins, amino acids or unknown) | 8 | <u> </u> | 3 | 5 | 8 |
| | Atimo acids and yeast extract serve as growth factors | <u> </u> | 1 | † | - | + |
| | (vitamins alone insufficient) | 1 | | 1 | 0 | |
| | Require unknown growth factors | 0 | <u> </u> | Ō | 0 | 0 |
| | Vitamins serve as growth factors | 7 | 1 | 2 | 5 | 7 |
| | | | J | -L | ······································ | |

| Percentage | | | | | | | | | |
|------------|---|-----|-----|--|----------|-------|--|--|--|
| 30 | OF ORGANISMS TESTED Table XXVI - Station 1 | 4C | 20C | Water | Sediment | Total | | | |
| <u></u> | OF CAREATSIS TESTED | | | | | | | | |
| MODE | HOLOGY | | | | | | | | |
| | | | | | | | | | |
| | Non-migmontod (menu) and an in- | | | | | | | | |
| | Non-pigmented (gray) colonies Produce non-diffusible pigment | 11 | | 0 | 20 | 11 | | | |
| | Produce diffusible pigment | 66 | | 50 | 80 | 66 | | | |
| | Pigment not recorded | 0 | | 0 | 0 | 0 | | | |
| | righent hot recorded | 22 | | 50 | 0 | 22 | | | |
| DUVO | TOLOGY | | | | | | | | |
| <u></u> | | | | | | | | | |
| | Capable of growth at 5C | [| | | | | | | |
| | Capable of growth at 10C | | | | | | | | |
| | Capable of growth at 15C | 100 | | 100 | 100 | 100 | | | |
| | Capable of growth at 150 | 100 | | 100 | 100 | 100 | | | |
| | Capable of growth at 20C | 78 | | 50 | 100 | 78 | | | |
| | Capable of growth at 37C | 0 | - | 0 | 0 | 0 | | | |
| | Capable of growth in presence of 3% NaCl | 100 | | 100 | 100 | 100 | | | |
| | Capable of growth in presence of 5% NaCl | 66 | | 100 | 40 | 66 | | | |
| | Capable of growth in presence of 7.5% NaCl | 22 | | 25 | 20 | 22 | | | |
| \sim | Capable of growth at pH 4 or pH 5 | 78 | | 75 | 80 | 78 | | | |
| Õ | Capable of growth at pH 6 | 100 | | 100 | 100 | 100 | | | |
| 70 | Capable of growth at pH 7 | 100 | | 100 | 100 | 100 | | | |
| | Capable of growth at pH 8 or pH 9 | 100 | | 100 | 100 | 100 | | | |
| | | | | | <u> </u> | | | | |
| NUT | ITIONAL | | | | | · • | | | |
| | | | | | | | | | |
| | Capable of utilizing carbohydrates | 89 | | 75 | 100 | 89 | | | |
| | Capable of utilizing amino acids | 78 | - | 75 | 80 | 78 | | | |
| | Capable of utilizing alcohols | 33 | | 25 | 40 | 33 | | | |
| | Capable of utilizing phenol | 0 | | 0 | 0 | 0 | | | |
| | Capable of utilizing carboxylic acids (TCA cycle) | 22 | | 25 | 20 | 22 | | | |
| | Capable of utilizing fatty acids | 33 | | 25 | 40 | 33 | | | |
| | Capable of utilizing pyruvic acid | 44 | | 50 | 40 | 44 | | | |
| | Capable of utilizing acetic acid | 22 | | 25 | 20 | 22 | | | |
| | Capable of utilizing benzoic acid | 0 | | 0 | | L | | | |
| | Capable of utilizing hydrocarbons | 0 | | the second s | 0 | 0 | | | |
| | Capable of utilizing hydrocarbons at 5C in presence of 3% NaCl | 0 | | 0 | 0 | 0 | | | |
| | Require growth factors (vitamins, amino acids or unknown) | 89 | | 0 | 0 | 0 | | | |
| | Amino acids and yeast extract serve as growth factors | 69 | | 75 | 100 | 89 | | | |
| | (vitamins alone insufficient) | 11 | | າະ | ^ | 11 | | | |
| | Require unknown growth factors | | | 25 | 0 | 11 | | | |
| | Vitamins serve as growth factors | 0 | | 0 | 0 | 0 | | | |
| | | 78 | | 50 | 100 | | | | |

| | 40 | | 20 | C . |
|--|------------|------------|-------|----------|
| Table XXVII - Station 2 | Water | Sediment | Water | Sediment |
| NO. OF ORGANISMS TESTED | 28 | 29 | 24 | 24 |
| | | | | |
| MORPHOLOGY | | | | |
| | | | | |
| Non-pigmented (gray) colonies | 10 | 19 | 18 | 2 |
| Produce non-diffusible pigment | 14 | 4 | 6 | 9 |
| Produce diffusible pigment | 0 | 0 | 0 | 0 |
| Pignent not recorded | 4 | 6 | 0 | 13 |
| | | | | |
| PHYSIOLOGY | | | | |
| | | | | |
| Capable of growth at 5C | | | 24 | 24 |
| Capable of growth at 10C | 25 | 29 | 24 | 24 |
| Capable of growth at 15C | 25 | 28 | 24 | 24 |
| Capable of growth at 20C | 20 | 10 | | |
| Capable of growth at 37C | 0 | 0 | 1 | 1 |
| Capable of growth in presence of 3% NaCl | 20 | 28 | 24 | 21 |
| Capable of growth in presence of 5% NaCl | 17 | 17 | 23 | 8 |
| Capable of growth in presence of 7.5% NaCl | 7 | 3 | 11 | 1 1 |
| Capable of growth at pH 4 or pH 5 | 5 | 18 | 10 | 9 |
| Capable of growth at pH 6 | 17 | 26 | 24 | 24 |
| Capable of growth at pH 7 | 20 | 27 | 24 | 23 |
| Capable of growth at pH 8 or pH 9 | 21 | 23 | 24 | 22 |
| | | - | 1 | |
| NUTRITIONAL | | | 1 | |
| | | | | |
| Capable of utilizing carbohydrates | 15 | 21 | 23 | 6 |
| Capable of utilizing amino acids | 16 | 14 | 13 | 4 |
| Capable of utilizing alcohols | 11 | 17 | 20 | 2 |
| Capable of utilizing phenol | 0 | 1 | 0 | 0 |
| Capable of utilizing carboxylic acids (TCA cycle) | 13 | 17 | 21 | 3 |
| Capable of utilizing fatty acids | 11 | 4 | 20 | 4 |
| Capable of utilizing pyruvic acid | 11 | 8 | 19 | 9 |
| Capable of utilizing acetic acid | 7 | | | 2 |
| Capable of utilizing benzoic acid | | 4 | 19 | |
| Capable of utilizing hydrocarbons | | - <u>-</u> | | |
| Capable of utilizing hydrocarbons at 5C in presence of 3% NaCl | 0 | ··· | | 0 |
| Paquire growth factors (vitamins, amino acids or unknown) | 25 | 25 | 22 | 23 |
| Atim acids and yeast extract serve as growth factors | | | | |
| (vitamins alone insufficient) | 8 | Ė | 0 | 13 |
| Paquire unknown growth factors | | | | 6 |
| Vitamins serve as growth factors | 14 | 18 | 22 | |
| | <u>k</u> * | 1 10 | | š |

| NO 0 | Table XXVIII - Station 2 | 4C | | | Sediment | |
|-------------|--|------|-----|-----|----------|-----|
| <u>w. u</u> | F ORGANISMS TESTED | 58 | 49 | 52 | 53 | 105 |
| MORPH | OLOGY | | | | | |
| | Non-pigmented (gray) colonies | . 29 | 20 | 28 | 21 | 49 |
| | Produce non-diffusible pigment | 18 | 15 | 20 | 13 | 33 |
| | Produce diffusible pigment | 0 | 0 | 0 | 0 | 0 |
| | Pignent not recorded | 10 | 13 | 4 | 19 | 23 |
| | | | | | | |
| PHYSI | OLOGY | | | | | |
| | Capable of growth at 5C | | 48 | | | |
| | Capable of growth at 10C | 54 | 48 | 49 | 43 | 102 |
| | Capable of growth at 15C | 53 | 48 | 49 | 42 | 101 |
| | Capable of growth at 20C | 30 | | | | |
| | Capable of growth at 37C | 0 | 2 | 1 | 1 | 2 |
| | Capable of growth in presence of 3% NaCl | 48 | 45 | 44 | 49 | 93 |
| | Capable of growth in presence of 5% NaCl | 34 | 31 | 40 | 25 | 65 |
| | Capable of growth in presence of 7.5% NaCl | 10 | 12 | 18 | 4 | 22 |
| | Capable of growth at pH 4 or pH 5 | 23 | 19 | 15 | 27 | 42 |
| 20 | Capable of growth at pH 6 | 43 | 48 | 41 | 50 | 91 |
| | Capable of growth at pH 7 | 47 | 47 | 44 | 50 | 94 |
| | Capable of growth at pH 8 or pH 9 | 44 | 46 | 45 | 45 | 90 |
| NUTRI | TIONAL | | | | | |
| | Capable of utilizing carbohydrates | 36 | 29 | 38 | 27 | 65 |
| | Capable of utilizing amino acids | 30 | 17 | 29 | 18 | 47 |
| | Capable of utilizing alcohols | _38 | 22 | 31 | 19 | 50 |
| | Capable of utilizing phenol | 1 | 0 | 0 | 1 | 1 |
| | Capable of utilizing carboxylic acids (TCA cycle) | 30 | 24 | 34 | 20 | 54 |
| | Capable of utilizing fatty acids | 15 | 24 | 31 | 8 | 39 |
| | Capable of utilizing pyruvic acid | 19 | 28 | 30 | 17 | 47 |
| | Capable of utilizing acetic acid | 111 | 21 | 26 | 6 | 32 |
| | Capable of utilizing benzoic acid | 0 | 1 0 | 0 | 0 | 0 |
| | Capable of utilizing hydrocarbons | 1 1 | 0 | 1 0 | 1 1 | 1 |
| | Capable of utilizing hydrocarbons at 5C in presence of 3% NaCl | 1 | 0 | 1 0 | 1 1 | 1 |
| | Require growth factors (vitamins, amino acids or unknown) | 50 | 45 | 47 | 48 | 95 |
| | Amino acids and yeast extract serve as growth factors | | | 1 | | |
| | (vitamins alone insufficient) | 13 | 13 | 8 | 18 | |
| | Require unknown growth factors | 5 | 6 | 3 | 8 | 11 |
| | Vitamins serve as growth factors | 32 | 26 | 36 | 22 | 58 |

| | | Percentage | | | | | | |
|-------|---|------------|-----|-------|----------|----------|--|--|
| | Table XXIX - Station 2 | 4C | 20C | Water | Sediment | Total | | |
| NO. (| OF ORGANISMS TESTED | | | | | | | |
| | | | | | | | | |
| MORPI | CLOGY | | | | | | | |
| | | | | | | | | |
| | Non-pignented (gray) colonies | 51 | 42 | 54 | 40 | 47 | | |
| | Produce non-diffusible pigment | 32 | 31 | 38 | 25 | 31 | | |
| | Produce diffusible pigment | 0 | 0 | 0 | 0 | 0 | | |
| | Pignent not recorded | 18 | 27 | 8 | 36 | 22 | | |
| | | | | | | | | |
| PHVS | IOLOGY | | | | | | | |
| | | | | | | | | |
| | Capable of growth at 5C | | 100 | | | | | |
| | Capable of growth at 10C | 95 | 100 | 94 | 100 | 97 | | |
| | Capable of growth at 15C | 93 | 100 | 94 | 98 | 96 | | |
| | Capable of growth at 20C | 53 | | | | | | |
| | Capable of growth at 37C | 0 | 4 | 2 | 2 | 2 | | |
| | Capable of growth in presence of 3% NaCl | 84 | 94 | 85 | 92 | 89 | | |
| | Capable of growth in presence of 5% NaCl | 60 | 64 | 77 | 47 | 62 | | |
| | Capable of growth in presence of 7.5% NaCl | 18 | 25 | 35 | 8 | 21 | | |
| 57 | Capable of growth at pH 4 or pH 5 | 40 | 40 | 29 | 51 | 40 | | |
| ~ | Capable of growth at pH 6 | 75 | 100 | 79 | 94 | 87 | | |
| | Capable of growth at pH 7 | 82 | 98 | 85 | 94 | 90 | | |
| | Capable of growth at pH 8 or pH 9 | 77 | 96 | 87 | 85 | 86 | | |
| | | | | | | | | |
| NUTF | ATTONAL CONTRACT OF A CONTRACT. | | 1 | i i | | | | |
| | | | | | | | | |
| | Capable of utilizing carbohydrates | 63 | 60 | 73 | 51 | 62 | | |
| | Capable of utilizing amino acids | 52 | 35 | 56 | 34 | 45 | | |
| | Capable of utilizing alcohols | 67 | 46 | 60 | 36 | 48 | | |
| | Capable of utilizing phenol | 2 | | | 2 | <u> </u> | | |
| | Capable of utilizing carboxylic acids (TCA cycle) | 53 | 50 | 65 | 38 | 51 | | |
| | Capable of utilizing fatty acids | 26 | 50 | 60 | 15 | 37 | | |
| | Capable of utilizing pyruvic acid | 33 | 58 | 58 | 32 | 45 | | |
| | Catable of utilizing acetic acid | 19 | 44 | 50 | 11 | 30 | | |
| | Capable of utilizing benzoic acid | 0 | 0 | 0 | 0 | 0 | | |
| | Capable of utilizing hydrocarbons | 2 | 0 | 0 | 2 | 1 | | |
| | Capable of utilizing hydrocarbons at 5C in presence of 3% NaCl | 2 | 0 | 0 | 2 | 1 | | |
| | Require growth factors (vitamins, amino acids or unknown) | 88 | 94 | 90 | 91 | 90 | | |
| | Amino acids and yeast extract serve as growth factors | | | | | | | |
| | (vitamins alone insufficient) | 23 | 27 | 15 | 34 | 25 | | |
| | Require unknown growth factors | 9 | 12 | 6 | 15 | 10 | | |
| | Vitamins serve as growth factors | 56 | 54 | 69 | 42 | 55 | | |

i

| | 4C | | | | | |
|--|----------|---------------|----------|---------------------------------------|--|--|
| Table XXX - Station 10 | Water | Sediment | Water | Sediment | | |
| NO. OF ORGANISMS TESTED | 13 | 24 | 24 | 22 | | |
| MORPHOLOGY | | | | | | |
| | | | | | | |
| Non-pigmented (gray) colonies | 0 | 13 | 3 | 8 | | |
| Produce non-diffusible pigment | 7 | 3 | 19 | 10 | | |
| Produce diffusible pigment | | 0 | 0 | 0 | | |
| Pignent not recorded | 6 | 8 | 2 | 4 | | |
| PHYSIOLOGY | | | | | | |
| | 1 | | | | | |
| Capable of growth at 5C | | | 24 | 21 | | |
| Capable of growth at 10C | 13 | 24 | 24 | 21 | | |
| Capable of growth at 15C | 13 | 23 | 24 | 19 | | |
| Capable of growth at 20C | 6 | 4 | - | - | | |
| Capable of growth at 37C | 0 | 0 | 3 | 2 | | |
| Capable of growth in presence of 3% NaCl | 11 | 23 | 24 | 21 | | |
| Capable of growth in presence of 5% NaCl | 10 | 20 | 21 | 21 | | |
| Capable of growth in presence of 7.5% NaCl | 4 | 0 | 13 | 15 | | |
| 24 Capable of growth at pH 4 or pH 5 | 7 | 19 | 24 | 19 | | |
| Capable of growth at pH 6 | 10 | 22 | 24 | 21 | | |
| Capable of growth at ph / | 11 | 22 | 24 | 20 | | |
| Capable of growth at pH 8 or pH 9 | 13 | 24 | 24 | 21 | | |
| NUTRITIONAL | | | | | | |
| Capable of utilizing carbohydrates | 6 | 15 | 20 | 13 | | |
| Capable of utilizing amino acids | 0 | 6 | 20 | $\frac{13}{12}$ | | |
| Capable of utilizing alcohols | 2 | 12 | | | | |
| Capable of utilizing phenol | | | 18 | 13 | | |
| Capable of utilizing carboxylic acids (TCA cycle) | 0 | 10 | 13 | | | |
| Capable of utilizing fatty acids | 0 | 5 | 19 | $\frac{14}{14}$ | | |
| Capable of utilizing pyruvic acid | 2 | 16 | 19 | 14 | | |
| Capable of utilizing acetic acid | | 3 | 15 | 14 14 | | |
| Capable of utilizing benzoic acid | | | | 5 | | |
| Capable of utilizing hydrocarbons | <u>0</u> | - <u></u> | 3 | | | |
| Capable of utilizing hydrocarbons at 5C in presence of 3% NaCl | | 0 | 3 | 3 | | |
| Require growth factors (vitamins, amino acids or unknown) | 12 | 16 | 18 | 18 | | |
| Aniro acids and yeast extract serve as growth factors | | - <u> +</u> 9 | ╶┼╌┈╧ᅃ╌╴ | ++° | | |
| (vitamins alone insufficient) | 3 | 1 | 2 | 3 | | |
| Require urknown growth factors | | <u> </u> | | 3 | | |
| | <u>_</u> | 1. M | 1 (J | · · · · · · · · · · · · · · · · · · · | | |

| | Table XXXI - Station 10 | 4C | | | Sediment | |
|-----------|---|---------------|----------|----------|-------------|-----|
| <u>v.</u> | OF ORGANISMS TESTED | 37 | 46 | 37 | 46 | 83 |
| | | | | | | |
| ORI | PHOLOGY | | | | | |
| | Non-nigmonted (gray) colonies | . 13 | 11 | 3 | 21 | 24 |
| | Non-pigmented (gray) colonies Produce non-diffusible pigment | 10 | 29 | 26 | 13 | 39 |
| | Produce diffusible pigment | 0 | 0 | 0 | 0 | 0 |
| | Piquent not recorded | 14 | 6 | 8 | 12 | 20 |
| | | <u> _ 14</u> | <u> </u> | <u> </u> | <u>↓</u> ≜€ | |
| HYS | SIOLOGY | | | | | |
| | | | | | | |
| | Capable of growth at 5C | | 45 | | | |
| | Capable of growth at 10C | 37 | 45 | 37 | 45 | 82 |
| | Capable of growth at 15C | 36 | 43 | 37 | 42 | 79 |
| | Capable of growth at 20C | 10 | | | | |
| | Capable of growth at 37C | 0 | 5 | 3 | 2 | 5 |
| | Capable of growth in presence of 3% NaCl | 34 | 45 | 35 | 44 | 79 |
| | Capable of growth in presence of 5% NaCl | | 42 | 31 | 41 | 72 |
| | Capable of growth in presence of 7.5% NaCl | 4 | _28_ | 17 | 15 | 32 |
| | Capable of growth at pH 4 or pH 5 | 16 | 43 | 31 | | 69 |
| | Capable of growth at pH 6 | 32 | 45_ | 34 | 43 | |
| | Capable of growth at pH 7 | 33 | 44 | 35 | 42 | 77 |
| | Capable of growth at pH 8 or pH 9 | 37 | 45 | | 45 | 83 |
| | | | | | | |
| <u>UI</u> | RITIONAL | | | 1 | | 1 |
| | Capable of utilizing carbohydrates | 111 | .33 | 26 | 28 | 54 |
| | Capable of utilizing amino acids | 6 | 32 | 20 | 18 | 38 |
| | Capable of utilizing alcohols | 14 | 31 | 20 | 25 | 45 |
| | Capable of utilizing phenol | 0 | 1 | 1 | 0 | 1 |
| | Capable of utilizing carboxylic acids (TCA cycle) | 10 | 27 | 13 | 24 | 37 |
| | Capable of utilizing fatty acids | 5 | 33 | 19 | 19 | •38 |
| | Capable of utilizing pyruvic acid | 18 | 32 | 20 | 30 | 50 |
| | Capable of utilizing acetic acid | 3 | 29 | 15 | 17 | 32 |
| | Capable of utilizing benzoic acid | | 8 | 3 | 5 | 8 |
| | Capable of utilizing hydrocarbons | 0 | 6 | 3 | 3 | 6 |
| | Capable of utilizing hydrocarbons at 5C in presence of 3% NaCl | | 6 | 3 | 3 | 6 |
| | Require growth factors (vitamins, amino acids or unknown) | 28 | | 30 | 34 | 64 |
| | Atino acids and yeast extract serve as growth factors | 1 | | | | 1 |
| | (vitamins alone insufficient) | 7 | 6 | 6 | 7 | 13 |
| | Require unknown growth factors | 3 | 3 | 3 | 3 | 6 |
| | Vitamins serve as growth factors | 18 | 27 | 21 | 24 | 45 |

,

| Percentage | | | | | | | |
|--------------------------|---|----------|-----------------|-------|----------|----------|--|
| | Table XXXII - Station 10 | 4C | 20C | Water | Sediment | Total | |
| NO. OF ORGANISM | S TESTED | | | | | | |
| MODDUCT COM | | | | | | | |
| MORPHOLOGY | | | | | | | |
| Non-nimon | tod (man) polouion | | | 1 | | | |
| | ted (gray) colonies | 35 | 24 | 8 | 46 | | |
| Produce no Produce di | n-diffusible pigment | 27 | 63 | 70 | 28 | 47 | |
| Picce un | treorded | 0 | 0 | 0 | 0 | 0 | |
| | | | 13 | 22 | 26 | | |
| PHYSIOLOGY | | | | | | | |
| 1110101001 | | | | | | | |
| Capable of | growth at 5C | | | | | | |
| | growth at 10C | | 98 | | | | |
| | growth at 15C | <u> </u> | 98 | 100 | 98 | 99 | |
| | growth at 20C | 27 | 93 | 100 | 91 | 95 | |
| | growth at 37C | | $+\frac{-}{11}$ | 8 | 4 | <u> </u> | |
| Capable of | growth in presence of 3% NaCl | 92 | 98 | 95 | 96 | -95 | |
| Capable of | growth in presence of 5% NaCl | 81 | 91 | 84 | 89 | 87 | |
| Capable of | growth in presence of 7.5% NaCl | 11 | 61 | 46 | 33 | 39 | |
| on Capable of | growth at pH 4 or pH 5 | 43 | 93 | 84 | 83 | 83 | |
| | growth at pH 6 | 86 | 98 | 92 | 93 | 93 | |
| | growth at pH 7 | 89 | 96 | 95 | 91 | 93 | |
| Capable of | growth at pH 8 or pH 9 | 100 | 98 | 100 | 98 | 100 | |
| | | | | | | | |
| NUTRITIONAL | | | | | | | |
| Comphile of | | | 1 | | | | |
| Capable of | utilizing carbohydrates | | 72 | 70 | 61 | 65 | |
| | ULTIZING AREAD ACTOS | 16 | 70 | 54 | | 46 | |
| Capable of | utilizing alcohols utilizing phenol | 38 | 67 | 54 | 54 | 54 | |
| Capable of | utilizing carboxylic acids (TCA cycle) | | 2 | 3 | 0 | 1 | |
| Capable of | utilizing fatty acids | 27 | 59 | 35 | 52 | 45 | |
| Capable of | utilizing pyruvic acid | 14 | 72 | 51 | 41 | 46 | |
| | | 49 | 70 | 54 | 65 | 60 | |
| Capable of | f utilizing acetic acid | 8_ | 63 | 41 | 37 | 38 | |
| Capable of | f utilizing benzoic acid f utilizing hydrocarbons | 0 | 17 | 8 | 11 | 10 | |
| Canable of | f utilizing hydrocarbong of 50 in magness of 20 mg | 0 | 13 | 8 | 7 | 7 | |
| Benuire of | f utilizing hydrocarbons at 5C in presence of 3% NaCl rowth factors (vitamins, amino acids or unknown) | 0_ | 13 | 8 | 7 | 7 | |
| Amino acio | is and yeast extract serve as growth factors | 76 | 78 | 81 | 74 | 77 | |
| | (vitamins alone insufficient) | | | | | | |
| Recuire un | hkrown growth factors | 19 | 13 | 16 | 15 | 16 | |
| | serve as growth factors | | $\frac{7}{50}$ | - 8 | | 7 | |
| | | 49 | 59 | 57 | 52 | 54 | |

:

:

| | 4 | C | 20C | | |
|--|-------|----------|-------|----------|--|
| Table XXXIII - Station 30 | Water | Sediment | Water | Sediment | |
| NO. OF ORGANISMS TESTED | 2 | 24 | 25 | 24 | |
| | | | | | |
| NORPHOLOGY | | | | | |
| | | | | | |
| Non-pigmented (gray) colonies | 0 | 11 | 19 | 8 | |
| Produce non-diffusible pigment | 2 | 7 | 1 | 10 | |
| Produce diffusible pigment | 0 | 3 | 0 | 0 | |
| Pigment not recorded | 0 | 3 | ö | 6 | |
| | | | | | |
| PHYSIOLOGY | | | | | |
| | | | 1 | 24 | |
| Capable of growth at 5C | | | 24 | 24 | |
| Capable of growth at 10C | 2 | 22 | 23 | 24 | |
| Capable of growth at 15C | 1 | 22 | 23 | 24 | |
| Capable of growth at 20C | 2 | 18 | | | |
| Capable of growth at 37C | 0 | 0 | 0 | 1 | |
| Capable of growth in presence of 3% NaCl | 2 | 22 | 23 | 24 | |
| Capable of growth in presence of 5% NaCl | 0 | 15 | 23 | 17 | |
| Capable of growth in presence of 7.5% NaCl | 0 | 3 | 19 | 9 | |
| Capable of growth at pH 4 or pH 5 | 0 | 19 | 6 | 22 | |
| Capable of growth at pH 6 | 2 | 20 | 23 | 24 | |
| Capable of growth at pH 7 | 2 | 20 | 23 | 24 | |
| Capable of growth at pH 8 or pH 9 | 2 | 22 | 23 | 24 | |
| | | | | | |
| NUTRITIONAL | | | | | |
| | | | | | |
| Capable of utilizing carbohydrates | 2 | 11 | 21 | 7 | |
| Capable of utilizing amino acids | 0 | 14 | 21 | 8 | |
| Capable of utilizing alcohols | 0 | 4 | 21 | 2 | |
| Capable of utilizing phenol | 0 | 0 | 0 | 0 | |
| Capable of utilizing carboxylic acids (TCA cycle) | l | 13 | 22 | 7 | |
| Capable of utilizing fatty acids | 0 | 13 | 21 | 9 | |
| Capable of utilizing pyruvic acid | 1 | 17 | 20 | 7 | |
| Capable of utilizing acetic acid | 0 | 4 | 19 | 2 | |
| Capable of utilizing benzoic acid | 0 | 0 | 0 | 0 | |
| Capable of utilizing hydrocarbons | 0 | 1 | 0 | 0 | |
| Capable of utilizing hydrocarbons at 5C in presence of 3% NaCl | 0 | 1 | 0 | 0 | |
| Require growth factors (vitamins, amino acids or unknown) | 2 | 14 | 21 | 20 | |
| Amino acids and yeast extract serve as growth factors | | | | | |
| (vitamins alone insufficient) | 0 | 3 | 2 | 14 | |
| Fequire unknown growth factors | 0 | 0 | 2 | 1 | |
| Vitamins serve as growth factors | 2 | 11 | 17 | 5 | |

| NO. OF ORGANISMS TESTED Table XXXIV - Station 30 | 4C | 20C | | Sediment | |
|--|--|-----|----------|----------------|-----|
| | 26 | 49 | _26 | 48 | 75 |
| MORPHOLOGY | | | | | |
| | | | | | |
| Non-pigmented (gray) colonies | . 11 | 27 | 19 | 19 | 38 |
| Produce non-diffusible pigment | 9 | 11 | 3 | 17 | 20 |
| Produce diffusible pigment | 3 | | 0 | 3 | 3 |
| Pignent not recorded | 3 | 11 | 5 | 9 | 14 |
| | | | <u> </u> | † ⁻ | |
| PHYSIOLOGY | | 1 | | | |
| | | | | | |
| Capable of growth at 5C | | 48 | | | |
| Capable of growth at 10C | 24 | 47 | 25 | 46 | 71 |
| Capable of growth at 15C | 23 | 47 | 24 | 46 | 70 |
| Capable of growth at 20C | 20 | | | | |
| Capable of growth at 37C | 0 | 1 | 0 | 1 | 1 1 |
| Capable of growth in presence of 3% NaCl | 24 | 47 | 25 | 46 | 71 |
| Capable of growth in presence of 5% NaCl | 15 | 40 | 23 | 32 | 55 |
| Capable of growth in presence of 7.5% NaCl | 3 | 28 | 19 | 12 | 31 |
| Capable of growth at pH 4 or pH 5 | 19 | 28 | 6 | 41 | 47 |
| Co Capable of growth at pH 6 | 22 | 47 | 25 | 44 | 69 |
| Capable of growth at pH 7 | 22 | 47 | 25 | 44 | 69 |
| Capable of growth at pH 8 or pH 9 | 24 | 47 | 25 | 44 | 69 |
| | ······································ | | | | |
| NUTRITIONAL | | | | | |
| Capable of utilizing carbohydrates | | | | | |
| Capable of utilizing amino acids | 13_ | 28 | 23 | 18 | 41 |
| Capable of utilizing alcohols | 14 | 29 | 21 | 22 | 43 |
| Capable of utilizing phenol | 4_ | 23 | | 6 | 27 |
| Capable of utilizing carboxylic acids (TCA cycle) | 0 | 0 | <u> </u> | O | 0 |
| Capable of utilizing fatty acids | 14 | 29 | 23 | 20 | 43 |
| Capable of utilizing pyruvic acid | 13 | 30 | 21 | 22 | 43 |
| | 18 | 27 | 21 | 24 | 45 |
| Capable of utilizing acetic acid | 4 | 21 | 19 | 6 | 25 |
| Capable of utilizing benzoic acid | 0 | 0 | 0 | 0 | 0 |
| Capable of utilizing hydrocarbons | 1 | 0 | 0 | 1 | 1 |
| Capable of utilizing hydrocarbons at 5C in presence of 3% NaCl | 1 | 0 | 0 | 1 | 1 |
| Paquire growth factors (vitamins, amino acids or unknown) | 16 | 41 | 23 | 34 | 57 |
| Aniro acids and yeast extract serve as growth factors | | | <u>_</u> | - <u> </u> | 1 |
| (vitamins alone insufficient) | 3 | 16 | 2 | 17 | 19 |
| Require unknown growth factors Vitamins serve as growth factors | | 3 | 2 | 1 | 3 |
| | | | | | |

| | | Percentage | | | | | | |
|----------|---|------------|-----------------|------------|----------|-----------------|--|--|
| | Table XXXV - Station 30 | 4C | | | Sediment | Total | | |
| NO. | OF ORGANISMS TESTED | | | | | | | |
| | | | | | | | | |
| MORE | PHCLOGY | | | | 9 | | | |
| | | 10 | | 70 | 10 | 53 | | |
| | Non-pigmented (gray) colonies | • 42 | 55 | 70 | 40 | 51 27 | | |
| | Produce non-diffusible pigment | 35 | 22 | 11 | | | | |
| | Produce diffusible pigment | | 0 | 0 | 6 | 4 | | |
| | Pigment not recorded | | 22 | 18 | 19 | 19 | | |
| DUV | SIOLOGY | | | 1 | | | | |
| | | | | ł | | | | |
| | Capable of growth at 5C | | 98 | 1 | | | | |
| | Capable of growth at 10C | 92 | 96 | 93 | 96 | 95 | | |
| | Capable of growth at 15C | 88 | 96 | 89 | 96 | 93 | | |
| | Capable of growth at 20C | 77 | | | | | | |
| | Capable of growth at 37C | 0 | 2 | 0 | 2 | 1 | | |
| | Capable of growth in presence of 3% NaCl | 92 | .96 | 93 | 96 | 95 | | |
| | Capable of growth in presence of 5% NaCl | 58 | 82 | 85 | 67 | 73 | | |
| | Capable of growth in presence of 7.5% NaCl | 12 | 57 | 70 | 25 | 41 | | |
| | Capable of growth at pH 4 or pH 5 | 73 | 57 | 22 | 85 | 63 | | |
| 22 | Capable of growth at pH 6 | 85 | 96 | 93 | 92 | 92 | | |
| U | Capable of growth at pH 7 | 85 | 96 | 93 | 92 | 92 | | |
| | Capable of growth at pH 8 or pH 9 | 92 | 96 | 93 | 92 | 92 | | |
| | | : | | ļ | ţ | | | |
| NUT | RITIONAL | | | | | | | |
| | Orable of utilizing outphylopter | 1 50 | | 0 | 20 | | | |
| | Capable of utilizing carbohydrates | 50 | <u>57</u> 59 | 85 | 38 46 | <u>55</u> 57 | | |
| | Capable of utilizing amino acids Capable of utilizing alcohols | 15 | 47 | 78 | 13 | 36 | | |
| | Capable of utilizing phenol | | 4/ | | | 0 | | |
| | Capable of utilizing carboxylic acids (TCA cycle) | 54 | 59 | 85 | 42 | 57 | | |
| | Capable of utilizing facty acids | 50 | 61 | 78 | 46 | 57 | | |
| | Capable of utilizing pyruvic acid | 69 | .55 | 78 | 50 | 60 | | |
| | | | 1 | | | | | |
| | Capable of utilizing acetic acid | 15 | 43 | 70 | 13 | 33 | | |
| | Capable of utilizing benzoic acid | | 0 | 0 | 0 | <u> </u> | | |
| | Capable of utilizing hydrocarbons Capable of utilizing hydrocarbons at 5C in presence of 3% NaCl | 4_ | | <u> </u> | 2 | <u> </u> | | |
| | Require growth factors (vitamins, amino acids or unknown) | 4_ | <u> </u> | | 2- | + | | |
| | Amino acids and yeast extract serve as growth factors | 62 | 84 | | 71 | <u> </u> | | |
| | (vitamins alone insufficient) | 1 1 1 | | - | | 1 ar | | |
| | Fequire unknown growth factors | 12 | 33 | 7_7_7 | 352 | 25 | | |
| | Vitamins serve as growth factors | | 45 | 70 | 33 | 47 | | |
| | | <u>}</u> | 143. | (<u>U</u> | <u></u> | 4 | | |

| | | <u>4C 20C</u> | | | | |
|--------------|--|---------------|----------|----------|----------|--|
| | Table XXXVI - Station 55 | Water | Sediment | Water | Sediment | |
| <u>NO. (</u> | OF ORGANISIS TESTED | 23 | 25 | 19 | 24 | |
| 10000 | | | | | | |
| MURP. | HOLOGY | | | | | |
| | Non-nigmonted (gravi) galanies | | ~ | 16 | 10 | |
| | Non-pigmented (gray) colonies | 11 | 6 | 15 | 12 | |
| | Produce non-diffusible pigment Produce diffusible pigment | 17 | 18 | 3 | 8 | |
| | Pigment not recorded | 0 | 0 | 0 | 1 | |
| | rigaent not recorded | 5 | 1 | 1 | 3 | |
| PHYS | IOLOGY | | | | | |
| | | | | | | |
| | Capable of growth at 5C | | | 18 | 20 | |
| | Capable of growth at 10C | 23 | 24 | 18 | 23 | |
| | Capable of growth at 15C | 23 | 24 | 19 | 23 | |
| | Capable of growth at 20C | 23 | 19 | <u> </u> | | |
| | Capable of growth at 37C | 0 | 0 | 0 | 0 | |
| | Capable of growth in presence of 3% NaCl | 20 | 20 | 19 | 24 | |
| | Capable of growth in presence of 5% NaCl | 17 | 19 | 18 | 19 | |
| | Capable of growth in presence of 7.5% NaCl | 6 | 14 | 15 | 9 | |
| <i></i> | Capable of growth at pH 4 or pH 5 | 13 | 17 | 6 | 16 | |
| 80 | Capable of growth at pH 6 | 20 | 19 | 19 | 24 | |
| \cup | Capable of growth at pH 7 | 22 | 18 | 19 | 22 | |
| | Capable of growth at pH 8 or pH 9 | 23 | 22 | 19 | 24 | |
| | | | † | | | |
| NUTF | ITIONAL | i. | | | | |
| | | | | | | |
| | Capable of utilizing carbohydrates | 20 | 14 | 17 | 22 | |
| | Capable of utilizing amino acids | 13 | 14 | 16 | 16 | |
| | Capable of utilizing alcohols | 10 | 4 | 15 | 13 | |
| | Capable of utilizing phenol | 0 | 0 | 0 | 0 | |
| | Capable of utilizing carboxylic acids (TCA cycle) | 9 | 9 | 17 | 16 | |
| | Capable of utilizing fatty acids | 8 | 5 | 15 | 13 | |
| | Capable of utilizing pyruvic acid | 8 | 10 | 13 | 20 | |
| | Capable of utilizing acetic acid | 8 | 4 | 14 | 11 | |
| | Capable of utilizing benzoic acid | 0 | C | 1 1 | 0 | |
| | Capable of utilizing hydrocarbons | 0 | С | 1 | 0 | |
| | Capable of utilizing hydrocarbons at 5C in presence of 3% NaCl | 0 | 0 | 1 | 0 | |
| | Require growth factors (vitamins, amino acids or unknown) | 23 | 19 | 17 | 22 | |
| | Amino acids and yeast extract serve as growth factors | | | | | |
| | (vitamins alone insufficient) | 3 | 7 | 2 | 6 | |
| | Require unknown growth factors | 0 | 1 | 0 | 1 | |
| | Vitamins serve as growth factors | 20 | 11 | 15 | 15 | |

| NO. OF ONGAMINES TESTED International and the second s | | Table XXXVII - Station 55 | 4C | 20C | Water | Sediment | Total |
|--|------|------------------------------------|----------------|-----------------|--|---|---|
| NORPHOLOGY 7 27 16 18 34 Non-pignanted (gray) colonies 7 27 16 18 34 Produce non-diffusible pignent 0 1 0 1 1 1 Produce diffusible pignent 0 1 0 1 1 1 Pignent not recorded 6 4 6 4 6 4 10 Explaise of growth at 5C | NO. | | | | | | |
| Non-pictmented (gray) colonies 7 27 16 18 34 Produce non-diffusible pignent 35 11 20 26 46 Produce diffusible pignent 0 1 0 1 1 Prignent not recorded 6 4 6 4 10 FMNSIOLOGY 6 4 6 4 10 1 Capable of growth at 5C - 38 - - - Capable of growth at 10C 47 41 41 47 88 Capable of growth at 20C 42 - - - - - Capable of growth at 30C 0 < | | | | | | | |
| Non-pictmented (gray) colonies 7 27 16 18 34 Produce non-diffusible pignent 35 11 20 26 46 Produce diffusible pignent 0 1 0 1 1 Prignent not recorded 6 4 6 4 10 FMNSIOLOGY 6 4 6 4 10 1 Capable of growth at 5C - 38 - - - Capable of growth at 10C 47 41 41 47 88 Capable of growth at 20C 42 - - - - - Capable of growth at 30C 0 < | MORP | HOLOGY | - | | 1 | | i I |
| Nor-Piglement (refly) Condities 1 2 1 2 2 4 Produce diffusible pignent 0 1 0 1 0 1 1 1 Produce diffusible pignent 0 1 0 1 0 1 1 1 1 Produce diffusible pignent 0 1 0 1 0 1 | | | | | | | |
| Produce infinishe pigment 15 11 20 26 46 Produce diffusible pigment 0 1 0 1 1 Pigment not recorded 6 4 6 4 10 PINSIOLOX 6 4 6 4 10 Capable of growth at SC 38 Capable of growth at SC 47 41 41 47 88 Capable of growth at SC 47 42 42 47 69 Capable of growth at SC 0 | | Non-pigmented (gray) colonies | . 7 | 27 [,] | 16 | 18 | 34 |
| Produce diffusible pignent 0 1 0 1 1 1 Pignent mot recorded 6 4 6 4 10 PHNSIOLOGY | | | 35 | 11 | 20 | 26 | 46 |
| Pignent not recorded 6 4 6 4 10 PMNIOLOGY | | Produce diffusible pigment | 0 | 1 | 0 | 1 | 1 |
| Capable of growth at 5C | | | 6 | 4 | 6 | 4 | 10 |
| Capable of growth at 5C | | | | | | | |
| Capable of growth at 10C 47 41 41 47 48 Capable of growth at 15C 47 42 42 47 69 Capable of growth at 37C 0 | PHYS | IOLOGY | | | | | |
| Capable of growth at 10C 47 41 41 47 48 Capable of growth at 15C 47 42 42 47 69 Capable of growth at 37C 0 | | | | | | | |
| Capable of growth at 15C 47 42 42 47 69 Capable of growth at 20C 0 | | | | 38 | | <u> </u> | |
| Capable of growth at 20C 42 Capable of growth at 37C 0 <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> | | | | | | | |
| Capable of growth at 37C 0 </td <td></td> <td></td> <td></td> <td>42</td> <td>42</td> <td>47</td> <td></td> | | | | 42 | 42 | 47 | |
| Capable of growth in presence of 3% NACL 40 43 39 44 83 Capable of growth in presence of 5% NACL 36 37 35 38 73 Capable of growth in presence of 7.5% NACL 20 14 21 23 44 Capable of growth at pH 4 or pH 5 30 22 19 33 52 Capable of growth at pH 7 40 41 40 81 Capable of growth at pH 7 40 41 40 81 Capable of growth at pH 7 40 41 40 81 Capable of growth at pH 7 40 41 40 81 Capable of growth at pH 7 40 41 40 81 Capable of growth at pH 8 or pH 9 45 43 42 46 88 NUTRITIONAL 14 28 25 17 42 6 93 Capable of utilizing carbohydrates 27 32 29 30 59 59 Capable of utilizing phenol 0 0 0 0 0 0 12 14 28 | | | | | | | <u> </u> |
| Capable of growth in presence of 5% NaCl 36 37 35 38 73 Capable of growth in presence of 7.5% NaCl 20 14 21 23 44 Capable of growth at pH 4 or pH 5 30 22 19 33 52 Co Capable of growth at pH 6 39 43 39 41 80 Capable of growth at pH 7 40 41 41 40 81 Capable of growth at pH 8 or pH 9 45 43 42 46 88 NUTRITIONAL 27 32 29 30 59 Capable of utilizing carbohydrates 34 39 37 46 93 Capable of utilizing anino acids 27 32 29 30 59 Capable of utilizing phenol 0 0 0 0 0 0 Capable of utilizing carboxylic acids (TCA cycle) 18 33 26 25 51 Capable of utilizing fatty acids 13 28 23 16 41 Capable of utilizing pyruvic acid 18 33 21 <td< td=""><td></td><td></td><td></td><td></td><td>the second s</td><td></td><td></td></td<> | | | | | the second s | | |
| Capable of growth in presence of 7.5% NaCl 20 14 21 23 44 Capable of growth at pH 4 or pH 5 30 22 19 33 52 C0 Capable of growth at pH 6 39 43 39 41 80 C Capable of growth at pH 7 40 41 41 40 81 Capable of growth at pH 8 or pH 9 45 43 42 46 88 NUTRITIONAL 27 32 29 30 59 Capable of utilizing amino acids 27 32 29 30 59 Capable of utilizing carbohydrates 14 28 25 17 42 Capable of utilizing amino acids 14 28 25 17 42 Capable of utilizing carbohydrates 13 32 26 25 51 Capable of utilizing achols 14 28 23 18 41 Capable of utilizing carbohydrates 13 26 25 51 Capable of utilizing pyruvic acids 13 32 21 30 51 </td <td></td> <td></td> <td></td> <td></td> <td></td> <td>and the second se</td> <td></td> | | | | | | and the second se | |
| Capable of growth at pH 4 or pH 5 30 22 19 33 52 Capable of growth at pH 6 39 43 39 41 80 Capable of growth at pH 7 40 41 41 40 81 Capable of growth at pH 8 or pH 9 45 43 42 46 88 NUTRITIONAL 45 43 42 46 88 Capable of utilizing carbohydrates 34 39 37 46 93 Capable of utilizing anino acids 27 32 29 30 59 Capable of utilizing alcohols 14 28 25 17 42 Capable of utilizing carboxylic acids (TCA cycle) 18 33 26 25 51 Capable of utilizing fatty acids 13 28 23 18 41 Capable of utilizing pyruvic acid 12 25 22 15 37 Capable of utilizing hydrocarbons 0 1 0 1 0 1 Capable of utilizing hydrocarbons 1 0 1 0 1 | | | | | | the second s | |
| Co Capable of growth at pH 6 39 43 39 41 80 Capable of growth at pH 7 40 41 41 40 81 Capable of growth at pH 8 or pH 9 45 43 42 46 88 NUTRITIONAL 45 43 42 46 88 NUTRITIONAL 34 39 37 46 93 Capable of utilizing carbohydrates 34 39 37 46 93 Capable of utilizing amino acids 27 32 29 30 59 Capable of utilizing alcohols 14 28 25 17 42 Capable of utilizing carboxylic acids (TCA cycle) 18 33 26 25 51 Capable of utilizing pyruvic acid 13 28 23 18 41 Capable of utilizing pyruvic acid 13 28 23 18 41 Capable of utilizing byruvic acid 12 25 22 15 37 Capable of utilizing byruvic acid 0 1 0 1 0 1 <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> | | | | | | | |
| Capable of growth at pH 7 40 41 41 40 81 Capable of growth at pH 8 or pH 9 45 43 42 46 88 NUTRITIONAL 34 39 37 46 93 Capable of utilizing carbohydrates 34 39 37 46 93 Capable of utilizing amino acids 27 32 29 30 59 Capable of utilizing alcohols 14 28 25 17 42 Capable of utilizing phenol 0 0 0 0 0 0 Capable of utilizing carboxylic acids (TCA cycle) 18 33 26 25 51 Capable of utilizing fatty acids 13 28 23 18 41 Capable of utilizing physic acid 12 25 22 15 37 Capable of utilizing barzoic acid 0 1 1 0 1 Capable of utilizing hydrocarbons 0 1 1 0 1 Capable of utilizing hydrocarbons 10 1 0 1 1 0 | | | | | | | |
| Capable of growth at pH 8 or pH 9 45 43 42 46 88 NUTRITIONAL 45 43 42 46 88 Capable of utilizing carbohydrates 34 39 37 46 93 Capable of utilizing amino acids 27 32 29 30 59 Capable of utilizing anino acids 27 32 29 30 59 Capable of utilizing anino acids 27 32 29 30 59 Capable of utilizing anino acids 14 28 25 17 42 Capable of utilizing phenol 0 0 0 0 0 0 Capable of utilizing carboxylic acids (TCA cycle) 18 33 26 25 51 Capable of utilizing pyruvic acid 18 33 21 30 51 Capable of utilizing pyruvic acid 12 25 22 15 37 Capable of utilizing hydrocarbons 0 1 1 0 1 Capable of utilizing hydrocarbons at 5C in presence of 3% NaCl 0 1 1 <t< td=""><td></td><td></td><td></td><td></td><td></td><td></td><td></td></t<> | | | | | | | |
| NUTRITIONAL 34 39 37 46 93 Capable of utilizing amino acids 27 32 29 30 59 Capable of utilizing achols 14 28 25 17 42 Capable of utilizing phenol 0 0 0 0 0 0 Capable of utilizing carboxylic acids (TCA cycle) 18 33 26 25 51 Capable of utilizing fatty acids 13 28 23 18 41 Capable of utilizing pyruvic acid 18 33 21 30 51 Capable of utilizing pyruvic acid 12 25 22 15 37 Capable of utilizing byruvic acid 0 1 1 0 1 Capable of utilizing byruvic acid 0 1 1 0 1 Capable of utilizing byruvic acid 0 1 1 0 1 Capable of utilizing byruvic acid 0 1 1 0 1 Capable of utilizing byruvic acid 0 1 1 0 1 | þ | | | | | | |
| Capable of utilizing carbohydrates3439374693Capable of utilizing amino acids2732293059Capable of utilizing alcohols1428251742Capable of utilizing alcohols1428251742Capable of utilizing carboxylic acids (TCA cycle)1833262551Capable of utilizing fatty acids1328231841Capable of utilizing pyruvic acid1833213051Capable of utilizing banzoic acid1225221537Capable of utilizing hydrocarbons01101Capable of utilizing hydrocarbons01101Capable of utilizing hydrocarbons at 5C in presence of 3% NaCl01101Require growth factors (vitamins, amino acids or unknown)4239404181Amino acids and yeast extract serve as growth factors10851318Require unbrown growth factors11022 | | Capable of growth at pH 8 or pH 9 | | 43 | $42_{42_{-}}$ | 46 | 88 |
| Capable of utilizing carbohydrates3439374693Capable of utilizing amino acids2732293059Capable of utilizing alcohols1428251742Capable of utilizing alcohols1428251742Capable of utilizing carboxylic acids (TCA cycle)1833262551Capable of utilizing fatty acids1328231841Capable of utilizing pyruvic acid1833213051Capable of utilizing banzoic acid1225221537Capable of utilizing hydrocarbons01101Capable of utilizing hydrocarbons01101Capable of utilizing hydrocarbons at 5C in presence of 3% NaCl01101Require growth factors (vitamins, amino acids or unknown)4239404181Amino acids and yeast extract serve as growth factors10851318Require unbrown growth factors11022 | | | | | | | |
| Capable of utilizing amino acids 27 32 29 30 59 Capable of utilizing alcohols 14 28 25 17 42 Capable of utilizing phenol 0 0 0 0 0 0 Capable of utilizing carboxylic acids (TCA cycle) 18 33 26 25 51 Capable of utilizing fatty acids 13 28 23 18 41 Capable of utilizing pyruvic acid 18 33 21 30 51 Capable of utilizing pyruvic acid 12 25 22 15 37 Capable of utilizing barzoic acid 0 1 1 0 1 Capable of utilizing hydrocarbons 0 1 1 0 1 Capable of utilizing hydrocarbons 0 1 1 0 1 Capable of utilizing hydrocarbons 0 1 1 0 1 Capable of utilizing hydrocarbons 15 1 1 0 1 Capable of utilizing hydrocarbons (vitamins, amino acids or unknown) 42 39 40 | NUT | | | | | | 1 1 |
| Capable of utilizing amino acids 27 32 29 30 59 Capable of utilizing alcohols 14 28 25 17 42 Capable of utilizing phenol 0 0 0 0 0 0 Capable of utilizing carboxylic acids (TCA cycle) 18 33 26 25 51 Capable of utilizing fatty acids 13 28 23 18 41 Capable of utilizing pyruvic acid 18 33 21 30 51 Capable of utilizing pyruvic acid 12 25 22 15 37 Capable of utilizing barzoic acid 0 1 1 0 1 Capable of utilizing hydrocarbons 0 1 1 0 1 Capable of utilizing hydrocarbons 0 1 1 0 1 Capable of utilizing hydrocarbons 0 1 1 0 1 Capable of utilizing hydrocarbons 15 1 1 0 1 Capable of utilizing hydrocarbons (vitamins, amino acids or unknown) 42 39 40 | | Comphie of utilizing environmental | 24 | 20 | 27 | 16 | 0.2 |
| Capable of utilizing alcohols 14 28 25 17 42 Capable of utilizing phenol 0 0 0 0 0 0 Capable of utilizing carboxylic acids (TCA cycle) 18 33 26 25 51 Capable of utilizing fatty acids 13 28 23 18 41 Capable of utilizing pyruvic acid 18 33 21 30 51 Capable of utilizing acetic acid 12 25 22 15 37 Capable of utilizing benzoic acid 0 1 1 0 1 Capable of utilizing hydrocarbons 0 1 1 0 1 Capable of utilizing hydrocarbons 0 1 1 0 1 Capable of utilizing hydrocarbons at 5C in presence of 3% NaCl 0 1 1 0 1 Require growth factors (vitamins, amino acids or unknown) 42 39 40 41 81 Amino acids and yeast extract serve as growth factors 1 1 0 2 2 Kequire unknown growth factors 1 | | Capable of utilizing carbonyulates | | | | | |
| Capable of utilizing phenol00000Capable of utilizing carboxylic acids (TCA cycle)1833262551Capable of utilizing fatty acids1328231841Capable of utilizing pyruvic acid1833213051Capable of utilizing acetic acid1225221537Capable of utilizing barzoic acid01101Capable of utilizing hydrocarbons01101Capable of utilizing hydrocarbons01101Capable of utilizing hydrocarbons01101Capable of utilizing hydrocarbons at 5C in presence of 3% NaCl01101Require growth factors (vitamins, amino acids or unknown)4239404181Amino acids and yeast extract serve as growth factors011022Kequire unknown growth factors11022 | | Capable of utilizing alcoholg | | | | | |
| Capable of utilizing carboxylic acids (TCA cycle)1833262551Capable of utilizing fatty acids1328231841Capable of utilizing pyruvic acid1833213051Capable of utilizing acetic acid1225221537Capable of utilizing barzoic acid01101Capable of utilizing hydrocarbons01101Capable of utilizing hydrocarbons01101Capable of utilizing hydrocarbons01101Capable of utilizing hydrocarbons01101Capable of utilizing hydrocarbons at 5C in presence of 3% NaCl01101Require growth factors (vitamins, amino acids or unknown)4239404181Arino acids and yeast extract serve as growth factors11022Kequire unknown growth factors11022 | | | | | the second s | | |
| Capable of utilizing fatty acids1328231841Capable of utilizing pyruvic acid1833213051Capable of utilizing acetic acid1225221537Capable of utilizing benzoic acid01101Capable of utilizing benzoic acid01101Capable of utilizing hydrocarbons01101Capable of utilizing hydrocarbons at 5C in presence of 3% NaCl01101Capable of utilizing hydrocarbons at 5C in presence of 3% NaCl01101Require growth factors (vitamins, amino acids or unknown)4239404181Amino acids and yeast extract serve as growth factors10851318Require unknown growth factors11022 | | | | | | | |
| Capable of utilizing pyruvic acid1833213051Capable of utilizing acetic acid1225221537Capable of utilizing benzoic acid01101Capable of utilizing hydrocarbons01101Capable of utilizing hydrocarbons01101Capable of utilizing hydrocarbons at 5C in presence of 3% NaCl01101Capable of utilizing hydrocarbons at 5C in presence of 3% NaCl01101Require growth factors (vitamins, amino acids or unknown)4239404181Arino acids and yeast extract serve as growth factors011022Kequire unknown growth factors11022 | | | | | | | |
| Capable of utilizing acetic acid1225221537Capable of utilizing banzoic acid01101Capable of utilizing hydrocarbons01101Capable of utilizing hydrocarbons01101Capable of utilizing hydrocarbons at 5C in presence of 3% NaCl01101Capable of utilizing hydrocarbons at 5C in presence of 3% NaCl01101Require growth factors (vitamins, amino acids or unknown)4239404181Amino acids and yeast extract serve as growth factors011022Kequire unbnown growth factors110222 | | | | | the second s | | |
| Capable of utilizing benzoic acid01101Capable of utilizing hydrocarbons01101Capable of utilizing hydrocarbons at 5C in presence of 3% NaCl01101Capable of utilizing hydrocarbons at 5C in presence of 3% NaCl01101Require growth factors (vitamins, amino acids or unknown)4239404181Amino acids and yeast extract serve as growth factors11022Require unknown growth factors11022 | | | | | | | |
| Capable of utilizing hydrocarbons01101Capable of utilizing hydrocarbons at 5C in presence of 3% NaCl01101Require growth factors (vitamins, amino acids or unknown)4239404181Amino acids and yeast extract serve as growth factors011011Require unknown growth factors11022 | | | | | | | and the second se |
| Capable of utilizing hydrocarbons at 5C in presence of 3% NaCl01101Require growth factors (vitamins, amino acids or unknown)4239404181Amino acids and yeast extract serve as growth factors </td <td></td> <td></td> <td></td> <td>┼╌╴╧╌</td> <td>╶╋╼┈╪╾╸</td> <td></td> <td>╂┈┈╅╴┈╼╸</td> | | | | ┼╌╴╧╌ | ╶╋╼┈╪╾╸ | | ╂┈┈╅╴┈╼╸ |
| Require growth factors (vitamins, amino acids or unknown)4239404181Amino acids and yeast extract serve as growth factors (vitamins alone insufficient)10851318Require unknown growth factors11022 | | | | | ╶┿╌╍╪╌╸ | | + <u>+</u> |
| Amino acids and yeast extract serve as growth factors (vitamins alone insufficient)10851318Require unknown growth factors | | | | | | ~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~ | <u>і і і і і і і і і і і і і і і і і і і </u> |
| Require unknown growth factors(vitamins alone insufficient)10851318Image: Require unknown growth factors11022 | | | - 44. | - 29 | 40 | | +-°+ |
| Require unknown growth factors | | | 1 10 | 6 | 5 | 1 12 | 18 |
| | | | <u>+ + y</u> - | | | | |
| | | Vitamins serve as growth factors | 21 | 30 | 35 | 26 | 61 |

| | | Percentage | | | | | |
|------------|---|-----------------|----------|-----------------|----------|------------------|--|
| | Table XXXVIII - Station 55 | 4C | 20C | Water | Sediment | Total | |
| <u>NO.</u> | OF ORGANISMS TESTED | | | | | | |
| 1.0000 | | | | | | | |
| MORP | HOLOGY | | | | | | |
| | Non-nigmented (grow) colonies | | | | | | |
| | Non-pigmented (gray) colonies Produce non-diffusible pigment | • 15 | | 38 | 37 | 37 | |
| | Produce diffusible pignent | 73 | 26 | 48 | 53 | 50 | |
| | Pigment not recorded | 0 | 2 | | 2 | 1 | |
| | | 13 | 9 | 14 | . 8 | 11 | |
| DHAC | IOLOGY | 1 | | | | | |
| <u></u> | | | | | | | |
| | Capable of growth at 5C | | 88 | | | | |
| | Capable of growth at 10C | 98 | 95 | 98 | 96 | 97 | |
| | Capable of growth at 15C | 98 | 95 | | 96 | 76 | |
| | Capable of growth at 20C | 88 | 90 | 100 | 90 | /0 | |
| | Capable of growth at 37C | 0 | | | <u> </u> | | |
| | Capable of growth in presence of 3% NaCl | | 0 100 | 0 | 0 | 0 | |
| | Capable of growth in presence of 5% NaCl | <u>83</u> 75 | 86 | <u>93</u> 83 | 70 78 | 9 <u>1</u> 80 | |
| | Capable of growth in presence of 7.5% NaCl | 42 | 33 | 50 | 47 | 48 | |
| <u></u> | Capable of growth at pH 4 or pH 5 | 63 | 51 | 45 | 67 | 57 | |
| ထ လ | Capable of growth at pH 6 | 81 | 100 | 93 | 84 | | |
| 0 | Capable of growth at pH 7 | 83 | 95 | 93 | 82 | 89 | |
| | Capable of growth at pH 8 or pH 9 | 94 | 100 | 100 | 94 | 97 | |
| | | - 94 | | <u> </u> | 94 | 97 | |
| NUTH | RITIONAL | ļ | | | | | |
| | | ļ | | | | l i | |
| | Capable of utilizing carbohydrates | 71 | 91 | 88 | 94 | 91 | |
| | Capable of utilizing amino acids | 56 | 74 | 69 | 61 | 65 | |
| | Capable of utilizing alcohols | 29 | 65 | 60 | 35 | 46 | |
| | Capable of utilizing phenol | 0 | 0 | | 0 | 0 | |
| | Capable of utilizing carboxylic acids (TCA cycle) | 38 | 77 | 62 | 51 | 56 | |
| | Capable of utilizing fatty acids | 27 | 65 | 55 | 37 | . 45 | |
| | Capable of utilizing pyruvic acid | 38 | 77 | 50 | 61 | 56 | |
| | Capable of utilizing acetic acid | 25 | 58 | 52 | 30 | 41 | |
| | Capable of utilizing benzoic acid | 0 | | 2 | | | |
| | Capable of utilizing hydrocarbons | | 2 | 2 | 0 | <u>}</u> | |
| | Capable of utilizing hydrocarbons at 5C in presence of 3% NaCl | 0 | 2 | 2 | | <u>}</u> | |
| | Require growth factors (vitamins, amino acids or unknown) | 88 | 91 | 95 | 84 | 88 | |
| | Amino acids and yeast extract serve as growth factors | | -24 | | | | |
| | (vitamins alone insufficient) | 21 | 19 | 12 | 27 | 20 | |
| | Require unknown growth factors | 21 | <u>+</u> | | 4 | 2 | |
| | Vitamins serve as growth factors | 65 | 70 | 83 | 53 | 67 | |
| | | <u> </u> | I(¥ | 1 00 | 1 | <u> </u> | |

| | | 4C 20C | | | | |
|---|-----------------|-----------------|---|-------------------|--|--|
| Table XXXIX - Station 70 | Water | Sediment | Water | Sediment | | |
| NO. OF ORGANISMS TESTED | 25 | 25 | 20 | 25 | | |
| | | | | | | |
| MORPHOLOGY | | | | | | |
| Non-pigmented (gray) colonies | 3 | 6 | 15 | 11 | | |
| Produce non-diffusible pigment | 18 | 14 | 2 | 12 | | |
| Produce diffusible pigment | | 1 | 0 | 0 | | |
| Piquent not recorded | 4 | 4 | 3 | 2 | | |
| | 44 | | | <u>~</u> | | |
| PHYSIOLOGY | | | | | | |
| Capable of growth at 5C | | | 17 | 25 | | |
| Capable of growth at 10C | 24 | 24 | 19 | 25 | | |
| Capable of growth at 15C | 24 | 25 | 18 | 25 | | |
| Capable of growth at 20C | 23 | 19 | <u> </u> | | | |
| Capable of growth at 37C | 0 | 0 | 3 | 2 | | |
| Capable of growth in presence of 3% NaCl | 22 | 23 | 18 | 25 | | |
| Capable of growth in presence of 5% NaCl | 19 | 18 | 16 | 12 | | |
| Capable of growth in presence of 7.5% NaCl | 11 | 5 | 16 | 8 | | |
| Capable of growth at pH 4 or pH 5 | 10 | 19 | 5 | 18 | | |
| Capable of growth at pH 6 | 19 | 22 | 18 | 25 | | |
| Capable of growth at pH 7 | 20 | 23 | 18 | 25 | | |
| Capable of growth at pH 8 or pH 9 | 23 | 23 | 18 | 25 | | |
| NUTRITIONAL | | | | | | |
| Capable of utilizing carbohydrates | 18 | 17 | | 17 | | |
| Capable of utilizing amino acids | $\frac{10}{11}$ | $\frac{17}{19}$ | <u>14</u> 17 | 15 | | |
| Capable of utilizing alcohols | $\frac{11}{6}$ | 8 | 16 | $+\frac{15}{11}$ | | |
| Capable of utilizing phenol | 0 | 0 | | | | |
| Capable of utilizing carboxylic acids (TCA cycle) | 6 | 11 | 16 | 12 | | |
| Capable of utilizing fatty acids | 6 | 9 | 16 | · <u>12</u> ·9 | | |
| Capable of utilizing pyruvic acid | 8 | 13 | 15 | 15 | | |
| | + | 1 | <u> </u> | | | |
| Capable of utilizing acetic acid | 5 | 5 | 15 | 6 | | |
| Capable of utilizing benzoic acid | 0 | 0 | 0 | <u> </u> | | |
| Capable of utilizing hydrocarbons | 0 | 0 | <u> </u> | 0 | | |
| Capable of utilizing hydrocarbons at 5C in presence of 3% NaCl | 0 | 0 | 0 | 0 | | |
| Require growth factors (vitamins, amino acids or unknown) | 25 | 22 | 17 | 21 | | |
| Amino acids and yeast extract serve as growth factors | | - | Ι, | | | |
| (vitamins alone insufficient) Require unknown growth factors | 7 | 2 | 1 2 | 3 | | |
| | | 15 | 14 | 11 | | |
| Vitamins serve as growth factors | + | 1 12 | 14 | | | |

| Table XL - Station 70 | 4C | 20C | Water | Sediment | Total |
|--|----------|----------------|-----------------|----------|----------|
| NO. OF ORGANISMS TESTED | 50 | 45 | 45 | 50 | 95 |
| | | | | | |
| MORPHOLOGY | | | | | |
| Non-pigmented (gray) colonies | | 20 | | 1 1 - | F |
| Produce non-diffusible pigment | 9 | 26 14 | 8 | 17 | 25 46 |
| Produce diffusible pigment | | $\frac{14}{0}$ | 20 | 20 | |
| Pigment not recorded | | 5 | | | 1 13 |
| | <u>-</u> | <u> </u> | <u> '</u> | + | + |
| PHYSIOLOGY | | | | | |
| Capable of growth at 5C | | 42 | | | |
| Capable of growth at 10C | 48 | 44 | 43 | 49 | 52 |
| Capable of growth at 15C | 40 | 43 | 43 | 50 | 92 |
| Capable of growth at 20C | 49 | | | | - 92 |
| Capable of growth at 37C | | 5 | <u> </u> | 2 | 5 |
| Capable of growth in presence of 3% NaCl | 0 45 | 43 | 40 | 48 | |
| Capable of growth in presence of 5% NaCl | | | - | | 88 |
| Capable of growth in presence of 7.5% NaCl | 37 | _28_ | 35 | 30 | 65 |
| CC Capable of growth at pH 4 or pH 5 | 16 | 24 | <u>27</u> 15 | 13 | 40 |
| Capable of growth at pH 6 | <u> </u> | 23 43 | 37 | 47 | 52 84 |
| Capable of growth at pH 7 | 43 | 43 | 38 | 47 | 86 |
| Capable of growth at pH 8 or pH 9 | 46 | 43 | 41 | 48 | 89 |
| NUTRITIONAL | | | | | |
| | | | | | |
| Capable of utilizing carbohydrates | 35 | 31 | 32 | 34 | 66 |
| Capable of utilizing amino acids | 30 | 32 | 28 | 34 | 62 |
| Capable of utilizing alcohols | 14 | 27 | 22 | 19 | 41 |
| Capable of utilizing phenol | 0 | Ó | 0 | 0 | 0 |
| Capable of utilizing carboxylic acids (TCA cycle) | 17 | 23 | 22 | 23 | 45 |
| Capable of utilizing fatty acids | 15 | 18 | 22 | 18 | 40 |
| Capable of utilizing pyruvic acid | 21 | 28 | 23 | 28 | 51 |
| Capable of utilizing acetic acid | 10 | 11 | 20 | 11 | 31 |
| Capable of utilizing benzoic acid | 0 | 0 | 0 | | |
| Capable of utilizing hydrocarbons | | 0 | | 0 | 1 |
| Capable of utilizing hydrocarbons at 5C in presence of 3% NaCl | 0 | 1 õ | | 0 | |
| Require growth factors (vitamins, amino acids or unknown) | 47 | 43 | 42 | 43 | 85 |
| Amino acids and yeast extract serve as growth factors | | † <u> </u> | | <u></u> | 1 |
| (vitamins alone insufficient) | 12 | 12 | 8 | 12 | 20 |
| Require unknown growth factors | 2 | 5 | 2 | | 7 |
| Vitamins serve as growth factors | | | | | |

| Table XLI - Station 70 4C 20C Water Sediment Notal NO. OF ORGANISMS TESTED - - - - NOR-pignented (gray) colonies .18 58 18 34 26 Non-pignented (gray) colonies .18 58 14 52 48 Produce ciffusible pignent .2 0 0 3 1 Produce diffusible pignent .2 0 0 12 14 52 48 Capable of growth at SC Capable of growth at SC <td< th=""><th></th><th colspan="6">Percentage</th></td<> | | Percentage | | | | | |
|--|---|------------|-----|-------|----------|--|--|
| NO. OF ORGANISMS TESTED - <td>Table XLI - Station 70</td> <td>4C</td> <td>20C</td> <td>Water</td> <td>Sediment</td> <td>Total</td> | Table XLI - Station 70 | 4C | 20C | Water | Sediment | Total | |
| Non-pignented (gray) colonies .18 58 18 34 26 Produce non-diffusible pignent .2 0 0 3 1 Produce diffusible pignent .2 0 0 3 1 Pignent not recorded .16 11 16 11 12 14 PHYSIOLOGY | | | | | | | |
| Non-pignented (gray) colonies .18 58 18 34 26 Produce non-diffusible pignent .2 0 0 3 1 Produce diffusible pignent .2 0 0 3 1 Pignent not recorded .16 11 16 11 12 14 PHYSIOLOGY | | | | | | | |
| Produce and fifusible pigment 74 31 74 52 48 Produce and fifusible pigment 2 0 0 3 1 Pigment not recorded 16 11 16 12 14 PHNSIOLOGY Capable of growth at 5C | MORPHOLOGY | | | | | | |
| Produce non-diffusible pigment 1 1 44 52 48 Produce diffusible pigment 2 0 0 3 1 Pigment not recorded 16 11 15 12 14 PHYSIOLOGY Capable of growth at 5C | | | | | | | |
| Produce diffusible pigment 2 0 0 3 1 Pigment not recorded 16 11 16 12 14 PHYSIOLOGY 16 11 16 12 14 PHYSIOLOGY 93 Capable of growth at 10C 96 98 96 93 55 Capable of growth at 20C 84 Capable of growth at 20C 84 Capable of growth at 37C 0 11 7 4 5 Capable of growth in presence of 3% NaCl 90 96 89 93 Capable of growth in presence of 5% NaCl 22 55 60 68 Capable of growth at pH 4 or pH 5 48 51 33 74 55 Capable of growth at pH 6 62 96 91 96 94 Capable of growth at pH 7 86 96 91 96 94 Capable of growth at pH 7 62 96 91 96 94 | | - | | [| 1 | | |
| Pignent not recorded 16 11 16 12 14 PHYSIOLOGY | | L | • | | | | |
| PHYSIOLOXY | | 1 | | | - | | |
| Capable of growth at 5C 93 | Pigment not recorded | 10 | | 10 | 12 | 14 | |
| Capable of growth at 5C 93 | | | | | | | |
| Capable of growth at 10C 96 98 96 98 95 Capable of growth at 15C 98 96 93 100 97 Capable of growth at 20C 84 Capable of growth at 37C 0 11 7 4 5 Capable of growth at 37C 0 11 7 4 5 Capable of growth in presence of 3% NACL 90 96 89 96 93 Capable of growth in presence of 5% NACL 74 62 78 60 68 Capable of growth at pH 4 90 96 82 94 93 Capable of growth at pH 4 90 96 84 96 93 Capable of growth at pH 6 62 96 82 94 88 Capable of growth at pH 6 62 96 84 96 91 Capable of growth at pH 7 86 96 84 96 91 Capable of utilizing carbohydrates 70 69 71 68 69 Capable of utilizing phenol | PHYSIOLOGY | | | | 4 | | |
| Capable of growth at 10C 96 98 96 98 95 Capable of growth at 15C 98 96 93 100 97 Capable of growth at 20C 84 Capable of growth at 37C 0 11 7 4 5 Capable of growth at 37C 0 11 7 4 5 Capable of growth in presence of 3% NACL 90 96 89 96 93 Capable of growth in presence of 5% NACL 74 62 78 60 68 Capable of growth at pH 4 90 96 82 94 93 Capable of growth at pH 4 90 96 84 96 93 Capable of growth at pH 6 62 96 82 94 88 Capable of growth at pH 6 62 96 84 96 91 Capable of growth at pH 7 86 96 84 96 91 Capable of utilizing carbohydrates 70 69 71 68 69 Capable of utilizing phenol | | 1 | | | 1 | | |
| Capable of growth at 15C 98 96 93 100 97 Capable of growth at 20C 84 | | | | | | | |
| Capable of growth at 20C 84 Capable of growth at 37C 0 11 7 4 5 Capable of growth in presence of 3% NaCl 90 96 89 96 93 Capable of growth in presence of 7.5% NaCl 32 53 60 26 42 Capable of growth at pH 6 32 53 60 26 42 Capable of growth at pH 6 62 96 84 96 91 Capable of growth at pH 6 62 96 84 96 91 Capable of growth at pH 7 86 96 84 96 91 Capable of growth at pH 7 86 96 84 96 91 Capable of growth at pH 7 88 91 92 96 91 96 94 NUTRITIONAL 70 69 71 68 69 69 65 65 60 71 62 68 65 65 64 73 64 47 73 74 52 66 64 93 | | | _ | | | | |
| Capable of growth at 37C 0 11 7 4 5 Capable of growth in presence of 3% NaCl 90 96 89 96 93 Capable of growth in presence of 7.5% NaCl 74 62 78 60 68 Capable of growth in presence of 7.5% NaCl 32 53 60 26 42 Capable of growth at pH 4 or pH 5 48 51 33 74 55 Capable of growth at pH 7 68 96 84 96 91 Capable of growth at pH 7 68 96 84 96 91 Capable of growth at pH 8 or pH 9 92 96 91 96 94 NUTRITIONAL 70 69 71 68 69 Capable of utilizing amino acids 70 69 71 68 65 Capable of utilizing achols 28 60 49 38 43 Capable of utilizing achols 28 60 49 38 43 Capable of utilizing phenol 0 0 0 0 0 0 | | | 96 | 93 | 100 | 97 | |
| Capable of growth in presence of 3% NaCl 90 96 89 96 93 Capable of growth in presence of 5% NaCl 74 62 78 60 68 Capable of growth in presence of 7.5% NaCl 32 53 60 26 42 Capable of growth at pH 4 or pH 5 32 53 60 26 42 Capable of growth at pH 7 62 96 82 94 88 Capable of growth at pH 7 62 96 82 94 88 Capable of growth at pH 7 86 96 84 96 91 Capable of growth at pH 8 97 92 96 91 96 94 NUTRITIONAL 92 96 91 96 94 NUTRITIONAL 60 71 68 69 Capable of utilizing carbohydrates 70 69 71 68 69 Capable of utilizing actioacids 70 69 71 68 69 Capable of utilizing actioacids 70 69 71 68 69 Capable of utiliz | | 84 | | | | | |
| Capable of growth in presence of 5% NaCl 74 62 78 60 68 Capable of growth at pH 4 or pH 5 32 53 60 26 42 Capable of growth at pH 4 or pH 5 48 51 33 74 55 Capable of growth at pH 6 62 96 82 94 88 Capable of growth at pH 7 86 96 84 96 91 Capable of growth at pH 8 or pH 9 92 96 91 96 94 NUTRITIONAL 92 96 91 96 94 NUTRITIONAL 28 60 71 68 69 Capable of utilizing amino acids 28 60 49 38 43 Capable of utilizing carbohydrates 28 60 91 96 94 Capable of utilizing carbohydrates 20 0 0 0 0 0 Capable of utilizing carbohydrates 20 0 0 0 0 0 0 Capable of utilizing carbohydrates 20 24 44 42 23 <td></td> <td>0</td> <td>11</td> <td>7</td> <td>4</td> <td>5</td> | | 0 | 11 | 7 | 4 | 5 | |
| Capable of growth in presence of 7.5% NaCl 32 53 60 26 42 Capable of growth at pH 4 or pH 5 48 51 33 74 55 Capable of growth at pH 6 62 96 82 94 88 Co Capable of growth at pH 7 86 96 84 96 91 Capable of growth at pH 7 86 96 84 96 91 96 94 NUTRITIONAL 92 96 91 96 94 94 96 91 NUTRITIONAL 70 69 71 68 69 60 71 68 69 Capable of utilizing carbohydrates 70 69 71 68 69 Capable of utilizing amino acids 60 71 62 68 65 Capable of utilizing amino acids 28 60 49 38 43 Capable of utilizing phenol 0 0 0 0 0 Capable of utilizing phenol 30 40 49 36 42 Capable of utili | | 90 | 96 | 89 | 96 | 93 | |
| Capable of growth at pH 4 or pH 5 48 51 33 74 55 Capable of growth at pH 6 62 96 82 94 88 Capable of growth at pH 7 86 96 84 96 91 Capable of growth at pH 7 86 96 84 96 91 Capable of growth at pH 8 or pH 9 92 96 91 96 94 NUTRITIONAL 70 69 71 68 69 Capable of utilizing acholydrates 60 71 62 68 65 Capable of utilizing alcohols 28 60 49 38 43 Capable of utilizing phenol 0 0 0 0 0 Capable of utilizing carboxylic acids (TCA cycle) 34 51 49 46 47 Capable of utilizing pyruvic acid 30 40 49 36 42 Capable of utilizing pyruvic acid 20 24 44 22 33 Capable of utilizing benzoic acid 0 0 0 0 0 Capable of | | 74 | 62 | 78 | 60 | 68 | |
| Capable of growth at pH 6 62 96 82 94 88 Capable of growth at pH 7 86 96 84 96 91 Capable of growth at pH 8 or pH 9 92 96 91 96 94 NUTRITIONAL 92 96 91 96 94 NUTRITIONAL 70 69 71 68 69 Capable of utilizing carbohydrates 70 69 71 68 69 Capable of utilizing amino acids 60 71 62 68 65 Capable of utilizing anino acids 60 71 62 68 65 Capable of utilizing anino acids 60 71 62 68 65 Capable of utilizing anino acids 28 60 49 38 43 Capable of utilizing achols 28 60 49 36 42 Capable of utilizing tatty acids 30 40 49 36 42 Capable of utilizing pyruvic acid 20 24 44 22 33 Capable of utilizing benzoic ac | Capable of growth in presence of 7.5% NaCl | 32 | 53 | 60 | 26 | 42 | |
| Capable of growth at pH 6 62 96 82 94 88 Capable of growth at pH 7 86 96 84 96 91 Capable of growth at pH 8 or pH 9 92 96 91 96 94 NUTRITIONAL 92 96 91 96 94 NUTRITIONAL 70 69 71 68 69 Capable of utilizing carbohydrates 70 69 71 68 69 Capable of utilizing amino acids 60 71 62 68 65 Capable of utilizing anino acids 60 71 62 68 65 Capable of utilizing achols 28 60 49 38 43 Capable of utilizing carboxylic acids (TCA cycle) 34 51 49 46 47 Capable of utilizing fatty acids 30 40 49 36 42 Capable of utilizing pyruvic acid 20 24 44 22 33 Capable of utilizing benzoic acid 0 0 0 0 0 Capable of utilizi | Capable of growth at pH 4 or pH 5 | 48 | 51 | 33 | 74 | 55 | |
| C1 Capable of growth at pH 8 or pH 9 92 96 91 96 94 NUTRITIONAL 92 96 91 96 94 Capable of utilizing carbohydrates 70 69 71 68 69 Capable of utilizing amino acids 60 71 62 68 65 Capable of utilizing amino acids 60 71 62 68 65 Capable of utilizing achols 28 60 49 38 43 Capable of utilizing phenol 0 0 0 0 0 0 Capable of utilizing fatty acids 34 51 49 46 47 Capable of utilizing pyruvic acid 42 62 51 56 54 Capable of utilizing pyruvic acid 42 62 51 56 54 Capable of utilizing benzoic acid 20 24 44 22 33 Capable of utilizing benzoic acid 0 0 0 0 0 Capable of utilizing hydrocarbons 0 0 0 0 0 | Capable of growth at pH 6 | 62 | 96 | 82 | 94 | | |
| Capable of growth at pH 8 or pH 9 92 96 91 96 94 NUTRITIONAL 70 69 71 68 69 Capable of utilizing carbohydrates 70 69 71 68 69 Capable of utilizing amino acids 60 71 62 68 65 Capable of utilizing alcohols 28 60 49 38 43 Capable of utilizing phenol 0 0 0 0 0 0 Capable of utilizing carbohydrates 30 40 49 36 42 Capable of utilizing phenol 30 40 49 36 42 Capable of utilizing fatty acids 30 40 49 36 42 Capable of utilizing pyruvic acid 42 62 51 56 54 Capable of utilizing acetic acid 20 24 44 22 33 Capable of utilizing benzoic acid 0 0 0 0 0 Capable of utilizing hydrocarbons 0 0 0 0 0 0 | Capable of growth at ph 7 | 86 | 96 | 84 | 96 | | |
| Capable of utilizing carbohydrates 70 69 71 68 69 Capable of utilizing amino acids 60 71 62 68 65 Capable of utilizing alcohols 28 60 49 38 43 Capable of utilizing phenol 0 0 0 0 0 Capable of utilizing carboxylic acids (TCA cycle) 34 51 49 46 47 Capable of utilizing fatty acids 30 40 49 36 42 Capable of utilizing pyruvic acid 42 62 51 56 54 Capable of utilizing acetic acid 20 24 44 22 33 Capable of utilizing benzoic acid 0 0 0 0 0 Capable of utilizing hydrocarbons 0 0 0 0 0 Capable of utilizing hydrocarbons 0 0 0 0 0 Capable of utilizing hydrocarbons 15 0 0 0 0 0 | Capable of growth at pH 8 or pH 9 | 92 | 96 | 91 | 96 | 94 | |
| Capable of utilizing carbohydrates 70 69 71 68 69 Capable of utilizing amino acids 60 71 62 68 65 Capable of utilizing alcohols 28 60 49 38 43 Capable of utilizing phenol 0 0 0 0 0 Capable of utilizing carboxylic acids (TCA cycle) 34 51 49 46 47 Capable of utilizing fatty acids 30 40 49 36 42 Capable of utilizing pyruvic acid 42 62 51 56 54 Capable of utilizing acetic acid 20 24 44 22 33 Capable of utilizing benzoic acid 0 0 0 0 0 Capable of utilizing hydrocarbons 0 0 0 0 0 Capable of utilizing hydrocarbons 0 0 0 0 0 Capable of utilizing hydrocarbons 15 0 0 0 0 0 | | | 1 | | | | |
| Capable of utilizing amino acids 60 71 62 68 65 Capable of utilizing alcohols 28 60 49 38 43 Capable of utilizing phenol 0 0 0 0 0 0 Capable of utilizing carboxylic acids (TCA cycle) 34 51 49 46 47 Capable of utilizing fatty acids 30 40 49 36 42 Capable of utilizing pyruvic acid 42 62 51 56 54 Capable of utilizing acetic acid 20 24 44 22 33 Capable of utilizing benzoic acid 0 0 0 0 0 Capable of utilizing hydrocarbons 0 0 0 0 0 Capable of utilizing hydrocarbons 0 0 0 0 0 0 | NUTRITIONAL | 1 | | ļ | | | |
| Capable of utilizing amino acids 60 71 62 68 65 Capable of utilizing alcohols 28 60 49 38 43 Capable of utilizing phenol 0 0 0 0 0 0 Capable of utilizing carboxylic acids (TCA cycle) 34 51 49 46 47 Capable of utilizing fatty acids 30 40 49 36 42 Capable of utilizing pyruvic acid 42 62 51 56 54 Capable of utilizing acetic acid 20 24 44 22 33 Capable of utilizing benzoic acid 0 0 0 0 0 Capable of utilizing hydrocarbons 0 0 0 0 0 Capable of utilizing hydrocarbons 0 0 0 0 0 0 | | [| | | | | |
| Capable of utilizing alcohols2860493843Capable of utilizing phenol00000Capable of utilizing carboxylic acids (TCA cycle)3451494647Capable of utilizing fatty acids3040493642Capable of utilizing pyruvic acid4262515654Capable of utilizing acetic acid2024442233Capable of utilizing benzoic acid00000Capable of utilizing hydrocarbons00000Capable of utilizing hydrocarbons at 5C in presence of 3% NaCl0000 | Capable of utilizing carbohydrates | 70 | | | | | |
| Capable of utilizing alcohols2860493843Capable of utilizing phenol00000Capable of utilizing carboxylic acids (TCA cycle)3451494647Capable of utilizing fatty acids3040493642Capable of utilizing pyruvic acid4262515654Capable of utilizing acetic acid2024442233Capable of utilizing benzoic acid00000Capable of utilizing hydrocarbons00201Capable of utilizing hydrocarbons at 5C in presence of 3% NaCl00000 | Capable of utilizing amino acids | | 71 | | | | |
| Capable of utilizing carboxylic acids (TCA cycle)3451494647Capable of utilizing fatty acids3040493642Capable of utilizing pyruvic acid4262515654Capable of utilizing acetic acid2024442233Capable of utilizing benzoic acid00000Capable of utilizing hydrocarbons00000Capable of utilizing hydrocarbons00000Capable of utilizing hydrocarbons00000Capable of utilizing hydrocarbons at 5C in presence of 3% NaCl0000 | Capable of utilizing alcohols | 28 | | 49 | 38 | 43 | |
| Capable of utilizing fatty acids3040493642Capable of utilizing pyruvic acid4262515654Capable of utilizing acetic acid2024442233Capable of utilizing benzoic acid00000Capable of utilizing hydrocarbons00201Capable of utilizing hydrocarbons at 5C in presence of 3% NaCl00000 | | | | | | | |
| Capable of utilizing pyruvic acid4262515654Capable of utilizing acetic acid2024442233Capable of utilizing benzoic acid00000Capable of utilizing hydrocarbons00201Capable of utilizing hydrocarbons at 5C in presence of 3% NaCl00000 | | | | | | the second s | |
| Capable of utilizing acetic acid2024442233Capable of utilizing benzoic acid00000Capable of utilizing hydrocarbons00201Capable of utilizing hydrocarbons at 5C in presence of 3% NaCl00000 | | | | | | | |
| Capable of utilizing benzoic acid 0 0 0 0 0 Capable of utilizing hydrocarbons 0 0 2 0 1 Capable of utilizing hydrocarbons 0 0 0 0 0 0 Capable of utilizing hydrocarbons 0 0 0 0 0 0 | Capable of utilizing pyruvic acid | | | | | | |
| Capable of utilizing benzoic acid 0 0 0 0 0 0 Capable of utilizing hydrocarbons 0 0 2 0 1 Capable of utilizing hydrocarbons at 5C in presence of 3% NaCl 0 0 0 0 0 | Capable of utilizing acetic acid | 20 | 24 | 44 | 22 | 33 | |
| Capable of utilizing hydrocarbons00201Capable of utilizing hydrocarbons at 5C in presence of 3% NaCl00000 | | 1 | | | 0 | 0 | |
| Capable of utilizing hydrocarbons at 5C in presence of 3% NaCl | | | | | | 1 1 | |
| | | | | | | | |
| | Require growth factors (vitamins, amino acids or unknown) | 94 | - | | 86 | 89 | |
| Atino acids and yeast extract serve as growth factors | | 1 | 1 | | | 1 | |
| (vitamins alone insufficient) 24 27 18 24 21 | | 24 | 27 | 18 | 24 | 21 | |
| Require unknown growth factors | | 4 | | | | | |
| Vitamins serve as growth factors 66 58 71 52 61 | | 66 | | | | 61 | |

| | 4 | IC . | 20 | C |
|--|----------|----------|-----------------|-----------------|
| NO. OF ORGANISMS TESTED Table XLII - Station71 | Water | Sediment | Water | Sediment |
| NO. OF CAREFUSID TESTED | 25 | 24 | 21 | 24 |
| MDRPHOLOGY | | | | |
| | | | | |
| Non-pigmented (gray) colonies | 2 | 14 | 13 | |
| Produce non-diffusible pigment | 19 | 8 | 6 | 4 |
| Produce diffusible pigment | | | | |
| Pignent not recorded | 0 | 0 | 0 | 0 |
| | | | 6 | 44 |
| PHYSIOLOGY | | | | |
| Capable of growth at 5C | | | | |
| Capable of growth at 10C | 25 | 24 | 20 | 22 |
| Capable of growth at 15C | | | 19 | 22 |
| Capable of growth at 20C | 25 | 14 | 20 | 23 |
| Capable of growth at 37C | <u> </u> | 8 | | |
| Capable of growth in presence of 3% NaCl | 19 | 0 21 | 3 | 0 |
| Capable of growth in presence of 5% NaCl | 17 | 15 | <u>18</u> 19 | <u>19</u> 14 |
| Capable of growth in presence of 7.5% NaCl | | <u> </u> | - 17 | |
| Capable of growth at pH 4 or pH 5 | 14 | | 17 | 6 |
| Capable of growth at pH 6 | 20 | 21 | 20 | 21 23 |
| Cc Capable of growth at pH 7 | 23 | 22 | 20 | 23 |
| C Capable of growth at pH 8 or pH 9 | 24 | 23 | 20 | 23 |
| NUTRITIONAL | | | | |
| | | | | |
| Capable of utilizing carbohydrates | 20 | 16 | 19 | 8 |
| Capable of utilizing amino acids | 15 | 11 | 21 | 6 |
| Capable of utilizing alcohols | 4 | 11 | 18 | 10 |
| Capable of utilizing phenol | 0 | 0 | 0 | 0 |
| Capable of utilizing carboxylic acids (TCA cycle) | 11 | 15 | 20 | 9 |
| Capable of utilizing fatty acids | 5 | 4 | 16 | . 7 |
| Capable of utilizing pyruvic acid | 4 | 11 | 12 | 12 |
| Capable of utilizing acetic acid | 3 | 4 | 17 | 5 |
| Capable of utilizing benzoic acid | 0 | 0 | 2 | 0 |
| Capable of utilizing hydrocarbons | 1 | 0 | 1 | Ö |
| Capable of utilizing hydrocarbons at 5C in presence of 3% NaCl | 1 | 0 | 1 | 0 |
| Require growth factors (vitamins, amino acids or unknown) | 24 | 16 | 15 | 19 |
| Atimo acids and yeast extract serve as growth factors | | | | |
| Require unknown growth factors (vitamins alone insufficient) | 8 | 5 | 0 | 10 |
| Vitamins serve as growth factors | 0 | 3 | 1 | I |
| TRUMINED SELVE OF YLUNUI LOCIULS | 16 | 8 | 14 | 88 |

| Table XLIII - Station 71 | 4C | 20C | Water | Sediment | Total |
|--|----------|-----|-------|----------|---------|
| NC: OF ORGANISMS TESTED | 49 | 45 | 46 | 48 | 94 |
| | | | | Ţ | |
| NORPHOLOGY | | | | | |
| | | | | | |
| Non-pigmented (gray) colonies | . 16 | 17. | 15 | 18 | 33 |
| Produce non-diffusible pigment | 27 | 22 | 25 | 24 | 49 |
| Produce diffusible pigment | 0 | 0 | 0 | 0 | 0 |
| Pigment not recorded | 6 | 6 | 6 | 6 | 12 |
| | | | | | |
| PHYSIOLOGY | | | | | |
| | | | ļ | 1 | |
| Capable of growth at 5C | | 42 | | | |
| Capable of growth at 10C | 49 | 41 | 44 | 46 | 90 |
| Capable of growth at 150 | 39 | 43 | 45 | 37 | 82 |
| Capable of growth at 20C | 33 | | | | |
| Capable of growth at 37C | 1 | 3 | 4 | 0 | 4 |
| Capable of growth in presence of 3% NaCl | 40 | 37 | 37 | 40 | 77 |
| Capable of growth in presence of 5% NaCl | 32 | 33 | 36 | 29 | 65 |
| Capable of growth in presence of 7.5% NaCl | 8 | | 10 | 11 | 21 |
| Capable of growth at pH 4 or pH 5 | | 38 | 31 | 40 | 71 |
| Capable of growth at pH 6 | 41 | 43 | 40 | 44 | 84 |
| Co Capable of growth at pH 7 | 45 | 43 | 43 | 45 | 88 |
| Capable of growth at pH 8 or pH 9 | 47 | 43 | 44 | 46 | 90 |
| | | | | | |
| NUTRITIONAL | | | | | |
| | | | | | |
| Capable of utilizing carbohydrates | 36 | | 39 | 24 | 63 |
| Capable of utilizing amino acids | 26 | 27 | 36 | 17 | 53 |
| Capable of utilizing alcohols | 15 | 28 | 22 | 21 | 43 |
| Capable of utilizing phenol | 0 | | 0 | 0 | 0 55 |
| Capable of utilizing carboxylic acids (TCA cycle) | 26 | 29 | 21 | 24 | 32 |
| Capable of utilizing fatty acids | 9 | 23 | 21 | 11 | 32 |
| Capable of utilizing pyruvic acid | 15 | 24 | 16 | 23 | 29 |
| Capable of utilizing acetic acid | 7 | 22 | 20 | 9 | 29 |
| Capable of utilizing benzoic acid | 0 | 2 | 2 | 0 | 2 |
| Capable of utilizing hydrocarbons | <u>1</u> | 1 | 2 | 0 | 2 |
| Capable of utilizing hydrocarbons at 5C in presence of 3% NaCl | 1 | 1 | 2 | | 2 |
| Require growth factors (vitamins, amino acids or unknown) | 40 | 34 | 39 | 35 | 74 |
| Amino acids and yeast extract serve as growth factors | | | | | |
| (vitamins alone insufficient) | 13 | 10 | 8 | 15 | 23 |
| Require unknown growth factors | 3 | 2 | 9 | 4 | 13 |
| Vitamins serve as growth factors | 24 | 22 | 30_ | 16 | 46 |

| | | Percentage | | | | | |
|-------------|--|----------------|------|----------|-----------|------------|--|
| | Table XLIV - Station 71 | 4C | 20C | Water | Sediment | Total | |
| NO. OF ORG | NISMS TESTED | | | | | Ļ | |
| MODDUCT OCY | | | | | | | |
| MORPHOLOGY | | | | | | | |
| Non-p: | igmented (gray) colonies | • 33 | 38 ' | 33 | 38 | 35 | |
| | e non-diffusible pigment | 55 | 49 | 54 | 50 | 52 | |
| | ce diffusible pigment | 0 | 0 | 0 | 0 | 0 | |
| | nt not recorded | 12 | 13 | 13 | 13 | 13 | |
| 5 | | | | <u>_</u> | 1 | <u> </u> | |
| PHYSIOLOGY | | | | | | | |
| <u></u> | | | | | | [| |
| Capab | le of growth at 5C | | 93 | | | | |
| Capabi | le of growth at 10C | 100 | 91 | 96 | 96 | 96 | |
| Capab | le of growth at 15C | 80 | 96 | 98 | 77 | 87 | |
| Capab | le of growth at 20C | 67 | | | | | |
| | le of growth at 37C | 2 | 7 | 9 | 0 | 4 | |
| Capab | le of growth in presence of 3% NaCl | 82 | 82 | 80 | 83 | 82 | |
| | le of growth in presence of 5% NaCl | 65 | .73 | 78 | 60 | 69 | |
| | le of growth in presence of 7.5% NaCl | 16 | .29 | 22 | 23 | 22 | |
| | le of growth at pH 4 or pH 5 | 67 | 84 | 67 | 83 | 76 | |
| | le of growth at pH 6 | 84 | 96 | 87 | 92 | 89 | |
| Capab | le of growth at pH 7 | 92 | 96 | 93 | 94 | 94 | |
| Capab | le of growth at pH 8 or pH 9 | 96 | 96 | 96 | 96 | 96 | |
| | | | | | | | |
| NUTRITIONA | | | | | | | |
| Capab | le of utilizing carbohydrates | 73 | 60 | 85 | 50 | 63 | |
| | le of utilizing amino acids | 53 | 60 | 78 | 35 | 56 | |
| | le of utilizing alcohols | 31 | 62 | 48 | 44 | 46 | |
| | le of utilizing phenol | | 0 | 0 | 0 | 0 | |
| | le of utilizing carboxylic acids (TCA cycle) | 53 | 64 | 67 | 50 | 58 | |
| | le of utilizing fatty acids | 18 | 51 | 46 | 23 | 34 | |
| | le of utilizing pyruvic acid | 31 | 53 | 35 | 48 | 41 | |
| | ble of utilizing acetic acid | 14 | 49 | 43 | 19 | 31 | |
| | ble of utilizing beazoic acid | $+\frac{1}{0}$ | | | | + | |
| | ble of utilizing hydrocarbons | | 4 | 4 | _ <u></u> | + | |
| | ble of utilizing hydrocarbons at 5C in presence of 3% NaCl | 2 | | 4 | 0 | + | |
| | Le growth factors (vitamins, amino acids or unknown) | 2 82 | 70 | 4 | 73 | 79 | |
| | acids and yeast extract serve as growth factors | <u>+ 84</u> | 76 | 85 | (3 | + <u>'</u> | |
| | (vitamins alone insufficient) | 27 | 22 | 17 | 31 | 24 | |
| | Lie unknown growth factors | 6 | 4 | 20 | 8 | 14 | |
| Kegu | | | | | | | |

I

-

ADDENDUM

 $\mathbf{O}\mathbf{\Gamma}$

ANNUAL REPORT

Assessment of Potential Interactions of Microorganisms and Pollutants Resulting from Petroleum Development on the Outer Continental Shelf in the Beaufort Sea

April 1, 1976

- Submitted by: Ronald M. Atlas Principal Investigator Department of Biology University of Louisville Louisville, Kentucky 40208
- Prepared for: Outer Continental Shelf Energy Assessment Program National Atmospheric and Oceanographic Administration Fairbanks Project Office Fairbanks, Alaska

Strains isolated from water at 4C showing gray colonies on solid medium.

| Ţ. | 800053L | BEAUFORT | SAMPLE | 20 | MATER | 04C | STATION002 |
|---------|---------|----------|--------|----|-------|-----|------------|
| 2 | B00058L | BEAUFORT | SAMPLE | 20 | WATER | 04C | STATION002 |
| З | B99059L | BEAUFORT | SAMPLE | 20 | WATER | 04C | STATION002 |
| 4 | B00067L | BEAUFORT | SAMPLE | 20 | MATER | 04C | STATION002 |
| 5 | B00069L | BEAUFORT | SAMPLE | 20 | MATER | 04C | STATION002 |
| 6 | B00071L | BEAUFORT | SAMPLE | 20 | WATER | 04C | STATION002 |
| 7 | B00073L | BEAUFORT | SAMPLE | 20 | WATER | 04C | STATION002 |
| 8 | B00075L | BEAUFORT | SAMPLE | 20 | WATER | 04C | STATION002 |
| 9 | B00109L | BERUFORT | SAMPLE | 27 | WATER | 04C | STATION071 |
| 10 | B00114L | BEAUFORT | SAMPLE | 27 | WATER | 04C | STATION071 |
| 11 | B00174L | BEAUFORT | SAMPLE | 24 | MATER | 04C | STATION055 |
| 12 | B00216L | BEAUFORT | SAMPLE | 26 | NATER | 04C | STATION070 |
| $1 \Im$ | B00219L | BEAUFORT | SAMPLE | 26 | MATER | Ø4C | STATION070 |
| 14 | B99225L | BEAUFORT | SAMPLE | 26 | WATER | 04C | STATION070 |
| 15 | B00282L | BEAUFORT | SAMPLE | 19 | MATER | 04C | STATION001 |
| 16 | B00283L | BEAUFORT | SAMPLE | 19 | WATER | Ø4C | STATION001 |
| 17 | B00294L | BEAUFORT | SAMPLE | 36 | MATER | Ø4C | STATION002 |
| 18 | B00295L | BEAUFORT | SAMPLE | 36 | MATER | 04C | STATION002 |

EHD FORM 18 STRAIMS

Strains isolated from sediment at 4C showing gray colonies on solid medium.

| | | | | | | | OTOTIONO10 |
|----------|------------------|----------|--------|----------|----------|--------|-------------|
| 1 | 800028L | BEAUFORT | SAMPLE | 63 | SEDIMENT | 04C | STATION010 |
| 2 | B00029L | BEAUFORT | SAMPLE | 63 | SEDIMENT | 04C | STATION010 |
| 3 | B30030L | BEAUFORT | SAMPLE | 83 | SEDIMENT | 04C | STATION010 |
| 4 | 8999332L | BEAUFORT | SAMPLE | 63 | SEDIMENT | 04C | STATION010 |
| 5 | 880033L | BERUFORT | SAMPLE | 63 | SEDIMENT | 04C | STATION010 |
| | B90034L | BERUFORT | SAMPLE | 03 | SEDIMENT | 04C | STATION010 |
| ê | | | SAMPLE | 03 | SEDIMENT | 04C | STATION010 |
| 7 | 800038L | BEAUFORT | | | | | STATION010 |
| 8 | 800039L | BEAUFORT | SAMPLE | 63 | SEDIMENT | 64C | |
| 9 | 800 040 L | BEAUFORT | SAMPLE | 63 | SEDIMENT | 04C | STATION010 |
| 10 | 899 941L | BEAUFORT | SAMPLE | 63 | SEDIMENT | 04C | STATION010 |
| i 1 | B00047L | BEAUFORT | SAMPLE | 63 | SEDIMENT | 04C | STATION010 |
| 12 | B00048L | BEAUFORT | SAMPLE | 03 | SEDIMENT | 04C | STATION010 |
| 13 | B00049L | BEAUFORT | SAMPLE | 03 | SEDIMENT | 04C | STATION010 |
| 14 | B00077L | BEAUFORT | SAMPLE | 16 | SEDIMENT | 04C | STATION002 |
| 15 | B00078L | BEAUFORT | SAMPLE | 16 | SEDIMENT | 04C | STATION002 |
| 16 | BBBBBBB | BEAUFORT | SAMPLE | 16 | SEDIMENT | 04C | STATION002 |
| 17 | B00082L | BEAUFORT | SAMPLE | 16 | SEDIMENT | 04C | STATION002 |
| | B00084L | BEAUFORT | SAMPLE | 16 | SEDIMENT | 04C | STATION002 |
| 18 | | BEAUFORT | SAMPLE | 16 | SEDIMENT | 04C | STATION002 |
| 19 | B00085L | | | 16 | SEDIMENT | 04C | STATION002 |
| 20 | B90986L | BEAUFORT | SAMPLE | | | | STATION002 |
| 21 | 800089L | BEAUFORT | SAMPLE | 16 | SEDIMENT | 04C | |
| 22 | B96091L | BERUFORT | SAMPLE | 16 | SEDIMENT | 04C | STATION002 |
| 23 | B00093L | BEAUFORT | SAMPLE | 16 | SEDIMENT | 04C | STATION002 |
| 24 | B00094L | BEAUFORT | SAMPLE | 16 | SEDIMENT | 04C | STATION002 |
| 25 | B00095L | BEAUFORT | SAMPLE | 16 | SEDIMENT | 04C | STATION002 |
| 26 | B00097L | BERUFORT | SAMPLE | 16 | SEDIMENT | 04C | STATION002 |
| 27 | B00098L | BEAUFORT | SAMPLE | 16 | SEDIMENT | 040 | STATION002 |
| 28 | B00099L | BEAUFORT | SAMPLE | 16 | SEDIMENT | 04C | STATION002 |
| 29 | B00100L | BERUFORT | SAMPLE | 16 | SEDIMENT | 04C | STATION002 |
| 30 | B00126L | BEAUFORT | SAMPLE | ŝž | SEDIMENT | 04C | STATION071 |
| | B00127L | BEAUFORT | SAMPLE | 22 | SEDIMENT | 04C | STATION071 |
| 31 | | | SAMPLE | 22 | SEDIMENT | 04C | STATION071 |
| 32 | B00128L | BEAUFORT | SAMPLE | 22 | SEDIMENT | 04C | STATION071 |
| 33 | B00129L | BEAUFORT | | | | 04C | STATION071 |
| 34 | B00130L | BEAUFORT | SAMPLE | 22 | SEDIMENT | | |
| 35 | B00131L | BEAUFORT | SAMPLE | 55 | SEDIMENT | 04C | STATION071 |
| 36 | B00132L | BEAUFORT | SAMPLE | 55 | SEDIMENT | 04C | STATION071 |
| 37 | 800133L | BEAUFORT | SAMPLE | 22 | SEDIMENT | 04C | STATION071 |
| 38 | B00134L | BEAUFORT | | | SEDIMENT | | STATION071 |
| 39 | B00135L | BEAUFORT | SAMPLE | 32 | SEDIMENT | 04C | STATION071 |
| 40 | B00136L | BEAUFORT | SAMPLE | 22 | SEDIMENT | 04C | STATION071 |
| -11 | 800137L | BEAUFORT | SAMPLE | 22 | SEDIMENT | 04C | STATION071 |
| 42 | B00149L | BEAUFORT | SAMPLE | 22 | SEDIMENT | 04C | STATION071 |
| 43 | 300150L | BEAUFORT | SAMPLE | 22 | SEDIMENT | 04C | STATION071 |
| | 699176L | BEAUFORT | SAMPLE | 20 | SEDIMENT | 04C | STATION055 |
| 다다 스타 | B99181L | BEAUFORT | SAMPLE | 20 | SEDIMENT | 04C | STATION055 |
| 45 | | BEAUFORT | SAMPLE | 20 | SEDIMENT | 04C | STATION055 |
| 46 | B00189L | BEAUFORT | SAMPLE | 20 | SEDIMENT | 04C | STATION055 |
| 47 | 800191L | BEAUFORT | SAMPLE | 20 | SEDIMENT | 04C | STATION055 |
| 48 | B00195L | | | 20 | SEDIMENT | 04C | STATION055 |
| 49 | B00197L | BEAUFORT | SAMPLE | | | 84C | STATION070 |
| 50 | 800226L | BEAUFORT | SAMPLE | <u> </u> | SEDIMENT | Clehr" | 01101100300 |
| | | | | | | | |

| 51 | B00227L | BEAUFORT | SAMPLE | 21 | SEDIMENT | 04C | STATION070 |
|----|-----------------|----------|--------|-----|----------|-----|------------|
| 52 | B00236L | BEAUFORT | SAMPLE | 21 | SEDIMENT | 04C | STATION070 |
| 53 | B00241L | BEAUFORT | SAMPLE | 21 | SEDIMENT | 04C | STATION070 |
| 54 | B00244L | BEAUFORT | SAMPLE | 21 | SEDIMENT | 04C | STATION070 |
| 55 | B00248L | BEAUFORT | SAMPLE | 21 | SEDIMENT | 04C | STATION070 |
| 56 | B00251L | BEAUFORT | SAMPLE | 69 | SEDIMENT | 04C | STATION030 |
| 57 | B00252L | BEAUFORT | SAMPLE | 09 | SEDIMENT | Ø4C | STATION030 |
| 58 | B00253L | BEAUFORT | SAMPLE | 09 | SEDIMENT | 04C | STATION030 |
| 59 | B00257L | BEAUFORT | SAMPLE | 69 | SEDIMENT | Ø4C | STATION030 |
| 60 | B00258L | BEAUFORT | SAMPLE | Ø9. | SEDIMENT | 04C | STATION030 |
| 61 | B00265L | BEAUFORT | SAMPLE | 09 | SEDIMENT | 04C | STATION030 |
| 62 | B00267L | BEAUFORT | SAMPLE | 09 | SEDIMENT | Ø4C | STATION030 |
| 63 | B00268L | BEAUFORT | SAMPLE | 09 | SEDIMENT | 04C | STATION030 |
| 64 | B00271L | BEAUFORT | SAMPLE | 09 | SEDIMENT | 04C | STATION030 |
| 65 | B00273L | BEAUFORT | SAMPLE | 09 | SEDIMENT | 04C | STATION030 |
| 66 | B00275L | BEAUFORT | SAMPLE | 69 | SEDIMENT | 04C | STATION030 |
| 67 | B0029 0L | BEAUFORT | SAMPLE | 15 | SEDIMENT | 04C | STATION001 |
| 68 | B00297L | BEAUFORT | SAMPLE | 32 | SEDIMENT | 04C | STATION002 |
| 69 | B00298L | BEAUFORT | SAMPLE | 32 | SEDIMENT | 04C | STATION002 |
| 70 | B00300L | BEAUFORT | SAMPLE | 32 | SEDIMENT | 04C | STATION002 |

.

END FORM 70 STRAINS

Strains isolated from water at 20C showing gray colonies on solid medium.

| | | | | | | | |
|----------|-----------------|----------------------|--------|-------|--------|-----------|--|
| 1 | B00002H | DEAUFORT | SAMPLE | 03 | WATER | 20C | STATION010 |
| â | B00003H | BEAUFORT | SAMPLE | 03 | WATER | 20C | STATION010 |
| З | B00010H | BEAUFORT | SAMPLE | 03 | WATER | 200 | STATION010 |
| 4 | B00051H | BEAUFORT | SAMPLE | 20 | WATER | 20C | STATION020 |
| 5 | B00053H | BEAUFORT | SAMPLE | 20 | WATER | 20C | STATION020 |
| 6 | B00054H | BERUFORT | SAMPLE | 20 | WATER | 200 | STATION020 |
| 7 | B00055H | BEAUFORT | SAMPLE | 20 | WATER | 200 | STATION020 |
| 8 | B00058H | BEAUFORT | SAMPLE | 20 | WATER | 200 | STATION002 |
| 9 | B00059H | BEAUFORT | SAMPLE | 20 | WATER | 200 | STATION002 |
| 10 | B00060H | REAUFORT | SAMPLE | 20 | WATER | 20C | STATION002 |
| 11 | B00061H | BEAUFORT | SAMPLE | 20 | WATER | 200 | STATION002 |
| 12 | B00064H | BEAUFORT | SAMPLE | 20 | WATER | 200 | STATION002 |
| | B00065H | BEAUFORT | SAMPLE | 20 | WATER | 200 | STATION002 |
| 13 | B00066H | BEAUFORT | SAMPLE | 20 | MATER | 200 | STATION002 |
| 14 | B00067H | BEAUFORT | SAMPLE | 20 | WATER | 200 | STATION002 |
| 15 | B00068H | BEAUFORT | SAMPLE | 20 | WATER | 200 | STATION002 |
| 16 | 800069H | BEAUFORT | SAMPLE | 20 | WATER | 200 | STATION002 |
| 17 | B00070H | BEAUFORT | SAMPLE | 20 | WATER | 200 | STATION002 |
| 18 | | BEAUFORT | SAMPLE | 20 | WATER | 200 | STATION002 |
| 19 22 | B00072H | BEAUFORT | SAMPLE | 20 | WATER | 200 | STATION002 |
| 20 | B00073H | BEAUFORT | SAMPLE | 20 | WATER | 200 | STATION002 |
| 21 | B00075H | BEAUFORT | SAMPLE | 27 | WATER | 200 | STATION071 |
| 22 | B00101H | BEAUFORT | SAMPLE | 27 | WATER | 200 | STATION071 |
| 23 | B00102H | BEAUFORT | SAMPLE | 27 | WATER | 200 | STATION071 |
| 24 | BOO103H | BEAUFORT | SAMPLE | 27 | WATER | 200 | STATION071 |
| 25 | B00104H | BEAUFORT | SAMPLE | 27 | WATER | 20C | STATION071 |
| 26 | B00110H | BEAUFORT | SAMPLE | 27 | WATER | 20C | STATIONØ71 |
| 27 | B00113H | BEAUFORT | SAMPLE | 27 | WATER | 20C | STATION071 |
| 28 | B00114H | BEAUFORT | SAMPLE | 27 | WATER | 20C | |
| 29 | B00115H | BEAUFORT | SAMPLE | 27 | WATER | 200 | |
| 30 | B00116H | BEAUFORT | SAMPLE | 27 | WATER | 200 | ······································ |
| 31 | B00118H | BEAUFORT | SAMPLE | 27 | WATER | 200 | |
| 32 | B00119H | BEAUFORT | SAMPLE | 27 | WATER | 200 | |
| 33 | B00120H | BEAUFORT | SAMPLE | | WATER | 200 | |
| 34 | B00121H | BEAUFORT | SAMPLE | | WATER | 200 | |
| 35 | 800151H | BEAUFORT | SAMPLE | | MATER | 200 | |
| 36 | B00152H | BEAUFORT | SAMPLE | | | | |
| 37 | B00153H | | COMPLE | 24 | WATER | 200 | STATION055 |
| 38 | B00154H | BEAUFORT BEAUFORT | | 24 | MATER | 200 | STATION055 |
| 39 | B00155H | | | | HATER | 200 | |
| 40 | B00156H | BEAUFORT | | | | 200 | |
| 41 | B00158H | BEAUFORT | | | | | STATION055 |
| 42 | B00159H | BEAUFORT | | | | | |
| 43 | 800160H | BEAUFORT | | | MATER | | |
| 44 | B00161H | BEAUFORT | | 24 | WATER | 200 | STATION055 |
| 45 | B00163H | BEAUFORT | | | | | |
| 46 | BØØ164H | BEAUFORT | | | | | |
| 47 | B00166H | BEAUFORT | | | | | |
| 48 | B00168H | BEAUFORT | | | | | |
| 49 | B00169H | BEAUFORT | | 4 | WATER | | |
| 50 | B002 02H | BEAUFORT | | 60 | MUT EV | المته الم | OTHER DESIGN OF |
| | | | | | | | |

| 51 | B00204H | BEAUFORT | SAMPLE | | | 20C | |
|-------------|---------|----------|--------|------|-------|-----|------------|
| 52 | B00205H | BEAUFORT | SAMPLE | 26 | MATER | 20C | STATION070 |
| 53 | B00206H | BEAUFORT | SAMPLE | 26 | WATER | 20C | STATION070 |
| 54 | B00207H | BEAUFORT | SAMPLE | 26 | WATER | 20C | STATION070 |
| 55 | B90208H | BEAUFORT | SAMPLE | - 26 | WATER | 20C | STATION070 |
| 56 | B00210H | BEAUFORT | | 26 | MATER | 200 | STATION070 |
| 57 | B00211H | BEAUFORT | SAMPLE | 26 | WATER | 20C | STATION070 |
| 58 | B00212H | BEAUFORT | SAMPLE | 26 | MATER | 200 | STATION070 |
| 59 | B00213H | BEAUFORT | SAMPLE | 26 | WATER | 200 | STATION070 |
| 60 | B00217H | BEAUFORT | SAMPLE | 26 | WATER | 200 | STATION070 |
| 61 | B00219H | BEAUFORT | SAMPLE | 26 | WATER | 20C | STATION070 |
| 62 | B00221H | BEAUFORT | SAMPLE | 26 | WATER | 20C | STATION070 |
| 63 | B00222H | BEAUFORT | SAMPLE | 26 | WATER | 20C | STATION070 |
| 64 | B00223H | BEAUFORT | SAMPLE | 26 | WATER | 20C | STATION070 |
| 65 | B00251H | BEAUFORT | SAMPLE | 11 | WATER | 20C | STATION030 |
| 66 | B00252H | BEAUFORT | SAMPLE | 11 | WATER | 200 | STATION030 |
| 67 | B00253H | BEAUFORT | SAMPLE | 11 | WATER | 200 | STATION030 |
| 68 | B00254H | BEAUFORT | SAMPLE | 11 | WATER | 200 | STATION030 |
| 69 | B00255H | BERUFORT | SAMPLE | 11 | WATER | 200 | STATION030 |
| 70 | B00258H | BEAUFORT | SAMPLE | 11 | WATER | 200 | STATION030 |
| 71 | B00259H | BEAUFORT | SAMPLE | 11 | WATER | 200 | STATION030 |
| 72 | B00260H | BEAUFORT | SAMPLE | 11 | WATER | 20C | STATION030 |
| 73 | B90261H | BEAUFORT | SAMPLE | 11 | WATER | 20C | STATION030 |
| 74 | B00262H | BEAUFORT | SAMPLE | 11 | MATER | 200 | STATION030 |
| 75 | B00263H | BEAUFORT | SAMPLE | 11 | WATER | 200 | STATION030 |
| 76 | B00264H | BEAUFORT | SAMPLE | 11 | WATER | 20C | STATION030 |
| 77 | B00265H | BEAUFORT | SAMPLE | 11 | WATER | 20C | STATION030 |
| 78 | B00268H | BEAUFORT | SAMPLE | 11 | WATER | 200 | STATION030 |
| 79 | B00269H | BEAUFORT | SAMPLE | 11 | WATER | 20C | STATION030 |
| 80 | 800270H | BEAUFORT | SAMPLE | 11 | WATER | 200 | STATION030 |
| $\otimes 1$ | B00271H | BEAUFORT | SAMPLE | 11 | WATER | 20C | STATION030 |
| 82 | B00273H | BEAUFORT | SAMPLE | 11 | MATER | 200 | STATION030 |
| 83 | B00275H | BEAUFORT | SAMPLE | 11 | WATER | 200 | STATION030 |
| | | | | | | | |

END FORM

Strains isolated from sediment at 20C showing gray colonies on solid medium.

| s next the e | | an an an an an | | | | | |
|--------------|--------------------|----------------|----------|----|------------|-------------|--------------------------|
| 1 | B00026H | BEAUFORT | SAMPLE | 03 | SEDIMENT | 20C | STATION010 |
| 2 | 300029H | BEAUFORT | SAMPLE | Ø3 | SEDIMENT | 20C | STATION010 |
| З | B00030H | BEAUFORT | SAMPLE | 03 | SEDIMENT | 200 | STATION010 |
| 4 | B00032H | | SAMPLE | 03 | SEDIMENT | 200 | STATION010 |
| č. | B00033H | BEAUFORT | SAMPLE | 03 | SEDIMENT | 200 | STATION010 |
| 6 | B00038H | | SAMPLE | 63 | SEDIMENT | 200 | STATION010 |
| 7 | B00042H | | SAMPLE | 03 | SEDIMENT | 200 | STATION010 |
| 8 | B00045H | | SAMPLE | 03 | SEDIMENT | 200 | STATION010 |
| ģ | B00086H | | SAMPLE | 16 | SEDIMENT | 200 | STATION002 |
| 10 | B00098H | BEAUFORT | SAMPLE | 16 | SEDIMENT | 200 | STATION002 |
| 11 | B00135H | BEAUFORT | SAMPLE | 22 | SEDIMENT | 20C | STATION071 |
| 12 | . B00141H | BEAUFORT | SAMPLE | 22 | SEDIMENT | 20C | STATION071 |
| 13 | B00145H | BEAUFORT | SAMPLE | 22 | SEDIMENT | 20C | STATION071 |
| 14 | E00178H | BEAUFORT | SAMPLE | 20 | SEDIMENT | 200 | STATION055 |
| 15 | B00179H | BEAUFORT | SAMPLE | 20 | SEDIMENT | 20C | STATION055 |
| 16 | - E00180H | BEAUFORT | SAMPLE | 20 | SEDIMENT | 20C | STATION055 |
| 17 | B00182H | BEAUFORT | SAMPLE | 22 | SEDIMENT | 20C | STATION071 |
| 18 | B00184H | | SAMPLE | | SEDIMENT | 200 | STATION055 |
| 19 | B00185H | | | | | | STATION055 |
| 20 | B00187H | | SAMPLE | 50 | SEDIMENT | 200 | STATION055 |
| 21 | B00188H | | SAMPLE | 20 | SEDIMENT | 20C | STATION055 |
| 22 | B00189H | | SAMPLE | 56 | SEDIMENT | 50C | STATION055 |
| 23 | B00192H | | SAMPLE | 20 | SEDIMENT | 200 | STATION055 |
| 24 | _B00193H | | SAMPLE | 20 | SEDIMENT | 200 | STATION055 |
| 25 | B00198H | | SAMPLE | 20 | SEDIMENT | 200 | STATION055 |
| 26 | 800200H | | SAMPLE | 20 | SEDIMENT | 200 | STATION055 |
| 27 | B00230H | | SAMPLE | 21 | SEDIMENT | 200 | STATION070 |
| 28 | B00233H | BEAUFORT | SAMPLE | 21 | SEDIMENT | 200 | STATION070 |
| 29 | B00235H | | SAMPLE | | SEDIMENT | 200 | STATION070 |
| 30 | B00237H | | SAMPLE | 21 | SEDIMENT | 200 | STATION070 |
| 31 | B00533H | | SAMPLE | 21 | SEDIMENT | 200 | STATION070 |
| 32 | B00240H | BEAUFORT | SAMPLE | 21 | SEDIMENT | 200 | STATION070 |
| 33. | B00241H | BEAUFORT | SAMPLE | 21 | SEDIMENT | 200 | STATION070 STATION070 |
| 34 | B00243H | BEAUFORT | SAMPLE | 21 | SEDIMENT | 20C | STATION070 |
| 35 | B00244H | BEAUFORT | SAMPLE | 21 | SEDIMENT | 200 | STATION070 |
| 36 | B00249H | BEAUFORT | SAMPLE | 21 | SEDIMENT | | |
| 37 | B00250H | BEAUFORT | | | SEDIMENT | | STATION070 STATION030 |
| 38 | B00276H | | | | SEDIMENT | | STATION030 |
| 39 | B00283H | | | | SEDIMENT | | STATION030 |
| 40 | B00284H | | | | | | STATION030 |
| 41 | B00286H | | SAMPLE | | SEDIMENT | | |
| 42 | B00287H | | | | | | STATION030 STATION030 |
| 43 | B00288H | | | | SEDIMENT | | STATION030 |
| 44 49 | B00290H B00295H | | | | | | STATION030 |
| 45 | REACAOH | BEAUFORT | onnument | 07 | OF DIRETAL | <u>a</u> 00 | 0101100000 |

END FORM 45 STRAINS

Strains isolated from water at 4C producing at least one of the following non-diffusible pigments: white, red, pink, brown, black, green, violet, blue, gold, orange.

| 1 | B00005L | BEAUFORT | ° SAMPLE | 103 | MATER | 040 | STATION010 |
|---------|---------|--------------|-----------|-----------|-------|-------|------------|
| 2 | B00006L | BERUFORT | SAMPLE | 03 | ИНТЕР | 040 | STATION010 |
| 3 | B00009L | BEAUFORT | | | | | |
| 4 | B00012L | | | | | | |
| | | BEAUFORT | | | | | |
| 5 | B00014L | BEAUFORT | | | WATER | | |
| 6 | B00024L | BEAUFORT | SAMPLE | 03 | WATER | - 04C | STATION010 |
| 7 | 800025L | BEAUFORT | SAMPLE | 03 | MATER | - Ø4C | STATION010 |
| 8 | B00051L | BEAUFORT | SAMPLE | 20 | WATER | 040 | STATION002 |
| 9 | B00052L | BEAUFORT | | | WATER | | |
| 10 | B00055L | BEAUFORT | | | WATER | | |
| 11 | B00057L | BEAUFORT | | | WATER | | |
| | | | | | | | |
| 12 | B00060L | BEAUFORT | | | WATER | | |
| 13 | B00061L | BEAUFORT | | | WATER | | |
| 14 | B00062L | BEAUFORT | SAMPLE | | WATER | Ø4C | STATION002 |
| 15 | B00063L | BEAUFORT | SAMPLE | -20 | WATER | -040 | STATION002 |
| 16 | B00066L | BEAUFORT | SAMPLE | 20 | WATER | -04C | STATION002 |
| 17 | 300068L | BERUFORT | SAMPLE | | MATER | | |
| 18 | B00070L | BEAUFORT | SAMPLE | | WATER | | |
| 19 | E00074L | BEAUFORT | SAMPLE | | WATER | - + - | |
| | | BEAUFORT | | | | | |
| 20 | B00101L | | SAMPLE | | WATER | 04C | STATION071 |
| 21 | B00102L | BEAUFORT | SAMPLE | | WATER | 04C | STATION071 |
| 22 | B00104L | BEAUFORT | SAMPLE | | MATER | 04C | STATION071 |
| 23 | B00105L | BEAUFORT | SAMPLE | | WATER | -04C | STATION071 |
| 24 | B00106L | BEAUFORT | SAMPLE | 27 | MATER | 04C | STATION071 |
| 25 | B00107L | BEAUFORT | SAMPLE | 27 | MATER | 04C | STATION071 |
| 26 | B00108L | BEAUFORT | SAMPLE | 27 | MATER | 04C | STATION071 |
| 27 | B00110L | BEAUFORT | SAMPLE | | WATER | 04C | STATION071 |
| 28 | B00111L | BEAUFORT | SAMPLE | 27 | WATER | 04C | STATION071 |
| 29 | B00112L | BEAUFORT | SAMPLE | 27 | WATER | 04C | STATION071 |
| 30 | B00113L | BEAUFORT | SAMPLE | 27 | | | |
| | | | | | WATER | 04C | STATION071 |
| 31 | B00115L | BEAUFORT | SAMPLE | 27 | WATER | 04C | STATION071 |
| 32 | B00116L | BEAUFORT | SAMPLE | 27 | WATER | 04C | STATION071 |
| 33 | B00118L | BEAUFORT | SAMPLE | 27 | WATER | 04C | STATION071 |
| 34 | B00120L | BEAUFORT | SAMPLE | 27 | WATER | 04C | STATION071 |
| 35 | B00121L | BEAUFORT | SAMPLE | 27 | WATER | 04C | STATION071 |
| 36 | B00122L | BEAUFORT | SAMPLE | 27 | WATER | 04C | STATION071 |
| 37 | B00124L | BEAUFORT | SAMPLE | 27 | WATER | 04C | STATION071 |
| 38 | B00125L | BEAUFORT | | | WATER | | STATION071 |
| 39 | B00151L | BEAUFORT | SAMPLE | | | 04C | STATION055 |
| 40 | B00154L | BEAUFORT | SAMPLE | | WATER | 04C | STATION055 |
| 41 | 800155L | | | | | | |
| | | BEAUFORT | SAMPLE | | WATER | 04C | STATION055 |
| 42 | B00156L | BEAUFORT | SAMPLE | | WATER | 04C | STATION055 |
| 43 | BØØ157L | BEAUFORT | | | WATER | 04C | STATION055 |
| 44 | B00159L | BEAUFORT | SAMPLE | | | 04C | STATION055 |
| 45 | B00162L | BEAUFORT | SAMPLE | 24 | WATER | 04C | STATION055 |
| 46 | B00163L | BEAUFORT | | | WATER | 04C | STATION055 |
| 47 | B00165L | BEAUFORT | | | WATER | 04C | STATION055 |
| 48 | B00166L | BEAUFORT | | | WATER | 04C | STATION055 |
| 49 | B00168L | BEAUFORT | SAMPLE | | WATER | 04C | STATION055 |
| 50 | B00169L | BEAUFORT | SAMPLE | | | | |
| -11 C.I | TOOTOPE | DELTION OR I | OF THE LE | C4 | WATER | 04C | STATION055 |

| 51 | B00170L | BEAUFORT SAMPLE 24 WATER 04C STATION055 |
|----|---------|--|
| 52 | B00171L | BEAUFORT SAMPLE 24 WATER 04C STATION055 BEAUFORT SAMPLE 24 WATER 04C STATION055 |
| 53 | B00172L | BEAUFORT SAMPLE 24 WATER 04C STATION055 |
| 54 | B00173L | |
| 55 | B00175L | BEAUFORT SAMPLE 24 WATER 04C STATION055 BEAUFORT SAMPLE 24 WATER 04C STATION055 |
| 56 | B00201L | BEAUFORT SAMPLE 26 WATER 04C STATION070 |
| 57 | B00203L | BEAUFORT SAMPLE 26 WATER 04C STATION070 |
| 58 | 800204L | BEAUFORT SAMPLE 26 WATER 04C STATION070 |
| 59 | B00205L | BEAUFORT SAMPLE 26 WATER 04C STATION070 |
| 60 | B00206L | BEAUFORT SAMPLE 26 WATER 04C STATION070 |
| 61 | B00207L | BEAUFORT SAMPLE 26 WATER 04C STATION070 |
| 62 | B00208L | BEAUFORT SAMPLE 26 WATER 04C STATION070 |
| 63 | B00209L | BEAUFORT SAMPLE 26 WATER 04C STATION070 |
| 64 | B00210L | BEAUFORT SAMPLE 26 WATER 04C STATION070 |
| 65 | B00213L | BEAUFORT SAMPLE 26 WATER 04C STATION070 |
| 66 | B00214L | BEAUFORT SAMPLE 26 WATER 04C STATION070 |
| 67 | B00215L | BEAUFORT SAMPLE 26 WATER 04C STATION070 |
| 68 | B00217L | BEAUFORT SAMPLE 26 WATER 04C STATION070 |
| 69 | B00218L | BEAUFORT SAMPLE 26 WATER 04C STATION070 |
| 70 | B00220L | BEAUFORT SAMPLE 26 WATER 04C STATION070 |
| 71 | B00222L | BEAUFORT SAMPLE 26 WATER 04C STATION070 |
| 72 | BØØ223L | BEAUFORT SAMPLE 26 WATER 04C STATION070 |
| 73 | B00224L | BEAUFORT SAMPLE 26 WATER 04C STATION070 |
| 74 | B00278L | BEAUFORT SAMPLE 11 WATER 04C STATION030 |
| 75 | B00280L | BEAUFORT SAMPLE 11 WATER 04C STATION030 |
| 76 | B00281L | BEAUFORT SAMPLE 19 WATER 04C STATION001 |
| 77 | B00284L | BEAUFORT SAMPLE 19 WATER 04C STATION001 |
| 78 | B00291L | BEAUFORT SAMPLE 36 WATER 04C STATION002 |
| 79 | B00292L | BEAUFORT SAMPLE 36 WATER 04C STATION002 |
| | | |

EMD FORM 79 STRAIMS

97

Strains isolated from sediment at 4C producing any one of the following non-diffusible pigments: white, red, pink, brown, black, green, violet, blue, gold, orange.

| 1 | B00026L | BEAUFORT | SAMPLE | 03 | SEDIMENT | 04C | STATION010 |
|----------|--------------------|-----------|------------------|----------|----------|------------|--------------------------|
| â | B00027L | BEAUFORT | SAMPLE | 03 | SEDIMENT | 04C | STATION010 |
| 3 | B00044L | BEAUFORT | SAMPLE | 03 | SEDIMENT | 04C | STATION010 |
| 4 | B00076L | BEAUFORT | SAMPLE | 16 | SEDIMENT | 04C | STATION002 |
| 5 | B00079L | BEAUFORT | SAMPLE | 16 | SEDIMENT | 04C | STATION002 |
| ě | B00083L | BEAUFORT | SAMPLE | 16 | SEDIMENT | 04C | STATION002 |
| Ž | B00088L | BEAUFORT | SAMPLE | 16 | SEDIMENT | 04C | STATION002 |
| 8 | B00138L | BEAUFORT | SAMPLE | 22 | SEDIMENT | 04C | STATION071 |
| ē | B00139L | BEAUFORT | SAMPLE | 22 | SEDIMENT | 04C | STATION071 |
| 10 | B00140L | BEAUFORT | SAMPLE | 22 | SEDIMENT | 04C | STATION071 |
| 11 | B00141L | BEAUFORT | SAMPLE | 22 | SEDIMENT | 04C | STATION071 |
| 12 | B00143L | BEAUFORT | SAMPLE | 22 | SEDIMENT | 04C | STATION071 |
| 13 | B00144L | BEAUFORT | SAMPLE | 22 | SEDIMENT | 04C | STATION071 |
| 主斗 | B00145L | BEAUFORT | SAMPLE | 22 | SEDIMENT | 04C | STATION071 |
| 15 | B00148L | BEAUFORT | SAMPLE | 22 | SEDIMENT | 04C | STATION071 |
| 16 | B00178L | BEAUFORT | SAMPLE | 20 | SEDIMENT | 04C | STATION055 |
| 17 | B00179L | BEAUFORT | SAMPLE | 20 | SEDIMENT | 04C | STATION055 |
| 18 | B00180L | BEAUFORT | SAMPLE | 20 | SEDIMENT | 04C | STATION055 |
| 19 | B00182L | BEAUFORT | SAMPLE | 20 | SEDIMENT | 04C | STATION055 |
| 20 | B00183L | BEAUFORT | SAMPLE | 20 | SEDIMENT | 04C | STATION055 |
| 21 | B00184L | BEAUFORT | SAMPLE | 20 | SEDIMENT | 04C | STATION055 |
| 22 | B00185L | BEAUFORT | SAMPLE | 20 | SEDIMENT | 04C | STATION055 |
| 23 | B90186L | BEAUFORT | SAMPLE | 20 | SEDIMENT | 04C | STATION055 |
| 24 | B00187L | BEAUFORT | SAMPLE | 20 | SEDIMENT | 04C | STATION055 |
| 25 | B00188L | BEAUFORT | SAMPLE | 20 | SEDIMENT | 04C | STATION055 |
| 26 | B00190L | BEAUFORT | SAMPLE | 20 | SEDIMENT | 04C | STATION055 |
| 27 | B00192L | BEAUFORT | SAMPLE | 20 | SEDIMENT | 04C | STATION055 |
| 28 | B00193L | BEAUFORT | SAMPLE | 20 | SEDIMENT | 04C | STATION055 |
| 29 | B00194L | BEAUFORT | SAMPLE | 20 | SEDIMENT | 94C | STATION055 |
| 30 | B00196L | BEAUFORT | SAMPLE | 20 | SEDIMENT | 04C | STATION055 |
| 31 | B00198L | BEAUFORT | SAMPLE | 20 | SEDIMENT | 04C | STATION055 STATION055 |
| 32 | B00199L | BEAUFORT | SAMPLE | 20 | SEDIMENT | 04C | |
| 33 | B00200L | BEAUFORT | SAMPLE | 20 | SEDIMENT | 04C 04C | STATION055 STATION070 |
| 34 OF | B00228L | BEAUFORT | SAMPLE | 21 21 | SEDIMENT | 04C 04C | STATION070 |
| 35 | B00230L | BEAUFORT | SAMPLE | 21 | SEDIMENT | 04C | STATION070 |
| 36 | B00231L B00233L | BEAUFORT | SAMPLE SAMPLE | 21 | SEDIMENT | 04C | STATION070 |
| 37 20 | B00233L B00234L | BEAUFORT | SAMPLE | 21 21 | SEDIMENT | 04C | STATION070 |
| 38 39 | B00237L | BEAUFORT | SAMPLE | 21 | SEDIMENT | 04C | STATION070 |
| 37 40 | B00238L | BEAUFORT | SAMPLE | 21 | SEDIMENT | 04C | STATION070 |
| -160 | DODEDOL | DEFICIENT | | C. 1 | CEDINEIN | 040 | |

| 41 42 | 800239L 800240L | BEAUFORT BEAUFORT | SAMPLE 21 SAMPLE 21 | | 04C STATION070 04C STATION070 |
|----------|--------------------|----------------------|------------------------|----------|----------------------------------|
| 43 | B00245L | BEAUFORT | SAMPLE 21 | | 04C STATION070 |
| 44 | B00246L | BEAUFORT | SAMPLE 21 SAMPLE 21 | | 04C STATION070 04C STATION070 |
| 45 46 | 800247L 800249L | BEAUFORT | SAMPLE 21 | SEDIMENT | 04C STATION070 |
| 47 | 800250L | BEAUFORT | SAMPLE 21 | SEDIMENT | 04C STATION070 |
| 48 | B00254L | BEAUFORT | SAMPLE 09 | | 04C STATION030 |
| 49 | B00256L | BEAUFORT | SAMPLE 09 | | 04C STATION030 |
| 50 | B00262L | BEAUFORT | SAMPLE 09 | SEDIMENT | 04C STATION030 |
| 51 | B00263L | BEAUFORT | SAMPLE 09 | SEDIMENT | 04C STATION030 |
| 52 | E99264L | BEAUFORT | SAMPLE 09 | SEDIMENT | 04C STATION030 |
| 53 | B00269L | BEAUFORT | SAMPLE 09 | SEDIMENT | 04C STATION030 |
| 54 | B00274L | BEAUFORT | SAMPLE 09 | SEDIMENT | 04C STATION030 |
| 55 | 800286L | BEAUFORT | SAMPLE 15 | SEDIMENT | 04C STATION001 |
| 56 | B00287L | BEAUFORT | SAMPLE 15 | SEDIMENT | 04C STATION001 |
| 57 | 800288L | BEAUFORT | SAMPLE 15 | SEDIMENT | 04C STATION001 |
| 58 | B00289L | BEAUFORT | SAMPLE 15 | SEDIMENT | 04C STATION001 |

END FORM 58 STRAINS

.

Strains isolated from water at 20C producing any one of the following non-diffusible pigments: white, red, pink, brown, black, green, violet, blue, gold, orange.

| 1 | B00004H | BEAUFORT SAMPLE 03 WATER 20C STATION010 |
|---------|------------------|---|
| 2 | B00005H | BEAUFORT SAMPLE 03 WATER 20C STATION010 |
| З | B00006H | BEAUFORT SAMPLE 03 WATER 20C STATION010 |
| 4 | 80 00 07H | BEAUFORT SAMPLE 03 WATER 20C STATION010 |
| 5 | B00008H | BEAUFORT SAMPLE 03 WATER 20C STATION010 |
| 6 | B00011H | BEAUFORT SAMPLE 03 WATER 200 STATION010 |
| 7 | B00012H | BEAUFORT SAMPLE 03 WATER 20C STATION010 |
| 8 | B00013H | BEAUFORT SAMPLE 03 WATER 20C STATION010 |
| 9 | B00014H | BEAUFORT SAMPLE 03 WATER 20C STATION010 |
| 10 | B00015H | BEAUFORT SAMPLE 03 WATER 20C STATION010 |
| 11 | B00016H | BEAUFORT SAMPLE 03 WATER 200 STATION010 |
| 12 | B00017H | BEAUFORT SAMPLE 03 WATER 20C STATION010 |
| 13 | B00018H | BEAUFORT SAMPLE 03 WATER 200 STATION010 |
| 14 | B00019H | BEAUFORT SAMPLE 03 WATER 20C STATION010 |
| 15 | B00020H | BEAUFORT SAMPLE 03 WATER 20C STATION010 |
| 16 | B00021H | BEAUFORT SAMPLE 03 WATER 20C STATION010 |
| 17 | B00022H | BEAUFORT SAMPLE 03 WATER 200 STATION010 |
| 18 | B00023H | BEAUFORT SAMPLE 03 WATER 20C STATION010 |
| 19 | B00024H | BEAUFORT SAMPLE 03 WATER 20C STATION010 |
| 20 | B00052H | BEAUFORT SAMPLE 20 WATER 20C STATION020 |
| ≥ 1 | B00056H | BEAUFORT SAMPLE 20 WATER 20C STATION020 |
| 22 | B00057H | BEAUFORT SAMPLE 20 WATER 20C STATION020 |
| 23 | 800062H | BEAUFORT SAMPLE 20 WATER 20C STATION002 |
| 24 | B00063H | BEAUFORT SAMPLE 20 WATER 20C STATION002 |
| 25 | B00071H | BEAUFORT SAMPLE 20 WATER 20C STATION002 |
| 26 | B00106H | BEAUFORT SAMPLE 27 WATER 20C STATION071 |
| 27 | B00111H | BEAUFORT SAMPLE 27 WATER 20C STATION071 |
| 58 | B00112H | BEAUFORT SAMPLE 27 WATER 20C STATION071 |
| 29 | B00117H | BEAUFORT SAMPLE 27 WATER 20C STATION071 |
| 30 | B00122H | BEAUFORT SAMPLE 27 WATER 20C STATION071 |
| 31 | B00123H | BEAUFORT SAMPLE 27 WATER 20C STATION071 |
| 32 | B00157H | BEAUFORT SAMPLE 24 WATER 20C STATION055 |
| 33 | B00165H | BEAUFORT SAMPLE 24 WATER 20C STATION055 |
| 34 | B00170H | BEAUFORT SAMPLE 24 WATER 20C STATION055 |
| 35 | 800203H | BEAUFORT SAMPLE 26 WATER 20C STATION070 |
| 36 | B00216H | BEAUFORT SAMPLE 26 WATER 20C STATION070 |
| 37 | B00253H | BEAUFORT SAMPLE 11 WATER 20C STATION030 |
| | | |

END FORM

37 STRAINS

Strains isolated from sediment at 20C producing any one of the following non-diffusible pigments: white, red, pink, brown, black, green, violet, blue, gold, orange.

| | 8000 0 74 | neou eona | SAMPLE 03 | SEDIMENT | 200 | STATION010 |
|----------|------------------|-----------|-----------|----------|-----|------------|
| 1 | B00027H | BEAUFORT | | | 200 | STATION010 |
| 3 | B00028H | BEAUFORT | SAMPLE 03 | | | |
| 3 | E00031H | BEAUFORT | SAMPLE 03 | | 200 | STATION010 |
| 4 | B00035H | BEAUFORT | SAMPLE 03 | | 200 | STATION010 |
| 5 | B00036H | BEAUFORT | SAMPLE 03 | | 50C | STATION010 |
| 6 | B00037H | BEAUFORT | SAMPLE 03 | | 20C | STATION010 |
| 7 | 800039H | BEAUFORT | SAMPLE 03 | | 20C | STATION010 |
| 8 | B00044H | BEAUFORT | SAMPLE 03 | | 20C | STATION010 |
| 9 | B00047H | BEAUFORT | SAMPLE 03 | | 20C | STATION010 |
| 10 | B00048H | BEAUFORT | SAMPLE 03 | SEDIMENT | 20C | STATION010 |
| 11 | B00076H | BEAUFORT | SAMPLE 16 | SEDIMENT | 20C | STATION002 |
| 12 | B00077H | BEAUFORT | SAMPLE 16 | SEDIMENT | 20C | STATION002 |
| 13 | B00078H | BEAUFORT | SAMPLE 16 | SEDIMENT | 20C | STATION002 |
| 14 | B00084H | BEAUFORT | SAMPLE 16 | SEDIMENT | 200 | STATION002 |
| 15 | B00085H | BEAUFORT | SAMPLE 16 | SEDIMENT | 200 | STATION002 |
| 16 | B00091H | BEAUFORT | SAMPLE 16 | SEDIMENT | 20C | STATION002 |
| 17 | E00095H | BEAUFORT | SAMPLE 16 | SEDIMENT | 200 | STATION002 |
| 18 | B00096H | BEAUFORT | SAMPLE 16 | SEDIMENT | 200 | STATION002 |
| 19 | B00097H | BEAUFORT | SAMPLE 16 | SEDIMENT | 200 | STATION002 |
| 20 | B00126H | BEAUFORT | SAMPLE 22 | SEDIMENT | 200 | STATION071 |
| 21 | B00127H | BEAUFORT | SAMPLE 22 | SEDIMENT | 200 | STATION071 |
| 22 | B00128H | BEAUFORT | SAMPLE 22 | SEDIMENT | 200 | STATION071 |
| 23 | B00129H | BEAUFORT | SAMPLE 22 | SEDIMENT | 200 | STATION071 |
| 24 | B00132H | BEAUFORT | SAMPLE 22 | SEDIMENT | 200 | STATION071 |
| 25 | B00133H | BEAUFORT | SAMPLE 22 | SEDIMENT | 200 | STATION071 |
| 26 26 | B00136H | BEAUFORT | SAMPLE 22 | SEDIMENT | 200 | STATION071 |
| 20 27 | B00138H | BEAUFORT | SAMPLE 22 | SEDIMENT | 200 | STATION071 |
| 28 | B00130H | BEAUFORT | SAMPLE 22 | SEDIMENT | 200 | STATION071 |
| 29 29 | B00142H | BEAUFORT | SAMPLE 22 | SEDIMENT | 200 | STATION071 |
| с7 30 | B00142H | BEAUFORT | SAMPLE 22 | SEDIMENT | 200 | STATION071 |
| | B00143H | BEAUFORT | SAMPLE 22 | SEDIMENT | 200 | STATION071 |
| 31 | B00144H | BEAUFORT | SAMPLE 22 | SEDIMENT | 200 | STATION071 |
| 32 | | BEAUFORT | SAMPLE 22 | SEDIMENT | 200 | STATION071 |
| 33 | B00148H | BEAUFORT | SAMPLE 22 | SEDIMENT | 200 | STATION071 |
| 34 | B00149H | BEAUFORT | SAMPLE 22 | SEDIMENT | 200 | STATION071 |
| 35 | B00150H | | SAMPLE 20 | SEDIMENT | 200 | STATION055 |
| 36 | B00176H | BEAUFORT | SAMPLE 20 | SEDIMENT | 200 | STATION055 |
| 37 | B00177H | BEAUFORT | | | | STATION055 |
| 38 | B00181H | BEAUFORT | | | | STATION055 |
| 39 | B00186H | BEAUFORT | | SEDIMENT | 200 | |
| 40 | B00190H | BEAUFORT | SAMPLE 20 | SEDIMENT | | STATION055 |
| 41 | B00194H | BEAUFORT | SAMPLE 20 | SEDIMENT | 200 | STATION055 |
| 42 | B00196H | BEAUFORT | SAMPLE 20 | SEDIMENT | 200 | STATION055 |
| 43 | B00199H | BEAUFORT | SAMPLE 20 | | 500 | STATION055 |
| 44 | B00226H | BEAUFORT | SAMPLE 21 | SEDIMENT | 20C | STATION070 |
| 45 | B00227H | BEAUFORT | SAMPLE 21 | SEDIMENT | 200 | STATION070 |
| 46 | B00228H | BEAUFORT | SAMPLE 21 | SEDIMENT | 200 | STATION070 |
| 47 | B00229H | BEAUFORT | SAMPLE 21 | SEDIMENT | 200 | STATION070 |
| 48 | B00231H | BEAUFORT | SAMPLE 21 | SEDIMENT | 20C | STATION070 |
| 49 | B00232H | BEAUFORT | SAMPLE 21 | SEDIMENT | 200 | STATION070 |
| 50 | BØØ234H | BEAUFORT | SAMPLE 21 | SEDIMENT | 20C | STATION070 |
| | | | | | | |

| 51 | B00242H | BEAUFORT | SAMPLE @ | 21 SEDIMENT | 20C STATION070 |
|----|------------------|----------|----------|--------------------|----------------|
| 52 | B00243H | BEAUFORT | SAMPLE 2 | 21 SEDIMENT | 20C STATION070 |
| 53 | B00246H | BEAUFORT | SAMPLE 2 | 21 SEDIMENT | 20C STATION070 |
| 54 | B00247H | BEAUFORT | SAMPLE 2 | 21 SEDIMENT | 20C STATION070 |
| 55 | B00248H | BEAUFORT | SAMPLE 2 | 21 SEDIMENT | 20C STATION070 |
| 56 | B00277H | BEAUFORT | SAMPLE (| 39 SEDIMENT | 20C STATION030 |
| 57 | B00278H | BEAUFORT | SAMPLE 0 | 39 SEDIMENT | 20C STATION030 |
| 58 | B00279H | BEAUFORT | SAMPLE @ | 99 SEDIMENT | 20C STATION030 |
| 59 | B00280H | BEAUFORT | SAMPLE 0 | 99 SEDIMENT | 20C STATION030 |
| 60 | B00285H | BEAUFORT | SAMPLE 0 | 99 SEDIMENT | 20C STATION030 |
| 61 | B00289H | BEAUFORT | SAMPLE 0 | 99 SEDIMENT | 20C STATION030 |
| 62 | B0 0 292H | BEAUFORT | SAMPLE 0 | 39 SEDIMENT | 20C STATION030 |
| 63 | B00296H | BEAUFORT | SAMPLE 0 | 99 SEDIMENT | 20C STATION030 |
| 64 | B00297H | BEAUFORT | SAMPLE 0 | 99 SEDIMENT | 20C STATION030 |
| 65 | B00300H | BEAUFORT | SAMPLE 0 | 9 SEDIMENT | 20C STATION030 |

END FORM 65 STRAINS

Strains isolated from sediment at 4C producing at least one of the following diffusible pigments: blue, yellow, green, red, orange, violet, brown, black.

| a B | 800242L 800260L 800263L 800266L | BEAUFORT | SAMPLE | 09 09 | SEDIMENT | 04C 04C | STATION070 STATION030 STATION030 STATION030 |
|--------|--|----------|--------|----------|----------|------------|--|
|--------|--|----------|--------|----------|----------|------------|--|

END FORM

4 STRAINS

Strains isolated from water or sediment at 20C producing any diffusible pigment.

1 B00186H BEAUFORT SAMPLE 20 SEDIMENT 20C STATION055

END FORM

1 STRAINS

| | | | | | uoten | 000 | OTOTIONO10 |
|----------------------|---------|-----------------------|----------------|-------------|--------|-----|------------|
| 1 | B00001H | BEAUFORT | SAMPLE | | WATER | 20C | STATION010 |
| 2 | B00002H | BEAUFORT | SAMPLE | Ø3 | WATER | 200 | STATION010 |
| З | B00003H | BEAUFORT | SAMPLE | 03 | WATER | 200 | STATION010 |
| 4 | B00004H | BEAUFORT | SAMPLE | 03 | WATER | 20C | STATION010 |
| 5 | B00005H | BEAUFORT | SAMPLE | 63 | WATER | 200 | STATION010 |
| 6 | B00006H | BEAUFORT | SAMPLE | <u> 0</u> З | WATER | 200 | STATION010 |
| | B00007H | BEAUFORT | SAMPLE | 03 | WATER | 200 | STATION010 |
| 7 | | BEAUFORT | SAMPLE | 03 | WATER | 200 | STATION010 |
| 8 | B00008H | | SAMPLE | 03 | WATER | 200 | STATION010 |
| .9 | B00009H | BEAUFORT | SAMPLE | 03 | WATER | 200 | STATION010 |
| 10 | B00010H | BEAUFORT | | | | 200 | STATION010 |
| 11 | B00011H | BEAUFORT | SAMPLE | 03 | WATER | | STATION010 |
| 12 | B00012H | BEAUFORT | SAMPLE | 03 | WATER | 200 | |
| 13 | B00013H | BEAUFORT | SAMPLE | 03 | WATER | | STATION010 |
| 14 | B00014H | BEAUFORT | SAMPLE | 03 | WATER | 200 | STATION010 |
| 15 | B00015H | BEAUFORT | SAMPLE | 63 | WATER | 20C | STATION010 |
| 16 | B00016H | BEAUFORT | SAMPLE | 03 | WATER | 200 | STATION010 |
| 17 | B00017H | BEAUFORT | SAMPLE | 03 | WATER | 20C | STATION010 |
| 18 | B00018H | BEAUFORT | SAMPLE | Ø3 | WATER | 200 | STATION010 |
| 19 | B00019H | BEAUFORT | SAMPLE | 03 | WATER | 200 | STATION010 |
| | B00020H | BEAUFORT | SAMPLE | <u>03</u> | WATER | 200 | STATION010 |
| 20 | | BEAUFORT | SAMPLE | йЗ. | WATER | 20C | STATION010 |
| 21 | B00021H | BEAUFORT | SAMPLE | 03 | WATER | 200 | STATION010 |
| 22 | B00022H | | SAMPLE | 03 | WATER | 200 | STATION010 |
| 23 | B00023H | BEAUFORT | | 03 | WATER | 200 | STATION010 |
| 24 | B00024H | BEAUFORT | SAMPLE | | | | STATION020 |
| 25 | B00051H | BEAUFORT | SAMPLE | 20 | WATER | 200 | |
| 26 | B00052H | BEAUFORT | SAMPLE | 20 | WATER | 200 | STATION020 |
| 27 | B00053H | BEAUFORT | SAMPLE | 20 | WATER | 200 | STATION020 |
| 28 | B00054H | BEAUFORT | SAMPLE | 20 | WATER | 20C | STATION020 |
| 29 | B00055H | BEAUFORT | SAMPLE | 20 | WATER | 20C | STATION020 |
| 30 | B00056H | BEAUFORT | SAMPLE | 20 | WATER | 200 | STATION020 |
| Ξī | B00057H | BEAUFORT | SAMPLE | 20 | WATER | 200 | STATION020 |
| 32 | B00058H | BEAUFORT | SAMPLE | 20 | WATER | 20C | STATION002 |
| 33 | B00059H | BEAUFORT | SAMPLE | 20 | WRITER | 200 | STATION002 |
| 34 | B00060H | BEAUFORT | SAMPLE | 20 | WATER | 200 | STATION002 |
| 35 | B00061H | BEAUFORT | SAMPLE | 20 | WATER | 200 | STATION002 |
| 35 36 | B00062H | BEAUFORT | SAMPLE | 20 | WATER | 200 | STATION002 |
| 36 37 | B00063H | BEAUFORT | SAMPLE | 20 | WATER | 200 | STATION002 |
| | | BEAUFORT | SAMPLE | | | | |
| 38 | B00064H | | SAMPLE | | WATER | | STATION002 |
| 39 | B00065H | BEAUFORT | SAMPLE | | | 200 | STATION002 |
| 40 | B00066H | BEAUFORT | | | | | STATION002 |
| 41 | B00067H | BEAUFORT | SAMPLE | 20 | WATER | 200 | |
| 42 | B00068H | BEAUFORT | SAMPLE | | WATER | 500 | STATION002 |
| 43 | B00069H | BEAUFORT | SAMPLE | | WATER | 20C | STATION002 |
| 44 | B00070H | BEAUFORT | SAMPLE | | WATER | 200 | STATION002 |
| 45 | B00071H | BEAUFORT | SAMPLE | | WATER | 200 | STATION002 |
| 46 | B00072H | BEAUFORT | SAMPLE | 20 | WATER | 20C | STATION002 |
| 47 | B00073H | BEAUFORT | SAMPLE | 20 | WATER | 20S | STATION002 |
| 48 | B00075H | BEAUFORT | SAMPLE | | WATER | 200 | STATION002 |
| 49 | B00101H | BEAUFORT | SAMPLE | | WATER | 200 | STATION071 |
| 7 2 50 | B00102H | BEAUFORT | SAMPLE | | WATER | 200 | STATION071 |
| . 1 0 | 1001060 | المرابية المحر ومحالم | aut III kantaa | | | | |

| | DOO100 0 | |
|--------------|-----------------|--|
| 51 | B00103H | BEAUFORT SAMPLE 27 WATER 20C STATION071 |
| 52 | | BEAUFORT SAMPLE 27 WATER 20C STATION071 |
| 53 | B00106H | BEAUFORT SAMPLE 27 WATER 20C STATION071 |
| 54 | B00109H | BEAUFORT SAMPLE 27 WATER 20C STATION071 |
| 55 | B00110H | BEAUFORT SAMPLE 27 WATER 20C STATION071 |
| 56 | B00111H | BEAUFORT SAMPLE 27 WATER 20C STATION071 |
| 57 | B00112H | BEAUFORT SAMPLE 27 WATER 200 STATION071 |
| 58 | B00113H | BEAUFORT SAMPLE 27 WATER 20C STATION071 |
| 59 | B00113H | BEAUFORT SAMPLE 27 WATER 200 STATION071 |
| | | |
| 60 | B00115H | BEAUFORT SAMPLE 27 WATER 20C STATION071 |
| 61 | B00116H | BEAUFORT SAMPLE 27 WATER 20C STATION071 |
| -62 | B00117H | BEAUFORT SAMPLE 27 WATER 20C STATION071 |
| 63 | B00118H | BEAUFORT SAMPLE 27 WATER 200 STATION071 |
| 64 | B00119H | BEAUFORT SAMPLE 27 WATER 200 STATION071 |
| 65 | B00120H | BEAUFORT SAMPLE 27 WATER 20C STATION071 |
| 66 | B00121H | BEAUFORT SAMPLE 27 WATER 20C STATION071 |
| 67 | B00122H | BEAUFORT SAMPLE 27 WATER 20C STATION071 |
| 68 | B00123H | BEAUFORT SAMPLE 27 WATER 200 STATION071 |
| 69 | B00151H | BEAUFORT SAMPLE 24 WATER 200 STATION055 |
| 70 | B00152H | BEAUFORT SAMPLE 24 WATER 200 STATION055 |
| 71 | B00152H | |
| | | |
| 72 | B00154H | BEAUFORT SAMPLE 24 WATER 20C STATION055 |
| 73 | B00155H | BEAUFORT SAMPLE 24 WATER 20C STATION055 |
| 74 | B00156H | BEAUFORT SAMPLE 24 WATER 20C STATION055 |
| .75 | B00157H | BEAUFORT SAMPLE 24 WATER 20C STATION055 |
| 76 | B00158H | BEAUFORT SAMPLE 24 WATER 20C STATION055 |
| 77 | B00159H | BEAUFORT SAMPLE 24 WATER 20C STATION055 |
| 78 | B00160H | BEAUFORT SAMPLE 24 WATER 200 STATION055 |
| 79 | B00161H | BEAUFORT SAMPLE 24 WATER 20C STATION055 |
| 80 | B00163H | BEAUFORT SAMPLE 24 WATER 20C STATION055 |
| 81 | B00164H | BEAUFORT SAMPLE 24 WATER 20C STATION055 |
| 82 | B00165H | BEAUFORT SAMPLE 24 WATER 200 STATION055 |
| 83 | B00166H | BEAUFORT SAMPLE 24 WATER 200 STATION055 |
| 84 | B00168H | |
| 85 | B00169H | |
| | | |
| 86 | B00170H | BEAUFORT SAMPLE 24 WATER 20C STATION055 |
| 87 | B00201H | BEAUFORT SAMPLE 26 WATER 20C STATION070 |
| 88 | 800202H | BEAUFORT SAMPLE 26 WATER 20C STATION070 |
| 89 | B00204H | BEAUFORT SAMPLE 26 WATER 20C STATION070 |
| 90 | B00205H | BEAUFORT SAMPLE 26 WATER 20C STATION070 |
| 91 | B00206H | REAUFORT SAMPLE 26 WATER 20C STATION070 |
| 92 | B00207H | BEAUFORT SAMPLE 26 WATER 20C STATION070 |
| 93 | B00208H | BEAUFORT SAMPLE 26 WATER 20C STATION070 |
| 94 | B00210H | BEAUFORT SAMPLE 26 WATER 200 STATION070 |
| 95 | B00211H | BEAUFORT SAMPLE 26 WATER 20C STATION070 |
| 96 | B00212H | BEAUFORT SAMPLE 26 WATER 20C STATION070 |
| 97 | B00213H | BEAUFORT SAMPLE 26 WATER 20C STATION070 |
| 98 | B00216H | BEAUFORT SAMPLE 26 WATER 20C STATION070 |
| 99 | B00217H | BEAUFORT SAMPLE 26 WATER 20C STATION070 |
| | B00219H | BEAUFORT SAMPLE 26 WATER 200 STATION070 |
| du "au" "au" | | DENOTORI ONNELLE LO WHILK LOU SIMIIUN070 |

| 101 | B00221H | BEAUFORT SAMPLE 26 WATER 20C STATION070 |
|-----|---------|---|
| 102 | B00222H | BEAUFORT SAMPLE 26 WATER 20C STATION070 |
| 103 | Вөөггэн | BEAUFORT SAMPLE 26 WATER 20C STATION070 |
| 104 | B00251H | BEAUFORT SAMPLE 11 WATER 20C STATION030 |
| 105 | B00252H | BEAUFORT SAMPLE 11 WATER 20C STATION030 |
| 106 | B00253H | BEAUFORT SAMPLE 11 WATER 20C STATION030 |
| 107 | B00254H | BEAUFORT SAMPLE 11 WATER 20C STATION030 |
| 108 | B00255H | BEAUFORT SAMPLE 11 WATER 20C STATION030 |
| 109 | B00256H | BEAUFORT SAMPLE 11 WATER 20C STATION030 |
| 110 | B00257H | BEAUFORT SAMPLE 11 WATER 20C STATION030 |
| 111 | B00258H | BEAUFORT SAMPLE 11 WATER 20C STATION030 |
| 112 | B00259H | BEAUFORT SAMPLE 11 WATER 20C STATION030 |
| 113 | B00260H | BEAUFORT SAMPLE 11 WATER 20C STATION030 |
| 114 | B00261H | BEAUFORT SAMPLE 11 WATER 20C STATION030 |
| 115 | B00262H | BEAUFORT SAMPLE 11 WATER 20C STATION030 |
| 116 | B00263H | BEAUFORT SAMPLE 11 WATER 20C STATION030 |
| 117 | B00264H | BEAUFORT SAMPLE 11 WATER 20C STATION030 |
| 118 | B00265H | BEAUFORT SAMPLE 11 WATER 20C STATION030 |
| 119 | B00266H | BEAUFORT SAMPLE 11 WATER 20C STATION030 |
| 120 | B00268H | BEAUFORT SAMPLE 11 WATER 20C STATION030 |
| 121 | B00569H | BEAUFORT SAMPLE 11 WATER 20C STATION030 |
| 122 | B00270H | BEAUFORT SAMPLE 11 WATER 20C STATION030 |
| 123 | B00271H | BEAUFORT SAMPLE 11 WATER 20C STATION030 |
| 124 | B00272H | BEAUFORT SAMPLE 11 WATER 20C STATION030 |
| 125 | B00273H | BEAUFORT SAMPLE 11 WATER 20C STATION030 |
| 126 | B00274H | BEAUFORT SAMPLE 11 WATER 20C STATION030 |
| 127 | B00275H | BEAUFORT SAMPLE 11 WATER 20C STATION030 |

_ . . .

END FORM 127 STRAINS

| | The The The The The Party of the State | |
|----------|--|---|
| 1 | B00026H | BEAUFORT SAMPLE 03 SEDIMENT 20C STATION010 |
| 2 | B00027H | BEAUFORT SAMPLE 03 SEDIMENT 20C STATION010 |
| З | B00028H | BEAUFORT SAMPLE 03 SEDIMENT 20C STATION010 |
| 4 | B00029H | BEAUFORT SAMPLE 03 SEDIMENT 20C STATION010 |
| 5 | B00030H | BEAUFORT SAMPLE 03 SEDIMENT 20C STATION010 |
| 6 | E00031H | BEAUFORT SAMPLE 03 SEDIMENT 20C STATION010 |
| 7 | B00032H | BEAUFORT SAMPLE 03 SEDIMENT 20C STATION010 |
| 8 | B00033H | BEAUFORT SAMPLE 03 SEDIMENT 20C STATION010 |
| 9 | B00035H | BEAUFORT SAMPLE 03 SEDIMENT 200 STATION010 |
| 10 | B00036H | BEAUFORT SAMPLE 03 SEDIMENT 20C STATION010 |
| 11 | B00037H | BEAUFORT SAMPLE 03 SEDIMENT 200 STATION010 |
| 12 | BØØØ38H | BEAUFORT SAMPLE 03 SEDIMENT 200 STATION010 |
| 13 | B00039H | |
| 14 | B00040H | |
| 15 | B00041H | |
| | | BEAUFORT SAMPLE 03 SEDIMENT 20C STATION010 |
| 16 | B00042H | BEAUFORT SAMPLE 03 SEDIMENT 20C STATION010 |
| 17 | B00043H | BERUFORT SAMPLE 03 SEDIMENT 20C STATION010 |
| 18 | B00044H | BEAUFORT SAMPLE 03 SEDIMENT 20C STATION010 |
| 19 | B00045H | BEAUFORT SAMPLE 03 SEDIMENT 20C STATION010 |
| 20 | B00047H | BEAUFORT SAMPLE 03 SEDIMENT 20C STATION010 |
| 21 | B00048H | BEAUFORT SAMPLE 03 SEDIMENT 20C STATION010 |
| 22 | B00076H | BEAUFORT SAMPLE 16 SEDIMENT 20C STATION002 |
| 23 | B00077H | BEAUFORT SAMPLE 16 SEDIMENT 20C STATION002 |
| 24 | B00078H | BEAUFORT SAMPLE 16 SEDIMENT 20C STATION002 |
| 25 | B00079H | BEAUFORT SAMPLE 16 SEDIMENT 20C STATION002 |
| 26 | B00080H | BEAUFORT SAMPLE 16 SEDIMENT 20C STATION002 |
| 27 | B00081H | BEAUFORT SAMPLE 16 SEDIMENT 20C STATION002 |
| 28 | B00082H | BEAUFORT SAMPLE 16 SEDIMENT 20C STATION002 |
| 29 | B00083H | BEAUFORT SAMPLE 16 SEDIMENT 20C STATION002 |
| 30 | B00 0 84H | BEAUFORT SAMPLE 16 SEDIMENT 20C STATION002 |
| 31 | B00085H | BEAUFORT SAMPLE 16 SEDIMENT 20C STATION002 |
| 32 | B00086H | BEAUFORT SAMPLE 16 SEDIMENT 20C STATION002 |
| 33 | B00087H | BEAUFORT SAMPLE 16 SEDIMENT 20C STATION002 |
| 34 | B00088H | BEAUFORT SAMPLE 16 SEDIMENT 20C STATION002 |
| 35 | B00089H | BEAUFORT SAMPLE 16 SEDIMENT 200 STATION002 |
| 36 | B00091H | BEAUFORT SAMPLE 16 SEDIMENT 200 STATION002 |
| 37 | B00092H | BEAUFORT SAMPLE 16 SEDIMENT 200 STATION002 |
| 38 | B00093H | BEAUFORT SAMPLE 16 SEDIMENT 200 STATION002 |
| 39 | B00094H | BEAUFORT SAMPLE 16 SEDIMENT 20C STATION002 |
| 40 | B00095H | BEAUFORT SAMPLE 16 SEDIMENT 200 STATION002 |
| 41 | B00096H | |
| 42 | B00097H | |
| 43 | B00098H | The second |
| 44 | B00099H | BEAUFORT SAMPLE 16 SEDIMENT 200 STATION002 |
| 45 | B00100H | BEAUFORT SAMPLE 16 SEDIMENT 200 STATION002 |
| 46 | B00126H | BEAUFORT SAMPLE 16 SEDIMENT 20C STATION002 |
| 47 47 | | BEAUFORT SAMPLE 22 SEDIMENT 20C STATION071 |
| 47 48 | 800127H | BEAUFORT SAMPLE 22 SEDIMENT 20C STATION071 |
| 49 49 | 800128H | BEAUFORT SAMPLE 22 SEDIMENT 20C STATION071 |
| 47 50 | 800129H | BEAUFORT SAMPLE 22 SEDIMENT 20C STATION071 |
| -00 | B00130H | BEAUFORT SAMPLE 22 SEDIMENT 20C STATION071 |
| | | |

| | | | | s senter trade to the | | STATION071 |
|----------|---------|----------|--|-----------------------|-----|------------|
| 51 | B00131H | BEAUFORT | SAMPLE 2 | | | |
| 52 | B00132H | BEAUFORT | SAMPLE 2 | | | STATION071 |
| 53 | B00133H | BEAUFORT | SAMPLE 2 | 2 SEDIMENT | | STATION071 |
| 54 | B00135H | BEAUFORT | SAMPLE 2 | 2 SEDIMENT | 20C | STATION071 |
| 55 | B00136H | BEAUFORT | SAMPLE 2 | 2 SEDIMENT | 200 | STATION071 |
| 56 | B00138H | BEAUFORT | SAMPLE 2 | | 20C | STATION071 |
| | | BEAUFORT | SAMPLE 2 | | | STATION071 |
| 57 | B00140H | BEAUFORT | SAMPLE 2 | | | STATION071 |
| 58 | B00141H | | SAMPLE 2 | | | STATION071 |
| 59 | B00142H | BEAUFORT | | 2 SEDIMENT | | STATION071 |
| 60 | B00143H | BEAUFORT | | | | STATION071 |
| 61 | B00144H | BEAUFORT | | 2 SEDIMENT | | STATION071 |
| 62 | B00145H | BEAUFORT | | 2 SEDIMENT | - | STATION071 |
| 63 | B00146H | BEAUFORT | | 2 SEDIMENT | | |
| 64 | B00147H | BEAUFORT | | 2 SEDIMENT | | STATION071 |
| 65 | B00148H | BEAUFORT | | 2 SEDIMENT | | STATION071 |
| 66 | B00149H | BEAUFORT | | 2 SEDIMENT | | STATION071 |
| 67 | B00150H | BEAUFORT | SAMPLE 2 | 2 SEDIMENT | 20C | STATION071 |
| 68 68 | B00176H | BEAUFORT | SAMPLE 2 | 0 SEDIMENT | 200 | STATION055 |
| 69 | B00177H | BEAUFORT | | 0 SEDIMENT | 200 | STATION055 |
| 70 70 | B00178H | BEAUFORT | | 0 SEDIMENT | 200 | STATION055 |
| | B00179H | BEAUFORT | | 0 SEDIMENT | | STATION055 |
| 71 | | BEAUFORT | | 0 SEDIMENT | | STATION055 |
| 72 | B00180H | BEAUFORT | | 0 SEDIMENT | | STATION055 |
| 73 | B00181H | BEAUFORT | | Ø SEDIMENT | | STATION055 |
| 74 | B00183H | | •••••••••••••••••••••••••••••••••••••• | 0 SEDIMENT | | STATION055 |
| 75 | B00184H | BEAUFORT | | | | STATION055 |
| 76 | B00186H | BEAUFORT | ÷···· | | | STATION055 |
| 77 | B00187H | BEAUFORT | | Ø SEDIMENT | | |
| 78 | B00188H | BEAUFORT | | 0 SEDIMENT | | STATION055 |
| 79 | B00189H | BEAUFORT | | 0 SEDIMENT | | STATION055 |
| 80 | B00190H | REAUFORT | SAMPLE 8 | Ø SEDIMENT | 200 | STATION055 |
| 81 | B00191H | BEAUFORT | SAMPLE 2 | 0 SEDIMENT | 20C | STATION055 |
| 82 | B00192H | BEAUFORT | SAMPLE S | 0 SEDIMENT | 200 | STATION055 |
| 83 | B00194H | BEAUFORT | SAMPLE 2 | 0 SEDIMENT | 200 | STATION055 |
| 84 | B00196H | BEAUFORT | SAMPLE & | 0 SEDIMENT | 200 | STATION055 |
| 85 | B00197H | BEAUFORT | | 0 SEDIMENT | 20C | STATION055 |
| 86 | B00198H | BEAUFORT | | 0 SEDIMENT | 200 | STATION055 |
| 87 | B00200H | BEAUFORT | | Ø SEDIMENT | | STATION055 |
| 88 | B00226H | BEAUFORT | SAMPLE 2 | - | | STATION070 |
| 89 | B00227H | BEAUFORT | SAMPLE 2 | | | STATION070 |
| 90 | B00228H | BEAUFORT | SAMPLE 2 | ••• | | STATION070 |
| 91 | B00229H | BEAUFORT | SAMPLE 2 | | | STATION070 |
| 92 92 | B00230H | BEAUFORT | SAMPLE 2 | | | STATION070 |
| 24 93 | B00231H | BEAUFORT | SAMPLE 2 | | | STATION070 |
| | B00232H | BEAUFORT | SAMPLE 2 | | | STATION070 |
| 94 os | | BEAUFORT | SAMPLE 2 | | | STATION070 |
| 95 04 | B00233H | | | | | STATION070 |
| 96 07 | B00234H | BEAUFORT | | | | STATION070 |
| 97 | B00235H | BEAUFORT | SAMPLE 2 | | | STATION070 |
| 98 | B00236H | BEAUFORT | SAMPLE 2 | | | |
| 99 | B00237H | BEAUFORT | SAMPLE 2 | | | STATION070 |
| 100 | B00238H | BEAUFORT | SAMPLE 2 | 1 SEDIMENT | 200 | STATION070 |

| 101 | B00239H | BEAUFORT SAMPLE 21 SEDIMENT 20C S | TATION070 |
|-----|---------|------------------------------------|-----------|
| 102 | B00240H | | TATION070 |
| 103 | B00241H | | TATION070 |
| 100 | B00242H | | TATION070 |
| 105 | B00243H | | TATION070 |
| 106 | B00244H | | TATION070 |
| 108 | B00245H | | TATION070 |
| 108 | B00246H | | TATION070 |
| 109 | B00247H | | TATION070 |
| 110 | B00248H | | TATION070 |
| 111 | B00249H | | TATION070 |
| 112 | B00250H | | TATION070 |
| 113 | B00276H | | TATION030 |
| 114 | B00277H | | TATION030 |
| 115 | B00278H | | TATION030 |
| 116 | B00279H | | TATION030 |
| 117 | B00280H | | TATION030 |
| 118 | B00281H | | TATION030 |
| 119 | B00282H | BEAUFORT SAMPLE 09 SEDIMENT 20C ST | TATION030 |
| 120 | B00283H | BEAUFORT SAMPLE 09 SEDIMENT 20C ST | TATION030 |
| 121 | B00284H | BEAUFORT SAMPLE 09 SEDIMENT 20C ST | TATION030 |
| 122 | B00285H | BEAUFORT SAMPLE 09 SEDIMENT 20C ST | TATION030 |
| 123 | B00286H | BEAUFORT SAMPLE 09 SEDIMENT 20C ST | TATION030 |
| 124 | B00287H | BEAUFORT SAMPLE 09 SEDIMENT 20C ST | TATION030 |
| 125 | B00288H | BEAUFORT SAMPLE 09 SEDIMENT 200 ST | TATION030 |
| 126 | B00289H | BEAUFORT SAMPLE 09 SEDIMENT 20C S1 | TATION030 |
| 127 | B00290H | BEAUFORT SAMPLE 09 SEDIMENT 20C ST | FATION030 |
| 128 | B00292H | BEAUFORT SAMPLE 09 SEDIMENT 20C ST | TATION030 |
| 129 | B00293H | | ration030 |
| 130 | B00294H | | TATION030 |
| 131 | B00295H | | FATION030 |
| 132 | B00296H | | FATION030 |
| 133 | B00297H | | ATION030 |
| 134 | B00298H | | FATION030 |
| 135 | B00299H | | ATION030 |
| 136 | 800300H | BEAUFORT SAMPLE 09 SEDIMENT 20C ST | FATION030 |

.

END FORM 136 STRAINS

| | | | | | | | omor toucto |
|--------|--------------------|----------|--------|------------|-------|------------|-------------|
| 1 | B00003L | BEAUFORT | SAMPLE | | | | STATION010 |
| 2 | B00005L | BEAUFORT | SAMPLE | 03 | WATER | 04C | STATION010 |
| З | B00006L | BEAUFORT | SAMPLE | 03 | WATER | 04C | STATION010 |
| 4 | B00009L | BEAUFORT | SAMPLE | 03 | NATER | 04C | STATION010 |
| 5 | B00012L | BEAUFORT | SAMPLE | 03 | MATER | 04C | STATION010 |
| 5 6 | 200013L | BEAUFORT | SAMPLE | | WATER | 04C | STATION010 |
| 7 | B00014L | BEAUFORT | SAMPLE | 0 3 | WATER | 04C | STATION010 |
| | | BEAUFORT | SAMPLE | 03 | WATER | 04C | STATION010 |
| 8 | B00015L | BEAUFORT | SAMPLE | 03 03 | WATER | 04C | STATION010 |
| .9 | B00021L | | SAMPLE | 03 | WATER | 040 040 | STATION010 |
| 10 | B00022L | BEAUFORT | | | WATER | 04C | STATION010 |
| 11 | B00023L | BEAUFORT | SAMPLE | 03 | | 04C | STATION010 |
| 12 | B00024L | BEAUFORT | SAMPLE | 03 | WATER | | |
| 13 | B00025L | BEAUFORT | SAMPLE | <u>03</u> | WATER | 04C | STATION010 |
| 14 | B00052L | BEAUFORT | SAMPLE | 20 | WATER | 04C | STATION002 |
| 15 | B00053L | BEAUFORT | SAMPLE | 20 | WATER | 04C | STATION002 |
| 16 | B00054L | BEAUFORT | SAMPLE | 20 | WATER | 04C | STATION002 |
| 17 | B00055L | BEAUFORT | SAMPLE | 20 | WATER | 04C | STATION002 |
| 18 | B00057L | BEAUFORT | SAMPLE | 20 | WATER | 04C- | STATION002 |
| 19 | B00058L | BEAUFORT | SAMPLE | 20 | WATER | 04C | STATION002 |
| 20 | B00059L | BEAUFORT | SAMPLE | 20 | WATER | 04C | STATION002 |
| 21 | B00060L | BEAUFORT | SAMPLE | 20 | WATER | 04C | STATION002 |
| 22 | B00061L | BEAUFORT | SAMPLE | 20 | WATER | 04C | STATION002 |
| | | BEAUFORT | SAMPLE | 20 | WATER | 04C | STATION002 |
| 23 | B00062L | BEAUFORT | SAMPLE | 20 | WATER | 04C | STATION002 |
| 24 | B00063L | | SAMPLE | 20 | WATER | 04C | STATION002 |
| 25 | B00066L | BEAUFORT | | | WATER | 04C | STATION002 |
| 26 | B00067L | BEAUFORT | SAMPLE | 20 | | | STATION002 |
| 27 | B00068L | BEAUFORT | SAMPLE | 20 | WATER | 04C | STATION002 |
| 28 | B00069L | BEAUFORT | SAMPLE | 50 | WATER | 04C | |
| 29 | B00070L | BEAUFORT | SAMPLE | 20 | WATER | 04C | STATION002 |
| 30 | B00071L | BEAUFORT | SAMPLE | 20 | WATER | 04C | STATION002 |
| 31 | B00072L | BEAUFORT | SAMPLE | 20 | WATER | 04C | STATION002 |
| 32 | 800073L | BEAUFORT | SAMPLE | 20 | WATER | 04C | STATION002 |
| 33 | B00074L | BEAUFORT | SAMPLE | 20 | WATER | 04C | STATION002 |
| 34 | B00075L | BEAUFORT | SAMPLE | 20 | WATER | 04C | STATION002 |
| 35 | B00101L | BEAUFORT | SAMPLE | 27 | WATER | 04C | STATION071 |
| 36 | B00102L | BEAUFORT | SAMPLE | 27 | WATER | 04C | STATION071 |
| 37 | 800103L | BEAUFORT | SAMPLE | | WATER | 04C | STATION071 |
| 38 | B00104L | BEBUEORT | SAMPLE | | | | STATION071 |
| 39 | B00105L | BEAUFORT | | 27 | WATER | 04C | STATION071 |
| | | BEAUFORT | | | | | |
| 40 | 800106L 800107L | BEAUFORT | SAMPLE | | WATER | | STATION071 |
| 41 | | BEAUFORT | SAMPLE | | WATER | | STATION071 |
| 42 | B00108L | | SAMPLE | | | | STATION071 |
| 43 | B00109L | BEAUFORT | | | WATER | | |
| 44 | B00110L | BEAUFORT | SAMPLE | | | | STATION071 |
| 45 | B00111L | BEAUFORT | SAMPLE | | | | STATION071 |
| 46 | B00112L | BEAUFORT | SAMPLE | | | | STATION071 |
| 47 | B00113L | BEAUFORT | SAMPLE | | | | STATION071 |
| 48 | B00114L | BEAUFORT | SAMPLE | | | | STATION071 |
| 49 | B00115L | BEAUFORT | | | | | STATION071 |
| 50 - | B00116L | BEAUFORT | SAMPLE | 27 | WHTER | 04C | STATION071 |
| | | | | | | | |

| 51 | B00117L | BEAUFORT | SAMPLE | | WATER | 04C | STATION071 |
|------------------|-----------|----------|---------|--------------|--------|------------|------------|
| 52 | E00118L | BEAUFORT | SAMPLE | -27 | WATER | -04C | STATION071 |
| 53 | B00119L | BEAUFORT | SAMPLE | 27 | WATER | Ø4C | STATION071 |
| 54 | B00120L | BEAUFORT | SAMPLE | 27 | WATER | | |
| | | | | | | | |
| 55 | B00121L | BEAUFORT | SAMPLE | 27 | WATER | | STATION071 |
| 56 | B00122L | BEAUFORT | SAMPLE | 27 | NATER | | STATION071 |
| 57 | B00123L | BEAUFORT | SAMPLE | 27 | WATER | -04C | STATION071 |
| 58 | B00124L | BEAUFORT | SAMPLE | 27 | WATER | 04C | STATION071 |
| 59 | B00125L | BEAUFORT | SAMPLE | 27 | WATER | 04C | STATION071 |
| 60 | B00151L | BEAUFORT | SAMPLE | | WATER | | STATION055 |
| $\widetilde{61}$ | 800152L | BEAUFORT | SAMPLE | | WATER | | STATION055 |
| 62 | B00153L | BEAUFORT | SAMPLE | 24 | WATER | 04C | STATION055 |
| | | | | | | | |
| 63 | B60154L | BEAUFORT | SAMPLE | 24 | WATER | 04C | STATION055 |
| 64 | B00155L | BEAUFORT | SAMPLE | 24 | WATER | 04C | STATION055 |
| 65 | B00156L | BEAUFORT | SAMPLE | 24 | WATER | 04C | STATION055 |
| 66 | B00157L | BEAUFORT | SAMPLE | 24 | WATER | 04C | STATION055 |
| 67 | B90159L | BEAUFORT | SAMPLE | 24 | WATER | 04C | STATION055 |
| 68 | B00160L | BEAUFORT | SAMPLE | 24 | WATER | 04C | STATION055 |
| 69 | B00162L | BEAUFORT | SAMPLE | 24 | WATER | | STATION055 |
| | B00163L | BEAUFORT | SAMPLE | 24 | WATER | 04C | STATION055 |
| 70 | | | | | | | |
| $\overline{21}$ | B00164L | BEAUFORT | SAMPLE | 24 | WATER | 040 | STATION055 |
| 72 | B00165L | BEAUFORT | SAMPLE | 24 | WATER | 04C | STATION055 |
| 73 | B00166L | BEAUFORT | SAMPLE | 24 | MATER | 04C | STATION055 |
| 74 | B00167L | BEAUFORT | SAMPLE | 24 | WATER | 04C | STATION055 |
| 75 | B00168L | BEAUFORT | SAMPLE | 24 | WHITER | 04C | STATION055 |
| 76 | B00169L | BEAUFORT | SAMPLE | | WATER | 04C | STATION055 |
| 77 | B00170L | BEAUFORT | SAMPLE | | WATER | 04C | STATION055 |
| | | BEAUFORT | SAMPLE | 24 | WATER | 04C | STATION055 |
| 78 | B00171L | | | | | | |
| 79 | B00172L | BEAUFORT | SAMPLE | 24 | WATER | 04C | STATION055 |
| 80 | B00173L | BEAUFORT | SAMPLE | 24 | WATER | 04C | STATION055 |
| 81 | 800174L | BEAUFORT | SAMPLE | 24 | WATER | 04C | STATION055 |
| 82 | E00175L | BEAUFORT | SAMPLE | 24 | WATER | 04C | STATION055 |
| 83 | B00201L | BEAUFORT | SAMPLE | 26 | WATER | 04C | STATION070 |
| 84 | B00202L | BERUFORT | SAMPLE | 26 | WATER | 04C | STATION070 |
| 85 | B00203L | BEAUFORT | SAMPLE | $\tilde{26}$ | WATER | 04C | STATION070 |
| 86 | B00205L | BEAUFORT | SAMPLE | 26 | | 04C | STATION070 |
| 87 | 800206L | BEAUFORT | SAMPLE | | | | |
| 88 88 | B90207L | | | | | | STATION070 |
| <u></u> 89 | | | SHIFLE | 20 0.0 | MHIER | 04C | STATION070 |
| | 899298L | BEAUFORT | SHAPLE | 26 | MHIER | 04C | STATION070 |
| 90 | B99599L | BEAUFORT | SHMPLE | 26 | WATER | 04C | STATION070 |
| 91 | B00210L | BEAUFORT | SAMPLE | 26 | WATER | 04C | STATION070 |
| 92 | B00211L | BEAUFORT | SAMPLE | 26 | WATER | 04C | STATION070 |
| 93 | B00212L | BEAUFORT | SAMPLE | 26 | WATER | | STATION070 |
| 94 | - B00213L | | | | | | STATION070 |
| 95 | B00214L | | | | | | STATION070 |
| 96 | B00215L | | CAMPLE | 26 | LATED | one Gae | STATION070 |
| 97 | B00216L | BEAUFORT | COMDIE | പാ വമ | | | |
| 98 | B00218L | | | | | | STATION070 |
| | | | | <u>6</u> 6 | MHIER | 64C | STATION070 |
| 99 | B00218L | BEHUFURT | SHPIPLE | 26 | MHTER | 04C | STATION070 |
| 100 | B00219L | BEHUFORT | SAMPLE | 26 | MATER | 04C | STATION070 |
| | | | | | | | |

| 101 | B00220L | BEAUFORT | SAMPLE | 26 | WATER | 04C | STATION070 |
|-----|---------|----------|--------|----|-------|-----|------------|
| 102 | B00221L | BEAUFORT | SAMPLE | 26 | WATER | Ø4C | STATION070 |
| 103 | B00222L | BEAUFORT | SAMPLE | 26 | WATER | 04C | STATION070 |
| 104 | B00223L | BEAUFORT | SAMPLE | 26 | WATER | 04C | STATION070 |
| 105 | B00224L | BEAUFORT | SAMPLE | 26 | WATER | 04C | STATION070 |
| 106 | B00225L | BEAUFORT | SAMPLE | 26 | MATER | 04C | STATION070 |
| 197 | B00278L | BEAUFORT | SAMPLE | 11 | WATER | 04C | STATION030 |
| 108 | B00280L | BEAUFORT | SAMPLE | 11 | WATER | 04C | STATION030 |
| 109 | B00281L | BEAUFORT | SAMPLE | 19 | WATER | 04C | |
| 110 | B00282L | BEAUFORT | SAMPLE | 19 | WATER | 04C | STATION001 |
| 111 | B00283L | BEAUFORT | SAMPLE | 19 | WATER | 04C | STATION001 |
| 112 | B00284L | BEAUFORT | SAMPLE | 19 | WATER | 04C | STATION001 |
| 113 | B00291L | BEAUFORT | SAMPLE | 36 | MATER | 04C | STATION002 |
| 114 | B00292L | BEAUFORT | SAMPLE | 36 | WATER | 04C | STATION002 |
| 115 | B00294L | BEAUFORT | SAMPLE | 36 | WATER | 04C | STATION002 |
| 116 | B00295L | BEAUFORT | SAMPLE | 36 | WATER | Ø4C | STATION002 |

END FORM 145 STRAINS

Strains isolated from sediment at 40 capable of growth at 10C.

| 1 | | | · | | | | |
|-----|---------|----------|----------|-----------|----------|-------|------------|
| 1 | 800026L | BEAUFORT | SAMPLE | 03 | SEDIMENT | ' 04C | STATION010 |
| 2 | B00027L | BEAUFORT | SAMPLE | 03 | SEDIMENT | 04C | STATION010 |
| 3 | B00028L | BEAUFORT | | 03 | SEDIMENT | | STATION010 |
| | B00029L | BEAUFORT | | 03 | | | STATION010 |
| 4 | | | | | SEDIMENT | | |
| 5 | B00030L | BEAUFORT | | 03 | SEDIMENT | | STATION010 |
| 6 | B00031L | BEAUFORT | SAMPLE | Ø3 | SEDIMENT | 04C | STATION010 |
| 7 | B00032L | BEAUFORT | SAMPLE | Ø3 | SEDIMENT | -040 | STATION010 |
| 8 | B00033L | BEAUFORT | SAMPLE | Ø3 | SEDIMENT | 04C | STATION010 |
| - 9 | B00034L | BEAUFORT | | 03 | SEDIMENT | 04C | STATION010 |
| 10 | B00035L | BEAUFORT | | <u>03</u> | SEDIMENT | 04C | STATION010 |
| | | | | 03 | SEDIMENT | 04C | STATION010 |
| 11 | B00036L | BEAUFORT | | | | | |
| 12 | B00037L | BEAUFORT | | 03 | SEDIMENT | -04C | STATION010 |
| 13 | B00038L | BEAUFORT | SAMPLE | 03 | SEDIMENT | 04C | STATION010 |
| 14 | B00039L | BEAUFORT | SAMPLE | 63 | SEDIMENT | 04C | STATION010 |
| 15 | B00040L | BEAUFORT | SAMPLE | 03 | SEDIMENT | 04C | STATION010 |
| 16 | B00041L | BEAUFORT | SAMPLE | 03 | SEDIMENT | 04C | STATION010 |
| 17 | 800042L | BEAUFORT | SAMPLE | ЙЗ. | SEDIMENT | 04C | STATION010 |
| | B00043L | BEAUFORT | SAMPLE | 03 03 | SEDIMENT | 04C | STATION010 |
| 18 | | | | | | 04C | STATION010 |
| 19 | B00044L | BEAUFORT | SAMPLE | 03 | SEDIMENT | | |
| 20 | B00046L | BEAUFORT | | 03 | SEDIMENT | 04C | STATION010 |
| 21 | B00047L | BEAUFORT | | 03 | SEDIMENT | 04C | STATION010 |
| 22 | B00048L | BEAUFORT | SAMPLE | 03 | SEDIMENT | 04C | STATION010 |
| 23 | B00049L | BEAUFORT | SAMPLE | 03 | SEDIMENT | 04C | STATION010 |
| 24 | B00050L | BEAUFORT | SAMPLE | Ø3 | SEDIMENT | 04C | STATION010 |
| 25 | B00076L | BEAUFORT | SAMPLE | 16 | SEDIMENT | 04C | STATION002 |
| 26 | B00077L | BEAUFORT | SAMPLE | 16 | SEDIMENT | 04Č | STATION002 |
| | | | SAMPLE | 16 | SEDIMENT | 04C | STATION002 |
| 27 | B00078L | BEAUFORT | | | | | |
| 28 | B00079L | BEAUFORT | SAMPLE | 16 | SEDIMENT | 04C | STATION002 |
| 29 | B00080L | BEAUFORT | SAMPLE | 16 | SEDIMENT | 04C | STATION002 |
| 30 | B00081L | BEAUFORT | SAMPLE | 16 | SEDIMENT | 04C | STATION002 |
| 31 | B00082L | BEAUFORT | SAMPLE | 16 | SEDIMENT | 04C | STATION002 |
| 32 | B00083L | BEAUFORT | SAMPLE | 16 | SEDIMENT | Ø4C | STATION002 |
| 33 | 500084L | BEAUFORT | SAMPLE | 16 | SEDIMENT | | STATION002 |
| 34 | B00085L | BEAUFORT | SAMPLE | 16 | SEDIMENT | 04C | STATION002 |
| | | | | 16 | SEDIMENT | 04C | STATION002 |
| 35 | B00086L | BEAUFORT | SAMPLE | | | | |
| 36 | B00087L | BEAUFORT | SAMPLE | 16 | SEDIMENT | 04C | STATION002 |
| 37 | B00088L | BEAUFORT | SAMPLE | 16 | SEDIMENT | 04C | STATION002 |
| 38 | B00089L | BEAUFORT | | | SEDIMENT | | |
| 39 | B00091L | BEAUFORT | SAMPLE | 16 | SEDIMENT | 04C | STATION002 |
| 40 | B00092L | BEAUFORT | SAMPLE | 16 | SEDIMENT | 04C | STATION002 |
| 41 | BOODSL | BEAUFORT | SAMPLE | 16 | SEDIMENT | 04C | STATION002 |
| 42 | B00094L | BEAUFORT | | | SEDIMENT | 04C | STATION002 |
| 43 | B00095L | BEAUFORT | | | SEDIMENT | | |
| 44 | B00096L | | | | | 04C | STATION002 |
| | | BEAUFORT | | | SEDIMENT | 04C | STATION002 |
| 45 | B00097L | BEAUFORT | | | SEDIMENT | 04C | STATION002 |
| 46 | B00098L | BEAUFORT | | | SEDIMENT | | STATION002 |
| 47 | B00099L | BEAUFORT | | | SEDIMENT | 04C | STATION002 |
| 48 | B00100L | BEAUFORT | | | SEDIMENT | 04C | STATION002 |
| 49 | B00126L | BEAUFORT | SAMPLE (| | SEDIMENT | | STATION071 |
| 50 | B00127L | BEAUFORT | | | SEDIMENT | | STATION071 |
| - T | | | | | | | |

| 51 | B00128L | BEAUFORT | SAMPLE | 55 | SEDIMENT | | STATION071 |
|----------|-----------------------------|---|--------|----|----------|-----|--|
| 52 | B00129L | BEAUFORT | SAMPLE | 22 | SEDIMENT | Ø4C | STATION071 |
| 53 | B00130L | BEAUFORT | SAMPLE | 22 | SEDIMENT | | |
| 54 | B00131L | BEAUFORT | SAMPLE | 22 | SEDIMENT | 04C | |
| | | | | | | 04C | STATION071 |
| 55 | B00132L | BEAUFORT | SAMPLE | 22 | SEDIMENT | | |
| 56 | B00133L | BEAUFORT | SAMPLE | 55 | SEDIMENT | 04C | STATION071 |
| 57 | B00134L | BEAUFORT | SAMPLE | 22 | SEDIMENT | 04C | STATION071 |
| 58 | B00135L | BEAUFORT | SAMPLE | 22 | SEDIMENT | 04C | STATION071 |
| 59 | 800136L | BEAUFORT | SAMPLE | 22 | SEDIMENT | 04C | STATION071 |
| 60 | B00137L | BEAUFORT | SAMPLE | 22 | SEDIMENT | 94C | STATION071 |
| 61 | B00138L | BEAUFORT | SAMPLE | 22 | SEDIMENT | 04C | STATION071 |
| 62 | B00139L | BEAUFORT | SAMPLE | 22 | SEDIMENT | 04C | STATION071 |
| | | BEAUFORT | SAMPLE | 22 | SEDIMENT | 04C | STATION071 |
| 63 | B00140L | | SAMPLE | 55 | SEDIMENT | 04Č | STATION071 |
| 64 | B00141L | BEAUFORT | | | | 04C | STATION071 |
| 65 | B00143L | BEAUFORT | SAMPLE | 22 | SEDIMENT | | |
| 66 | B00144L | BEAUFORT | SAMPLE | 22 | SEDIMENT | 04C | STATION071 |
| 67 1 | B00145L | BEAUFORT | SAMPLE | 22 | SEDIMENT | 04C | STATION071 |
| 68 | B90146L | BEAUFORT | SAMPLE | 22 | SEDIMENT | 04C | STATION071 |
| 69 | B00147L | BEAUFORT | SAMPLE | 22 | SEDIMENT | 04C | STATION071 |
| 70 | B00148L | BEAUFORT | SAMPLE | 22 | SEDIMENT | 04C | STATION071 |
| 71 | B00149L | BEAUFORT | SAMPLE | 22 | SEDIMENT | 04C | STATION071 |
| 72 | E00150L | BEAUFORT | SAMPLE | 22 | SEDIMENT | 04C | STATION071 |
| 73 | B00176L | BEAUFORT | SAMPLE | 20 | SEDIMENT | 04C | STATION055 |
| 74 | B00177L | BEAUFORT | SAMPLE | 20 | SEDIMENT | 04C | STATION055 |
| 75 | 800178L | BEAUFORT | SAMPLE | | SEDIMENT | 04C | STATION055 |
| | | BEAUFORT | SAMPLE | 20 | SEDIMENT | 04Č | STATION055 |
| 76 | B00179L | | | 20 | SEDIMENT | 04C | STATION055 |
| 77 | B00180L | BEAUFORT | SAMPLE | | SEDIMENT | 04C | STATION055 |
| 78 | B00181L | BEAUFORT | SAMPLE | | | | STATION055 |
| 79 | B00182L | BEAUFORT | SAMPLE | 20 | SEDIMENT | 04C | |
| 80 | B00183L | BEAUFORT | SAMPLE | 20 | SEDIMENT | 04C | STRTION055 |
| 81 | 800184L | BEAUFORT | SAMPLE | 20 | SEDIMENT | 04C | STATION055 |
| 82 | B00185L | BEAUFORT | SAMPLE | 20 | SEDIMENT | 04C | STATION055 |
| 83 | B00186L | BEAUFORT | SAMPLE | 20 | SEDIMENT | 04C | STATION055 |
| 84 | B00187L | BEAUFORT | SAMPLE | 20 | SEDIMENT | 04C | STATION055 |
| 85 | B00188L | BEAUFORT | SAMPLE | 20 | SEDIMENT | 04C | STATION055 |
| 86 | B00189L | BEAUFORT | SAMPLE | | | 04C | |
| 87 | B00190L | BEAUFORT | | | SEDIMENT | | STATION055 |
| | | | | | | | STATION055 |
| 88 | B00191L | | | | SEDIMENT | | STATION055 |
| 89 66 | B00192L | | | | | | STATION055 |
| 90 | 800194L | | | | SEDIMENT | | |
| 91 | B00195L | BEAUFORT | | | SEDIMENT | | STATION055 |
| 92 | B00196L | BEAUFORT | | | SEDIMENT | | STATION055 |
| 93 | B00197L | BEAUFORT | | | SEDIMENT | | STATION055 |
| 94 | B00198L | BEAUFORT | | | SEDIMENT | | |
| 95 | B00199L | BEAUFORT | SAMPLE | | SEDIMENT | | STATION055 |
| 96 | B00200L | BEAUFORT | | | | | STATION055 |
| 97 | B00226L | BEAUFORT | | | | | STATION070 |
| 98 | B00227L | BEAUFORT | | | | | STATION070 |
| 99 | B00228L | BEAUFORT | | | | | STATION070 |
| 100 | B00229L | BEAUFORT | | | | | |
| an | ana and "na nan ana a' Dari | (and the state of the st | | | | | ···· ································ |

| 101 | B00230L | BEAUFORT | SAMPLE | $\mathbb{E}1$ | SEDIMENT | -04C | STATION070 |
|-----|---------|----------|--------|-----------------|----------|------|------------|
| 102 | B00232L | BEAUFORT | SAMPLE | 21 | SEDIMENT | 04C | STATION070 |
| | B00233L | BEAUFORT | SAMPLE | $\overline{21}$ | SEDIMENT | 04C | |
| 103 | | | | | | | |
| 104 | B00234L | BEAUFORT | SAMPLE | 21 | SEDIMENT | Ø4C | |
| 105 | B00235L | BEAUFORT | SAMPLE | 21 | SEDIMENT | -04C | STATION070 |
| 106 | B00236L | BEAUFORT | SAMPLE | 21 | SEDIMENT | 04C | STATION070 |
| | B00237L | BEAUFORT | SAMPLE | 21 | SEDIMENT | 04C | STATION070 |
| 107 | | | | | | | |
| 108 | B00238L | BEAUFORT | SAMPLE | 21 | SEDIMENT | 04C | STATION070 |
| 109 | B00239L | BEAUFORT | SAMPLE | 21 | SEDIMENT | 04C | STATION070 |
| 110 | B00240L | BEAUFORT | SAMPLE | 21 | SEDIMENT | 04C | STATION070 |
| 111 | B00241L | BEAUFORT | SAMPLE | 21 | SEDIMENT | Ø4C | STATION070 |
| | | | | | | | |
| 112 | B00242L | BEAUFORT | SAMPLE | 21 | SEDIMENT | 04C | STATION070 |
| 113 | B00243L | BEAUFORT | SAMPLE | 21 | SEDIMENT | 04C | STATION070 |
| 114 | B00244L | BEAUFORT | SAMPLE | 21 | SEDIMENT | Ø4C | STATION070 |
| 115 | B00245L | BEAUFORT | SAMPLE | 21 | SEDIMENT | 04C | STATION070 |
| | B00246L | BEAUFORT | SAMPLE | 21 | SEDIMENT | 04C | STATION070 |
| 116 | | | | | | | |
| 117 | B00247L | BEAUFORT | SAMPLE | 21 | SEDIMENT | 04C | STATION070 |
| 118 | B00248L | BEAUFORT | SAMPLE | 21 | SEDIMENT | 04C | STATION070 |
| 119 | B00249L | BEAUFORT | SAMPLE | 21 | SEDIMENT | 04C | STATION070 |
| 120 | B00250L | BEAUFORT | | 21 | SEDIMENT | 04C | STATION070 |
| 121 | B00251L | BEAUFORT | SAMPLE | 09 | SEDIMENT | 04C | STATION030 |
| | | | | | | | |
| 122 | 800252L | BEAUFORT | SAMPLE | | SEDIMENT | 04C | STATION030 |
| 123 | 800253L | BEAUFORT | SAMPLE | Ø9. | SEDIMENT | 04C | STATION030 |
| 124 | 800254L | BEAUFORT | SAMPLE | Ø9. | SEDIMENT | 04C | STATION030 |
| 125 | B00256L | BEAUFORT | SAMPLE | <u>09</u> | SEDIMENT | Ø4C | STATION030 |
| 126 | B00257L | BEAUFORT | | | SEDIMENT | 04C | STATION030 |
| 127 | B00258L | BEAUFORT | SAMPLE | | SEDIMENT | 04C | STATION030 |
| | | | | | | | |
| 128 | B00259L | BEAUFORT | | <u>09</u> | SEDIMENT | 04C | STATION030 |
| 129 | B00261L | BEAUFORT | | Ø9 | SEDIMENT | 04C | STATION030 |
| 130 | B00262L | BEAUFORT | SAMPLE | 69 | SEDIMENT | 04C | STATION030 |
| 131 | B00263L | BEAUFORT | SAMPLE | Ø9 | SEDIMENT | Ø4C | STATION030 |
| 132 | B00264L | BEAUFORT | | 09 | SEDIMENT | 04C | STATION030 |
| 133 | B00265L | BEAUFORT | | <u>0</u> 9 | SEDIMENT | 04C | STATION030 |
| | | | | | | | |
| 134 | B00266L | BEAUFORT | | 69 | SEDIMENT | 04C | STATION030 |
| 135 | B00267L | BEAUFORT | SAMPLE | 09 | SEDIMENT | 04C | STATION030 |
| 136 | B00268L | BEAUFORT | SAMPLE | 09. | SEDIMENT | 84C | STATION030 |
| 137 | 300269L | BEAUFORT | SAMPLE | <u>09</u> | SEDIMENT | 04C | STATION030 |
| 138 | B00271L | | | | | | STATION030 |
| | | | | | | | STATION030 |
| 139 | B90272L | BEAUFORT | | | | + | |
| 140 | B00273L | BEAUFORT | | | | | STATION030 |
| 141 | B00274L | BEAUFORT | | | | | STATION030 |
| 142 | B00275L | BEAUFORT | SAMPLE | 09 | SEDIMENT | 04C | STATION030 |
| 143 | B00286L | BEAUFORT | | 15 | | | STATION001 |
| 144 | B00287L | BEAUFORT | | 15 | | | STATION001 |
| | | | | | | | |
| 145 | B00288L | BEAUFORT | | | | | STATION001 |
| 146 | 800289L | BEAUFORT | | | | | STATION001 |
| 147 | 800290L | BEAUFORT | SAMPLE | 15 | SEDIMENT | 04C | STATION001 |
| 148 | B00296L | BEAUFORT | SAMPLE | 32 | SEDIMENT | 04C | STATION002 |
| 149 | B00297L | | | | | | STATION002 |
| 150 | B00298L | | | | | | STATION002 |
| | | | | | | | |
| 151 | 800299L | | | | | | STATION002 |
| 152 | BOOSOOL | REHOLOK) | SHULF | - - | SEDIMENT | 64C | STATION002 |

END FORM

152 STRAINS

| 1 | E00001H | BEAUFORT | SAMPLE | 03 | WATER | 200 | STATION010 |
|----------|---------|----------|--------|-----|-------|-----|------------|
| ā | 800002H | BEAUFORT | SAMPLE | 03 | WATER | 200 | STATION010 |
| 3 | B00003H | BEAUFORT | SAMPLE | 03 | WATER | 20C | STATION010 |
| | B00004H | BEAUFORT | SAMPLE | йЗ. | WATER | 200 | STATION010 |
| 4 | | | | | WATER | 200 | STATION010 |
| 5 | B00005H | BEAUFORT | SAMPLE | 03 | | | |
| 6 | B00006H | BEAUFORT | SAMPLE | 63 | WATER | 200 | STATION010 |
| 7 | B00007H | BEAUFORT | SAMPLE | Ø3 | WATER | 200 | STATION010 |
| 8 | B00008H | BEAUFORT | SAMPLE | 03 | WATER | 200 | STATION010 |
| 9 | B00009H | BEAUFORT | SAMPLE | 03 | WATER | 200 | STATION010 |
| 10 | B00010H | BEAUFORT | SAMPLE | 03 | WATER | 20C | STATION010 |
| 11 | B00011H | BEAUFORT | SAMPLE | 03 | WATER | 20C | STATION010 |
| 12 | 800012H | BEAUFORT | SAMPLE | 03 | WATER | 20C | STATION010 |
| 13 | B00013H | BEAUFORT | SAMPLE | 03 | WATER | 200 | STATION010 |
| 14 | B00014H | BEAUFORT | SAMPLE | 03 | WATER | 200 | STATION010 |
| 15 | B00015H | BEAUFORT | SAMPLE | 03 | WATER | 200 | STATION010 |
| 16 | B00016H | BEAUFORT | SAMPLE | õ3 | WATER | 200 | STATION010 |
| | | BEAUFORT | SAMPLE | 03 | WATER | 200 | STATION010 |
| 17 | B00017H | | | | WATER | 200 | STATION010 |
| 18 | B00018H | BEAUFORT | SAMPLE | 03 | | | |
| 19 | B00019H | BEAUFORT | SAMPLE | 03 | MATER | 200 | STATION010 |
| 20 | 800020H | BEAUFORT | SAMPLE | 03 | WATER | 200 | STATION010 |
| 21 | B00021H | BEAUFORT | SAMPLE | 03 | WATER | 200 | STATION010 |
| 22 | B00022H | BEAUFORT | SAMPLE | 03 | WATER | 200 | STATION010 |
| 23 | B00023H | BEAUFORT | SAMPLE | 03 | MATER | 20C | STATION010 |
| 24 | B00024H | BEAUFORT | SAMPLE | 03 | WATER | 200 | STATION010 |
| 25 | B00051H | BEAUFORT | SAMPLE | 20 | WATER | 200 | STATION020 |
| 26 | B00052H | BEAUFORT | SAMPLE | 20 | WATER | 200 | STATION020 |
| 27 | B00053H | BEAUFORT | SAMPLE | 20 | WATER | 200 | STATION020 |
| 28 | B00054H | BEAUFORT | SAMPLE | 20 | WATER | 200 | STATION020 |
| | B00055H | BEAUFORT | SAMPLE | 20 | WATER | 200 | STATION020 |
| 29 | | BEAUFORT | SAMPLE | 20 | WATER | 200 | STATION020 |
| 30 | B00056H | | | 20 | WATER | 200 | STATION020 |
| 31 | B00057H | BEAUFORT | SAMPLE | | | 200 | STATION002 |
| 32 | B00058H | BEAUFORT | SAMPLE | 20 | WATER | | |
| 33 | B00059H | BEAUFORT | SAMPLE | 20 | WATER | 200 | STATION002 |
| 34 | 800060H | BEAUFORT | SAMPLE | 20 | WATER | 200 | STATION002 |
| 35 | B00061H | BEAUFORT | SAMPLE | 20 | WATER | 200 | STATION002 |
| 36 | B00062H | BEAUFORT | SAMPLE | 20 | WATER | 20C | STATION002 |
| 37 | B00063H | BEAUFORT | SAMPLE | 20 | WATER | 20C | STATION002 |
| 38 | 800064H | BEAUFORT | SAMPLE | 20 | WATER | | |
| 39 | B00065H | BEAUFORT | SAMPLE | | WATER | | |
| 40 | B00066H | BEAUFORT | SAMPLE | 20 | WATER | 200 | STATION002 |
| 41 | B00067H | BEAUFORT | SAMPLE | 20 | WATER | 200 | STATION002 |
| 42 | B00068H | BEAUFORT | SAMPLE | | WATER | | STATION002 |
| 43 | B00069H | BEAUFORT | SAMPLE | | WATER | | |
| 40 44 | B00070H | BEAUFORT | SAMPLE | | WATER | | |
| | | BEAUFORT | SAMPLE | | WATER | | |
| 45 44 | B00071H | | | | WATER | | |
| 46 | B00072H | BEAUFORT | SAMPLE | | | | |
| 47 | 800073H | BEAUFORT | SAMPLE | | WATER | | |
| 48 | B00075H | BEAUFORT | SAMPLE | | WATER | | |
| 49 | B00101H | BEAUFORT | SAMPLE | | WATER | | |
| 50 | B00102H | BEAUFORT | SAMPLE | 27 | WATER | 200 | STATION071 |
| | | | | | | | |

| 51 | | BEAUFORT SAMPLE 27 WATER 200 STATION071 |
|----------|----------------------------|---|
| 52 | B00104H | BEAUFORT SAMPLE 27 WATER 20C STATION071 |
| 53 | B00106H | BEAUFORT SAMPLE 27 WATER 200 STATION071 |
| 54 | B00109H | BEAUFORT SAMPLE 27 WATER 20C STATION071 |
| 55 | B00110H | BEAUFORT SAMPLE 27 WATER 20C STATION071 |
| 56 | B00112H | BEAUFORT SAMPLE 27 WATER 20C STATION071 |
| 57 | B00113H | BEAUFORT SAMPLE 27 WATER 20C STATION071 |
| 58 | B00114H | BEAUFORT SAMPLE 27 WATER 200 STATION071 |
| 59 | B00115H | BEAUFORT SAMPLE 27 WATER 200 STATION071 |
| 60 | B00116H | BEAUFORT SAMPLE 27 WATER 200 STATION071 |
| 61 | B00117H | |
| 62 | B0011SH | |
| | | BEAUFORT SAMPLE 27 WATER 200 STATION071 |
| 63 | B00119H | BEAUFORT SAMPLE 27 WATER 20C STATION071 |
| 64 | B00120H | BEAUFORT SAMPLE 27 WATER 20C STATION071 |
| 65 | B00121H | BEAUFORT SAMPLE 27 WATER 20C STATION071 |
| 66 | B00122H | BEAUFORT SAMPLE 27 WATER 20C STATION071 |
| 67 | B00123H | BEAUFORT SAMPLE 27 WATER 20C STATION071 |
| 68 | B00151H | BEAUFORT SAMPLE 24 WATER 20C STATION055 |
| 69 | B00152H | BEAUFORT SAMPLE 24 WATER 20C STATION055 |
| 70 | B00153H | BEAUFORT SAMPLE 24 WATER 200 STATION055 |
| 71 | B00154H | BEAUFORT SAMPLE 24 WATER 20C STATION055 |
| 72 | B00155H | BEAUFORT SAMPLE 24 WATER 20C STATION055 |
| 73 | B00156H | BEAUFORT SAMPLE 24 WATER 20C STATION055 |
| 74 | B00157H | BEAUFORT SAMPLE 24 WATER 20C STATION055 |
| 75 | B00158H | BEAUFORT SAMPLE 24 WATER 20C STATION055 |
| 76 | B00159H | BEAUFORT SAMPLE 24 WATER 20C STATION055 |
| 77 | B00160H | BEAUFORT SAMPLE 24 WATER 20C STATION055 |
| 78 | B00161H | BEAUFORT SAMPLE 24 WATER 20C STATION055 |
| 79 | B00163H | BEAUFORT SAMPLE 24 WATER 20C STATION055 |
| 80 | B00164H | BEAUFORT SAMPLE 24 WATER 20C STATION055 |
| 81 | B00165H | BEAUFORT SAMPLE 24 WATER 20C STATION055 |
| 82 | B00166H | BEAUFORT SAMPLE 24 WATER 20C STATION055 |
| 83 | B00168H | BEAUFORT SAMPLE 24 WATER 20C STATION055 |
| 84 | B00169H | BEAUFORT SAMPLE 24 WATER 20C STATION055 |
| 85 | B00170H | BEAUFORT SAMPLE 24 WATER 20C STATION055 |
| 86 | B00201H | BEAUFORT SAMPLE 26 WATER 20C STATION070 |
| 87 | B00202H | BEAUFORT SAMPLE 26 WATER 20C STATION070 |
| 88 | B00203H | BEAUFORT SAMPLE 26 WATER 20C STATION070 |
| 89 | B00204H | BEAUFORT SAMPLE 26 WATER 20C STATION070 |
| 90 | B00205H | BEAUFORT SAMPLE 26 WATER 20C STATION070 |
| 91 | B00206H | BEAUFORT SAMPLE 26 WATER 20C STATION070 |
| 92 | B00207H | BEAUFORT SAMPLE 26 WATER 20C STATION070 |
| 93 | B00208H | BEAUFORT SAMPLE 26 WATER 20C STATION070 |
| 94 | B00210H | BEAUFORT SAMPLE 26 WATER 20C STATION070 |
| 95 | B00211H | BEAUFORT SAMPLE 26 WATER 20C STATION070 |
| 96 | B00212H | BEAUFORT SAMPLE 26 WATER 200 STATION070 |
| 97 | B00213H | BEAUFORT SAMPLE 26 WATER 200 STATION070 |
| 98 | B00216H | BEAUFORT SAMPLE 26 WATER 200 STATION070 |
| 99 | B00217H | BEAUFORT SAMPLE 26 WATER 200 STATION070 |
| 100 | B00219H | BEAUFORT SAMPLE 26 WATER 200 STATION070 |
| an at an | and the two man all at F 1 | LEAST STALL LO WHEN DOD OTHIODORD |

.

| 101 | B00220H | BEAUFORT | SAMPLE | 26 | WATER | 200 | STATION070 |
|-----|---------|----------|--------|-----|-------|-----|------------|
| 102 | B00221H | BEAUFORT | SAMPLE | 26 | WATER | 200 | STATION070 |
| 103 | B00222H | BEAUFORT | SAMPLE | 26 | WATER | 20C | STATION070 |
| 104 | B00223H | BEAUFORT | SAMPLE | 26 | WATER | 20C | STATION070 |
| 105 | B00251H | BEAUFORT | SAMPLE | 11 | WATER | 200 | STATION030 |
| 106 | B00252H | BEAUFORT | SAMPLE | 11 | WATER | 200 | STATION030 |
| 107 | B00253H | BEAUFORT | SAMPLE | 11 | WATER | 200 | STATION030 |
| 108 | B00254H | BEAUFORT | SAMPLE | 1.1 | WATER | 20C | STATION030 |
| 109 | B00255H | BEAUFORT | SAMPLE | 11 | WATER | 200 | STATION030 |
| 110 | B00256H | BEAUFORT | SAMPLE | 11 | WATER | 200 | STATION030 |
| 111 | B00257H | BEAUFORT | SAMPLE | 11 | WATER | 20C | STATION030 |
| 112 | B00258H | BEAUFORT | SAMPLE | 11 | WATER | 200 | STATION030 |
| 113 | B00259H | BEAUFORT | SAMPLE | 11 | WATER | 20C | STATION030 |
| 114 | B00260H | BEAUFORT | SAMPLE | 11 | WATER | 200 | STATION030 |
| 115 | B00261H | BEAUFORT | SAMPLE | 11 | WATER | 20C | STATION030 |
| 116 | B00262H | BEAUFORT | SAMPLE | 11 | WATER | 20C | STATION030 |
| 117 | B00263H | BEAUFORT | SAMPLE | 11 | WATER | 20C | STATION030 |
| 118 | B00264H | BEAUFORT | SAMPLE | 11 | WATER | 20C | STATION030 |
| 119 | B00265H | BEAUFORT | SAMPLE | 11 | WATER | 200 | STATION030 |
| 120 | B00266H | BEAUFORT | SAMPLE | 11 | WATER | 20C | STATION030 |
| 121 | B00268H | BEAUFORT | SAMPLE | 11 | WATER | 20C | STATION030 |
| 122 | B00269H | BEAUFORT | SAMPLE | 11 | WATER | 200 | STATION030 |
| 123 | B00270H | BEAUFORT | SAMPLE | 11 | WATER | 200 | STATION030 |
| 124 | B90271H | BEAUFORT | SAMPLE | 11 | WATER | 200 | STATION030 |
| 125 | B00272H | BEAUFORT | SAMPLE | 11 | WATER | 200 | STATION030 |
| 126 | B00273H | BEAUFORT | SAMPLE | 11 | WATER | 200 | STATION030 |
| 127 | B00275H | BEAUFORT | SAMPLE | 11 | WATER | 20C | STATION030 |

END FORM 127 STRAINS

| 1 | B00026H | BEAUFORT | | 33 SEDIMEN | |
|----------|----------|------------|-------------------------|------------------------|------------------|
| 2 | B00027H | BEAUFORT | ···· · ··· ·· · · · · · | 33 SEDIMEN | |
| 3 | B00028H | BEAUFORT | SAMPLE 0 | 33 SEDIMEN | T 20C STATION010 |
| 4 | B00029H | BEAUFORT | SAMPLE @ | 3 SEDIMEN | T 20C STATION010 |
| 5 | B00030H | BEAUFORT | SAMPLE 0 | 3 SEDIMEN | T 20C STATION010 |
| 6 | B00031H | BEAUFORT | SAMPLE 0 | 3 SEDIMEN | T 20C STATION010 |
| 7 | B00032H | BEAUFORT | | 3 SEDIMEN | |
| 8 | BOOOSSH | BEAUFORT | | 3 SEDIMEN | |
| à | 800035H | BEAUFORT | | BEDIMEN | |
| 10 | B00036H | BEAUFORT | |)3 SEDIMEN | |
| 11 | B00037H | BEAUFORT | | 3 SEDIMEN 3 SEDIMEN | |
| | 1000038H | | | 3 SEDIMEN 3 SEDIMEN | |
| 12 | | BEAUFORT | | | |
| 13 | B00039H | BEAUFORT | | 3 SEDIMEN | |
| 14 | B00040H | BEAUFORT | | 3 SEDIMEN | |
| 15 | B00041H | BEAUFORT | | 3 SEDIMEN | |
| 16 | B00042H | BEAUFORT | | 3 SEDIMEN | |
| 17 | B00043H | BEAUFORT | | 3 SEDIMEN | |
| 18 | B00044H | BEAUFORT | | 3 SEDIMEN | |
| 19 | B00045H | BEAUFORT | | 3 SEDIMEN | |
| 20 | B00047H | BEAUFORT | | 3 SEDIMEN | |
| 21 | B00048H | BEAUFORT | | 3 SEDIMEN | |
| 22 | B00076H | BEAUFORT | SAMPLE 1 | 6 SEDIMEN | T 20C STATION002 |
| 23 | B00077H | BEAUFORT | SAMPLE 1 | 6 SEDIMEN | T 20C STATION002 |
| 24 | B00078H | BEAUFORT | SAMPLE 1 | 6 SEDIMEN | T 20C STATION002 |
| 25 | B00079H | BEAUFORT | SAMPLE 1 | 6 SEDIMEN | T 20C STATION002 |
| 26 | B00080H | BEAUFORT | SAMPLE 1 | 6 SEDIMEN | T 20C STATION002 |
| 27 | B00081H | BEAUFORT | SAMPLE 1 | 6 SEDIMEN | T 20C STATION002 |
| 28 | B00082H | BEAUFORT | | 6 SEDIMEN | T 20C STATION002 |
| 29 | B00083H | BEAUFORT | | 6 SEDIMEN | |
| 30 | B00084H | BEAUFORT | | 6 SEDIMEN | |
| 31 | B00085H | BEAUFORT | | 6 SEDIMEN | |
| 32 | B00086H | BEAUFORT | | 6 SEDIMEN | |
| 33 | B00087H | BERUFORT | | 6 SEDIMEN | |
| | B00088H | BEAUFORT | | 6 SEDIMEN | |
| 34 35 | BODOSOH | BEAUFORT | | 6 SEDIMEN | |
| 36 | B00091H | BEAUFORT | | 6 SEDIMEN | |
| 37 | B00092H | BEAUFORT | | 6 SEDIMEN | |
| 38 38 | 800092H | | | | T 20C STATION002 |
| 39 39 | B00094H | BEAUFORT | | | T 20C STATION002 |
| 37 40 | B00095H | | | | T 20C STATION002 |
| 40 41 | | | | | |
| | B00096H | | | | T 20C STATION002 |
| 42 | B00097H | | | | T 20C STATION002 |
| 43 | B00098H | | | | T 20C STATION002 |
| 44 | B00099H | BEAUFORT | | | T 20C STATION002 |
| 45 | B00100H | BEAUFORT | SAMPLE 1 | 6 SEDIMEN | T 20C STATION002 |
| 46 | B0016 | | | | |
| | | T SAMPLE 2 | | | |
| 47 | B00127H | | | | F 20C STATION071 |
| 48 | B00128H | | | | 7 200 STATION071 |
| 49 | B00129H | BEAUFORT | SAMPLE 2: | 2 SEDIMEN | 7 20C STATION071 |
| | | | | | |

| 100 ATA | 0001000 | BEAUFORT | SAMPLE 22 | SEDIMENT | 20C | STATION071 |
|----------|--------------------|----------|------------------------|----------|-----|------------|
| 50 | B00130H | | SAMPLE 22 | SEDIMENT | 200 | STATION071 |
| 51 | B00131H | BEAUFORT | | * | 200 | STATION071 |
| 52 | B00132H | BEAUFORT | SAMPLE 22 | SEDIMENT | | STATION071 |
| 53 | B00133H | BEAUFORT | SAMPLE 22 | SEDIMENT | 200 | |
| 54 | B00135H | BEAUFORT | SAMPLE 22 | SEDIMENT | 200 | STATION071 |
| 55 | B00136H | BEAUFORT | SAMPLE 22 | SEDIMENT | 200 | STATION071 |
| 56 | B00138H | BEAUFORT | SAMPLE 22 | SEDIMENT | 20C | STATION071 |
| 57 | B00139H | BEAUFORT | SAMPLE 22 | SEDIMENT | 200 | STATION071 |
| 58 | B00140H | BEAUFORT | SAMPLE 22 | SEDIMENT | 200 | STATION071 |
| 59 | B00141H | BEAUFORT | SAMPLE 22 | SEDIMENT | 20C | STATION071 |
| 60 | B00142H | BEAUFORT | SAMPLE 22 | SEDIMENT | 20C | STATION071 |
| 61 | B00143H | BEAUFORT | SAMPLE 22 | SEDIMENT | 200 | STATION071 |
| 62 | B00144H | BEAUFORT | SAMPLE 22 | SEDIMENT | 20C | STATION071 |
| 63 | B00145H | BEAUFORT | SAMPLE 22 | SEDIMENT | 200 | STATION071 |
| 64 | B00146H | BEAUFORT | SAMPLE 22 | SEDIMENT | 200 | STATION071 |
| 65 | B00147H | BEAUFORT | SAMPLE 22 | SEDIMENT | 200 | STATION071 |
| 66 66 | B00148H | BEAUFORT | SAMPLE 22 | SEDIMENT | 200 | STATION071 |
| 67 | B00149H | BEAUFORT | SAMPLE 22 | SEDIMENT | 200 | STATION071 |
| | B00149H B00150H | BEAUFORT | SAMPLE 22 | SEDIMENT | 200 | STATION071 |
| 68 70 | | BEAUFORT | SAMPLE 20 | SEDIMENT | 200 | STATION055 |
| 69 70 | B00176H | BEAUFORT | SAMPLE 20 | SEDIMENT | 200 | STATION055 |
| 70 | B00177H | BEAUFORT | SAMPLE 20 | SEDIMENT | 200 | STATION055 |
| 71 | 800178H | BEAUFORT | SAMPLE 20 | SEDIMENT | 200 | STATION055 |
| 72 | B00179H | BEAUFORT | SAMPLE 20 | SEDIMENT | 200 | STATION055 |
| 73 | B00180H | | | | 200 | STATION055 |
| 74 | B00181H | BEAUFORT | SAMPLE 20 SAMPLE 20 | SEDIMENT | 200 | STATION055 |
| 75 | B00183H | BEAUFORT | | SEDIMENT | 200 | STATION055 |
| 76 | B00184H | BEAUFORT | | SEDIMENT | 200 | STATION055 |
| 77 | B00185H | BEAUFORT | | SEDIMENT | 200 | STATION055 |
| 78 | B00186H | BEAUFORT | | SEDIMENT | 200 | STATION055 |
| 79 | B00187H | BEAUFORT | SAMPLE 20 SAMPLE 20 | SEDIMENT | 200 | STATION055 |
| 80 | B00188H | BEAUFORT | | SEDIMENT | 200 | STATION055 |
| 81 | B00189H | BEAUFORT | SAMPLE 20 | SEDIMENT | 200 | STATION055 |
| 82 | B00190H | BEAUFORT | SAMPLE 20 | | 200 | STATION055 |
| 83 | B00191H | BEAUFORT | SAMPLE 20 | SEDIMENT | 200 | STATION055 |
| 84 | B00192H | BEAUFORT | SAMPLE 20 | SEDIMENT | 200 | STATION055 |
| 85 | B00193H | BEAUFORT | SAMPLE 20 | | | STATION055 |
| 86 | B00194H | BEAUFORT | SAMPLE 20 | | 200 | |
| 87 | B00196H | BEAUFORT | | | 200 | STATION055 |
| 88 | B00197H | BEAUFORT | | | 200 | STATION055 |
| 89 | 300198H | BEAUFORT | | | 200 | STATION055 |
| 90 | B00199H | BEAUFORT | | | 200 | STATION055 |
| 91 | B00200H | BEAUFORT | SAMPLE 20 | | 200 | STATION055 |
| 92 | B00226H | BEAUFORT | SAMPLE 21 | SEDIMENT | 200 | STATION070 |
| 93 | B00227H | BEAUFORT | SAMPLE 21 | SEDIMENT | 200 | STATION070 |
| 94 | B00228H | BEAUFORT | SAMPLE 21 | SEDIMENT | 200 | STATION070 |
| 95 | B00229H | BEAUFORT | SAMPLE 21 | SEDIMENT | 200 | STATION070 |
| 96 | B00530H | BEAUFORT | | SEDIMENT | 200 | STATION070 |
| 97 | B00231H | BEAUFORT | SAMPLE 21 | SEDIMENT | 200 | STATION070 |
| 98 99 | B00232H | BEAUFORT | SAMPLE 21 | SEDIMENT | 200 | STATION070 |
| | B00233H | BEAUFORT | | | 200 | STATION070 |
| 100 | B00234H | BEAUFORT | SAMPLE 21 | SEDIMENT | 200 | STATION070 |

| 101 | B00235H | BEAUFORT | SHMPLE | | SEDIMENT | 200 | STATION070 |
|-----|---------|----------|--------|------------|----------|-----|------------|
| 102 | B00236H | BEAUFORT | SAMPLE | 21 | SEDIMENT | 200 | STATION070 |
| 103 | B00237H | BEAUFORT | SAMPLE | 21 | SEDIMENT | 200 | STATION070 |
| 104 | B00238H | BEAUFORT | SAMPLE | 21 | SEDIMENT | 200 | STATION070 |
| 105 | B00239H | BEAUFORT | SAMPLE | ʻ21 | SEDIMENT | 200 | STATION070 |
| 106 | B00240H | BEAUFORT | SAMPLE | 21 | SEDIMENT | 200 | STATION070 |
| 107 | B00241H | BEAUFORT | SAMPLE | 21 | SEDIMENT | 200 | STATION070 |
| 108 | B00242H | BEAUFORT | SAMPLE | 21 | SEDIMENT | | STATION070 |
| 109 | B00243H | BEAUFORT | SAMPLE | 21 | SEDIMENT | 200 | STATION070 |
| 110 | B00244H | BEAUFORT | SAMPLE | 21 | SEDIMENT | 200 | STATION070 |
| 111 | B00245H | BEAUFORT | SAMPLE | 21 | SEDIMENT | 200 | STATION070 |
| 112 | B00246H | BEAUFORT | SAMPLE | 21 | SEDIMENT | 200 | STATION070 |
| 113 | B00247H | BEAUFORT | SAMPLE | 21 | SEDIMENT | 200 | STATION070 |
| 114 | B00248H | BEAUFORT | SAMPLE | 21 | SEDIMENT | 20C | STATION070 |
| 115 | B00249H | BEAUFORT | SAMPLE | 21 | SEDIMENT | 200 | STATION070 |
| 116 | B00250H | BEAUFORT | SAMPLE | 21 | SEDIMENT | 200 | STATION070 |
| 117 | B00276H | BEAUFORT | SAMPLE | 09 | SEDIMENT | 200 | STATION030 |
| 118 | B00277H | BEAUFORT | SAMPLE | 0 9 | SEDIMENT | 200 | STATION030 |
| 119 | B00278H | BEAUFORT | SAMPLE | 09 | SEDIMENT | 200 | STATION030 |
| 120 | B00279H | BEAUFORT | SAMPLE | 0 9 | SEDIMENT | 200 | STATION030 |
| 121 | B00280H | BEAUFORT | SAMPLE | 09 | SEDIMENT | 20C | STATION030 |
| 122 | B00281H | BEAUFORT | SAMPLE | 09 | SEDIMENT | 20C | STATION030 |
| 123 | B00282H | BEAUFORT | SAMPLE | 0 9 | SEDIMENT | 200 | STATION030 |
| 124 | B00283H | BEAUFORT | SAMPLE | 09 | SEDIMENT | 20C | STATION030 |
| 125 | B00284H | BEAUFORT | SAMPLE | Ø9 | SEDIMENT | 200 | STATION030 |
| 126 | B00285H | BEAUFORT | SAMPLE | Ø9 | SEDIMENT | 20C | STATION030 |
| 127 | B00286H | BEAUFORT | SAMPLE | Ø9 | SEDIMENT | 20C | STATION030 |
| 128 | B00287H | BEAUFORT | SAMPLE | Ø9 | SEDIMENT | 20C | STATION030 |
| 129 | B00288H | BEAUFORT | SAMPLE | 09 | SEDIMENT | 20C | STATION030 |
| 130 | B00289H | BEAUFORT | SAMPLE | 09 | SEDIMENT | 20C | STATION030 |
| 131 | B00290H | BEAUFORT | SAMPLE | <u>09</u> | SEDIMENT | 200 | STATION030 |
| 132 | B00292H | BEAUFORT | SAMPLE | 09 | SEDIMENT | 20C | STATION030 |
| 133 | B00293H | BEAUFORT | SAMPLE | 09 | SEDIMENT | 200 | STATION030 |
| 134 | B00294H | BEAUFORT | SAMPLE | Ø9 | SEDIMENT | 20C | STATION030 |
| 135 | B00295H | BEAUFORT | SAMPLE | Ø9 | SEDIMENT | 200 | STATION030 |
| 136 | B00296H | BEAUFORT | SAMPLE | <u>6</u> 9 | SEDIMENT | 200 | STATION030 |
| 137 | B00297H | BEAUFORT | SAMPLE | <u>09</u> | SEDIMENT | 200 | STATION030 |
| 138 | B00298H | BEAUFORT | SAMPLE | Ø9 | SEDIMENT | 200 | STATION030 |
| 139 | B00299H | BEAUFORT | | <u>09</u> | SEDIMENT | 200 | STATION030 |
| 140 | B00300H | BEAUFORT | SAMPLE | 09 | SEDIMENT | 200 | STATION030 |
| | | | | | | | |

END FORM 140 STRAINS

| 1 | B00003L | BEAUFORT | SAMPLE | 03 | WATER | 04C | STATION010 |
|----------------|---------|----------|---------------------------------|-----------|-------|------|------------|
| 2 | 800005L | BEAUFORT | SAMPLE | 03 | WATER | 04C | STATION010 |
| 3 | B00006L | BEAUFORT | SAMPLE | | WATER | 04C | STATION010 |
| 4 | B00009L | BEAUFORT | SAMPLE | | WATER | 04C | STATION010 |
| | | BEAUFORT | SAMPLE | | WATER | 04C | STATION010 |
| 5 | B00012L | | SAMPLE | 03 03 | WATER | 04C | STATION010 |
| 6 | B00013L | BEAUFORT | *** · · · · · · · · · · · · · · | | WATER | 04C | STATION010 |
| 7 | B00014L | BEAUFORT | SAMPLE | 03 | | | |
| 8 | B00015L | BEAUFORT | SAMPLE | 03 aa | WATER | 04C | STATION010 |
| 9 | B00021L | BEAUFORT | SAMPLE | <u>03</u> | WATER | 04C | STATION010 |
| 10 | B00022L | BEAUFORT | SAMPLE | 03 | WATER | 04C | STATION010 |
| 11 | B00023L | BEAUFORT | SAMPLE | 03 | WATER | 04C | STATION010 |
| 12 | B00024L | BEAUFORT | SAMPLE | 03 | WATER | 04C | STATION010 |
| 13 | B00025L | BEAUFORT | SAMPLE | 03 | WATER | 04C | STATION010 |
| 14 | B00052L | BEAUFORT | SAMPLE | 20 | WATER | 04C | STATION002 |
| 15 | B00053L | BEAUFORT | SAMPLE | 20 | WATER | 04C | STATION002 |
| 16 | B00054L | BEAUFORT | SAMPLE | 20 | WATER | 04C | STATION002 |
| 17 | B00055L | BEAUFORT | SAMPLE | 20 | WATER | 04C | STATION002 |
| $\frac{1}{18}$ | B00057L | BEAUFORT | SAMPLE | 20 | WATER | 04C | STATION002 |
| 19 | B00058L | BEAUFORT | SAMPLE | ΞÕ | WATER | 04C | STATION002 |
| | B00059L | BEAUFORT | SAMPLE | 20 | WATER | 04C | STATION002 |
| 20 | | BEAUFORT | SAMPLE | - | WATER | | STATION002 |
| 21 | B00060L | BEAUFORT | SAMPLE | 20 | WATER | 04C | STATION002 |
| 22 | B00061L | | SAMPLE | 20 | WATER | 04C | STATION002 |
| 23 | B00062L | BEAUFORT | | | | 04C | STATION002 |
| 24 | B00063L | BEAUFORT | SAMPLE | 20 | WATER | | STATION002 |
| 25 | B00066L | BEAUFORT | SAMPLE | | WATER | 04C | |
| 26 | B00067L | BEAUFORT | SAMPLE | 20 | WATER | Ø4C | STATION002 |
| 27 | B00068L | BEAUFORT | SAMPLE | 20 | WATER | Ø4C | STATION002 |
| 28 | B00069L | BEAUFORT | SAMPLE | 20 | WATER | Ø4C | STATION002 |
| 29 | B00070L | BEAUFORT | SAMPLE | 20 | WATER | 04C | STATION002 |
| 30 | B00071L | BEAUFORT | SAMPLE | 20 | WATER | 04C | STATION002 |
| 31 | B00072L | BEAUFORT | SAMPLE | 20 | WATER | 04C | STATION002 |
| 32 | B00073L | BEAUFORT | SAMPLE | 20 | WATER | Ø4C | STATION002 |
| 33 | B00074L | BEAUFORT | SAMPLE | 20 | WATER | 04C | STATION002 |
| 34 | B00075L | BEAUFORT | SAMPLE | 20 | WATER | 04C | STATION002 |
| 35 | B00101L | BERUFORT | SAMPLE | 27 | WATER | 04C- | STATION071 |
| 36 | E00102L | BEAUFORT | SAMPLE | 27 | WATER | 04C | STATION071 |
| 37 | B00103L | BEAUFORT | SAMPLE | | WATER | | STATION071 |
| 38 | B00104L | BEAUFORT | | 27 | UATER | 04C | STATION071 |
| | B00105L | BEAUFORT | SAMPLE | | | ñ4C | STATION071 |
| 39 | | BEAUFORT | SAMPLE | | | | STATION071 |
| 40 | B00106L | BERUFORT | | | | | STATION071 |
| 41 | 800107L | | | | | | |
| 42 | B00108L | BEAUFORT | SAMPLE | | | | STATION071 |
| 43 | B00109L | BEAUFORT | SAMPLE | | | | STATION071 |
| 44 | B00110L | BEAUFORT | SAMPLE | | | | STATION071 |
| 45 | B00111L | BEAUFORT | | 27 | WATER | | STATION071 |
| 46 | B00112L | BEAUFORT | | 27 | | | STATION071 |
| 47 | B00113L | BEAUFORT | | 27 | | | STATION071 |
| 48 | B00114L | BEAUFORT | | 27 | | | STATION071 |
| 49 | B00115L | BEAUFORT | SAMPLE | | | | STATION071 |
| 50 | B00116L | BEAUFORT | SAMPLE | 27 | WATER | 04C | STATION071 |
| | | | | | | | |

| | 51 | B60117L | DECUEODE COMPLE OF LOTER ALC ATATAMARA |
|-------|----------|----------|---|
| | 52 | B00118L | BEAUFORT SAMPLE 27 WATER 04C STATION071 |
| | | | BEAUFORT SAMPLE 27 WATER 04C STATION071 |
| | 53 | B00119L | BEAUFORT SAMPLE 27 WATER 04C STATION071 |
| 100 A | 54 | B00120L | BEAUFORT SAMPLE 27 WATER 04C STATION071 |
| 55 | | 3121L | BEAUFORT SAMPLE 27 WATER 04C STATION071 |
| | 56 | B00122L | BEAUFORT SAMPLE 27 WATER 04C STATION071 |
| | 57 | B00123L | BEAUFORT SAMPLE 27 WATER 04C STATION071 |
| | 58 | B00124L | BEAUFORT SAMPLE 27 WATER 04C STATION071 |
| | 59 | 800125L | BEAUFORT SAMPLE 27 WATER 04C STATION071 |
| | 60 | B00151L | BEAUFORT SAMPLE 24 WATER 04C STATION055 |
| | 61 | B00152L | BEAUFORT SAMPLE 24 WATER 04C STATION055 |
| | 62 | B00153L | BEAUFORT SAMPLE 24 WATER 04C STATION055 |
| | 63 | B00154L | BEAUFORT SAMPLE 24 WATER 04C STATION055 |
| | 64 | B00155L | BEAUFORT SAMPLE 24 WATER 04C STATION055 |
| | 65 | B00156L | BEAUFORT SAMPLE 24 WATER 04C STATION055 |
| | 66 | B00157L | BEAUFORT SAMPLE 24 WATER 04C STATION055 |
| | 67 | 800159L | BEAUFORT SAMPLE 24 WATER 04C STATION055 |
| | 68 | B00160L | BEAUFORT SAMPLE 24 WATER 04C STATION055 |
| | 69 | B00162L | BEAUFORT SAMPLE 24 WATER 04C STATION055 |
| | 70 | B00163L | BEAUFORT SAMPLE 24 WATER 04C STATION055 |
| | 71 | B00164L | BEAUFORT SAMPLE 24 WATER 04C STATION055 |
| | 72 | B00165L | BEAUFORT SAMPLE 24 WATER 04C STATION055 |
| | 73 | B00166L | BEAUFORT SAMPLE 24 WATER 04C STATION055 |
| | 74 | B00167L | BEAUFORT SAMPLE 24 WATER 04C STATION055 |
| | 75 | B00168L | BEAUFORT SAMPLE 24 WATER 04C STATION055 |
| | 76 | 800169L | BEAUFORT SAMPLE 24 WATER 04C STATION055 |
| | 77 | 800170L | BEAUFORT SAMPLE 24 WATER 04C STATION055 |
| | 78 | B00171L | BEAUFORT SAMPLE 24 WATER 04C STATION055 |
| | 79 | B00172L | BEAUFORT SAMPLE 24 WATER 04C STATION055 |
| | 80 | B00173L | BEAUFORT SAMPLE 24 WATER 04C STATION055 |
| | 81 | B00174L | BEAUFORT SAMPLE 24 WATER 04C STATION055 |
| | 82 | B00175L | BEAUFORT SAMPLE 24 WATER 04C STATION055 |
| | 83 | B00201L | BEAUFORT SAMPLE 26 WATER 04C STATION070 |
| | 84 | BOOSOSE | |
| | 85 | B00203L | |
| | 86 | B00204L | |
| | 87 | 800205L | |
| | 88 | B00206L | |
| | 89 | B00207L | |
| | 90 | B00208L | |
| | 91 | B00209L | |
| | 92 | B00210L | |
| | 93 | 300211L | |
| | 94 | B00212L | |
| | 95 | B00213L | |
| | 96 | B00214L | |
| | 97 | B00215L | |
| | 98 | B00216L | |
| | 20 99 | B00217L | |
| | 99 00 | B00218L | |
| 1 | 00 | DODE LOF | BEAUFORT SAMPLE 26 WATER 04C STATION070 |

| 101 | 800219L | REAUFORT | SAMPLE | 26 | WATER | 04C | STATION070 |
|-----|---------|----------|---------|----|---------|-----|------------|
| 102 | B00220L | BEAUFORT | SAMPLE | 26 | WATER | 04C | STATION070 |
| 102 | B00221L | BEAUFORT | SAMPLE | 26 | WATER | 04C | STATION070 |
| 103 | ROMESE | BEAUFORT | | 26 | WATER | 04C | STATION070 |
| 105 | BUNSSSE | BEAUFORT | SAMPLE | 26 | WATER | ñ4C | STATION070 |
| | B00225L | BEAUFORT | SAMPLE | 26 | WATER | 04C | STATION070 |
| 106 | | | | | • | | |
| 107 | BØØ278L | BEAUFORT | SAMPLE | 11 | WATER | 04C | |
| 108 | B00281L | BEAUFORT | SAMPLE | 19 | WATER | 04C | STATION001 |
| 109 | B00282L | BEAUFORT | SAMPLE | 19 | WATER | 04C | STATION001 |
| 110 | B00283L | BEAUFORT | SAMPLE | 19 | WATER | 04C | STATION001 |
| 111 | 800284L | BEAUFORT | SAMPLE | 19 | WATER | 04C | STATION001 |
| 112 | B00291L | BEAUFORT | SAMPLE | 36 | WATER | 04C | STATION002 |
| 113 | 800292L | BEAUFORT | SAMPLE | 36 | WATER | 04C | STATION002 |
| 114 | B00294L | BEAUFORT | SAMPLE | 36 | WATER | 04C | STATION002 |
| | | | SAMPLE | 36 | WATER | 04C | STATIONAAS |
| 115 | B00295L | BEAUFORT | ODUIPLE | 00 | MULLER. | 040 | OTHIONOOL |

END FORM 115 STRAINS

Strains isolated from sediment at 4C capable of growth at 15C.

- ·

| 1 B00022L BERUFORT SAMPLE 03 SEDIMENT 04C STATION010 2 B00022L BERUFORT SAMPLE 03 SEDIMENT 04C STATION010 4 B00022L BERUFORT SAMPLE 03 SEDIMENT 04C STATION010 5 B00023L BERUFORT SAMPLE 03 SEDIMENT 04C STATION010 6 B00031L BERUFORT SAMPLE 03 SEDIMENT 04C STATION010 7 B00032L BERUFORT SAMPLE 03 SEDIMENT 04C STATION010 9 B00033L BERUFORT SAMPLE 03 SEDIMENT 04C STATION010 9 B00033L BERUFORT SAMPLE 03 SEDIMENT 04C STATION010 10 B00033L BERUFORT SAMPLE 03 SEDIMENT 04C STATION010 11 B00033L BERUFORT SAMPLE 03 SEDIMENT 04C STATION010 12 B00033L BERUFORT SAMPLE 03 SEDIMENT 04C STATION010 13 B00033L BERUFORT SAMPLE 03 SEDIMENT 04C STATION010 14 B00041L BERUFORT SAMPLE 03 SEDIMENT 04C STATION010 15 B00041L BERUFORT SAMPLE 03 SEDIMENT 04C STATION010 16 B00042L BERUFORT SAMPLE 03 SEDIMENT 04C STATION010 17 B00044L BERUFORT SAMPLE 03 SEDIMENT 04C STATION010 18 B00044L BERUFORT SAMPLE 03 SEDIMENT 04C STATION010 19 <td< th=""><th></th><th></th><th></th><th></th><th></th><th></th><th></th><th></th></td<> | | | | | | | | |
|--|----|---------|------------|--------|----|----------|------|------------|
| 3 B00029L BEAUFORT SAMPLE 03 SEDIMENT 04C STATION010 4 B00029L BEAUFORT SAMPLE 03 SEDIMENT 04C STATION010 6 B00031L BEAUFORT SAMPLE 03 SEDIMENT 04C STATION010 7 B00032L BEAUFORT SAMPLE 03 SEDIMENT 04C STATION010 8 B00033L BEAUFORT SAMPLE 03 SEDIMENT 04C STATION010 9 B00033L BEAUFORT SAMPLE 03 SEDIMENT 04C STATION010 10 B00033L BEAUFORT SAMPLE 03 SEDIMENT 04C STATION010 11 B00033L BEAUFORT SAMPLE 03 SEDIMENT 04C STATION010 12 B00033L BEAUFORT SAMPLE 03 SEDIMENT 04C STATION010 13 B00040L BEAUFORT SAMPLE 03 SEDIMENT 04C STATION010 14 B00044L BEAUFORT SAMPLE 03 SEDIMENT 04C STATION010 15 B00044L BEAUFORT SAMPLE 03 SEDIMENT 04C STATION010 16 B00044L BEAUFORT SAMPLE 03 SEDIMENT 04C STATION010 17 B00044L BEAUFORT SAMPLE 03 SEDIMENT 04C | | | BEHUF UR I | | | | | |
| 4 BEQUFORT SAMPLE G3 SEDIMENT G4C STATION010 5 B00031L BEAUFORT SAMPLE G3 SEDIMENT G4C STATION010 7 B00032L BEAUFORT SAMPLE G3 SEDIMENT G4C STATION010 8 B00033L BEAUFORT SAMPLE G3 SEDIMENT G4C STATION010 9 B00033L BEAUFORT SAMPLE G3 SEDIMENT G4C STATION010 10 B00033L BEAUFORT SAMPLE G3 SEDIMENT G4C STATION010 11 B00033L BEAUFORT SAMPLE G3 SEDIMENT G4C STATION010 12 B00033L BEAUFORT SAMPLE G3 SEDIMENT G4C STATION010 13 B00040L BEAUFORT SAMPLE G3 SEDIMENT G4C STATION010 14 B00041L BEAUFORT SAMPLE G3 SEDIMENT G4C STATION010 15 B00042L BEAUFORT SAMPLE G3 SEDIMENT <td< td=""><td>2</td><td>B00027L</td><td>BEAUFORT</td><td>SAMPLE</td><td>03</td><td>SEDIMENT</td><td>-04C</td><td></td></td<> | 2 | B00027L | BEAUFORT | SAMPLE | 03 | SEDIMENT | -04C | |
| 4 BEGUFORT SAMPLE G3 SEDIMENT G4C STATION010 5 B00030L BEAUFORT SAMPLE G3 SEDIMENT G4C STATION010 7 B00031L BEAUFORT SAMPLE G3 SEDIMENT G4C STATION010 8 B00033L BEAUFORT SAMPLE G3 SEDIMENT G4C STATION010 9 B00033L BEAUFORT SAMPLE G3 SEDIMENT G4C STATION010 10 B00033L BEAUFORT SAMPLE G3 SEDIMENT G4C STATION010 11 B00033L BEAUFORT SAMPLE G3 SEDIMENT G4C STATION010 12 B00033L BEAUFORT SAMPLE G3 SEDIMENT G4C STATION010 13 B00043L BEAUFORT SAMPLE G3 SEDIMENT G4C STATION010 14 B00044L BEAUFORT SAMPLE G3 SEDIMENT G4C STATION010 15 B00043L BEAUFORT SAMPLE G3 SEDIMENT <td< td=""><td>З</td><td>B00028L</td><td>BERUFORT</td><td>SAMPLE</td><td>03</td><td>SEDIMENT</td><td>-04C</td><td>STATION010</td></td<> | З | B00028L | BERUFORT | SAMPLE | 03 | SEDIMENT | -04C | STATION010 |
| 5 B00030L BERUFORT SAMPLE 03 SEDIMENT 04C STATION010 6 B00031L BERUFORT SAMPLE 03 SEDIMENT 04C STATION010 7 B00032L BERUFORT SAMPLE 03 SEDIMENT 04C STATION010 9 B00033L BERUFORT SAMPLE 03 SEDIMENT 04C STATION010 10 B00033L BERUFORT SAMPLE 03 SEDIMENT 04C STATION010 11 B00033L BERUFORT SAMPLE 03 SEDIMENT 04C STATION010 12 B00033L BERUFORT SAMPLE 03 SEDIMENT 04C STATION010 13 B00033L BERUFORT SAMPLE 03 SEDIMENT 04C STATION010 14 B00040L BERUFORT SAMPLE 03 SEDIMENT 04C STATION010 15 B00041L BERUFORT SAMPLE 03 SEDIMENT 04C STATION010 16 B00042L BERUFORT SAMPLE 03 SEDIMENT 04C STATION010 17 B00042L BERUFORT SAMPLE 03 SEDIMENT 04C STATION010 18 B00044L BERUFORT SAMPLE 03 SEDIMENT 04C STATION010 19 B00042L BERUFORT SAMPLE 03 SEDIMENT 04C STATION010 19 B00044L BERUFORT SAMPLE 03 SEDIMENT 04C STATION010 20 B00044L BERUFORT SAMPLE 03 SEDIMENT 04C STATION010 21 B00044L BERUFORT SAMPLE 03 SEDIMENT 04C STATION010 22 | | B00029L | BEAUFORT | SAMPLE | 93 | SEDIMENT | 04C | STATION010 |
| 6 B0003L BEAUFORT SAMPLE 03 SEDIMENT 04C STATION010 7 B0003L BEAUFORT SAMPLE 03 SEDIMENT 04C STATION010 9 B0003L BEAUFORT SAMPLE 03 SEDIMENT 04C STATION010 10 B0003L BEAUFORT SAMPLE 03 SEDIMENT 04C STATION010 11 B0003L BEAUFORT SAMPLE 03 SEDIMENT 04C STATION010 12 B0003SL BEAUFORT SAMPLE 03 SEDIMENT 04C STATION010 13 B0003SL BEAUFORT SAMPLE 03 SEDIMENT 04C STATION010 14 B00044L BEAUFORT SAMPLE 03 SEDIMENT 04C STATION010 15 B00044L BEAUFORT SAMPLE 03 SEDIMENT 04C STATION010 16 B00044L BEAUFORT SAMPLE 03 SEDIMENT 04C STATION010 17 B00044L BEAUFORT SAMPLE 03 SEDIMENT | | | | | | | | · - · |
| 7 B00032L BEAUFORT SAMPLE 03 SEDIMENT 04C STATION010 8 B00033L BEAUFORT SAMPLE 03 SEDIMENT 04C STATION010 10 B00035L BEAUFORT SAMPLE 03 SEDIMENT 04C STATION010 11 B00037L BEAUFORT SAMPLE 03 SEDIMENT 04C STATION010 12 B00038L BEAUFORT SAMPLE 03 SEDIMENT 04C STATION010 13 B00039L BEAUFORT SAMPLE 03 SEDIMENT 04C STATION010 14 B00040L BEAUFORT SAMPLE 03 SEDIMENT 04C STATION010 15 B00041L BEAUFORT SAMPLE 03 SEDIMENT 04C STATION010 16 B00042L BEAUFORT SAMPLE 03 SEDIMENT 04C STATION010 17 B00044L BEAUFORT SAMPLE 03 SEDIMENT 04C STATION010 18 B00044L BEAUFORT SAMPLE 03 SEDIMENT 04C STATION010 18 B00044L BEAUFORT SAMPLE 03 SEDIMENT 04C STATION010 19 B00044L BEAUFORT SAMPLE 03 SEDIMENT 04C STATION010 | | | | | | | | |
| 8 B000033L BEAUFORT SAMPLE 03 SEDIMENT 04C STATION010 9 B00035L BEAUFORT SAMPLE 03 SEDIMENT 04C STATION010 11 B00037L BEAUFORT SAMPLE 03 SEDIMENT 04C STATION010 12 B00039L BEAUFORT SAMPLE 03 SEDIMENT 04C STATION010 13 B00039L BEAUFORT SAMPLE 03 SEDIMENT 04C STATION010 14 B00040L BEAUFORT SAMPLE 03 SEDIMENT 04C STATION010 15 B00041L BEAUFORT SAMPLE 03 SEDIMENT 04C STATION010 16 B00042L BEAUFORT SAMPLE 03 SEDIMENT 04C STATION010 17 B00043L BEAUFORT SAMPLE 03 SEDIMENT 04C STATION010 18 B00044L BEAUFORT SAMPLE 03 SEDIMENT 04 | | | | | | | | |
| 9 B00035L BEAUFORT SAMPLE 03 SEDIMENT 04C STATION010 10 B00037L BEAUFORT SAMPLE 03 SEDIMENT 04C STATION010 12 B00038L BEAUFORT SAMPLE 03 SEDIMENT 04C STATION010 13 B00039L BEAUFORT SAMPLE 03 SEDIMENT 04C STATION010 14 B00040L BEAUFORT SAMPLE 03 SEDIMENT 04C STATION010 15 B00041L BEAUFORT SAMPLE 03 SEDIMENT 04C STATION010 16 B00042L BEAUFORT SAMPLE 03 SEDIMENT 04C STATION010 17 B00043L BEAUFORT SAMPLE 03 SEDIMENT 04C STATION010 18 B00044L BEAUFORT SAMPLE 03 SEDIMENT 04C STATION010 18 B00044L BEAUFORT SAMPLE 03 SEDIMENT 04C STATION010 19 B00044L BEAUFORT SAMPLE 03 SEDIMENT 04C STATION010 21 B00044L BEAUFORT SAMPLE 03 SEDIMENT 04C STATION010 22 B00044L BEAUFORT SAMPLE 03 SEDIMENT 04C STATION010 | | | | | | | | |
| 16B00036LBERUFORT SAMPLEG3SEDIMENT G4CG4CGTATION01011B00038LBERUFORT SAMPLEG3SEDIMENT G4CG4CGTATION01012B00039LBERUFORT SAMPLEG3SEDIMENT G4CG4CGTATION01013B00039LBERUFORT SAMPLEG3SEDIMENT G4CG4CGTATION01014B00040LBERUFORT SAMPLEG3SEDIMENT G4CG4CSTATION01015B00041LBERUFORT SAMPLEG3SEDIMENT G4CG4CSTATION01016B00042LBERUFORT SAMPLEG3SEDIMENT G4CG4CSTATION01017B00044LBERUFORT SAMPLEG3SEDIMENT G4CG4CSTATION01018B00044LBERUFORT SAMPLEG3SEDIMENT G4CG4CSTATION01019B00044LBERUFORT SAMPLEG3SEDIMENT G4CG4CSTATION01020B00047LBERUFORT SAMPLEG3SEDIMENT G4CG4CSTATION01021B00046LBERUFORT SAMPLEG3SEDIMENT G4CG4CSTATION01022B00047LBERUFORT SAMPLEG3SEDIMENT G4CG4CSTATION01023B00041LBERUFORT SAMPLEG3SEDIMENT G4CG4CSTATION01024B00042LBERUFORT SAMPLEG3SEDIMENT G4CG4CSTATION0225B00071LBERUFORT SAMPLE16 | | | | | | | | |
| 11 B00037L BEAUFORT SAMPLE 03 SEDIMENT 04C STATION019 12 B00039L BEAUFORT SAMPLE 03 SEDIMENT 04C STATION010 13 B00039L BEAUFORT SAMPLE 03 SEDIMENT 04C STATION010 14 B00041L BEAUFORT SAMPLE 03 SEDIMENT 04C STATION010 15 B00041L BEAUFORT SAMPLE 03 SEDIMENT 04C STATION010 16 B00042L BEAUFORT SAMPLE 03 SEDIMENT 04C STATION010 17 B00044L BEAUFORT SAMPLE 03 SEDIMENT 04C STATION010 18 B00044L BEAUFORT SAMPLE 03 SEDIMENT 04C STATION010 21 B00048L BEAUFORT SAMPLE 16 SEDIMENT 04C STATION010 22 B00047L BEAUFORT SAMPLE 16 SEDIMENT 0 | | | | | | | | |
| 12B00038LBEAUFORT SAMPLE03SEDIMENT04CSTATION01013B00039LBEAUFORT SAMPLE03SEDIMENT04CSTATION01014B00040LBEAUFORT SAMPLE03SEDIMENT04CSTATION01015B00041LBEAUFORT SAMPLE03SEDIMENT04CSTATION01016B00042LBEAUFORT SAMPLE03SEDIMENT04CSTATION01017B00043LBEAUFORT SAMPLE03SEDIMENT04CSTATION01018B00044LBEAUFORT SAMPLE03SEDIMENT04CSTATION01019B00046LBEAUFORT SAMPLE03SEDIMENT04CSTATION01020B00044LBEAUFORT SAMPLE03SEDIMENT04CSTATION01021B00048LBEAUFORT SAMPLE03SEDIMENT04CSTATION01022B00049LBEAUFORT SAMPLE03SEDIMENT04CSTATION01023B00076LBEAUFORT SAMPLE16SEDIMENT04CSTATION00226B00078LBEAUFORT SAMPLE16SEDIMENT04CSTATION00227B00079LBEAUFORT SAMPLE16SEDIMENT04CSTATION00228B00078LBEAUFORT SAMPLE16SEDIMENT04CSTATION00229B00081LBEAUFORT SAMPLE16SEDIMENT04CSTATION00229B00081LBEAUFORT SAMPLE16SEDIMENT04CSTATION00220 | | | | | | | | |
| 13B00039LBEAUFORT SAMPLE 03SEDIMENT 04CSTATION01014B00040LBERUFORT SAMPLE 03SEDIMENT 04CSTATION01015B00041LBERUFORT SAMPLE 03SEDIMENT 04CSTATION01016B00042LBERUFORT SAMPLE 03SEDIMENT 04CSTATION01017B00043LBERUFORT SAMPLE 03SEDIMENT 04CSTATION01018B00044LBERUFORT SAMPLE 03SEDIMENT 04CSTATION01019B00044LBERUFORT SAMPLE 03SEDIMENT 04CSTATION01020B00047LBERUFORT SAMPLE 03SEDIMENT 04CSTATION01021B00048LBERUFORT SAMPLE 03SEDIMENT 04CSTATION01022B00049LBERUFORT SAMPLE 03SEDIMENT 04CSTATION01023B00050LBERUFORT SAMPLE 16SEDIMENT 04CSTATION02224B00076LBERUFORT SAMPLE 16SEDIMENT 04CSTATION02225B00078LBERUFORT SAMPLE 16SEDIMENT 04CSTATION02226B00078LBERUFORT SAMPLE 16SEDIMENT 04CSTATION02227B00078LBERUFORT SAMPLE 16SEDIMENT 04CSTATION02228B00082LBERUFORT SAMPLE 16SEDIMENT 04CSTATION02229B00083LBERUFORT SAMPLE 16SEDIMENT 04CSTATION02229B00083LBERUFORT SAMPLE 16SEDIMENT 04CSTATION02229B00082LBERUFORT SAMPLE 16SEDIMENT 04CSTATION02229B00083LBERUFORT SAMPLE 16SEDIMENT 04C <t< td=""><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></t<> | | | | | | | | |
| 14B00040LBEAUFORT SAMPLE 03SEDIMENT 04CSTATION01015B00041LBEAUFORT SAMPLE 03SEDIMENT 04CSTATION01016B00042LBEAUFORT SAMPLE 03SEDIMENT 04CSTATION01017B00043LBEAUFORT SAMPLE 03SEDIMENT 04CSTATION01018B00044LBEAUFORT SAMPLE 03SEDIMENT 04CSTATION01019B00044LBEAUFORT SAMPLE 03SEDIMENT 04CSTATION01020B00047LBEAUFORT SAMPLE 03SEDIMENT 04CSTATION01021B00048LBEAUFORT SAMPLE 03SEDIMENT 04CSTATION01022B00049LBEAUFORT SAMPLE 03SEDIMENT 04CSTATION01023B00076LBEAUFORT SAMPLE 16SEDIMENT 04CSTATION02225B00077LBEAUFORT SAMPLE 16SEDIMENT 04CSTATION02226B00078LBEAUFORT SAMPLE 16SEDIMENT 04CSTATION02227B00078LBEAUFORT SAMPLE 16SEDIMENT 04CSTATION02228B00080LBEAUFORT SAMPLE 16SEDIMENT 04CSTATION02229B00081LBEAUFORT SAMPLE 16SEDIMENT 04CSTATION02229B00082LBEAUFORT SAMPLE 16SEDIMENT 04CSTATION02220B00084LBEAUFORT SAMPLE 16SEDIMENT 04CSTATION02220B00084LBEAUFORT SAMPLE 16SEDIMENT 04CSTATION02220B00084LBEAUFORT SAMPLE 16SEDIMENT 04CSTATION02220B00084LBEAUFORT SAMPLE 16SEDIMENT 04C <t< td=""><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></t<> | | | | | | | | |
| 15B00041LBEAUFORT SAMPLE 03SEDIMENT 04CSTATION01016B00042LBEAUFORT SAMPLE 03SEDIMENT 04CSTATION01017B00043LBEAUFORT SAMPLE 03SEDIMENT 04CSTATION01018B00044LBEAUFORT SAMPLE 03SEDIMENT 04CSTATION01019B00046LBEAUFORT SAMPLE 03SEDIMENT 04CSTATION01020B00047LBEAUFORT SAMPLE 03SEDIMENT 04CSTATION01021B00048LBEAUFORT SAMPLE 03SEDIMENT 04CSTATION01023B00049LBEAUFORT SAMPLE 03SEDIMENT 04CSTATION01024B00072LBEAUFORT SAMPLE 16SEDIMENT 04CSTATION02225B00077LBEAUFORT SAMPLE 16SEDIMENT 04CSTATION02226B00073LBEAUFORT SAMPLE 16SEDIMENT 04CSTATION02227B00073LBEAUFORT SAMPLE 16SEDIMENT 04CSTATION02228B00081LBEAUFORT SAMPLE 16SEDIMENT 04CSTATION02229B00081LBEAUFORT SAMPLE 16SEDIMENT 04CSTATION02220B00082LBEAUFORT SAMPLE 16SEDIMENT 04CSTATION02228B00083LBEAUFORT SAMPLE 16SEDIMENT 04CSTATION02229B00083LBEAUFORT SAMPLE 16SEDIMENT 04CSTATION02220B00082LBEAUFORT SAMPLE 16SEDIMENT 04CSTATION02229B00083LBEAUFORT SAMPLE 16SEDIMENT 04CSTATION02220B00082LBEAUFORT SAMPLE 16SEDIMENT 04C <t< td=""><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></t<> | | | | | | | | |
| 16B00042LBEAUFORT SAMPLE 03SEDIMENT 04CSTATION01017B00044LBEAUFORT SAMPLE 03SEDIMENT 04CSTATION01018B00044LBEAUFORT SAMPLE 03SEDIMENT 04CSTATION01020B00046LBEAUFORT SAMPLE 03SEDIMENT 04CSTATION01021B00048LBEAUFORT SAMPLE 03SEDIMENT 04CSTATION01022B00047LBEAUFORT SAMPLE 03SEDIMENT 04CSTATION01023B00049LBEAUFORT SAMPLE 03SEDIMENT 04CSTATION01024B00076LBEAUFORT SAMPLE 03SEDIMENT 04CSTATION02225B00077LBEAUFORT SAMPLE 16SEDIMENT 04CSTATION02226B00078LBEAUFORT SAMPLE 16SEDIMENT 04CSTATION02227B00079LBEAUFORT SAMPLE 16SEDIMENT 04CSTATION02228B00080LBEAUFORT SAMPLE 16SEDIMENT 04CSTATION02229B00081LBEAUFORT SAMPLE 16SEDIMENT 04CSTATION02229B00082LBEAUFORT SAMPLE 16SEDIMENT 04CSTATION02220B00082LBEAUFORT SAMPLE 16SEDIMENT 04CSTATION02221B00083LBEAUFORT SAMPLE 16SEDIMENT 04CSTATION02223B00085LBEAUFORT SAMPLE 16SEDIMENT 04CSTATION02224B00085LBEAUFORT SAMPLE 16SEDIMENT 04CSTATION02225B00082LBEAUFORT SAMPLE 16SEDIMENT 04CSTATION02226B00083LBEAUFORT SAMPLE 16SEDIMENT 04C <t< td=""><td></td><td>B00040L</td><td>BEAUFORT</td><td>SAMPLE</td><td>Ø3</td><td>SEDIMENT</td><td>04C</td><td></td></t<> | | B00040L | BEAUFORT | SAMPLE | Ø3 | SEDIMENT | 04C | |
| 17B&0043LBEAUFORT SAMPLE 03SEDIMENT 04CSTATION01018B00044LBEAUFORT SAMPLE 03SEDIMENT 04CSTATION01019B00046LBEAUFORT SAMPLE 03SEDIMENT 04CSTATION01020B00047LBEAUFORT SAMPLE 03SEDIMENT 04CSTATION01021B00048LBEAUFORT SAMPLE 03SEDIMENT 04CSTATION01022B00049LBEAUFORT SAMPLE 03SEDIMENT 04CSTATION01023B00076LBEAUFORT SAMPLE 03SEDIMENT 04CSTATION02225B00071LBEAUFORT SAMPLE 16SEDIMENT 04CSTATION02226B00078LBEAUFORT SAMPLE 16SEDIMENT 04CSTATION02227B00079LBEAUFORT SAMPLE 16SEDIMENT 04CSTATION02228B00080LBEAUFORT SAMPLE 16SEDIMENT 04CSTATION02229B00081LBEAUFORT SAMPLE 16SEDIMENT 04CSTATION02230B00082LBEAUFORT SAMPLE 16SEDIMENT 04CSTATION02231B00083LBEAUFORT SAMPLE 16SEDIMENT 04CSTATION02232B00083LBEAUFORT SAMPLE 16SEDIMENT 04CSTATION02233B00083LBEAUFORT SAMPLE 16SEDIMENT 04CSTATION02234B00084LBEAUFORT SAMPLE 16SEDIMENT 04CSTATION02235B00083LBEAUFORT SAMPLE 16SEDIMENT 04CSTATION02236B00093LBEAUFORT SAMPLE 16SEDIMENT 04CSTATION02235B00093LBEAUFORT SAMPLE 16SEDIMENT 04C <t< td=""><td>15</td><td>B00041L</td><td>BEAUFORT</td><td>SAMPLE</td><td>Ø3</td><td>SEDIMENT</td><td>Ø4C</td><td>STATION010</td></t<> | 15 | B00041L | BEAUFORT | SAMPLE | Ø3 | SEDIMENT | Ø4C | STATION010 |
| 17B00043LBEAUFORT SAMPLE03SEDIMENT04CSTATION01018B00044LBEAUFORT SAMPLE03SEDIMENT04CSTATION01020B00047LBEAUFORT SAMPLE03SEDIMENT04CSTATION01021B00048LBEAUFORT SAMPLE03SEDIMENT04CSTATION01022B00049LBEAUFORT SAMPLE03SEDIMENT04CSTATION01023B00050LBEAUFORT SAMPLE03SEDIMENT04CSTATION02024B0007CLBEAUFORT SAMPLE16SEDIMENT04CSTATION02225B00072LBEAUFORT SAMPLE16SEDIMENT04CSTATION02226B00078LBEAUFORT SAMPLE16SEDIMENT04CSTATION02227B00079LBEAUFORT SAMPLE16SEDIMENT04CSTATION02228B00082LBEAUFORT SAMPLE16SEDIMENT04CSTATION02229B00083LBEAUFORT SAMPLE16SEDIMENT04CSTATION02230B00082LBEAUFORT SAMPLE16SEDIMENT04CSTATION02231B00083LBEAUFORT SAMPLE16SEDIMENT04CSTATION02232B00084LBEAUFORT SAMPLE16SEDIMENT04CSTATION02233B00085LBEAUFORT SAMPLE16SEDIMENT04CSTATION02234B00085LBEAUFORT SAMPLE16SEDIMENT04CSTATION02235 | 16 | B00042L | BEAUFORT | SAMPLE | 03 | SEDIMENT | 04C | STATION010 |
| 18B00044LBEAUFORTSAMPLE03SEDIMENT04CSTATION01019B00047LBEAUFORTSAMPLE03SEDIMENT04CSTATION01021B00047LBEAUFORTSAMPLE03SEDIMENT04CSTATION01022B00049LBEAUFORTSAMPLE03SEDIMENT04CSTATION01023B00050LBEAUFORTSAMPLE03SEDIMENT04CSTATION02024B00076LBEAUFORTSAMPLE16SEDIMENT04CSTATION02225B00077LBEAUFORTSAMPLE16SEDIMENT04CSTATION02226B00078LBEAUFORTSAMPLE16SEDIMENT04CSTATION02227B00079LBEAUFORTSAMPLE16SEDIMENT04CSTATION02228B00080LBEAUFORTSAMPLE16SEDIMENT04CSTATION02229B00081LBEAUFORTSAMPLE16SEDIMENT04CSTATION02230B00083LBEAUFORTSAMPLE16SEDIMENT04CSTATION02231B00084LBEAUFORTSAMPLE16SEDIMENT04CSTATION02232B00084LBEAUFORTSAMPLE16SEDIMENT04CSTATION02233B00085LBEAUFORTSAMPLE16SEDIMENT04CSTATION02234B00088LBEAUFORTSAMPLE16SEDIMENT04CSTATION022 <t< td=""><td></td><td>B00043L</td><td>BEAUFORT</td><td>SAMPLE</td><td>63</td><td>SEDIMENT</td><td>04C</td><td>STATION010</td></t<> | | B00043L | BEAUFORT | SAMPLE | 63 | SEDIMENT | 04C | STATION010 |
| 19B00046LBEAUFORTSAMPLE03SEDIMENT04CSTATION01021B00047LBEAUFORTSAMPLE03SEDIMENT04CSTATION01022B00048LBEAUFORTSAMPLE03SEDIMENT04CSTATION01023B00050LBEAUFORTSAMPLE03SEDIMENT04CSTATION01024B00076LBEAUFORTSAMPLE16SEDIMENT04CSTATION00225B00077LBEAUFORTSAMPLE16SEDIMENT04CSTATION00226B00078LBEAUFORTSAMPLE16SEDIMENT04CSTATION00227B00079LBEAUFORTSAMPLE16SEDIMENT04CSTATION00228B00080LBEAUFORTSAMPLE16SEDIMENT04CSTATION00229B00081LBEAUFORTSAMPLE16SEDIMENT04CSTATION00229B00082LBEAUFORTSAMPLE16SEDIMENT04CSTATION00230B00082LBEAUFORTSAMPLE16SEDIMENT04CSTATION00231B00083LBEAUFORTSAMPLE16SEDIMENT04CSTATION00232B00084LBEAUFORTSAMPLE16SEDIMENT04CSTATION00233B00085LBEAUFORTSAMPLE16SEDIMENT04CSTATION00234B00086LBEAUFORTSAMPLE16SEDIMENT04CSTATION002 <t< td=""><td></td><td></td><td></td><td></td><td>63</td><td>SEDIMENT</td><td>04C</td><td>STATION010</td></t<> | | | | | 63 | SEDIMENT | 04C | STATION010 |
| 20B00047LBEAUFORTSAMPLE03SEDIMENT04CSTATION01021B00049LBEAUFORTSAMPLE03SEDIMENT04CSTATION01023B00050LBEAUFORTSAMPLE03SEDIMENT04CSTATION02024B00076LBEAUFORTSAMPLE16SEDIMENT04CSTATION02225B00077LBEAUFORTSAMPLE16SEDIMENT04CSTATION02226B00078LBEAUFORTSAMPLE16SEDIMENT04CSTATION02227B00079LBEAUFORTSAMPLE16SEDIMENT04CSTATION02228B00082LBEAUFORTSAMPLE16SEDIMENT04CSTATION02229B00081LBEAUFORTSAMPLE16SEDIMENT04CSTATION02230B00082LBEAUFORTSAMPLE16SEDIMENT04CSTATION02231B00083LBEAUFORTSAMPLE16SEDIMENT04CSTATION02232B00084LBEAUFORTSAMPLE16SEDIMENT04CSTATION02233B00085LBEAUFORTSAMPLE16SEDIMENT04CSTATION02235B00087LBEAUFORTSAMPLE16SEDIMENT04CSTATION02236B00088LBEAUFORTSAMPLE16SEDIMENT04CSTATION02237B00088LBEAUFORTSAMPLE16SEDIMENT04CSTATION022 <t< td=""><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></t<> | | | | | | | | |
| 21B00049LBEAUFORTSAMPLEØ3SEDIMENTØ4CSTATION01022B00049LBEAUFORTSAMPLEØ3SEDIMENTØ4CSTATION01023B00076LBEAUFORTSAMPLEØ3SEDIMENTØ4CSTATION01224B00076LBEAUFORTSAMPLE16SEDIMENTØ4CSTATION00225B00077LBEAUFORTSAMPLE16SEDIMENTØ4CSTATION00226B00079LBEAUFORTSAMPLE16SEDIMENTØ4CSTATION00227B00079LBEAUFORTSAMPLE16SEDIMENTØ4CSTATION00228B00080LBEAUFORTSAMPLE16SEDIMENTØ4CSTATION00229B00081LBEAUFORTSAMPLE16SEDIMENTØ4CSTATION00230B00082LBEAUFORTSAMPLE16SEDIMENTØ4CSTATION00231B00083LBEAUFORTSAMPLE16SEDIMENTØ4CSTATION00233B00084LBEAUFORTSAMPLE16SEDIMENTØ4CSTATION00234B00084LBEAUFORTSAMPLE16SEDIMENTØ4CSTATION00235B00085LBEAUFORTSAMPLE16SEDIMENTØ4CSTATION00236B00089LBEAUFORTSAMPLE16SEDIMENTØ4CSTATION00237B00089LBEAUFORTSAMPLE16SEDIMENTØ4CSTATION002 <t< td=""><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></t<> | | | | | | | | |
| 22B00049LBEAUFORTSAMPLE03SEDIMENT04CSTATION01023B00050LBEAUFORTSAMPLE03SEDIMENT04CSTATION00224B00076LBEAUFORTSAMPLE16SEDIMENT04CSTATION00225B00077LBEAUFORTSAMPLE16SEDIMENT04CSTATION00226B00078LBEAUFORTSAMPLE16SEDIMENT04CSTATION00227B00078LBEAUFORTSAMPLE16SEDIMENT04CSTATION00228B00082LBEAUFORTSAMPLE16SEDIMENT04CSTATION00229B00081LBEAUFORTSAMPLE16SEDIMENT04CSTATION00229B00082LBEAUFORTSAMPLE16SEDIMENT04CSTATION00230B00082LBEAUFORTSAMPLE16SEDIMENT04CSTATION00231B00083LBEAUFORTSAMPLE16SEDIMENT04CSTATION00232B00084LBEAUFORTSAMPLE16SEDIMENT04CSTATION00233B00085LBEAUFORTSAMPLE16SEDIMENT04CSTATION00234B00082LBEAUFORTSAMPLE16SEDIMENT04CSTATION00235B00087LBEAUFORTSAMPLE16SEDIMENT04CSTATION00236B00093LBEAUFORTSAMPLE16SEDIMENT04CSTATION002 <t< td=""><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></t<> | | | | | | | | |
| 23B00050LBEAUFORT SAMPLE03SEDIMENT04CSTATION01024B00076LBEAUFORT SAMPLE16SEDIMENT04CSTATION00225B00077LBEAUFORT SAMPLE16SEDIMENT04CSTATION00226B00078LBEAUFORT SAMPLE16SEDIMENT04CSTATION00227B00079LBEAUFORT SAMPLE16SEDIMENT04CSTATION00228B00080LBEAUFORT SAMPLE16SEDIMENT04CSTATION00229B00081LBEAUFORT SAMPLE16SEDIMENT04CSTATION00230B00082LBEAUFORT SAMPLE16SEDIMENT04CSTATION00231B00083LBEAUFORT SAMPLE16SEDIMENT04CSTATION00232B00084LBEAUFORT SAMPLE16SEDIMENT04CSTATION00233B00085LBEAUFORT SAMPLE16SEDIMENT04CSTATION00234B00086LBEAUFORT SAMPLE16SEDIMENT04CSTATION00235B00083LBEAUFORT SAMPLE16SEDIMENT04CSTATION00236B00089LBEAUFORT SAMPLE16SEDIMENT04CSTATION00237B00089LBEAUFORT SAMPLE16SEDIMENT04CSTATION00238B00091LBEAUFORT SAMPLE16SEDIMENT04CSTATION00239B00092LBEAUFORT SAMPLE16SEDIMENT04CSTATION00239 | | | | | | | 04C | |
| 24B00076LBEAUFORTSAMPLE16SEDIMENT04CSTATION00225B00077LBEAUFORTSAMPLE16SEDIMENT04CSTATION00226B00078LBEAUFORTSAMPLE16SEDIMENT04CSTATION00227B00079LBEAUFORTSAMPLE16SEDIMENT04CSTATION00228B00080LBEAUFORTSAMPLE16SEDIMENT04CSTATION00229B00081LBEAUFORTSAMPLE16SEDIMENT04CSTATION00229B00082LBEAUFORTSAMPLE16SEDIMENT04CSTATION00230B00082LBEAUFORTSAMPLE16SEDIMENT04CSTATION00231B00083LBEAUFORTSAMPLE16SEDIMENT04CSTATION00232B00084LBEAUFORTSAMPLE16SEDIMENT04CSTATION00233B00085LBEAUFORTSAMPLE16SEDIMENT04CSTATION00234B00086LBEAUFORTSAMPLE16SEDIMENT04CSTATION00235B00082LBEAUFORTSAMPLE16SEDIMENT04CSTATION00236B00093LBEAUFORTSAMPLE16SEDIMENT04CSTATION00237B00093LBEAUFORTSAMPLE16SEDIMENT04CSTATION00238B00093LBEAUFORTSAMPLE16SEDIMENT04CSTATION002 <t< td=""><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></t<> | | | | | | | | |
| 25B00077LBEAUFORT SAMPLE16SEDIMENT04CSTATION00226B00078LBEAUFORT SAMPLE16SEDIMENT04CSTATION00227B00079LBEAUFORT SAMPLE16SEDIMENT04CSTATION00228B00080LBEAUFORT SAMPLE16SEDIMENT04CSTATION00229B00081LBEAUFORT SAMPLE16SEDIMENT04CSTATION00230B00082LBEAUFORT SAMPLE16SEDIMENT04CSTATION00231B00083LBEAUFORT SAMPLE16SEDIMENT04CSTATION00232B00083LBEAUFORT SAMPLE16SEDIMENT04CSTATION00233B00085LBEAUFORT SAMPLE16SEDIMENT04CSTATION00234B00086LBEAUFORT SAMPLE16SEDIMENT04CSTATION00235B00087LBEAUFORT SAMPLE16SEDIMENT04CSTATION00236B00088LBEAUFORT SAMPLE16SEDIMENT04CSTATION00237B00089LBEAUFORT SAMPLE16SEDIMENT04CSTATION00238B00091LBEAUFORT SAMPLE16SEDIMENT04CSTATION00239B00092LBEAUFORT SAMPLE16SEDIMENT04CSTATION00240B00093LBEAUFORT SAMPLE16SEDIMENT04CSTATION00241B00094LBEAUFORT SAMPLE16SEDIMENT04CSTATION00242 | | | | | | | | |
| 26B0007SLBEAUFORTSAMPLE16SEDIMENT04CSTATION00227B00079LBEAUFORTSAMPLE16SEDIMENT04CSTATION00228B00080LBEAUFORTSAMPLE16SEDIMENT04CSTATION00229B00081LBEAUFORTSAMPLE16SEDIMENT04CSTATION00230B00082LBEAUFORTSAMPLE16SEDIMENT04CSTATION00231B00083LBEAUFORTSAMPLE16SEDIMENT04CSTATION00232B00084LBEAUFORTSAMPLE16SEDIMENT04CSTATION00233B00085LBEAUFORTSAMPLE16SEDIMENT04CSTATION00234B00086LBEAUFORTSAMPLE16SEDIMENT04CSTATION00235B00085LBEAUFORTSAMPLE16SEDIMENT04CSTATION00236B00088LBEAUFORTSAMPLE16SEDIMENT04CSTATION00237B00089LBEAUFORTSAMPLE16SEDIMENT04CSTATION00238B00091LBEAUFORTSAMPLE16SEDIMENT04CSTATION00239B00092LBEAUFORTSAMPLE16SEDIMENT04CSTATION00240B00093LBEAUFORTSAMPLE16SEDIMENT04CSTATION00241B00094LBEAUFORTSAMPLE16SEDIMENT04CSTATION002 <t< td=""><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></t<> | | | | | | | | |
| 27B00079LBEAUFORTSAMPLE16SEDIMENT04CSTATION00228B00080LBEAUFORTSAMPLE16SEDIMENT04CSTATION00229B00081LBEAUFORTSAMPLE16SEDIMENT04CSTATION00230B00083LBEAUFORTSAMPLE16SEDIMENT04CSTATION00231B00083LBEAUFORTSAMPLE16SEDIMENT04CSTATION00232B00084LBEAUFORTSAMPLE16SEDIMENT04CSTATION00233B00085LBEAUFORTSAMPLE16SEDIMENT04CSTATION00234B00086LBEAUFORTSAMPLE16SEDIMENT04CSTATION00235B00087LBEAUFORTSAMPLE16SEDIMENT04CSTATION00236B00088LBEAUFORTSAMPLE16SEDIMENT04CSTATION00237B00089LBEAUFORTSAMPLE16SEDIMENT04CSTATION00238B00091LBEAUFORTSAMPLE16SEDIMENT04CSTATION00239B00092LBEAUFORTSAMPLE16SEDIMENT04CSTATION00240B00093LBEAUFORTSAMPLE16SEDIMENT04CSTATION00241B00094LBEAUFORTSAMPLE16SEDIMENT04CSTATION00243B00096LBEAUFORTSAMPLE16SEDIMENT04CSTATION002 <t< td=""><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></t<> | | | | | | | | |
| 28B00080LBEAUFORTSAMPLE16SEDIMENT04CSTATION00229B00081LBEAUFORTSAMPLE16SEDIMENT04CSTATION00230B00082LBEAUFORTSAMPLE16SEDIMENT04CSTATION00231B00083LBEAUFORTSAMPLE16SEDIMENT04CSTATION00232B00084LBEAUFORTSAMPLE16SEDIMENT04CSTATION00233B00085LBEAUFORTSAMPLE16SEDIMENT04CSTATION00234B00086LBEAUFORTSAMPLE16SEDIMENT04CSTATION00235B00087LBEAUFORTSAMPLE16SEDIMENT04CSTATION00236B00088LBEAUFORTSAMPLE16SEDIMENT04CSTATION00237B00089LBEAUFORTSAMPLE16SEDIMENT04CSTATION00238B00091LBEAUFORTSAMPLE16SEDIMENT04CSTATION00239B00092LBEAUFORTSAMPLE16SEDIMENT04CSTATION00240B00093LBEAUFORTSAMPLE16SEDIMENT04CSTATION00241B00094LBEAUFORTSAMPLE16SEDIMENT04CSTATION00242B00095LBEAUFORTSAMPLE16SEDIMENT04CSTATION00243B00096LBEAUFORTSAMPLE16SEDIMENT04CSTATION002 <t< td=""><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></t<> | | | | | | | | |
| 29B00081LBEAUFORTSAMPLE16SEDIMENT04CSTATION00230B00082LBEAUFORTSAMPLE16SEDIMENT04CSTATION00231B00083LBEAUFORTSAMPLE16SEDIMENT04CSTATION00232B00084LBEAUFORTSAMPLE16SEDIMENT04CSTATION00233B00085LBEAUFORTSAMPLE16SEDIMENT04CSTATION00234B00086LBEAUFORTSAMPLE16SEDIMENT04CSTATION00235B00087LBEAUFORTSAMPLE16SEDIMENT04CSTATION00236B00088LBEAUFORTSAMPLE16SEDIMENT04CSTATION00237B00089LBEAUFORTSAMPLE16SEDIMENT04CSTATION00238B00091LBEAUFORTSAMPLE16SEDIMENT04CSTATION00239B00092LBEAUFORTSAMPLE16SEDIMENT04CSTATION00240B00093LBEAUFORTSAMPLE16SEDIMENT04CSTATION00241B00094LBEAUFORTSAMPLE16SEDIMENT04CSTATION00243B00096LBEAUFORTSAMPLE16SEDIMENT04CSTATION00244B00097LBEAUFORTSAMPLE16SEDIMENT04CSTATION00245B00098LBEAUFORTSAMPLE16SEDIMENT04CSTATION002 <t< td=""><td></td><td></td><td></td><td>-</td><td></td><td></td><td></td><td></td></t<> | | | | - | | | | |
| 30B00082LBEAUFORTSAMPLE16SEDIMENT04CSTATION00231B00083LBEAUFORTSAMPLE16SEDIMENT04CSTATION00232B00084LBEAUFORTSAMPLE16SEDIMENT04CSTATION00233B00085LBEAUFORTSAMPLE16SEDIMENT04CSTATION00234B00086LBEAUFORTSAMPLE16SEDIMENT04CSTATION00235B00087LBEAUFORTSAMPLE16SEDIMENT04CSTATION00236B00088LBEAUFORTSAMPLE16SEDIMENT04CSTATION00237B00089LBEAUFORTSAMPLE16SEDIMENT04CSTATION00238B00091LBEAUFORTSAMPLE16SEDIMENT04CSTATION00239B00092LBEAUFORTSAMPLE16SEDIMENT04CSTATION00240B00093LBEAUFORTSAMPLE16SEDIMENT04CSTATION00241B00094LBEAUFORTSAMPLE16SEDIMENT04CSTATION00243B00096LBEAUFORTSAMPLE16SEDIMENT04CSTATION00244B00097LBEAUFORTSAMPLE16SEDIMENT04CSTATION00245B00098LBEAUFORTSAMPLE16SEDIMENT04CSTATION00246B00099LBEAUFORTSAMPLE16SEDIMENT04CSTATION002 <t< td=""><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></t<> | | | | | | | | |
| 31B00083LBEAUFORTSAMPLE16SEDIMENT04CSTATION00232B00084LBEAUFORTSAMPLE16SEDIMENT04CSTATION00233B00085LBEAUFORTSAMPLE16SEDIMENT04CSTATION00234B00086LBEAUFORTSAMPLE16SEDIMENT04CSTATION00235B00087LBEAUFORTSAMPLE16SEDIMENT04CSTATION00236B00088LBEAUFORTSAMPLE16SEDIMENT04CSTATION00237B00089LBEAUFORTSAMPLE16SEDIMENT04CSTATION00238B00091LBEAUFORTSAMPLE16SEDIMENT04CSTATION00239B00092LBEAUFORTSAMPLE16SEDIMENT04CSTATION00240B00093LBEAUFORTSAMPLE16SEDIMENT04CSTATION00241B00094LBEAUFORTSAMPLE16SEDIMENT04CSTATION00242B00095LBEAUFORTSAMPLE16SEDIMENT04CSTATION00243B00096LBEAUFORTSAMPLE16SEDIMENT04CSTATION00244B00097LBEAUFORTSAMPLE16SEDIMENT04CSTATION00245B00098LBEAUFORTSAMPLE16SEDIMENT04CSTATION00246B00099LBEAUFORTSAMPLE16SEDIMENT04CSTATION002 <t< td=""><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></t<> | | | | | | | | |
| 32BØØØ84LBEAUFORTSAMPLE16SEDIMENTØ4CSTATIONØØ233BØØØ85LBEAUFORTSAMPLE16SEDIMENTØ4CSTATIONØØ234BØØØ86LBEAUFORTSAMPLE16SEDIMENTØ4CSTATIONØØ235BØØØ87LBEAUFORTSAMPLE16SEDIMENTØ4CSTATIONØØ236BØØØ88LBEAUFORTSAMPLE16SEDIMENTØ4CSTATIONØØ237BØØØ89LBEAUFORTSAMPLE16SEDIMENTØ4CSTATIONØØ238BØØØ91LBEAUFORTSAMPLE16SEDIMENTØ4CSTATIONØØ239BØØØ92LBEAUFORTSAMPLE16SEDIMENTØ4CSTATIONØØ240BØØØ93LBEAUFORTSAMPLE16SEDIMENTØ4CSTATIONØØ241BØØØ93LBEAUFORTSAMPLE16SEDIMENTØ4CSTATIONØØ242BØØØ94LBEAUFORTSAMPLE16SEDIMENTØ4CSTATIONØØ243BØØØ96LBEAUFORTSAMPLE16SEDIMENTØ4CSTATIONØØ244BØØØ96LBEAUFORTSAMPLE16SEDIMENTØ4CSTATIONØØ245BØØ098LBEAUFORTSAMPLE16SEDIMENTØ4CSTATIONØØ246BØØ099LBEAUFORTSAMPLE16SEDIMENTØ4CSTATIONØØ247BØØ100LBEAUFORTSAMPLE16SEDIMENTØ4CSTATIONØØ2 <t< td=""><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></t<> | | | | | | | | |
| 33B00085LBEAUFORTSAMPLE16SEDIMENT04CSTATION00234B00086LBEAUFORTSAMPLE16SEDIMENT04CSTATION00235B00087LBEAUFORTSAMPLE16SEDIMENT04CSTATION00236B00088LBEAUFORTSAMPLE16SEDIMENT04CSTATION00237B00089LBEAUFORTSAMPLE16SEDIMENT04CSTATION00238B00091LBEAUFORTSAMPLE16SEDIMENT04CSTATION00239B00092LBEAUFORTSAMPLE16SEDIMENT04CSTATION00240B00093LBEAUFORTSAMPLE16SEDIMENT04CSTATION00241B00094LBEAUFORTSAMPLE16SEDIMENT04CSTATION00242B00095LBEAUFORTSAMPLE16SEDIMENT04CSTATION00243B00096LBEAUFORTSAMPLE16SEDIMENT04CSTATION00244B00097LBEAUFORTSAMPLE16SEDIMENT04CSTATION00245B00098LBEAUFORTSAMPLE16SEDIMENT04CSTATION00246B00099LBEAUFORTSAMPLE16SEDIMENT04CSTATION00247B00100LBEAUFORTSAMPLE16SEDIMENT04CSTATION00248B00126LBEAUFORTSAMPLE16SEDIMENT04CSTATION02 <td< td=""><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></td<> | | | | | | | | |
| 34B00086LBEAUFORTSAMPLE16SEDIMENT04CSTATION00235B00087LBEAUFORTSAMPLE16SEDIMENT04CSTATION00236B00088LBEAUFORTSAMPLE16SEDIMENT04CSTATION00237B00089LBEAUFORTSAMPLE16SEDIMENT04CSTATION00238B00091LBEAUFORTSAMPLE16SEDIMENT04CSTATION00239B00092LBEAUFORTSAMPLE16SEDIMENT04CSTATION00240B00093LBEAUFORTSAMPLE16SEDIMENT04CSTATION00241B00094LBEAUFORTSAMPLE16SEDIMENT04CSTATION00242B00095LBEAUFORTSAMPLE16SEDIMENT04CSTATION00243B00096LBEAUFORTSAMPLE16SEDIMENT04CSTATION00244B00097LBEAUFORTSAMPLE16SEDIMENT04CSTATION00245B00098LBEAUFORTSAMPLE16SEDIMENT04CSTATION00246B00099LBEAUFORTSAMPLE16SEDIMENT04CSTATION00247B00100LBEAUFORTSAMPLE16SEDIMENT04CSTATION00248B00126LBEAUFORTSAMPLE16SEDIMENT04CSTATION00249B00127LBEAUFORTSAMPLE22SEDIMENT04CSTATION021 <t< td=""><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></t<> | | | | | | | | |
| 35B00087LBEAUFORTSAMPLE16SEDIMENT04CSTATION00236B00088LBEAUFORTSAMPLE16SEDIMENT04CSTATION00237B00089LBEAUFORTSAMPLE16SEDIMENT04CSTATION00238B00091LBEAUFORTSAMPLE16SEDIMENT04CSTATION00239B00092LBEAUFORTSAMPLE16SEDIMENT04CSTATION00240B00093LBEAUFORTSAMPLE16SEDIMENT04CSTATION00241B00094LBEAUFORTSAMPLE16SEDIMENT04CSTATION00242B00095LBEAUFORTSAMPLE16SEDIMENT04CSTATION00243B00096LBEAUFORTSAMPLE16SEDIMENT04CSTATION00244B00097LBEAUFORTSAMPLE16SEDIMENT04CSTATION00245B00098LBEAUFORTSAMPLE16SEDIMENT04CSTATION00246B00099LBEAUFORTSAMPLE16SEDIMENT04CSTATION00247B00100LBEAUFORTSAMPLE16SEDIMENT04CSTATION00248B00126LBEAUFORTSAMPLE16SEDIMENT04CSTATION00249B00127LBEAUFORTSAMPLE22SEDIMENT04CSTATION0249B00127LBEAUFORTSAMPLE22SEDIMENT04CSTATION02 | | | | | | | | |
| 36BØØØ88LBEAUFORTSAMPLE16SEDIMENTØ4CSTATIONØØ237BØØØ89LBEAUFORTSAMPLE16SEDIMENTØ4CSTATIONØØ238BØØØ91LBEAUFORTSAMPLE16SEDIMENTØ4CSTATIONØØ239BØØØ92LBEAUFORTSAMPLE16SEDIMENTØ4CSTATIONØØ240BØØØ93LBEAUFORTSAMPLE16SEDIMENTØ4CSTATIONØØ241BØØØ94LBEAUFORTSAMPLE16SEDIMENTØ4CSTATIONØØ242BØØØ94LBEAUFORTSAMPLE16SEDIMENTØ4CSTATIONØØ243BØØØ96LBEAUFORTSAMPLE16SEDIMENTØ4CSTATIONØØ244BØØØ96LBEAUFORTSAMPLE16SEDIMENTØ4CSTATIONØØ245BØØØ98LBEAUFORTSAMPLE16SEDIMENTØ4CSTATIONØØ245BØØØ98LBEAUFORTSAMPLE16SEDIMENTØ4CSTATIONØØ246BØØØ98LBEAUFORTSAMPLE16SEDIMENTØ4CSTATIONØØ247BØØ100LBEAUFORTSAMPLE16SEDIMENTØ4CSTATIONØ248BØØ126LBEAUFORTSAMPLE16SEDIMENTØ4CSTATIONØ249BØØ126LBEAUFORTSAMPLE22SEDIMENTØ4CSTATIONØ7149BØØ127LBEAUFORTSAMPLE22SEDIMENTØ4CSTATIONØ71 | | | | | | | | |
| 37B00089LBEAUFORTSAMPLE16SEDIMENT04CSTATION00238B00091LBEAUFORTSAMPLE16SEDIMENT04CSTATION00239B00092LBEAUFORTSAMPLE16SEDIMENT04CSTATION00240B00093LBEAUFORTSAMPLE16SEDIMENT04CSTATION00241B00094LBEAUFORTSAMPLE16SEDIMENT04CSTATION00242B00095LBEAUFORTSAMPLE16SEDIMENT04CSTATION00243B00096LBEAUFORTSAMPLE16SEDIMENT04CSTATION00244B00097LBEAUFORTSAMPLE16SEDIMENT04CSTATION00245B00098LBEAUFORTSAMPLE16SEDIMENT04CSTATION00246B00098LBEAUFORTSAMPLE16SEDIMENT04CSTATION00247B00100LBEAUFORTSAMPLE16SEDIMENT04CSTATION02248B00126LBEAUFORTSAMPLE16SEDIMENT04CSTATION02149B00127LBEAUFORTSAMPLE22SEDIMENT04CSTATION021 | | | | | | | | |
| 38BØØØ91LBEAUFORTSAMPLE16SEDIMENTØ4CSTATIONØØ239BØØØ92LBEAUFORTSAMPLE16SEDIMENTØ4CSTATIONØØ240BØØØ93LBEAUFORTSAMPLE16SEDIMENTØ4CSTATIONØØ241BØØØ94LBEAUFORTSAMPLE16SEDIMENTØ4CSTATIONØØ242BØØØ94LBEAUFORTSAMPLE16SEDIMENTØ4CSTATIONØØ243BØØØ96LBEAUFORTSAMPLE16SEDIMENTØ4CSTATIONØØ244BØØØ97LBEAUFORTSAMPLE16SEDIMENTØ4CSTATIONØØ245BØØØ98LBEAUFORTSAMPLE16SEDIMENTØ4CSTATIONØØ246BØØØ98LBEAUFORTSAMPLE16SEDIMENTØ4CSTATIONØØ247BØØ100LBEAUFORTSAMPLE16SEDIMENTØ4CSTATIONØØ248BØØ126LBEAUFORTSAMPLE16SEDIMENTØ4CSTATIONØ249BØ0127LBEAUFORTSAMPLE22SEDIMENTØ4CSTATIONØ71 | | | | | | | | |
| 39B00092LBEAUFORTSAMPLE16SEDIMENT04CSTATION00240B00093LBEAUFORTSAMPLE16SEDIMENT04CSTATION00241B00094LBEAUFORTSAMPLE16SEDIMENT04CSTATION00242B00095LBEAUFORTSAMPLE16SEDIMENT04CSTATION00243B00096LBEAUFORTSAMPLE16SEDIMENT04CSTATION00244B00097LBEAUFORTSAMPLE16SEDIMENT04CSTATION00245B00098LBEAUFORTSAMPLE16SEDIMENT04CSTATION00246B00099LBEAUFORTSAMPLE16SEDIMENT04CSTATION00247B00100LBEAUFORTSAMPLE16SEDIMENT04CSTATION00248B00126LBEAUFORTSAMPLE16SEDIMENT04CSTATION02149B00127LBEAUFORTSAMPLE22SEDIMENT04CSTATION071 | | | | | | | | |
| 40B00093LBEAUFORT SAMPLE 16SEDIMENT 04CSTATION00241B00094LBEAUFORT SAMPLE 16SEDIMENT 04CSTATION00242B00095LBEAUFORT SAMPLE 16SEDIMENT 04CSTATION00243B00096LBEAUFORT SAMPLE 16SEDIMENT 04CSTATION00244B00097LBEAUFORT SAMPLE 16SEDIMENT 04CSTATION00245B00098LBEAUFORT SAMPLE 16SEDIMENT 04CSTATION00246B00099LBEAUFORT SAMPLE 16SEDIMENT 04CSTATION00247B00100LBEAUFORT SAMPLE 16SEDIMENT 04CSTATION00248B00126LBEAUFORT SAMPLE 22SEDIMENT 04CSTATION07149B00127LBEAUFORT SAMPLE 22SEDIMENT 04CSTATION071 | | | | | | | | |
| 41B00094LBEAUFORTSAMPLE16SEDIMENT04CSTATION00242B00095LBEAUFORTSAMPLE16SEDIMENT04CSTATION00243B00096LBEAUFORTSAMPLE16SEDIMENT04CSTATION00244B00097LBEAUFORTSAMPLE16SEDIMENT04CSTATION00245B00098LBEAUFORTSAMPLE16SEDIMENT04CSTATION00246B00099LBEAUFORTSAMPLE16SEDIMENT04CSTATION00247B00100LBEAUFORTSAMPLE16SEDIMENT04CSTATION00248B00126LBEAUFORTSAMPLE16SEDIMENT04CSTATION07149B00127LBEAUFORTSAMPLE22SEDIMENT04CSTATION071 | | | | | | | | |
| 42B00095LBEAUFORTSAMPLE16SEDIMENT04CSTATION00243B00096LBEAUFORTSAMPLE16SEDIMENT04CSTATION00244B00097LBEAUFORTSAMPLE16SEDIMENT04CSTATION00245B00098LBEAUFORTSAMPLE16SEDIMENT04CSTATION00246B00099LBEAUFORTSAMPLE16SEDIMENT04CSTATION00247B00100LBEAUFORTSAMPLE16SEDIMENT04CSTATION00248B00126LBEAUFORTSAMPLE16SEDIMENT04CSTATION07149B00127LBEAUFORTSAMPLE22SEDIMENT04CSTATION071 | | | | | | | | • • |
| 43B00096LBEAUFORTSAMPLE16SEDIMENT04CSTATION00244B00097LBEAUFORTSAMPLE16SEDIMENT04CSTATION00245B00098LBEAUFORTSAMPLE16SEDIMENT04CSTATION00246B00099LBEAUFORTSAMPLE16SEDIMENT04CSTATION00247B00100LBEAUFORTSAMPLE16SEDIMENT04CSTATION00248B00126LBEAUFORTSAMPLE16SEDIMENT04CSTATION00249B00127LBEAUFORTSAMPLE22SEDIMENT04CSTATION071 | | | | | | | | |
| 44B00097LBEAUFORT SAMPLE 16SEDIMENT 04CSTATION00245B00098LBEAUFORT SAMPLE 16SEDIMENT 04CSTATION00246B00099LBEAUFORT SAMPLE 16SEDIMENT 04CSTATION00247B00100LBEAUFORT SAMPLE 16SEDIMENT 04CSTATION00248B00126LBEAUFORT SAMPLE 22SEDIMENT 04CSTATION07149B00127LBEAUFORT SAMPLE 22SEDIMENT 04CSTATION071 | | | | | | | | |
| 45B00098LBEAUFORT SAMPLE 16SEDIMENT 04CSTATION00246B00099LBEAUFORT SAMPLE 16SEDIMENT 04CSTATION00247B00100LBEAUFORT SAMPLE 16SEDIMENT 04CSTATION00248B00126LBEAUFORT SAMPLE 22SEDIMENT 04CSTATION07149B00127LBEAUFORT SAMPLE 22SEDIMENT 04CSTATION071 | | | | | | | | |
| 46B00099LBEAUFORT SAMPLE 16SEDIMENT 04CSTATION00247B00100LBEAUFORT SAMPLE 16SEDIMENT 04CSTATION00248B00126LBEAUFORT SAMPLE 22SEDIMENT 04CSTATION07149B00127LBEAUFORT SAMPLE 22SEDIMENT 04CSTATION071 | | | | | | | | |
| 47B00100LBEAUFORT SAMPLE 16SEDIMENT 04CSTATION00248B00126LBEAUFORT SAMPLE 22SEDIMENT 04CSTATION07149B00127LBEAUFORT SAMPLE 22SEDIMENT 04CSTATION071 | | | | | | | | |
| 48B00126LBEAUFORT SAMPLE 22SEDIMENT 04CSTATION07149B00127LBEAUFORT SAMPLE 22SEDIMENT 04CSTATION071 | | | | | | | | |
| 49 B00127L BEAUFORT SAMPLE 22 SEDIMENT 04C STATION071 | | | | | | | | |
| | | | | | | | | |
| 50 B00128L BEAUFORT SAMPLE 22 SEDIMENT 04C STATION071 | | | | | | | | |
| | 50 | R00158F | BEAUFORT | SAMPLE | 22 | SEDIMENT | 04C | STATION071 |

| 51 | B00129L | BEAUFORT | SAMPLE 22 | | 04C STATION071 |
|-----|---------|------------|-----------|----------|----------------|
| 52 | B00130L | BEAUFORT | SAMPLE 22 | SEDIMENT | 04C STATION071 |
| | | BEAUFORT | SAMPLE 22 | | 04C STATION071 |
| 53 | 800131L | | | | |
| 54 | B00132L | BEAUFORT | SAMPLE 22 | | 04C STATION071 |
| 55 | B00133L | BEAUFORT | SAMPLE 22 | SEDIMENT | 04C STATION071 |
| | B00134L | BEAUFORT | SAMPLE 22 | | 04C STATION071 |
| 56 | | | | | |
| 57 | B00135L | BEAUFORT | SAMPLE 22 | | 04C STATION071 |
| 58 | B00136L | BEAUFORT | SAMPLE 22 | SEDIMENT | 04C STATION071 |
| 59 | B00137L | BEAUFORT | SAMPLE 22 | SEDIMENT | 04C STATION071 |
| | | | | | 04C STATION071 |
| 60 | B00138L | BEAUFORT | | | |
| 61 | B00139L | BEAUFORT | SAMPLE 22 | | 04C STATION071 |
| 62 | B00140L | BEAUFORT | SAMPLE 22 | SEDIMENT | 04C STATION071 |
| | | BEAUFORT | SAMPLE 22 | | 04C STATION071 |
| 63 | B00141L | | | | |
| 64 | B00143L | BEAUFORT | SAMPLE 22 | | 04C STATION071 |
| 65 | B00144L | BEAUFORT | SAMPLE 22 | SEDIMENT | 04C STATION071 |
| 66 | B00145L | BEAUFORT | SAMPLE 22 | SEDIMENT | 04C STATION071 |
| | | | | | 04C STATION071 |
| 67 | B00146L | BEAUFORT | SAMPLE 22 | | |
| 68 | B00147L | BEAUFORT | SAMPLE 22 | SEDIMENT | 04C STATION071 |
| 69 | B00148L | BEAUFORT | SAMPLE 22 | SEDIMENT | 04C STATION071 |
| | | | SAMPLE 22 | | 04C STATION071 |
| 70 | B00149L | BEAUFORT | | | |
| 71 | B00150L | BEAUFORT | SAMPLE 22 | | 04C STATION071 |
| 72 | B00176L | BEAUFORT | SAMPLE 20 | SEDIMENT | 04C STATION055 |
| 73 | B00177L | BEAUFORT | SAMPLE 20 | SEDIMENT | 04C STATION055 |
| | | BEAUFORT | SAMPLE 20 | | 04C STATION055 |
| 74 | B00178L | • • | | | 04C STATION055 |
| 75 | B00179L | BEAUFORT | SAMPLE 20 | | |
| 76 | B00180L | BEAUFORT | SAMPLE 20 | SEDIMENT | 04C STATION055 |
| 77 | B00181L | BEAUFORT | SAMPLE 20 | SEDIMENT | 04C STATION055 |
| 78 | 800182L | BEAUFORT | SAMPLE 20 | SEDIMENT | 04C STATION055 |
| | | | | | 04C STATION055 |
| 79 | B00183L | BEAUFORT | | | |
| 80 | B00184L | BEAUFORT | SAMPLE 20 | SEDIMENT | 04C STATION055 |
| 81 | 800185L | BEAUFORT | SAMPLE 20 | SEDIMENT | 04C STATION055 |
| ŝŝ | B00186L | BEAUFORT | SAMPLE 20 | SEDIMENT | 04C STATION055 |
| | | BEAUFORT | SAMPLE 20 | • , | 04C STATION055 |
| 83 | B00187L | | | | |
| 84 | B00188L | BEAUFORT | SAMPLE 20 | | |
| 85 | B00189L | BEAUFORT | SAMPLE 20 | SEDIMENT | 04C STATION055 |
| 86 | 800190L | BEAUFORT | SAMPLE 20 | SEDIMENT | 04C STATION055 |
| | B00191L | BEAUFORT | SAMPLE 20 | | 04C STATION055 |
| 87 | | DENUT ON T | | | |
| 88 | B00192L | BEHURUR I | SHIPLE 20 | SEDIREIN | 04C STATION055 |
| 89 | B00194L | BEAUFORT | SAMPLE 20 | SEDIMENT | 04C STATION055 |
| 90 | B00195L | BEAUFORT | SAMPLE 20 | SEDIMENT | 04C STATION055 |
| 91 | B00196L | BEAUFORT | | | 04C STATION055 |
| | | | | | 04C STATION055 |
| 92 | B00197L | BEAUFORT | | | |
| 93 | B00198L | BEAUFORT | | | 04C STATION055 |
| 94 | B00199L | BEAUFORT | | | 04C STATION055 |
| 95 | B00200L | BEAUFORT | SAMPLE 20 | SEDIMENT | 04C STATION055 |
| | | BEAUFORT | | | 04C STATION070 |
| 96 | B00556F | | | | |
| 97 | B00227L | BEAUFORT | | | 04C STATION070 |
| 98 | B00228L | BEAUFORT | SAMPLE 21 | | 04C STATION070 |
| 99 | B00229L | BEAUFORT | SAMPLE 21 | SEDIMENT | 04C STATION070 |
| | 800230L | BEAUFORT | | | 04C STATION070 |
| 100 | | | | | 04C STATION070 |
| 101 | B00231L | BEAUFORT | | | |
| 102 | B00232L | BEAUFORT | | | 04C STATION070 |
| 103 | B00233L | BEAUFORT | SAMPLE 21 | SEDIMENT | 04C STATION070 |
| 104 | B00234L | BEAUFORT | | | |
| | | | | | |
| 105 | B00235L | BEAUFORT | | | |
| 106 | B00236L | BEAUFORT | | | 04C STATION070 |
| 107 | B00237L | BERUFORT | SAMPLE 21 | | 04C STATION070 |
| 108 | B00238L | BEAUFORT | | SEDIMENT | 04C STATION070 |
| | B00239L | BEAUFORT | | | 04C STATION070 |
| 109 | | | | | 04C STATION070 |
| 110 | 800240L | BEAUFORT | SAMPLE 21 | SEDINERI | OTE CHILDING C |
| | | | | | |

.

| | B00241L | BEAUFORT | SAMPLE | 21 | SEDIMENT | Ø4C | STATION070 |
|--------------|------------------------------|---------------------------|------------------|---------------|-----------|------------|--------------|
| 111 112 | B90242L | BEAUFORT | | | SEDIMENT | | |
| 113 | 800243L | BEAUFORT | | 21 | SEDIMENT | | STATION070 |
| | B00244L | BEAUFORT | | 21 | SEDIMENT | | STATION070 |
| 114 | | | | | | | |
| 115 | B00245L | BEAUFORT | | 21 | SEDIMENT | | STATION070 |
| 116 | B00246L | BEAUFORT | SAMPLE | 21 | SEDIMENT | | STATION070 |
| 117 | B00247L | BEAUFORT | SAMPLE | 21 | SEDIMENT | | STATION070 |
| 118 | B00248L | BEAUFORT | SAMPLE | 21 | SEDIMENT | | STATION070 |
| 119 | B00249L | BEAUFORT | | 21 | SEDIMENT | | STATION070 |
| 120 | B00250L | BEAUFORT | | 21 | SEDIMENT | | STATION070 |
| 121 | B00251L | BEAUFORT | SAMPLE | Ø9 | SEDIMENT | 04C | STATION030 |
| 122 | B00252L | BEAUFORT | SAMPLE | Ø9 | SEDIMENT | 04C | STATION030 |
| 123 | B00253L | BEAUFORT | SAMPLE | 09 | SEDIMENT | 04C | STATION030 |
| 124 | B00254L | BEAUFORT | SAMPLE | 09 | SEDIMENT | 04C | STATION030 |
| 125 | B00256L | BEAUFORT | SAMPLE | 09 | SEDIMENT | 04C | STATION030 |
| 126 | B00257L | BEAUFORT | SAMPLE | 09 | SEDIMENT | 04C | STATION030 |
| 127 | B00258L | BEAUFORT | SAMPLE | Ø9 | SEDIMENT | 04C | STATION030 |
| 128 | B00259L | BEAUFORT | SAMPLE | 09 | SEDIMENT | 04C | STATION030 |
| 129 | B00261L | BEAUFORT | SAMPLE | 09 | SEDIMENT | 04C | STATION030 |
| 130 | B00262L | BEAUFORT | SAMPLE | 09 | SEDIMENT | 04C | STATION030 |
| 131 | B00263L | BEAUFORT | SAMPLE | 09 | SEDIMENT | 04C | STATION030 |
| 132 | B00264L | BEAUFORT | SAMPLE | 69 | SEDIMENT | 04C | STATION030 |
| 133 | 800265L | BEAUFORT | SAMPLE | 09 | SEDIMENT | 04C | STATION030 |
| 134 | B00266L | BEAUFORT | SAMPLE | 09 | SEDIMENT | 04C | STATION030 |
| 135 | B00267L | BEAUFORT | SAMPLE | Ø9 | SEDIMENT | 04C | STATION030 |
| 136 | B00268L | BEAUFORT | SAMPLE | <u>0</u> 9 | SEDIMENT | 04C | STATION030 |
| 137 | B00269L | BEAUFORT | SAMPLE | Ø9 | SEDIMENT | 04C | STATION030 |
| 138 | B90271L | BEAUFORT | SAMPLE | <u>0</u> 9 | SEDIMENT | 04C | STATION030 |
| 139 | B00272L | BEAUFORT | SAMPLE | 09 | SEDIMENT | 040 040 | STATION030 |
| 140 | B00273L | BEAUFORT | SAMPLE | 69 | SEDIMENT | 04C | STATION030 |
| 141 | B00274L | BEAUFORT | SAMPLE | <u>0</u> 9 | SEDIMENT | 04C | STATION030 |
| 142 | B00275L | BEAUFORT | SAMPLE | õ9 | SEDIMENT | 04C | STATION030 |
| 143 | B00286L | BEAUFORT | SAMPLE | 15 | SEDIMENT | 04C | STATION001 |
| 144 | B00287L | BEAUFORT | SAMPLE | 15 | SEDIMENT | | STATION001 |
| 145 | B00288L | BEAUFORT | SAMPLE | 15 | SEDIMENT | | STATION001 |
| 146 | B00289L | BEAUFORT | SAMPLE | | SEDIMENT | | STATION001 |
| 147 | B00290L | BEAUFORT | SAMPLE | | SEDIMENT | | STATION001 |
| 148 | B00296L | BEAUFORT | | | SEDIMENT | | STATION002 |
| 149 | B00297L | BEAUFORT | | | SEDIMENT | | STATION002 |
| 150 | B00298L | BEAUFORT | | | SEDIMENT | | STATION002 |
| 151 | B00299L | | | | SEDIMENT | | STATION002 |
| ala "an" ala | and for the loss of the last | المراجع المساعية المساحية | waiti i i baalaa | ني ا ل | OF DIVENI | 046 | STREET ONDER |

-

END FORM 151 STRAINS

| 1 | B00001H | BEAUFORT | SAMPLE | | WATER | | |
|----|---------|-----------|----------|------|---------|-------|------------|
| 2 | B00002H | BEAUFORT | SAMPLE | Ø3 | WATER | 200 | STATION010 |
| 3 | B00003H | BEAUFORT | SAMPLE | 03 | WATER | 20C | STATION010 |
| 4 | B00004H | BEAUFORT | SAMPLE | 03 | WATER | 20C | STATION010 |
| 5 | B00005H | BEAUFORT | SAMPLE | 03 | WATER | 20C | STATION010 |
| 6 | B00006H | BEAUFRT : | SAMPLE (| 03 I | ARTER (| 200 (| STATION010 |
| 7 | B00007H | BEAUFORT | SAMPLE | 03 | WATER | 200 | STATION010 |
| 8 | B00008H | BEAUFORT | SAMPLE | 03 | WATER | 200 | STATION010 |
| ğ | B00009H | BEAUFORT | SAMPLE | 03 | WATER | 200 | STATION010 |
| 10 | B00010H | BEAUFORT | SAMPLE | 03 | WATER | 200 | STATION010 |
| | | BEAUFORT | SAMPLE | 03 | WATER | 200 | STATION010 |
| 11 | B00011H | | | 03 | | 200 | STATION010 |
| 12 | B00012H | BEAUFORT | SAMPLE | | WATER | | |
| 13 | B00013H | BEAUFORT | SAMPLE | 03 | WATER | 200 | STATION010 |
| 14 | B00014H | BEAUFORT | SAMPLE | 03 | WATER | 20C | STATION010 |
| 15 | B00015H | BEAUFORT | SAMPLE | 03 | WATER | 200 | STATION010 |
| 16 | B00016H | BEAUFORT | SAMPLE | ØЗ | WATER | 20C | STATION010 |
| 17 | B00017H | BEAUFORT | SAMPLE | 03 | WATER | 200 | STATION010 |
| 18 | E00018H | BEAUFORT | SAMPLE | 93 | WATER | 200 | STATION010 |
| 19 | B00019H | BEAUFORT | SAMPLE | 03 | WATER | 200 | STATION010 |
| 20 | B00020H | BEAUFORT | SAMPLE | 03 | WATER | 200 | STATION010 |
| 21 | B00021H | BEAUFORT | SAMPLE | 03 | WATER | 20C | STATION010 |
| 22 | B00022H | BEAUFORT | SAMPLE | | WATER | 200 | STATION010 |
| 23 | 800023H | BEAUFORT | SAMPLE | 03 | WATER | 200 | STATION010 |
| 24 | B00024H | BEAUFORT | SAMPLE | йš | WATER | 200 | STATION010 |
| | | BEAUFORT | SAMPLE | 20 | MATER | 200 | STATION020 |
| 25 | B00051H | | | | | 200 | STATION020 |
| 26 | B00052H | BEAUFORT | SAMPLE | 20 | WATER | | |
| 27 | B00053H | BEAUFORT | SAMPLE | 20 | WATER | 200 | STATION020 |
| 28 | B00054H | BEAUFORT | SAMPLE | 20 | WATER | 200 | STATION020 |
| 59 | B00055H | BEAUFORT | SAMPLE | 20 | WATER | 200 | STATION020 |
| 30 | B00056H | BEAUFORT | SAMPLE | 20 | WATER | 290 | STATION020 |
| 31 | B00057H | BEAUFORT | SAMPLE | 20 | WATER | 20C | STATION020 |
| 32 | B00058H | BEAUFORT | SAMPLE | 80 | WATER | 200 | STATION002 |
| 33 | B00059H | BEAUFORT | SAMPLE | 20 | MATER | 200 | STATION002 |
| 34 | B00060H | BEAUFORT | SAMPLE | 20 | WATER | 200 | STATION002 |
| 35 | B00061H | BEAUFORT | SAMPLE | 20 | WATER | 20C | STATION002 |
| 36 | B00062H | BEAUFORT | SAMPLE | 20 | WATER | 200 | STATION002 |
| 37 | B00063H | BEAUFORT | SAMPLE | 20 | WATER | 200 | STATION002 |
| 38 | B00064H | BEAUFORT | | | | 200 | STATION002 |
| 39 | B00065H | BEAUFORT | SAMPLE | | | | STATION002 |
| 40 | B00066H | BEAUFORT | SAMPLE | | WATER | 200 | STATION002 |
| | | | | | | 200 | STATION002 |
| 41 | B00067H | BEAUFORT | SAMPLE | 20 | WATER | | |
| 42 | B00068H | BEAUFORT | SAMPLE | | MATER | 200 | STATION002 |
| 43 | B00069H | BEAUFORT | SAMPLE | | WATER | 200 | STATION002 |
| 44 | B00070H | BEAUFORT | SAMPLE | | WATER | 200 | STATION002 |
| 45 | B00071H | BEAUFORT | SAMPLE | 20 | WATER | 200 | STATION002 |
| 46 | B00072H | BEAUFORT | SAMPLE | | WATER | 500 | STATION002 |
| 47 | B00073H | BEAUFORT | SAMPLE | | WATER | 200 | STATION002 |
| 48 | B00075H | BEAUFORT | SAMPLE | | WATER | 20C | STATION002 |
| 49 | B00101H | BEAUFORT | SAMPLE | 27 | WATER | 59C | STATION071 |
| 50 | B00102H | BEAUFORT | SAMPLE | 27 | WATER | 200 | STATION071 |
| | | | | | | | |

| 51 | B00103H | BEAUFORT | SAMPLE | 27 | MATER | 20C | STATION071 |
|----------|---------|----------|--------|---------------|-------|-----|------------|
| 52 | B00104H | BEAUFORT | | 27 | WATER | 200 | STATION071 |
| | | | | 27 | WATER | 200 | STATION071 |
| 53 | B00106H | BEAUFORT | | | | 200 | STATION071 |
| 54 | B00109H | BEAUFORT | | 27 | WATER | | |
| 55 | B00110H | BEAUFORT | SAMPLE | 27 | WATER | 20C | STATION071 |
| 56 | B00111H | BEAUFORT | SAMPLE | 27 | WATER | 200 | STATION071 |
| | | BEAUFORT | •••••• | 27 | WATER | 200 | STATION071 |
| 57 | B00112H | | | 27 | WATER | 200 | STATION071 |
| 58 | E00113H | BEAUFORT | | | | | STATION071 |
| 59 | B00114H | BEAUFORT | | 27 | WHTER | 200 | |
| 60 | B00115H | BEAUFORT | | 27 | WATER | 200 | STATION071 |
| 61 | B00116H | BEAUFORT | SAMPLE | 27 | WATER | 200 | STATION071 |
| 62 | B00117H | BEAUFORT | | 27 | WATER | 200 | STATION071 |
| | | BEAUFORT | SAMPLE | 27 | WATER | 200 | STATION071 |
| 63 | B00118H | | | | | 200 | STATION071 |
| 64 | B00119H | BEAUFORT | SAMPLE | 27 | WATER | | |
| 65 | B00120H | BEAUFORT | | 27 | WATER | 200 | STATION071 |
| 66 | B00121H | BEAUFORT | SAMPLE | 27 | WATER | 200 | STATION071 |
| 67 | B00122H | BEAUFORT | SAMPLE | 27 | WATER | 200 | STATION071 |
| | | BEAUFORT | SAMPLE | 27 | WATER | 200 | STATION071 |
| 68 | 800123H | | SAMPLE | 24 | WATER | 200 | STATION055 |
| 69 | B00151H | BEAUFORT | | | | 200 | STATION055 |
| 70 | B00152H | BEAUFORT | SAMPLE | 24 | WATER | | |
| 71 | B00153H | BEAUFORT | SAMPLE | 24 | WATER | 200 | STATION055 |
| 72 | B00154H | BEAUFORT | SAMPLE | 24 | WATER | 200 | STATION055 |
| 73 | B00155H | BEAUFORT | SAMPLE | 24 | WATER | 200 | STATION055 |
| 74 | B00156H | BEAUFORT | SAMPLE | 24 | WATER | 200 | STATION055 |
| | | BEAUFORT | SAMPLE | 24 | WATER | 20C | STATION055 |
| 75 | 800157H | | SAMPLE | 24 | WATER | 200 | STATION055 |
| 76 | B00158H | BEAUFORT | | | | 200 | STATION055 |
| 77 | B00159H | BEAUFORT | SAMPLE | 24 | WATER | | |
| 78 | B00160H | BEAUFORT | SAMPLE | 24 | WATER | | |
| 79 | B00161H | BEAUFORT | SAMPLE | 24 | WATER | 200 | STATION055 |
| 80 | B00162H | BEAUFORT | SAMPLE | 24, | WATER | 200 | STATION055 |
| 81 | B00163H | BEAUFORT | SAMPLE | 24 | WATER | 200 | STATION055 |
| | | | | | | | STATION055 |
| 82 | B00164H | BEAUFORT | SAMPLE | 24 | WATER | 200 | |
| 83 | B00165H | BEAUFORT | SAMPLE | 24 | WATER | 200 | STATION055 |
| -84 | B00166H | BEAUFORT | SAMPLE | 24 | WATER | 20C | STATION055 |
| 85 | B00168H | BEAUFORT | SAMPLE | $\mathbb{Z}4$ | WATER | 20C | STATION055 |
| 86 | B00169H | BEAUFORT | SAMPLE | 24 | WATER | 200 | STATION055 |
| 87 | B00170H | BEAUFORT | | | WATER | 200 | STATION055 |
| 88 | B00201H | | | | | | STATION070 |
| 89 | B00202H | | | | | | STATION070 |
| | | | | | | | |
| 90 | B00203H | BEAUFORT | | | | | |
| 91 | B00204H | BEAUFORT | | | | | |
| 92 | 800205H | BEAUFORT | | | | | |
| 93 | B00206H | BEAUFORT | SAMPLE | 26 | WATER | 20C | STATION070 |
| 94 | 300207H | BEAUFORT | SAMPLE | 26 | WATER | 20C | STATION070 |
| 95 | B00208H | BEAUFORT | | | | | |
| 96 | 800210H | | | | | | STATION070 |
| 97 | B00211H | BEAUFORT | | | | | STATION070 |
| 27 98 | | | | | | | STATION070 |
| | B00212H | BEAUFORT | | | | | |
| .99 | B00213H | BEAUFORT | | | | | |
| 100 | B00216H | BEAUFORT | SHMPLE | 26 | MHTER | SRC | STATION070 |
| | | | | | | | |

.

| 4 74 4 | 00001701 | | COMPLE | <u>-</u> | voren | 000 | STATION070 |
|--------|----------|---------------------------------------|--------|-----------------|-------|-------------------|------------|
| 101 | B00217H | BEAUFORT | SAMPLE | | •••• | | |
| 102 | B00219H | BEAUFORT | SAMPLE | 26 | WATER | 200 | STATION070 |
| 103 | B00221H | BEAUFORT | SAMPLE | 26 | WATER | 20C | STATION070 |
| 104 | B00222H | BEAUFORT | SAMPLE | 26 | WATER | 200 | STATION070 |
| 105 | B00223H | BEAUFORT | SAMPLE | 26 | WATER | 203 | STATION070 |
| 106 | B00251H | BEAUFORT | SAMPLE | 11 | WATER | 200 | STATION030 |
| 107 | B00252H | BEAUFORT | SAMPLE | 11 | WATER | 200 | STATION030 |
| 108 | B00253H | BEAUFORT | SAMPLE | 11 | WATER | 200 | STATION030 |
| 109 | B00254H | BEAUFORT | SAMPLE | 11 | WATER | 200 | STATION030 |
| 110 | B00255H | BEAUFORT | SAMPLE | 11 | WATER | 20C | STATION030 |
| 111 | B00256H | BEAUFORT | SAMPLE | 11 | WATER | 200 | STATION030 |
| 112 | B00257H | BEAUFORT | SAMPLE | 11 | WATER | 200 | STATION030 |
| 113 | BØØ258H | BEAUFORT | SAMPLE | 11 | WATER | 200 | STATION030 |
| 114 | B00259H | BEAUFORT | SAMPLE | 11 | WATER | 200 | STATION030 |
| 115 | B00260H | BEAUFORT | SAMPLE | 11 | WATER | 200 | STATION030 |
| 116 | B00261H | BEAUFORT | SAMPLE | 11 | WATER | 20C | STATION030 |
| 117 | B00262H | BEAUFORT | SAMPLE | 11 | WATER | 20C | STATION030 |
| 118 | B00263H | BEAUFORT | SAMPLE | 11 | WATER | 200 | STATION030 |
| 119 | 800264H | BEAUFORT | SAMPLE | 11 | WATER | 200 | STATION030 |
| 120 | B00265H | BEAUFORT | SAMPLE | 11 | WATER | 200 | STATION030 |
| 121 | 800266H | BEAUFORT | SAMPLE | 11 | WATER | 20C | ŚTATION030 |
| 122 | B00268H | BEAUFORT | SAMPLE | 11 | WATER | 280 | STATION030 |
| 123 | B00269H | BERNFORT | SAMPLE | 11 | WATER | 200 | STATION030 |
| 124 | 800270H | BERNEORT | SAMPLE | 11 | WATER | 200 | STATION030 |
| 125 | B00271H | BEAUFORT | SAMPLE | 11 | WATER | 200 | STATION030 |
| | | · · · · · · · · · · · · · · · · · · · | | a. . | | The second second | |
| 126 | B00272H | BEAUFORT | SAMPLE | 11 | WATER | 200 | STATION030 |
| 127 | B00273H | BEAUFORT | SAMPLE | 11 | WATER | 200 | STATION030 |
| 128 | B00275H | BEAUFORT | SAMPLE | 11 | MATER | 20C | STATION030 |

END FORM 128 STRAINS

| 1 | B00026H | BEAUFORT | SAMPLE | 03 | SEDIMENT | 200 | STATION010 |
|----------|------------|------------------------|----------|---------|--------------------------------|-------|-----------------------------|
| 2 | 800027H | BEAUFORT | SAMPLE | 03 | SEDIMENT | 200 | STATION010 |
| 3 | B00028H | BEAUFORT | SAMPLE | 03 | SEDIMENT | 200 | STATION010 |
| 4 | B00029H | BEAUFORT | - | 03 | SEDIMENT | 200 | STATION010 |
| | | | | | | | STATION010 |
| 5 | 800030H | BEAUFORT | | 03 | SEDIMENT | 200 | |
| 6 | B00031H | BEAUFORT | | 03 | SEDIMENT | 20C | STATION010 |
| 7 | B00032H | BEAUFORT | SAMPLE | 03 | SEDIMENT | 20C | STATION010 |
| 8 | B00033H | BEAUFORT | SAMPLE (| 03 | SEDIMENT | 200 | STATION010 |
| 9 | B00037H | BEAUFORT | SAMPLE (| 03 | SEDIMENT | 200 | STATION010 |
| 10 | B00038H | BEAUFORT | | 03 | SEDIMENT | 20C | STATION010 |
| 11 | B00039H | BEAUFORT | | Ø3 | SEDIMENT | 200 | STATION010 |
| | | BERUFORT | | | | 200 | STATION010 |
| 12 | B00040H | | | 83 | SEDIMENT | | - · · |
| 13 | B00041H | BEAUFORT | | 03 | SEDIMENT | 200 | STATION010 |
| 14 | B00042H | BEAUFORT | SAMPLE (| 93 | SEDIMENT | 20C | STATION010 |
| 15 | B00043H | BEAUFORT | SAMPLE (| 03 | SEDIMENT | 200 | STATION010 |
| 16 | B00044H | BEAUFORT | SAMPLE (| 03 | SEDIMENT | 200 | STATION010 |
| 17 | B00045H | BEAUFORT | | 03 | SEDIMENT | 200 | STATION010 |
| 18 | B00047H | BEAUFORT | | 93 - | SEDIMENT | 200 | STATION010 |
| | | | | 03 | SEDIMENT | 200 | STATION010 |
| 19 | B00048H | BEAUFORT | | | | | |
| 20 | B00076H | BEAUFORT | | 16 | SEDIMENT | 200 | STATION002 |
| 21 | B00077H | BEAUFORT | ······ | 16 | SEDIMENT | 20C | STATION002 |
| 22 | B00078H | BEAUFORT | SAMPLE | 16 | SEDIMENT | 200 | STATION002 |
| 23 | B00079H | BEAUFORT | SAMPLE : | 16 | SEDIMENT | 200 | STATION002 |
| 24 | B00080H | BEAUFORT | SAMPLE : | 16 | SEDIMENT | 200 | STATION002 |
| 25 | B00081H | BEAUFORT | | 16 | SEDIMENT | 200 | STATION002 |
| | | | | 16 | SEDIMENT | 200 | STATION002 |
| 26 | B00082H | BEAUFORT | | | | | |
| 27 | B00083H | BEAUFORT | | 16 | SEDIMENT | 200 | STATION002 |
| 28 | B00084H | BEAUFORT | | 16 | SEDIMENT | 200 | STATION002 |
| 29 | B00085H | BEAUFORT | | 16 | SEDIMENT | 200 | STATION002 |
| 30 | B00086H | BEAUFORT | SAMPLE 1 | 16 | SEDIMENT | 200 | STATION002 |
| 31 | B00087H | BERUFORT | SAMPLE 1 | 16 | SEDIMENT | 200 | STATION002 |
| 32 | B00088H | BEAUFORT | SAMPLE : | 16 | SEDIMENT | 200 | STATION002 |
| 33 | B00089H | BEAUFORT | | 16 | SEDIMENT | 20C | STATION002 |
| 33 34 | B00091H | BEAUFORT | | 16 | SEDIMENT | 200 | STATION002 |
| | | | | 16 | SEDIMENT | 200 | STATION002 |
| 35 | B00092H | BEAUFORT | | | | | |
| 36 | B00093H | BEAUFORT | | 16 | SEDIMENT | 200 | STATION002 |
| 37 | B00094H | BEAUFORT | | | SEDIMENT | 200 | STATION002 |
| 38 | B00095H | BEAUFORT | | | SEDIMENT | | |
| 39 | B00096H | BEAUFORT | SAMPLE 1 | 16 | SEDIMENT | 20C | STATION002 |
| 40 | B00097H | BEAUFORT | SAMPLE 1 | 16 | SEDIMENT | 200 | STATION002 |
| 41 | B00098H | BEAUFORT | | | SEDIMENT | | STATION002 |
| 42 | B00099H | BEAUFORT | | | SEDIMENT | | STATION002 |
| | | | | | SEDIMENT | | STATION002 |
| 43 | B00100H | BEAUFORT | | | | | |
| 44 | B00126H | BERUFORT | | | SEDIMENT | | STATION071 |
| 45 | B00127H | BEAUFORT | | | SEDIMENT | | STATION071 |
| 46 | B00128H | BEAUFORT | | | SEDIMENT | | STATION071 |
| 47 | B00129H | BEAUFORT | SAMPLE 2 | 22 | SEDIMENT | 200 | STATION071 |
| 48 | B00130H | BEAUFORT | SAMPLE a | 22 | SEDIMENT | 200 | STATION071 |
| 49 | B00131H | BEAUFORT | | | SEDIMENT | | |
| 50 | B00132H | BEAUFORT | | | SEDIMENT | | STATION071 |
| 00 | 1001010111 | dathart Parts Sattin 1 | | - 1 | nan marakat ak ti tina fa ti t | ····· | saa ah bir ah marti taar bi |

| 51 | B00133H | BEAUFORT | SAMPLE 22 | SEDIMENT | 20C STATION071 |
|------|-------------------------|----------|------------|---|----------------|
| 52 | B00135H | BEAUFORT | SAMPLE 22 | SEDIMENT | 20C STATION071 |
| | •••••• | | -, | | - |
| 53 | B00136H | BEAUFORT | SAMPLE 22 | SEDIMENT | 20C STATION071 |
| 54 | B00138H | BEAUFORT | SAMPLE 22 | SEDIMENT | 20C STATION071 |
| 55 | B00139H | BEAUFORT | SAMPLE 22 | SEDIMENT | 20C STATION071 |
| | | | | ••••••••••••••••••••••••••••••••••••••• | |
| 56 | B00140H | BEAUFORT | SAMPLE 22 | SEDIMENT | 20C STATION071 |
| 57 | B00141H | BEAUFORT | SAMPLE 22 | SEDIMENT | 20C STATION071 |
| 58 | B00142H | BEAUFORT | SAMPLE 22 | SEDIMENT | 20C STATION071 |
| | | | | | |
| 59 | B00143H | BEAUFORT | SAMPLE 22 | SEDIMENT | 20C STATION071 |
| 60 | E00144H | BEAUFORT | SAMPLE 22 | SEDIMENT | 20C STATION071 |
| 61 | B00145H | BEAUFORT | SAMPLE 22 | SEDIMENT | 20C STATION071 |
| | | | | | 20C STATION071 |
| 62 | B00146H | BEAUFORT | SAMPLE 22 | SEDIMENT | |
| 63 | B00147H | BEAUFORT | SAMPLE 22 | SEDIMENT | 20C STATION071 |
| 64 | B00148H | BEAUFORT | SAMPLE 22 | SEDIMENT | 20C STATION071 |
| | •··· ·· · · · · · · · · | | | SEDIMENT | 20C STATION071 |
| 65 | B00149H | BEAUFORT | | | |
| 66 | B00150H | BEAUFORT | SAMPLE 22 | SEDIMENT | 20C STATION071 |
| 67 | B00176H | BEAUFORT | SAMPLE 20 | SEDIMENT | 20C STATION055 |
| | | | SAMPLE 20 | SEDIMENT | 20C STATION055 |
| 68 | B00177H | BEAUFORT | | | |
| 69 | B00178H | BEAUFORT | SAMPLE 20 | SEDIMENT | 20C STATION055 |
| 70 | B00179H | BEAUFORT | SAMPLE 20 | SEDIMENT | 20C STATION055 |
| 71 | B00180H | BEAUFORT | SAMPLE 20 | SEDIMENT | 20C STATION055 |
| | | | | | |
| 72 | B00181H | BEAUFORT | SAMPLE 20 | SEDIMENT | 20C STATION055 |
| 73 | B00183H | BEAUFORT | SAMPLE 20 | SEDIMENT | 20C STATION055 |
| 74 | B00184H | BEAUFORT | SAMPLE 20 | SEDIMENT | 20C STATION055 |
| | | BEAUFORT | SAMPLE 20 | SEDIMENT | 20C STATION055 |
| 75 | B00185H | | | | |
| 76 | B00186H | BEAUFORT | SAMPLE 20 | SEDIMENT | 20C STATION055 |
| 77 | B00187H | BEAUFORT | SAMPLE 20 | SEDIMENT | 20C STATION055 |
| 78 | B00188H | BEAUFORT | SAMPLE 20 | SEDIMENT | 20C STATION055 |
| | | | SAMPLE 20 | SEDIMENT | 20C STATION055 |
| 79 | B00189H | BEAUFORT | | | |
| 80 | B00190H | BEAUFORT | SAMPLE 20 | SEDIMENT | 20C STATION055 |
| 81 | B00191H | BEAUFORT | SAMPLE 20 | SEDIMENT | 20C STATION055 |
| | B00192H | BEAUFORT | SAMPLE 20 | SEDIMENT | 20C STATION055 |
| 82 | | | | | 20C STATION055 |
| 83 | B00193H | BEAUFORT | SAMPLE 20 | SEDIMENT | |
| 84 | B00194H | BEAUFORT | SAMPLE 20 | SEDIMENT | 20C STATION055 |
| 85 | B00196H | BEAUFORT | SAMPLE 20 | SEDIMENT | 20C STATION055 |
| | | BEAUFORT | SAMPLE 20 | SEDIMENT | 20C STATION055 |
| 86 | B00197H | | | | |
| 87 | B00198H | BEAUFORT | SAMPLE 20 | SEDIMENT | |
| 88 | B00199H | BEAUFORT | SAMPLE 20 | SEDIMENT | 20C STATION055 |
| 89 | B00200H | BEAUFORT | SAMPLE 20 | SEDIMENT | 20C STATION055 |
| | | | SAMPLE 21 | SEDIMENT | 20C STATION070 |
| 90 | B00226H | BEAUFORT | ********** | | |
| - 91 | B00227H | BEAUFORT | SAMPLE 21 | SEDIMENT | 20C STATION070 |
| 92 | B00228H | BEAUFORT | SAMPLE 21 | SEDIMENT | 20C STATION070 |
| 93 | B00229H | BEAUFORT | SAMPLE 21 | SEDIMENT | 20C STATION070 |
| | | | | | 20C STATION070 |
| 94 | B00230H | BEAUFORT | SAMPLE 21 | SEDIMENT | |
| 95 | B00231H | BEAUFORT | SAMPLE 21 | SEDIMENT | 20C STATION070 |
| 96 | B00232H | BEAUFORT | SAMPLE 21 | SEDIMENT | 20C STATION070 |
| | | BEAUFORT | SAMPLE 21 | SEDIMENT | 20C STATION070 |
| 97 | B00233H | | | SEDIMENT | 20C STATION070 |
| 98 | B00234H | BEAUFORT | SAMPLE 21 | | |
| 99 | E00235H | BEAUFORT | SAMPLE 21 | SEDIMENT | 20C STATION070 |
| 100 | B00236H | BEAUFORT | SAMPLE 21 | SEDIMENT | 20C STATION070 |
| | | BEAUFORT | SAMPLE 21 | SEDIMENT | 20C STATION070 |
| 101 | B00237H | | | | |
| 102 | 800238H | BEAUFORT | SAMPLE 21 | SEDIMENT | 20C STATION070 |
| 103 | B00239H | BEAUFORT | SAMPLE 21 | SEDIMENT | 20C STATION070 |
| 104 | B00240H | BEAUFORT | SAMPLE 21 | SEDIMENT | 20C STATION070 |
| | | | SAMPLE 21 | SEDIMENT | |
| 105 | B00241H | BEAUFORT | OUDLE CI | OF DIVELU | LOP OTHETONOLO |

| 106 | B00242H | BEAUFORT | SAMPLE 2 | 1 SEDIMENT | 20C STATION070 |
|-----|---------|----------|----------|-------------------|----------------|
| 107 | B00243H | BEAUFORT | | 1 SEDIMENT | |
| 108 | B00244H | BEAUFORT | SAMPLE 2 | 1 SEDIMENT | |
| 109 | B00245H | BEAUFORT | SAMPLE 2 | | |
| 110 | B00246H | BEAUFORT | SAMPLE 2 | 1 SEDIMENT | |
| 111 | B00247H | BEAUFORT | SAMPLE 2 | 1 SEDIMENT | |
| 112 | B00248H | BEAUFORT | SAMPLE 2 | 1 SEDIMENT | 20C STATION070 |
| 113 | B00249H | BEAUFORT | SAMPLE 2 | 1 SEDIMENT | 20C STATION070 |
| 114 | B00250H | BEAUFORT | SAMPLE 2 | 1 SEDIMENT | 20C STATION070 |
| 115 | BØØ276H | BEAUFORT | SAMPLE 0 | 9 SEDIMENT | 20C STATION030 |
| 116 | B00277H | BEAUFORT | SAMPLE 0 | 9 SEDIMENT | 20C STATION030 |
| 117 | B00278H | BEAUFORT | SAMPLE Ø | 9 SEDIMENT | 20C STATION030 |
| 118 | B00279H | BEAUFORT | SAMPLE 0 | 9 SEDIMENT | 20C STATION030 |
| 119 | B00280H | BEAUFORT | SAMPLE 0 | 9 SEDIMENT | 20C STATION030 |
| 120 | B00281H | BEAUFORT | SAMPLE 0 | | 20C STATION030 |
| 121 | B00282H | BEAUFORT | SAMPLE 0 | 9 SEDIMENT | 20C STATION030 |
| 122 | B00283H | BEAUFORT | SAMPLE 0 | 9 SEDIMENT | 20C STATION030 |
| 123 | B00284H | BEAUFORT | SAMPLE 0 | 9 SEDIMENT | 20C STATION030 |
| 124 | B00285H | BEAUFORT | SAMPLE 0 | 9 SEDIMENT | 20C STATION030 |
| 125 | B00286H | BEAUFORT | SAMPLE 0 | 9 SEDIMENT | 20C STATION030 |
| 126 | B00287H | BEAUFORT | SAMPLE 0 | 9 SEDIMENT | 20C STATION030 |
| 127 | B00288H | BEAUFORT | SAMPLE 0 | 9 SEDIMENT | 20C STATION030 |
| 128 | B00289H | BEAUFORT | SAMPLE 0 | 9 SEDIMENT | 20C STATION030 |
| 129 | 800290H | BEAUFORT | SAMPLE 0 | 9 SEDIMENT | 20C STATION030 |
| 130 | B00292H | BEAUFORT | SAMPLE 0 | 9 SEDIMENT | 20C STATION030 |
| 131 | B00293H | BEAUFORT | SAMPLE 0 | 9 SEDIMENT | 20C STATION030 |
| 132 | B00294H | BEAUFORT | SAMPLE Ø | | 20C STATION030 |
| 133 | B00295H | BEAUFORT | SAMPLE 0 | 9 SEDIMENT | 20C STATION030 |
| 134 | B00296H | BEAUFORT | SAMPLE 0 | 9 SEDIMENT | 20C STATION030 |
| 135 | B00297H | BEAUFORT | SAMPLE 0 | 9 SEDIMENT | 20C STATION030 |
| 136 | B00298H | BEAUFORT | SAMPLE 0 | 9 SEDIMENT | 20C STATION030 |
| 137 | B00299H | BEAUFORT | SAMPLE 0 | | 20C STATION030 |
| 138 | B00300H | BEAUFORT | SAMPLE 0 | 9 SEDIMENT | 20C STATION030 |
| | | | | | |

END FORM 138 STRAINS

| 1 | 800003L | BEAUFORT | SAMPLE | 03 | MATER | 04C | STATION010 |
|---------------|------------------|----------|--------|-----|-------|-----|------------|
| \mathcal{E} | 800005L | BEAUFORT | SAMPLE | 03 | WATER | 04C | STATION010 |
| З | 800006L | BEAUFORT | SAMPLE | 03 | WATER | 04C | STATION010 |
| 4 | B00013L | BEAUFORT | SAMPLE | ØЗ | WATER | 04C | STATION010 |
| 5 | B00015L | BEAUFORT | SAMPLE | õŝ. | MATER | 04C | STATION010 |
| | BOODIC | BEAUFORT | SAMPLE | õ3 | WATER | 04C | STATION010 |
| ė. T | BOODESE | BEAUFORT | SAMPLE | 20 | WATER | 04C | STATION002 |
| | | | SAMPLE | 20 | MATER | 04C | STATION002 |
| 8 | B00053L | BEAUFORT | | | WATER | 04C | STATION002 |
| Э | B00054L | BEAUFORT | SAMPLE | 20 | | 04C | STATION002 |
| 10 | B00055L | BEAUFORT | SAMPLE | 20 | WATER | 04C | STATION002 |
| 11 | 880057L | BEAUFORT | SAMPLE | 20 | WATER | | |
| 1 = | 3099 28 F | BEAUFORT | SAMPLE | 20 | WATER | 04C | STATION002 |
| 13 | B88859L | BEAUFORT | SAMPLE | 50 | WATER | 04C | STATION002 |
| 14 | B00060L | BEAUFORT | SAMPLE | 20 | MATER | 04C | STATION002 |
| 15 | B00061L | BEAUFORT | SAMPLE | 20 | WATER | 04C | STATION002 |
| 16 | B00062L | BEAUFORT | SAMPLE | 20 | MATER | 04C | STATION002 |
| 17 | 899963L | BERUFORT | SAMPLE | 20 | WATER | 04C | STATION002 |
| 18 | B00066L | BEAUFORT | SAMPLE | 20 | WATER | 04C | STATION002 |
| 19 | B00067L | BEAUFORT | SAMPLE | 20 | WATER | 04C | STATION002 |
| 20 | B00068L | BEAUFORT | SAMPLE | 20 | WATER | Ø4C | STATION002 |
| 21 | B00070L | BEAUFORT | SAMPLE | 20 | MATER | 04C | STATION002 |
| | B00071L | BEAUFORT | SAMPLE | 20 | WATER | 04C | STATION002 |
| 23 | B00072L | BEAUFORT | SAMPLE | 20 | WATER | õ4Č | STATION002 |
| 24 | B00073L | BEAUFORT | SAMPLE | 20 | MATER | 04C | STATION002 |
| сч 25 | 800074L | BEAUFORT | SAMPLE | 20 | WATER | 04C | STATION002 |
| | B00074L | BEAUFORT | SAMPLE | 20 | WATER | 04C | STATION002 |
| 26 | | BEAUFORT | SAMPLE | 27 | MATER | 04C | STATION071 |
| 27 | 800101L | BEAUFORT | SAMPLE | 27 | WATER | 04Č | STATION071 |
| 28 | 800102L | | SAMPLE | 27 | WATER | 04C | STATION071 |
| 29 | 800103L | BEAUFORT | | | WATER | 04C | STATION071 |
| 38 | B90104L | BEAUFORT | SAMPLE | 27 | | | STATION071 |
| 31 | 800105L | BEAUFORT | SAMPLE | 27 | WATER | 04C | |
| 32 | B00106L | BEAUFORT | SAMPLE | 27 | WATER | 04C | STATION071 |
| 33 | B00107L | BEAUFORT | SAMPLE | 27 | WATER | 04C | STATION071 |
| 34 | 800108L | BEAUFORT | SAMPLE | 27 | WATER | 04C | STATION071 |
| 35 | B00109L | BEAUFORT | SAMPLE | 27 | WATER | 04C | STATION071 |
| 36 | B00110L | BEAUFORT | SAMPLE | 27 | WATER | 04C | STATION071 |
| 37 | B00111L | BEAUFORT | SAMPLE | 27 | WATER | 04C | STATION071 |
| 38 | B00112L | BEAUFORT | SAMPLE | 27 | MATER | 04C | STATION071 |
| 39 | B00113L | BEAUFORT | SAMPLE | 27 | NHTER | 04C | STATION071 |
| 40 | B00114L | BEAUFORT | SAMPLE | 27 | MATER | 04C | STATION071 |
| 41 | B00115L | BERUFORT | SAMPLE | 27 | HATER | 04C | STATION071 |
| 42 | B00116L | BERUFORT | SAMPLE | | WATER | | STATION071 |
| 43 | B00117L | BEAUFORT | | 27 | WATER | | STATION071 |
| 44 | B00118L | BEAUFORT | | 27 | WATER | | STATION071 |
| 45 45 | B00119L | BEAUFORT | SAMPLE | 27 | | 04C | STATION071 |
| | | BEAUFORT | SAMPLE | 27 | WATER | | STATION071 |
| 46 47 | B00120L | | SAMPLE | 27 | | | STATION071 |
| 47 | B00121L | BEAUFORT | | | | | |
| 48 | B00122L | BEAUFORT | SAMPLE | 27 | | | STATION071 |
| 49 50 | B00123L | BEAUFORT | | | | | STATION071 |
| 50 | B00124L | BEAUFORT | SAMPLE | C(| MHIEN | 040 | STATION071 |
| | | | | | | | |

| 51 | B90125L | BEAUFORT SAMPLE 27 WATER 04C STATION071 |
|--------------|--|---|
| 52 | B00151L | BEAUFORT SAMPLE 24 WATER 04C STATION055 |
| 53 | | BEAUFORT SAMPLE 24 WATER 04C STATION055 |
| 54 | | |
| | | |
| 55 | | BEAUFORT SAMPLE 24 WATER 04C STATION055 |
| .56 | B00155L | BEAUFORT SAMPLE 24 WATER 04C STATION055 |
| 57 | B00156L | BEAUFORT SAMPLE 24 WATER 04C STATION055 |
| 58 | B00157L | BEAUFORT SAMPLE 24 WATER 04C STATION055 |
| 59 | B00159L | BEAUFORT SAMPLE 24 WATER 04C STATION055 |
| 60 | B00160L | |
| | | |
| 61 | B00162L | BEAUFORT SAMPLE 24 WATER 04C STATION055 |
| 62 | 800163L | BEAUFORT SAMPLE 24 WATER 04C STATION055 |
| 63 | B00164L | BEAUFORT SAMPLE 24 WATER 04C STATION055 |
| 64 | B00165L | BEAUFORT SAMPLE 24 WATER 04C STATION055 |
| 65 | B00166L | BEAUFORT SAMPLE 24 WATER 04C STATION055 |
| <u>66</u> | B00167L | BEAUFORT SAMPLE 24 WATER 04C STATION055 |
| 67 | B00168L | |
| | | BEAUFORT SAMPLE 24 WATER 04C STATION055 |
| 68 | B00169L | BEAUFORT SAMPLE 24 WATER 04C STATION055 |
| 69 | B00170L | BEAUFORT SAMPLE 24 WATER 04C STATION055 |
| 79 | B00171L | BEAUFORT SAMPLE 24 WATER 04C STATION055 |
| 71 | B00172L | BEAUFORT SAMPLE 24 WATER 04C STATION055 |
| 72 | 800173L | BEAUFORT SAMPLE 24 WATER 04C STATION055 |
| 73 | B00174L | BEAUFORT SAMPLE 24 WATER 04C STATION055 |
| 74 | B90175L | |
| | | |
| 75 | B00201L | BEAUFORT SAMPLE 26 WATER 04C STATION070 |
| 76 | B00505F | BEAUFORT SAMPLE 26 WATER 04C STATION070 |
| 77 | 800203L | BEAUFORT SAMPLE 26 WATER 04C STATION070 |
| 78 | B00204L | BEAUFORT SAMPLE 26 WATER 04C STATION070 |
| 79 | B00205L | BEAUFORT SAMPLE 26 WATER 04C STATION070 |
| 80 | B00206L | BEAUFORT SAMPLE 26 WATER 04C STATION070 |
| 81 | B00207L | |
| | | |
| 82 | B00208L | BEAUFORT SAMPLE 26 WATER 04C STATION070 |
| 83 | B00209L | BEAUFORT SAMPLE 26 WATER 04C STATION070 |
| 84 | B00210L | BEAUFORT SAMPLE 26 WATER 04C STATION070 |
| 85 | B00211L | BEAUFORT SAMPLE 26 WATER 04C STATION070 |
| 86 | B00212L | BEAUFORT SAMPLE 26 WATER 04C STATION070 |
| 87 | B00213L | BEAUFORT SAMPLE 26 WATER 04C STATION070 |
| 88 | B00214L | BEAUFORT SAMPLE 26 WATER 04C STATION070 |
| 89 | B00215L | |
| | | BEAUFORT SAMPLE 26 WATER 04C STATION070 |
| 99 | B00216L | BEAUFORT SAMPLE 26 WATER 04C STATION070 |
| 91 | B00217L | BEAUFORT SAMPLE 26 WATER 04C STATION070 |
| 92 | B00218L | BEAUFORT SAMPLE 26 WATER 04C STATION070 |
| 93 | 800219L | BEAUFORT SAMPLE 26 WATER 04C STATION070 |
| 94 | B00220L | BEAUFORT SAMPLE 26 WATER 04C STATION070 |
| 95 | B00222L | BEAUFORT SAMPLE 26 WATER 04C STATION070 |
| | B00223L | BEAUFORT SAMPLE 26 WATER 04C STATION070 |
| | B00225L | |
| 97 98 | | BEAUFORT SAMPLE 26 WATER 040 STATION070 |
| | B00278L | BEAUFORT SAMPLE 11 WATER 04C STATION030 |
| 99 | B00280L | BEAUFORT SAMPLE 11 WATER 04C STATION030 |
| 100 | 800281L | BEAUFORT SAMPLE 19 WATER 04C STATION001 |
| 161 | B00283L | BEAUFORT SAMPLE 19 WATER 04C STATION001 |
| 102 | B00291L | BEAUFORT SAMPLE 36 WATER 04C STATION002 |
| 103 | B00294L | BEAUFORT SAMPLE 36 WATER 04C STATION002 |
| $100 \\ 104$ | B00295L | BEAUFORT SAMPLE 36 WATER 04C STATION002 |
| 107 | ي المراجع الي من المراجع الي المراجع الي | DERVIORI VARIEE SO MATER 046 STATION006 |
| | | |

-

END FORM 104 STRAINS

Strains isolated from sediment at 4C capable of growth at 20C.

| 4 | 800026L | BERUFORT | SAMPLE 03 | SEDIMENT | 04C STATION010' |
|------------|---------|----------|--------------------------|----------|---------------------------------------|
| | | BEAUFORT | SAMPLE 03 | SEDIMENT | 04C STATION010 |
| 2 | B00031L | BEAUFORT | SAMPLE 03 | SEDIMENT | 04C STATION010 |
| - | B88838L | | SAMPLE 03 | SEDIMENT | 04C STATION010 |
| 4 | 899959L | BEAUFORT | SAMPLE 16 | SEDIMENT | 04C STATION002 |
| 5 | E00078L | BEAUFORT | | SEDIMENT | 04C STATION002 |
| Ś | 899981L | BEAUFORT | | SEDIMENT | 04C STATION002 |
| 7 | B99084L | BEAUFORT | SAMPLE 16 | SEDIMENT | 04C STATION002 |
| 8 | R00085L | BEAUFORT | SAMPLE 16 | | 04C STATION002 |
| 9 | B00088L | BEAUFORT | SAMPLE 16 | SEDIMENT | |
| 10 | E00093L | BEAUFORT | SAMPLE 16 | SEDIMENT | |
| 11 | B00096L | BEAUFORT | SAMPLE 16 | SEDIMENT | 04C STATION002 |
| 12 | B00127L | BEAUFORT | SAMPLE 22 | SEDIMENT | 04C STATION071 |
| 13 | B00130L | BEAUFORT | SAMPLE 22 | SEDIMENT | 04C STATION071 |
| 14 | B00138L | BEAUFORT | SAMPLE 22 | SEDIMENT | 04C STATION071 |
| 15 | B00139L | BEAUFORT | SAMPLE 22 | SEDIMENT | 04C STATION071 |
| $10 \\ 16$ | B00140L | BEAUFORT | SAMPLE 22 | SEDIMENT | 04C STATION071 |
| 18 17 | B00143L | BEAUFORT | SAMPLE 22 | SEDIMENT | 04C STATION071 |
| | B00146L | BEAUFORT | SAMPLE 22 | SEDIMENT | 04C STATION071 |
| 18 | | BEAUFORT | SAMPLE 22 | SEDIMENT | 04C STATION071 |
| 19 | B00150L | BEAUFORT | SAMPLE 20 | SEDIMENT | 04C STATION055 |
| 20 | B00177L | BEAUFORT | SAMPLE 20 | SEDIMENT | 04C STATION055 |
| 21 | B00178L | | SAMPLE 20 | SEDIMENT | 04C STATION055 |
| 22 | B00179L | BEAUFORT | SAMPLE 20 | SEDIMENT | 04C STATION055 |
| 23 | B00180L | BEAUFORT | SAMPLE 20 | SEDIMENT | 04C STATION055 |
| 24 | B00182L | BEAUFORT | SAMPLE 20 | SEDIMENT | 04C STATION055 |
| 25 | B00183L | BEAUFORT | SAMPLE 20 | SEDIMENT | 04C STATION055 |
| 26 | B00186L | BEAUFORT | SAMPLE 20 | SEDIMENT | 04C STATION055 |
| 27 | B00187L | BEAUFORT | SAMPLE 20 | SEDIMENT | 04C STATION055 |
| 58 | B00188L | BEAUFORT | SAMPLE 20 | SEDIMENT | 04C STATION055 |
| 29 | B00189L | BEAUFORT | SAMPLE 20 | SEDIMENT | 04C STATION055 |
| 30 | B00190L | BEAUFORT | SAMPLE 20 | SEDIMENT | 04C STATION055 |
| 31 | B00191L | BEAUFORT | SAMPLE 20 | SEDIMENT | 04C STATION055 |
| 32 | B90192L | BEAUFORT | 44 F 10 F 10 10 1 | SEDIMENT | 04C STATION055 |
| 33 | B00194L | BEAUFORT | | SEDIMENT | 04C STATION055 |
| 34 | B00196L | BEAUFORT | | SEDIMENT | 04C STATION055 |
| 35 | B00197L | BEAUFORT | | SEDIMENT | 04C STATION055 |
| 36 | B00198L | BEAUFORT | SAMPLE 20 | | |
| 37 | 800199L | BEAUFORT | SAMPLE 20 | | |
| 33 | 800200L | BEAUFORT | | | |
| 39 | 800556L | BEAUFORT | | | |
| 40 | B00227L | BEAUFORT | | SEDIMENT | |
| 4 Î. | 890228L | BEAUFORT | | SEDIMENT | 04C STATION070 |
| 42 | B00559F | BEHUFORT | | SEDIMENT | |
| 43 | B00230L | BEAUFORT | | SEDIMENT | |
| 44 | B00232L | BEAUFORT | | SEDIMENT | |
| 45 | B00233L | BEAUFORT | | SEDIMENT | |
| 46 | B00234L | BEAUFORT | | SEDIMENT | |
| 47 | B00235L | BEAUFORT | | SEDIMENT | · · · · · · · · · · · · · · · · · · · |
| 48 | B00236L | BEAUFORT | | SEDIMENT | |
| 49 | B00237L | BEAUFORT | | | |
| 50 | 800238L | BEAUFORT | SAMPLE 21 | SEDIMENT | 04C STATION070 |
| | | | | | |

•

| 51 | 800240L | BEAUFORT SAMPLE 21 SEDIMENT 04C STATION07 | Ø |
|----|---------|--|---|
| 52 | B00241L | BEAUFORT SAMPLE 21 SEDIMENT 04C STATION07 | Ø |
| 53 | B00243L | BEAUFORT SAMPLE 21 SEDIMENT 04C STATION07 | ō |
| 54 | B00244L | BEAUFORT SAMPLE 21 SEDIMENT 04C STATION07 | |
| 55 | B00245L | BEAUFORT SAMPLE 21 SEDIMENT 04C STATION07 | |
| 56 | B00246L | BEAUFORT SAMPLE 21 SEDIMENT 04C STATION07 | - |
| 57 | B00247L | BEAUFORT SAMPLE 21 SEDIMENT 04C STATION07 | |
| 58 | B00249L | BEAUFORT SAMPLE 21 SEDIMENT 04C STATION07 | |
| 59 | B00250L | BEAUFORT SAMPLE 21 SEDIMENT 04C STATION070 | |
| 60 | B00251L | BEAUFORT SAMPLE 09 SEDIMENT 04C STATION030 | |
| 61 | B00252L | BEAUFORT SAMPLE 09 SEDIMENT 04C STATION030 | |
| 62 | 800253L | BEAUFORT SAMPLE 09 SEDIMENT 04C STATION030 | |
| 63 | B00254L | BEAUFORT SAMPLE 09 SEDIMENT 04C STATION030 | |
| 64 | B00256L | BEAUFORT SAMPLE 09 SEDIMENT 04C STATION030 | |
| 65 | B00257L | BEAUFORT SAMPLE 09 SEDIMENT 04C STATION030 | |
| 66 | B00258L | BEAUFORT SAMPLE 09 SEDIMENT 04C STATION030 | - |
| 67 | B00259L | BEAUFORT SAMPLE 09 SEDIMENT 04C STATION030 | - |
| 68 | B00261L | BEAUFORT SAMPLE 09 SEDIMENT 04C STATION030 | - |
| 69 | B00263L | BEAUFORT SAMPLE 09 SEDIMENT 04C STATION030 | |
| 70 | B00264L | BEAUFORT SAMPLE 09 SEDIMENT 04C STATION030 | |
| 71 | B00266L | BEAUFORT SAMPLE 09 SEDIMENT 04C STATION030 | |
| 72 | B00267L | BEAUFORT SAMPLE 09 SEDIMENT 04C STATION030 | |
| 73 | 800269L | BEAUFORT SAMPLE 09 SEDIMENT 04C STATION030 | |
| 74 | B00272L | BEAUFORT SAMPLE 09 SEDIMENT 04C STATION030 | |
| 75 | 800273L | BEAUFORT SAMPLE 09 SEDIMENT 04C STATION030 | |
| 76 | B00274L | BEAUFORT SAMPLE 09 SEDIMENT 04C STATION030 | |
| 77 | B00275L | BEAUFORT SAMPLE 09 SEDIMENT 04C STATION030 | |
| 78 | B00286L | BEAUFORT SAMPLE 15 SEDIMENT 04C STATION001 | |
| 79 | B00287L | BEAUFORT SAMPLE 15 SEDIMENT 04C STATION001 | |
| 80 | B00288L | BEAUFORT SAMPLE 15 SEDIMENT 04C STATION001 | |
| 81 | B00289L | BEAUFORT SAMPLE 15 SEDIMENT 04C STATION001 | |
| 82 | B00290L | BEAUFORT SAMPLE 15 SEDIMENT 04C STATION001 | |
| 83 | B00296L | BEAUFORT SAMPLE 32 SEDIMENT 04C STATION002 | |
| 84 | B00297L | BEAUFORT SAMPLE 32 SEDIMENT 04C STATION002 | |
| 85 | B00299L | TO A ROOM AND A REAL A | |
| | | BEHOFURI SHMPLE 32 SEDIMENT 04C STATION002 | |

END FORM 85 STRAINS

,

1 B00117L BEAUFORT SAMPLE 27 WATER 04C STATION071

END FORM

| 7 | B00014H | BEAUFORT | SAMPLE | 03 | WATER | 200 | STATION010 |
|----|---------|----------|--------|----|-------|-----|------------|
| 2 | B00017H | | | | | | STATION010 |
| 3 | B00024H | | | | | | STATION010 |
| 4 | B00067H | BEAUFORT | SAMPLE | 20 | MATER | 200 | STATION002 |
| 5 | B00112H | BEAUFORT | SAMPLE | 27 | MATER | 290 | STATION071 |
| 6 | B00122H | BEAUFORT | SAMPLE | 27 | WATER | 200 | STATION071 |
| 7 | B00123H | BEAUFORT | SAMPLE | 27 | MATER | 200 | STATION071 |
| 8 | B00203H | | | | | | STATION070 |
| Э | B00216H | | | | | | STATION070 |
| 10 | B00555H | | | | | | STATION070 |

EHD FORM

Strains isolated from sediment at 20C capable of growth at 37C.

| | 800027H 800036H 800098H 800098H | BEAUFORT | SAMPLE SAMPLE | 03 16 | SEDIMENT SEDIMENT | 200 200 | STATION010 STATION010 STATION002 STATION070 |
|---|--|----------|------------------|----------|----------------------|------------|--|
| 4 | B00229H | BEAUFORT | SAMPLE | 21 | SEDIMENT | SRC | STHITOMOTO |
| 5 | B00230H | BEAUFORT | SAMPLE | 21 | SEDIMENT | 200 | STATION070 |
| 6 | 800293H | BEAUFORT | SAMPLE | 09 | SEDIMENT | ΞθC | STATION030 |

END FORM

Strains isolated from water at 4C capable of growth in the presence of 3% NaCl.

| 1 | BOODOSL | BEAUFORT | SAMPLE | | WATER | 04C | |
|---------------|--------------------------------------|--|-----------------|---------------|--------------|-----|---|
| æ | B00005L | BEAUFORT | SAMPLE | 03 | WATER | 04C | STATION010 |
| З | 800006L | BEAUFORT | SAMPLE | 03 | WATER | 04C | STATION010 |
| 4 | B90009L | BEAUFORT | SAMPLE | 03 | WATER | 04C | STATION010 |
| 5 | B00012L | BEAUFORT | SAMPLE | 03 | MATER | 04C | STATION010 |
| 6 | 300013L | BEAUFORT | SAMPLE | 03 | WATER | 04C | STATION010 |
| 7 | B90014L | BEAUFORT | SAMPLE | 03 | MATER | 04C | STATION010 |
| s | B00021L | BEAUFORT | SAMPLE | юŝ | MATER | 04C | STATION010 |
| 9 | BOOOZEL | BEAUFORT | SAMPLE | 03 | MATER | 04C | STATION010 |
| | | BEAUFORT | SAMPLE | 03 | WATER | 04C | STATION010 |
| 10 | B90024L | | SAMPLE | 03 | MATER | 04C | STATION010 |
| 11 | 800025L | BEAUFORT | | | | | STATION002 |
| 12 | 600053L | BEAUFORT | SAMPLE | 20 | WATER | 040 | |
| 13 | E00054L | BEAUFORT | SAMPLE | 20 | WATER | 04C | STATION002 |
| 14 | B00057L | BEAUFORT | SAMPLE | 20 | NATER | 04C | STRTION002 |
| 15 | 200058L | BEAUFORT | SAMPLE | 20 | WATER | 04C | STATION002 |
| 1.6 | B90060L | BEAUFORT | SAMPLE | 20 | WATER | 04C | STATION002 |
| 17 | B00062L | BEAUFORT | SAMPLE | 29 | MATER | 04C | STATION002 |
| 18 | B00063L | BEAUFORT | SAMPLE | 20 | WATER | 04C | STATION002 |
| 19 | B00066L | BEAUFORT | SAMPLE | 20 | WATER | 04C | STATION002 |
| 20 | B00067L | BEAUFORT | SAMPLE | 20 | MATER | 04C | STATION002 |
| 21 | 390068L | BERUFORT | SAMPLE | 20 | WATER | @4C | STATION002 |
| 22 | B00069L | BERUFORT | SAMPLE | 20 | WATER | 04C | STATION002 |
| 23 | B00071L | BEAUFORT | SAMPLE | 20 | MATER | 04C | STATION002 |
| 24 | 800072L | BEAUFORT | SAMPLE | 20 | WATER | 040 | STATION002 |
| 25 | 300073L | BEAUFORT | SAMPLE | 20 | WATER | 04C | STATION002 |
| 26 | B00074L | BEAUFORT | SAMPLE | 20 | WATEF | ñ - | STATION002 |
| 27- | B00075L | BEAUFORT | SAMPLE | 20 | WATEF | | STATION002 |
| 28 | B00103L | BEAUFORT | SAMP'S | 27 | ИНТЕ | | STATION071 |
| 29 | B00104L | BEAUFORT | SAMPLE | 27 | WATEN | | STATION671 |
| | B00106L | BEAUFORT | SAMPLE | 27 | WATER | ю. | STATION071 |
| 30 | | BEAUFORT | SAMPLE | 27 | MATER | 04C | STATION071 |
| 31 | B00108L | BEAUFORT | SAMPLE | 27 | WATER | 04C | STATION071 |
| 32 | B00109L | | | در 27 | WATER | 04C | STATION071 |
| 33 | B90111L | BEAUFORT | SAMPLE | | | 04C | STATION071 |
| 34 | B00112L | BERUFORT | SAMPLE | 27 | WATER | | STATION071 |
| 35 | B00113L | BEAUFORT | SAMPLE | 27 | WATER | 040 | |
| 36 | B00114L | BEAUFORT | SAMPLE | 27 | MATER | 04C | STATION071 |
| 37 | B00115L | BEAUFORT | SAMPLE | 27 | WATER | 04C | STATION071 |
| 38 | B00116L | BEAUFORT | | | | | STATION071 |
| 39 | 300117L | BEAUFORT | SAMPLE | | MATER | | |
| 40 | B00119L | BEAUFORT | SAMPLE | 27 | WATER | 04C | STATION071 |
| 41 | B99120L | BERUFORT | SAMPLE | 27 | WATER | 04C | STATION071 |
| 42 | 800121L | BEAUFORT | SAMPLE | 27 | WATER | 04C | STATION071 |
| 43 | 800122L | BEAUFORT | SAMPLE | | MATER | | STATION071 |
| ci ci | B00123L | BEAUFORT | | | WATER | | |
| 45 | 300124L | BEAUFORT | | | WATER | | |
| 46 | B00125L | BEHUFORT | | | WATER | | |
| 47 | 899151L | BEAUFORT | | | NATER | 04C | |
| 48 | B00152L | BERUFORT | | | MATER | 04C | |
| 49 | 300153L | BEAUFORT | SAMPLE | | | | STATION055 |
| Sé | B00154L | BEAUFORT | SAMPLE | | MATER | | STATION055 |
| ` ~ .' | autorites finanzais fautori di Basso | The state of the second se | -m-17111 houles | ⊾ n ‴T | ւվել է հավեչ | | and the the state of |

| | | BEAUFORT SAMPLE 24 WATER 04C STATION055 |
|-------------|---------|--|
| 51 | R00155L | DEAD OF CHARTER AN NOTED AND STATIONASS |
| 52 | B00156L | BENUT UNI DINNEL CANTER AND CTOTION055 |
| ្ល | B90157L | BEHURUKI SHURLE ET HOTEO AVE STATION055 |
| 드라 | 800159L | BEMUNURI ONNILL LI DOTED DAG CTOTION055 |
| 35 | B00160L | BEHUFUE) OFFICE STOTED OVE CTOTIONOSS |
| 56 | B00163L | BEHORDER ON BLE LA MATTER OVE CTOTIONASS |
| 57 | B00164L | |
| 58 | B00165L | BEHURURU OFFICIER ENTRY EL TOTAL AND A OTOTIONOES |
| 59 | B00166L | |
| 60 60 | B00167L | SEMULTER CONTRACTOR STATES AND A STATEMENT |
| 61 | 800169L | BEAUFORT SAMPLE 24 WATER 040 STATIONOSS |
| | 899179L | BEAUFORT SAMPLE 24 WATER MAL STATIONAUU |
| 62 | B00171L | BEALFORT SAMPLE 24 WATER 040 STATIONSS |
| 63 | | DEFINET SAMPLE 24 WATER 040 STRIIO 1800 |
| 64 | B00173L | TOUTOPT CAMPLE 24 WATER 040 STATLUNUDD |
| 65 | 800174L | PEOUTODT CAMPLE 24 WATER 040 STHILUNUDD |
| t to | 800175L | DEDUCIOR CARLES 26 WATER 04C STATION070 |
| 67 | B00201L | PEOUTOPT CAMPLE 26 WATER 040 STATION070 |
| 68 | 800202L | DEDUCTOR CAMPLE 26 WATER 04C STATION070 |
| 69 | B90203L | DEPENDENCE STATION070 |
| 79 | B99205L | BEAUFORT OFFICE DE LOTER DAC CTOTTON070 |
| 71 | B90506F | BENUTURI ONNELL LO MATTER AND CTOTION070 |
| 72 | B00207L | BEHUFURI SHIFTLE LO MATER AND CTATIONG70 |
| 73 | B99508L | BEHUPUR: SHUFLE LO PROFES OVE CTOTION070 |
| 74 | 800210L | SCHURURI SAMPLE LO MATTO ALC CTATION070 |
| 75 | B00212L | BEHURUNI SHOULL LO MATER AND CTATION070 |
| 76 | B00213L | BEHOFURI SHAFLE DE HOTER OVE CTETION070 |
| 77 | B00214L | BERUPURI ONALLE LE PARTE ALS STOTIONATA |
| 78 | B00215L | BEHURDER SHITCE IS HOTED OVE CTOTION070 |
| 79 | 800216L | BEHURDET SATILLE LO HITER ONO CTATION020 |
| 80 | B00217L | BEMORDET ON THE BALLETTE OVE CTOTIONG70 |
| ≈ 1 | 899218L | THE PLACE WITH PLACE PARTY PAR |
| 88 | B90219L | BEAUFORT SAMPLE 26 WATER 04C STATION070 |
| 83 | B00220L | BEAUFORT SAMPLE 26 WATER 04C STATION070 |
| 84 | 800221L | BEAUFORT SAMPLE 26 WATER 04C STATION070 |
| 85 | 899222L | BEAUFORT SAMPLE 26 WATER 04C STATION070 |
| 86 | 800223L | BEAUFORT SAMPLE 26 WATER 04C STATION070 |
| 87 | B00224L | BEAUFORT SAMPLE 26 WATER 04C STATION070 |
| 88 | B00225L | BEAUFORT SAMPLE 26 WATER 04C STATION070 |
| 89 | 300278L | BEAUFORT SAMPLE 11 WATER 04C STATION030 |
| 90 | B00280L | BEAUFORT SAMPLE 11 WATER 04C STATION030 |
| 91 | B00281L | REAUFORT SAMPLE 19 WATER 04C STATION001 |
| 92 91 | 800282L | BEAUFORT SAMPLE 19 WATER 040 STATION001 |
| 93 | 890283L | PERUFORT SAMPLE 19 WATER 04C STATION001 |
| 94 94 | 800284L | REPUEDRT SAMPLE 19 WATER 04C STATION001 |
| | B00291L | REPUEDRT SAMPLE 36 WATER 04C STATION002 |
| 95 | B00521C | REPUERRT SAMPLE 36 WATER 04C STATION002 |
| 96 | | BEAUFORT SAMPLE 36 WATER 04C STATION002 |
| 97 | 800294L | BEAUFORT SAMPLE 36 WATER 04C STATION002 |
| 98 | B00295L | THE REAL PLANE AND DEPENDENCE AND A REAL PLANE AND A REAL PLANE. |

END FORM 98 STRAINS

| 1 | BBBBBBB | BEAUFORT | | | | | |
|---------------|------------------------|------------------|---------------------|-------------|-------------------|------------|-------------|
| 2 | 800027L | BEAUFORT | | | | | |
| 3 | 300028L | BEAUFORT | SAMPLE | | •• | | |
| 4 | 800029L | BEAUFORT | | | | | |
| 5 | B99939L | BEAUFORT | | | SEDIMENT | : 04C | STATION010 |
| E, | B00031L | BEAUFORT | SPIMPLE | 03 | SEDIMENT | ' 04C | STATION010 |
| 7 | 800032L | BEAUFORT | SAMPLE | 03 | SEDIMENT | 04C | STATION010 |
| 8 | 30 0033L | BEAUFORT | SAMPLE | 03 | SEDIMENT | 040 | STATION010 |
| ģ | B00034L | BEAUFORT | SAMPLE | 03 | SEDIMENT | 04C | STATION010 |
| 18 | B99935L | BEAUFORT | SAMPLE | 63 | SEDIMENT | 04C | |
| 11 | B99936L | BEAUFORT | SAMPLE | 03 | SEDIMENT | 04C | |
| 12 | 500037L | BEAUFORT | SAMPLE | | SEDIMENT | 94C | |
| 13 | 800039L | BEAUFORT | | | SEDIMENT | 04C | STATION010 |
| 14 | B99949L | BEAUFORT | SAMPLE | | SEDIMENT | 04C | STATION010 |
| 15 | B66041L | BEAUFORT | | | SEDIMENT | 04C | STATION010 |
| 16 | B00042L | BEAUFORT | | 83 | SEDIMENT | 04C | STATION010 |
| 17 | E00043L | BEAUFORT | SAMPLE | 03 | SEDIMENT | 04C | STATION010 |
| 19 19 | B90044L | BEAUFORT | SAMPLE | 03 | SEDIMENT | 04C | STATION010 |
| 19 | B00044C | BEAUFORT | SAMPLE | 03 | SEDIMENT | 04C | STATION010 |
| Ξē | B00047L | BEAUFORT | SAMPLE | - 63 193 | SEDIMENT | 04C | STATION010 |
| 21 | B00048L | BEAUFORT | SAMPLE | | SEDIMENT | 040 040 | STATION010 |
| 22 | 8999491 | BEAUFORT | SAMPLE | 03 | SEDIMENT | | |
| 23 | 800059L | | SAMPLE | юс 03 | | 04C | STATION010 |
| 20 24 | | BEAUFORT | | | SEDIMENT | 04C | STATION010 |
| | 800076L | BEAUFORT | SAMPLE | 16 | SEDIMENT | 04C | STATION002 |
| 25 | B00077L | BEAUFORT | SAMPLE | 16 | SEDIMENT | 04C | STATION002 |
| 26 | 899978L | BERUFORT | SAMPLE | 16 | SEDIMENT | 04C | STATION002 |
| 27 | B00079L | BEAUFORT | SAMPLE | 16 | SEDIMENT | 04C | STATION002 |
| 28 | B00080L | BEAUFORT | SAMPLE | 16 | SEDIMENT | 04C | STATION002 |
| 29 | B00082L | BEAUFORT | SAMPLE | 16 | SEDIMENT | Ø4C | STATION002 |
| 39 | B00083L | BEAUFORT | SAMPLE | 16 | SEDIMENT | 04C | STATION002 |
| 31 | B00084L | BEAUFORT | SAMPLE | 16 | SEDIMENT | 04C | STATION002 |
| 32 | 800085L | BEAUFORT | SAMPLE | i6 | SEDIMENT | 04C | STATION002 |
| 33 | 800086L | BEAUFORT | SAMPLE | 16 | SEDIMENT | 04C | STATION002 |
| 34 | 800087L | BEAUFORT | SAMPLE | 16 | SEDIMENT | 94C | STATION002 |
| 357 | B00088L | BEAUFORT | SAMPLE | 16 | SEDIMENT | 04C | STATION002 |
| 36 | 800089L | BEAUFORT | SAMPLE | 16 | SEDIMENT | 04C | STATION002 |
| 37 | B00091L | BEAUFORT | SAMPLE | 16 | SEDIMENT | | STATION002 |
| 38 | 300092L | BEAUFORT | SAMPLE | 16 | SEDIMENT | 04C | STATION002 |
| 39 | 800093L | BEAUFORT | SAMPLE | 16 | SEDIMENT | 04C | STATION002 |
| 40 | B00094L | BEAUFORT | SAMPLE | 16 | SEDIMENT | 04C | STATION002 |
| 4 <u>i</u> | 800095L | BEAUFORT | SAMPLE | 16 | SEDIMENT | 04C | STATION002 |
| 42 | B90096L | BERUFORT | SAMPLE | 16 | SEDIMENT | 04C | STATION002 |
| 43 | B00097L | BEAUFORT | SAMPLE | | SEDIMENT | | STATION002 |
| 44 | B00098L | BEAUFORT | SAMPLE | | SEDIMENT | | STATION002 |
| 45 | BOOD99L | BEAUFORT | SAMPLE | | SEDIMENT | | STATION002 |
| 46 | B00100L | BEAUFORT | SAMPLE | | SEDIMENT | | STATION002 |
| 47 | B00126L | BEAUFORT | SAMPLE | | SEDIMENT | | STATION071 |
| 48 | B00127L | BEAUFORT | SAMPLE | | SEDIMENT | | STATION071 |
| 49 | B00128L | BEAUFORT | | | SEDIMENT | | STATION071 |
| 50 | 800129L | BEAUFORT | | | SEDIMENT | | STATION071 |
| · • • · • • • | energian de las al las | anteres series i | ∿an't 11 11 kan kan | L- L- | and a real of the | | THEFT THEFT |

| | | | | | CONTRACTOR AND A STOCK | 040 | 070770N071 |
|-----------|--------------------|---------------|------------|----------|------------------------|--------|------------|
| 51 | B00130L | BEAUFORT | SAMPLE | | | | STATION071 |
| 52 | B00131L | BEAUFORT | SAMPLE | 22 | SEDIMENT | 04C | STATION071 |
| 53 | B00132L | BEAUFORT | SAMPLE | 22 | SEDIMENT | 04C | STATION071 |
| 54 | 800133L | BEAUFORT | SAMPLE | 22 | SEDIMENT | 04C | STATION071 |
| 55 | B00134L | BEAUFORT | SAMPLE | 22 | SEDIMENT | 04C | STATION071 |
| 56 | B00135L | BEAUFORT | SAMPLE | 22 | SEDIMENT | 04C | STATION071 |
| 57 | B00136L | BEAUFORT | SAMPLE | 22 | SEDIMENT | 04C | STATION071 |
| 58 | B00137L | BEAUFORT | SAMPLE | 22 | SEDIMENT | 04C | STATION071 |
| 59 | B00141L | BEAUFORT | SAMPLE | 22 | SEDIMENT | Ø4C | STATION071 |
| 60 | 800143L | BEAUFORT | SAMPLE | 22 | SEDIMENT | 04C | STATION071 |
| 61 | B00144L | BEAUFORT | SAMPLE | 22 | SEDIMENT | 04C | STATION071 |
| 62 | B00145L | BEAUFORT | SAMPLE | 22 | SEDIMENT | 04C | STATION071 |
| 63 | B00146L | BEAUFORT | SAMPLE | 22 | SEDIMENT | 04C | STATION071 |
| 64 | B00147L | BEAUFORT | SAMPLE | 22 | SEDIMENT | 04C | STATION071 |
| 65 | B00148L | BEAUFORT | SAMPLE | 22 | SEDIMENT | 04C | STATION071 |
| 66 66 | B00149L | BEAUFORT | SAMPLE | 22 | SEDIMENT | 04C | STATION071 |
| | | BEAUFORT | SAMPLE | 22 | SEDIMENT | 04C | STATION071 |
| 67 20 | 800150L | | SAMPLE | 20 | SEDIMENT | 04C | STATION055 |
| 68 | B00176L | BEAUFORT | | | SEDIMENT | 04C | STATION055 |
| 69 | B00178L | BEAUFORT | SAMPLE | 20 | | 04C | STATION055 |
| 70 | 800179L | BEAUFORT | SAMPLE | 20 | SEDIMENT | 04C | STATION055 |
| 71 | B90180L | BEAUFORT | SAMPLE | 20 | SEDIMENT | 04C | |
| 72 | 800181L | BEAUFORT | SAMPLE | 20 | SEDIMENT | | STATION055 |
| 73 | B00182L | BEAUFORT | SAMPLE | 20 | SEDIMENT | 04C | STATION055 |
| 74 | B00183L | BEAUFORT | SAMPLE | 20 | SEDIMENT | 04C | STATION055 |
| 75 | B00184L | BEAUFORT | SAMPLE | 20 | SEDIMENT | 04C | STATION055 |
| 76 | B00185L | BEAUFORT | SAMPLE | 20 | SEDIMENT | 04C | STATION055 |
| 77 | B00186L | BEAUFORT | SAMPLE | 20 | SEDIMENT | 04C | STATION055 |
| 78 | B00188L | BEAUFORT | SAMPLE | 20 | SEDIMENT | 04C | STATION055 |
| 79 | 800190L | BEAUFORT | SAMPLE | 20 | SEDIMENT | 04C | STATION055 |
| 80 | B00191L | BEAUFORT | SAMPLE | 20 | SEDIMENT | 04C | STATION055 |
| 81 | B00192L | BEAUFORT | SAMPLE | 20 | SEDIMENT | 04C | STATION055 |
| 82 | B99194L | BEAUFORT | SAMPLE | 20 | SEDIMENT | 94C | STATION055 |
| 83 | B00195L | BEAUFORT | SAMPLE | 20 | SEDIMENT | 04C | STATION055 |
| 84 | B00196L | BEFILIFORT | SAMPLE | 20 | SEDIMENT | 04C | STATION055 |
| 85 | 800198L | BEAUFORT | SAMPLE | 20 | SEDIMENT | 04C | STATION055 |
| 86 | B00199L | BEAUFORT | SAMPLE | 20 | SEDIMENT | 04C | STATION055 |
| 87 | 800200L | BEAUFORT | SAMPLE | 20 | SEDIMENT | 04C | STATION055 |
| 88 | B00226L | BEAUFORT | | 21 | SEDIMENT | | STATION070 |
| 89 | B00227L | BEAUFORT | SAMPLE | 21 | SEDIMENT | 04C | |
| 90 | B00228L | BEAUFORT | SAMPLE | 21 | SEDIMENT | 04C | |
| 91 | B00229L | BEAUFORT | SAMPLE | 21 | SEDIMENT | 04C | STATION070 |
| 92 | B00230L | BEAUFORT | SAMPLE | 21 | SEDIMENT | 04C | STATION070 |
| 93 | B90232L | BEAUFORT | SAMPLE | 21 | SEDIMENT | 04C | STATION070 |
| 20 94 | B00233L | BEAUFORT | SAMPLE | 21 | SEDIMENT | 04C | STATION070 |
| | 800234L | BEAUFORT | SAMPLE | 21 | SEDIMENT | 04C | STATION070 |
| 20 96 | 800235L | BEAUFORT | SAMPLE | 21 21 | SEDIMENT | 04C | STATION070 |
| 20 97 | 800236L | BEAUFORT | SAMPLE | 21 | SEDIMENT | 04C | STATION070 |
| | 800236L 800237L | BEAUFORT | SAMPLE | 21 | SEDIMENT | 04C | STATION070 |
| 98 99 | 800237L 800238L | BEAUFORT | SAMPLE | 21 21 | SEDIMENT | | STATION070 |
| 99 100 | 800238L 800240L | BERUFORT | SAMPLE | | SEDIMENT | 04C | |
| 1.6363 | DENC-HELL | DELTION UP: (| omnin L.C. | C. J. | -96-134 (AC134 | 1.1-31 | CERTINGED |

| | 0000441 | BEAUFORT | SAMPLE | 21 | SEDIMENT | 04C STATION070 |
|--------------|--------------------|---------------|----------------|-----------|--|----------------|
| 101 | B00241L B00242L | BEAUFORT | SAMPLE | 21 | SEDIMENT | 04C STATION070 |
| 102 | | BEAUFORT | SAMPLE | 21 | SEDIMENT | 04C STATION070 |
| 103 | B00243L | BEAUFORT | SAMPLE | 21 | SEDIMENT | 04C STATION070 |
| 104 | B90244L | BEAUFORT | SAMPLE | 21 | SEDIMENT | 04C STATION070 |
| 105 | B00245L | | SAMPLE | 21 | SEDIMENT | 04C STATION070 |
| 106 | B00246L | BEAUFORT | SAMPLE | 21 | SEDIMENT | 04C STATION070 |
| 107 | B00247L | BEAUFORT | SAMPLE | 21 | SEDIMENT | 04C STATION070 |
| 108 | B90248L | BEAUFORT | SAMPLE | 21 | SEDIMENT | 04C STATION070 |
| 109 | B00249L | BEAUFORT | | 21 | SEDIMENT | 04C STATION070 |
| 119 | B00250L | BEAUFORT | SAMPLE | | SEDIMENT | 04C STATION030 |
| 111 | B00251L | BEAUFORT | SAMPLE | Ø9 20 | | 04C STATION030 |
| 11Ξ | B00252L | BEAUFORT | SAMPLE | 09 22 | SEDIMENT | + · - · · |
| 113 | B00253L | BEAUFORT | SAMPLE | 09 | SEDIMENT | |
| 114 | B00254L | BEAUFORT | SAMPLE | <u>09</u> | SEDIMENT | - |
| 115 | B00256L | BEAUFORT | SAMPLE | 09 | SEDIMENT | 04C STATION030 |
| 116 | B00257L | BEAUFORT | SAMPLE | 69 | SEDIMENT | 04C STATION030 |
| 117 | B00258L | BEAUFORT | SAMPLE | <u>09</u> | SEDIMENT | 04C STATION030 |
| 118 | B00259L | BEAUFORT | SAMPLE | 69 | SEDIMENT | 04C STATION030 |
| 119 | B00261L | BEAUFORT | SAMPLE | 09 | SEDIMENT | 04C STATION030 |
| 120 | B00262L | BEAUFORT | SAMPLE | 69 | SEDIMENT | 04C STATION030 |
| 121 | 300263L | BEAUFORT | SAMPLE | 09 | SEDIMENT | 04C STATION030 |
| 122 | B00264L | BEAUFORT | SAMPLE | 09 | SEDIMENT | 04C STATION030 |
| 123 | B00265L | BEAUFORT | SAMPLE | 09 | SEDIMENT | 04C STATION030 |
| 124 | B00266L | BEAUFORT | SAMPLE | 09 | SEDIMENT | 04C STATION030 |
| 125 | B00267L | BEAUFORT | SAMPLE | 09 | SEDIMENT | 04C STATION030 |
| 126 | B00268L | BEAUFORT | SAMPLE | Ø9 | SEDIMENT | 04C STATION030 |
| 127 | B00269L | BEAUFORT | SAMPLE | 09 | SEDIMENT | 04C STATION030 |
| 128 | B00271L | BERUFORT | SAMPLE | 09 | SEDIMENT | 04C STATION030 |
| 129 | B00272L | BEAUFORT | SAMPLE | 09 | SEDIMENT | 04C STATION030 |
| 130 | B00273L | BEAUFORT | SAMPLE | 09 | SEDIMENT | 04C STATION030 |
| 131 | B00274L | BEAUFORT | SAMPLE | 09 | SEDIMENT | 04C STATION030 |
| 132 | 880275L | BEAUFORT | SAMPLE | 09 | SEDIMENT | 04C STATION030 |
| 133 | B00286L | BEAUFORT | SAMPLE | 15 | SEDIMENT | 04C STATION001 |
| 134 | B00287L | BEAUFORT | SAMPLE | 15 | SEDIMENT | 04C STATION001 |
| 135 | B90288L | BEAUFORT | SAMPLE | 15 | SEDIMENT | 04C STATION001 |
| $130 \\ 136$ | B00289L | BEAUFORT | SAMPLE | 15 | SEDIMENT | 04C STATION001 |
| $130 \\ 137$ | B00299L | BEAUFORT | SAMPLE | 15 | SEDIMENT | 04C STATION001 |
| 138 | B00296L | BEAUFORT | SAMPLE | 32 | SEDIMENT | 04C STATION002 |
| 139 | 800290L | BEAUFORT | SAMPLE | 32 | SEDIMENT | 04C STATION002 |
| 137 140 | 800298L | BEAUFORT | SAMPLE | 32 | SEDIMENT | 04C STATION002 |
| $140 \\ 141$ | B00299L | BEAUFORT | SAMPLE | 32 | SEDIMENT | 04C STATION002 |
| | 800277L 800300L | BEAUFORT | SAMPLE | 32 | SEDIMENT | 04C STATION002 |
| 142 | DEGOSOOF | DELIDER OP. I | معاسط التلالين | ·' I | -a, an | |

END FORM 142 STRAINS

Strains isolated from water at 20C capable of growth in the presence of 3% NaCl.

| | | | | | A LOW AND A REAL PROPERTY. | | 一十一十千百日后十八 |
|----|--------------------|-----------|------------------|------------|----------------------------|----------------|--|
| | B99991H | BEAUFORT | SAMPLE | | MATER | 200 | STATION010 |
| Ē | B00002H | BEAUFORT | SAMPLE | 93 | MATER | 200 | STATION010 |
| 3 | BBBBBBBH | BEAUFORT | SAMPLE | 03 | WATER | 200 | STATION010 |
| | B00004H | BEAUFORT | SAMPLE | 03 | WATER | 200 | STATION010 |
| 4 | | BEAUFORT | SAMPLE | 03 | WATER | 200 | STATION010 |
| 5 | 800005H | | SAMPLE | 03 | WATER | 200 | STATION010 |
| 6 | 800006H | BEAUFORT | | | | 200 | STATION010 |
| 7 | B00007H | BEAUFORT | SAMPLE | 03 | NATER | | |
| 8 | E90008H | BEAUFORT | SAMPLE | 03 | WATER | 200 | STATION010 |
| 9 | B00009H | BEAUFORT | SAMPLE | 63 | WATER | 200 | STATION010 |
| 10 | B00010H | BEAUFORT | SAMPLE | Ø3 | WATER | 20C | STATION010 |
| 11 | B00011H | BEAUFORT | SAMPLE | 03 | WATER | 20C | STATION010 |
| | | BERUFORT | SAMPLE | 03 | WATER | 200 | STATION010 |
| 12 | B00012H | BEAUFORT | SAMPLE | 03 | WATER | 200 | STATION010 |
| 13 | B00013H | | SAMPLE | 03 | WATER | 200 | STATION010 |
| 14 | B90014H | BEAUFORT | | | WATER | 200 | STATION010 |
| 15 | B00015H | BEAUFORT | SAMPLE | 03 | | | STATION010 |
| 16 | B00016H | BEAUFORT | SAMPLE | | WATER | 200 | |
| 17 | B00017H | BEAUFORT | SAMPLE | | WATER | 200 | STATION010 |
| 18 | B00018H | BERUFORT | SAMPLE | 63 | MATER | 200 | STATION010 |
| 19 | B00019H | BEAUFORT | SAMPLE | 03 | MATER | 20C | STATION010 |
| 20 | 800020H | BEAUFORT | SAMPLE | 03 | WATER | 200 | STATION010 |
| | B00021H | BEAUFORT | SAMPLE | | WATER | 200 | STATION010 |
| 21 | B00022H | BEAUFORT | SAMPLE | | WATER | 200 | STATION010 |
| 22 | | BEAUFORT | SAMPLE | | WATER | 200 | STATION010 |
| 23 | E00023H | | SAMPLE | | WATER | 200 | STATION010 |
| 24 | B00024H | BEAUFORT | | | WATER | 200 | STATION020 |
| 25 | B00051H | BEAUFORT | SAMPLE | | | 200 | STATION020 |
| 26 | B00052H | BEAUFORT | SAMPLE | | WATER | | STATION020 |
| 27 | 800053H | BEAUFORT | SAMPLE | | WATER | 200 | |
| 28 | B00054H | BEAUFORT | SAMPLE | | WATER | 200 | STATION020 |
| 29 | B00055H | BEAUFORT | SAMPLE | 20 | WATER | 20C | STATION020 |
| 30 | B00056H | BEAUFORT | SAMPLE | 20 | WATER | 20C | STATION020 |
| 31 | B00057H | BEAUFORT | SAMPLE | -20 | WATER | 200 | STATION020 |
| 32 | 200058H | BEAUFORT | SAMPLE | 20 | WATER | 200 | STATION002 |
| | B00059H | BEAUFORT | SAMPLE | | WATER | 200 | STATION002 |
| 33 | | BEAUFORT | SAMPLE | | WATER | 200 | STATION002 |
| 34 | B00060H | | SAMPLE | | WATER | 200 | STATION002 |
| 35 | B00061H | BEAUFORT | | | WATER | 200 | STATION002 |
| 36 | B00062H | BEAUFORT | SAMPLE | | | 200 | STATION002 |
| 37 | B00063H | BEAUFORT | SAMPLE | | WATER | | STATION002 |
| 38 | B00064H | BEAUFORT | SAMPLE | | | 200 | STATION002 |
| 39 | B00065H | BEAUFORT | | | | 200 | |
| 40 | B00066H | BEAUFORT | SAMPLE | | WATER | 200 | STATION002 |
| 41 | B00067H | BEAUFORT | | | | | STATIONUUL |
| 42 | B00068H | BEAUFORT | | | | | STATION002 |
| 43 | B00069H | BEAUFORT | SAMPLE | 20 | | | STATION002 |
| 44 | B00070H | BEAUFORT | | | | | STATION002 |
| 45 | B00071H | BEAUFORT | | 20 | MATER | 200 | STATION002 |
| 46 | B00072H | BEAUFORT | | | WATER | 200 | |
| 47 | B00073H | BEAUFORT | | | | | |
| | вөөөлон 800075H | BEAUFORT | | | | | |
| 48 | | BEAUFORT | | | | | |
| 49 | B00101H | BEAUFORT | | | | | |
| 50 | E00102H | DEMORUM I | ⇒⊡r1 r ⊏£ | , <u>1</u> | 641 C 1 1 | Enc. "art "en" | and the second |

| 4 | Ý | \odot |
|-----|-----|------------|
| JI. | • 夾 | $^{\circ}$ |

| 51 | B00103H | BEAUFORT | SAMPLE | 27 | WATER | 200 | STATION071 |
|-----------------|---------|-----------|----------|----|-------|-----|------------|
| 52 | B00104H | BEAUFORT | SAMPLE | 27 | WATER | 200 | |
| 53 | B00104H | BEAUFORT | SAMPLE | 27 | WATER | 200 | |
| | | | | | | 200 | |
| 54 | B00109H | BEAUFORT | SAMPLE | 27 | | | |
| 55 | B00111H | BEAUFORT | SAMPLE | 27 | WATER | 500 | |
| 56 | B00112H | BEAUFORT | SAMPLE | 27 | WATER | 200 | |
| 57 | B00113H | BEAUFORT | SAMPLE | 27 | WATER | 20C | STATION071 |
| 58 | B00115H | BEAUFORT | SAMPLE | 27 | WATER | 200 | STATION071 |
| 59 | B00116H | BEAUFORT | SAMPLE | 27 | WATER | 200 | STATION071 |
| 60 | B00117H | BEAUFORT | | 27 | WATER | 200 | STATION071 |
| 61 | B00118H | BEAUFORT | | 27 | MATER | 200 | STATION071 |
| 62 | B00119H | BEAUFORT | | 27 | WATER | 200 | STATION071 |
| 63 | B00120H | BEAUFORT | | 27 | WATER | 200 | STATION071 |
| | | BEAUFORT | | 27 | WATER | 200 | STATION071 |
| 64 | B00121H | | | | | | STATION071 |
| 65 | B00122H | BEAUFORT | | 27 | WATER | | |
| 66 | B00123H | BEAUFORT | | 27 | WATER | | STATION071 |
| 67 | B00151H | BEAUFORT | | 24 | MATER | | STATION055 |
| 68 | B00152H | BEAUFORT | SAMPLE | 24 | | | STATION055 |
| 69 | B00153H | BEAUFORT | SAMPLE | 24 | WATER | 200 | STATION055 |
| 70 | B00154H | BEAUFORT | SAMPLE | 24 | WATER | 200 | STATION055 |
| 71 | B00155H | BERUFORT | SAMPLE | 24 | WATER | 200 | STATION055 |
| 72 | B00156H | BEAUFORT | | 24 | | 200 | STATION055 |
| 73 | B00157H | BEAUFORT | | 24 | | 200 | STATION055 |
| 74 | B00158H | BEAUFORT | | 24 | | 200 | STATION055 |
| | | BEAUFORT | | 24 | | 200 | STATION055 |
| 75 | B00159H | | | | | | |
| $\overline{26}$ | B00160H | BEAUFORT | SAMPLE | | | | STATION055 |
| 77 | B00161H | BEAUFORT | SAMPLE | | | | STATION055 |
| 78 | B00162H | BEAUFORT | | | WATER | | STATION055 |
| 79 | B00163H | BEAUFORT | | | WATER | | STATION055 |
| 80 | B00164H | REALIFORT | | 24 | | | STATION055 |
| 81 | B00165H | BEAUFORT | SAMPLE | 24 | WATER | 200 | STATION055 |
| 82 | B00166H | BEAUFORT | SAMPLE | 24 | WATER | 200 | STATION055 |
| 83 | B00168H | BEAUFORT | SAMPLE | 24 | WATER | 20C | STATION055 |
| 84 | B00169H | BEAUFORT | SAMPLE | 24 | MATER | 200 | STATION055 |
| 85 | B00170H | BEAUFORT | | 24 | WATER | 200 | STATION055 |
| 86 | B00201H | BEAUFORT | | 26 | WATER | 200 | STATION070 |
| 87 | B00202H | BEAUFORT | SAMPLE | | WATER | 200 | STATION070 |
| | B00203H | | | | | | |
| 88 | | | | | | | STATION070 |
| 89 | B00204H | | | | | | STATION070 |
| 90 | B00205H | | | | | | STATION070 |
| 91 | B00206H | BEAUFORT | | | | | |
| 92 | B00207H | BEAUFORT | | | | | |
| 93 | 800208H | | | | | | STATION070 |
| 94 | B00210H | | | | | | STATION070 |
| 95 | B00211H | BEAUFORT | SAMPLE : | 26 | WATER | 200 | STATION070 |
| 96 | B00212H | BEAUFORT | SAMPLE : | 26 | WATER | 20C | STATION070 |
| 97 | B00213H | | | | | | STATION070 |
| 98 | B00216H | | | | | | STATION070 |
| 99 | B00217H | BEAUFORT | | | | | STATION070 |
| 100 | B00219H | | | | | | STATION070 |
| $100 \\ 101$ | B00221H | | | | | | STATION070 |
| | | | | | | | |
| 102 | B00222H | | | | | | STATION070 |
| 103 | 800223H | | | | | | STATION070 |
| 104 | 800251H | | | | | | STATION030 |
| 105 | 800252H | BEAUFORT | SAMPLE : | 11 | WATER | 200 | STATION030 |
| | | | | | | | |

v

| 106 | B00253H | BEAUFORT | SAMPLE | 11 | WATER | 200 | STATION030 |
|-----|---------|----------|--------|----|-------|-----|------------|
| 107 | B00254H | BEAUFORT | SAMPLE | 11 | WATER | 200 | STATION030 |
| 108 | B00255H | BEAUFORT | SAMPLE | 11 | WATER | 200 | STATION030 |
| 109 | B00256H | BEAUFORT | SAMPLE | 11 | WATER | 200 | STATION030 |
| 110 | B00257H | BEAUFORT | SAMPLE | 11 | WATER | 200 | STATION030 |
| 111 | B00258H | BEAUFORT | SAMPLE | 11 | WATER | 200 | STATION030 |
| 112 | B00259H | BEAUFORT | SAMPLE | 11 | WATER | 200 | STATION030 |
| 113 | B00260H | BEAUFORT | SAMPLE | 11 | WATER | 200 | STATION030 |
| 114 | B00261H | BEAUFORT | SAMPLE | 11 | WATER | 200 | STATION030 |
| 115 | B00262H | BEAUFORT | SAMPLE | 11 | WATER | 200 | STATION030 |
| 116 | B00263H | BEAUFORT | SAMPLE | 11 | WATER | 200 | STATION030 |
| 117 | B00264H | BEAUFORT | SAMPLE | 11 | WATER | 20C | STATION030 |
| 118 | B00265H | BEAUFORT | SAMPLE | 11 | WATER | 200 | STATION030 |
| 119 | B00266H | BEAUFORT | SAMPLE | 11 | WATER | 200 | STATION030 |
| 120 | B00268H | BEAUFORT | SAMPLE | 11 | WATER | 200 | STATION030 |
| 121 | B00269H | BEAUFORT | SAMPLE | 11 | MATER | 200 | STATION030 |
| 122 | B00270H | BEAUFORT | SAMPLE | 11 | WATER | 200 | STATION030 |
| 123 | B00271H | BEAUFORT | SAMPLE | 11 | WATER | 20C | STATION030 |
| 124 | B00272H | BEAUFORT | SAMPLE | 11 | WATER | 200 | STATION030 |
| 125 | B90273H | BEAUFORT | SAMPLE | 11 | WATER | 200 | STATION030 |
| 126 | B00275H | BEAUFORT | SAMPLE | 11 | MATER | 200 | STATION030 |

END FORM 126 STRAINS

Strains isolated from sediment at 20C capable of growth in the presence of 3% NaCl.

| 1 | B00026H | BEAUFORT | SAMPLE | 63 | SEDIMENT | 200 | STATION010 |
|---------|---------|----------|--------|-------------|----------|-----|------------|
| 2 | 800027H | BEAUFORT | SAMPLE | 03 | SEDIMENT | 200 | STATION010 |
| З | B00028H | BEAUFORT | SAMPLE | 03 | SEDIMENT | 200 | STATION010 |
| 4 | 800029H | BEAUFORT | SAMPLE | 03 | SEDIMENT | 200 | STATION010 |
| 5 | 800030H | BEAUFORT | SAMPLE | <u>8</u> 3 | SEDIMENT | 200 | STATION010 |
| 6 | 600031H | BEAUFORT | SAMPLE | õ3 | SEDIMENT | 200 | STATION010 |
| | | | SAMPLE | 03 | SEDIMENT | 200 | STATION010 |
| 7 | B00032H | BEAUFORT | | | | 200 | STATION010 |
| 8 | 800033H | BEAUFORT | SAMPLE | 03 | SEDIMENT | 200 | |
| 9 | B00035H | BEAUFORT | SAMPLE | 03 | SEDIMENT | | STATION010 |
| 10 | 800036H | BEAUFORT | SAMPLE | 63 | SEDIMENT | 200 | STATION010 |
| 11 | B00037H | BEAUFORT | SAMPLE | 63 | SEDIMENT | 200 | STATION010 |
| $1 \ge$ | 800038H | BEAUFORT | SAMPLE | 63 | SEDIMENT | 200 | STATION010 |
| 13 | B00039H | BEAUFORT | SAMPLE | 03 | SEDIMENT | 20C | STATION010 |
| 14 | B00040H | BEAUFORT | SAMPLE | 63 | SEDIMENT | 200 | STATION010 |
| 15 | B00041H | BEAUFORT | SAMPLE | 03 | SEDIMENT | 200 | STATION010 |
| 16 | B00042H | BEAUFORT | SAMPLE | 63 | SEDIMENT | 200 | STATION010 |
| 17 | B00043H | BEAUFORT | SAMPLE | 0 3 | SEDIMENT | 200 | STATION010 |
| 18 | B00044H | BEAUFORT | SAMPLE | | SEDIMENT | 200 | STATION010 |
| | | BEAUFORT | SAMPLE | 03 | SEDIMENT | 200 | STATION010 |
| 19 | B00045H | | | | | 200 | STATION010 |
| 20 | B00047H | BEAUFORT | SAMPLE | 03 | SEDIMENT | | |
| 21 | E00048H | BEAUFORT | SAMPLE | 03 | SEDIMENT | 200 | STATION010 |
| 22 | B00076H | BEAUFORT | SAMPLE | 16 | SEDIMENT | 200 | STATION002 |
| 23 | B00077H | BEAUFORT | SAMPLE | 16 | SEDIMENT | 200 | STATION002 |
| 골격 | B00078H | BEAUFORT | SAMPLE | 16 | SEDIMENT | 200 | STATION002 |
| 25 | E00079H | BEAUFORT | SAMPLE | 1ϵ | SEDIMENT | 20C | STATION002 |
| ē6 | B00081H | BEAUFORT | SAMPLE | 16 | SEDIMENT | 200 | STATION002 |
| 27 | 800082H | BEAUFORT | SAMPLE | 16 | SEDIMENT | 200 | STATION002 |
| 28 | 800083H | BEAUFORT | SAMPLE | 16 | SEDIMENT | 200 | STATION002 |
| 29 | B00084H | BEAUFORT | SAMPLE | 16 | SEDIMENT | 200 | STATION002 |
| | B00085H | BEAUFORT | SAMPLE | 16 | SEDIMENT | 200 | STATION002 |
| 30 | + | | SAMPLE | 16 | SEDIMENT | 200 | STATION002 |
| 31 | 800086H | BEAUFORT | | | | | |
| 32 | E00087H | BEAUFORT | SAMPLE | 16 | SEDIMENT | 200 | STATION002 |
| 33 | B00088H | BEAUFORT | SAMPLE | 16 | SEDIMENT | 200 | STATION002 |
| 34 | B00089H | BEAUFORT | SAMPLE | 16 | SEDIMENT | 200 | STATION002 |
| 35 | B00091H | BEAUFORT | SAMPLE | 16 | SEDIMENT | 20C | STATION002 |
| 36 | B00092H | BEAUFORT | SAMPLE | 16 | SEDIMENT | 200 | STATION002 |
| 37 | B00093H | BEAUFORT | SAMPLE | 16 | SEDIMENT | 200 | STATION002 |
| 38 | B00094H | BEAUFORT | SAMPLE | 16 | SEDIMENT | 200 | STATION002 |
| 39 | B00095H | BERUFORT | SAMPLE | | SEDIMENT | 200 | STATION002 |
| 40 | B00096H | BEAUFORT | SAMPLE | 16 | SEDIMENT | 200 | STATION002 |
| | | | | 16 | SEDIMENT | 200 | STATION002 |
| 41 | B00098H | BEAUFORT | SAMPLE | | | | |
| 42 | B00099H | BEAUFORT | SAMPLE | 16 | SEDIMENT | 200 | STATION002 |
| 43 | B00126H | BEAUFORT | SAMPLE | 55 | SEDIMENT | 200 | STATION071 |
| 44 | B00127H | BEAUFORT | SAMPLE | 22 | SEDIMENT | 200 | STATION071 |
| 45 | B00128H | BEAUFORT | SAMPLE | 22 | SEDIMENT | 200 | STATION071 |
| 46 | B00129H | BEAUFORT | | 22 | SEDIMENT | 20C | STATION071 |
| 47 | B00130H | BEAUFORT | SAMPLE | 22 | SEDIMENT | 200 | STATION071 |
| | | | | | | | |

| | 48 | E00131H | BEAUFORT | SAMPLE | 22 | | 200 | |
|----|---------|---------|--------------|--------|-----|----------|------------|------------|
| | 49 | B00132H | BEAUFORT | SAMPLE | 55 | SEDIMENT | 200 | STATION071 |
| | 50 | B00135H | BEAUFORT | SAMPLE | 22 | SEDIMENT | 200 | STATION071 |
| | 51 | B00136H | BEAUFORT | SAMPLE | 22 | SEDIMENT | 200 | STATION071 |
| | 52 | B00138H | BEAUFORT | SAMPLE | 22 | SEDIMENT | 200 | STATION071 |
| | 53 | B00139H | BEAUFORT | SAMPLE | 22 | SEDIMENT | 200 | STATION071 |
| | 54 | B00140H | BEAUFORT | SAMPLE | 22 | SEDIMENT | 200 | STATION071 |
| | 55 | B00141H | BEAUFORT | SAMPLE | 22 | SEDIMENT | 200 | STATION071 |
| | 56 | B00142H | BEAUFORT | SAMPLE | 22 | SEDIMENT | 20C | STATION071 |
| | 57 | B00143H | BEAUFORT | SAMPLE | 22 | SEDIMENT | 200 | STATION071 |
| | 58 | B00144H | BEAUFORT | SAMPLE | 22 | SEDIMENT | 200 | STATION071 |
| | 59 | B00145H | BEAUFORT | SAMPLE | 22 | SEDIMENT | 290 | STATION071 |
| | 60 | B00146H | BEAUFORT | SAMPLE | 22 | SEDIMENT | 200 | STATION071 |
| | 61 | B00147H | BEAUFORT | SAMPLE | 22 | SEDIMENT | 200 | STATION071 |
| | | B00148H | BEAUFORT | SAMPLE | 22 | SEDIMENT | 200 | STATION071 |
| | 62 | B00140H | BEAUFORT | SAMPLE | 22 | SEDIMENT | 200 | STATION071 |
| | 63 | B001496 | BEAUFORT | SAMPLE | 22 | SEDIMENT | 200 | STATION071 |
| | 64 | | BEAUFORT | SAMPLE | 20 | SEDIMENT | 200 | STATION055 |
| | 65 | B00176H | BEAUFORT | SAMPLE | 20 | SEDIMENT | 200 | STATION055 |
| | 66 | B00177H | | SAMPLE | 20 | SEDIMENT | 200 | STATION055 |
| | 67 | B00178H | BEAUFORT | | 20 | SEDIMENT | 200 | STATION055 |
| | 68 | B00179H | BEAUFORT | SAMPLE | | SEDIMENT | 200 | STATION055 |
| | 69 | B00180H | BEAUFORT | SAMPLE | 20 | SEDIMENT | 200 | STATION055 |
| | 70 | B00181H | BEAUFORT | SAMPLE | 20 | | 200 | STATION055 |
| | 71 | B00183H | BEAUFORT | SAMPLE | 20 | SEDIMENT | 200 | STATION055 |
| | 72 | B00184H | BEAUFORT | SAMPLE | 20 | SEDIMENT | 200 | STATION055 |
| | 73 | B00185H | BEAUFORT | SAMPLE | 20 | SEDIMENT | 200 | STATION055 |
| | 74 | B00186H | BEAUFORT | SAMPLE | 20 | SEDIMENT | | STATION055 |
| | 75 | B00187H | BEAUFORT | SAMPLE | 20 | SEDIMENT | 200 200 | STATION055 |
| | 76 | B00188H | BEAUFORT | SAMPLE | 20 | SEDIMENT | 200 | STATION055 |
| | 77 | B00189H | BEAUFORT | SAMPLE | 20 | SEDIMENT | 200 | STATION055 |
| | 78 | E00190H | BEAUFORT | SAMPLE | 20 | SEDIMENT | | STATION055 |
| | 79 | B00191H | BEAUFORT | SAMPLE | 20 | SEDIMENT | 200 | STATION055 |
| | 80 | B00192H | BEAUFORT | SAMPLE | 20 | SEDIMENT | 200 | STATION055 |
| | 81 | B00193H | BEAUFORT | SAMPLE | 20 | SEDIMENT | 200 | |
| | 82 | B00194H | BEAUFORT | SAMPLE | 20 | SEDIMENT | 200 | STATION055 |
| | 83 | E00195H | BEAUFORT | SAMPLE | 20 | SEDIMENT | 200 | STATION055 |
| | 84 | B00196H | BEAUFORT | SAMPLE | 50 | SEDIMENT | 200 | STATION055 |
| | 85 | B00197H | BEAUFORT | SAMPLE | 20 | | | STATION055 |
| | 86 | B00198H | BEAUFORT | SAMPLE | -20 | SEDIMENT | 200 | |
| | 87 | B00199H | BEAUFORT | SAMPLE | 20 | SEDIMENT | 200 | |
| | 88 | E00200H | BEAUFORT | SAMPLE | 50 | SEDIMENT | 200 | |
| | 89 | B00226H | BEAUFORT | SAMPLE | 21 | SEDIMENT | 200 | |
| | 90 | B00227H | BEAUFORT | SAMPLE | 21 | SEDIMENT | 200 | |
| | 91 | B00228H | BEAUFORT | SAMPLE | 21 | SEDIMENT | 200 | |
| | 92 | B00229H | BEAUFORT | SAMPLE | 21 | SEDIMENT | 20C | |
| | 93 | B00230H | BEAUFORT | SAMPLE | 21 | SEDIMENT | 20C | STATION070 |
| | 94 | B00231H | BEAUFORT | SAMPLE | 21 | SEDIMENT | 200 | |
| | 95 | 800535H | BEAUFORT | SAMPLE | • | SEDIMENT | 20C | |
| | 96 | B00233H | BEAUFORT | SAMPLE | | SEDIMENT | | STATION070 |
| 97 | | 234H | BEAUFORT SAM | | | | | TION070 |
| | 98 | B00235H | BEAUFORT | | | SEDIMENT | | STATION070 |
| | ġġ | B00236H | BEAUFORT | SAMPLE | 21 | | 200 | |
| | 100 | B00237H | BEAUFORT | SAMPLE | 21 | SEDIMENT | 200 | STATION070 |
| | | | | | | | | |

| 101 | B00238H | BEAUFORT SAMPLE 21 SEDIMENT 20C STATION0 | 70 |
|-----|---------|---|-----|
| 102 | B00239H | BEAUFORT SAMPLE 21 SEDIMENT 20C STATION0 | 70 |
| 103 | B00240H | BEAUFORT SAMPLE 21 SEDIMENT 20C STATIONO | 70 |
| 104 | B00241H | BEAUFORT SAMPLE 21 SEDIMENT 20C STATIONO | |
| 105 | B00242H | BEAUFORT SAMPLE 21 SEDIMENT 20C STATIONO | . – |
| 106 | B00243H | BEAUFORT SAMPLE 21 SEDIMENT 20C STATION0 | |
| 107 | B00244H | BEAUFORT SAMPLE 21 SEDIMENT 20C STATION0 | |
| 108 | B00245H | BEAUFORT SAMPLE 21 SEDIMENT 20C STATION0 | |
| 189 | B00246H | BEAUFORT SAMPLE 21 SEDIMENT 20C STATION07 | |
| 110 | B00247H | BEAUFORT SAMPLE 21 SEDIMENT 20C STATION07 | |
| 111 | B00248H | BEAUFORT SAMPLE 21 SEDIMENT 20C STATION07 | |
| 112 | B00249H | BEAUFORT SAMPLE 21 SEDIMENT 20C STATION07 | 70 |
| 113 | B00250H | BEAUFORT SAMPLE 21 SEDIMENT 20C STATION07 | 70 |
| 114 | B00276H | BEAUFORT SAMPLE 09 SEDIMENT 20C STATION03 | 30 |
| 115 | B00277H | BEAUFORT SAMPLE 09 SEDIMENT 20C STATION03 | |
| 116 | B00278H | BEAUFORT SAMPLE 09 SEDIMENT 20C STATION03 | 30 |
| 117 | 800279H | BEAUFORT SAMPLE 09 SEDIMENT 20C STATION03 | 30 |
| 118 | B00280H | BEAUFORT SAMPLE 09 SEDIMENT 20C STATION03 | 30 |
| 119 | B00281H | BEAUFORT SAMPLE 09 SEDIMENT 20C STATION03 | 30 |
| 120 | B00282H | BEAUFORT SAMPLE 09 SEDIMENT 20C STATION03 | 30 |
| 121 | B00283H | BEAUFORT SAMPLE 09 SEDIMENT 20C STATION03 | 0 |
| 122 | B00284H | BEAUFORT SAMPLE 09 SEDIMENT 20C STATION03 | 9 |
| 123 | B00285H | BEAUFORT SAMPLE 09 SEDIMENT 20C STATION03 | |
| 124 | B00286H | BEAUFORT SAMPLE 09 SEDIMENT 20C STATION03 | |
| 125 | B00287H | BEAUFORT SAMPLE 09 SEDIMENT 20C STATION03 | |
| 126 | B00288H | BEAUFORT SAMPLE 09 SEDIMENT 20C STATION03 | |
| 127 | B00289H | BEAUFORT SAMPLE 09 SEDIMENT 20C STATION03 | |
| 128 | B00290H | BERUFORT SAMPLE 09 SEDIMENT 20C STATION03 | |
| 129 | B00292H | BERUFORT SAMPLE 09 SEDIMENT 20C STATION03 | |
| 130 | B00293H | BEAUFORT SAMPLE 09 SEDIMENT 20C STATION03 | |
| 131 | B00294H | BEAUFORT SAMPLE 09 SEDIMENT 20C STATION03 | |
| 132 | B00295H | BEAUFORT SAMPLE 09 SEDIMENT 20C STATION03 | |
| 133 | B00296H | BEAUFORT SAMPLE 09 SEDIMENT 20C STATION03 | |
| 134 | B00297H | BEAUFORT SAMPLE 09 SEDIMENT 20C STATION03 | |
| 135 | B00298H | BEAUFORT SAMPLE 09 SEDIMENT 20C STATION03 | |
| 136 | B00299H | BEAUFORT SAMPLE 09 SEDIMENT 20C STATION03 | |
| 137 | 800300H | BEAUFORT SAMPLE 09 SEDIMENT 20C STATION03 | 0 |
| | | | |

END FORM

Strains isolated from water at 4C capable of growth in the presence of 5% NaCl.

| | | | | | | 040 | STATION010 |
|-------|---------------------------|---|--------|----|------------|-----|------------|
| 1 | B00003L | BEAUFORT | SAMPLE | | • •• • • • | 04C | STATION010 |
| E | B00005L | BEAUFORT | SAMPLE | 03 | WATER | 04C | |
| З | B00006L | BEAUFORT | SAMPLE | 63 | MATER | 04C | STATION010 |
| 4 | BOOOD9L | BEAUFORT | SAMPLE | 03 | WATER | 04C | STATION010 |
| 5 | B00012L | BEAUFORT | SAMPLE | 03 | WATER | 04C | STATION010 |
| 6 | B00014L | BEAUFORT | SAMPLE | 03 | MATER | 941 | STATION010 |
| | B90021L | BEAUFORT | SAMPLE | 33 | WATER | | STATION010 |
| 64-19 | B00022L | BEAUFORT | SAMPLE | 93 | MATEN | | STATION010 |
| | B00024L | BEAUFORT | SAMPLE | 03 | WATER | Öq. | STATION010 |
| 9 | ••• •• = = = • • • | BEAUFORT | SAMPLE | ñЗ | WATER | 04C | STATION010 |
| 10 | 800025L | BEAUFORT | SAMPLE | 20 | WATER | 04C | STATION002 |
| 11 | B00053L | | SAMPLE | 20 | WATER | 04C | STATION002 |
| 12 | B00054L | BEAUFORT | | 20 | WATER | 04C | STATION002 |
| 13 | B00057L | BEAUFORT | SAMPLE | | WATER | 04C | STATION002 |
| 14 | B00058L | BEAUFORT | SAMPLE | 20 | | 04C | STATION002 |
| 15 | 80006 0L | BEAUFORT | SAMPLE | 50 | WATER | | STATION002 |
| 16 | B00062L | BEAUFORT | SAMPLE | 20 | WATER | 04C | |
| 17 | B00063L | BEAUFORT | SAMPLE | 50 | WATER | 04C | STATION002 |
| 18 | B00066L | BEAUFORT | SAMPLE | 20 | WATER | 04C | STATION002 |
| 19 | B00067L | BEAUFORT | SAMPLE | 20 | WATER | 04C | STATION002 |
| 20 | B00068L | BEAUFORT | SAMPLE | 29 | WATER | 04C | STATION002 |
| 21 | B00069L | BEAUFORT | SAMPLE | 20 | WATER | 04C | STATION002 |
| | B00074L | BEAUFORT | SAMPLE | 20 | WATER | Ø4C | STATION002 |
| 22 | B00075L | BEAUFORT | SAMPLE | 20 | WATER | 04C | STATION002 |
| 23 | | BEAUFORT | SAMPLE | 27 | WATER | 04C | STATION071 |
| 24 | 800103L | | SAMPLE | 27 | WATER | 04C | STATION071 |
| 25 | B00104L | BEAUFORT | SAMPLE | 27 | WATER | 04C | STATION071 |
| 26 | B00106L | BEAUFORT | | | WATER | 04C | STATION071 |
| 27 | B90108L | BEAUFORT | SAMPLE | 27 | | 04C | STATION071 |
| 28 | B00109L | BEAUFORT | SAMPLE | 27 | MATER | | STATION071 |
| 29 | B00111L | BEAUFORT | SAMPLE | 27 | WATER | 040 | STATION071 |
| 30 | B00112L | BEAUFORT | SAMPLE | 27 | WATER | 04C | |
| 31 | B00113L | BEAUFORT | SAMPLE | 27 | WATER | 04C | STATION071 |
| 32 | B00115L | BEAUFORT | SAMPLE | 27 | WATER | 04C | STATION071 |
| 33 | B00116L | BEAUFORT | SAMPLE | | WATER | Ø4C | STATION071 |
| 34 | B00117L | BEAUFORT | SAMPLE | 27 | WATER | 04C | STATION071 |
| 35 | B00119L | BEAUFORT | SAMPLE | | WATER | 04C | STATION071 |
| 36 | B00120L | BEAUFORT | SAMPLE | 27 | WATER | 04C | STATION071 |
| 37 | B00121L | BEAUFORT | SAMPLE | 27 | WATER | 04C | STATION071 |
| 38 | B00122L | BEAUFORT | SAMPLE | 27 | WATER | 04C | STATION071 |
| | B00124L | BEAUFORT | SAMPLE | 27 | WATER | 04C | STATION071 |
| 39 | | BEAUFORT | SAMPLE | | | 04C | STATION071 |
| 40 | B00125L | | | | | | |
| -41 | B00151L | BEAUFORT | SAMPLE | | | | - |
| 42 | B00152L | BEAUFORT | SAMPLE | | | | |
| 43 | B00153L | BEAUFORT | SAMPLE | | | | |
| 44 | B00154L | BEAUFORT | SAMPLE | | | | STATION055 |
| 45 | 800155L | BEAUFORT | SAMPLE | | | | STATION055 |
| 46 | B00156L | BEAUFORT | SAMPLE | | | | STATION055 |
| 47 | B00157L | BEAUFORT | SAMPLE | | | | |
| 48 | B00160L | BEAUFORT | SAMPLE | 24 | WATER | | |
| 49 | B00163L | BEAUFORT | SAMPLE | 24 | WATER | | |
| 50 | B00164L | BEAUFORT | | 24 | WATER | 04C | STATION055 |
| -"IEI | DUDITOLE | and the second state of the second | | | | | |

| 51 | 800165L | BEAUFORT | SAMPLE | 24 | WATER | 04C | STATION055 |
|------------------|---------|----------|--------|---------------|--------|-----|------------|
| 52 | B00167L | BEAUFORT | SAMPLE | 24 | WATER | 04C | STATION055 |
| 53 | 300169L | BEAUFORT | SAMPLE | 24 | WATER | 04C | STATION055 |
| 54 | 800170L | BEAUFORT | SAMPLE | 24 | WATER | 04C | STATION055 |
| 55 | B00171L | BEAUFORT | SAMPLE | $\mathbb{Z}4$ | WATER | 04C | STATION055 |
| 56 | 800173L | BEAUFORT | SAMPLE | 24 | MATER | 04C | STATION055 |
| 107 - 77 - 11 | B00175L | BEAUFORT | SAMPLE | 24 | WATER | 04C | STATION055 |
| 58 | B00201L | BEAUFORT | SAMPLE | 26 | MATER | 04C | STATION070 |
| 59 | 800202L | BEAUFORT | SAMPLE | 26 | WATER | 04C | STATION070 |
| 60 | B00203L | BEAUFORT | SAMPLE | 26 | WATER | 04C | STATION070 |
| 61 | 800205L | BEAUFORT | SAMPLE | 26 | WHITER | 04C | STATION070 |
| 62 | B00206L | BEAUFORT | SAMPLE | 26 | MATER | 04C | STATION070 |
| 63 | 800207L | BEAUFORT | SAMPLE | 26 | WATER | 04C | STATION070 |
| 64 | B00208L | BEAUFORT | SAMPLE | 56 | WATER | 04C | STATION070 |
| 65 | B00210L | BEAUFORT | SAMPLE | 26 | WATER | 04C | STATION070 |
| 66 | 800212L | BEAUFORT | SAMPLE | 26 | WATER | 04C | STATION070 |
| 67 | B00213L | BEAUFORT | SAMPLE | 26 | MATER | 04C | STATION070 |
| 68 | B00216L | BEAUFORT | SAMPLE | 26 | WATER | 04C | STATION070 |
| 69 | B00217L | BEAUFORT | SAMPLE | 26 | WATER | 04C | STATION070 |
| 70 | B00218L | BEAUFORT | SAMPLE | 26 | NATER | 04C | STATION070 |
| 71 | B00220L | BEAUFORT | SAMPLE | 26 | WATER | 04C | STATION070 |
| 72 | B00221L | BEAUFORT | SAMPLE | 26 | MATER | 04C | STATION070 |
| 73 | 800222L | BEAUFORT | SAMPLE | 26 | WATER | 04C | STATION070 |
| 74 | 800223L | BERUFORT | SAMPLE | 26 | WATER | 04C | STATION070 |
| 75 | B00224L | BEAUFORT | SAMPLE | 56 | WATER | 04C | STATION070 |
| 76 | B00225L | BEAUFORT | SAMPLE | 26 | WATER | 04C | STATION070 |
| 77 | B00281L | BEAUFORT | SAMPLE | 19 | WATER | 04C | STATION001 |
| 78 | B00282L | BEAUFORT | SAMPLE | 19 | WATER | 04C | STATION001 |
| 79 | B00283L | BEAUFORT | SAMPLE | 19 | WATER | 04C | STATION001 |
| 80 | 800284L | BEAUFORT | SAMPLE | 19 | WATER | 04C | STATION001 |
| $\otimes 1$ | B00291L | BEAUFORT | SAMPLE | 36 | WATER | 04C | STATION002 |
| 82 | B00292L | BEAUFORT | SAMPLE | 36 | MATER | 04C | STATION002 |
| 83 | 800294L | BEAUFORT | SAMPLE | 36 | WATER | 04C | STATION002 |
| 84 | 800295L | BEAUFORT | SAMPLE | 36 | WATER | 04C | STATION002 |

END FORM 84 STRAINS

Strains isolated form sediment at 4C capable of growth in presence of 5% NaCl.

| | | | | | | | comparent control d |
|-------------|----------------|----------|--------|------|----------|------|---------------------|
| L | 356626L | BEAUFORT | SAMPLE | | SEDIMENT | | STATION010 |
| 2 | B00027L | BEAUFORT | SAMPLE | 03 | SEDIMENT | 04C | STATION010 |
| 3 | 500028L | SERUFORT | SAMPLE | 03 | SEDIMENT | 04C | STATION010 |
| -+ | B00031L | BERUFORT | SAMPLE | 03 | SEDIMENT | 04C | STATION010 |
| | BOODSEL | BEAUFORT | SAMPLE | 63 | SEDIMENT | 04C | STATION010 |
| | | BEAUFORT | SAMPLE | 03 | SEDIMENT | 04C | STATION010 |
| | 899933L | BEAUFORT | SAMPLE | õ3 | SEDIMENT | 04C | STATION010 |
| 7 | 899935L | | SAMPLE | 03 | SEDIMENT | 04C | STATION010 |
| 8 | 800036L | BEAUFORT | SAMPLE | 03 | SEDIMENT | 04C | STATION010 |
| 9 | 600037L | BEAUFORT | | | SEDIMENT | 04C | STATION010 |
| 18 | B00039L | BEAUFORT | SAMPLE | 03 | | 04C | STATION010 |
| 11 | B90040L | BEAUFORT | SAMPLE | 83 | SEDIMENT | | STATION010 |
| 13 | B00041L | BEAUFORT | SAMPLE | 03 | SEDIMENT | 04C | STATION010 |
| 13 | B00042L | BEAUFORT | SAMPLE | 63 | SEDIMENT | 04C | |
| 14 | B00043L | BEAUFORT | SAMPLE | 03 | SEDIMENT | 04C | STATION010 |
| 15 | <u>B90044L</u> | BEAUFORT | SAMPLE | 03 | SEDIMENT | 040 | STATION010 |
| 16 | B08646L | BERUFORT | SAMPLE | 11.3 | SEDIMENT | 040 | STATION010 |
| 17 | 3000471 | BEAUFORT | SAMPLE | 03 | SEDIMENT | 94C | STATION010 |
| 18 | B00048L | BERUFORT | SAMPLE | 63 | SEDIMENT | 04C | STATION010 |
| 19 | B00049L | BERUFORT | SAMPLE | 03 | SEDIMENT | 04C | STATION010 |
| 20 | B00050L | BEAUFORT | SAMPLE | 03 | SEDIMENT | 04C | STATION010 |
| | B00076L | BEAUFORT | SAMPLE | 16 | SEDIMENT | 04C | STATION002 |
| 21 | | BERUFORT | SAMPLE | 16 | SEDIMENT | 04C | STATION002 |
| 22 | 800077L | BEAUFORT | SAMPLE | 16 | SEDIMENT | 04C | STATION002 |
| 23 | B00078L | BEAUFORT | SAMPLE | 16 | SEDIMENT | 04C | STATION002 |
| 24 | B00079L | | | 16 | SEDIMENT | 04C | STATION002 |
| 25 | 800080L | BEAUFORT | SAMPLE | | SEDIMENT | 04C | STATION002 |
| ΞĿ | B00082L | BEAUFORT | SAMPLE | 16 | | 04C | STATION002 |
| 27 | B00083L | BEAUFORT | SAMPLE | 16 | SEDIMENT | | STATION002 |
| 28 | 800086L | BEAUFORT | SAMPLE | 16 | SEDIMENT | 04C | STATION002 |
| 29 | E90987L | BEAUFORT | SAMPLE | 16 | SEDIMENT | 040 | |
| 39 | 600088L | BEAUFORT | SAMPLE | 16 | SEDIMENT | 04C | STATION002 |
| 31 | B99092L | BEAUFORT | SAMPLE | 16 | SEDIMENT | 04C | STATION002 |
| 32 | B00095L | BEAUFORT | SAMPLE | 16 | SEDIMENT | 04C | STATION002 |
| 33 | B00096L | BEAUFORT | SAMPLE | 16 | SEDIMENT | 04C | STATION002 |
| 34 | B00100L | BEAUFORT | SAMPLE | 16 | SEDIMENT | 04C | STATION002 |
| 35 | B00126L | BEAUFORT | SAMPLE | 22 | SEDIMENT | 04C | STATION071 |
| 36 | B00127L | BEAUFORT | SAMPLE | 22 | SEDIMENT | 04C | STATION071 |
| 37 | B00128L | BEAUFORT | SAMPLE | 22 | | 04C | STATION071 |
| | B90129L | BERUFORT | SAMPLE | | SEDIMENT | 04C | STATION071 |
| 38 | | BEAUFORT | | | SEDIMENT | 04C | STATION071 |
| 39 | B20130L | REAUFORT | | | SEDIMENT | 04C | STATION071 |
| 40 | B00131L | BEAUFORT | | | SEDIMENT | 640 | STATION071 |
| -, <u>1</u> | 8001321 | | SAMPLE | | SEDIMENT | 04C | |
| 42 | 800134L | BEAUFORT | | | SEDIMENT | 04C | |
| 43 | B00135L | BEAUFORT | | | SEDIMENT | | STATION071 |
| -14 | 800137L | BEAUFORT | | | | | STATION071 |
| 45 | B00143L | BEAUFORT | | | | | STATION071 |
| 46 | 800144L | BEAUFORT | | | | | STATION071 |
| 47 | 800145L | BEAUFORT | | | | | STATION071 |
| 48 | 800149L | BERUFORT | | | | | |
| 4 - | B00150L | BEAUFORT | | | | | STATION071 |
| 5ð | BØØ176L | BERNFORT | SAMPLE | 20 | SEDIMENT | 194U | STATION055 |
| | | | | | | | |

| | | مهر معرابة النعروا والعادية الور | | | | |
|------------|-----------------|----------------------------------|--------|-----------|----------|----------------|
| 51 | B00178L | BEAUFORT | | | | 04C STATION055 |
| 52 | B00179L | BEAUFORT | SAMPLE | 20 | SEDIMENT | 04C STATION055 |
| 53 | B00180L | BEAUFORT | SAMPLE | 20 | SEDIMENT | 04C STATION055 |
| 54 | B00181L | BEAUFORT | | | | |
| | | | | | | |
| 55 | B00182L | BEAUFORT | | | | |
| 56 | B00183L | BEAUFORT | SAMPLE | 20 | SEDIMENT | 04C STATION055 |
| 57 | B99184L | BEAUFORT | SAMPLE | 20 | SEDIMENT | 04C STATION055 |
| 58 | B00185L | BEAUFORT | | | | |
| | | | | | | |
| 59 | B90186L | BEAUFORT | | | | |
| 60 | B00188L | BEAUFORT | | | | |
| 61 | B00190L | BEAUFORT | SAMPLE | 20 | SEDIMENT | 04C STATION055 |
| 62 | B00191L | BEAUFORT | SAMPLE | 20 | SEDIMENT | 04C STATION055 |
| 63 | B00192L | BEAUFORT | | | | |
| 64 | B00195L | BERUFORT | | | | |
| | | | | | | |
| 65 | B00196L | BEAUFORT | | | SEDIMENT | |
| 66 | B00198L | BEAUFORT | SAMPLE | | | |
| 67 | 800199L | BEAUFORT | SAMPLE | 20 | SEDIMENT | 04C STATION055 |
| 68 | B99200L | BEAUFORT | SAMPLE | 20 | SEDIMENT | 04C STATION055 |
| 69 | 800227L | BEAUFORT | SAMPLE | $\Xi 1$ | SEDIMENT | 04C STATION070 |
| 70 | B00228L | BEAUFORT | | 21 | SEDIMENT | |
| 71 | 800230L | | | | SEDIMENT | |
| | | BEAUFORT | | | | |
| 72 | B00232L | BEAUFORT | | | SEDIMENT | 04C STATION070 |
| 73 | B00233L | BEAUFORT | | | SEDIMENT | 04C STATION070 |
| 74 | B00234L | BEAUFORT | SAMPLE | 21 | SEDIMENT | 04C STATION070 |
| 75 | B00236L | BEAUFORT | SAMPLE | 21 | SEDIMENT | 04C STATION070 |
| $\dot{76}$ | B00237L | BEAUFORT | | | SEDIMENT | 04C STATION070 |
| 77 | B00238L | BEAUFORT | SAMPLE | 21 | SEDIMENT | 04C STATION070 |
| | | | | | | |
| 78 | B00241L | BEAUFORT | SAMPLE | 21 | SEDIMENT | 04C STATION070 |
| 79 | B00242L | BEAUFORT | SAMPLE | 21 | SEDIMENT | 04C STATION070 |
| 80 | B00243L | BEAUFORT | SAMPLE | ≥ 1 | SEDIMENT | 04C STATION070 |
| 31 | <u>B00244L</u> | BEAUFORT | SAMPLE | 21 | SEDIMENT | 04C STATION070 |
| 82 | B00245L | BERUFORT | SAMPLE | 21 | SEDIMENT | 04C STATION070 |
| 83 | B00246L | BEAUFORT | SAMPLE | 21 | SEDIMENT | 04C STATION070 |
| | - | | | 21 | SEDIMENT | 04C STATION070 |
| 84 | B00247L | BEAUFORT | SAMPLE | | | |
| 85 | 800248L | BEAUFORT | SAMPLE | 21 | SEDIMENT | 04C STATION070 |
| 86 | B00249L | BEAUFORT | SAMPLE | ≥ 1 | SEDIMENT | 04C STATION070 |
| 87 | B00251L | BEAUFORT | SAMPLE | 09 | SEDIMENT | 04C STATION030 |
| 88 | B00252L | BEAUFORT | SAMPLE | Ø9 | SEDIMENT | 04C STATION030 |
| ŝ9 | B00254L | BEAUFORT | SAMPLE | | | 04C STATION030 |
| 90 | B00256L | BEAUFORT | SAMPLE | õ9 | | 04C STATION030 |
| 91 | B00258L | BEAUFORT | SAMPLE | 09 09 | SEDIMENT | 04C STATION030 |
| | | | | | | |
| 98 | B00262L | BEAUFORT | SAMPLE | 69 | SEDIMENT | 04C STATION030 |
| 93 | B00263L | BEAUFORT | SAMPLE | Ø9 | SEDIMENT | 04C STATION030 |
| 94 | B99264L | BEAUFORT | SAMPLE | 69 | SEDIMENT | 04C STATION030 |
| 95 | 899265L | BEAUFORT | SAMPLE | 09 | SEDIMENT | 04C STATION030 |
| 96 | B00266L | BERUFORT | SAMPLE | 09 | SEDIMENT | 04C STATION030 |
| 97 | B99267L | BEAUFORT | SAMPLE | <u>09</u> | SEDIMENT | 04C STATION030 |
| | | BEAUFORT | | 09 09 | SEDIMENT | 040 STATION030 |
| 98 | B00268L | | | | | |
| 99 | B00269L | BEAUFORT | · · | 09 | SEDIMENT | 04C STATION030 |
| 100 | B00271L | BEAUFORT | | 69 | SEDIMENT | 04C STATION030 |
| 101 | B00273L | BEAUFORT | SAMPLE | 09 | SEDIMENT | 04C STATION030 |
| 102 | B00287L | BEAUFORT | SAMPLE | 15 | SEDIMENT | 04C STATION001 |
| 103 | B00290L | BEAUFORT | SAMPLE | 15 | SEDIMENT | 04C STATION001 |
| 104 | B00298L | BEAUFORT | SAMPLE | 32 | SEDIMENT | 04C STATION002 |
| | B00299L | BEAUFORT | SAMPLE | 32 | SEDIMENT | |
| 105 | | | | | | |
| 106 | 8003 00L | BEAUFORT | SAMPLE | 32 | SEDIMENT | 04C STATION002 |
| | | | | | | |

END FORM

Strains isolated from water at 20C capable of growth in the presence of 5% NaCl.

| | د. | paggatu | BEAUFORT SAMPLE 03 WATER 20C STATION010 |
|---|----------|-------------------------------------|--|
| | 1 | B00001H B00002H | PERLIFORT SAMPLE 03 WATER 200 STATIUNULU |
| | 3 | 800002H | PERMEMET SAMPLE 03 WATER 200 STATIONULU |
| | 3 | | PEQUEORT SAMPLE 03 WATER 200 STATIONU10 |
| | 4 | в000 04H в000 0 5H | PEOLEOPT SAMPLE AS WATER 200 STATIUNULU |
| - | 5 | | CONFORT SAMPLE AS WATER 200 STATION010 |
| 6 | | | DEDUCTORT SAMPLE AS WATER 200 STATION010 |
| | 7 | B00007H B00008H | PROVIDENT CAMPLE AS WATER 200 STATIUNULU |
| | 8 | вооооон вооооон | PROVEDET SAMPLE AS WATER 200 STATIONULU |
| | 9 | | REAUFORT SAMPLE 03 WATER 20C STATIUNU10 |
| | 10 | B00010H B00012H | BEAUFORT SAMPLE 03 WATER 20C STATION010 |
| | 11 | B00012H | PERUPOPT SOMPLE AS WATER 200 STATION010 |
| | 12 | B00013H B00014H | BEAUFORT SAMPLE 03 WATER 200 STATIONULU |
| | 13 | B00014H B00016H | DEDUCOPT CAMPLE AS WATER 200 STATIONULU |
| | 14 | | BEAUFORT SAMPLE 03 WATER 200 STATIONULU |
| | 15 | B00017H | PCONFORT SAMPLE 03 WATER 200 STATIONULU |
| | 16 | 800018H 800020H | PEQUEOPT SAMPLE 03 WATER 200 STATIONULU |
| | 17 | , | DECONFORT SAMPLE AS WATER 200 STATION010 |
| | 18 | B00021H | DEOUTODE COMPLE OR WATER 200 STATIONULU |
| | 19 | B00022H B00023H | DECUCOPT CAMPLE 03 WATER 200 STATIONULU |
| | 20 | | PROVIDENT CAMPLE 03 WATER 200 STATIONULU |
| | 21 | B00024H | PEAUFORT SAMPLE 20 WATER 20C STATION020 |
| | 22 | B00051H B00052H | BEALFORT SAMPLE 20 WATER 200 STATIONU20 |
| | 23 | 800053H | BEAUFORT SAMPLE 20 WATER 200 STATIUMU20 |
| | 24 | B000000H B00054H | BEALFORT SAMPLE 20 WATER 200 STATION020 |
| | 25 | 800055H | BEAUFORT SAMPLE 20 WATER 200 STATION020 |
| | 26 | B00057H | REALFORT SAMPLE 20 WATER 200 STHILDING20 |
| | 27 | B00058H | REALFORT SAMPLE 20 WATER 200 STHILDHOUL |
| | 28 29 | B00059H | BEAUFORT SAMPLE 20 WATER 200 STATION002 |
| | 29 30 | B00060H | REALFORT SAMPLE 20 WATER 200 STATION00C |
| | 30 31 | B00061H | BEAUFORT SAMPLE 20 WATER 200 STATION002 |
| | 32 | B00062H | BEAUFORT SAMPLE 20 WATER 20C STATION002 |
| | ас 33 | 800063H | BEAUFORT SAMPLE 20 WATER 20C STATION002 |
| | 34 | B80064H | BEAUFORT SAMPLE 20 WATER 20C STATION002 |
| | 35 | B00065H | BEAUFORT SAMPLE 20 WATER 20C STATION002 BEAUFORT SAMPLE 20 WATER 20C STATION002 |
| | 36 | B90066H | 经济性性的 计微学 法自己的 医后侧静脉的 网络马马马马马马马马马马马马马马马马马马马马马马马马马马马马马马马马马马马马 |
| | 37 | B00067H | BEHUFURI OFFICE CO CTOTIONGOD |
| | 38 | B00068H | BEAUFORT SAMPLE 20 WATER 20C STATION002 BEAUFORT SAMPLE 20 WATER 20C STATION002 |
| | 39 | B00069H | BEHUFURI ONNI CE CO MARTE OCO CTOTION002 |
| | 49 | B00070H | BEHURUK) ONTHELE LO MITTER TETETIONOOO |
| | 41 | B00071H | BEHUFURI SHAFLE LO ANTES SOO STOTIONGOD |
| | 42 | B00072H | BEHUFURI OHMILL LO MARES OGO CTOTIONGGO |
| | 43 | B00073H | BEHUNUKI ONNELL LO MATTER ODO CTOTIONGOD |
| | 44 | B00075H | BEAUFURI SAMPLE LO MARTE SOC CTOTION071 |
| | 45 | B90101H | BEMUFURI SHARE OF HEREE OOC CTOTION071 |
| | 46 | B00102H | BEHURURA ONNILL LA MARTER SOO STOTIONO71 |
| | 47 | B90103H | BEMURUKI SHUKUE EN HUNDER OOD STOTIONG71 |
| | 48 | B00104H | DEFUTURE OF THE CE CONTRACT CONTINUES |
| | 49 | 800106H | DEPUT ON CHARGE OF STREET ONG CTOTIONG71 |
| | 50 | B00109H | BEAUFORT SAMPLE 27 WATER 20C STATION0/1 |
| | | | |

| 51 | B00110H | BEAUFORT SAMPLE 27 WATER 200 STATION021 |
|--------|---------|---|
| 52 | | |
| 53 | | the second |
| 54 | | and the set of the cool of the other the |
| 55 | | BEAUFORT SAMPLE 27 WATER 20C STATION071 |
| 56 | | BEAUFORT SAMPLE 27 WATER 20C STATION071 |
| | | BEAUFORT SAMPLE 27 WATER 20C STATION071 |
| 57 | | BEAUFORT SAMPLE 27 WATER 20C STATION071 |
| 58 | | BEAUFORT SAMPLE 27 WATER 20C STATION071 |
| 59 | | BEAUFORT SAMPLE 27 WATER 20C STATION071 |
| 60 | | BEAUFORT SAMPLE 27 WATER 20C STATION071 |
| 61 | B00121H | BEAUFORT SAMPLE 27 WATER 20C STATION071 |
| 62 | B00122H | BEAUFORT SAMPLE 27 WATER 20C STATION071 |
| 63 | B00123H | BEAUFORT SAMPLE 27 WATER 20C STATION071 |
| 64 | B00151H | BEAUFORT SAMPLE 24 WATER 20C STATION055 |
| 65 | B00152H | BEAUFORT SAMPLE 24 WATER 20C STATION055 |
| 66 | B00153H | BEAUFORT SAMPLE 24 WATER 20C STATION055 |
| 67 | B00154H | BEAUFORT SAMPLE 24 WATER 200 STATION055 |
| 68 | B00155H | BEAUFORT SAMPLE 24 WATER 200 STATION055 |
| 69 | B00156H | BEAUFORT SAMPLE 24 WATER 200 STATION055 |
| 70 | B00158H | BEAUFORT SAMPLE 24 WATER 200 STATION055 |
| 71 | B00159H | |
| 72 | B00160H | |
| 73 | B00161H | |
| 74 | B00162H | |
| 75 | B00163H | |
| 76 | E00164H | |
| 77 | B00165H | |
| 78 | B00166H | |
| 79 | B00168H | BEAUFORT SAMPLE 24 WATER 20C STATION055 |
| 80 | B00169H | BEAUFORT SAMPLE 24 WATER 20C STATION055 |
| 81 | | BEAUFORT SAMPLE 24 WATER 20C STATION055 |
| | 800170H | BEAUFORT SAMPLE 24 WATER 20C STATION055 |
| 82 | B00202H | BEAUFORT SAMPLE 26 WATER 20C STATION070 |
| 83 | B00203H | BEAUFORT SAMPLE 26 WATER 20C STATION070 |
| 84 | B00204H | BEAUFORT SAMPLE 26 WATER 20C STATION070 |
| 85 | B00205H | BEAUFORT SAMPLE 26 WATER 20C STATION070 |
| 86 | B00206H | BEAUFORT SAMPLE 26 WATER 20C STATION070 |
| 87 | B00207H | BEAUFORT SAMPLE 26 WATER 20C STATION070 |
| 88 | B00210H | BEAUFORT SAMPLE 26 WATER 20C STATION070 |
| 89 | B00211H | BEAUFORT SAMPLE 26 WATER 20C STATION070 |
| 90 | B00212H | BEAUFORT SAMPLE 26 WATER 200 STATION070 |
| 91 | B00213H | BEAUFORT SAMPLE 26 WATER 20C STATION070 |
| 92 | B00216H | BEAUFORT SAMPLE 26 WATER 200 STATION070 |
| 93 | B00217H | BEAUFORT SAMPLE 26 WATER 200 STATION070 |
| 94 | B00219H | BEAUFORT SAMPLE 26 WATER 20C STATION070 |
| 95 | B00221H | BEAUFORT SAMPLE 26 WATER 20C STATION070 |
| 96 | B00222H | BEAUFORT SAMPLE 26 WATER 20C STATION070 |
| 97 | B00223H | BEAUFORT SAMPLE 26 WATER 20C STATION070 |
| 98 | B00251H | BEAUFORT SAMPLE 11 WATER 20C STATION030 |
| 99 | B00252H | |
| 100 | B00253H | DECUMPER AND A CONTRACT LOC ON A CONSTRAINED |
| | | BEHUFURT SAMPLE 11 WATER 20C STATION030 |

| 101 102 103 104 105 106 107 108 109 110 111 | B00254H B00255H B00256H B00258H B00258H B00259H B00260H B00260H B00263H B00263H B00264H | BEAUFORT BEAUFORT BEAUFORT BEAUFORT BEAUFORT BEAUFORT BEAUFORT BEAUFORT BEAUFORT BEAUFORT | SAMPLE SAMPLE SAMPLE SAMPLE SAMPLE SAMPLE SAMPLE SAMPLE SAMPLE SAMPLE | 11 11 11 11 11 11 11 11 11 | WATER WATER WATER WATER WATER WATER WATER WATER WATER WATER | 200 200 200 200 200 200 200 200 200 200 | STATION030 STATION030 STATION030 STATION030 STATION030 STATION030 STATION030 STATION030 STATION030 STATION030 STATION030 STATION030 |
|---|---|--|--|--|--|--|--|
| 113 114 115 116 117 118 119 120 STOP? | B00265H B00266H B00269H B00270H B00270H B00272H B00273H B00273H (Y/N):N | BEAUFORT BEAUFORT BEAUFORT BEAUFORT BEAUFORT BEAUFORT BEAUFORT | SAMPLE SAMPLE SAMPLE SAMPLE SAMPLE SAMPLE SAMPLE | 11 11 11 11 11 11 11 | WATER WATER WATER WATER WATER WATER WATER | 200 200 200 200 200 200 200 200 200 | STATION030 STATION030 STATION030 STATION030 STATION030 STATION030 STATION030 STATION030 |

EMD FORM 120 STRAINS

Strains isolated from sediment at 20C capable of growth in the presence of 5% NaCl.

| 1 | B00026H | BEAUFORT SAMPLE 03 SEDIMENT 20C STATION010 |
|-----------|---------------------------------------|---|
| 2 | | |
| 3 | | |
| -4 | 800029H | |
| 5 | 1990930H | BEAUFORT SAMPLE 03 SEDIMENT 200 STATION010 |
| 6 | B00031H | BEAUFORT SAMPLE 03 SEDIMENT 200 STATION010 |
| 7 | B00032H | BEAUFORT SAMPLE 03 SEDIMENT 200 STATION010 |
| s S | B00033H | BEAUFORT SAMPLE 03 SEDIMENT 20C STATION010 |
| 9 | B00035H | BEAUFORT SAMPLE 03 SEDIMENT 20C STATION010 BEAUFORT SAMPLE 03 SEDIMENT 20C STATION010 |
| - 10 | 800036H | |
| 11 | B00037H | BEAUFORT SAMPLE 03 SEDIMENT 20C STATION010 BEAUFORT SAMPLE 03 SEDIMENT 20C STATION010 |
| 12 | B00038H | |
| 13 | B00039H | |
| 13 | B00040H | BEAUFORT SAMPLE 03 SEDIMENT 200 STATION010 |
| 15 | B00041H | BEAUFORT SAMPLE 03 SEDIMENT 200 STATION010 |
| 10 16 | B00042H | BEAUFORT SAMPLE 03 SEDIMENT 200 STATION010 |
| 17 | вооо чен Вооочен | BEAUFORT SAMPLE 03 SEDIMENT 20C STATION010 |
| 18^{17} | B00044H | BEAUFORT SAMPLE 03 SEDIMENT 200 STATION010 |
| 10 | воооччн Воооч5н | BEAUFORT SAMPLE 03 SEDIMENT 200 STATION010 |
| 20 | B00047H | BEAUFORT SAMPLE 03 SEDIMENT 200 STATION010 |
| 21 | B00048H | BEAUFORT SAMPLE 03 SEDIMENT 200 STATION010 |
| 22 | B00045H | BEAUFORT SAMPLE 03 SEDIMENT 200 STATION010 BEAUFORT SAMPLE 16 SEDIMENT 200 STATION002 |
| 23 | B90086H | |
| 24 | B00087H | |
| 25 | B00089H | |
| 26 | B00093H | |
| 27 | B00094H | |
| 28 | B00095H | |
| 29 | B00098H | |
| 30 | B00126H | |
| 31 | B00128H | |
| 32 | B00131H | |
| 33 | B00136H | |
| 34 | B00138H | |
| 35 | B00139H | The second |
| 36 | B00140H | |
| 37 | B00142H | |
| 38 | B00143H | |
| 39 | B00144H | |
| 40 | B00145H | |
| 41 | B00146H | |
| 42 | B00147H | |
| 43 | B00148H | |
| 44 | B00177H | |
| 45 | B00178H | |
| 46 | B00179H | |
| 47 | B00180H | |
| 48 | B90181H | |
| 49 | B00183H | BEAUFORT SAMPLE 20 SEDIMENT 20C STATION055 BEAUFORT SAMPLE 20 SEDIMENT 20C STATION055 |
| 50 | B00184H | BEAUFORT SAMPLE 20 SEDIMENT 200 STATION055 |
| | ··· ·· ·· ·· ·· ·· ·· · · · · · · · · | |

| 51 | B00186H | BEAUFORT | SAMPLE 2 | SEDIMENT | 20C STATION055 |
|------------|---------|----------|----------|---------------------------|----------------|
| 52 | B00187H | BEAUFORT | SAMPLE 2 | B SEDIMENT | 20C STATION055 |
| 53 | B00188H | BEAUFORT | SAMPLE 2 | 9 SEDIMENT | 20C STATION055 |
| 54 | B00189H | BEAUFORT | SAMPLE 2 | 3 SEDIMENT | 20C STATION055 |
| 55 | B00190H | BEAUFORT | SAMPLE 2 | 3 SEDIMENT | 20C STATION055 |
| 56 | B00193H | BEAUFORT | SAMPLE 2 | 9 SEDIMENT | 20C STATION055 |
| 57 | B00194H | BEAUFORT | SAMPLE 2 | SEDIMENT | 20C STATION055 |
| 58 | B00196H | BEAUFORT | SAMPLE 2 | | 20C STATION055 |
| 59 | B00197H | BEAUFORT | SAMPLE 2 | SEDIMENT | 20C STATION055 |
| 6Ø | B00198H | BEAUFORT | SAMPLE 2 | | 20C STATION055 |
| 61 | B00199H | BEAUFORT | SAMPLE 2 | | 20C STATION055 |
| 62 | B00200H | BEAUFORT | SAMPLE 2 | | 20C STATION055 |
| 63 | B00227H | BEAUFORT | SAMPLE 2 | | 20C STATION070 |
| 64 | B00230H | BEAUFORT | SAMPLE 2 | | 20C STATION070 |
| 65 | B00234H | BEAUFORT | SAMPLE 2 | | 20C STATION070 |
| 66 | B00235H | BEAUFORT | SAMPLE 2 | | 20C STATION070 |
| 67 | B00238H | BEAUFORT | SAMPLE 2 | | 20C STATION070 |
| 68 68 | B00239H | BEAUFORT | SAMPLE 2 | | 20C STATION070 |
| 69 | B00240H | BEAUFORT | SAMPLE 2 | | 20C STATION070 |
| 70 | B00241H | BEAUFORT | SAMPLE 2 | | 20C STATION070 |
| 71 | B00243H | BEAUFORT | SAMPLE 2 | | 20C STATION070 |
| 72 | B00244H | BEAUFORT | SAMPLE 2 | | 20C STATION070 |
| 73 | B00248H | BEAUFORT | SAMPLE 2 | | 20C STATION070 |
| 74 | B00250H | BEAUFORT | SAMPLE 2 | SEDIMENT | 20C STATION070 |
| 75 | B00277H | BEAUFORT | SAMPLE 0 | 9 SEDIMENT | 20C STATION030 |
| $\dot{76}$ | B00278H | BEAUFORT | SAMPLE 0 | 9 SEDIMENT | 20C STATION030 |
| 77 | B00279H | BEAUFORT | SAMPLE 0 | SEDIMENT | 20C STATION030 |
| 78 | B00280H | BEAUFORT | SAMPLE 0 | 9 SEDIMENT | 20C STATION030 |
| 79 | B00282H | BEAUFORT | SAMPLE 0 | 9 SEDIMENT | 20C STATION030 |
| 80 | B00283H | BEAUFORT | SAMPLE 0 | 9 SEDIMENT | 20C STATION030 |
| 81 | B00284H | BEAUFORT | SAMPLE 0 | 9 SEDIMENT | 20C STATION030 |
| 82 | B00287H | BEAUFORT | SAMPLE 0 | SEDIMENT | 20C STATION030 |
| 83 | B00288H | BEAUFORT | SAMPLE 0 | 9 SEDIMENT | 20C STATION030 |
| 84 | B00289H | BEAUFORT | SAMPLE 0 | 9 SEDIMENT | 20C STATION030 |
| 85 | B00290H | BEAUFORT | SAMPLE 0 | 9 SEDIMENT | 20C STATION030 |
| 8ē | B00292H | BEAUFORT | SAMPLE Ø | 9 SEDIMENT | 20C STATION030 |
| 87 | B00293H | BEAUFORT | SAMPLE 0 | 9 SEDIMENT | 20C STATION030 |
| 88 | B00296H | BEAUFORT | SAMPLE 0 | 9 SEDIM <mark>E</mark> NT | 20C STATION030 |
| 89 | B00297H | BEAUFORT | SAMPLE 0 | 9 SEDIMENT | 20C STATION030 |
| 90 | B00298H | BEAUFORT | SAMPLE 0 | | 20C STATION030 |
| 91 | B00299H | BEAUFORT | SAMPLE 0 | 9 SEDIMENT | 20C STATION030 |
| | | | | | |

END FORM 91 STRAINS

| | 1 | مرمد رسور ومرار محرورا الرابس محرور مرود | | ~~ | | ~ ~ ~ | otottovo.o |
|-----------|-------------------|--|--------|--------------|-------|-------|------------|
| 1 | BOOODSL | BEAUFORT | SAMPLE | | WATER | 040 | STATION010 |
| a | B99996L | BEAUFORT | SAMPLE | 03 | WATER | 04C | STATION010 |
| З | B00021L | BEAUFORT | SAMPLE | 03 | MATER | 04C | STATION010 |
| 4 | B00024L | BEAUFORT | SAMPLE | 03 | WATER | 04C | STATION010 |
| 5 | 800057L | BEAUFORT | SAMPLE | 20 | MATER | 04C | STATION002 |
| 6 | B00058L | BEAUFORT | SAMPLE | 20 | WATER | 04C | STATION002 |
| 7 | B00060L | BEAUFORT | SAMPLE | 20 | WATER | 04C | STATION002 |
| 8 | 800062L | BEAUFORT | SAMPLE | 20 | WATER | Ø4C | STATION002 |
| 9 | B00063L | BÉAUFORT | SAMPLE | 20 | WATER | Ø4C | STATION002 |
| 10 | 800066L | BEAUFORT | SAMPLE | 20 | WATER | 04C | STATION002 |
| 11 | 20006SL | BEAUFORT | SAMPLE | 20 | WATER | 04C | STATION002 |
| 12 | B00109L | BEAUFORT | SAMPLE | 27 | NATER | 04C | STATION071 |
| $1 \odot$ | E00111L | BEAUFORT | SAMPLE | 27 | WATER | 04C | STATION071 |
| 14 | B00117L | BEAUFORT | SAMPLE | 27 | MATER | 04C | STATION071 |
| 15 | 800157L | BEAUFORT | SAMPLE | 24 | MATER | 04C | STATION055 |
| 16 | B00163L | BEAUFORT | SAMPLE | 24 | WATER | 04C | STATION055 |
| 17 | B00164L | BERUFORT | SAMPLE | 24 | WATER | 04C | STATION055 |
| 18 | 800165L | BEAUFORT | SAMPLE | 24 | WATER | Ø4C | STATION055 |
| 19 | B00173L | BEAUFORT | SAMPLE | 24 | WATER | 04C | STATION055 |
| 20 | B00175L | BEAUFORT | SAMPLE | 24 | WATER | 04C | STATION055 |
| 21 | B00202L | BEAUFORT | SAMPLE | 26 | WATER | 04C | STATION070 |
| 22 | B00203L | BEAUFORT | SAMPLE | 26 | WATER | Ø4C | STATION070 |
| 23 | B00205L | BEAUFORT | SAMPLE | 26 | WATER | 04C | STATION070 |
| 24 | B00206L | BEAUFORT | SAMPLE | 26° | WATER | 04C | STATION070 |
| 25 | 380 8207 L | BEAUFORT | SAMPLE | 26 | WATER | 04C | STATION070 |
| 26 | B0 0208L | BEAUFORT | SAMPLE | 26 | WATER | 04C | STATION070 |
| 27 | 800210L | BEAUFORT | SAMPLE | 26 | WATER | 04C | STATION070 |
| 28 | B00212L | BEAUFORT | SAMPLE | 26 | WATER | 04C | STATION070 |
| 29 | B00213L | BEAUFORT | SAMPLE | 26 | WATER | 04C | STATION070 |
| 30 | B00217L | BEAUFORT | SAMPLE | 26 | WATER | 04C | STATION070 |
| 31 | 800218L | BEAUFORT | SAMPLE | 26 | WATER | 04C | STATION070 |
| 32 | B00282L | BEAUFORT | SAMPLE | 19 | WATER | 04C | STATION001 |
| | | | | | | | |

END FORM

32 STRAINS

Strains isolated from water at 4C capable of growth in presence of 7.5% NaCl.

Strains isolated from sediment at 4C capable of growth in presence of 7.5% NaCl.

| | en anta anta atta atta atta a | BEAUFORT | SAMPLE | 16 | SEDIMENT | 04C | STATION002 |
|----------|-------------------------------|----------------------------------|--------|------------|----------|------|------------|
| 1 | 2000 38L | BEAUFORT | | 16 | SEDIMENT | 04C | STATION002 |
| 2 | B00095L | BEAUFORT | | pp. | SEDIMENT | 04C | STATION071 |
| . 3 | B90126L | REAUFORT | | 22 | SEDIMENT | 04C | STATION071 |
| 4 | B00127L | BEAUFORT | | 22 | SEDIMENT | Ø4C | STATION071 |
| 5 | B00133L | BEAUFORT | | 22 | SEDIMENT | 04C | STATION071 |
| 6 | B00134L | BEAUFORT | | 22 | SEDIMENT | 04C | STATION071 |
| 7 | B00143L | BEAUFORT | ••• | 2A | SEDIMENT | 04C | STATION055 |
| 8 | B00178L | BEAUFORT | | PÃ. | SEDIMENT | 04C | STATION055 |
| 9 | B00179L | BEAUFORT | | 20 | SEDIMENT | 04C | STATION055 |
| 10 | B00180L | REAUFORT | | 20 | SEDIMENT | 04C | STATION055 |
| 11 | B00181L | BEAUFORT | | 20 | SEDIMENT | 94C | STATION055 |
| 12 | B00182L | BEAUFORT | | 20 | SEDIMENT | 04C | STATION055 |
| 13 | B00183L | BEAUFORT | | 20 | SEDIMENT | 04C | STATION055 |
| 14 | B00184L | BEAUFORT | | 20 | SEDIMENT | 04C | STATION055 |
| 15 | B00185L | BEAUFORT | | 20 | SEDIMENT | 04C | STATION055 |
| 16 | B00186L | BEAUFORT | | 20 | SEDIMENT | 04C | STATIONØ55 |
| 17 | B00190L B00192L | BEAUFORT | | 20 | SEDIMENT | 04C | STATION055 |
| 18 | B00196L | BEAUFORT | | 20 | SEDIMENT | 04C | STATION055 |
| 19 | 800198L | BEAUFORT | | 20 | SEDIMENT | 04C | STATION055 |
| 20 | RANZORL | BEAUFORT | SAMPLE | 20 | SEDIMENT | 04C | STATION055 |
| 21 | | BEAUFORT | SAMPLE | 21 | SEDIMENT | 04C | STATION070 |
| 22 | 800227L | BEAUFORT | SAMPLE | 21 | SEDIMENT | 04C | STATION070 |
| 23 | 800236L 800237L | BEAUFORT | SAMPLE | 21 | SEDIMENT | 04C | STATION070 |
| 24 | B00237L B00246L | BEAUFORT | SAMPLE | 21 | SEDIMENT | 04C | STATION070 |
| 25 | 800249L | BEAUFORT | SAMPLE | 2ī | SEDIMENT | 04C | STATION070 |
| 26 | B00242C B00251L | BEAUFORT | SAMPLE | 09 | SEDIMENT | -04C | STATION030 |
| 27 28 | B00264L | BEAUFORT | SAMPLE | <u>0</u> 9 | SEDIMENT | 04C | STATION030 |
| 29 29 | 600269L | BEAUFORT | SAMPLE | <u>0</u> 9 | SEDIMENT | 04C | STATION030 |
| 20 30 | B00287L | BEAUFORT | SAMPLE | 15 | SEDIMENT | 04C | STATION001 |
| 30 31 | 800299L | REAUFORT | SAMPLE | 32 | SEDIMENT | 04C | STATION002 |
| -04 - | معائد المربية ليا التالية ليز | and favor a financial country of | | | | | |

END FORM

Strains isolated from water at 20C capable of growth in presence of 7.5% NaCl.

| 1 | B00001H | BEAUFORT SAMPLE 03 WATER 20C STATION010 |
|-----------|---------|---|
| 2 | B00002H | BEAUFORT SAMPLE 03 WATER 200 STATION010 |
| З | B00003H | BEAUFORT SAMPLE 03 WATER 200 STATION010 |
| 4 | B00005H | BEAUFORT SAMPLE 03 WATER 200 STATION010 |
| 5 | B00007H | BEAUFORT SAMPLE 03 WATER 20C STATION010 |
| 6 | B00008H | BEAUFORT SAMPLE 03 WATER 20C STATION010 |
| ř | B00009H | BEAUFORT SAMPLE 03 WATER 200 STATION010 |
| 8 | B00017H | BEAUFORT SAMPLE 03 WATER 20C STATION010 |
| 9 | B00018H | BEAUFORT SAMPLE 03 WATER 20C STATION010 |
| 19 | B00020H | BEAUFORT SAMPLE 03 WATER 20C STATION010 |
| 11 | B00021H | BEAUFORT SAMPLE 03 WATER 20C STATION010 |
| 12 | B00022H | BEAUFORT SAMPLE 03 WATER 20C STATION010 |
| 13 | B00024H | BEAUFORT SAMPLE 03 WATER 20C STATION010 |
| 14 | B00052H | BEAUFORT SAMPLE 20 WATER 20C STATION020 |
| 15 | B00054H | BEAUFORT SAMPLE 20 WATER 20C STATION020 |
| 16 | B00055H | BEAUFORT SAMPLE 20 WATER 20C STATION020 |
| 17 | B00059H | BEAUFORT SAMPLE 20 WATER 20C STATION002 |
| 18 | B00061H | BEAUFORT SAMPLE 20 WATER 20C STATION002 |
| 19 | B00064H | BEAUFORT SAMPLE 20 WATER 20C STATION002 |
| 20 | B00066H | BEAUFORT SAMPLE 20 WATER 20C STATION002 |
| 21 | B00070H | BEAUFORT SAMPLE 20 WATER 20C STATION002 |
| 22 | B00071H | BEAUFORT SAMPLE 20 WATER 20C STATION002 |
| 23 | B00072H | BEAUFORT SAMPLE 20 WATER 20C STATION002 |
| 24 | B00073H | BEAUFORT SAMPLE 20 WATER 20C STATION002 |
| 25 | B00106H | BEAUFORT SAMPLE 27 WATER 20C STATION071 |
| 26 | B00112H | BEAUFORT SAMPLE 27 WATER 20C STATION071 |
| 27 | B00113H | BEAUFORT SAMPLE 27 WATER 20C STATION071 |
| 28 | B00118H | BEAUFORT SAMPLE 27 WATER 20C STATION071 |
| 29 | B00119H | BEAUFORT SAMPLE 27 WATER 20C STATION071 |
| 30 | B00122H | BEAUFORT SAMPLE 27 WATER 20C STATION071 |
| 31 | B00123H | BEAUFORT SAMPLE 27 WATER 20C STATION071 |
| 35 | B00151H | BEAUFORT SAMPLE 24 WATER 20C STATION055 |
| 33 | B00152H | BEAUFORT SAMPLE 24 WATER 20C STATION055 |
| 34 | B00154H | BEAUFORT SAMPLE 24 WATER 20C STATION055 |
| 35 | B00155H | BEAUFORT SAMPLE 24 WATER 20C STATION055 |
| 36 | B00156H | BEAUFORT SAMPLE 24 WATER 20C STATION055 |
| 37 | 800158H | BEAUFORT SAMPLE 24 WATER 20C STATION055 |
| 38 39 | B00159H | BEAUFORT SAMPLE 24 WATER 20C STATION055 |
| ୍ୟମ 40 | 800160H | BEAUFORT SAMPLE 24 WATER 20C STATION055 |
| 4463 | 300162H | BEAUFORT SAMPLE 24 WATER 20C STATION055 |

| | | | | | | | OTOTIONOEE |
|----------|-----------------|-------------|---------------|----|----------|--------------------------|--------------|
| 41 | B00163H | BEAUFORT | SAMPLE | 24 | WATER | 200 | STATION055 |
| 42 | B00164H | BEAUFORT | SAMPLE | 24 | WATER | 200 | STATION055 |
| 43 | B00166H | BEAUFORT | SAMPLE | 24 | WATER | 200 | STATION055 |
| 4वे | B00168H | BEAUFORT | SAMPLE | 24 | WATER | 200 | STATION055 |
| 45 | B00169H | BEAUFORT | SAMPLE | 24 | WATER | 200 | STATION055 |
| 46 | B00170H | BEAUFORT | SAMPLE | 24 | WATER | 20C | STATION055 |
| 47 | B00202H | BEAUFORT | SAMPLE | 26 | WATER | 200 | STATION070 |
| 48 | B00203H | BEAUFORT | SAMPLE | 26 | WATER | 200 | STATION070 |
| 49 | B00204H | BEAUFORT | SAMPLE | 26 | WATER | 200 | STATION070 |
| 50 | B00205H | BEAUFORT | SAMPLE | 26 | WATER | 20C | STATION070 |
| 51 | B00206H | BEAUFORT | SAMPLE | 26 | WATER | 200 | STATION070 |
| 52 | B00207H | BEAUFORT | SAMPLE | 26 | WATER | 20C | STATION070 |
| 53 | B00208H | BEAUFORT | SAMPLE | 26 | WATER | 200 | STATION070 |
| 54 | B00210H | BERUFORT | SAMPLE | 26 | WATER | 200 | STATION070 |
| 55 | B00211H | BEAUFORT | SAMPLE | 26 | WATER | 200 | STATION070 |
| | B00212H | BEAUFORT | SAMPLE | 26 | WATER | 200 | STATION070 |
| 57 | B00213H | BEAUFORT | SAMPLE | 26 | WATER | 200 | STATION070 |
| | B00216H | BEAUFORT | SAMPLE | 26 | WATER | 200 | STATION070 |
| 58 50 | | BEAUFORT | SAMPLE | 26 | WATER | 200 | STATION070 |
| 59 | B00217H | | | | WATER | 200 | STATION070 |
| 60 | B00219H | BEAUFORT | SAMPLE | 26 | | | STATION070 |
| 61 | 800221H | BEAUFORT | SAMPLE | 26 | WATER | 200 | STATION070 |
| 62 | B00222H | BEAUFORT | SAMPLE | 26 | WATER | 200 | |
| 63 | B00251H | BEAUFORT | SAMPLE | 11 | WATER | 200 | STATION030 |
| 64 | B00252H | BEAUFORT | SAMPLE | 11 | WATER | 200 | STATION030 |
| 65 | B00254H | BEAUFORT | SAMPLE | 11 | WATER | 200 | STATION030 |
| 66 | 800255H | BEAUFORT | SAMPLE | 11 | WATER | 200 | STATION030 |
| 67 | B00256H | BEAUFORT | SAMPLE | 11 | WATER | 200 | STATION030 |
| 68 | B00258H | BEAUFORT | SAMPLE | 11 | WATER | 200 | STATION030 |
| 69 | B00259H | BEAUFORT | SAMPLE | 11 | WATER | 200 | STATION030 |
| 70 | B0026 0H | BEAUFORT | SAMPLE | 11 | WATER | 20C | STATION030 |
| 71 | B00262H | BEAUFORT | SAMPLE | 11 | WATER | 20C | STATION030 |
| 72 | B00263H | BEAUFORT | SAMPLE | 11 | WATER | 20C | STATION030 |
| 73 | B00264H | BEAUFORT | SAMPLE | 11 | WATER | 200 | STATION030 |
| 74 | B00265H | BEAUFORT | SAMPLE | 11 | WATER | 200 | STATION030 |
| 75 | B00266H | BEAUFORT | SAMPLE | 11 | WATER | 20C | STATION030 |
| 76 | B00268H | BEAUFORT | SAMPLE | 11 | WATER | 20C | STATION030 |
| 77 | B00269H | BEAUFORT | SAMPLE | 11 | WATER | 20C | STATION030 |
| 78 | B00270H | BEAUFORT | SAMPLE | 11 | WATER | 200 | STATION030 |
| 79 | B00272H | BEAUFORT | SAMPLE | 11 | WATER | 200 | STATION030 |
| 80 | B00273H | BEAUFORT | SAMPLE | 11 | WATER | 200 | STATION030 |
| 81 | B00275H | BEAUFORT | SAMPLE | 11 | WATER | 200 | STATION030 |
| sur au | | AND OF OR I | աններ է հետեր | ΤT | MODELES. | ميا ايكانيو ا | 011112010000 |

END FORM 81 STRAINS

Strains isolated from sediment at 20C capable of growth in presence of 7.5% NaCl.

| | | | | en en an in 1400 hauten | 20C STATION010 |
|----------|--------------------|----------|-----------|-------------------------|----------------|
| 1 | B00026H | BEAUFORT | SAMPLE 03 | SEDIMENT | |
| 2 | B00027H | | | | 20C STATION010 |
| З | B00028H | BEAUFORT | SAMPLE 03 | SEDIMENT | 20C STATION010 |
| 4 | B00029H | BEAUFORT | SAMPLE 03 | SEDIMENT | 20C STATION010 |
| 5 | B 0033H | BEAUFORT | SAMPLE 03 | SEDIMENT | 20C STATION010 |
| 6 | B00035H | BEAUFORT | SAMPLE 03 | SEDIMENT | 20C STATION010 |
| 7 | B00036H | BEAUFORT | SAMPLE 03 | SEDIMENT | 20C STATION010 |
| 8 | B00037H | BEAUFORT | SAMPLE 03 | SEDIMENT | 20C STATION010 |
| 9 | B00038H | BEAUFORT | SAMPLE 03 | SEDIMENT | 20C STATION010 |
| 10 | B00039H | BEAUFORT | SAMPLE 03 | SEDIMENT | 20C STATION010 |
| 11 | B00042H | BEAUFORT | SAMPLE 03 | SEDIMENT | 20C STATION010 |
| îŻ | B00043H | BEAUFORT | SAMPLE 03 | SEDIMENT | 20C STATION010 |
| 13 | B00044H | BEAUFORT | SAMPLE 03 | SEDIMENT | 20C STATION010 |
| 14 | B00045H | BEAUFORT | SAMPLE 03 | SEDIMENT | 20C STATION010 |
| 15 | B00048H | BEAUFORT | SAMPLE 03 | SEDIMENT | 20C STATION010 |
| 16 | B00098H | BEAUFORT | SAMPLE 16 | SEDIMENT | 20C STATION002 |
| 17 | B00131H | BEAUFORT | SAMPLE 22 | SEDIMENT | 20C STATION071 |
| 18 | B00136H | BEAUFORT | SAMPLE 22 | SEDIMENT | 20C STATION071 |
| 19 | B90140H | BEAUFORT | SAMPLE 22 | SEDIMENT | 20C STATION071 |
| 20 | B00143H | BEAUFORT | SAMPLE 22 | SEDIMENT | 20C STATION071 |
| 21 | B00145H | BEAUFORT | SAMPLE 22 | SEDIMENT | 20C STATION071 |
| 22 | B00148H | BEAUFORT | SAMPLE 22 | SEDIMENT | 20C STATION071 |
| 23 | B00178H | BEAUFORT | SAMPLE 20 | SEDIMENT | 20C STATION055 |
| 24 24 | B00180H | BEAUFORT | SAMPLE 20 | SEDIMENT | 20C STATION055 |
| 25 25 | B00183H | BEAUFORT | SAMPLE 20 | SEDIMENT | 20C STATION055 |
| 26 26 | B00187H | BEAUFORT | SAMPLE 20 | SEDIMENT | 20C STATION055 |
| 27 27 | B00188H | BEAUFORT | SAMPLE 20 | SEDIMENT | 20C STATION055 |
| 28 | B00190H | BEAUFORT | SAMPLE 20 | SEDIMENT | 20C STATION055 |
| 29 29 | B00193H | BEAUFORT | SAMPLE 20 | SEDIMENT | 20C STATION055 |
| с7 30 | B00195H | BEAUFORT | SAMPLE 20 | SEDIMENT | 20C STATION055 |
| 30 31 | B00200H | BEAUFORT | SAMPLE 20 | SEDIMENT | 20C STATION055 |
| | B00220H | BEAUFORT | SAMPLE 21 | SEDIMENT | 20C STATION070 |
| 32 00 | B00230H | BEAUFORT | SAMPLE 21 | SEDIMENT | 20C STATION070 |
| 33 | B00239H | BEAUFORT | SAMPLE 21 | SEDIMENT | 20C STATION070 |
| 34 05 | B00230H | BEAUFORT | SAMPLE 21 | SEDIMENT | 20C STATION070 |
| 35 | B00240H | BEAUFORT | SAMPLE 21 | SEDIMENT | 20C STATION070 |
| 36 | B00243H | BEAUFORT | SAMPLE 21 | SEDIMENT | 20C STATION070 |
| 37 | B00243H | BEAUFORT | SAMPLE 21 | SEDIMENT | 20C STATION070 |
| 38 | B00250H | BEAUFORT | SAMPLE 21 | SEDIMENT | |
| 39 40 | B00200H B00279H | BEAUFORT | SAMPLE 09 | SEDIMENT | 20C STATION030 |
| 40 | | BEAUFORT | SAMPLE 09 | SEDIMENT | 20C STATION030 |
| 41 | 800280H | | SAMPLE 09 | SEDIMENT | 20C STATION030 |
| 42 | B00283H | BEAUFORT | SAMPLE 09 | SEDIMENT | 20C STATION030 |
| 43 | B00284H | | SAMPLE 07 | SEDIMENT | 20C STATION030 |
| 44 | B00287H | BEAUFORT | | SEDIMENT | 20C STATION030 |
| 45 | B00289H | BEAUFORT | | SEDIMENT | 200 STATION030 |
| 46 | B00293H | BEAUFORT | SAMPLE 09 | | 200 STATION030 |
| 47 | B00296H | BEAUFORT | SAMPLE 09 | SEDIMENT | |
| 48 | B00297H | BEAUFORT | SAMPLE 09 | SCDINEN | ESC 20010000 |
| | | | | | |

END FORM

| 1 | BOOOOSL | BEAUFORT | SAMPLE | 03 | MATER | <u> []</u> 40] | STATION010 |
|------------|--------------------|----------------------|-------------------------------|--------------|---------|----------------|------------|
| a | 33 8396 L | BEAUFORT | SAMPLE | 03 | MATER | 94C | STATION010 |
| 3 | B90013L | BEAUFORT | SAMPLE | 03 | WATER | 04C | STATION010 |
| ± i | B00014L | BEAUFORT | SAMPLE | 03 | MATER | 04C | STATION010 |
| 5 | 800015L | BEAUFORT | SAMPLE | 63 | WATER | 04C | STATION010 |
| 6 | 800021L | BEAUFORT | SAMPLE | 03 | WATER | 64C | STATION010 |
| 7 | B00024L | BEAUFORT | SAMPLE | 03 | MATER | 04C | STATION010 |
| | | BEAUFORT | SAMPLE | 20 | WATER | 04C | STATION002 |
| 8 | 800054L | | SAMPLE | 20 | WATER | 04C | STATION002 |
| 9 | 800060L | BEAUFORT | | | WATER | 04C | STATION002 |
| 10 | 599968L | BEAUFORT | SAMPLE | 20 | | | STATION002 |
| 1 1 | 800069L | BEAUFORT | SAMPLE | 20 | WATER | 84C | STATION002 |
| 12 | B00072L | BEAUFORT | SAMPLE | 50 | WATER | 04C | - |
| 1.3 | 800103L | BEAUFORT | SAMPLE | 27 | WATER | 04C | STATION071 |
| <u>,</u> 4 | 800104L | BEAUFORT | SAMPLE | 27 | MATER | 04C | STATION071 |
| 15 | B00106L | BEAUFORT | SAMPLE | 27 | MATER | 04C | STATION071 |
| 16 | B00108L | BEAUFORT | SAMPLE | 27 | MATER | 04C | STATION071 |
| 17 | B00111L | BEAUFORT | SAMPLE | 27 | WATER | 04C | STATION071 |
| 18 | B00113L | BEAUFORT | SAMPLE | 27 | WATER | 04C | STATION071 |
| 19 | 800115L | BEAUFORT | SAMPLE | 27 | MATER | 04C | STATION071 |
| 20 | B00117L | BEAUFORT | SAMPLE | 27 | WHITER | 040 | STATION071 |
| 21 | B00119L | BERUFORT | SAMPLE | 27 | MATER | 040 | STATION071 |
| 22 | B30120L | BEAUFORT | SAMPLE | 27 | MATER | 04C | STATION071 |
| 23 | B00121L | BEAUFORT | SAMPLE | 27 | MATER | 04C | STATION071 |
| 24 | 200122L | BEAUFORT | SAMPLE | 27 | WATER | 04C | STATION071 |
| 25 | 800124L | BEAUFORT | SAMPLE | 27 | MATER | 04C | STATION071 |
| 26 | 800125L | BERUFORT | SAMPLE | 27 | MATER | 04C | STATION071 |
| 27 | B99154L | BEAUFORT | SAMPLE | 24 | MATER | 04C | STATION055 |
| 28 | 800155L | BERUFORT | SAMPLE | 24 | MATER | 04C | STATION055 |
| 29 | B00157L | BEAUFORT | SAMPLE | 24 | WATER | 04C | STATION055 |
| | B00160L | BEAUFORT | SAMPLE | 24 | WATER | 04C | STATION055 |
| 30 31 | 800163L | BEAUFORT | SAMPLE | 24 | WATER | 04C | STATION055 |
| 32 | B00165L | BEAUFORT | SAMPLE | 24 | WATER | 04C | STATION055 |
| 33 | B00100L | BERUFORT | SAMPLE | 24 | WATER | 04C | STATION055 |
| | B00167L | BEAUFORT | SAMPLE | 24 | WATER | 04C | STATION055 |
| 34 | | BEAUFORT | SAMPLE | | MATER | 04C | STATION055 |
| 35 | 800169L | BEAUFORT | SAMPLE | 24 | WATER | 04C | STATION055 |
| 36 | 800170L 800171L | BEAUFORT | SAMPLE | | MATER | 04C | STATION055 |
| 37 | B00173L | BEAUFORT | | 24 | | | STATION055 |
| 38 | B00175L | DEALENDT | | ्य | WATER | ติสกั | STATION055 |
| 39 | B00203L | BEAUFORT | SAMPLE SAMPLE | 26 | WATER | ดสกั | STATION070 |
| 40 | | BEAUFORT | | | MATER | | |
| 41 | B90205L | SERUFURI DECURION | COMPLET LUEL CONTRACTOR DE | - 60 - 72 | | - 64C | STATION070 |
| 42 | 800206L | | | | | DHC DdC | STATION070 |
| 43 | 800207L | BEAUFORT | | | | | STATION070 |
| 44 | 800208L | BEAUFORT | | | | | |
| 45 | B00210L | BEAUFORT | | | MATER | - 040 - 040 | STATION070 |
| 46 | 800213L | BEAUFORT | | | | | |
| 47 | 800217L | BEAUFORT | | | MATER | | |
| 48 | 800218L | BEAUFORT | | | WATER | | |
| 49 | 300220L | BERUFORT | | | | | |
| 50 | B00281L | BEAUFORT | SHMPLE | 19 | MED LES | 040 | STATION001 |
| 54 | 200282L | BEAUFORT | SHMPLE | 19 | MHILE | 194U 2010 | STATION001 |
| 52 | 800284L | BEAUFORT | SHMPLE | 19 | MHILE | 년위년 6년 6 | STATION001 |
| 53 | 800291L | BERUFORT | SHMPLE | ან | MHIER | 아파다 | STATION002 |
| | | | | | | | |

EMD FORM

| 4 | 399926L | BEAUFORT | SAMPLE (| 33 | SEDIMENT | | STATION010 |
|----------|----------------|----------------------|---|------------|---|-------------|------------|
| 1 | | BEAUFORT | | 33 | SEDIMENT | | STATION010 |
| ŝ | 800027L | BEAUFORT | | | SEDIMENT | 04C | STATION010 |
| Э | 800028L | BEAUFORT | | | SEDIMENT | 04C | STATION010 |
| 4 | B00029L | | | | SEDIMENT | | STATION010 |
| 5 | 800030L | BEAUFORT | | | SEDIMENT | | STATION010 |
| ő | 800032L | BEAUFORT | | | SEDIMENT | | STATION010 |
| 7 | 800033L | BEAUFORT | | | SEDIMENT | | STATION010 |
| 8 | B00035L | BEAUFORT | | | SEDIMENT | | STATION010 |
| 9 | <u>800036L</u> | BEAUFORT | | | | | STATION010 |
| 10 | B00037L | BEAUFORT | | | SEDIMENT | | STATION010 |
| 11 | B00039L | BEAUFORT | * · · · · · · · · · · · · · · · · · · · | | SEDIMENT | 04C | |
| 12 | B00040L | BEAUFORT | | 03 | SEDIMENT | 04C | STATION010 |
| 13 | B30041L | BEAUFORT | | 03 | SEDIMENT | 04C | STATION010 |
| 14 | B00042L | BEAUFORT | SAMPLE | 03 | SEDIMENT | 04C | STATION010 |
| 15 | B00044L | BEAUFORT | SAMPLE | 03 | SEDIMENT | 04C | STATION010 |
| 10 16 | B00047L | BEAUFORT | SAMPLE | 03 | SEDIMENT | 04C | STATION010 |
| | B00048L | BEAUFORT | | 03 | SEDIMENT | 04C | STATION010 |
| 17 | B00049L | BEAUFORT | | 03 | SEDIMENT | 04C | STATION010 |
| 18 | | BEAUFORT | | 03 | SEDIMENT | 04C | STATION010 |
| 19 | 800050L | BEAUFORT | SAMPLE | 16 | SEDIMENT | 04C | STATION002 |
| 20 | B00076L | BEAUFORT | SAMPLE | 16 | SEDIMENT | 04C | STATION002 |
| 21 | B00077L | BEAUFORT | SAMPLE | 16 | SEDIMENT | 04C | STATION002 |
| 22 | 800079L | | SAMPLE | 16 | SEDIMENT | 04C | STATION002 |
| 23 | B00080L | BEAUFORT | SAMPLE | $16 \\ 16$ | SEDIMENT | 04C | STATION002 |
| 24 | B00082L | BEAUFORT | | $16 \\ 16$ | SEDIMENT | 04C | STATION002 |
| 25 | B00087L | BEAUFORT | SAMPLE | | SEDIMENT | 04C | STATION002 |
| 26 | B00089L | BEAUFORT | SAMPLE | 16 | SEDIMENT | 04C | STATION002 |
| 27 | B00091L | BEAUFORT | SAMPLE | 16 | SEDIMENT | 04C | STATION002 |
| 28 | B00092L | BEAUFORT | SAMPLE | 16 | | | STATION002 |
| 29 | B00094L | BEAUFORT | SAMPLE | 16 | SEDIMENT | | STATION002 |
| 30 | B00095L | BEAUFORT | SAMPLE | 16 | SEDIMENT | | STATION002 |
| 31 | B00096L | BEAUFORT | SAMPLE | 16 | SEDIMENT | | STATION002 |
| 32 | B00097L | BEAUFORT | SAMPLE | 16 | SEDIMENT | | STATION002 |
| 33 | B00098L | BEAUFORT | SAMPLE | 16 | SEDIMENT | | STATION002 |
| 34 | B00099L | BEAUFORT | SAMPLE | 16 | SEDIMENT | | STATION002 |
| 35 | B00100L | BEAUFORT | SAMPLE | 16 | SEDIMENT | | |
| 36 | B00126L | BEAUFORT | SAMPLE | 22 | SEDIMENT | | STATION071 |
| 37 | B00128L | BEAUFORT | | 22 | | 040 | STATION071 |
| 38 | B00129L | BEAUFORT | SAMPLE | 22 | | 04C | STATION071 |
| 39 | B00130L | BEAUFORT | SAMPLE | 22 | SEDIMENT | | STATION071 |
| 35 40 | B00131L | BEAUFORT | | 22 | SEDIMENT | ` Ø4C | |
| 41 | B00132L | BEAUFORT | | | | 04C | |
| | B00133L | BEAUFORT | | | SEDIMENT | 04C | STATION071 |
| 42 | B00134L | BEAUFORT | | | | 04C | STATION071 |
| 43 | | BEAUFORT | | | | | STATION071 |
| 44 | B00135L | BEAUFORT | | | | 04C | STATION071 |
| 45 | B00136L | BEAUFORT | | | | | STATION071 |
| 46 | B00137L | BEAUFORT | | | | | STATION071 |
| 47 | B00141L | BEAUFORT | | | | | |
| 48 | 800143L | | | | | | |
| 49 | B00144L | BEAUFORT BEAUFORT | | | | | |
| 50 | B00145L | BEHUR OF I | orant LC | las be | -,,',,',,,,,,,,',,,,',, , , , , , , , , | 1997 B 1997 | = |
| | | | | | | | |

| 51 | B00147L | BEAUFORT SAMPLE 22 SEDIMENT 04C STATION071 |
|------------|--|--|
| 52 | B00148L | BEAUFORT SAMPLE 22 SEDIMENT 04C STATION071 |
| 53 | | BEAUFORT SAMPLE 22 SEDIMENT 04C STATION071 |
| 54 | | BEAUFORT SAMPLE 22 SEDIMENT 04C STATION071 |
| 55 | | |
| | | |
| 56 | | BEAUFORT SAMPLE 20 SEDIMENT 04C STATION055 |
| 57 | | BEAUFORT SAMPLE 20 SEDIMENT 04C STATION055 |
| 58 | B00181L | BEAUFORT SAMPLE 20 SEDIMENT 04C STATION055 |
| 59 | B00182L | BEAUFORT SAMPLE 20 SEDIMENT 04C STATION055 |
| 60 | B00183L | BEAUFORT SAMPLE 20 SEDIMENT 04C STATION055 |
| 61 | B00184L | BEAUFORT SAMPLE 20 SEDIMENT 04C STATION055 |
| 6 2 | B00185L | BEAUFORT SAMPLE 20 SEDIMENT 04C STATION055 |
| o∟ 63 | B00186L | |
| | | BEAUFORT SAMPLE 20 SEDIMENT 04C STATION055 |
| 64 | B00187L | BEAUFORT SAMPLE 20 SEDIMENT 04C STATION055 |
| 65 | B00188L | BEAUFORT SAMPLE 20 SEDIMENT 04C STATION055 |
| 66 | B00189L | BEAUFORT SAMPLE 20 SEDIMENT 04C STATION055 |
| 67 | B00191L | BEAUFORT SAMPLE 20 SEDIMENT 04C STATION055 |
| 68 | B00192L | BEAUFORT SAMPLE 20 SEDIMENT 04C STATION055 |
| 69 | 800195L | BEAUFORT SAMPLE 20 SEDIMENT 04C STATION055 |
| 70 | B00198L | BEAUFORT SAMPLE 20 SEDIMENT 04C STATION055 |
| 71 | B00200L | |
| | | BEAUFORT SAMPLE 20 SEDIMENT 04C STATION055 |
| 72 | B00227L | BEAUFORT SAMPLE 21 SEDIMENT 04C STATION070 |
| 73 | B00228L | BEAUFORT SAMPLE 21 SEDIMENT 04C STATION070 |
| 74 | B00229L | BEAUFORT SAMPLE 21 SEDIMENT 04C STATION070 |
| 75 | B00530L | BEAUFORT SAMPLE 21 SEDIMENT 04C STATION070 |
| 76 | B00232L | BEAUFORT SAMPLE 21 SEDIMENT 04C STATION070 |
| 77 | 800234L | BEAUFORT SAMPLE 21 SEDIMENT 04C STATION070 |
| 78 | 800235L | BEAUFORT SAMPLE 21 SEDIMENT 04C STATION070 |
| 79 | B00236L | BEAUFORT SAMPLE 21 SEDIMENT 04C STATION070 |
| 80 | B00237L | BEAUFORT SAMPLE 21 SEDIMENT 04C STATION070 |
| 31 | B00238L | |
| 82 | B00240L | |
| | | BEAUFORT SAMPLE 21 SEDIMENT 04C STATION070 |
| 33 | 800241L | BEAUFORT SAMPLE 21 SEDIMENT 04C STATION070 |
| 84 | B00242L | BEAUFORT SAMPLE 21 SEDIMENT 04C STATION070 |
| 85 | B00244L | BEAUFORT SAMPLE 21 SEDIMENT 04C STATION070 |
| 86 | B00245L | BEAUFORT SAMPLE 21 SEDIMENT 04C STATION070 |
| 87 | B00246L | BEAUFORT SAMPLE 21 SEDIMENT 04C STATION070 |
| 88 | B00247L | BEAUFORT SAMPLE 21 SEDIMENT 04C STATION070 |
| 89 | B00248L | BEAUFORT SAMPLE 21 SEDIMENT 04C STATION070 |
| 90 | B00249L | BEAUFORT SAMPLE 21 SEDIMENT 04C STATION070 |
| 91 | B00251L | PERHENDET COMPLE DE SEDIMENT DAG STATINGUYU |
| 92 | B00252L | BEAUFORT SAMPLE 09 SEDIMENT 04C STATION030 |
| | | BEAUFORT SAMPLE 09 SEDIMENT 04C STATION030 |
| 93 | 800253L | BEAUFORT SAMPLE 09 SEDIMENT 04C STATION030 |
| 94 | B90254L | BEAUFORT SAMPLE 09 SEDIMENT 04C STATION030 |
| 95 | B00256L | BEAUFORT SAMPLE 09 SEDIMENT 04C STATION030 |
| 96 | B00257L | BEAUFORT SAMPLE 09 SEDIMENT 04C STATION030 |
| 97 | B00259L | BEAUFORT SAMPLE 09 SEDIMENT 04C STATION030 |
| 98 | 800261L | BEAUFORT SAMPLE 09 SEDIMENT 04C STATION030 |
| 99 | B90262L | BEAUFORT SAMPLE 09 SEDIMENT 04C STATION030 |
| 100 | 800263L | BEAUFORT SAMPLE 09 SEDIMENT 04C STATION030 |
| | and the second | AND A COMPLETE OF SEDINELL RAC STRITCHRONDSN |

| 101 | 300264L | BEAUFORT | SAMPLE | 09 | SEDIMENT | 04C | STATION030 |
|-----|---------|----------|--------|----|----------|-----|------------|
| 102 | 800265L | BEAUFORT | SAMPLE | 09 | SEDIMENT | | STATION030 |
| 103 | B00266L | BEAUFORT | SAMPLE | 09 | SEDIMENT | | STATION030 |
| 104 | B00267L | BEAUFORT | SAMPLE | 09 | SEDIMENT | 04C | STATION030 |
| 105 | 800268L | BEAUFORT | SAMPLE | 09 | SEDIMENT | 04C | STATION030 |
| 106 | B00269L | BEAUFORT | SAMPLE | 09 | SEDIMENT | 04C | STATION030 |
| 107 | B00272L | BEAUFORT | SAMPLE | 69 | SEDIMENT | 04C | STATION030 |
| 108 | B00273L | BEAUFORT | SAMPLE | 09 | SEDIMENT | 04C | STATION030 |
| 109 | B00274L | BEAUFORT | SAMPLE | 09 | SEDIMENT | 04C | STATION030 |
| 110 | B00287L | BEAUFORT | SAMPLE | 15 | SEDIMENT | 04C | STATION001 |
| 111 | B00288L | BEAUFORT | SAMPLE | 15 | SEDIMENT | 04C | STATION001 |
| 112 | B00289L | BEAUFORT | SAMPLE | 15 | SEDIMENT | 04C | STATION001 |
| 113 | B00290L | BEAUFORT | SAMPLE | 15 | SEDIMENT | 04C | STATION001 |
| 114 | 800297L | BEALFORT | SAMPLE | 32 | SEDIMENT | 04C | STATION002 |
| 115 | B00299L | BEAUFORT | SAMPLE | 32 | SEDIMENT | 04C | STATION002 |
| | | | | | | | |

END FORM 115 STRAINS ENTER COMMAND

| Ï. | E00001H | BEAUFORT | SAMPLE | | MATER | 200 | STATION010 |
|----|---------|---|-------------------|---------|-----------------|-------|------------|
| 3 | B00002H | BEAUFORT | SAMPLE | -03 | WATER | 200 | STATION010 |
| 3 | B00003H | BEAUFORT | SAMPLE | -03 | WATER | 200 | STATION010 |
| 4 | 300004H | BEAUFORT | SAMPLE | 03 | WATER | 200 | STATION010 |
| Ś | B00005H | BEAUFORT | SAMPLE | ЙЗ | WATER | 200 | STATION010 |
| 6 | B00006H | BEAUFORT | SAMPLE | 03 | WATER | 200 | STATION010 |
| | | | SAMPLE | 03 | WATER | 200 | STATION010 |
| 7 | B00007H | BEAUFORT | | | | | |
| 8 | B00008H | BEAUFORT | SAMPLE | 03 | WATER | 200 | STATION010 |
| 9 | 800009H | BEAUFORT | SAMPLE | 03 | WATER | 200 | STATION010 |
| 10 | B00010H | BEAUFORT | SAMPLE | 03 | WATER | 20C | STATION010 |
| 11 | B00011H | BEAUFORT | SAMPLE | 03 | WATER | 20C | STATION010 |
| 12 | B00012H | BEAUFORT | SAMPLE | 03 | MATER | 200 | STATION010 |
| 13 | B00013H | BEAUFORT | SAMPLE | 03 | WATER | 200 | STATION010 |
| 14 | B00014H | BEAUFORT | SAMPLE | 03 | WATER | 200 | STATION010 |
| 15 | B00015H | BEAUFORT | SAMPLE | | WATER | 200 | STATION010 |
| 16 | 800016H | BEAUFORT | SAMPLE | | WATER | 200 | STATION010 |
| 17 | B00017H | BEAUFORT | SAMPLE | | WATER | 200 | STATION010 |
| | | | SAMPLE | | WATER | 200 | STATION010 |
| 18 | B00018H | BEAUFORT | | | | | |
| 19 | B00019H | BEAUFORT | SAMPLE | 03 | WATER | 200 | STATION010 |
| 20 | B00020H | BEAUFORT | SAMPLE | 63 | WATER | 200 | STATION010 |
| 21 | B00021H | BEAUFORT | SAMPLE | 03 | NATER | 200 | STATION010 |
| 22 | B00022H | BEAUFORT | SAMPLE | 03 | WATER | 200 | STATION010 |
| 23 | B00023H | BEAUFORT | SAMPLE | 03 | WATER | 200 | STATION010 |
| 24 | B00024H | BEAUFORT | SAMPLE | 03 | WATER | 200 | STATION010 |
| 25 | 800052H | BEAUFORT | SAMPLE | 20 | WATER | 200 | STATION020 |
| 26 | B00054H | BEAUFORT | SAMPLE | 20 | WATER | 200 | STATION020 |
| 27 | B00055H | BEAUFORT | SAMPLE | 20 | WATER | 200 | STATION020 |
| 28 | B00056H | BEAUFORT | SAMPLE | 20 | WATER | 200 | STATION020 |
| 29 | B00057H | BEAUFORT | SAMPLE | 20 | WATER | 200 | STATION020 |
| | | | SAMPLE | 20 | WATER | 200 | STATION002 |
| 30 | B00062H | BEAUFORT | | | | | STATION002 |
| 31 | B00063H | BEAUFORT | SAMPLE | 20 | WATER | 200 | |
| 32 | B00070H | BEAUFORT | SAMPLE | 20 | WATER | 200 | STATION002 |
| 33 | B00071H | BEAUFORT | SAMPLE | 20 | WATER | 200 | STATION002 |
| 34 | B00075H | BEAUFORT | SAMPLE | 20 | WATER | 200 | STATION002 |
| 35 | B00101H | BEAUFORT | SAMPLE | 27 | WATER | 200 | STATION071 |
| 36 | B00102H | BEAUFORT | SAMPLE | 27 | WATER | 200 | STATION071 |
| 37 | B00103H | BEAUFORT | SAMPLE | 27 | WATER | 20C | STATION071 |
| 38 | B99106H | BEAUFORT | SAMPLE | 27 | WATER | 200 | STATION071 |
| 39 | B00109H | BERUFORT | SAMPLE | - | WATER | 200 | STATION071 |
| 40 | B00110H | BEAUFORT | SAMPLE | 27 | WATER | 200 | STATION071 |
| 41 | B00111H | BEAUFORT | SAMPLE | 27 | WATER | 200 | STATION071 |
| | | | | | | | |
| 42 | B00112H | BEAUFORT | SAMPLE | 27 | WATER | 200 | STATION071 |
| 43 | B00113H | BEAUFORT | SAMPLE | 27 | WATER | 200 | STATION071 |
| 44 | B00114H | BEAUFORT | SAMPLE | 27 | WATER | 200 | STATION071 |
| 45 | B00115H | BEAUFORT | SAMPLE | 27 | WATER | 200 | STATION071 |
| 46 | B90116H | BEAUFORT | SAMPLE | 27 | MATER | 200 | STATION071 |
| 47 | B00117H | BEAUFORT | SAMPLE | 27 | WATER | 200 | STATION071 |
| 48 | B00118H | BEAUFORT | SAMPLE | 27 | MATER | 200 | STATION071 |
| 49 | B00119H | BEAUFORT | SAMPLE | 27 | MATER | 200 | STATION071 |
| 50 | B00122H | BEAUFORT | SAMPLE | 27 | | 200 | STATION071 |
| | | and the state of the | and it if the bas | 4m p. 3 | and a closel fe | ····· | |

Strains isolated from water at 20C capable of growth at pH 4 or pH 5.

| 123456789012345678 | B00123H B00154H B00155H B00157H B00169H B00169H B00201H B00201H B00203H B00207H B00222H B002252H B00253H B00253H B00255H B00255H B00265H B00266H B00272H | BEAUFORT BEAUFORT BEAUFORT BEAUFORT BEAUFORT BEAUFORT BEAUFORT BEAUFORT BEAUFORT BEAUFORT BEAUFORT BEAUFORT BEAUFORT BEAUFORT BEAUFORT BEAUFORT | SAMPLE SAMPLE SAMPLE SAMPLE SAMPLE SAMPLE SAMPLE SAMPLE SAMPLE SAMPLE SAMPLE SAMPLE SAMPLE SAMPLE SAMPLE | $\begin{array}{c} 27\\ 24\\ 24\\ 24\\ 24\\ 26\\ 26\\ 26\\ 26\\ 26\\ 11\\ 11\\ 11\\ 11\\ 11\\ 11\\ 11\\ 11\\ \end{array}$ | WATER WATER WATER WATER WATER WATER WATER WATER WATER WATER WATER WATER WATER WATER WATER WATER | 200 200 200 200 200 200 200 200 200 200 | STATION071 STATION055 STATION055 STATION055 STATION055 STATION055 STATION070 STATION070 STATION070 STATION070 STATION070 STATION070 STATION030 STATION030 STATION030 STATION030 STATION030 STATION030 |
|--------------------|--|--|--|--|--|--|--|
|--------------------|--|--|--|--|--|--|--|

END FORM 68 STRAINS

,

| | | | | _ | | ADD OTOTIONGIO |
|----|---------------------|----------|---------------------------------------|------------|----------|----------------|
| 1 | B90956H | BEAUFORT | | | SEDIMENT | 20C STATION010 |
| Ξ | 800027H | BEAUFORT | | | SEDIMENT | 200 STATION010 |
| 3 | B00028H | BEAUFORT | SAMPLE (| | SEDIMENT | 20C STATION010 |
| 4 | B00029H | BEAUFORT | SAMPLE (| 33 | SEDIMENT | 20C STATION010 |
| 5 | B00030H | BEAUFORT | SAMPLE (| 33 | SEDIMENT | 20C STATION010 |
| | B00031H | BEAUFORT | SAMPLE (| 33 | SEDIMENT | 20C STATION010 |
| 6 | | BEAUFORT | | 23 | SEDIMENT | 20C STATION010 |
| 7 | 800032H | BEAUFORT | | 33 | SEDIMENT | 20C STATION010 |
| 8 | BOOOSSH | BEAUFORT | | 93 | SEDIMENT | 20C STATION010 |
| 9 | B00035H | BEAUFORT | | 03 | SEDIMENT | 20C STATION010 |
| 10 | B00036H | BEAUFORT | · · · · · · · · · · · · · · · · · · · | 93 | SEDIMENT | 20C STATION010 |
| 11 | B00037H | BEAUFORT | | 83 | SEDIMENT | 20C STATION010 |
| 12 | B00038H | BEAUFORT | . | 03 | SEDIMENT | 20C STATION010 |
| 13 | B00039H | BEAUFORT | ···· | 03 | SEDIMENT | 20C STATION010 |
| 14 | B00042H | BERUFORT | . | 03. | SEDIMENT | 20C STATION010 |
| 15 | B00043H | BEAUFORT | | 03 | SEDIMENT | 20C STATION010 |
| 16 | B00044H | BEAUFORT | | 03 | SEDIMENT | 20C STATION010 |
| 17 | B00045H | | | 03. | SEDIMENT | 20C STATION010 |
| 18 | B00047H | BEAUFORT | | 03 03 | SEDIMENT | 20C STATION010 |
| 19 | B00048H | BEAUFORT | | 16 | SEDIMENT | 20C STATION002 |
| 20 | B00077H | BEAUFORT | SAMPLE | 16^{-10} | SEDIMENT | 20C STATION002 |
| 21 | B00078H | BEAUFORT | SAMPLE | 16 | SEDIMENT | 20C STATION002 |
| 55 | B00085H | BEAUFORT | SAMPLE | $16 \\ 16$ | SEDIMENT | 200 STATION002 |
| 23 | B00089H | BEAUFORT | SAMPLE | 16^{10} | SEDIMENT | 200 STATION002 |
| 24 | B00092H | BEAUFORT | | 16 | SEDIMENT | 200 STATION002 |
| 25 | B00093H | BEAUFORT | SAMPLE | | SEDIMENT | 200 STATION002 |
| 26 | B00095H | BEAUFORT | SAMPLE | 16 | SEDIMENT | 20C STATION002 |
| 27 | B00098H | BEAUFORT | SAMPLE | 16 | SEDIMENT | 200 STATION002 |
| 28 | B00099H | BEAUFORT | SAMPLE | 16 | | 200 STATION071 |
| 29 | B00126H | BEAUFORT | | 22 | SEDIMENT | 20C STATION071 |
| 30 | B00127H | BEAUFORT | | 22 | SEDIMENT | 200 STATION071 |
| 31 | B00128H | BEAUFORT | | 22 | SEDIMENT | 200 STATION071 |
| 32 | B00129H | BEAUFORT | | 22 | | 20C STATION071 |
| 33 | B00130H | BEAUFORT | | 22 | SEDIMENT | 20C STATION071 |
| 34 | B00131H | BEAUFORT | SAMPLE | 23 | SEDIMENT | 20C STATION071 |
| 35 | B00132H | BEAUFORT | SAMPLE | 22 | SEDIMENT | 200 STATION071 |
| 36 | B00133H | BEAUFORT | SAMPLE | 22 | SEDIMENT | |
| 37 | B00135H | BEAUFORT | SAMPLE | 55 | | |
| 38 | B00136H | BEAUFORT | | | | |
| 39 | B00138H | BEAUFORT | | | | |
| 40 | B00140H | BEAUFORT | | | | |
| 41 | B00141H | BEAUFORT | | 22 | | |
| 42 | B00142H | BEAUFORT | | 22 | | |
| 43 | 800143H | BEAUFORT | SAMPLE | 22 | | |
| 44 | B00144H | BEAUFORT | | 23 | | |
| 45 | B00145H | BEAUFORT | | 22 | | |
| 46 | B00146H | BEAUFORT | | | SEDIMENT | |
| 47 | B00147H | BEAUFORT | | | SEDIMENT | |
| 48 | B00148H | BEAUFORT | SAMPLE | 22 | SEDIMENT | |
| 49 | B00150H | BEAUFORT | SAMPLE | 22 | SEDIMENT | 20C STATION071 |
| 50 | B00176H | BEAUFORT | | 20 | SEDIMENT | 20C STATION055 |
| 00 | anternerae e 1818 s | | | | | |

J.

| 51 B00179 | H BEAUFORT SAMPLE 20 SEDIMENT 20C STATION055 |
|--------------------------|--|
| 52 B00180 | |
| 53 B00183 | The set of the te to other the startoneoo |
| 54 B00184 | U TROUTROET AND A COLDINAL COUDINITONOUS |
| 55 B00185 | Sector Statute Le Septrient 200 Station833 |
| 56 B00187 | The second |
| | 1 Sector and the to orbiticity for other to be |
| | The second of the construction and startioned a |
| | , |
| | THE ACT OF A CONTRACT OF STATISTICS |
| 60 B00192 | |
| 61 B00193F | BEAUFORT SAMPLE 20 SEDIMENT 20C STATION055 |
| 62 B00 195 H | BEAUFORT SAMPLE 20 SEDIMENT 20C STATION055 |
| 63 B00196H | BERUFORT SAMPLE 20 SEDIMENT 20C STATIONASS |
| 64 B00197H | BEAUFORT SAMPLE 20 SEDIMENT 20C STATION055 |
| 65 B00200H | BEAUFORT SAMPLE 20 SEDIMENT 20C STATION055 |
| 66 B00226H | |
| 67 B00227H | |
| 68 B00228H | |
| 69 B00229H | The second secon |
| 70 B00230H | TRANSPORT OF THE AT OLD THEM EDG STATIUNDYD |
| 71 B00231H | BENERAL CI DEDINENT EUC STATIONO70 |
| 72 B00232H | STATEL LI SEDINER EGE STATIONOYO |
| 73 B00234H | DECLERATION OF CL OFDINENT COC STRITUNOVO |
| 74 B00235H | STATE ET SEDINER ED STATIONE/O |
| | BOULDE CI SEDINENT 200 STATION070 |
| | DESCRIPTION OF THE PROPERTY OF STRILLING OF |
| | THE OF THE EL SEDINER ED STATION |
| 77 B00239H | THE ALL STREET OF DITICHT DOD STRICTURED |
| 78 B00242H | BEAUFORT SAMPLE 21 SEDIMENT 20C STATION070 |
| 79 B00244H | BEAUFORT SAMPLE 21 SEDIMENT 200 STATION070 |
| 80 B00245H | BEAUFORT SAMPLE 21 SEDIMENT 20C STATION070 |
| 81 B00246H | BEAUFORT SAMPLE 21 SEDIMENT 20C STATION070 |
| 82 B00248H | BEAUFORT SAMPLE 21 SEDIMENT 200 STATION070 |
| 83 B00249H | BEAUFORT SAMPLE 21 SEDIMENT 20C STATION070 |
| 84 B00276H | provinces and a second to contract of the |
| 85 B00277H | |
| 86 B00278H | DESUBORE ENDER SECTION FOR SHIELD FOR S |
| 87 B00280H | |
| 88 B00281H | |
| 89 B00282H | |
| 90 B00283H | BEAUFORT SAMPLE 09 SEDIMENT 20C STATION030 |
| 91 B00284H | BEAUFORT SAMPLE 09 SEDIMENT 20C STATION030 |
| 92 B00285H | BEAUFORT SAMPLE 09 SEDIMENT 20C STATION030 |
| 93 B00286H | BEAUFORT SAMPLE 09 SEDIMENT 20C STATION030 |
| 94 B00287H | BEAUFORT SAMPLE 09 SEDIMENT 20C STATION030 |
| 95 B00289H | BEAUFORT SAMPLE 09 SEDIMENT 20C STATION030 |
| 96 B00290H | BEAUFORT SAMPLE 09 SEDIMENT 20C STATION030 |
| | BEAUFORT SAMPLE 09 SEDIMENT 20C STATION030 |
| 97 B00292H 98 B00293H | BEAUFORT SAMPLE 09 SEDIMENT 20C STATION030 |
| | BEAUFORT SAMPLE 09 SEDIMENT 20C STATION030 |
| | BEHURURI SHMPLE 09 SEDIMENT 200 STATIONA3A |
| 100 B00295H | BEHURURI SAMPLE 09 SEDIMENT PAC STATIONARA |
| 101 B00296H | BEHUFURT SAMPLE 09 SEDIMENT 200 STATIONARA |
| 102 B00297H | BEAUFORT SAMPLE 09 SEDIMENT PAC STATIONARA |
| 103 B00298H | BEAUFORT SAMPLE 09 SEDIMENT 200 STATION030 |
| 104 B00299H | BEHURURI SHMPLE 09 SEDIMENT 200 STATIONA3A |
| 105 B00300H | BEAUFORT SAMPLE 09 SEDIMENT 20C STATION030 |
| | |

END FORM 105 STRAINS

| 4 | 800003L | BEAUFORT SAMPLE 03 WATER 04C STATION010 |
|----------|--------------------|---|
| į. , | B90005L | BEAUFORT SAMPLE 03 WATER 04C STATION010 |
| 2 | B000000 | REALFORT SAMPLE 03 WATER 04C STATION010 |
| 3 | B00013L | PERMITORI SAMPLE 03 WATER 04C STATION010 |
| -1 | 800013C | PEQUEOPT SAMPLE AS WATER 04C STATION010 |
| 5 | B00014L | PEQUEORT SAMPLE 03 WATER 04C STATION010 |
| 6 | B00021L | DEMUTORT SAMPLE 03 WATER 04C STATION010 |
| 7 | | PERUFORT SAMPLE 03 WATER 04C STATION010 |
| ŝ | B00022L | DEGUSORT SAMPLE AS WATER 04C STATION010 |
| .9 | 800024L | PEOUFORT SAMPLE AS WATER 04C STATION010 |
| 10 | 800025L | PEQUEORT SAMPLE 20 WATER 040 STATION002 |
| 11 | B00052L | SCALFORT SAMPLE 20 WATER 04C STATION002 |
| 12 | B90053L | PERIFORT SAMPLE 20 WATER 04C STATION002 |
| 13 | 880054L | DEALFORT SAMPLE 20 WATER 04C STATION002 |
| 14 | 800055L 800060L | PEQUEORT SAMPLE 20 WATER 04C STATION002 |
| 15 | | DECONFORT SAMPLE ON WATER 04C STATION002 |
| 16 | B00061L | PERUFORT SAMPLE 20 WATER 04C STATION002 |
| 17 | 200062L | BEAUFORT SAMPLE 20 WATER 04C STATION002 |
| 18 | 800063L | BEAUFORT SAMPLE 20 WATER 04C STATION002 |
| 19 | B00066L | BEAUFORT SAMPLE 20 WATER 04C STATION002 |
| 20 | 100067L | BEAUFORT SAMPLE 20 WATER 04C STATION002 |
| 21 | 800068L | REAUFORT SAMPLE 20 WATER 04C STATION002 |
| 55 | B00069L | BEAUFORT SAMPLE 20 WATER 04C STATION002 |
| 23 | B00070L | BEAUFORT SAMPLE 20 WATER 04C STATION002 |
| 24 | B00071L | BERUFURI STATES STATES STATES STATES |
| 25 | B00072L | BEMURURI SHINCE DO MINER SIG STOTIONOGO |
| 26 | B00074L | DEMORONAL ON THE LE DO THE STORE ON CONTROLOGY |
| 27 | B00075L | BERUFORT OTHER LO HITTER ONO CONTIONORI |
| 28 | 800103L | BEAUFORT SAMPLE 27 WATER 04C STATION071 BEAUFORT SAMPLE 27 WATER 04C STATION071 |
| 29 | B00104L | BEAUFORT SAMPLE 27 WATER 04C STATION071 |
| 30 | B00105L | BEAUFORT SAMPLE 27 WATER 04C STATION071 |
| 31 | B00106L | DEDUCORT SAMPLE 27 WATER 04C STATION071 |
| 32 | B00107L | DEALFORT SAMPLE 27 WATER 04C STATION071 |
| 33 | 800108L | BEAUFORT SAMPLE 27 WATER 04C STATION071 |
| 34 | 800109L | BEAUFORT SAMPLE 27 WATER 04C STATION071 |
| 35 | B00111L | BEAUFORT SAMPLE 27 WATER 04C STATION071 |
| 36 | 300113L | PEONEORT SAMPLE 27 WATER 04C STATION071 |
| 37 | B00115L | PROVEDET SAMPLE 27 WATER 04C STATION071 |
| 38 | B00116L B00117L | DEGLEDRET SAMPLE 27 MATER 04C STATION071 |
| 39 | B00118L | PEQUEORT SAMPLE 27 WATER 04C STATION071 |
| -10 | 800119L | DEGULEOPT SAMPLE 27 WATER 04C STATION071 |
| 41 | 800120L | PEQUEORT SAMPLE 27 WATER 04C STATION071 |
| -2 | B00121L | PEALEORT SAMPLE 27 WATER 04C STATION071 |
| 43 44 | B00122L | REALFORT SAMPLE 27 NATER 04C STATION071 |
| | B00123L | PEOLEOPT SAMPLE 27 WATER 04C STATION071 |
| 45 42 | B00123L | REQUERRE SAMPLE 27 WATER 04C STATION071 |
| 46 | B00124C B00125L | DEGLEOPT CAMPLE 27 WATER 04C STATION071 |
| 47 48 | B00152L | DEGUEORT SAMPLE 24 WATER 04C STATION055 |
| 48 49 | B00153L | SFAUFORT SAMPLE 24 WATER 04C STATION055 |
| 47 50 | | BEAUFORT SAMPLE 24 WATER 04C STATION055 |
| 00 | ひどうび アイシュナナー | Actual Parts for a second s |

| | The state was a strength of | |
|----------|-----------------------------|--|
| 51 | | BEAUFORT SAMPLE 24 WATER 04C STATION055 |
| 52 | | BEAUFORT SAMPLE 24 WATER 04C STATION055 |
| 53 | | BEAUFORT SAMPLE 24 WATER 04C STATION055 |
| 54 | | BEAUFORT SAMPLE 24 WATER 04C STATION055 |
| 55 | | BEAUFORT SAMPLE 24 WATER 04C STATION055 |
| ្រា | B00163L | BEAUFORT SAMPLE 24 WATER 04C STATION055 |
| 57 | B00164L | BEAUFORT SAMPLE 24 WATER 04C STATION055 |
| 58 | B00165L | BEAUFORT SAMPLE 24 WATER 04C STATION055 |
| 59 | B00166L | BEAUFORT SAMPLE 24 WATER 04C STATION055 |
| 60 | B00167L | |
| 61 | 800168L | THE REPORT OF A DECK |
| 62 | B00169L | THE PROPERTY AND A PROPERTY OFFICE OFFICE OFFICE OFFICE |
| 63 | B00170L | The second se |
| 64 | B00171L | The second s |
| 65 | 800172L | |
| 66 | B00173L | |
| 67 | 899175L | |
| 68 | B00201L | |
| 69 | B00202L | DECISION CONTRACTOR OF CONTRACTOR |
| 70 | B00203L | BEAUFORT SAMPLE 26 WATER 04C STATION070 BEAUFORT SAMPLE 26 WATER 04C STATION070 |
| 71 | B90205L | BEAUFORT SAMPLE 26 WATER 04C STATION070 |
| 72 | B00506L | BEAUFORT SAMPLE 26 WATER 04C STATION070 |
| 73 | B00207L | BEAUFORT SAMPLE 26 WATER 04C STATION070 |
| 74 | B99208L | BEAUFORT SAMPLE 26 WATER 04C STATION070 |
| 1 | B00209L | BEAUFORT SAMPLE 26 WATER 04C STATION070 |
| 76 | 800210L | BEAUFORT SAMPLE 26 WATER 04C STATION070 |
| 77 | B00211L | BEAUFORT SAMPLE 26 WATER 04C STATION070 |
| 78 | B00212L | BEAUFORT SAMPLE 26 WATER 04C STATION070 |
| 79 | B00213L | BEAUFORT SAMPLE 26 WATER 04C STATION070 |
| 30 | B90214L | BEAUFORT SAMPLE 26 WATER 04C STATION070 |
| 31 | B00215L | BEAUFORT SAMPLE 26 WATER 04C STATION070 |
| 82 | B00216L | BEAUFORT SAMPLE 26 WATER 04C STATION070 |
| 83 | 890217L | BEAUFORT SAMPLE 26 WATER 04C STATION070 |
| 84 | B00218L | BEAUFORT SAMPLE 26 WATER 04C STATION070 |
| 85 | B00219L | BEAUFORT SAMPLE 26 WATER 04C STATION070 |
| 86 | 800220L | BEAUFORT SAMPLE 26 WATER 04C STATION020 |
| 87 | B00278L | BEAUFORT SAMPLE 11 WATER 04C STATIONOR |
| 88 | B90280L | BLAUFORT SAMPLE 11 WATER A4C STATIONADA |
| 89 | B98281L | BEAUFORT SAMPLE 19 WATER AAC STATIONAAL |
| 90 | B00282L | BEHUFURT SAMPLE 19 WATER 04C STATION001 |
| 91 | 800283L | BEAUFORT SAMPLE 19 WATER 04C STATION001 |
| 92 | B00284L | BEAUFORT SAMPLE 19 WATER 04C STATION001 |
| 93 od | B00291L | BEAUFORT SAMPLE 36 WATER 04C STATIONAAP |
| 94 | B00292L | BEAUFORT SAMPLE 36 WATER 04C STATION002 |
| | | |

END FORM 94 STRAINS

Strains isolated from sediment at 4C capable of growth at pH 6.

_ . .

| 1 | 399926L | BEAUFORT | SAMPLE 03 | SEDIMENT | 04C STATION010 |
|------------|---------------|----------|-----------|---------------------------------|--------------------|
| Ê | B00027L | BEAUFORT | SAMPLE 03 | SEDIMENT | 04C STATION010 |
| | 890028L | BEAUFORT | SAMPLE 03 | SEDIMENT | 04C STATION010 |
| З | | BEAUFORT | SAMPLE 03 | | 04C STATION010 |
| 4 | 800029L | BEAUFORT | SAMPLE 03 | | 04C STATION010 |
| 5 | 899939L | BEAUFORT | SAMPLE 03 | | 04C STATION010 |
| 6 | B00031L | | SAMPLE 03 | | 04C STATION010 |
| 7 | 300032L | BEAUFORT | SAMPLE 00 | | 04C STATION010 |
| 8 | 800033L | BEAUFORT | | | 04C STATION010 |
| 9 | B99934L | BEAUFORT | | | 04C STATION010 |
| 10 | B00035L | BEAUFORT | SAMPLE 03 | | 04C STATION010 |
| 11 | E99936L | BEAUFORT | SAMPLE 03 | | 04C STATION010 |
| 12 | B00037L | BEAUFORT | SAMPLE 03 | | |
| 13 | B00038L | BEAUFORT | SAMPLE ØS | | |
| 14 | B00039L | BEAUFORT | SAMPLE 03 | | |
| 15 | B00040L | BEAUFORT | SAMPLE 03 | | 04C STATION010 |
| 1 6 | B00041L | BEAUFORT | SAMPLE 03 | | 04C STATION010 |
| 17 | B00042L | BEAUFORT | SAMPLE 00 | | 04C STATION010 |
| 18 | B00044L | BEAUFORT | SAMPLE 00 | SEDIMENT | 04C STATION010 |
| 19 | B00047L | BEAUFORT | SAMPLE 0 | SEDIMENT | 04C STATION010 |
| 20 | B00048L | BEAUFORT | SAMPLE 0 | SEDIMENT | 04C STATION010 |
| | B00049L | BEAUFORT | SAMPLE 0 | | 04C STATION010 |
| 21 | ••• = = · · · | BEAUFORT | SAMPLE 0 | | 04C STATION010 |
| 22 | 200050L | BEAUFORT | SAMPLE 10 | | 04C STATION002 |
| 23 | B00076L | BEAUFORT | SAMPLE 1 | | 04C STATION002 |
| 24 | B00077L | | SAMPLE 1 | | 04C STATION002 |
| 25 | B00078L | BEAUFORT | | | 04C STATION002 |
| 26 | B00079L | BEAUFORT | SAMPLE 1 | | 04C STATION002 |
| 27 | 1980080L | BEAUFORT | | | 04C STATION002 |
| 28 | B00081L | BEAUFORT | | | 04C STATION002 |
| 29 | B00082L | BEAUFORT | SAMPLE 1 | | 04C STATION002 |
| 30 | B00083L | BEAUFORT | SAMPLE 1 | | 04C STATION002 |
| 31 | B90985L | BEAUFORT | SAMPLE 1 | | 04C STATION002 |
| 32 | B00086L | BEAUFORT | SAMPLE 1 | | 04C STATION002 |
| 33 | B00087L | BEAUFORT | SAMPLE 1 | | |
| 34 | B00088L | BEAUFORT | SAMPLE 1 | | |
| 35 | B00089L | BEAUFORT | SAMPLE 1 | | |
| 36 | B00091L | BEAUFORT | SAMPLE 1 | | |
| 37 | B00092L | BEAUFORT | SAMPLE 1 | S SEDIMENT | 04C STATION002 |
| 38 | B00093L | BEAUFORT | | 5 SEDIMENT | 04C STATION002 |
| 39 | B00094L | BEAUFORT | SAMPLE 1 | S SEDIMENT | |
| 40 | B00095L | BERUFORT | SAMPLE 1 | 5 SEDIMENT | |
| | 300096L | BEAUFORT | SAMPLE 1 | 5 SEDIMENT | 04C STATION002 |
| 41 | B00097L | BEAUFORT | | S SEDIMENT | |
| 42 | | BEAUFORT | | 5 SEDIMENT | |
| 43 | B00098L | | | 5 SEDIMENT | |
| 44 | B00099L | BERUFORT | | 5 SEDIMENT | |
| 45 | B00100L | BEAUFORT | | S SEDIMENT | • · · - |
| 46 | B00126L | BEAUFORT | | <u>- OCDINCNI</u> N OCDINCNI | |
| 47 | B90128L | BEAUFORT | | SEDIMENT | |
| 48 | B00129L | BEAUFORT | | 2 SEDIMENT | |
| 49 | B00130L | BEAUFORT | | 2 SEDIMENT | |
| 50 | B00131L | BEAUFORT | SAMPLE 2 | 2 SEDIMENT | Ref Other former r |
| | | | | | |

| 51 | B00132L | BEAUFORT | r sample | 2 2 ĉ | SEDIMENT | F 040 | STATION071 |
|----------|---|---------------------|----------------------|------------|---|-------|------------|
| 52 | B00133L | BEAUFORT | SAMPLE | 1 22 | SEDIMENT | 1 040 | STATION071 |
| 53 | B00134L | BEAUFORT | | | | | |
| 54 | B00135L | BEAUFOR1 | | | | | |
| 55 | | | | | | | |
| | B00136L | BEAUFORT | | | | | |
| 56 | B00137L | BEAUFORT | | | | - 04C | STATION071 |
| 57 | B00138L | BEAUFORT | SAMPLE | 22 | SEDIMENT | 04C | STATION071 |
| 58 | E00140L | BEAUFORT | SAMPLE | 23 | SEDIMENT | | |
| 59 | B00141L | BEAUFORT | | | | · · = | |
| 60 | B00143L | BERUFORT | | | | | |
| | | | | | | | |
| 61 | B00144L | BEAUFORT | | | | | |
| 62 | B00145L | BEAUFORT | | | SEDIMENT | 04C | STATION071 |
| 63 | B90147L | BEAUFORT | SAMPLE | 22 | SEDIMENT | 04C | STATION071 |
| 64 | B00148L | BEAUFORT | SAMPLE | 22 | SEDIMENT | | STATION071 |
| 65 | B00149L | BEAUFORT | | | | | STATION071 |
| 66 | 800150L | BEAUFORT | | 22 | | | STATION071 |
| 67 | B00178L | | · · | | | | |
| | | BEAUFORT | | 50 | | | STATION055 |
| 68 | B00179L | BEAUFORT | | - 20 | | | STATION055 |
| 69 | B00180L | BEAUFORT | SAMPLE | -20 | SEDIMENT | 04C | STATION055 |
| 70 | B00181L | BEAUFORT | SAMPLE | 20 | SEDIMENT | 04C | STATION055 |
| 71 | B00182L | BEAUFORT | SAMPLE | 20 | SEDIMENT | 04C | STATION055 |
| 72 | 800183L | BEAUFORT | SAMPLE | 20 | SEDIMENT | 04C | STATION055 |
| 73 | B00184L | BEAUFORT | SAMPLE | 20 | SEDIMENT | | |
| 74 | | | | | | 04C | STATION055 |
| | B00185L | BEAUFORT | SAMPLE | 50 | SEDIMENT | 04C | STATION055 |
| 75 | B00186L | BEAUFORT | | 20 | SEDIMENT | 04C | STATION055 |
| 76 | B00187L | BEAUFORT | SAMPLE | -20 | SEDIMENT | 04C | STATION055 |
| 77 | B00188L | BEAUFORT | SAMPLE | -20 | SEDIMENT | 04C | STATION055 |
| 78 | B00189L | BEAUFORT | SAMPLE | 20 | SEDIMENT | 04C | STATION055 |
| 79 | 800191L | BEAUFORT | SAMPLE | 20 | SEDIMENT | 04C | STATION055 |
| 80 | B00192L | BEAUFORT | SAMPLE | 20 | SEDIMENT | 04C | |
| 81 | | | | | | | STATION055 |
| | 800194L | BEAUFORT | SAMPLE | 50 | SEDIMENT | 04C | STATION055 |
| 82 | B00195L | BEAUFORT | SAMPLE | 20 | SEDIMENT | Ø4C | STATION055 |
| 83 | B00197L | BEAUFORT | SAMPLE | 20 | SEDIMENT | 04C | STATION055 |
| 84 | B00198L | BEAUFORT | SAMPLE | 20 | SEDIMENT | 04C | STATION055 |
| 85 | B00200L | BEAUFORT | SAMPLE | 20 | SEDIMENT | 04C | STATION055 |
| 86 | B00227L | BEAUFORT | SAMPLE | 21 | | | |
| 87 | B00228L | | | | SEDIMENT | 04C | STATION070 |
| | | BEAUFORT | SAMPLE | 21 | SEDIMENT | 94C | STATION070 |
| 88 | B00229L | BEAUFORT | SAMPLE | | | Ø4C | STATION070 |
| 89 | B00230L | BEAUFORT | SAMPLE | 21 | SEDIMENT | 04C | STATION070 |
| 90 | B00232L | BEAUFORT | SAMPLE | 21 | SEDIMENT | 04C | STATION070 |
| 91 | 800234L | BEAUFORT | | 21 | SEDIMENT | | STATION070 |
| 92 | B00235L | BEAUFORT | SAMPLE | 21 | SEDIMENT | | STATION070 |
| 93 | B90236L | BEAUFORT | SAMPLE | 21 | SEDIMENT | | |
| 94 | B00237L | | | | | | STATION070 |
| | | BEAUFORT | SAMPLE | 21 | SEDIMENT | | STATION070 |
| 95 SA | 800238L | BEAUFORT | SAMPLE | 21 | SEDIMENT | | STATION070 |
| 96 | B00239L | BEAUFORT | | 21 | SEDIMENT | 04C | STATION070 |
| 97 | B00240L | BEAUFORT | SAMPLE | 21 | SEDIMENT | 04C | STATION070 |
| 98 | B90241L | BEAUFORT | | | SEDIMENT | | STATION070 |
| 99 | B00242L | BEAUFORT | | | | | STATION070 |
| 100 | 800243L | BEAUFORT | SAMPLE | | | | |
| | Lan an an Art and Art a | Actual Part (2.97%) | - i i fi L.E. | 6 A | Contraction (Contraction of the Contraction of the | 040 | STATION070 |

| 4 65 9 | 899244L | BEAUFORT | SAMPLE | 21 | SEDIMENT | 04C | STATION070 |
|--------------|---------|----------|--------|---------|----------|-----|------------|
| 101 102 | 800244L | BEAUFORT | SAMPLE | 21 | SEDIMENT | 04C | STATION070 |
| 102 | 800246L | BEAUFORT | SAMPLE | 21 | SEDIMENT | 040 | STATION070 |
| $103 \\ 104$ | B00247L | BEAUFORT | SAMPLE | 21 | SEDIMENT | 04C | STATION070 |
| 104 | B00248L | BEAUFORT | SAMPLE | 21 | SEDIMENT | 04C | STATION070 |
| $100 \\ 106$ | B00249L | BEAUFORT | SAMPLE | ≥ 1 | SEDIMENT | 04C | STATION070 |
| 107 | 800250L | BEAUFORT | SAMPLE | 21 | SEDIMENT | 04C | STATION070 |
| 108 | B00251L | BEAUFORT | SAMPLE | 09 | SEDIMENT | 04C | STATION030 |
| 109 | B00252L | BEAUFORT | SAMPLE | 69 | SEDIMENT | 04C | STATION030 |
| 110 | 800253L | BEAUFORT | SAMPLE | 09 | SEDIMENT | 04C | STATION030 |
| 111 | B00254L | BEAUFORT | SAMPLE | 09 | SEDIMENT | 04C | STATION030 |
| 112 | 800256L | BEAUFORT | SAMPLE | 09 | SEDIMENT | 04C | STATION030 |
| 113 | B00257L | BEAUFORT | SAMPLE | 09 | SEDIMENT | 04C | STATION030 |
| 114 | 800259L | BEAUFORT | SAMPLE | 09 | SEDIMENT | 04C | STATION030 |
| 115 | B99261L | BEAUFORT | SAMPLE | 69 | SEDIMENT | 04C | STATION030 |
| 116 | B00262L | BEAUFORT | SAMPLE | 09 | SEDIMENT | 04C | STATION030 |
| 117 | B99263L | BEAUFORT | SAMPLE | 09 | SEDIMENT | 04C | STATION030 |
| 118 | B00264L | BEAUFORT | SAMPLE | 09 | SEDIMENT | 04C | STATION030 |
| 119 | B00265L | BEAUFORT | SAMPLE | 09 | SEDIMENT | 04C | STATION030 |
| 120 | B00266L | BEAUFORT | SAMPLE | 09 | SEDIMENT | 04C | STATION030 |
| 121 | B00267L | BEAUFORT | SAMPLE | 09 | SEDIMENT | Ø4C | STATION030 |
| 122 | B90268L | BEAUFORT | SAMPLE | 09 | SEDIMENT | 04C | STATION030 |
| 123 | B00269L | BEAUFORT | SAMPLE | 09 | SEDIMENT | 04C | STATION030 |
| 124 | B00272L | BEAUFORT | SAMPLE | 09 | SEDIMENT | 04C | STATION030 |
| 125 | B00273L | BERUFORT | SAMPLE | 09 | SEDIMENT | 04C | STATION030 |
| 126 | B00274L | BEAUFORT | SAMPLE | Ø9 | SEDIMENT | 04C | STATION030 |
| 127 | B00275L | BEAUFORT | SAMPLE | Ø9 | SEDIMENT | 04C | STATION030 |
| 128 | B00286L | BEAUFORT | SAMPLE | 15 | SEDIMENT | 04C | STATION001 |
| 129 | 800287L | BEAUFORT | SAMPLE | 15 | SEDIMENT | 04C | STATION001 |
| 130 | B00288L | BEAUFORT | SAMPLE | 15 | SEDIMENT | 04C | STATION001 |
| 131 | B00289L | BEAUFORT | SAMPLE | 15 | SEDIMENT | 04C | STATION001 |
| 132 | B00290L | BEAUFORT | SAMPLE | 15 | SEDIMENT | 04C | STATION001 |
| 133 | B90296L | BEAUFORT | SAMPLE | 38 | SEDIMENT | 04C | STATION002 |
| 134 | B00297L | BERUFORT | SAMPLE | 32 | SEDIMENT | 04C | STATION002 |
| 135 | B00299L | BEAUFORT | SAMPLE | 32 | SEDIMENT | 04C | STATION002 |
| | | | | | | | |

END FORM 135 STRAINS

| 1 | B00001H | BEAUFORT | SAMPLE | <u> </u> Ø3 | MATER | 200 | STATION010 |
|----------|--------------------|----------|------------------|----------------|----------------|----------------|--------------------------|
| È | 200002H | BEAUFORT | | | WATER | | |
| u S | B00002H | | SAMPLE | | WATER | 200 | |
| い 4 | 500003H 00004H | BEAUFORT | | | | | STATION010 |
| | | | SAMPLE | | | | |
| 5 | B00005H | BEAUFORT | | | WATER | 200 | STATION010 STATION010 |
| 6 7 | 800006H | BEAUFORT | SAMPLE | | WATER | 200 | |
| | 800007H | BEAUFORT | SAMPLE | | WATER | 200 | STATION010 |
| 8 9 | B00008H | BEAUFORT | SAMPLE SAMPLE | | WATER | 200 | STATION010 |
| - | BOOODOH | BEAUFORT | | | WATER | 200 | STATION010 STATION010 |
| 10 | B00010H | BEAUFORT | SAMPLE | | WATER WATER | - 200 - 200 | STATION010 |
| 11 12 | B00011H | BEAUFORT | SAMPLE SAMPLE | | | 200 | STATION010 |
| 13 | B00012H B00013H | BEAUFORT | | 03 03 | WATER | 200 | STATION010 |
| | | BEAUFORT | SAMPLE | юз 03 | WATER | 200 | |
| 14 | B00014H | BEAUFORT | SAMPLE | | WATER | | STATION010 |
| 15 | B00015H | BEAUFORT | SAMPLE | 03 | WATER | 200 | STATION010 |
| 16 | B00016H | BEAUFORT | SAMPLE | 03 | WATER | 200 | STATION010 |
| 17 | B00017H | BEAUFORT | SAMPLE | 03 | WATER | 200 | STATION010 |
| 18 | B00018H | BEAUFORT | SAMPLE | 03 | WATER | 200 | STATION010 |
| 19 | B00019H | BEAUFORT | SAMPLE | 03 | WATER | 200 | STATION010 |
| 20 | 800020H | BEAUFORT | SAMPLE | 9 3 | WATER | 200 | STATION010 |
| 21 | B00021H | BEAUFORT | SAMPLE | 03 | WATER | 200 | STATION010 |
| 22 | B00022H | BEAUFORT | SAMPLE | 03 | WATER | 200 | STATION010 |
| 23 | B00023H | BEAUFORT | SAMPLE | 03 | WATER | 200 | STATION010 |
| 24 | B00024H | BEAUFORT | SAMPLE | 03 | WATER | 200 | STATION010 |
| 25 | B00051H | BEAUFORT | SAMPLE | 20 | WATER | 200 | STATION020 |
| 26 | B00052H | BEAUFORT | SAMPLE | 20 | WATER | 200 | STATION020 |
| 27 | 800053H | BEAUFORT | SAMPLE | 20 | WATER | 200 | STATION020 |
| 28 | B00054H | BEAUFORT | SAMPLE | 20 | WATER | 200 | STATION020 |
| 29 | B00055H | BEAUFORT | SAMPLE | 20 | WATER | 200 | STATION020 |
| 30 | B00056H | BEAUFORT | SAMPLE | 20 | WATER | 200 | STATION020 |
| 31 | B00057H | BEAUFORT | SAMPLE | 20 | WATER | 200 | STATION020 |
| 32 | B00058H | BEAUFORT | SAMPLE | 20 | WATER | 200 | STATION002 |
| 33 | B00059H | BEAUFORT | SAMPLE | 20 | WATER | 200 | STATION002 |
| 34 | B00060H | BEAUFORT | SAMPLE | 20 | WATER | 200 | STATION002 STATION002 |
| 35 | B00061H | BEAUFORT | SAMPLE | 20 | WATER | 200 | STATION002 |
| 36 | B00062H | BEAUFORT | SAMPLE | 20 | WATER | 200 | STATION002 |
| 37 | B00063H | BEAUFORT | SAMPLE | 20 | WATER | 200 | |
| 38 | 800064H | BEAUFORT | SAMPLE | | | | STATION002 STATION002 |
| 39 | 800065H | BEAUFORT | SAMPLE | | WATER | 200 | STATION002 |
| 40 | B00066H | BEAUFORT | | | | | |
| 41 | 800067H | BEAUFORT | SAMPLE | | WATER | 20C | STATION002 |
| 42 | B00068H | BEAUFORT | SAMPLE | | WATER | | STATION002 |
| 43 | B00069H | BEAUFORT | SAMPLE | | | 20C | STATION002 |
| 44 | B00070H | BEAUFORT | SAMPLE | | | 20C | STATION002 |
| 45 | B00071H | BEAUFORT | SAMPLE | | | 200 | STATION002 |
| 46 | B00072H | BEAUFORT | SAMPLE | | | 200 | STATION002 |
| 47 | B00073H | BEAUFORT | SAMPLE | | | 20C | STATION002 |
| 48 | B00075H | BEAUFORT | SAMPLE | | | 200 | STATION002 |
| 49 | B00101H | BEAUFORT | SAMPLE | | | 20C | STATION071 |
| 50 | B00102H | BEAUFORT | SAMPLE | 27 | WATER | 20C | STATION071 |

| | | requese sauch r of vetro ass statistics 4 |
|----------|---------|---|
| 51 | B00103H | BEAUFORT SAMPLE 27 WATER 20C STATION071 |
| 52 | B00104H | BEAUFORT SAMPLE 27 WATER 200 STATION071 |
| 53 | B00106H | BEAUFORT SAMPLE 27 WATER 200 STATION071 |
| 54 | B00109H | BEAUFORT SAMPLE 27 WATER 20C STATION071 |
| 55 | B00110H | BEAUFORT SAMPLE 27 WATER 200 STATION071 |
| | | |
| 56 | B90111H | |
| 57 | B00112H | BEAUFORT SAMPLE 27 WATER 200 STATION071 |
| 58 | B00113H | BEAUFORT SAMPLE 27 WATER 20C STATION071 |
| 59 | B00114H | BEAUFORT SAMPLE 27 WATER 20C STATION071 |
| 60 | B00115H | BEAUFORT SAMPLE 27 WATER 200 STATION071 |
| 61 | B00116H | BEAUFORT SAMPLE 27 WATER 20C STATION071 |
| 62 | B00117H | BEAUFORT SAMPLE 27 WATER 20C STATION071 |
| | B00118H | BEAUFORT SAMPLE 27 WATER 20C STATION071 |
| 63 | | |
| 64 | B00119H | |
| 65 | B00120H | BEAUFORT SAMPLE 27 WATER 20C STATION071 |
| 66 | B00121H | BEAUFORT SAMPLE 27 WATER 20C STATION071 |
| 67 | B00122H | BEAUFORT SAMPLE 27 WATER 20C STATION071 |
| 68 | B00123H | BEAUFORT SAMPLE 27 WATER 20C STATION071 |
| 69 | B00151H | BEAUFORT SAMPLE 24 WATER 20C STATION055 |
| 70 | B00152H | BEAUFORT SAMPLE 24 WATER 20C STATION055 |
| 71 | B00153H | BEAUFORT SAMPLE 24 WATER 200 STATION055 |
| | | |
| 72 | B00154H | |
| 73 | B00155H | BEAUFORT SAMPLE 24 WATER 20C STATION055 |
| 74 | B00156H | BEAUFORT SAMPLE 24 WATER 20C STATION055 |
| 75 | B00157H | BEAUFORT SAMPLE 24 WATER 20C STATION055 |
| 76 | B00158H | BEAUFORT SAMPLE 24 WATER 20C STATION055 |
| 77 | B00159H | BEAUFORT SAMPLE 24 WATER 20C STATION055 |
| 78 | B00160H | BEAUFORT SAMPLE 24 WATER 20C STATION055 |
| 79 | B00161H | BEAUFORT SAMPLE 24 WATER 200 STATION055 |
| | | |
| 80 | B00162H | |
| 81 | 800163H | BEAUFORT SAMPLE 24 WATER 20C STATION055 |
| 82 | B00164H | BEAUFORT SAMPLE 24 WATER 20C STATION055 |
| 83 | B00165H | BEAUFORT SAMPLE 24 WATER 20C STATION055 |
| 84 | B00166H | BEAUFORT SAMPLE 24 WATER 20C STATION055 |
| | | BEAUFORT SAMPLE 24 WATER 200 STATION055 |
| 85 | B00168H | |
| 86 | B00169H | |
| 87 | 800170H | BEAUFORT SAMPLE 24 WATER 20C STATION055 |
| 88 | 600201H | BEAUFORT SAMPLE 26 WATER 20C STATION070 |
| 89 | B00202H | BEAUFORT SAMPLE 26 WATER 20C STATION070 |
| 90 | B00203H | BEAUFORT SAMPLE 26 WATER 20C STATION070 |
| 91 | B00204H | BEAUFORT SAMPLE 26 WATER 20C STATION070 |
| 92 | B00205H | BEAUFORT SAMPLE 26 WATER 20C STATION070 |
| 93 | B00206H | BEAUFORT SAMPLE 26 WATER 200 STATION070 |
| 20 94 | 200200H | BEAUFORT SAMPLE 26 WATER 200 STATION070 |
| | | |
| 95 | 800208H | |
| 96 | B00210H | BEAUFORT SAMPLE 26 WATER 200 STATION070 |
| 97 | 800211H | BEAUFORT SAMPLE 26 WATER 20C STATION070 |
| 98 | 800212H | BEAUFORT SAMPLE 26 WATER 20C STATION070 |
| 99 | B00213H | BEAUFORT SAMPLE 26 WATER 20C STATION070 |
| 100 | 800216H | BEAUFORT SAMPLE 26 WATER 20C STATION070 |
| | | • • • • • • • • • • • • • • • • |

| 101 | B00217H | BEAUFORT | SAMPLE | 26 | WATER | 200 | STATION070 |
|-----------|---------|----------|--------|----|-------|-----|------------|
| 102 | B00219H | BEAUFORT | SAMPLE | 26 | WATER | 20C | STATION070 |
| 103 | B00221H | BEAUFORT | SAMPLE | 26 | WATER | 200 | STATION070 |
| 104 | B00222H | BEAUFORT | SAMPLE | 26 | WATER | 20C | STATION070 |
| 105 | B00223H | BEAUFORT | SAMPLE | 26 | WATER | 200 | STATION070 |
| 106 | B00251H | BEAUFORT | SAMPLE | 11 | WATER | 200 | STATION030 |
| 107 | B00252H | BEAUFORT | SAMPLE | 11 | WATER | 200 | STATION030 |
| 108 | B00253H | BEAUFORT | SAMPLE | 11 | WATER | 200 | STATION030 |
| 109 | 800254H | BEAUFORT | SAMPLE | 11 | MATER | 200 | STATION030 |
| 110 | B00255H | BEAUFORT | SAMPLE | 11 | WATER | 20C | STATION030 |
| 111 | B00256H | BEAUFORT | SAMPLE | 11 | WATER | 200 | STATION030 |
| 112 | B00257H | BEAUFORT | SAMPLE | 11 | WATER | 200 | STATION030 |
| 113 | B00258H | BEAUFORT | SAMPLE | 11 | WATER | 20C | STATION030 |
| 114 | B00259H | BEAUFORT | SAMPLE | 11 | WATER | 20C | STATION030 |
| 115 | 800260H | BEAUFORT | SAMPLE | 11 | WATER | 200 | STATION030 |
| 116 | B00261H | BEAUFORT | SAMPLE | 11 | WATER | 20C | STATION030 |
| 117 | B00262H | BEAUFORT | SAMPLE | 11 | WATER | 200 | STATION030 |
| 118 | B00263H | BEAUFORT | SAMPLE | 11 | WATER | 200 | STATION030 |
| 119 | B00264H | BEAUFORT | SAMPLE | 11 | WATER | 20C | STATION030 |
| 120 | B00265H | BEAUFORT | SAMPLE | 11 | WATER | 200 | STATION030 |
| $1 \ge 1$ | 800266H | BEAUFORT | SAMPLE | 11 | WATER | 20C | STATION030 |
| 122 | B00268H | BEAUFORT | SAMPLE | 11 | WATER | 20C | STATION030 |
| 123 | B00269H | BEAUFORT | SAMPLE | 11 | WATER | 200 | STATION030 |
| 124 | 800270H | BEAUFORT | SAMPLE | 11 | WATER | 200 | STATION030 |
| 125 | B00271H | BEAUFORT | SAMPLE | 11 | WATER | 200 | STATION030 |
| 126 | B99272H | BEAUFORT | SAMPLE | 11 | WATER | 20C | STATION030 |
| 127 | B00273H | BEAUFORT | SAMPLE | 11 | WATER | 203 | STATION030 |
| 128 | B00275H | BEAUFORT | SAMPLE | 11 | WATER | 50C | STATION030 |

END FORM

| ï | 300026H | BEAUFORT | SAMPLE | 03 | SEDIMENT | 200 | STATION010 |
|----------|--------------------|----------------------|--------|------------|----------|-----|------------|
| 2 | B00027H | BEAUFORT | SAMPLE | 03 | SEDIMENT | 200 | STATION010 |
| З | B00028H | BEAUFORT | SAMPLE | Ø3 | SEDIMENT | 200 | STATION010 |
| 4 | B00029H | BEAUFORT | SAMPLE | 03 | SEDIMENT | 200 | STATION010 |
| Ś | B00030H | BEAUFORT | SAMPLE | <u>03</u> | SEDIMENT | 200 | STATION010 |
| 6 | B00031H | BEAUFORT | SAMPLE | 03 | SEDIMENT | 20C | STATION010 |
| | B00032H | BEAUFORT | SAMPLE | 03 03 | SEDIMENT | 200 | STATION010 |
| 7 | B00033H | BEAUFORT | SAMPLE | 03 | SEDIMENT | 200 | STATION010 |
| 8 | | | SAMPLE | 03 | SEDIMENT | 200 | STATION010 |
| .9 | B00035H | BEAUFORT | | | | 200 | STATION010 |
| 10 | B00036H | BEAUFORT | SAMPLE | 03 | SEDIMENT | | |
| 11 | B00037H | BEAUFORT | SAMPLE | 03 | SEDIMENT | 200 | STATION010 |
| 12 | B00038H | BEAUFORT | SAMPLE | 63 | SEDIMENT | 200 | STATION010 |
| 13 | B00039H | BEAUFORT | SAMPLE | Ø3 | SEDIMENT | 202 | STATION010 |
| 14 | B00040H | BEAUFORT | SAMPLE | 03 | SEDIMENT | 200 | STATION010 |
| 15 | B00041H | BEAUFORT | SAMPLE | 03 | SEDIMENT | 200 | STATION010 |
| 16 | B00042H | BEAUFORT | SAMPLE | ØЗ | SEDIMENT | 200 | STATION010 |
| 17 | B00043H | BEAUFORT | SAMPLE | 03 | SEDIMENT | 200 | STATION010 |
| 18 | B00044H | BEAUFORT | SAMPLE | Ø 3 | SEDIMENT | 200 | STATION010 |
| 19 | B00045H | BEAUFORT | SAMPLE | 03 | SEDIMENT | 20C | STATION010 |
| 20 | B00047H | BEAUFORT | SAMPLE | ŨЗ | SEDIMENT | 200 | STATION010 |
| 21 | B00048H | BEAUFORT | SAMPLE | Ø3 | SEDIMENT | 200 | STATION010 |
| 22 | B00076H | BEAUFORT | SAMPLE | 16 | SEDIMENT | 200 | STATION002 |
| 23 | B00077H | BEAUFORT | SAMPLE | 16 | SEDIMENT | 200 | STATION002 |
| 24 | B00078H | BEAUFORT | SAMPLE | 16 | SEDIMENT | 200 | STATION002 |
| 25 | B00079H | BEAUFORT | SAMPLE | 16 | SEDIMENT | 200 | STATION002 |
| 26 | BOOOSOH | BEAUFORT | SAMPLE | 16 | SEDIMENT | 200 | STATION002 |
| 27 | B00081H | BEAUFORT | SAMPLE | 16 | SEDIMENT | 200 | STATION002 |
| 28 | B00082H | BEAUFORT | SAMPLE | 16 | SEDIMENT | 200 | STATION002 |
| 29 | B00083H | BEAUFORT | SAMPLE | 16 | SEDIMENT | 200 | STATION002 |
| 30 | B00084H | BEAUFORT | SAMPLE | 16 | SEDIMENT | 200 | STATION002 |
| 30 31 | B00085H | BEAUFORT | SAMPLE | 16 | SEDIMENT | 200 | STATION002 |
| | | BEAUFORT | SAMPLE | 16 | SEDIMENT | 200 | STATION002 |
| 32 | 800086H | BEAUFORT | SAMPLE | 16 | SEDIMENT | 290 | STATION002 |
| 33 | B00087H B00088H | BEAUFORT | SAMPLE | 16 | SEDIMENT | 290 | STATION002 |
| 34 OF | 5000000 500089H | BEAUFORT | SAMPLE | 16 | SEDIMENT | 200 | STATION002 |
| 35 54 | | BEAUFORT | SAMPLE | 16 | SEDIMENT | 200 | STATION002 |
| 36 | B00091H | BEAUFORT | SAMPLE | 16 | SEDIMENT | 200 | STATION002 |
| 37 | B00092H | | | | | 200 | STATION002 |
| 38 | B99993H | BEAUFORT | SAMPLE | 16 16 | SEDIMENT | 200 | STATION002 |
| 39 | B00094H | BEAUFORT | SAMPLE | $16 \\ 16$ | SEDIMENT | | STATION002 |
| 40 41 | 800095H 800096H | BEAUFORT BEAUFORT | SAMPLE | $16 \\ 16$ | SEDIMENT | 200 | |
| 42 | B90097H | BEAUFORT | | | | 200 | STATION002 |
| 43 | B00098H | | SAMPLE | 16 | SEDIMENT | 200 | STATION002 |
| 43 44 | B00099H | BEAUFORT | SAMPLE | 16 | SEDIMENT | 200 | STATION002 |
| 45 | B00100H | BEAUFORT | SAMPLE | 16 | SEDIMENT | 200 | STATION002 |
| | BO0126H | BEAUFORT | SAMPLE | 16 | SEDIMENT | 200 | STATION002 |
| 46 47 | B00126H B00127H | BEAUFORT | | 22 | SEDIMENT | 200 | STATION071 |
| 47 40 | | BEAUFORT | | | SEDIMENT | 200 | STATION071 |
| 48 40 | B00128H | BEAUFORT | | | SEDIMENT | 200 | STATION071 |
| 49 50 | B00129H | BEAUFORT | SAMPLE | | SEDIMENT | 200 | STATION071 |
| 50 | B00130H | BEAUFORT | SHMPLE | 22 | SEDIMENT | 200 | STATION071 |

| 51 | B00131H | BEAUFORT | SAMPLE 22 | SEDIMENT | 20C STATION071 |
|------------|---------|----------|-----------|----------|----------------|
| 52 | B00132H | BEAUFORT | SAMPLE 22 | SEDIMENT | 20C STATION071 |
| 53 | B00133H | BEAUFORT | SAMPLE 22 | SEDIMENT | 20C STATION071 |
| 54 | B00135H | BEAUFORT | SAMPLE 22 | SEDIMENT | 20C STATION071 |
| 55 | B00136H | BEAUFORT | SAMPLE 22 | SEDIMENT | 20C STATION071 |
| 56 | B00138H | BEAUFORT | SAMPLE 22 | | 20C STATION071 |
| 57 | B00139H | BEAUFORT | SAMPLE 22 | | 20C STATION071 |
| <u>5</u> 8 | B00140H | BEAUFORT | SAMPLE 22 | | 20C STATION071 |
| 59 | B00141H | BEAUFORT | SAMPLE 22 | | 20C STATION071 |
| 60 | B00142H | BEAUFORT | SAMPLE 22 | SEDIMENT | 20C STATION071 |
| 61 | 800143H | BEAUFORT | SAMPLE 22 | | 20C STATION071 |
| 62 | B00144H | BEAUFORT | SAMPLE 22 | SEDIMENT | 20C STATION071 |
| 63 | B00145H | BEAUFORT | SAMPLE 22 | SEDIMENT | 20C STATION071 |
| 64 | B00146H | BEAUFORT | SAMPLE 22 | SEDIMENT | 200 STATION071 |
| 65 | B00147H | BEAUFORT | SAMPLE 22 | SEDIMENT | 20C STATION071 |
| 66 | B00148H | BEAUFORT | SAMPLE 22 | SEDIMENT | 20C STATION071 |
| 67 67 | B00149H | BEAUFORT | SAMPLE 22 | SEDIMENT | 20C STATION071 |
| 68 | B00150H | BEAUFORT | SAMPLE 22 | SEDIMENT | 20C STATION071 |
| 69 | B00176H | BEAUFORT | SAMPLE 20 | SEDIMENT | 20C STATION055 |
| 70 | B00177H | BEAUFORT | SAMPLE 20 | SEDIMENT | 20C STATION055 |
| 71 | B00178H | BEAUFORT | SAMPLE 20 | SEDIMENT | 200 STATION055 |
| 72 | | | | SEDIMENT | |
| | B00179H | BEAUFORT | | | |
| 73 | B00180H | BEAUFORT | SAMPLE 20 | SEDIMENT | 20C STATION055 |
| 74 | B00181H | BEAUFORT | SAMPLE 20 | SEDIMENT | 20C STATION055 |
| 75 | B00183H | BEAUFORT | SAMPLE 20 | SEDIMENT | 20C STATION055 |
| 76 | B00184H | BEAUFORT | SAMPLE 20 | SEDIMENT | 20C STATION055 |
| 77 | B90185H | BEAUFORT | SAMPLE 20 | SEDIMENT | 20C STATION055 |
| 78 | B00186H | BEAUFORT | SAMPLE 20 | SEDIMENT | 20C STATION055 |
| 79 | B00187H | BEAUFORT | SAMPLE 20 | SEDIMENT | 20C STATION055 |
| ŝõ | B00188H | BEAUFORT | SAMPLE 20 | SEDIMENT | 20C STATION055 |
| 81 | B00189H | BEAUFORT | SAMPLE 20 | SEDIMENT | 20C STATION055 |
| 82 | B00190H | BEAUFORT | SAMPLE 20 | SEDIMENT | 20C STATION055 |
| 83 | B00191H | BEAUFORT | SAMPLE 20 | SEDIMENT | 200 STATION055 |
| 84 | B00192H | BEAUFORT | SAMPLE 20 | SEDIMENT | 20C STATION055 |
| 85 | 800193H | BEAUFORT | SAMPLE 20 | SEDIMENT | 200 STATION055 |
| 86 | B00194H | BEAUFORT | SAMPLE 20 | SEDIMENT | 20C STATION055 |
| 87 | B00195H | BEAUFORT | SAMPLE 20 | SEDIMENT | 20C STATION055 |
| 88 | B00196H | BEAUFORT | | | 20C STATION055 |
| 89 | B00197H | BEAUFORT | SAMPLE 20 | | 20C STATION055 |
| 90 | B00198H | BEAUFORT | SAMPLE 20 | SEDIMENT | 20C STATION055 |
| 91 | B00199H | BEAUFORT | SAMPLE 20 | SEDIMENT | 20C STATION055 |
| 92 | B00200H | BEAUFORT | SAMPLE 20 | SEDIMENT | 20C STATION055 |
| 93 | B00226H | BEAUFORT | SAMPLE 21 | SEDIMENT | 20C STATION070 |
| 94 | B00227H | BEAUFORT | SAMPLE 21 | SEDIMENT | 20C STATION070 |
| -1-5 | B00228H | BEAUFORT | SAMPLE 21 | SEDIMENT | 20C STATION070 |
| | | | | | |

| c | The second state | 19.100 (19.1.100 (19.1.100)) - A A A A A A A A A A A A A A A A A A |
|----------|------------------|--|
| 96 | | BEAUFORT SAMPLE 21 SEDIMENT 20C STATION070 |
| 97 | | BEAUFORT SAMPLE 21 SEDIMENT 20C STATION070 |
| 98 | | BEAUFORT SAMPLE 21 SEDIMENT 20C STATION070 |
| 99 | B00232H | BEAUFORT SAMPLE 21 SEDIMENT 20C STATION070 |
| 100 | B00233H | BEAUFORT SAMPLE 21 SEDIMENT 20C STATION070 |
| 101 | B00234H | BEAUFORT SAMPLE 21 SEDIMENT 20C STATION070 |
| 102 | B00235H | BEAUFORT SAMPLE 21 SEDIMENT 20C STATION070 |
| 103 | B00236H | BEAUFORT SAMPLE 21 SEDIMENT 20C STATION070 |
| 104 | B00237H | BEAUFORT SAMPLE 21 SEDIMENT 20C STATION070 |
| 105 | B00238H | BEAUFORT SAMPLE 21 SEDIMENT 20C STATION070 |
| 106 | B00239H | BEAUFORT SAMPLE 21 SEDIMENT 200 STATION070 |
| 107 | B00240H | BEAUFORT SAMPLE 21 SEDIMENT 200 STATION070 |
| 108 | B00241H | BEAUFORT SAMPLE 21 SEDIMENT 200 STATION070 |
| 109 | B00242H | BEAUFORT SAMPLE 21 SEDIMENT 200 STATION070 |
| 110 | B00243H | |
| 111 | B00244H | |
| 112 | B00245H | |
| | | |
| 113 | B00246H | BEAUFORT SAMPLE 21 SEDIMENT 20C STATION070 |
| 114 | B00247H | BEAUFORT SAMPLE 21 SEDIMENT 20C STATION070 |
| 115 | B00248H | BEAUFORT SAMPLE 21 SEDIMENT 20C STATION070 |
| 116 | B00249H | BEAUFORT SAMPLE 21 SEDIMENT 20C STATION070 |
| 117 | B00250H | BEAUFORT SAMPLE 21 SEDIMENT 20C STATION070 |
| 118 | B00276H | BEAUFORT SAMPLE 09 SEDIMENT 20C STATION030 |
| 119 | B00277H | BEAUFORT SAMPLE 09 SEDIMENT 20C STATION030 |
| 120 | R00278H | BEAUFORT SAMPLE 09 SEDIMENT 20C STATION030 |
| 121 | B00279H | BEAUFORT SAMPLE 09 SEDIMENT 20C STATION030 |
| 122 | B00280H | BEAUFORT SAMPLE 09 SEDIMENT 20C STATION030 |
| 123 | B00281H | BEAUFORT SAMPLE 09 SEDIMENT 20C STATION030 |
| 124 | B00282H | BEAUFORT SAMPLE 09 SEDIMENT 20C STATION030 |
| 125 | B00283H | BEAUFORT SAMPLE 09 SEDIMENT 20C STATION030 |
| 126 | B00284H | BEAUFORT SAMPLE 09 SEDIMENT 20C STATION030 |
| 127 | B00285H | BEAUFORT SAMPLE 09 SEDIMENT 20C STATION030 |
| 128 | B00286H | BEAUFORT SAMPLE 09 SEDIMENT 20C STATION030 |
| 129 | B00287H | BEAUFORT SAMPLE 09 SEDIMENT 20C STATION030 |
| 130 | B00288H | BEAUFORT SAMPLE 09 SEDIMENT 20C STATION030 |
| 131 | B00289H | BEAUFORT SAMPLE 09 SEDIMENT 20C STATION030 |
| 132 | B00290H | BEAUFORT SAMPLE 09 SEDIMENT 200 STATION030 |
| 133 | B00292H | BEAUFORT SAMPLE 09 SEDIMENT 200 STATION030 |
| 134 | B00293H | BEAUFORT SAMPLE 09 SEDIMENT 200 STATION030 |
| 135 | B00294H | BEAUFORT SAMPLE 09 SEDIMENT 200 STATION030 |
| 136 | B00295H | BEAUFORT SAMPLE 09 SEDIMENT 200 STATION030 |
| 127 | B00296H | BEAUFORT SAMPLE 09 SEDIMENT 200 STATION030 |
| 138 | B00297H | BEAUFORT SAMPLE 09 SEDIMENT 200 STATION030 |
| 139 | B00298H | |
| 140 | B00299H | |
| 141 | B00300H | BEMUFORT SAMPLE 09 SEDIMENT 20C STATION030 BEAUFORT SAMPLE 09 SEDIMENT 20C STATION030 |
| | | DENSION ON THE OF OLDINENT 200 STRITUN030 |
| | | |

END FORM 141 STRAINS

| | | | | | , | ~ | 0.77571061010 |
|----|------------|------------------|---------------|-----|------------|----------------------------------|-----------------------------------|
| 1 | 800003L | BEAUFORT | SAMPLE | | MATER | | STATION010 |
| 2 | B999985L | BERUFORT | SAMPLE | 63 | WATER | 04C | STATION010 |
| 3 | 300006L | BEAUFORT | SAMPLE | 63 | MATER | 04C | STATION010 |
| 4 | B00013L | BEAUFORT | SAMPLE | 03 | MATER | 04C | STATION010 |
| | | BEAUFORT | SAMPLE | 03 | MATER | 04C | STATION010 |
| 5 | B00014L | | | 03 | WATER | 040 040 | STATION010 |
| 6 | 300015L | BEAUFORT | SAMPLE | | | | |
| 7 | B00021L | BEAUFORT | SAMPLE | 63 | WATER | 04C | STATION010 |
| 3 | B90022L | BEAUFORT | SFIMPLE | 03 | WATER | 04C | STATION010 |
| 9 | 800023L | BEAUFORT | SAMPLE | Ø3 | MATER | 04C | STATION010 |
| 10 | 800024L | BEAUFORT | SAMPLE | 03 | MATER | Ø4C | STATION010 |
| 11 | B00025L | BEAUFORT | SAMPLE | 03 | MATER | 04C | STATION010 |
| 12 | B00052L | BEAUFORT | SAMPLE | 20 | MATER | 04C | STATION002 |
| | | BEAUFORT | SAMPLE | 20 | WATER | 04C | STATION002 |
| 13 | B00053L | | | 20 | WATER | 04C | STATION002 |
| 14 | B00054L | BEAUFORT | SAMPLE | | | 04C | STATION002 |
| 15 | B00055L | BEAUFORT | SAMPLE | 20 | WATER | | |
| 16 | 300059L | BEAUFORT | SAMPLE | 56 | WATER | 04C | STATION002 |
| 17 | B00060L | BEAUFORT | SAMPLE | 50 | WATER | 04C | STATION002 |
| 13 | 200062L | BEAUFORT | SAMPLE | 20 | WATER | 04C | STATION002 |
| 19 | B00063L | BEAUFORT | SAMPLE | 20 | WATER | 04C | STATION002 |
| 20 | B00066L | BEAUFORT | SAMPLE | 20 | MATER | 04C | STATION002 |
| 21 | B99967L | BERUFORT | SAMPLE | 20 | WATER | 04C | STATION002 |
| 22 | B00068L | BEAUFORT | SAMPLE | 20 | WATER | 04C | STATION002 |
| 23 | 800069L | BEAUFORT | SAMPLE | 20 | WATER | 04C | STATION002 |
| 24 | B00070L | BEAUFORT | SAMPLE | 20 | WATER | 04C | STATION002 |
| | | BEAUFORT | SAMPLE | 20 | WATER | 04C | STATION002 |
| 25 | B00071L | | SAMPLE | 20 | WATER | 04C | STATION002 |
| 26 | B00072L | BEAUFORT | | | WATER | 04C | STATION002 |
| 27 | 800073L | BEAUFORT | SAMPLE | 20 | | | STATION002 |
| 28 | B00074L | BEAUFORT | SAMPLE | 20 | MATER | 04C | |
| 29 | 800075L | BEAUFORT | SAMPLE | 20 | WATER | 04C | STATION002 |
| 30 | B00101L | BEAUFORT | SAMPLE | 27 | WATER | 04C | STATION071 |
| 31 | B99192L | BEAUFORT | SAMPLE | 27 | MATER | 04C | STATION071 |
| 32 | 800103L | BEAUFORT | SAMPLE | 27 | MATER | 04C | STATION071 |
| 33 | B90104L | BEAUFORT | SAMPLE | 27 | WATER | 04C | STATION071 |
| 34 | 899105L | BEAUFORT | SAMPLE | 27 | WATER | 04C | STATION071 |
| 35 | B99106L | BEAUFORT | SAMPLE | 27 | MATER | 04C | STATION071 |
| 36 | B00107L | BEAUFORT | SAMPLE | 27 | MATER | 04C | STATION071 |
| 37 | B00108L | BEAUFORT | SAMPLE | 27 | WATER | 04C | STATION071 |
| | 800109L | BEAUFORT | | 27 | WATER | | |
| 33 | | | | | WATER | | |
| 39 | B00111L | BEAUFORT | | | | | ••••• |
| 40 | 800113L | BEAUFORT | ···· | | | | |
| 41 | B00114L | BEAUFORT | SAMPLE | | | | |
| 45 | B00115L | BEFILFORT | SAMPLE | | MATER | | |
| 43 | 800116L | BEAUFORT | SAMPLE | | WATER | | STATION071 |
| 4 | 800117L | BEAUFORT | SAMPLE | | MATER | | STATION071 |
| 45 | B00118L | BEAUFORT | SAMPLE | 27 | MATER | | STATION071 |
| 46 | 800119L | BEAUFORT | SAMPLE | 27 | MATER | 04C | |
| 47 | 800120L | BERUFORT | SAMPLE | | | 04C | STATION071 |
| 48 | B00121L | BEAUFORT | SAMPLE | | HATER | | STATION071 |
| 49 | 800122L | BERUFORT | SAMPLE | | WHTER | | |
| | B30123L | BEAUFORT | | | WATER | | |
| 50 | 00001C.Ct. | DEFENSION (SERVE | -1990 H. L.E. | I I | r 40 1 * f | 1997 - C. 1997 1997 - C. 1997 | raan yogo olar da haan Dhah Di da |

| 51 | Exercise and an | |
|--------------|-----------------|--|
| | | BEAUFORT SAMPLE 27 WATER 04C STATION071 |
| 52 | | BEAUFORT SAMPLE 27 WATER 04C STATION071 |
| 53 | | BEAUFORT SAMPLE 24 WATER 04C STATION055 |
| 54 | B00153L | BEAUFORT SAMPLE 24 WATER 04C STATION055 |
| 55 | B00154L | BEAUFORT SAMPLE 24 WATER 04C STATION055 |
| 56 | | |
| 57 | | |
| | B00156L | BEAUFORT SAMPLE 24 WATER 04C STATION055 |
| 58 | | BEAUFORT SAMPLE 24 WATER 04C STATION055 |
| 59 | E00159L | BEAUFORT SAMPLE 24 WATER 04C STATION055 |
| 60 | B00160L | BEAUFORT SAMPLE 24 WATER 04C STATION055 |
| 61 | B00162L | BEAUFORT SAMPLE 24 WATER 04C STATION055 |
| 62 | 800163L | |
| 63 | 800164L | |
| 64 | B00165L | |
| | | BEAUFORT SAMPLE 24 WATER 04C STATION055 |
| 65 | B99166L | BEAUFORT SAMPLE 24 WATER 04C STATION055 |
| 66 | B00167L | BEAUFORT SAMPLE 24 WATER 04C STATION055 |
| 67 | B00168L | BEAUFORT SAMPLE 24 WATER 04C STATION055 |
| 68 | B00169L | BEAUFORT SAMPLE 24 WATER 04C STATION055 |
| 69 | B90170L | BEAUFORT SAMPLE 24 WATER 04C STATION055 |
| 70 | B00171L | BEAUFORT SAMPLE 24 WATER 04C STATION055 |
| 71 | B00172L | |
| $7\hat{\Xi}$ | B00173L | |
| 73 | B00174L | |
| 74 | B90175L | |
| 75 | B90201L | |
| 76 | BOOLOIL | |
| 77 | BOOSOSL | BEAUFORT SAMPLE 26 WATER 04C STATION070 |
| 78 | | BEAUFORT SAMPLE 26 WATER 04C STATION070 |
| 79 | B00205L | BEAUFORT SAMPLE 26 WATER 04C STATION070 |
| | B00206L | SERUFORT SAMPLE 26 WATER 04C STATION070 |
| 80 | B00207L | BEAUFORT SAMPLE 26 WATER 04C STATION070 |
| 81 | 800208L | BEAUFORT SAMPLE 26 WATER 04C STATION070 |
| 82 | 800209L | BEAUFORT SAMPLE 26 WATER 04C STATION070 |
| 83 | B00210L | BEAUFORT SAMPLE 26 WATER 04C STATION070 |
| 84 | B90211L | BEAUFORT SAMPLE 26 WATER 04C STATION070 |
| 85 | B00212L | BEAUFORT SAMPLE 26 WATER 04C STATION070 |
| 86 | B00213L | BEAUFORT SAMPLE 26 WATER 04C STATION070 |
| 87 | B00214L | BEAUFORT SAMPLE 26 WATER 04C STATION070 |
| 38 | 300215L | BEAUFORT SAMPLE 26 WATER 04C STATION070 |
| 89 | 800216L | |
| 99 | B00217L | |
| 91 | 800218L | |
| 92 | B00219L | BEAUFORT SAMPLE 26 WATER 04C STATION070 |
| 93 24 | | BEAUFORT SAMPLE 26 WATER 04C STATION070 |
| | B90220L | BEAUFORT SAMPLE 26 WATER 04C STATION070 |
| 94 | E00221L | BEAUFORT SAMPLE 26 WATER 04C STATION070 |
| 95 | 300278L | BLAUFORT SAMPLE 11 WATER 04C STATION030 |
| 96 | BOOSSOL | BEAUFORT SAMPLE 11 WATER 04C STATION030 |
| 97 | F99581F | BEAUFORT SAMPLE 19 WATER 04C STATION001 |
| 98 | B00282L | BEAUFORT SAMPLE 19 WATER 04C STATION001 |
| 99 | 899283L | BEAUFORT SAMPLE 19 WATER 04C STATION001 |
| 100 | B00284L | BEAUFORT SAMPLE 19 WATER 04C STATION001 |
| 101 | 800291L | |
| 102 | 290292L | BEAUFORT SAMPLE 36 WATER 04C STATION002 BEAUFORT SAMPLE 36 WATER 04C STATION002 |
| | | WARNERS OF THE OF MILLER ONE STRUTTINGS |

END FORM 102 STRAINS

| SAMPLE | 22 | SEDIMEI SEDIMEI |
|--------|----|--------------------|
| 1 | 88 | |

| 1 | 300026L | BERUFORT | SAMPLE 03 | SEDIMENT | 04C STATION010 |
|----------|-----------------|------------|-----------------|------------|---------------------------|
| ā | B99927L | BEAUFORT | SAMPLE 03 | SEDIMENT | 04C STATION010 |
| 3 | B99958L | BEAUFORT | SAMPLE 03 | SEDIMENT | 04C STATION010 |
| | F00059F | BEAUFORT | SAMPLE 03 | | 04C STATION010 |
| 4 | | BEAUFORT | SAMPLE 03 | | 04C STATION010 |
| 5 | 800030L | | SAMPLE 03 | | 04C STATION010 |
| 6 | B00031L | BEAUFORT | •••• | | 04C STATION010 |
| ŕ | E000357 | BEAUFORT | | | 04C STATION010 |
| 8 | B00033L | BEAUFORT | | | 04C STATION010 |
| 9 | B00034L | BEAUFORT | SAMPLE 03 | | |
| 10 | B00035L | BEAUFORT | SAMPLE 03 | | |
| 11 | 800036L | BEAUFORT | SAMPLE 03 | | - · · · · · · · · · · · · |
| 12 | B00037L | BEAUFORT | SAMPLE 03 | | 04C STATION010 |
| 13 | B00038L | BEAUFORT | SAMPLE 03 | | 04C STATION010 |
| 14 | 500039L | BEAUFORT | SAMPLE 03 | | 04C STATION010 |
| 15 | B00040L | BEAUFORT | SAMPLE 03 | SEDIMENT | 04C STATION010 |
| 16 | B00041L | BEAUFORT | SAMPLE 03 | SEDIMENT | 04C STATION010 |
| 17 | B00042L | BERUFORT | SAMPLE 03 | SEDIMENT | 04C STATION010 |
| 18 | B00044L | BERUFORT | SAMPLE 03 | SEDIMENT | 84C STATION010 |
| 19 | B00047L | BERUFORT | SAMPLE 03 | | 04C STATICN010 |
| | B00048L | BEAUFORT | SAMPLE 03 | | 04C STATION010 |
| 20 | | BEAUFORT | SAMPLE 03 | | 04C STATION010 |
| 21 | B00049L | | SAMPLE 03 | | 04C STATION010 |
| 22 | 800 050L | BEAUFORT | | | 04C STATION002 |
| 23 | B00076L | BEAUFORT | | | 04C STATION002 |
| 24 | B00077L | BEAUFORT | SAMPLE 10 | | |
| 25 | B00078L | BEAUFORT | SAMPLE 10 | | |
| 26 | B00079L | BEAUFORT | SAMPLE 10 | | 04C STATION002 |
| 27 | B00080L | BEAUFORT | SAMPLE 10 | | 04C STATION002 |
| 28 | B00081L | BEAUFORT | SAMPLE 10 | | 04C STATION002 |
| 29 | B00082L | BEAUFORT | SAMPLE 10 | | 04C STATION002 |
| 30 | B00083L | BEAUFORT | SAMPLE 10 | | 04C STATION002 |
| 31 | B00084L | BEAUFORT | SAMPLE 10 | S SEDIMENT | 04C STATION002 |
| 32 | B00085L | BEAUFORT | SAMPLE 10 | SEDIMENT | 04C STATION002 |
| 33 | 390086L | BEAUFORT | SAMPLE 1 | SEDIMENT | 04C STATION002 |
| 34 | B99087L | BEAUFORT | SAMPLE 1 | SEDIMENT | 04C STATION002 |
| 35 | 20000SSL | BEAUFORT | SAMPLE 1 | | 04C STATION002 |
| | B00089L | BEAUFORT | SAMPLE 1 | | 04C STATION002 |
| 36 | | | SAMPLE 1) | | 04C STATION002 |
| 37 | B00091L | BEAUFORT | | | 04C STATION002 |
| 38 | B00092L | BEAUFORT | | | |
| 39 | 800093L | BEAUFORT | | | |
| 40 | B00094L | BEAUFORT | SAMPLE 1 | | |
| 41 | B00095L | BEAUFORT | SAMPLE 10 | | |
| 42 | B00096L | BERUFORT | SAMPLE i | | |
| 43 | B00097L | BEAUFORT | SAMPLE 1 | | |
| 44 | B00098L | BEAUFORT | SAMPLE 1 | S SEDIMENT | |
| 45 | B99936 | BEAUFORT | SAMPLE 1 | 5 SEDIMENT | 04C STATION002 |
| | B00100L | BEAUFORT | SAMPLE 1 | | 04C STATION002 |
| 46 | B00126L | BEAUFORT | | | 04C STATION071 |
| 47 40 | | BEAUFORT | | SEDIMENT | 04C STATION071 |
| 48 | 800128L | BEAUFORT | ••• | SEDIMENT | |
| 49 | B00129L | BEAUFORT | SAMPLE 2 | | |
| 59 | B00130L | DEPUT OF I | 11 11 1. Junior | , | |
| | | | | | |

| 51 | B00131L | BEAUFORT | SAMPLE 22 | SEDIMENT | 04C STATION071 |
|----------|----------------|------------------|-------------------------|----------------------|----------------|
| 52 | B00132L | BEAUFORT | SAMPLE 22 | SEDIMENT | 04C STATION071 |
| 53 | B00133L | BEAUFORT | SAMPLE 22 | SEDIMENT | 04C STATION071 |
| 54 | B00134L | BEAUFORT | SAMPLE 22 | SEDIMENT | 04C STATION071 |
| | B00135L | BEAUFORT | SAMPLE 22 | SEDIMENT | 04C STATION071 |
| 55 | | BEAUFORT | SAMPLE 22 | SEDIMENT | 04C STATION071 |
| 56 | B00136L | BEAUFORT | SAMPLE 22 | SEDIMENT | 04C STATION071 |
| 57 | B00137L | | SAMPLE 22 | SEDIMENT | 04C STATION071 |
| 58 | B00138L | BEAUFORT | SAMPLE 22 | SEDIMENT | 04C STATION071 |
| 59 | B00140L | BEAUFORT | | SEDIMENT | 04C STATION071 |
| еŪ | B00141L | BEAUFORT | SAMPLE 22 | | 04C STATION071 |
| 61 | 800143L | BEAUFORT | SAMPLE 22 | SEDIMENT | 04C STATION071 |
| 62 | B00144L | BEAUFORT | SAMPLE 22 | SEDIMENT | |
| 63 | B00145L | BEAUFORT | SAMPLE 22 | SEDIMENT | |
| 64 | B00146L | BEAUFORT | SAMPLE 22 | SEDIMENT | 04C STATION071 |
| 65 | B00147L | BEAUFORT | SAMPLE 22 | SEDIMENT | 04C STATION071 |
| 66 | B00148L | BEAUFORT | SAMPLE 22 | SEDIMENT | 04C STATION071 |
| 67 | B00149L | BEAUFORT | SAMPLE 22 | SEDIMENT | 04C STATION071 |
| 68 | B00150L | BEAUFORT | SAMPLE 22 | SEDIMENT | 04C STATION071 |
| 69 69 | B00138L | BEAUFORT | SAMPLE 20 | SEDIMENT | 04C STATION055 |
| | B00170L | BEAUFORT | SAMPLE 20 | SEDIMENT | 04C STATION055 |
| 70 | | BEAUFORT | SAMPLE 20 | SEDIMENT | 04C STATION055 |
| 71 | B00180L | BEAUFORT | SAMPLE 20 | SEDIMENT | 04C STATION055 |
| 72 | B00181L | | SAMPLE 20 | SEDIMENT | 04C STATION055 |
| 73 | B00182L | BEAUFORT | •••••• | SEDIMENT | 04C STATION055 |
| 74 | 600183L | BEAUFORT | | | 04C STATION055 |
| 75 | <u>800184L</u> | BEAUFORT | SAMPLE 20 | SEDIMENT | |
| 76 | 800185L | BEAUFORT | SAMPLE 20 | SEDIMENT | 04C STATION055 |
| 77 | 800186L | BEAUFORT | SAMPLE 20 | SEDIMENT | 04C STATION055 |
| 78 | B00187L | BEAUFORT | SAMPLE 20 | SEDIMENT | 04C STATION055 |
| 79 | B00188L | BEAUFORT | SAMPLE 20 | SEDIMENT | 04C STATION055 |
| 80 | B00189L | BEAUFORT | SAMPLE 20 | SEDIMENT | 04C STATION055 |
| āi | B00191L | BEAUFORT | SAMPLE 20 | SEDIMENT | 04C STATION055 |
| 82 82 | 890192L | BEAUFORT | SAMPLE 20 | SEDIMENT | 04C STATION055 |
| | B00194L | BEAUFORT | SAMPLE 20 | SEDIMENT | 04C STATION055 |
| 83 | | BEAUFORT | SAMPLE 20 | SEDIMENT | 04C STATION055 |
| 84 | B00195L | BEAUFORT | SAMPLE 20 | SEDIMENT | 04C STATION055 |
| 35 | 800198L | | SAMPLE 20 | SEDIMENT | 04C STATION055 |
| 86 | B00200L | BEAUFORT | SAMPLE 21 | SEDIMENT | 04C STATION070 |
| 87 | B00226L | BEAUFORT | | CEDIMENT | 04C STATION070 |
| 88 | 800227L | BEAUFORT | SAMPLE 21 | SEDIMENT | |
| 89 | 800228L | BEAUFORT | | OCDINENT OCDINENT | 04C STATION070 |
| 99 | B90229L | BEAUFORT | SAMPLE 21 | | |
| 91 | 899230L | BEAUFORT | SAMPLE 21 | SEDIMENT | |
| 92 | B90535F | BEAUFORT | SAMPLE 21 | SEDIMENT | |
| 93 | 800234L | BERUFORT | SAMPLE 21 | SEDIMENT | |
| 94 | B00235L | BEAUFORT | SAMPLE 21 | SEDIMENT | |
| 95 | B00236L | BEAUFORT | SAMPLE 21 | SEDIMENT | |
| 96 | 800237L | BEAUFORT | | | |
| 97 | 800238L | BEAUFORT | | SEDIMENT | 04C STATION070 |
| 98 | B00239L | BEAUFORT | | SEDIMENT | 04C STATION070 |
| 99 99 | B00240L | BEAUFORT | | SEDIMENT | |
| | B00240L | BEAUFORT | | | |
| 100 | 100000410 | TOTA OCH. (CAN) | 'a.'i 17 11 kalen yaada | | |

| 101 102 103 | 800242L 800243L 800244L | BEAUFORT BEAUFORT BEAUFORT | Sample Sample Sample | 21 21 21 | SEDIMENT SEDIMENT SEDIMENT | 04C 04C | STATION070 STATION070 |
|-------------------|-------------------------------|----------------------------------|----------------------------|----------------|----------------------------------|------------|------------------------------|
| 194 105 | 800245L 800246L | BEAUFORT | SAMPLE | 21 | SEDIMENT | 04C | STATION070 |
| 106 | B00246L B00247L | BEAUFORT | SAMPLE | 21 21 | SEDIMENT | 04C | STATION070 |
| 100 | B00248L | BEAUFORT | SAMPLE | 21 | SEDIMENT | 04C 04C | STATION070 STATION070 |
| 108 | B00249L | BEAUFORT | SAMPLE | 21 | SEDIMENT | 04C | STATION070 |
| 109 | 800250L | BEAUFORT | SAMPLE | 21 | SEDIMENT | 04C | STATION070 |
| 110 | 800251L | BEAUFORT | SAMPLE | 09 | SEDIMENT | 04C | STATION030 |
| 111 | B00252L | BEAUFORT | SAMPLE | <u>0</u> 9 | SEDIMENT | 04C | STATION030 |
| 112 | B00253L | BEAUFORT | SAMPLE | 09 | SEDIMENT | 04C | STATION030 |
| 113 | B00254L | BEAUFORT | SAMPLE | 09 | SEDIMENT | 04C | STATION030 |
| 114 | B00256L | BEAUFORT | SAMPLE | 09 | SEDIMENT | 04C | STATION030 |
| 115 | B00257L | BEAUFORT | SAMPLE | 09 | SEDIMENT | 04C | STATION030 |
| 116 | B00259L | BEAUFORT | | 09 | SEDIMENT | 04C | STATION030 |
| 117 | 800261L | BEAUFORT | SAMPLE | 09 | SEDIMENT | 04C | STATION030 |
| 118 | B00565F | BEAUFORT | | 69 | SEDIMENT | 04C | STATION030 |
| 119 | B00263L | BEAUFORT | | 69 | SEDINENT | 04C | STATION030 |
| 120 | B00264L | BEAUFORT | | 69 | SEDIMENT | 04C | STATION030 |
| 121 | B90265L | BEAUFORT | | 69 | SEDIMENT | 04C | STATION030 |
| 155 | B00266L | BEAUFORT | | 69 | SEDIMENT | 04C | STATION030 |
| 123 | 800267L | BEAUFORT | | 69 | SEDIMENT | 04C | STATION030 |
| 124 | 800268L | BEAUFORT | | 09 | SEDIMENT | 04C | STATION030 |
| 125 | 800269L | BEAUFORT | | 09 | SEDIMENT | 04C | STATION030 |
| 126 | B00272L | BEAUFORT | | 09 | SEDIMENT | 04C | STATION030 |
| 127 | 800273L | BEAUFORT | | <u>89</u> | SEDIMENT | 04C | STATION030 |
| 128 | 800274L | BEAUFORT | | 69 | SEDIMENT | 04C | STATION030 |
| 129 | B00275L | BEAUFORT | | 99 - | SEDIMENT | 04C | STATION030 |
| 130 | 800286L | BEAUFORT | | 15 | SEDIMENT | 04C | STATION001 |
| 131 | B00287L | BEAUFORT | | 15 | SEDIMENT | 04C | STATION001 |
| 132 | B00288L | BEAUFORT | | 15 | SEDIMENT | 04C | STATION001 |
| 133 | 800289L | BEAUFORT | | 15 | SEDIMENT | 04C | STATION001 |
| 134 135 | 800290L 800296L | BEAUFORT | | 15 | SEDIMENT | 04C | STATION001 |
| $130 \\ 136$ | 800296L 800297L | BEAUFORT BEAUFORT | | 32 32 | SEDIMENT. | 64C | STATION002 |
| 130 137 | B00297L | BEAUFORT | | | SEDIMENT SEDIMENT | 04C 04C | STATION002 - STATION002 - |
| J11 | ⊥, | TYE?? BOL 73621 | | <u> </u> | OCTOTINETLI I | ապե | orminonand, |

EMD FORM 137 STRAINS

.

| 0 0 | 890001H 800002H 800003H | BEAUFORT | SAMPLE | 03 03 | WATER WATER | 200 200 | STATION010 STATION010 |
|---------------|-------------------------------|--------------------|--------|------------|--------------------|----------------------------|--------------------------|
| 0 0 | B00003H | | SAMPLE | 62 | WATER | 200 | STATIONNIN |
| З | B00003H | | · | 6.0 | | | |
| | | BEAUFORT | SAMPLE | 63 | MATER | 20C | STATION010 |
| 4 | B00004H | BEAUFORT | SAMPLE | 03 | NATER | 200 | STATION010 |
| 5 | B00005H | BEAUFORT | SAMPLE | 63 | WATER | 200 | STATION010 |
| 0 6 | B00006H | BEAUFORT | SAMPLE | 03 | WATER | 20C | STATION010 |
| | B00007H | BEAUFORT | SAMPLE | 03 | WATER | 200 | STATION010 |
| 7 | | BEAUFORT | SAMPLE | <u>0</u> 3 | WATER | 20C | STATION010 |
| 8 | 800008H | BEAUFORT | SAMPLE | 03 | WATER | 20C | STATION010 |
| 9 | B00009H | | SAMPLE | 03 | WATER | 200 | STATION010 |
| 10 | B00010H | BEAUFORT | SAMPLE | 03 03 | WATER | 200 | STATION010 |
| 11 | B00011H | BEAUFORT | | 03 03 | WATER | 200 | STATION010 |
| 12 | B00012H | BEAUFORT | SAMPLE | | WATER | 200 | STATION010 |
| 13 | 200013H | BEAUFORT | SAMPLE | 03 | | 200 | STATION010 |
| 14 | B00014H | BEAUFORT | SAMPLE | 03 | WATER | | STATION010 |
| 15 | B00015H | BEAUFORT | SAMPLE | 03 | WATER | 200 | STATION010 |
| 16 | B00016H | BEAUFORT | SAMPLE | 63 | WATER | 200 | |
| 17 | B00017H | BEAUFORT | SAMPLE | 63 | WATER | 200 | STATION010 |
| 18 | 80001SH | BEAUFORT | SAMPLE | 03 | WATER | 20C | STATION010 |
| 19 | 830019H | BEAUFORT | SAMPLE | ØЗ | WATER | 200 | STATION010 |
| 20 | 800020H | BEAUFORT | SAMPLE | 03 | MATER | 200 | STATION010 |
| 21 | B00021H | BEAUFORT | SAMPLE | 03 | WATER | 200 | STATION010 |
| 22 | B00022H | BEAUFORT | SAMPLE | 03 | WHITER | 200 | STATION010 |
| 23 | B00023H | BEAUFORT | SAMPLE | 03 | WATER | 200 | STATION010 |
| 24 | B00024H | BEAUFORT | SAMPLE | 63 | WATER | 200 | STATION010 |
| 25 | 800051H | BEAUFORT | SAMPLE | 20 | WATER | 200 | STATION020 |
| 26 | 800052H | BEAUFORT | SAMPLE | 20 | WATER | 200 | STATION020 |
| 27 | 800053H | BEAUFORT | SAMPLE | 20 | WATER | 200 | STATION020 |
| 28 | B00054H | BEAUFORT | SAMPLE | 20 | MATER | 20C | STATION020 |
| 29 | B00055H | BEAUFORT | SAMPLE | 20 | WATER | 200 | STATION020 |
| 30 | B00056H | BEAUFORT | SAMPLE | 20 | WATER | 200 | STATION020 |
| 31 | B00057H | BEAUFORT | SAMPLE | 20 | WATER | 20C | STATION020 |
| 32 | B00058H | BEAUFORT | SAMPLE | 20 | WATER | 200 | STATION002 |
| 33 | B00059H | BEAUFORT | SAMPLE | 20 | WATER | 20C | STATION002 |
| 34 | 300060H | BEAUFORT | SAMPLE | 20 | WATER | 20C | STATION002 |
| 35 | B00061H | BEAUFORT | SAMPLE | 20 | WATER | 200 | STATION002 |
| 36 | B00062H | BEAUFORT | SAMPLE | 20 | WATER | 20C | STATION002 |
| 37 | 800063H | BEAUFORT | SAMPLE | 20 | WATER | 200 | STATION002 |
| 38 | B00064H | BEAUFORT | SAMPLE | -20 | WATER | 200 | STATION002 |
| 39 | B00065H | BEAUFORT | SAMPLE | 20 | WATER | 20C | STATION002 |
| 40 | B00066H | BEAUFORT | SAMPLE | 20 | WATER | 20C | STATION002 |
| 41 | B00067H | BEAUFORT | SAMPLE | 20 | WATER | 200 | STATION002 |
| 42 | B00068H | BEAUFORT | | | | | STATION002 |
| 43 | B90069H | BEAUFORT | | | WATER | | |
| | B00070H | BEAUFORT | | | | | |
| 44 45 | вооогон 800071Н | BEAUFORT | | | | | |
| 40 46 | B00072H | BEAUFORT | | | WATER | | |
| 40 47 | B00073H | BEAUFORT | | | MATER | | |
| 47 48 | 800075H | BEAUFORT | | | | | |
| 49 49 | B0007 OH B00101H | BEAUFORT | | | | | |
| 49 50 | B00102H | BEAUFORT | | | | | |
| _0 <u>8</u> 0 | THE TRUE T | Alfant Bast 1995 F | · | . | print i fillend fi | 949-0-10-1964 [*] | |

Strains isolated from water at 20C capable of growth at pH 7.

| 51 | paataou | RECHECCT CONDUE OF NOTED COS STOTES |
|----------|---------|---|
| | B00103H | BEAUFORT SAMPLE 27 WATER 20C STATION071 |
| 52 | | BEAUFORT SAMPLE 27 WATER 20C STATION071 |
| 53 | | BEAUFORT SAMPLE 27 WATER 20C STATION071 |
| 54 | | BEAUFORT SAMPLE 27 WATER 20C STATION071 |
| 55 | | BEAUFORT SAMPLE 27 WATER 20C STATION071 |
| 56 | B00111H | BEAUFORT SAMPLE 27 WATER 20C STATION071 |
| 57 | B00112H | BEAUFORT SAMPLE 27 WATER 20C STATION071 |
| 58 | B00113H | BEAUFORT SAMPLE 27 WATER 20C STATION071 |
| 59 | B00114H | BEAUFORT SAMPLE 27 WATER 20C STATION071 |
| 60 | B00115H | BEAUFORT SAMPLE 27 WATER 20C STATION071 |
| 61 | B00116H | BEAUFORT SAMPLE 27 WATER 200 STATION071 |
| 62 | B00117H | BEAUFORT SAMPLE 27 WATER 200 STATION071 |
| 63 | B0011SH | BEAUFORT SAMPLE 27 WATER 200 STATION071 |
| 64 | B00119H | |
| 65 | B00120H | |
| | | |
| | B00121H | BEAUFORT SAMPLE 27 WATER 20C STATION071 |
| 67 | B00122H | BEAUFORT SAMPLE 27 WATER 20C STATION071 |
| 68 | 800123H | BEAUFORT SAMPLE 27 WATER 20C STATION071 |
| 69 | B00151H | BEAUFORT SAMPLE 24 WATER 20C STATION055 |
| 70 | B00152H | BEAUFORT SAMPLE 24 WATER 20C STATION055 |
| 71 | B00153H | BEAUFORT SAMPLE 24 WATER 20C STATION055 |
| 72 | B00154H | BEAUFORT SAMPLE 24 WATER 20C STATION055 |
| 73 | B00155H | BEAUFORT SAMPLE 24 WATER 20C STATION055 |
| 74 | B00156H | BEAUFORT SAMPLE 24 WATER 200 STATION055 |
| 75 | B00157H | BEAUFORT SAMPLE 24 WATER 20C STATION055 |
| 76 | B00158H | BEAUFORT SAMPLE 24 WATER 20C STATION055 |
| 77 | B00159H | BEAUFORT SAMPLE 24 WATER 20C STATION055 |
| 78 | B00160H | BEAUFORT SAMPLE 24 WATER 20C STATION055 |
| 79 | B00161H | BEAUFORT SAMPLE 24 WATER 20C STATION055 |
| 80 | B00162H | BEAUFORT SAMPLE 24 WATER 20C STATION055 |
| 81 | B00163H | BEAUFORT SAMPLE 24 WATER 20C STATION055 |
| 82 | B00164H | BEAUFORT SAMPLE 24 WATER 20C STATION055 |
| 83 | B00165H | BEAUFORT SAMPLE 24 WATER 200 STATION055 |
| 84 | B00166H | BEAUFORT SAMPLE 24 WATER 200 STATION055 |
| 85 | B00168H | BEAUFORT SAMPLE 24 WATER 200 STATION055 |
| 86 | B00169H | |
| 87 | B00170H | |
| 88 | B00201H | |
| 89 | B00202H | |
| 90 | B00203H | |
| 91 | B00204H | |
| 92 | B00205H | |
| 93 | B00206H | |
| 94 | | BEAUFORT SAMPLE 26 WATER 200 STATION070 |
| 24 95 | 800207H | BEAUFORT SAMPLE 26 WATER 20C STATION070 |
| | B00208H | BEAUFORT SAMPLE 26 WATER 200 STATION070 |
| 96 07 | 800210H | BEAUFORT SAMPLE 26 WATER 20C STATION070 |
| 97 50 | B00211H | BEAUFORT SAMPLE 26 WATER 20C STATION070 |
| 98 | B00212H | BEAUFORT SAMPLE 26 WATER 20C STATION070 |
| 99 | B00213H | BEAUFORT SAMPLE 26 WATER 20C STATION070 |
| 100 | B00216H | BEAUFORT SAMPLE 26 WATER PAC STATION070 |
| | | |

| | | | and the state of the | | | 000 | STATION070 |
|-------------|--------------|----------|---|----|-------|-----|------------|
| 101 | B00217H | BEAUFORT | SAMPLE | 26 | WATER | 200 | |
| 192 | B00219H | BEAUFORT | SAMPLE | 26 | NATER | 200 | STATION070 |
| 103 | B00221H | BEAUFORT | SAMPLE | 26 | WATER | 20C | STATION070 |
| 104 | B00222H | BEAUFORT | SAMPLE | 26 | WATER | 200 | STATION070 |
| 105 | B00223H | BEAUFORT | SAMPLE | 26 | WATER | 200 | STATION070 |
| 106 | B00251H | BEAUFORT | SAMPLE | 11 | WATER | 200 | STATION030 |
| 107 | B00252H | BEAUFORT | SAMPLE | 11 | WATER | 200 | STATION030 |
| 108 | B00253H | BEAUFORT | SAMPLE | 11 | WATER | 200 | STATION030 |
| 109 | B00254H | BEAUFORT | SAMPLE | 11 | WATER | 200 | STATION030 |
| 110 | B00255H | BEAUFORT | SAMPLE | 11 | WATER | 200 | STATION030 |
| 111 | B00256H | BEAUFORT | SAMPLE | 11 | WATER | 200 | STATION030 |
| 112 | B00257H | BEAUFORT | SAMPLE | 11 | MATER | 200 | STATION030 |
| 113 | B90258H | BEAUFORT | SAMPLE | 11 | WATER | 200 | STATION030 |
| 114 | B00259H | BEAUFORT | SAMPLE | 11 | WATER | 20C | STATION030 |
| 115 | B00260H | BEAUFORT | SAMPLE | 11 | WATER | 20C | STATION030 |
| 116 | B00261H | BEAUFORT | SAMPLE | 11 | MATER | 200 | STATION030 |
| 117 | B00262H | BEAUFORT | SAMPLE | 11 | WATER | 20C | STATION030 |
| 118 | B00263H | BEAUFORT | SAMPLE | 11 | WATER | 200 | STATION030 |
| 119 | B00264H | BEAUFORT | SAMPLE | 11 | WATER | 200 | STATION030 |
| 120 | B00265H | BEAUFORT | SAMPLE | 11 | MATER | 200 | STATION030 |
| 121 | 800266H | BEAUFORT | SAMPLE | 11 | MATER | 20C | STATION030 |
| 122 | 800268H | BEAUFORT | SAMPLE | 11 | WATER | 200 | STATION030 |
| 123 | B00269H | BEAUFORT | SAMPLE | 11 | MATER | 200 | STATIONØ30 |
| 124 | B00270H | BEAUFORT | SAMPLE | 11 | MATER | 200 | STATION030 |
| 125 | B00271H | BEAUFORT | SAMPLE | 11 | WATER | 200 | STATION030 |
| 126 | B00272H | BEAUFORT | SAMPLE | 11 | MATER | 200 | STATION030 |
| 120 | 800273H | BEAUFORT | SAMPLE | 11 | WATER | 200 | STATION030 |
| 128 | B00275H | BERUFORT | SAMPLE | 11 | WATER | 200 | STATION030 |
| الما بها بل | Tracers esti | | | | | | |

---- --- ---

END FORM

.

.

| 1. | B00026H | BEAUFORT | SAMPLE | | SEDIMENT | 200 | STATION010 |
|--------|----------------|----------|--------|-----|----------|-----|------------|
| 2 | <u>800027H</u> | BEAUFORT | SAMPLE | 03 | SEDIMENT | 20C | STATION010 |
| З | B00028H | BEAUFORT | SAMPLE | 03 | SEDIMENT | 200 | STATION010 |
| 4 | B00029H | BEAUFORT | SAMPLE | 03 | SEDIMENT | 290 | STATION010 |
| 5 | 300030H | BEAUFORT | SAMPLE | 03 | SEDIMENT | 200 | STATION010 |
| 6 | B00031H | BEAUFORT | SAMPLE | 03 | SEDIMENT | 200 | STATION010 |
| - Ž | B00032H | BEAUFORT | SAMPLE | ЙЗ. | SEDIMENT | 200 | STATION010 |
| 8 | B00033H | BEAUFORT | SAMPLE | õ3 | SEDIMENT | 200 | STATION010 |
| o 9 | B00035H | BEAUFORT | SAMPLE | 03 | SEDIMENT | 200 | STATION010 |
| | | | | 03 | SEDIMENT | 200 | STATION010 |
| 10 | B00036H | BEAUFORT | SAMPLE | | SEDIMENT | 200 | STATION010 |
| 11 | B00037H | BEAUFORT | SAMPLE | 03 | | | STATION010 |
| 12 | B00038H | BEAUFORT | SAMPLE | 03 | SEDIMENT | 200 | |
| 13 | B00039H | BEAUFORT | SAMPLE | 03 | SEDIMENT | 20C | STATION010 |
| 14 | 800040H | BEAUFORT | SAMPLE | 03 | SEDIMENT | 200 | STATION010 |
| 15 | B00042H | BEAUFORT | SAMPLE | 63 | SEDIMENT | 200 | STATION010 |
| 16 | B00043H | BEAUFORT | SAMPLE | 03 | SEDIMENT | 200 | STATION010 |
| 17 | B00044H | BEAUFORT | SAMPLE | 03 | SEDIMENT | 200 | STATION010 |
| 18 | B00045H | BEAUFORT | SAMPLE | 03 | SEDIMENT | 200 | STATION010 |
| 19 | B00047H | BEAUFORT | SAMPLE | ē3 | SEDIMENT | 200 | STATION010 |
| 20 | B00048H | BEAUFORT | SAMPLE | 03 | SEDIMENT | 200 | STATION010 |
| 20 | 800076H | BEAUFORT | SAMPLE | 16 | SEDIMENT | 200 | STATION002 |
| | | BEAUFORT | SAMPLE | 16 | SEDIMENT | 200 | STATION002 |
| 22 | B00077H | | SAMPLE | 16 | SEDIMENT | 200 | STATION002 |
| 23 | B00078H | BEAUFORT | | 16 | SEDIMENT | 200 | STATION002 |
| 24 | B00079H | BEAUFORT | SAMPLE | | | 200 | STATION002 |
| 25 | B00080H | BEAUFORT | SAMPLE | 16 | SEDIMENT | | |
| 26 | B00081H | BEAUFORT | SAMPLE | 16 | SEDIMENT | 200 | STATION002 |
| 27 | B00082H | BEAUFORT | SAMPLE | 16 | SEDIMENT | 200 | STATION002 |
| 28 | B00083H | BEAUFORT | SAMPLE | 16 | SEDIMENT | 200 | STATION002 |
| 29 | B00084H | BEAUFORT | SAMPLE | 16 | SEDIMENT | 200 | STATION002 |
| 30 | 200085H | BEAUFORT | SAMPLE | 16 | SEDIMENT | 200 | STATION002 |
| 31 | B00086H | BEAUFORT | SAMPLE | 16 | SEDIMENT | 200 | STATION002 |
| 32 | B00087H | BEAUFORT | SAMPLE | 16 | SEDIMENT | 200 | STATION002 |
| 33 | B00088H | BEAUFORT | SAMPLE | 16 | SEDIMENT | 200 | STATION002 |
| 34 | B00089H | BEAUFORT | SAMPLE | 16 | SEDIMENT | 200 | STATION002 |
| 35 | B00091H | BEAUFORT | SAMPLE | 16 | SEDIMENT | 200 | STATION002 |
| 36 | B00092H | BEAUFORT | SAMPLE | 16 | SEDIMENT | 200 | STATION002 |
| 37 | B00093H | BEAUFORT | SAMPLE | 16 | SEDIMENT | 200 | STATION002 |
| 38 | B00094H | BEAUFORT | | 16 | | | STATION002 |
| 39 | B00095H | BEAUFORT | SAMPLE | 16 | | 200 | |
| | 800090H | BEAUFORT | SAMPLE | 16 | SEDIMENT | 200 | STATION002 |
| 40 | | | | | | 200 | STATION002 |
| 41 | 300097H | BERUFORT | SAMPLE | 16 | SEDIMENT | | |
| 42 | B00098H | BEAUFORT | SAMPLE | 16 | SEDIMENT | 200 | STATION002 |
| 43 | B00099H | BEAUFORT | SAMPLE | 16 | SEDIMENT | 200 | STATION002 |
| 44 | B90126H | BEAUFORT | SAMPLE | 22 | SEDIMENT | 200 | STATION071 |
| 45 | B00127H | BEAUFORT | SAMPLE | 22 | SEDIMENT | 20C | STATION071 |
| 46 | B00128H | BEAUFORT | | 22 | SEDIMENT | 200 | STATION071 |
| 47 | B00129H | BEAUFORT | SAMPLE | 22 | SEDIMENT | 20C | STATION071 |
| 48 | 200130H | BEAUFORT | | 22 | SEDIMENT | 200 | STATION071 |
| 49 | B00131H | BEAUFORT | SAMPLE | 22 | SEDIMENT | 20C | STATION071 |
| 50 | B00132H | BEAUFORT | SAMPLE | 22 | SEDIMENT | 20C | STATION071 |
| | | | | | | | |

| 51 B00133H BEAUFORT SAMPLE 22 SEDIMENT 20C STATION071 52 B00136H BEAUFORT SAMPLE 22 SEDIMENT 20C STATION071 54 B00138H BEAUFORT SAMPLE 22 SEDIMENT 20C STATION071 55 B00149H BEAUFORT SAMPLE 22 SEDIMENT 20C STATION071 56 B00149H BEAUFORT SAMPLE 22 SEDIMENT 20C STATION071 57 B00142H BEAUFORT SAMPLE 22 SEDIMENT 20C STATION071 58 B00142H BEAUFORT SAMPLE 22 SEDIMENT 20C STATION071 58 B00144H BEAUFORT SAMPLE 22 SEDIMENT 20C STATION071 58 B00147H BEAUFORT SAMPLE 22 SEDIMENT 20C STATION071 59 B00178H BEAUFORT SAMPLE 28 SEDIMENT 2 | | | | | | AAA ATATIANG71 |
|---|-----|------------|----------|----------------------|----------------------|---------------------------------------|
| 52 B80135H BERUFORT SAMPLE 22 SEDIMENT 20C STATION071 53 B80136H BERUFORT SAMPLE 22 SEDIMENT 20C STATION071 54 B80138H BERUFORT SAMPLE 22 SEDIMENT 20C STATION071 55 B80139H BERUFORT SAMPLE 22 SEDIMENT 20C STATION071 56 B80140H BERUFORT SAMPLE 22 SEDIMENT 20C STATION071 57 B80142H BERUFORT SAMPLE 22 SEDIMENT 20C STATION071 58 B80142H BERUFORT SAMPLE 22 SEDIMENT 20C STATION071 59 B80143H BERUFORT SAMPLE 22 SEDIMENT 20C STATION071 61 B80144H BERUFORT SAMPLE 22 SEDIMENT 20C STATION071 62 B80146H BERUFORT SAMPLE 22 SEDIMENT 20C STATION071 64 B80147H BERUFORT SAMPLE 22 SEDIMENT 20C STATION071 65 B80176H BERUFORT SAMPLE 22 SEDIMENT 20C STATION071 66 B80176H BERUFORT SAMPLE 20 SEDIMENT 20C STATION071 67 B80178H BERUFORT SAMPLE 20 SEDIMENT 20C STATION071 68 B80178H BERU | 51 | B00133H | BEAUFORT | MIT II II III | | |
| 33 B00136H BERUFORT SAMPLE 22 SEDIMENT 20C STATION071 54 B00138H BERUFORT SAMPLE 22 SEDIMENT 20C STATION071 55 B00139H BERUFORT SAMPLE 22 SEDIMENT 20C STATION071 56 B00140H BERUFORT SAMPLE 22 SEDIMENT 20C STATION071 57 B00142H BERUFORT SAMPLE 22 SEDIMENT 20C STATION071 59 B00142H BERUFORT SAMPLE 22 SEDIMENT 20C STATION071 60 B00142H BERUFORT SAMPLE 22 SEDIMENT 20C STATION071 61 B00143H BERUFORT SAMPLE 22 SEDIMENT 20C STATION071 62 B00143H BERUFORT SAMPLE 22 SEDIMENT 20C STATION071 64 B00143H BERUFORT SAMPLE 22 SEDIMENT 20C STATION071 65 B00147H BERUFORT SAMPLE 22 SEDIMENT 20C STATION071 66 B00179H BERUFORT SAMPLE 20 SEDIMENT 20C STATION075 70 B00178H BERUFORT SAMPLE 20 SEDIMENT 20C STATION055 | | | BEAUFORT | SAMPLE 22 | | |
| Sector Sector< | | _ , | BEALFORT | SAMPLE 22 | SEDIMENT | 20C STATION071 |
| 347 500139H BERUFORT SAMPLE 22 SEDIMENT 20C STATION671 55 500140H BERUFORT SAMPLE 22 SEDIMENT 20C STATION671 57 500142H BERUFORT SAMPLE 22 SEDIMENT 20C STATION671 58 500142H BERUFORT SAMPLE 22 SEDIMENT 20C STATION671 59 500143H BERUFORT SAMPLE 22 SEDIMENT 20C STATION671 60 500143H BERUFORT SAMPLE 22 SEDIMENT 20C STATION671 63 500147H BERUFORT SAMPLE 22 SEDIMENT 20C STATION671 64 800149H BERUFORT SAMPLE 22 SEDIMENT 20C STATION671 65 800176H BERUFORT SAMPLE 20 SEDIMENT 20C STATION671 66 900176H BERUFORT SAMPLE 20 SEDIMENT | | | | SAMPLE 22 | SEDIMENT | 20C STATION071 |
| 355360140HBEAUFORTSAMPLE22SEDIMENT20CSTATION07157800141HBEAUFORTSAMPLE22SEDIMENT20CSTATION07158800142HBEAUFORTSAMPLE22SEDIMENT20CSTATION07159800143HBEAUFORTSAMPLE22SEDIMENT20CSTATION07160800144HBEAUFORTSAMPLE22SEDIMENT20CSTATION07161800145HBEAUFORTSAMPLE22SEDIMENT20CSTATION07163800147HBEAUFORTSAMPLE22SEDIMENT20CSTATION07164800149HBEAUFORTSAMPLE22SEDIMENT20CSTATION07165800176HBEAUFORTSAMPLE22SEDIMENT20CSTATION07166800176HBEAUFORTSAMPLE20SEDIMENT20CSTATION07567800178HBEAUFORTSAMPLE20SEDIMENT20CSTATION05569800178HBEAUFORTSAMPLE20SEDIMENT20CSTATION05571800180HBEAUFORTSAMPLE20SEDIMENT20CSTATION05572800181HBEAUFORTSAMPLE20SEDIMENT20CSTATION05573800180HBEAUFORTSAMPLE20SEDIMENT20CSTATION05574800184HBEAUFORTSAMPLE20SEDIMENT20CSTATION055< | | | | | | 20C STATION071 |
| 355360140HBEAUFORTSAMPLE22SEDIMENT20CSTATION07157800142HBEAUFORTSAMPLE22SEDIMENT20CSTATION07158800143HBEAUFORTSAMPLE22SEDIMENT20CSTATION07161800143HBEAUFORTSAMPLE22SEDIMENT20CSTATION07162800144HBEAUFORTSAMPLE22SEDIMENT20CSTATION07163800147HBEAUFORTSAMPLE22SEDIMENT20CSTATION07164800149HBEAUFORTSAMPLE22SEDIMENT20CSTATION07165800149HBEAUFORTSAMPLE22SEDIMENT20CSTATION07166800177HBEAUFORTSAMPLE20SEDIMENT20CSTATION07567800178HBEAUFORTSAMPLE20SEDIMENT20CSTATION07568800177HBEAUFORTSAMPLE20SEDIMENT20CSTATION05570800178HBEAUFORTSAMPLE20SEDIMENT20CSTATION05571800180HBEAUFORTSAMPLE20SEDIMENT20CSTATION05572800180HBEAUFORTSAMPLE20SEDIMENT20CSTATION05573800183HBEAUFORTSAMPLE20SEDIMENT20CSTATION05574800184HBEAUFORTSAMPLE20SEDIMENT20CSTATION055< | | | | | | · · · · · · · · · · · · · · · · · · · |
| 37BenitrinDeficitionDeficitionDeficitionDeficition58B00142HBEAUFORTSAMPLE22SEDIMENT20CSTATION07159B00144HBEAUFORTSAMPLE22SEDIMENT20CSTATION07160B00145HBEAUFORTSAMPLE22SEDIMENT20CSTATION07161B00146HBEAUFORTSAMPLE22SEDIMENT20CSTATION07163B00147HBEAUFORTSAMPLE22SEDIMENT20CSTATION07164B00148HBEAUFORTSAMPLE22SEDIMENT20CSTATION07165B00179HBEAUFORTSAMPLE22SEDIMENT20CSTATION07166B00176HBEAUFORTSAMPLE20SEDIMENT20CSTATION07567B00178HBEAUFORTSAMPLE20SEDIMENT20CSTATION05570B00180HBEAUFORTSAMPLE20SEDIMENT20CSTATION05571B00180HBEAUFORTSAMPLE20SEDIMENT20CSTATION05572B00181HBEAUFORTSAMPLE20SEDIMENT20CSTATION05573B00183HBEAUFORTSAMPLE20SEDIMENT20CSTATION05574B00184HBEAUFORTSAMPLE20SEDIMENT20CSTATION05575B00183HBEAUFORTSAMPLE20SEDIMENT20CSTATION05576B | | | | | | |
| 353360142HBEAUFORTSAMPLE22SEDIMENT20CSTATION07160800143HBEAUFORTSAMPLE22SEDIMENT20CSTATION07161800146HBEAUFORTSAMPLE22SEDIMENT20CSTATION07162800147HBEAUFORTSAMPLE22SEDIMENT20CSTATION07164800148HBEAUFORTSAMPLE22SEDIMENT20CSTATION07165800149HBEAUFORTSAMPLE22SEDIMENT20CSTATION07166800177HBEAUFORTSAMPLE22SEDIMENT20CSTATION07167800178HBEAUFORTSAMPLE20SEDIMENT20CSTATION07568800177HBEAUFORTSAMPLE20SEDIMENT20CSTATION05570800178HBEAUFORTSAMPLE20SEDIMENT20CSTATION05571800180HBEAUFORTSAMPLE20SEDIMENT20CSTATION05572800180HBEAUFORTSAMPLE20SEDIMENT20CSTATION05573800183HBEAUFORTSAMPLE20SEDIMENT20CSTATION05574800186HBEAUFORTSAMPLE20SEDIMENT20CSTATION05575800186HBEAUFORTSAMPLE20SEDIMENT20CSTATION05576800187HBEAUFORTSAMPLE20SEDIMENT20CSTATION055< | 57 | B00141H | | | | |
| 59 B00143H BEAUFORT SAMPLE 22 SEDIMENT 200 STATION071 60 B00145H BEAUFORT SAMPLE 22 SEDIMENT 200 STATION071 61 B00145H BEAUFORT SAMPLE 22 SEDIMENT 200 STATION071 63 B00147H BEAUFORT SAMPLE 22 SEDIMENT 200 STATION071 64 B00149H BEAUFORT SAMPLE 22 SEDIMENT 200 STATION071 65 B00176H BEAUFORT SAMPLE 22 SEDIMENT 200 STATION071 66 B00176H BEAUFORT SAMPLE 20 SEDIMENT 200 STATION055 69 B00178H BEAUFORT SAMPLE 20 SEDIMENT 200 STATION055 70 B00180H BEAUFORT SAMPLE 20 SEDIMENT 200 STATION055 73 B00180H BEAUFORT SAMPLE 20 SEDIMENT 2 | 58 | B00142H | | •••• | | |
| 60 B00144H BEAUFORT SAMPLE 22 SEDIMENT 20C STATION071 61 B00145H BEAUFORT SAMPLE 22 SEDIMENT 20C STATION071 63 B00147H BEAUFORT SAMPLE 22 SEDIMENT 20C STATION071 64 B00149H BEAUFORT SAMPLE 22 SEDIMENT 20C STATION071 65 B00149H BEAUFORT SAMPLE 22 SEDIMENT 20C STATION071 66 B00178H BEAUFORT SAMPLE 28 SEDIMENT 20C STATION075 67 B00178H BEAUFORT SAMPLE 20 SEDIMENT 20C STATION055 70 B0018H BEAUFORT SAMPLE 20 SEDIMENT 20C STATION055 71 B00180H BEAUFORT SAMPLE 20 SEDIMENT 20C STATION055 73 B00183H BEAUFORT SAMPLE 20 SEDIMENT 20 | 59 | B00143H | BEAUFORT | | | |
| 61 B00145H BEAUFORT SAMPLE 22 SEDIMENT 200 STATIONG1 62 B00147H BEAUFORT SAMPLE 22 SEDIMENT 200 STATIONG1 64 B00147H BEAUFORT SAMPLE 22 SEDIMENT 200 STATIONG1 65 B00149H BEAUFORT SAMPLE 22 SEDIMENT 200 STATIONG1 66 B00176H BEAUFORT SAMPLE 22 SEDIMENT 200 STATIONG75 67 B00179H BEAUFORT SAMPLE 20 SEDIMENT 200 STATIONG55 68 B00179H BEAUFORT SAMPLE 20 SEDIMENT 200 STATION655 70 B00180H BEAUFORT SAMPLE 20 SEDIMENT 200 STATION655 71 B00180H BEAUFORT SAMPLE 20 SEDIMENT 200 STATION655 72 B00183H BEAUFORT SAMPLE 20 SEDIMENT 200 </td <td></td> <td></td> <td>BEAUFORT</td> <td>SAMPLE 22</td> <td>SEDIMENT</td> <td></td> | | | BEAUFORT | SAMPLE 22 | SEDIMENT | |
| 62BØ0146HBERUFORTSAMPLE22SEDIMENT20CSTATION07163B00147HBERUFORTSAMPLE22SEDIMENT20CSTATION07164B00148HBERUFORTSAMPLE22SEDIMENT20CSTATION07165B00158HBERUFORTSAMPLE22SEDIMENT20CSTATION07166B00158HBERUFORTSAMPLE22SEDIMENT20CSTATION07167B00178HBERUFORTSAMPLE20SEDIMENT20CSTATION05569B00178HBERUFORTSAMPLE20SEDIMENT20CSTATION05570B00180HBERUFORTSAMPLE20SEDIMENT20CSTATION05571B00180HBERUFORTSAMPLE20SEDIMENT20CSTATION05573B00183HBERUFORTSAMPLE20SEDIMENT20CSTATION05574B00184HBERUFORTSAMPLE20SEDIMENT20CSTATION05575B00185HBERUFORTSAMPLE20SEDIMENT20CSTATION05576B00186HBERUFORTSAMPLE20SEDIMENT20CSTATION05577B00187HBERUFORTSAMPLE20SEDIMENT20CSTATION05578B00188HBERUFORTSAMPLE20SEDIMENT20CSTATION05579B00189HBERUFORTSAMPLE20SEDIMENT20CSTATION055 <t< td=""><td></td><td></td><td>BEAUFORT</td><td>SAMPLE 22</td><td>SEDIMENT</td><td></td></t<> | | | BEAUFORT | SAMPLE 22 | SEDIMENT | |
| 63B00147HBEAUFORTSAMPLE22SEDIMENT20CSTATION07164B00149HBEAUFORTSAMPLE22SEDIMENT20CSTATION07165B00149HBEAUFORTSAMPLE22SEDIMENT20CSTATION07167B00176HBEAUFORTSAMPLE20SEDIMENT20CSTATION07167B00178HBEAUFORTSAMPLE20SEDIMENT20CSTATION05568B00178HBEAUFORTSAMPLE20SEDIMENT20CSTATION05570B00180HBEAUFORTSAMPLE20SEDIMENT20CSTATION05571B00180HBEAUFORTSAMPLE20SEDIMENT20CSTATION05572B00181HBEAUFORTSAMPLE20SEDIMENT20CSTATION05573B00183HBEAUFORTSAMPLE20SEDIMENT20CSTATION05574B00184HBEAUFORTSAMPLE20SEDIMENT20CSTATION05575B00185HBEAUFORTSAMPLE20SEDIMENT20CSTATION05576B00189HBEAUFORTSAMPLE20SEDIMENT20CSTATION05577B00189HBEAUFORTSAMPLE20SEDIMENT20CSTATION055800199HBEAUFORTSAMPLE20SEDIMENT20CSTATION055800199HBEAUFORTSAMPLE20SEDIMENT20CSTATION05581B00193H </td <td></td> <td></td> <td></td> <td>SAMPLE 22</td> <td>SEDIMENT</td> <td></td> | | | | SAMPLE 22 | SEDIMENT | |
| 64 B00148H BERUFORT SAMPLE 22 SEDIMENT 20C STATION071 65 B00150H BERUFORT SAMPLE 22 SEDIMENT 20C STATION071 66 B00176H BERUFORT SAMPLE 28 SEDIMENT 20C STATION071 67 B00176H BERUFORT SAMPLE 28 SEDIMENT 20C STATION075 68 B00177H BERUFORT SAMPLE 20 SEDIMENT 20C STATION055 69 B00179H BERUFORT SAMPLE 20 SEDIMENT 20C STATION055 70 B00180H BERUFORT SAMPLE 20 SEDIMENT 20C STATION055 71 B00183H BERUFORT SAMPLE 20 SEDIMENT 20C STATION055 73 B00183H BERUFORT SAMPLE 20 SEDIMENT 20C STATION055 76 B00186H BERUFORT SAMPLE 20 SEDIMENT 2 | | | | | SEDIMENT | |
| 64 BOOL49H BERUFORT SAMPLE 22 SEDIMENT 20C STATION071 66 BOOL49H BERUFORT SAMPLE 22 SEDIMENT 20C STATION071 67 BOOL76H BERUFORT SAMPLE 20 SEDIMENT 20C STATION055 68 BOOL78H BERUFORT SAMPLE 20 SEDIMENT 20C STATION055 70 BOOL79H BERUFORT SAMPLE 20 SEDIMENT 20C STATION055 71 BOOL80H BERUFORT SAMPLE 20 SEDIMENT 20C STATION055 72 BOOL80H BERUFORT SAMPLE 20 SEDIMENT 20C STATION055 73 BOOL83H BERUFORT SAMPLE 20 SEDIMENT 20C STATION055 74 BOOL84H BERUFORT SAMPLE 20 SEDIMENT 20C STATION055 75 BOOL84H BERUFORT SAMPLE 20 SEDIMENT 2 | | | | | | 20C STATION071 |
| 66B00150HBEAUFORTSAMPLE22SEDIMENT20CSTATION07167B00176HBEAUFORTSAMPLE20SEDIMENT20CSTATION05568B00178HBEAUFORTSAMPLE20SEDIMENT20CSTATION05569B00179HBEAUFORTSAMPLE20SEDIMENT20CSTATION05570B00180HBEAUFORTSAMPLE20SEDIMENT20CSTATION05571B00180HBEAUFORTSAMPLE20SEDIMENT20CSTATION05572B00183HBEAUFORTSAMPLE20SEDIMENT20CSTATION05573B00183HBEAUFORTSAMPLE20SEDIMENT20CSTATION05574B00183HBEAUFORTSAMPLE20SEDIMENT20CSTATION05575B00183HBEAUFORTSAMPLE20SEDIMENT20CSTATION05576B00186HBEAUFORTSAMPLE20SEDIMENT20CSTATION05577B00187HBEAUFORTSAMPLE20SEDIMENT20CSTATION05578B00189HBEAUFORTSAMPLE20SEDIMENT20CSTATION05579B00189HBEAUFORTSAMPLE20SEDIMENT20CSTATION05580B00199HBEAUFORTSAMPLE20SEDIMENT20CSTATION05581B00195HBEAUFORTSAMPLE20SEDIMENT20CSTATION055 <t< td=""><td></td><td></td><td></td><td></td><td></td><td></td></t<> | | | | | | |
| BEBUISTBERUFORTSAMPLE20SEDIMENT20CSTATION05567B00177HBEAUFORTSAMPLE20SEDIMENT20CSTATION05569B00178HBEAUFORTSAMPLE20SEDIMENT20CSTATION05570B00179HBEAUFORTSAMPLE20SEDIMENT20CSTATION05571B00180HBEAUFORTSAMPLE20SEDIMENT20CSTATION05572B00183HBEAUFORTSAMPLE20SEDIMENT20CSTATION05573B00183HBEAUFORTSAMPLE20SEDIMENT20CSTATION05574B00184HBEAUFORTSAMPLE20SEDIMENT20CSTATION05575B00185HBEAUFORTSAMPLE20SEDIMENT20CSTATION05576B00186HBEAUFORTSAMPLE20SEDIMENT20CSTATION05577B00187HBEAUFORTSAMPLE20SEDIMENT20CSTATION05578B00188HBEAUFORTSAMPLE20SEDIMENT20CSTATION05580B00199HBEAUFORTSAMPLE20SEDIMENT20CSTATION05581B00192HBEAUFORTSAMPLE20SEDIMENT20CSTATION05582B00193HBEAUFORTSAMPLE20SEDIMENT20CSTATION05583B00193HBEAUFORTSAMPLE20SEDIMENT20CSTATION05584 <t< td=""><td></td><td></td><td></td><td></td><td></td><td></td></t<> | | | | | | |
| 67BODI 70HBERUFORTSAMPLE20SEDIMENT20CSTATION05568BODI 79HBERUFORTSAMPLE20SEDIMENT20CSTATION05570BODI 80HBERUFORTSAMPLE20SEDIMENT20CSTATION05571BODI 80HBERUFORTSAMPLE20SEDIMENT20CSTATION05572BODI 80HBERUFORTSAMPLE20SEDIMENT20CSTATION05573BODI 80HBERUFORTSAMPLE20SEDIMENT20CSTATION05574BODI 80HBERUFORTSAMPLE20SEDIMENT20CSTATION05575BODI 80HBERUFORTSAMPLE20SEDIMENT20CSTATION05576BODI 80HBERUFORTSAMPLE20SEDIMENT20CSTATION05577BODI 80HBERUFORTSAMPLE20SEDIMENT20CSTATION05578BODI 80HBERUFORTSAMPLE20SEDIMENT20CSTATION05580BODI 90HBERUFORTSAMPLE20SEDIMENT20CSTATION05581BODI 90HBERUFORTSAMPLE20SEDIMENT20CSTATION05582BODI 93HBERUFORTSAMPLE20SEDIMENT20CSTATION05583BODI 94HBERUFORTSAMPLE20SEDIMENT20CSTATION05584BODI 95HBERUFORTSAMPLE20SEDIMENT20CSTATION055 | | | | | | |
| 68BOBIT?RH BEAUFORTBEAUFORT SAMPLE20SEDIMENT SEDIMENT20CSTATION85571BOD128H BEAUFORTBEAUFORT SAMPLE20SEDIMENT SEDIMENT 20CSTATION85571BOD180H BEAUFORT SAMPLEBEDIMENT 20CSTATION85572BOD183H BEAUFORT SAMPLE20SEDIMENT 20CSTATION85573BOD183H BEAUFORT SAMPLE20SEDIMENT 20CSTATION85574BOD183H BEAUFORT SAMPLE20SEDIMENT 20CSTATION85575BOD185H BEAUFORT SAMPLE20SEDIMENT 20CSTATION85576BOD186H BEAUFORT SAMPLE20SEDIMENT 20CSTATION85577BOD187H BEAUFORT SAMPLE20SEDIMENT 20CSTATION85578BOD188H BEAUFORT SAMPLE20SEDIMENT 20CSTATION85580BOD190H BEAUFORT SAMPLE20SEDIMENT 20CSTATION85581BOD192H BEAUFORT SAMPLE20SEDIMENT 20CSTATION85582BOD193H BEAUFORT SAMPLE20SEDIMENT 20CSTATION85583BOD194H BEAUFORT SAMPLE20SEDIMENT 20CSTATION85584BOD195H BEAUFORT SAMPLE20SEDIMENT 20CSTATION85585BOD196H BEAUFORT SAMPLE20SEDIMENT 20CSTATION85586BOD197H BEAUFORT SAMPLE20SEDIMENT 20CSTATION85586BOD197H <br< td=""><td>67</td><td></td><td></td><td></td><td></td><td></td></br<> | 67 | | | | | |
| 69BOBITONBEAUFORTSAMPLE20SEDIMENT20CSTATION05571B00180HBEAUFORTSAMPLE20SEDIMENT20CSTATION05572B00183HBEAUFORTSAMPLE20SEDIMENT20CSTATION05573B00183HBEAUFORTSAMPLE20SEDIMENT20CSTATION05574B00183HBEAUFORTSAMPLE20SEDIMENT20CSTATION05575B00185HBEAUFORTSAMPLE20SEDIMENT20CSTATION05576B00185HBEAUFORTSAMPLE20SEDIMENT20CSTATION05577B00187HBEAUFORTSAMPLE20SEDIMENT20CSTATION05578B00198HBEAUFORTSAMPLE20SEDIMENT20CSTATION05580B00190HBEAUFORTSAMPLE20SEDIMENT20CSTATION05581B00192HBEAUFORTSAMPLE20SEDIMENT20CSTATION05582B00193HBEAUFORTSAMPLE20SEDIMENT20CSTATION05583B00194HBEAUFORTSAMPLE20SEDIMENT20CSTATION05584B00195HBEAUFORTSAMPLE20SEDIMENT20CSTATION05585B00195HBEAUFORTSAMPLE20SEDIMENT20CSTATION05586B00195HBEAUFORTSAMPLE20SEDIMENT20CSTATION055 <t< td=""><td>68</td><td>B00177H</td><td></td><td></td><td></td><td></td></t<> | 68 | B00177H | | | | |
| 71BEOLFORTSAMPLE20SEDIMENT20CSTATION85572B00180HBEAUFORTSAMPLE20SEDIMENT20CSTATION85573B00183HBEAUFORTSAMPLE20SEDIMENT20CSTATION85574B00184HBEAUFORTSAMPLE20SEDIMENT20CSTATION85575B00185HBEAUFORTSAMPLE20SEDIMENT20CSTATION85576B00186HBEAUFORTSAMPLE20SEDIMENT20CSTATION85577B00188HBEAUFORTSAMPLE20SEDIMENT20CSTATION85578B00188HBEAUFORTSAMPLE20SEDIMENT20CSTATION85579B00189HBEAUFORTSAMPLE20SEDIMENT20CSTATION85580B00190HBEAUFORTSAMPLE20SEDIMENT20CSTATION85581B00192HBEAUFORTSAMPLE20SEDIMENT20CSTATION85582B00193HBEAUFORTSAMPLE20SEDIMENT20CSTATION85584B00193HBEAUFORTSAMPLE20SEDIMENT20CSTATION85585B00196HBEAUFORTSAMPLE20SEDIMENT20CSTATION85586B00197HBEAUFORTSAMPLE20SEDIMENT20CSTATION85587B00198HBEAUFORTSAMPLE20SEDIMENT20CSTATION85588B00 | 69 | B00178H | | | | |
| 71 B00180H BEAUFORT SAMPLE 20 SEDIMENT 20C STATION855 72 B00183H BEAUFORT SAMPLE 20 SEDIMENT 20C STATION855 74 B00183H BEAUFORT SAMPLE 20 SEDIMENT 20C STATION855 75 B00186H BEAUFORT SAMPLE 20 SEDIMENT 20C STATION855 76 B00186H BEAUFORT SAMPLE 20 SEDIMENT 20C STATION855 77 B00187H BEAUFORT SAMPLE 20 SEDIMENT 20C STATION855 77 B00188H BEAUFORT SAMPLE 20 SEDIMENT 20C STATION855 78 B00188H BEAUFORT SAMPLE 20 SEDIMENT 20C STATION855 79 B00190H BEAUFORT SAMPLE 20 SEDIMENT 20C STATION855 80 B00192H BEAUFORT SAMPLE 20 SEDIMENT 20C STATION855 81 B00192H BEAUFORT SAMPLE 20 SEDIMENT 20C STATION855 82 B00193H BEAUFORT SAMPLE 20 SEDIMENT 20C STATION855 83 B00194H BEAUFORT SAMPLE 20 SEDIMENT 20C STATION855 | 70 | B00179H | BEAUFORT | | | |
| 72B00181HBEAUFORTSAMPLE20SEDIMENT20CSTATION05573B00183HBEAUFORTSAMPLE20SEDIMENT20CSTATION05574B00183HBEAUFORTSAMPLE20SEDIMENT20CSTATION05575B00185HBEAUFORTSAMPLE20SEDIMENT20CSTATION05576B00186HBEAUFORTSAMPLE20SEDIMENT20CSTATION05577B00187HBEAUFORTSAMPLE20SEDIMENT20CSTATION05579B00188HBEAUFORTSAMPLE20SEDIMENT20CSTATION05580B00190HBEAUFORTSAMPLE20SEDIMENT20CSTATION05581B00192HBEAUFORTSAMPLE20SEDIMENT20CSTATION05582B00193HBEAUFORTSAMPLE20SEDIMENT20CSTATION05583B00193HBEAUFORTSAMPLE20SEDIMENT20CSTATION05584B00195HBEAUFORTSAMPLE20SEDIMENT20CSTATION05585B00196HBEAUFORTSAMPLE20SEDIMENT20CSTATION05586B00197HBEAUFORTSAMPLE20SEDIMENT20CSTATION05587B00199HBEAUFORTSAMPLE20SEDIMENT20CSTATION05588B00220HBEAUFORTSAMPLE20SEDIMENT20CSTATION056 <t< td=""><td></td><td>R00180H</td><td>BEAUFORT</td><td></td><td></td><td></td></t<> | | R00180H | BEAUFORT | | | |
| 73B00183HBEAUFORTSAMPLE20SEDIMENT20CSTATION05574B00184HBEAUFORTSAMPLE20SEDIMENT20CSTATION05575B00185HBEAUFORTSAMPLE20SEDIMENT20CSTATION05576B00186HBEAUFORTSAMPLE20SEDIMENT20CSTATION05577B00187HBEAUFORTSAMPLE20SEDIMENT20CSTATION05578B00188HBEAUFORTSAMPLE20SEDIMENT20CSTATION05580B00190HBEAUFORTSAMPLE20SEDIMENT20CSTATION05581B00192HBEAUFORTSAMPLE20SEDIMENT20CSTATION05582B00193HBEAUFORTSAMPLE20SEDIMENT20CSTATION05583B00194HBEAUFORTSAMPLE20SEDIMENT20CSTATION05584B00195HBEAUFORTSAMPLE20SEDIMENT20CSTATION05585B00196HBEAUFORTSAMPLE20SEDIMENT20CSTATION05586B00197HBEAUFORTSAMPLE20SEDIMENT20CSTATION05587B00199HBEAUFORTSAMPLE20SEDIMENT20CSTATION05588B00220HBEAUFORTSAMPLE20SEDIMENT20CSTATION05589B00222HBEAUFORTSAMPLE21SEDIMENT20CSTATION070 <t< td=""><td></td><td></td><td>BEAUFORT</td><td>SAMPLE 20</td><td>SEDIMENT</td><td></td></t<> | | | BEAUFORT | SAMPLE 20 | SEDIMENT | |
| 74 B00184H BEAUFORT SAMPLE 20 SEDIMENT 20C STATION055 75 B00185H BEAUFORT SAMPLE 20 SEDIMENT 20C STATION055 76 B00186H BEAUFORT SAMPLE 20 SEDIMENT 20C STATION055 77 B00187H BEAUFORT SAMPLE 20 SEDIMENT 20C STATION055 78 B00188H BEAUFORT SAMPLE 20 SEDIMENT 20C STATION055 79 B00189H BEAUFORT SAMPLE 20 SEDIMENT 20C STATION055 80 B00194H BEAUFORT SAMPLE 20 SEDIMENT 20C STATION055 81 B00194H BEAUFORT SAMPLE 20 SEDIMENT 20C STATION055 82 B00194H BEAUFORT SAMPLE 20 SEDIMENT 20C STATION055 83 B00195H BEAUFORT SAMPLE 20 SEDIMENT 20C STATION055 84 B00195H BEAUFORT SAMPLE <t< td=""><td></td><td></td><td>• •</td><td>SAMPLE 20</td><td>SEDIMENT</td><td></td></t<> | | | • • | SAMPLE 20 | SEDIMENT | |
| 75 B60185H BEAUFORT SAMPLE 20 SEDIMENT 20C STATION055 76 B00186H BEAUFORT SAMPLE 20 SEDIMENT 20C STATION055 77 B00187H BEAUFORT SAMPLE 20 SEDIMENT 20C STATION055 78 B00188H BEAUFORT SAMPLE 20 SEDIMENT 20C STATION055 79 B00189H BEAUFORT SAMPLE 20 SEDIMENT 20C STATION055 80 B00190H BEAUFORT SAMPLE 20 SEDIMENT 20C STATION055 81 B00192H BEAUFORT SAMPLE 20 SEDIMENT 20C STATION055 82 B00193H BEAUFORT SAMPLE 20 SEDIMENT 20C STATION055 83 B00196H BEAUFORT SAMPLE 20 SEDIMENT 20C STATION055 84 B00197H BEAUFORT SAMPLE 20 SEDIMENT 2 | | | - · · | | SEDIMENT | |
| 76 BO0183H BEAUFORT SAMPLE 20 SEDIMENT 20C STATION055 77 B00187H BEAUFORT SAMPLE 20 SEDIMENT 20C STATION055 78 B00188H BEAUFORT SAMPLE 20 SEDIMENT 20C STATION055 79 B00189H BEAUFORT SAMPLE 20 SEDIMENT 20C STATION055 80 B00190H BEAUFORT SAMPLE 20 SEDIMENT 20C STATION055 81 B00192H BEAUFORT SAMPLE 20 SEDIMENT 20C STATION055 82 B00193H BEAUFORT SAMPLE 20 SEDIMENT 20C STATION055 83 B00194H BEAUFORT SAMPLE 20 SEDIMENT 20C STATION055 84 B00195H BEAUFORT SAMPLE 20 SEDIMENT 20C STATION055 85 B00196H BEAUFORT SAMPLE 20 SEDIMENT 2 | | | | | | 20C STATION055 |
| 76 800180H BEAUFORT SAMPLE 20 SEDIMENT 200 STATION055 78 800188H BEAUFORT SAMPLE 20 SEDIMENT 200 STATION055 79 800190H BEAUFORT SAMPLE 20 SEDIMENT 200 STATION055 80 800190H BEAUFORT SAMPLE 20 SEDIMENT 200 STATION055 81 800192H BEAUFORT SAMPLE 20 SEDIMENT 200 STATION055 82 800193H BEAUFORT SAMPLE 20 SEDIMENT 200 STATION055 83 800194H BEAUFORT SAMPLE 20 SEDIMENT 200 STATION055 84 800195H BEAUFORT SAMPLE 20 SEDIMENT 200 STATION055 85 800196H BEAUFORT SAMPLE 20 SEDIMENT 200 STATION055 86 800197H BEAUFORT SAMPLE 20 SEDIMENT 2 | | | | | | |
| 77B00187HBEAUFORTSAMPLE20SEDIMENT20CSTATION05579B00189HBEAUFORTSAMPLE20SEDIMENT20CSTATION05580B00190HBEAUFORTSAMPLE20SEDIMENT20CSTATION05581B00192HBEAUFORTSAMPLE20SEDIMENT20CSTATION05582B00193HBEAUFORTSAMPLE20SEDIMENT20CSTATION05583B00194HBEAUFORTSAMPLE20SEDIMENT20CSTATION05584B00195HBEAUFORTSAMPLE20SEDIMENT20CSTATION05585B00196HBEAUFORTSAMPLE20SEDIMENT20CSTATION05586B00197HBEAUFORTSAMPLE20SEDIMENT20CSTATION05587B00199HBEAUFORTSAMPLE20SEDIMENT20CSTATION05588B00200HBEAUFORTSAMPLE20SEDIMENT20CSTATION07690B00227HBEAUFORTSAMPLE21SEDIMENT20CSTATION07091B00228HBEAUFORTSAMPLE21SEDIMENT20CSTATION07092B00229HBEAUFORTSAMPLE21SEDIMENT20CSTATION07093B00230HBEAUFORTSAMPLE21SEDIMENT20CSTATION07094B00231HBEAUFORTSAMPLE21SEDIMENT20CSTATION070 <t< td=""><td></td><td></td><td></td><td></td><td></td><td></td></t<> | | | | | | |
| 78B00183HBEAUFORTSAMPLE20SEDIMENT20CSTATION05580B00190HBEAUFORTSAMPLE20SEDIMENT20CSTATION05581B00192HBEAUFORTSAMPLE20SEDIMENT20CSTATION05582B00193HBEAUFORTSAMPLE20SEDIMENT20CSTATION05583B00193HBEAUFORTSAMPLE20SEDIMENT20CSTATION05584B00195HBEAUFORTSAMPLE20SEDIMENT20CSTATION05585B00196HBEAUFORTSAMPLE20SEDIMENT20CSTATION05586B00197HBEAUFORTSAMPLE20SEDIMENT20CSTATION05587B00199HBEAUFORTSAMPLE20SEDIMENT20CSTATION05588B00200HBEAUFORTSAMPLE20SEDIMENT20CSTATION05589B00226HBEAUFORTSAMPLE21SEDIMENT20CSTATION07090B00227HBEAUFORTSAMPLE21SEDIMENT20CSTATION07091B00228HBEAUFORTSAMPLE21SEDIMENT20CSTATION07092B00230HBEAUFORTSAMPLE21SEDIMENT20CSTATION07093B00230HBEAUFORTSAMPLE21SEDIMENT20CSTATION07094B00231HBEAUFORTSAMPLE21SEDIMENT20CSTATION070 <t< td=""><td></td><td></td><td></td><td></td><td></td><td></td></t<> | | | | | | |
| 79B00139HBEAUFORTSAMPLE20SEDIMENT20CSTATION05581B00192HBEAUFORTSAMPLE20SEDIMENT20CSTATION05582B00193HBEAUFORTSAMPLE20SEDIMENT20CSTATION05583B00193HBEAUFORTSAMPLE20SEDIMENT20CSTATION05584B00195HBEAUFORTSAMPLE20SEDIMENT20CSTATION05585B00196HBEAUFORTSAMPLE20SEDIMENT20CSTATION05586B00197HBEAUFORTSAMPLE20SEDIMENT20CSTATION05587B00199HBEAUFORTSAMPLE20SEDIMENT20CSTATION05588B00200HBEAUFORTSAMPLE20SEDIMENT20CSTATION05589B00226HBEAUFORTSAMPLE21SEDIMENT20CSTATION07090B00227HBEAUFORTSAMPLE21SEDIMENT20CSTATION07091B00228HBEAUFORTSAMPLE21SEDIMENT20CSTATION07092B00230HBEAUFORTSAMPLE21SEDIMENT20CSTATION07093B00233HBEAUFORTSAMPLE21SEDIMENT20CSTATION07094B00233HBEAUFORTSAMPLE21SEDIMENT20CSTATION07095B00233HBEAUFORTSAMPLE21SEDIMENT20CSTATION070 <t< td=""><td></td><td></td><td></td><td></td><td></td><td></td></t<> | | | | | | |
| S0B00190HBERUFORTSAMPLE20SEDIMENT20CSTATION055S2B00193HBEAUFORTSAMPLE20SEDIMENT20CSTATION055S3B00194HBEAUFORTSAMPLE20SEDIMENT20CSTATION055S4B00195HBEAUFORTSAMPLE20SEDIMENT20CSTATION055S5B00196HBEAUFORTSAMPLE20SEDIMENT20CSTATION055S6B00197HBEAUFORTSAMPLE20SEDIMENT20CSTATION055S7B00199HBEAUFORTSAMPLE20SEDIMENT20CSTATION055S8B00200HBEAUFORTSAMPLE20SEDIMENT20CSTATION055S9B00226HBEAUFORTSAMPLE21SEDIMENT20CSTATION07090B00227HBEAUFORTSAMPLE21SEDIMENT20CSTATION07091B00228HBEAUFORTSAMPLE21SEDIMENT20CSTATION07092B00229HBEAUFORTSAMPLE21SEDIMENT20CSTATION07093B00230HBEAUFORTSAMPLE21SEDIMENT20CSTATION07094B00231HBEAUFORTSAMPLE21SEDIMENT20CSTATION07095B00232HBEAUFORTSAMPLE21SEDIMENT20CSTATION07096B00233HBEAUFORTSAMPLE21SEDIMENT20CSTATION070 <t< td=""><td>79</td><td></td><td></td><td></td><td></td><td></td></t<> | 79 | | | | | |
| S1D00192HBEAUFORTSAMPLE20SEDIMENT20CSTATION055S3B00194HBEAUFORTSAMPLE20SEDIMENT20CSTATION055S4B00195HBEAUFORTSAMPLE20SEDIMENT20CSTATION055S5B00196HBEAUFORTSAMPLE20SEDIMENT20CSTATION055S6B00197HBEAUFORTSAMPLE20SEDIMENT20CSTATION055S7B00199HBEAUFORTSAMPLE20SEDIMENT20CSTATION055S8B00200HBEAUFORTSAMPLE20SEDIMENT20CSTATION055S9B00226HBEAUFORTSAMPLE21SEDIMENT20CSTATION07090B00227HBEAUFORTSAMPLE21SEDIMENT20CSTATION07091B00228HBEAUFORTSAMPLE21SEDIMENT20CSTATION07092B00230HBEAUFORTSAMPLE21SEDIMENT20CSTATION07093B00230HBEAUFORTSAMPLE21SEDIMENT20CSTATION07094B00231HBEAUFORTSAMPLE21SEDIMENT20CSTATION07095B00233HBEAUFORTSAMPLE21SEDIMENT20CSTATION07096B00233HBEAUFORTSAMPLE21SEDIMENT20CSTATION07097B00234HBEAUFORTSAMPLE21SEDIMENT20CSTATION070 <t< td=""><td>80</td><td>B00190H</td><td>BEAUFORT</td><td></td><td></td><td></td></t<> | 80 | B00190H | BEAUFORT | | | |
| 82BØØ193HBEAUFORTSAMPLE20SEDIMENT20CSTATION05583BØØ194HBEAUFORTSAMPLE20SEDIMENT20CSTATION05584BØØ195HBEAUFORTSAMPLE20SEDIMENT20CSTATION05585BØØ196HBEAUFORTSAMPLE20SEDIMENT20CSTATION05586BØØ197HBEAUFORTSAMPLE20SEDIMENT20CSTATION05587BØØ199HBEAUFORTSAMPLE20SEDIMENT20CSTATION05588BØØ200HBEAUFORTSAMPLE20SEDIMENT20CSTATION05589BØØ226HBEAUFORTSAMPLE21SEDIMENT20CSTATION07090BØØ227HBEAUFORTSAMPLE21SEDIMENT20CSTATION07091BØØ228HBEAUFORTSAMPLE21SEDIMENT20CSTATION07092BØØ230HBEAUFORTSAMPLE21SEDIMENT20CSTATION07093BØØ230HBEAUFORTSAMPLE21SEDIMENT20CSTATION07094BØØ231HBEAUFORTSAMPLE21SEDIMENT20CSTATION07095BØØ232HBEAUFORTSAMPLE21SEDIMENT20CSTATION07096BØØ233HBEAUFORTSAMPLE21SEDIMENT20CSTATION07097BØØ236HBEAUFORTSAMPLE21SEDIMENT20CSTATION070 <t< td=""><td>81</td><td>B00192H</td><td>BEAUFORT</td><td>SAMPLE 20</td><td></td><td></td></t<> | 81 | B00192H | BEAUFORT | SAMPLE 20 | | |
| 83B00194HBEAUFORTSAMPLE20SEDIMENT20CSTATION05584B00195HBEAUFORTSAMPLE20SEDIMENT20CSTATION05585B00196HBEAUFORTSAMPLE20SEDIMENT20CSTATION05586B00197HBEAUFORTSAMPLE20SEDIMENT20CSTATION05587B00199HBEAUFORTSAMPLE20SEDIMENT20CSTATION05588B00200HBEAUFORTSAMPLE20SEDIMENT20CSTATION05589B00226HBEAUFORTSAMPLE21SEDIMENT20CSTATION07090B00227HBEAUFORTSAMPLE21SEDIMENT20CSTATION07091B00228HBEAUFORTSAMPLE21SEDIMENT20CSTATION07092B00229HBEAUFORTSAMPLE21SEDIMENT20CSTATION07093B00230HBEAUFORTSAMPLE21SEDIMENT20CSTATION07094B00231HBEAUFORTSAMPLE21SEDIMENT20CSTATION07095B00232HBEAUFORTSAMPLE21SEDIMENT20CSTATION07096B00233HBEAUFORTSAMPLE21SEDIMENT20CSTATION07097B00234HBEAUFORTSAMPLE21SEDIMENT20CSTATION07098B00235HBEAUFORTSAMPLE21SEDIMENT20CSTATION070 <t< td=""><td></td><td>R00193H</td><td>BEAUFORT</td><td>SAMPLE 20</td><td>SEDIMENT</td><td></td></t<> | | R00193H | BEAUFORT | SAMPLE 20 | SEDIMENT | |
| 84BØØ195HBEAUFORTSAMPLE20SEDIMENT20CSTATION05585BØ0196HBEAUFORTSAMPLE20SEDIMENT20CSTATION05586BØ0197HBEAUFORTSAMPLE20SEDIMENT20CSTATION05587BØ0199HBEAUFORTSAMPLE20SEDIMENT20CSTATION05588BØ0200HBEAUFORTSAMPLE20SEDIMENT20CSTATION05589BØ0226HBEAUFORTSAMPLE21SEDIMENT20CSTATION07090BØ0227HBEAUFORTSAMPLE21SEDIMENT20CSTATION07091BØ0228HBEAUFORTSAMPLE21SEDIMENT20CSTATION07092BØ0229HBEAUFORTSAMPLE21SEDIMENT20CSTATION07093BØ0230HBEAUFORTSAMPLE21SEDIMENT20CSTATION07094BØ0231HBEAUFORTSAMPLE21SEDIMENT20CSTATION07095BØ0232HBEAUFORTSAMPLE21SEDIMENT20CSTATION07096BØ0233HBEAUFORTSAMPLE21SEDIMENT20CSTATION07097BØ0234HBEAUFORTSAMPLE21SEDIMENT20CSTATION07098BØ0235HBEAUFORTSAMPLE21SEDIMENT20CSTATION07099BØ0236HBEAUFORTSAMPLE21SEDIMENT20CSTATION070 <t< td=""><td></td><td></td><td></td><td>SAMPLE 20</td><td>SEDIMENT</td><td>20C STATION055</td></t<> | | | | SAMPLE 20 | SEDIMENT | 20C STATION055 |
| 34BEOLYSHBEAUFORTSAMPLE20SEDIMENT20CSTATION05585B00197HBEAUFORTSAMPLE20SEDIMENT20CSTATION05587B00199HBEAUFORTSAMPLE20SEDIMENT20CSTATION05588B00200HBEAUFORTSAMPLE20SEDIMENT20CSTATION05589B00226HBEAUFORTSAMPLE21SEDIMENT20CSTATION07090B00227HBEAUFORTSAMPLE21SEDIMENT20CSTATION07091B00228HBEAUFORTSAMPLE21SEDIMENT20CSTATION07092B00228HBEAUFORTSAMPLE21SEDIMENT20CSTATION07093B00230HBEAUFORTSAMPLE21SEDIMENT20CSTATION07094B00231HBEAUFORTSAMPLE21SEDIMENT20CSTATION07095B00233HBEAUFORTSAMPLE21SEDIMENT20CSTATION07096B00233HBEAUFORTSAMPLE21SEDIMENT20CSTATION07097B00233HBEAUFORTSAMPLE21SEDIMENT20CSTATION07098B00236HBEAUFORTSAMPLE21SEDIMENT20CSTATION07099B00236HBEAUFORTSAMPLE21SEDIMENT20CSTATION07099B00236HBEAUFORTSAMPLE21SEDIMENT20CSTATION070 <t< td=""><td></td><td></td><td></td><td></td><td></td><td>20C STATION055</td></t<> | | | | | | 20C STATION055 |
| 86800197HBEAUFORTSAMPLE20SEDIMENT20CSTATION05587800199HBEAUFORTSAMPLE20SEDIMENT20CSTATION05588800200HBEAUFORTSAMPLE20SEDIMENT20CSTATION05589800226HBEAUFORTSAMPLE21SEDIMENT20CSTATION07090800227HBEAUFORTSAMPLE21SEDIMENT20CSTATION07091800228HBEAUFORTSAMPLE21SEDIMENT20CSTATION07092800229HBEAUFORTSAMPLE21SEDIMENT20CSTATION07093800230HBEAUFORTSAMPLE21SEDIMENT20CSTATION07094800231HBEAUFORTSAMPLE21SEDIMENT20CSTATION07095800232HBEAUFORTSAMPLE21SEDIMENT20CSTATION07096800233HBEAUFORTSAMPLE21SEDIMENT20CSTATION07097800234HBEAUFORTSAMPLE21SEDIMENT20CSTATION07098800235HBEAUFORTSAMPLE21SEDIMENT20CSTATION07099800236HBEAUFORTSAMPLE21SEDIMENT20CSTATION07099800236HBEAUFORTSAMPLE21SEDIMENT20CSTATION07099800236HBEAUFORTSAMPLE21SEDIMENT20CSTATION070 <t< td=""><td></td><td></td><td></td><td></td><td></td><td></td></t<> | | | | | | |
| 86B001911BEAUFORTSAMPLE20SEDIMENT20CSTATION05587B00200HBEAUFORTSAMPLE20SEDIMENT20CSTATION05589B00226HBEAUFORTSAMPLE21SEDIMENT20CSTATION07090B00227HBEAUFORTSAMPLE21SEDIMENT20CSTATION07091B00228HBEAUFORTSAMPLE21SEDIMENT20CSTATION07092B00229HBEAUFORTSAMPLE21SEDIMENT20CSTATION07093B00230HBEAUFORTSAMPLE21SEDIMENT20CSTATION07094B00231HBEAUFORTSAMPLE21SEDIMENT20CSTATION07095B00232HBEAUFORTSAMPLE21SEDIMENT20CSTATION07096B00233HBEAUFORTSAMPLE21SEDIMENT20CSTATION07097B00234HBEAUFORTSAMPLE21SEDIMENT20CSTATION07098B00235HBEAUFORTSAMPLE21SEDIMENT20CSTATION07099B00236HBEAUFORTSAMPLE21SEDIMENT20CSTATION07099B00236HBEAUFORTSAMPLE21SEDIMENT20CSTATION07099B00236HBEAUFORTSAMPLE21SEDIMENT20CSTATION07099B00236HBEAUFORTSAMPLE21SEDIMENT20CSTATION070 <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> | | | | | | |
| 87B001994BEAUFORTSAMPLE20SEDIMENT20CSTATION05589B00226HBEAUFORTSAMPLE21SEDIMENT20CSTATION07090B00227HBEAUFORTSAMPLE21SEDIMENT20CSTATION07091B00228HBEAUFORTSAMPLE21SEDIMENT20CSTATION07092B00229HBEAUFORTSAMPLE21SEDIMENT20CSTATION07093B00230HBEAUFORTSAMPLE21SEDIMENT20CSTATION07094B00231HBEAUFORTSAMPLE21SEDIMENT20CSTATION07095B00232HBEAUFORTSAMPLE21SEDIMENT20CSTATION07096B00233HBEAUFORTSAMPLE21SEDIMENT20CSTATION07097B00234HBEAUFORTSAMPLE21SEDIMENT20CSTATION07098B00235HBEAUFORTSAMPLE21SEDIMENT20CSTATION07099B00236HBEAUFORTSAMPLE21SEDIMENT20CSTATION07099B00236HBEAUFORTSAMPLE21SEDIMENT20CSTATION070 | | | | | | |
| 89B00226HBEAUFORTSAMPLE21SEDIMENT20CSTATION07090B00227HBEAUFORTSAMPLE21SEDIMENT20CSTATION07091B00228HBEAUFORTSAMPLE21SEDIMENT20CSTATION07092B00229HBEAUFORTSAMPLE21SEDIMENT20CSTATION07093B00230HBEAUFORTSAMPLE21SEDIMENT20CSTATION07094B00231HBEAUFORTSAMPLE21SEDIMENT20CSTATION07095B00232HBEAUFORTSAMPLE21SEDIMENT20CSTATION07096B00233HBEAUFORTSAMPLE21SEDIMENT20CSTATION07097B00234HBEAUFORTSAMPLE21SEDIMENT20CSTATION07098B00235HBEAUFORTSAMPLE21SEDIMENT20CSTATION07099B00236HBEAUFORTSAMPLE21SEDIMENT20CSTATION070 | | | | | OCDINENT OCDIMENT | |
| 37B00220HBEAUFORTSAMPLE21SEDIMENT20CSTATION07091B00228HBEAUFORTSAMPLE21SEDIMENT20CSTATION07092B00229HBEAUFORTSAMPLE21SEDIMENT20CSTATION07093B00230HBEAUFORTSAMPLE21SEDIMENT20CSTATION07094B00231HBEAUFORTSAMPLE21SEDIMENT20CSTATION07095B00232HBEAUFORTSAMPLE21SEDIMENT20CSTATION07096B00233HBEAUFORTSAMPLE21SEDIMENT20CSTATION07097B00234HBEAUFORTSAMPLE21SEDIMENT20CSTATION07098B00235HBEAUFORTSAMPLE21SEDIMENT20CSTATION07099B00236HBEAUFORTSAMPLE21SEDIMENT20CSTATION070 | | | | | | |
| 90BOOLLINBEAUFORTSAMPLE21SEDIMENT20CSTATION07091B00229HBEAUFORTSAMPLE21SEDIMENT20CSTATION07093B00230HBEAUFORTSAMPLE21SEDIMENT20CSTATION07094B00231HBEAUFORTSAMPLE21SEDIMENT20CSTATION07095B00232HBEAUFORTSAMPLE21SEDIMENT20CSTATION07096B00233HBEAUFORTSAMPLE21SEDIMENT20CSTATION07097B00234HBEAUFORTSAMPLE21SEDIMENT20CSTATION07098B00235HBEAUFORTSAMPLE21SEDIMENT20CSTATION07099B00236HBEAUFORTSAMPLE21SEDIMENT20CSTATION070 | 89 | B00226H | | | | |
| 91B00223HBEAUFORTSAMPLE21SEDIMENT20CSTATION07093B00230HBEAUFORTSAMPLE21SEDIMENT20CSTATION07094B00231HBEAUFORTSAMPLE21SEDIMENT20CSTATION07095B00232HBEAUFORTSAMPLE21SEDIMENT20CSTATION07096B00233HBEAUFORTSAMPLE21SEDIMENT20CSTATION07097B00234HBEAUFORTSAMPLE21SEDIMENT20CSTATION07098B00235HBEAUFORTSAMPLE21SEDIMENT20CSTATION07099B00236HBEAUFORTSAMPLE21SEDIMENT20CSTATION07099B00236HBEAUFORTSAMPLE21SEDIMENT20CSTATION070 | 90 | B00227H | BEAUFORT | | | |
| 92B00229HBEAUFORT SAMPLE 21SEDIMENT 20CSTATION07093B00230HBEAUFORT SAMPLE 21SEDIMENT 20CSTATION07094B00231HBEAUFORT SAMPLE 21SEDIMENT 20CSTATION07095B00232HBEAUFORT SAMPLE 21SEDIMENT 20CSTATION07096B00233HBEAUFORT SAMPLE 21SEDIMENT 20CSTATION07097B00234HBEAUFORT SAMPLE 21SEDIMENT 20CSTATION07097B00235HBEAUFORT SAMPLE 21SEDIMENT 20CSTATION07098B00235HBEAUFORT SAMPLE 21SEDIMENT 20CSTATION07099B00236HBEAUFORT SAMPLE 21SEDIMENT 20CSTATION070 | 91 | B00228H | BEAUFORT | SAMPLE 21 | | |
| 93B00230HBEAUFORT SAMPLE 21SEDIMENT 20CSTATION07094B00231HBEAUFORT SAMPLE 21SEDIMENT 20CSTATION07095B00232HBEAUFORT SAMPLE 21SEDIMENT 20CSTATION07096B00233HBEAUFORT SAMPLE 21SEDIMENT 20CSTATION07097B00234HBEAUFORT SAMPLE 21SEDIMENT 20CSTATION07097B00234HBEAUFORT SAMPLE 21SEDIMENT 20CSTATION07098B00235HBEAUFORT SAMPLE 21SEDIMENT 20CSTATION07099B00236HBEAUFORT SAMPLE 21SEDIMENT 20CSTATION070 | | | BEAUFORT | SAMPLE 21 | SEDIMENT | |
| 94B00231HBEAUFORT SAMPLE 21SEDIMENT 20CSTATION07095B00232HBEAUFORT SAMPLE 21SEDIMENT 20CSTATION07096B00233HBEAUFORT SAMPLE 21SEDIMENT 20CSTATION07097B00234HBEAUFORT SAMPLE 21SEDIMENT 20CSTATION07098B00235HBEAUFORT SAMPLE 21SEDIMENT 20CSTATION07099B00236HBEAUFORT SAMPLE 21SEDIMENT 20CSTATION07099B00236HBEAUFORT SAMPLE 21SEDIMENT 20CSTATION070 | | | | SAMPLE 21 | SEDIMENT | |
| 95B00232HBEAUFORT SAMPLE 21 SEDIMENT 20C STATION07096B00233HBEAUFORT SAMPLE 21 SEDIMENT 20C STATION07097B00234HBEAUFORT SAMPLE 21 SEDIMENT 20C STATION07098B00235HBEAUFORT SAMPLE 21 SEDIMENT 20C STATION07099B00236HBEAUFORT SAMPLE 21 SEDIMENT 20C STATION070 | | | | | | |
| 96B00233HBEAUFORT SAMPLE 21SEDIMENT 20CSTATION07097B00234HBEAUFORT SAMPLE 21SEDIMENT 20CSTATION07098B00235HBEAUFORT SAMPLE 21SEDIMENT 20CSTATION07099B00236HBEAUFORT SAMPLE 21SEDIMENT 20CSTATION070 | | | | | | |
| 97 B00234H BEAUFORT SAMPLE 21 SEDIMENT 20C STATION070 98 B00235H BEAUFORT SAMPLE 21 SEDIMENT 20C STATION070 99 B00236H BEAUFORT SAMPLE 21 SEDIMENT 20C STATION070 | | | | ••••• | | |
| 98 B00235H BEAUFORT SAMPLE 21 SEDIMENT 20C STATION070 99 B00236H BEAUFORT SAMPLE 21 SEDIMENT 20C STATION070 | | | | | | • |
| 99 B00236H BEAUFORT SAMPLE 21 SEDIMENT 20C STATION070 | | | | | | |
| 22 DOCLODIT SET OF THE OF CONTRACT OF CONTRACT | | | | | | |
| 100 B00237H BEMUKUKI SHMPLE 21 SEDIMENT 200 STRITONOVO | | | | | | |
| | 100 | B00237H | BEHOFORT | SHULF 51 | SEDIMENT. | 200 3101100000 |

÷

| 101 | B00238H | BEAUFORT | SAMPLE | 21 | SEDIMENT | 200 | STATION070 |
|-----|-----------|----------|--------|------------|----------|-----|------------|
| 102 | B00239H | BEAUFORT | SAMPLE | -21 | SEDIMENT | 200 | STATION070 |
| 103 | B00240H | BEAUFORT | | | SEDIMENT | 200 | STATION070 |
| 104 | B00241H | BEAUFORT | | | SEDIMENT | 200 | STATION070 |
| 105 | B00242H | BEAUFORT | SAMPLE | | SEDIMENT | 200 | STATION070 |
| 106 | B00243H | BEAUFORT | SAMPLE | | SEDIMENT | 200 | STATION070 |
| 107 | B00244H | BEAUFORT | SAMPLE | | SEDIMENT | 20C | STATION070 |
| 108 | 300245H | BERUFORT | SAMPLE | | SEDIMENT | 200 | STATION070 |
| 109 | B90246H | BEAUFORT | SAMPLE | 21 | SEDIMENT | 20C | STATION070 |
| 110 | B00247H | BEAUFORT | SAMPLE | | SEDIMENT | 20C | STATION070 |
| 111 | B00248H | BEAUFORT | SAMPLE | | SEDIMENT | 20C | STATION070 |
| 112 | B00249H | BEAUFORT | SAMPLE | 21 | SEDIMENT | 200 | STATION070 |
| 113 | B00250H | BEAUFORT | SAMPLE | 21 | SEDIMENT | 20C | STATION070 |
| 114 | B00276H | BEAUFORT | SAMPLE | 09 | SEDIMENT | 20C | STATION030 |
| 115 | B00277H | BEAUFORT | SAMPLE | 09 | SEDIMENT | 20C | STATION030 |
| 116 | B00278H | BEAUFORT | SAMPLE | 09 | SEDIMENT | 20C | STATION030 |
| 117 | B00279H | BEAUFORT | SAMPLE | 09 | SEDIMENT | 20C | STATION030 |
| 118 | B00280H | BEAUFORT | SAMPLE | 09 | SEDIMENT | 20C | STATION030 |
| 119 | B00281H | BEAUFORT | SAMPLE | 09 | SEDIMENT | 20C | STATION030 |
| 120 | B00282H | BEAUFORT | SAMPLE | 09 | SEDIMENT | 200 | STATION030 |
| 121 | B00283H | BEAUFORT | SAMPLE | 09 | SEDIMENT | 200 | STATION030 |
| 122 | B00284H | BEAUFORT | SAMPLE | 09 | SEDIMENT | 200 | STATION030 |
| 123 | B00285H | BEAUFORT | SAMPLE | 69 | SEDIMENT | 200 | STATION030 |
| 124 | B00286H | BEAUFORT | SAMPLE | 69 | SEDIMENT | 200 | STATION030 |
| 125 | B00287H | BEAUFORT | SAMPLE | Ø9 | SEDIMENT | 20C | STATION030 |
| 126 | . B00288H | BEAUFORT | SAMPLE | Ø9 | SEDIMENT | 200 | STATION030 |
| 127 | B00289H | BEAUFORT | SAMPLE | 69 | SEDIMENT | 20C | STATION030 |
| 128 | B00290H | BEAUFORT | SAMPLE | 09 | SEDIMENT | 20C | STATION030 |
| 129 | B00292H | BEAUFORT | SAMPLE | 69 | SEDIMENT | 200 | STATION030 |
| 130 | B00293H | BEAUFORT | SAMPLE | Ø9 | SEDIMENT | 20C | STATION030 |
| 131 | B00294H | BEAUFORT | SAMPLE | 69 | SEDIMENT | 200 | STATION030 |
| 132 | B00295H | BEAUFORT | SAMPLE | 09 | SEDIMENT | 200 | STATION030 |
| 133 | B00296H | BEAUFORT | SAMPLE | 09 | SEDIMENT | 500 | STATION030 |
| 134 | B00297H | BEAUFORT | SAMPLE | Ø9 | SEDIMENT | 200 | STATION030 |
| 135 | B00298H | BEAUFORT | SAMPLE | 69 | SEDIMENT | 50C | STATION030 |
| 136 | B00299H | BEAUFORT | SAMPLE | 09 99 | SEDIMENT | 20C | STATION030 |
| 137 | B00300H | BEAUFORT | SAMPLE | 8 9 | SEDIMENT | 20C | STATION030 |

END FORM

Strains isolated from water at 4C capable of growth at either pH 8 or pH 9.

| 2B00005LBEAUFORTSAMPLE03WATER04CSTAT3B00006LBEAUFORTSAMPLE03WATER04CSTAT4B00009LBEAUFORTSAMPLE03WATER04CSTAT5B00012LBEAUFORTSAMPLE03WATER04CSTAT6B00013LBEAUFORTSAMPLE03WATER04CSTAT7B00014LBEAUFORTSAMPLE03WATER04CSTAT8B00015LBEAUFORTSAMPLE03WATER04CSTAT9B00021LBEAUFORTSAMPLE03WATER04CSTAT10B00022LBEAUFORTSAMPLE03WATER04CSTAT11B00023LBEAUFORTSAMPLE03WATER04CSTAT12B00024LBEAUFORTSAMPLE03WATER04CSTAT13B00025LBEAUFORTSAMPLE03WATER04CSTAT14B00052LBEAUFORTSAMPLE20WATER04CSTAT15B00054LBEAUFORTSAMPLE20WATER04CSTAT15B00054LBEAUFORTSAMPLE20WATER04CSTAT | the second second second |
|---|--------------------------|
| 3B00006LBEAUFORTSAMPLE03WATER04CSTAT4B00009LBEAUFORTSAMPLE03WATER04CSTAT5B00012LBEAUFORTSAMPLE03WATER04CSTAT6B00013LBEAUFORTSAMPLE03WATER04CSTAT7B00014LBEAUFORTSAMPLE03WATER04CSTAT8B00015LBEAUFORTSAMPLE03WATER04CSTAT9B00021LBEAUFORTSAMPLE03WATER04CSTAT10B00022LBEAUFORTSAMPLE03WATER04CSTAT11B00023LBEAUFORTSAMPLE03WATER04CSTAT12B00024LBEAUFORTSAMPLE03WATER04CSTAT13B00025LBEAUFORTSAMPLE03WATER04CSTAT14B00052LBEAUFORTSAMPLE20WATER04CSTAT15B00054LBEAUFORTSAMPLE20WATER04CSTAT | ION010 |
| 4B00009LBEAUFORTSAMPLE03WATER04CSTAT5B00013LBEAUFORTSAMPLE03WATER04CSTAT6B00013LBEAUFORTSAMPLE03WATER04CSTAT7B00014LBEAUFORTSAMPLE03WATER04CSTAT8B00015LBEAUFORTSAMPLE03WATER04CSTAT9B00021LBEAUFORTSAMPLE03WATER04CSTAT10B00023LBEAUFORTSAMPLE03WATER04CSTAT11B00023LBEAUFORTSAMPLE03WATER04CSTAT12B00024LBEAUFORTSAMPLE03WATER04CSTAT13B00025LBEAUFORTSAMPLE03WATER04CSTAT14B00052LBEAUFORTSAMPLE20WATER04CSTAT15B00054LBEAUFORTSAMPLE20WATER04CSTAT16B00054LBEAUFORTSAMPLE20WATER04CSTAT | 101010 |
| 4B00009LBEAUFORTSAMPLE03WATER04CSTAT5B00012LBEAUFORTSAMPLE03WATER04CSTAT6B00013LBEAUFORTSAMPLE03WATER04CSTAT7B00014LBEAUFORTSAMPLE03WATER04CSTAT8B00015LBEAUFORTSAMPLE03WATER04CSTAT9B00021LBEAUFORTSAMPLE03WATER04CSTAT10B00022LBEAUFORTSAMPLE03WATER04CSTAT11B00023LBEAUFORTSAMPLE03WATER04CSTAT12B00024LBEAUFORTSAMPLE03WATER04CSTAT13B00025LBEAUFORTSAMPLE03WATER04CSTAT14B00052LBEAUFORTSAMPLE20WATER04CSTAT15B00053LBEAUFORTSAMPLE20WATER04CSTAT15B00054LBEAUFORTSAMPLE20WATER04CSTAT | 10/1010 |
| 6B00013LBERUFORTSAMPLE03WATER04CSTAT7B00014LBEAUFORTSAMPLE03WATER04CSTAT8B00015LBEAUFORTSAMPLE03WATER04CSTAT9B00021LBEAUFORTSAMPLE03WATER04CSTAT10B00022LBEAUFORTSAMPLE03WATER04CSTAT11B00023LBEAUFORTSAMPLE03WATER04CSTAT12B00024LBEAUFORTSAMPLE03WATER04CSTAT13B00025LBEAUFORTSAMPLE03WATER04CSTAT14B00052LBEAUFORTSAMPLE20WATER04CSTAT15B00053LBEAUFORTSAMPLE20WATER04CSTAT15B00054LBEAUFORTSAMPLE20WATER04CSTAT | ION010 |
| 6B00013LBEAUFORTSAMPLE03WATER04CSTAT7B00014LBEAUFORTSAMPLE03WATER04CSTAT9B00021LBEAUFORTSAMPLE03WATER04CSTAT10B00022LBEAUFORTSAMPLE03WATER04CSTAT11B00023LBEAUFORTSAMPLE03WATER04CSTAT12B00024LBEAUFORTSAMPLE03WATER04CSTAT13B00025LBEAUFORTSAMPLE03WATER04CSTAT14B00052LBEAUFORTSAMPLE20WATER04CSTAT15B00054LBEAUFORTSAMPLE20WATER04CSTAT | 101010 |
| 7B00014LBEAUFORTSAMPLE03WATER04CSTAT8B00015LBEAUFORTSAMPLE03WATER04CSTAT9B00021LBEAUFORTSAMPLE03WATER04CSTAT10B00022LBEAUFORTSAMPLE03WATER04CSTAT11B00023LBEAUFORTSAMPLE03WATER04CSTAT12B00024LBEAUFORTSAMPLE03WATER04CSTAT13B00025LBEAUFORTSAMPLE03WATER04CSTAT14B00052LBEAUFORTSAMPLE20WATER04CSTAT15B00053LBEAUFORTSAMPLE20WATER04CSTAT15B00054LBEAUFORTSAMPLE20WATER04CSTAT | ION010 |
| 8B00015LBEAUFORTSAMPLE03WATER04CSTAT9B00021LBEAUFORTSAMPLE03WATER04CSTAT10B00022LBEAUFORTSAMPLE03WATER04CSTAT11B00023LBEAUFORTSAMPLE03WATER04CSTAT12B00024LBEAUFORTSAMPLE03WATER04CSTAT13B00025LBEAUFORTSAMPLE03WATER04CSTAT14B00052LBEAUFORTSAMPLE20WATER04CSTAT15B00053LBEAUFORTSAMPLE20WATER04CSTAT16B00054LBEAUFORTSAMPLE20WATER04CSTAT | ION010 |
| 9B00021LBEAUFORTSAMPLE03WATER04CSTAT10B00022LBEAUFORTSAMPLE03WATER04CSTAT11B00023LBEAUFORTSAMPLE03WATER04CSTAT12B00024LBEAUFORTSAMPLE03WATER04CSTAT13B00025LBEAUFORTSAMPLE03WATER04CSTAT14B00052LBEAUFORTSAMPLE20WATER04CSTAT15B00053LBEAUFORTSAMPLE20WATER04CSTAT15B00054LBEAUFORTSAMPLE20WATER04CSTAT | 101010 |
| 10B00022LBEAUFORTSAMPLE03WATER04CSTAT11B00023LBEAUFORTSAMPLE03WATER04CSTAT12B00024LBEAUFORTSAMPLE03WATER04CSTAT13B00025LBEAUFORTSAMPLE03WATER04CSTAT14B00052LBEAUFORTSAMPLE20WATER04CSTAT15B00053LBEAUFORTSAMPLE20WATER04CSTAT16B00054LBEAUFORTSAMPLE20WATER04CSTAT | IONOIO |
| 11B00023LBEAUFORTSAMPLE03WATER04CSTAT12B00024LBEAUFORTSAMPLE03WATER04CSTAT13B00025LBEAUFORTSAMPLE03WATER04CSTAT14B00052LBEAUFORTSAMPLE20WATER04CSTAT15B00053LBEAUFORTSAMPLE20WATER04CSTAT16B00054LBEAUFORTSAMPLE20WATER04CSTAT | ION010 |
| 12B00024LBEAUFORTSAMPLE03WATER04CSTAT13300025LBEAUFORTSAMPLE03WATER04CSTAT14B00052LBEAUFORTSAMPLE20WATER04CSTAT15B00053LBEAUFORTSAMPLE20WATER04CSTAT16B00054LBEAUFORTSAMPLE20WATER04CSTAT | |
| 13B00025LBEAUFORT SAMPLE 03 WATER 04C STAT14B00052LBEAUFORT SAMPLE 20 WATER 04C STAT15B00053LBEAUFORT SAMPLE 20 WATER 04C STAT16B00054LBEAUFORT SAMPLE 20 WATER 04C STAT | |
| 14B00052LBEAUFORT SAMPLE 20 WATER 04C STAT15B00053LBEAUFORT SAMPLE 20 WATER 04C STAT15B00054LBEAUFORT SAMPLE 20 WATER 04C STAT | |
| 15B00053LBEAUFORT SAMPLE 20 WATER 04C STAT15B00054LBEAUFORT SAMPLE 20 WATER 04C STAT | |
| 15 B00054L BEAUFORT SAMPLE 20 WATER 04C STAT | |
| | |
| 17 DAMARSI DEGLEBOT COMPLE DA LOTED AAR STAT | 104002 |
| | 101002 |
| 13 B00057L BEAUFORT SAMPLE 20 WATER 04C STAT | 10H995 |
| | I0N995 |
| | 10H995 |
| 21 B00062L BEAUFORT SAMPLE 20 WATER 04C STAT | 1014002 |
| | 10N002 |
| | ION002 |
| | 1014002 |
| | 10H002 |
| | 10M002 |
| | 10002 |
| | 104002 |
| | 1014002 |
| | 101002 |
| | ION002 |
| | 1014002 |
| | 1014071 |
| | ION071 |
| | ION071 |
| n an | ION071 |
| | 104071 |
| | 100071 |
| | ION071 |
| | ION071 |
| | ION071 |
| | ION071 |
| | 100071 |
| | |
| | ION071 108071 |
| | 100071 |
| | ION071 |
| | ION071 |
| | ION071 |
| | I ONØ71 |
| 50 B00119L BEAUFORT SAMPLE 27 WATER 04C STAT: | 1014071 |

| Sign 201 BERNFORT SAMPLE 27 MATER 04C STATION071 Sign 2012L BERNFORT SAMPLE 27 WATER 04C STATION071 Sign 2015L BERNFORT SAMPLE 24 WATER 04C STATION075 Sign 2015L BERNFORT SAMPLE 24 WATER 04C STATION055 Sign 2015L BERNFORT SAMPLE 24 WATER 04C STATION055 B0015L BERNFORT SAMPLE 24 WATER 04C STATION055 B0016L BERNFORT SAMPLE 24 WATER 04C STATION055 | | | | | | | | |
|--|------|----------------------------------|---|----------|---------------|---------------------|------------|-----------------------------|
| 32 366121L BEAUFORT SAMPLE 27 WATER 04C STATION071 33 B00122L BEAUFORT SAMPLE 27 WATER 04C STATION071 34 S00123L BEAUFORT SAMPLE 27 WATER 04C STATION071 35 B00123L BEAUFORT SAMPLE 27 WATER 04C STATION071 36 B00124L BEAUFORT SAMPLE 24 WATER 04C STATION075 37 B00151L BEAUFORT SAMPLE 24 WATER 04C STATION055 38 B00152L BEAUFORT SAMPLE 24 WATER 04C STATION055 39 B00154L BEAUFORT SAMPLE 24 WATER 04C STATION055 40 B00154L BEAUFORT SAMPLE 24 WATER 04C STATION055 50 B00154L BEAUFORT SAMPLE 24 WATER 04C STATION055 51 B00156L BEAUFORT SAMPLE 24 WATER 04C STATION055 56 B00163L BEAUFORT SAMPLE 24 WATER 04C STATION055 57 B00163L BEAUFORT SAMPLE 24 WATER 04C STATION055 58 B00163L BEAUFORT SAMPLE 24 WATER 04C STATION055 58 B00163L BEAUFORT SAMPLE 24 WATER 04C | 51 | BAALEAL | BEAUFORT | SAMPLE | 27 | MATER | 04C | STATION071 |
| Biolizal BEAUFORT SAMPLE 27 WATER 94C STATION971 54 BO0123L BEAUFORT SAMPLE 27 WATER 94C STATION971 55 BO0123L BEAUFORT SAMPLE 27 WATER 94C STATION971 57 BO0153L BEAUFORT SAMPLE 24 WATER 94C STATION975 58 BO0153L BEAUFORT SAMPLE 24 WATER 94C STATION955 59 BO0153L BEAUFORT SAMPLE 24 WATER 94C STATION955 60 BO0157L BEAUFORT SAMPLE 24 WATER 94C STATION955 64 BO0157L BEAUFORT SAMPLE 24 WATER 94C STATION955 65 BO0163L BEAUFORT SAMPLE 24 WATER 94C STATION955 66 BO0163L BEAUFORT SAMPLE 24 WATER 94C STATION955 | | | REALFORT | SAMPLE | 27 | WATER | B4C | STATION071 |
| Biological BERUFORT SAMPLE 27 MATER 64C STATION071 55 B00124L BERUFORT SAMPLE 27 MATER 64C STATION071 56 B00151L BERUFORT SAMPLE 24 MATER 64C STATION075 57 B00151L BERUFORT SAMPLE 24 MATER 64C STATION055 58 B00154L BERUFORT SAMPLE 24 MATER 64C STATION055 64 B00154L BERUFORT SAMPLE 24 MATER 64C STATION055 65 B00152L BERUFORT SAMPLE 24 MATER 64C STATION055 66 B00162L BERUFORT SAMPLE 24 MATER 64C STATION055 66 B00162L BERUFORT SAMPLE 24 MATER 64C STATION055 66 B00162L BERUFORT SAMPLE 24 MATER 64C STATION055 | | | | | | | | |
| 35BOB124LBEAUFORTSAMPLE27MATER94CSTATION07136BOB125LBEAUFORTSAMPLE27MATER94CSTATION07137BOB151LBEAUFORTSAMPLE24MATER94CSTATION05538BOB152LBEAUFORTSAMPLE24MATER94CSTATION05539BOB154LBEAUFORTSAMPLE24MATER94CSTATION05530BOB155LBEAUFORTSAMPLE24MATER94CSTATION05531BOB157LBEAUFORTSAMPLE24MATER94CSTATION05536BOB157LBEAUFORTSAMPLE24MATER94CSTATION05536BOB157LBEAUFORTSAMPLE24MATER94CSTATION05536BOB164LBEAUFORTSAMPLE24MATER94CSTATION05536BOB164LBEAUFORTSAMPLE24MATER94CSTATION05537BOB165LBEAUFORTSAMPLE24MATER94CSTATION05538BOB164LBEAUFORTSAMPLE24MATER94CSTATION05538BOB164LBEAUFORTSAMPLE24MATER94CSTATION05538BOB164LBEAUFORTSAMPLE24MATER94CSTATION05538BOB164LBEAUFORTSAMPLE24MATER94CSTATION05538BOB164LBEAUFORTSA | | | | | | | | |
| 30300125LBEAUFORTSAMPLE27NATER94CSTATION07157B00151LBEAUFORTSAMPLE24NATER94CSTATION05558B00153LBEAUFORTSAMPLE24NATER94CSTATION05559B00153LBEAUFORTSAMPLE24NATER94CSTATION05551B00155LBEAUFORTSAMPLE24NATER94CSTATION05552B00157LBEAUFORTSAMPLE24NATER94CSTATION05553B00157LBEAUFORTSAMPLE24NATER94CSTATION05554B00159LBEAUFORTSAMPLE24NATER94CSTATION05555B00162LBEAUFORTSAMPLE24NATER94CSTATION05556B00163LBEAUFORTSAMPLE24NATER94CSTATION05557B00164LBEAUFORTSAMPLE24NATER94CSTATION05558B00164LBEAUFORTSAMPLE24NATER94CSTATION05559B00164LBEAUFORTSAMPLE24NATER94CSTATION05559B00164LBEAUFORTSAMPLE24NATER94CSTATION05550B00164LBEAUFORTSAMPLE24NATER94CSTATION05551B00161LBEAUFORTSAMPLE24NATER94CSTATION05552B00164LBEAUFORTSA | 54 | 500123L | | | | | | |
| 56B0012SLBERUFORT SAMPLE 27WATER 04C STATION07557B00151LBERUFORT SAMPLE 24WATER 04C STATION05558B00153LBERUFORT SAMPLE 24WATER 04C STATION05559B00153LBERUFORT SAMPLE 24WATER 04C STATION05550B00155LBERUFORT SAMPLE 24WATER 04C STATION05551B00157LBERUFORT SAMPLE 24WATER 04C STATION05553B00157LBERUFORT SAMPLE 24WATER 04C STATION05554B00157LBERUFORT SAMPLE 24WATER 04C STATION05555B00162LBERUFORT SAMPLE 24WATER 04C STATION05556B00162LBERUFORT SAMPLE 24WATER 04C STATION05557B00163LBERUFORT SAMPLE 24WATER 04C STATION05558B00164LBERUFORT SAMPLE 24WATER 04C STATION05559B00164LBERUFORT SAMPLE 24WATER 04C STATION05571B00165LBERUFORT SAMPLE 24WATER 04C STATION05572B00168LBERUFORT SAMPLE 24WATER 04C STATION05573B00169LBERUFORT SAMPLE 24WATER 04C STATION05574B00171LBERUFORT SAMPLE 24WATER 04C STATION05575B00171LBERUFORT SAMPLE 24WATER 04C STATION05576B00172LBERUFORT SAMPLE 24WATER 04C STATION05577B00173LBERUFORT SAMPLE 24WATER 04C STATION05578B00174LBERUFORT SAMPLE 24WATER 04C STATION05579B00173LBERUFORT SAMPLE 24WATER 04C STATION05579 <td>6765</td> <td>B00124L</td> <td>BEAUFORT</td> <td>SAMPLE</td> <td>27</td> <td>MATER</td> <td></td> <td></td> | 6765 | B00124L | BEAUFORT | SAMPLE | 27 | MATER | | |
| S7B00151LBEAUFORT SAMPLESAMPLE 24WATER WATER WATER 94CSTATION055S8B00152LBEAUFORT SAMPLESAMPLE 24WATER WATER 94CSTATION055S9B00153LBEAUFORT SAMPLESAMPLE 24WATER WATER 94CSTATION055S1B00155LBEAUFORT SAMPLESAMPLE 24WATER WATER 94CSTATION055S2B00157LBEAUFORT SAMPLESAMPLE 24WATER WATER 94CSTATION055S3B00157LBEAUFORT SAMPLESAMPLE 24WATER WATER 94CSTATION055S4B00157LBEAUFORT SAMPLESAMPLE 24WATER WATER 94CSTATION055S5B00162LBEAUFORT SAMPLE SAMPLE24WATER WATER 94CSTATION055S6B00163LBEAUFORT SAMPLE SAMPLE24WATER WATER 94CSTATION055S7B00164LBEAUFORT SAMPLE SAMPLE 24WATER WATER 94CSTATION055S8B00164LBEAUFORT SAMPLE SAMPLE 24WATER WATER 94CSTATION055S9B00165LBEAUFORT SAMPLE 24WATER WATER 94CSTATION055S9B00164LBEAUFORT SAMPLE 24WATER WATER 94CSTATION055S9B00165LBEAUFORT SAMPLE 24WATER WATER 94CSTATION055S9B00165LBEAUFORT SAMPLE 24WATER WATER 94CSTATION055S9B00165LBEAUFO | | | BERHEIORT | SAMPLE | 27 | MATER | 04C | STATION071 |
| See See See See Status | | | | | | | | STATION055 |
| Booltst BEAUFORT SAMPLE 24 WATER 64C STATION655 69 Booltst BEAUFORT SAMPLE 24 WATER 64C STATION655 61 Booltst BEAUFORT SAMPLE 24 WATER 64C STATION655 62 Booltst BEAUFORT SAMPLE 24 WATER 64C STATION655 63 Booltst BEAUFORT SAMPLE 24 WATER 64C STATION655 64 Booltst BEAUFORT SAMPLE 24 WATER 64C STATION655 65 Boolt62L BEAUFORT SAMPLE 24 WATER 64C STATION655 66 Boolt62L BEAUFORT SAMPLE 24 WATER 64C STATION655 67 Boolt64L BEAUFORT SAMPLE 24 WATER 64C STATION655 78 Boolt64L BEAUFORT SAMPLE 24 WATER 64C STATION655 | | | | | | | | |
| Boolstal BEAUFORT SAMPLE 24 MATER 04C STATION055 61 B00155L BEAUFORT SAMPLE 24 MATER 04C STATION055 62 B00156L BEAUFORT SAMPLE 24 MATER 04C STATION055 63 B00157L BEAUFORT SAMPLE 24 MATER 04C STATION055 64 B00159L BEAUFORT SAMPLE 24 MATER 04C STATION055 65 B00163L BEAUFORT SAMPLE 24 MATER 04C STATION055 66 B00164L BEAUFORT SAMPLE 24 MATER 04C STATION055 67 B00166L BEAUFORT SAMPLE 24 MATER 04C STATION055 68 B00166L BEAUFORT SAMPLE 24 MATER 04C STATION055 71 B00167L BEAUFORT SAMPLE 24 MATER 04C STATION055 | | | | | | | | |
| B00155L BEAUFORT SAMPLE 24 MATER 04C STATION055 62 B00155L BEAUFORT SAMPLE 24 MATER 04C STATION055 63 B00157L BEAUFORT SAMPLE 24 MATER 04C STATION055 64 B00159L BEAUFORT SAMPLE 24 MATER 04C STATION055 65 B00162L BEAUFORT SAMPLE 24 MATER 04C STATION055 66 B00163L BEAUFORT SAMPLE 24 MATER 04C STATION055 67 B00164L BEAUFORT SAMPLE 24 MATER 04C STATION055 68 B00164L BEAUFORT SAMPLE 24 MATER 04C STATION055 70 B00165L BEAUFORT SAMPLE 24 MATER 04C STATION055 71 B00172L BEAUFORT SAMPLE 24 MATER 04C STATION055 | 59 | B00153L | | | | | | |
| 62BØ0156LBERUFORTSAMPLE24WATERØ4CSTATION05563BØ0157LBERUFORTSAMPLE24WATERØ4CSTATION05564BØ0159LBERUFORTSAMPLE24WATERØ4CSTATION05565BØ0162LBERUFORTSAMPLE24WATERØ4CSTATION05566BØ0162LBERUFORTSAMPLE24WATERØ4CSTATION05567BØ0163LBERUFORTSAMPLE24WATERØ4CSTATION05568BØ0164LBERUFORTSAMPLE24WATERØ4CSTATION05570BØ0166LBERUFORTSAMPLE24WATERØ4CSTATION05571BØ0169LBERUFORTSAMPLE24WATERØ4CSTATION05573BØ0169LBERUFORTSAMPLE24WATERØ4CSTATION05574BØ0173LBERUFORTSAMPLE24WATERØ4CSTATION05575BØ0171LBERUFORTSAMPLE24WATERØ4CSTATION05576BØ0173LBERUFORTSAMPLE24WATERØ4CSTATION05577BØ0173LBERUFORTSAMPLE24WATERØ4CSTATION05578BØ0174LBERUFORTSAMPLE24WATERØ4CSTATION05578BØ0173LBERUFORTSAMPLE24WATERØ4CSTATION05578BØ0173LBERUFORTSA | 60 | B00154L | BEAUFORT | SAMPLE | | | | |
| 62BØØIS6LBEAUFORTSAMPLE24WATERØ4CSTATION05563BØØIS9LBEAUFORTSAMPLE24WATERØ4CSTATION05564BØØI60LBEAUFORTSAMPLE24WATERØ4CSTATION05565BØØI60LBEAUFORTSAMPLE24WATERØ4CSTATION05566BØØI60LBEAUFORTSAMPLE24WATERØ4CSTATION05567BØØI60LBEAUFORTSAMPLE24WATERØ4CSTATION05568BØØI66LBEAUFORTSAMPLE24WATERØ4CSTATION05570BØØI66LBEAUFORTSAMPLE24WATERØ4CSTATION05571BØØI69LBEAUFORTSAMPLE24WATERØ4CSTATION05573BØØI69LBEAUFORTSAMPLE24WATERØ4CSTATION05574BØØI72LBEAUFORTSAMPLE24WATERØ4CSTATION05575BØØ173LBEAUFORTSAMPLE24WATERØ4CSTATION05576BØØ173LBEAUFORTSAMPLE24WATERØ4CSTATION05577BØØ173LBEAUFORTSAMPLE24WATERØ4CSTATION05578BØØ173LBEAUFORTSAMPLE24WATERØ4CSTATION05578BØØ173LBEAUFORTSAMPLE24WATERØ4CSTATION05578BØØ173LBEAUFORTSA | e, t | R00155L | BEAUFORT | SAMPLE | 24 | MATER | 04C | STATION055 |
| B00157L BEAUFORT SAMPLE 24 MATER 04C STATION055 64 B00159L BEAUFORT SAMPLE 24 MATER 04C STATION055 65 B00162L BEAUFORT SAMPLE 24 MATER 04C STATION055 66 B00163L BEAUFORT SAMPLE 24 MATER 04C STATION055 67 B00164L BEAUFORT SAMPLE 24 MATER 04C STATION055 68 B00165L BEAUFORT SAMPLE 24 MATER 04C STATION055 70 B00166L BEAUFORT SAMPLE 24 MATER 04C STATION055 71 B00169L BEAUFORT SAMPLE 24 MATER 04C STATION055 72 B00171L BEAUFORT SAMPLE 24 MATER 04C STATION055 73 B00172L BEAUFORT SAMPLE 24 MATER 04C STATION055 | | | | SAMPLE | 24 | WATER | 04C | STATION055 |
| 64B00159LREAUFORT SAMPLESAMPLE24MATER MATER04C 64C 64C 64CSTATION05565B00162LBEAUFORT SAMPLESAMPLE24MATER MATER04C 64C 64CSTATION05566B00164LBEAUFORT SAMPLE24MATER MATER04C 64C 64CSTATION05567B00165LBEAUFORT SAMPLE24MATER MATER 64C04C 64C 64CSTATION05569B00166LBEAUFORT SAMPLE24MATER MATER 64C04C 64C 64C 64CSTATION05570B00166LBEAUFORT SAMPLE24MATER MATER 64C04C 64C 64C 64CSTATION05571B00169LBEAUFORT SAMPLESAMPLE 2424MATER MATER 64CSTATION05573B00170LBEAUFORT SAMPLESAMPLE 24WATER MATER 64CSTATION05576B00173LBEAUFORT SAMPLE24WATER MATER 64CSTATION05578B00173LBEAUFORT SAMPLE24WATER MATER 64CSTATION05579B00173LBEAUFORT SAMPLE24WATER MATER 64CSTATION05579B00173LBEAUFORT SAMPLE24WATER MATER 64CSTATION07679B00173LBEAUFORT SAMPLE24WATER MATER 64CSTATION07681300201LBEAUFORT SAMPLE26WATER MATER 64CSTATION07682B00201LBEAUFORT | | | | | | | | STATIONA55 |
| 65 B38168L BEAUFORT SAMPLE 24 WATER 04C STATION055 66 B30162L BEAUFORT SAMPLE 24 WATER 04C STATION055 67 B30163L BEAUFORT SAMPLE 24 WATER 04C STATION055 68 B30166L BEAUFORT SAMPLE 24 WATER 04C STATION055 70 B30166L BEAUFORT SAMPLE 24 WATER 04C STATION055 71 B30167L BEAUFORT SAMPLE 24 WATER 04C STATION055 72 B30169L BEAUFORT SAMPLE 24 WATER 04C STATION055 73 B30170L BEAUFORT SAMPLE 24 WATER 04C STATION055 74 B30172L BEAUFORT SAMPLE 24 WATER 04C STATION055 75 B30172L BEAUFORT SAMPLE 24 WATER 04C STATION055 | | | | | | | | |
| 03030162LBEAUFORTSAMPLE24MATER04CSTATION05567800163LBEAUFORTSAMPLE24MATER04CSTATION05569800165LBEAUFORTSAMPLE24MATER04CSTATION05569800165LBEAUFORTSAMPLE24MATER04CSTATION05570800166LBEAUFORTSAMPLE24MATER04CSTATION05571800168LBEAUFORTSAMPLE24MATER04CSTATION05572800168LBEAUFORTSAMPLE24MATER04CSTATION05573800170LBEAUFORTSAMPLE24MATER04CSTATION05574800172LBEAUFORTSAMPLE24MATER04CSTATION05575800173LBEAUFORTSAMPLE24MATER04CSTATION05576800173LBEAUFORTSAMPLE24WATER04CSTATION05578800173LBEAUFORTSAMPLE24WATER04CSTATION05579800175LBEAUFORTSAMPLE24WATER04CSTATION05579800175LBEAUFORTSAMPLE24WATER04CSTATION05579800175LBEAUFORTSAMPLE26WATER04CSTATION05579800175LBEAUFORTSAMPLE26WATER04CSTATION056800205LBEAUFORTSAMPLE <t< td=""><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></t<> | | | | | | | | |
| 67 Boolest BEAUFORT SAMPLE 24 MATER 04C STATION055 68 B00165L BEAUFORT SAMPLE 24 MATER 04C STATION055 70 B00166L BEAUFORT SAMPLE 24 MATER 04C STATION055 71 B00166L BEAUFORT SAMPLE 24 MATER 04C STATION055 72 B00168L BEAUFORT SAMPLE 24 MATER 04C STATION055 73 B00170L BEAUFORT SAMPLE 24 MATER 04C STATION055 73 B00171L BEAUFORT SAMPLE 24 MATER 04C STATION055 74 B00173L BEAUFORT SAMPLE 24 MATER 04C STATION055 75 B00173L BEAUFORT SAMPLE 24 MATER 04C STATION055 78 B00175L BEAUFORT SAMPLE 24 MATER 04C STATION055 | 65 | •••• | | | | | | |
| 16 BOBIGAL BEAUFORT SAMPLE 24 MATER 04C STATION055 69 BOBIGAL BEAUFORT SAMPLE 24 MATER 04C STATION055 70 BOBIGAL BEAUFORT SAMPLE 24 MATER 04C STATION055 71 BOBIGAL BEAUFORT SAMPLE 24 MATER 04C STATION055 72 BOBIGAL BEAUFORT SAMPLE 24 MATER 04C STATION055 73 BOBI71L BEAUFORT SAMPLE 24 MATER 04C STATION055 74 BOBI71L BEAUFORT SAMPLE 24 MATER 04C STATION055 75 BOBI73L BEAUFORT SAMPLE 24 MATER 04C STATION055 76 BOBI73L BEAUFORT SAMPLE 24 MATER 04C STATION055 78 BOBI74L BEAUFORT SAMPLE 24 MATER 04C STATION070 | 66 | B00162L | BEAUFORT | SAMPLE | | | | |
| 68 B00164L BEAUFORT SAMPLE 24 MATER 04C STATION055 69 B00165L BEAUFORT SAMPLE 24 WATER 04C STATION055 71 B00167L BEAUFORT SAMPLE 24 WATER 04C STATION055 72 B00169L BEAUFORT SAMPLE 24 WATER 04C STATION055 73 B00169L BEAUFORT SAMPLE 24 WATER 04C STATION055 73 B00170L BEAUFORT SAMPLE 24 WATER 04C STATION055 74 B00170L BEAUFORT SAMPLE 24 WATER 04C STATION055 75 B00172L BEAUFORT SAMPLE 24 WATER 04C STATION055 78 B00175L BEAUFORT SAMPLE 24 WATER 04C STATION055 80 B00201L BEAUFORT SAMPLE 24 WATER 04C STATION070 | 67 | R00163L | BEAUFORT | SAMPLE | 24 | MATER | 04C | STATION055 |
| 69 B00165L BEAUFORT SAMPLE 24 WATER 04C STATION055 70 B00166L BEAUFORT SAMPLE 24 WATER 04C STATION055 71 B00166L BEAUFORT SAMPLE 24 WATER 04C STATION055 72 B00168L BEAUFORT SAMPLE 24 WATER 04C STATION055 73 B00170L BEAUFORT SAMPLE 24 WATER 04C STATION055 74 B00171L BEAUFORT SAMPLE 24 WATER 04C STATION055 75 B00171L BEAUFORT SAMPLE 24 WATER 04C STATION055 76 B00173L BEAUFORT SAMPLE 24 WATER 04C STATION055 78 B00175L BEAUFORT SAMPLE 24 WATER 04C STATION055 79 B00125L BEAUFORT SAMPLE 24 WATER 04C STATION070 | | | BEAUFORT. | SAMPLE | 24 | MATER | 04C | STATION055 |
| 79 B00166L BEAUFORT SAMPLE 24 WATER 04C STATION055 71 B00168L BEAUFORT SAMPLE 24 WATER 04C STATION055 72 B00168L BEAUFORT SAMPLE 24 WATER 04C STATION055 73 B00170L BEAUFORT SAMPLE 24 WATER 04C STATION055 74 B00170L BEAUFORT SAMPLE 24 WATER 04C STATION055 75 B00171L BEAUFORT SAMPLE 24 WATER 04C STATION055 76 B00173L BEAUFORT SAMPLE 24 WATER 04C STATION055 78 B00174L BEAUFORT SAMPLE 24 WATER 04C STATION055 78 B00174L BEAUFORT SAMPLE 24 WATER 04C STATION055 78 B00174L BEAUFORT SAMPLE 24 WATER 04C STATION055 | | | | | $^{\circ}a$ | WATER | <u>04С</u> | STATION055 |
| 71 B00167L BEAUFORT SAMPLE 24 WATER 04C STATION055 72 B00168L BEAUFORT SAMPLE 24 WATER 04C STATION055 73 B00170L BEAUFORT SAMPLE 24 WATER 04C STATION055 74 B00170L BEAUFORT SAMPLE 24 WATER 04C STATION055 75 B00171L BEAUFORT SAMPLE 24 WATER 04C STATION055 76 B00173L BEAUFORT SAMPLE 24 WATER 04C STATION055 77 B00173L BEAUFORT SAMPLE 24 WATER 04C STATION055 78 B00175L BEAUFORT SAMPLE 24 WATER 04C STATION055 79 B00175L BEAUFORT SAMPLE 24 WATER 04C STATION076 81 B00201L BEAUFORT SAMPLE 26 WATER 04C STATION070 82 B00203L BEAUFORT SAMPLE 26 WATER | | | | | | | | |
| 72B00168LBEAUFORTSAMPLE24MATER04CSTATION05573B00169LBEAUFORTSAMPLE24MATER04CSTATION05574B00170LBEAUFORTSAMPLE24MATER04CSTATION05575B00171LBEAUFORTSAMPLE24MATER04CSTATION05576B00172LBEAUFORTSAMPLE24MATER04CSTATION05577B00173LBEAUFORTSAMPLE24MATER04CSTATION05578B00174LBEAUFORTSAMPLE24MATER04CSTATION05578B00175LBEAUFORTSAMPLE24MATER04CSTATION05580B00201LBEAUFORTSAMPLE24MATER04CSTATION05580B002021LBEAUFORTSAMPLE26MATER04CSTATION07081B00203LBEAUFORTSAMPLE26MATER04CSTATION07082B00203LBEAUFORTSAMPLE26MATER04CSTATION07083B00203LBEAUFORTSAMPLE26MATER04CSTATION07084B00206LBEAUFORTSAMPLE26MATER04CSTATION07085B00207LBEAUFORTSAMPLE26MATER04CSTATION07086B00208LBEAUFORTSAMPLE26MATER04CSTATION07087B00210LBEAUFORTS | | | | | | | | |
| 73B00169LBEAUFORTSAMPLE24MATER04CSTATION05574B00170LBEAUFORTSAMPLE24MATER04CSTATION05575B00171LBEAUFORTSAMPLE24MATER04CSTATION05576B00173LBEAUFORTSAMPLE24MATER04CSTATION05577B00173LBEAUFORTSAMPLE24MATER04CSTATION05578B00174LBEAUFORTSAMPLE24MATER04CSTATION05579B00175LBEAUFORTSAMPLE24MATER04CSTATION05580B00201LBEAUFORTSAMPLE26MATER04CSTATION05580B00202LBEAUFORTSAMPLE26MATER04CSTATION07081B00203LBEAUFORTSAMPLE26MATER04CSTATION07082B00203LBEAUFORTSAMPLE26MATER04CSTATION07083B00203LBEAUFORTSAMPLE26MATER04CSTATION07084B00206LBEAUFORTSAMPLE26MATER04CSTATION07085B00203LBEAUFORTSAMPLE26MATER04CSTATION07086B00208LBEAUFORTSAMPLE26MATER04CSTATION07087B00213LBEAUFORTSAMPLE26MATER04CSTATION07088B00213LBEAUFORTSA | | | | | | • • • • • • • • • • | | |
| 74Baol 70LBEAUFORTSAMPLE24WATER04CSTATION05575B00171LBEAUFORTSAMPLE24WATER04CSTATION05576B00172LBEAUFORTSAMPLE24WATER04CSTATION05577B00173LBEAUFORTSAMPLE24WATER04CSTATION05578B00173LBEAUFORTSAMPLE24WATER04CSTATION05579B00175LBEAUFORTSAMPLE24WATER04CSTATION05579B00175LBEAUFORTSAMPLE24WATER04CSTATION05579B00175LBEAUFORTSAMPLE26WATER04CSTATION05580B00201LBEAUFORTSAMPLE26WATER04CSTATION07081B20202LBEAUFORTSAMPLE26WATER04CSTATION07082B00203LBEAUFORTSAMPLE26WATER04CSTATION07083B00205LBEAUFORTSAMPLE26WATER04CSTATION07084B00206LBEAUFORTSAMPLE26WATER04CSTATION07085B00209LBEAUFORTSAMPLE26WATER04CSTATION07086B00209LBEAUFORTSAMPLE26WATER04CSTATION07087B00213LBEAUFORTSAMPLE26WATER04CSTATION07089B00214LBEAUFORTS | | | | | | | | |
| 75B00171LBEAUFORTSAMPLE24WATER04CSTATION05576B00173LBEAUFORTSAMPLE24WATER04CSTATION05577B00173LBEAUFORTSAMPLE24WATER04CSTATION05578B00174LBEAUFORTSAMPLE24WATER04CSTATION05579B00175LBEAUFORTSAMPLE24WATER04CSTATION05580B00201LBEAUFORTSAMPLE24WATER04CSTATION05580B00203LBEAUFORTSAMPLE26WATER04CSTATION07081B30203LBEAUFORTSAMPLE26WATER04CSTATION07082B00203LBEAUFORTSAMPLE26WATER04CSTATION07083B00205LBEAUFORTSAMPLE26WATER04CSTATION07084B00205LBEAUFORTSAMPLE26WATER04CSTATION07085B00205LBEAUFORTSAMPLE26WATER04CSTATION07086B00208LBEAUFORTSAMPLE26WATER04CSTATION07087B00210LBEAUFORTSAMPLE26WATER04CSTATION07088B00210LBEAUFORTSAMPLE26WATER04CSTATION07099B00211LBEAUFORTSAMPLE26WATER04CSTATION07091B00213LBEAUFORTSA | 73 | 800169L | BEAUFORT | | | | | |
| 76B00172LBEAUFORTSAMPLE24WATER04CSTATION05577B00173LBEAUFORTSAMPLE24WATER04CSTATION05578B00174LBEAUFORTSAMPLE24WATER04CSTATION05579B00175LBEAUFORTSAMPLE24WATER04CSTATION05580B00201LBEAUFORTSAMPLE26WATER04CSTATION07031330202LBEAUFORTSAMPLE26WATER04CSTATION07032B00203LBEAUFORTSAMPLE26WATER04CSTATION07033B00205LBEAUFORTSAMPLE26WATER04CSTATION07084B00206LBEAUFORTSAMPLE26WATER04CSTATION07085B00207LBEAUFORTSAMPLE26WATER04CSTATION07086B00208LBEAUFORTSAMPLE26WATER04CSTATION07087B00209LBEAUFORTSAMPLE26WATER04CSTATION07088B00211LBEAUFORTSAMPLE26WATER04CSTATION07098B00213LBEAUFORTSAMPLE26WATER04CSTATION07091B00213LBEAUFORTSAMPLE26WATER04CSTATION07093B00213LBEAUFORTSAMPLE26WATER04CSTATION07094B00216LBEAUFORTSA | 74 | B00170L | BEAUFORT | SAMPLE | 24 | MATER | 04C | STATION055 |
| 76 B00172L BEAUFORT SAMPLE 24 MATER 04C STATION055 77 B00173L BEAUFORT SAMPLE 24 MATER 04C STATION055 78 B00174L BEAUFORT SAMPLE 24 MATER 04C STATION055 79 B00175L BEAUFORT SAMPLE 24 MATER 04C STATION055 80 B00201L BEAUFORT SAMPLE 24 MATER 04C STATION055 80 B00201L BEAUFORT SAMPLE 26 MATER 04C STATION070 91 B30203L BEAUFORT SAMPLE 26 MATER 04C STATION070 83 B00205L BEAUFORT SAMPLE 26 MATER 04C STATION070 84 B00206L BEAUFORT SAMPLE 26 MATER 04C STATION070 85 B00207L BEAUFORT SAMPLE 26 MATER 04C STATION070 86 B00208L BEAUFORT SAMPLE 26 MATER | 2755 | B00171L | BEAUFORT | SAMPLE | $\mathbb{Z}4$ | MATER | 04C | STATION055 |
| 77 B00173L BEAUFORT SAMPLE 24 WATER 04C STATION055 78 B00175L BEAUFORT SAMPLE 24 WATER 04C STATION055 79 B00175L BEAUFORT SAMPLE 24 WATER 04C STATION055 80 B00201L BEAUFORT SAMPLE 26 WATER 04C STATION070 91 330202L BEAUFORT SAMPLE 26 WATER 04C STATION070 92 B00203L BEAUFORT SAMPLE 26 WATER 04C STATION070 83 B00203L BEAUFORT SAMPLE 26 WATER 04C STATION070 84 B00206L BEAUFORT SAMPLE 26 WATER 04C STATION070 85 B00207L BEAUFORT SAMPLE 26 WATER 04C STATION070 86 B00208L BEAUFORT SAMPLE 26 WATER 04C STATION070 87 B00210L BEAUFORT SAMPLE 26 WATER | | | BEELIFORT | SAMPLE | 24 | MATER | 04C | STATION055 |
| 78B00174LBEAUFORTSAMPLE24WATER04CSTATION05579B00175LBEAUFORTSAMPLE24WATER04CSTATION05580B00201LBEAUFORTSAMPLE26WATER04CSTATION07031B30202LBEAUFORTSAMPLE26WATER04CSTATION07032B00203LBEAUFORTSAMPLE26WATER04CSTATION07033B00205LBEAUFORTSAMPLE26WATER04CSTATION07084B00206LBEAUFORTSAMPLE26WATER04CSTATION07085B00207LBEAUFORTSAMPLE26WATER04CSTATION07086B00208LBEAUFORTSAMPLE26WATER04CSTATION07087B00209LBEAUFORTSAMPLE26WATER04CSTATION07088B00210LBEAUFORTSAMPLE26WATER04CSTATION07089B00211LBEAUFORTSAMPLE26WATER04CSTATION07090B00213LBEAUFORTSAMPLE26WATER04CSTATION07091B00213LBEAUFORTSAMPLE26WATER04CSTATION07092B00216LBEAUFORTSAMPLE26WATER04CSTATION07093B00216LBEAUFORTSAMPLE26WATER04CSTATION07094B00216LBEAUFORTSA | | | | - | | | 640 | STATION055 |
| 79B00175LBEAUFORTSAMPLE24WATER04CSTATION05580B00201LBEAUFORTSAMPLE26WATER04CSTATION07031B00203LBEAUFORTSAMPLE26WATER04CSTATION07032B00203LBEAUFORTSAMPLE26WATER04CSTATION07033B00205LBEAUFORTSAMPLE26WATER04CSTATION07034B00206LBEAUFORTSAMPLE26WATER04CSTATION07035B00207LBEAUFORTSAMPLE26WATER04CSTATION07036B00208LBEAUFORTSAMPLE26WATER04CSTATION07037B00209LBEAUFORTSAMPLE26WATER04CSTATION07038B00210LBEAUFORTSAMPLE26WATER04CSTATION07039B00211LBEAUFORTSAMPLE26WATER04CSTATION07039B00213LBEAUFORTSAMPLE26WATER04CSTATION07039B00214LBEAUFORTSAMPLE26WATER04CSTATION07039B00216LBEAUFORTSAMPLE26WATER04CSTATION07039B00216LBEAUFORTSAMPLE26WATER04CSTATION07039B00216LBEAUFORTSAMPLE26WATER04CSTATION07039B00216LBEAUFORTSA | | | | | | | | |
| 80B00201LBEAUFORTSAMPLE26MATER04CSTATION07031330202L32AUFORTSAMPLE26MATER04CSTATION07032B00203LBEAUFORTSAMPLE26MATER04CSTATION07033B00205LBEAUFORTSAMPLE26MATER04CSTATION07034B00206LBEAUFORTSAMPLE26MATER04CSTATION07035B00207LBEAUFORTSAMPLE26MATER04CSTATION07036B00208LBEAUFORTSAMPLE26MATER04CSTATION07037B00209LBEAUFORTSAMPLE26MATER04CSTATION07038B00210LBEAUFORTSAMPLE26MATER04CSTATION07039B00211LBEAUFORTSAMPLE26MATER04CSTATION07039B00213LBEAUFORTSAMPLE26MATER04CSTATION07039B00214LBEAUFORTSAMPLE26MATER04CSTATION07039B00215LBEAUFORTSAMPLE26MATER04CSTATION07034B00216LBEAUFORTSAMPLE26MATER04CSTATION07034B00216LBEAUFORTSAMPLE26MATER04CSTATION07036B00218LBEAUFORTSAMPLE26MATER04CSTATION07036B00216LBEAUFORTSA | | | | | | | | |
| S1338282LSEAUFORTSAMPLE26MATER04CSTATION07032B08203LBEAUFORTSAMPLE26MATER04CSTATION07033B08205LBEAUFORTSAMPLE26MATER04CSTATION07034B08206LBEAUFORTSAMPLE26MATER04CSTATION07035B08207LBEAUFORTSAMPLE26MATER04CSTATION07036B08208LBEAUFORTSAMPLE26MATER04CSTATION07037B08209LBEAUFORTSAMPLE26MATER04CSTATION07038B08210LBEAUFORTSAMPLE26MATER04CSTATION07038B08210LBEAUFORTSAMPLE26MATER04CSTATION07039B08211LBEAUFORTSAMPLE26MATER04CSTATION07090B08213LBEAUFORTSAMPLE26MATER04CSTATION07091B08213LBEAUFORTSAMPLE26MATER04CSTATION07092B08214LBEAUFORTSAMPLE26MATER04CSTATION07093B08215LBEAUFORTSAMPLE26MATER04CSTATION07094B08216LBEAUFORTSAMPLE26MATER04CSTATION07095B08217LBEAUFORTSAMPLE26MATER04CSTATION07096B08216LBEAUFORTSA | | | | | | | | |
| 32B00203LBEAUFORTSAMPLE26MATER04CSTATION07083B00205LBEAUFORTSAMPLE26MATER04CSTATION07084B00206LBEAUFORTSAMPLE26MATER04CSTATION07085B00208LBEAUFORTSAMPLE26MATER04CSTATION07086B00208LBEAUFORTSAMPLE26MATER04CSTATION07087B00209LBEAUFORTSAMPLE26MATER04CSTATION07088B00210LBEAUFORTSAMPLE26MATER04CSTATION07089B00211LBEAUFORTSAMPLE26MATER04CSTATION07090B00212LBEAUFORTSAMPLE26MATER04CSTATION07091B00213LBEAUFORTSAMPLE26MATER04CSTATION07092B00214LBEAUFORTSAMPLE26MATER04CSTATION07093B00216LBEAUFORTSAMPLE26MATER04CSTATION07094B00216LBEAUFORTSAMPLE26MATER04CSTATION07095B00213LBEAUFORTSAMPLE26MATER04CSTATION07096B00218LBEAUFORTSAMPLE26MATER04CSTATION07097B00219LBEAUFORTSAMPLE26MATER04CSTATION07098B00219LBEAUFORTSA | | | | | | | | |
| 83800205LBEAUFORTSAMPLE26WATER04CSTATION07084800206LBEAUFORTSAMPLE26WATER04CSTATION07085800207LBEAUFORTSAMPLE26WATER04CSTATION07086800209LBEAUFORTSAMPLE26WATER04CSTATION07087B00209LBEAUFORTSAMPLE26WATER04CSTATION07088800210LBEAUFORTSAMPLE26WATER04CSTATION07089800210LBEAUFORTSAMPLE26WATER04CSTATION07090800213LBEAUFORTSAMPLE26WATER04CSTATION07091800213LBEAUFORTSAMPLE26WATER04CSTATION07092800214LBEAUFORTSAMPLE26WATER04CSTATION07093800215LBEAUFORTSAMPLE26WATER04CSTATION07094800216LBEAUFORTSAMPLE26WATER04CSTATION07095800217LBEAUFORTSAMPLE26WATER04CSTATION07096800218LBEAUFORTSAMPLE26WATER04CSTATION07097800219LBEAUFORTSAMPLE26WATER04CSTATION07098800220LBEAUFORTSAMPLE26WATER04CSTATION07099800221LBEAUFORTSA | | 38 9202L | | | | MHTER | | * · · · · · · · · · · · · · |
| 84B00206LBEAUFORTSAMPLE26WATER04CSTATION07085B00207LBEAUFORTSAMPLE26WATER04CSTATION07086B00208LBEAUFORTSAMPLE26WATER04CSTATION07087B00209LBEAUFORTSAMPLE26WATER04CSTATION07088B00210LBEAUFORTSAMPLE26WATER04CSTATION07089B00211LBEAUFORTSAMPLE26WATER04CSTATION07090B00212LBEAUFORTSAMPLE26WATER04CSTATION07091B00213LBEAUFORTSAMPLE26WATER04CSTATION07092B00213LBEAUFORTSAMPLE26WATER04CSTATION07093B00216LBEAUFORTSAMPLE26WATER04CSTATION07094B00216LBEAUFORTSAMPLE26WATER04CSTATION07095B00217LBEAUFORTSAMPLE26WATER04CSTATION07096B00218LBEAUFORTSAMPLE26WATER04CSTATION07097B00219LBEAUFORTSAMPLE26WATER04CSTATION07098B00220LBEAUFORTSAMPLE26WATER04CSTATION07098B00220LBEAUFORTSAMPLE26WATER04CSTATION07099B00221LBEAUFORTSA | 32 | 899203L | BERUFORT | SAMPLE | 26 | MATER | 04C | STATION070 |
| 84B00206LBEAUFORTSAMPLE26WATER04CSTATION07085B00207LBEAUFORTSAMPLE26WATER04CSTATION07086B00209LBEAUFORTSAMPLE26WATER04CSTATION07087B00209LBEAUFORTSAMPLE26WATER04CSTATION07088B00210LBEAUFORTSAMPLE26WATER04CSTATION07089B00211LBEAUFORTSAMPLE26WATER04CSTATION07090B00212LBEAUFORTSAMPLE26WATER04CSTATION07091B00213LBEAUFORTSAMPLE26WATER04CSTATION07092B00214LBEAUFORTSAMPLE26WATER04CSTATION07093B00215LBEAUFORTSAMPLE26WATER04CSTATION07094B00216LBEAUFORTSAMPLE26WATER04CSTATION07095B00217LBEAUFORTSAMPLE26WATER04CSTATION07096B00218LBEAUFORTSAMPLE26WATER04CSTATION07097B00219LBEAUFORTSAMPLE26WATER04CSTATION07098B00220LBEAUFORTSAMPLE26WATER04CSTATION07098B00220LBEAUFORTSAMPLE26WATER04CSTATION07099B00221LBEAUFORTSA | 83 | B00205L | BEAUFORT | SAMPLE | 26 | MATER | 04C | STATION070 |
| 85B00207LBEAUFORTSAMPLE26WATER04CSTATION07086B00208LBEAUFORTSAMPLE26WATER04CSTATION07087B00209LBEAUFORTSAMPLE26WATER04CSTATION07088B00210LBEAUFORTSAMPLE26WATER04CSTATION07089B00211LBEAUFORTSAMPLE26WATER04CSTATION07090B00212LBEAUFORTSAMPLE26WATER04CSTATION07091B00213LBEAUFORTSAMPLE26WATER04CSTATION07092B00214LBEAUFORTSAMPLE26WATER04CSTATION07093B00216LBEAUFORTSAMPLE26WATER04CSTATION07094B00216LBEAUFORTSAMPLE26WATER04CSTATION07095B00218LBEAUFORTSAMPLE26WATER04CSTATION07096B00218LBEAUFORTSAMPLE26WATER04CSTATION07097B00219LBEAUFORTSAMPLE26WATER04CSTATION07098B00220LBEAUFORTSAMPLE26WATER04CSTATION07099B00221LBEAUFORTSAMPLE26WATER04CSTATION07094B00219LBEAUFORTSAMPLE26WATER04CSTATION07095B00218LBEAUFORTSA | | • | REBUECET | SAMPLE | 26 | MATER | 04C | STATION070 |
| 86B00208LBEAUFORTSAMPLE26WATER04CSTATION07087B00209LBEAUFORTSAMPLE26WATER04CSTATION07088B00210LBEAUFORTSAMPLE26WATER04CSTATION07089B00211LBEAUFORTSAMPLE26WATER04CSTATION07090B00212LBEAUFORTSAMPLE26WATER04CSTATION07091B00213LBEAUFORTSAMPLE26WATER04CSTATION07092B00213LBEAUFORTSAMPLE26WATER04CSTATION07093B00215LBEAUFORTSAMPLE26WATER04CSTATION07094B00216LBEAUFORTSAMPLE26WATER04CSTATION07095B00216LBEAUFORTSAMPLE26WATER04CSTATION07096B00218LBEAUFORTSAMPLE26WATER04CSTATION07097B00219LBEAUFORTSAMPLE26WATER04CSTATION07098B00220LBEAUFORTSAMPLE26WATER04CSTATION07098B00220LBEAUFORTSAMPLE26WATER04CSTATION07099B00221LBEAUFORTSAMPLE26WATER04CSTATION07093B00221LBEAUFORTSAMPLE26WATER04CSTATION07094B00221LBEAUFORTSA | | | | SAMPLE | 26 | | 04C | STATION070 |
| 87Ba0209LBEAUFORTSAMPLE26MATER04CSTATION07088B00210LBEAUFORTSAMPLE26MATER04CSTATION07089B00211LBEAUFORTSAMPLE26MATER04CSTATION07090B00212LBEAUFORTSAMPLE26MATER04CSTATION07091B00213LBEAUFORTSAMPLE26MATER04CSTATION07092B00214LBEAUFORTSAMPLE26MATER04CSTATION07093B00215LBEAUFORTSAMPLE26MATER04CSTATION07094B00216LBEAUFORTSAMPLE26MATER04CSTATION07095B00216LBEAUFORTSAMPLE26MATER04CSTATION07096B00218LBEAUFORTSAMPLE26MATER04CSTATION07097B00219LBEAUFORTSAMPLE26MATER04CSTATION07098B00220LBEAUFORTSAMPLE26MATER04CSTATION07098B00221LBEAUFORTSAMPLE26MATER04CSTATION07099B00221LBEAUFORTSAMPLE26MATER04CSTATION07093B00221LBEAUFORTSAMPLE26MATER04CSTATION07094B002221LBEAUFORTSAMPLE26MATER04CSTATION070 | | | | | | | | |
| S8B00210LBEAUFORTSAMPLE26MATER04CSTATION07089B00211LBEAUFORTSAMPLE26MATER04CSTATION07090B00212LBEAUFORTSAMPLE26MATER04CSTATION07091B00213LBEAUFORTSAMPLE26MATER04CSTATION07092B00214LBEAUFORTSAMPLE26MATER04CSTATION07093B00215LBEAUFORTSAMPLE26MATER04CSTATION07094B00216LBEAUFORTSAMPLE26MATER04CSTATION07095B00217LBEAUFORTSAMPLE26MATER04CSTATION07096B00218LBEAUFORTSAMPLE26MATER04CSTATION07097B00219LBEAUFORTSAMPLE26MATER04CSTATION07098B00220LBEAUFORTSAMPLE26MATER04CSTATION07099B00221LBEAUFORTSAMPLE26MATER04CSTATION070 | | | | . | | | | |
| 89B00211LBEAUFORTSAMPLE26WATER04CSTATION07090B00212LBEAUFORTSAMPLE26WATER04CSTATION07091B00213LBEAUFORTSAMPLE26WATER04CSTATION07092B00214LBEAUFORTSAMPLE26WATER04CSTATION07093B00215LBEAUFORTSAMPLE26WATER04CSTATION07094B00216LBEAUFORTSAMPLE26WATER04CSTATION07095B00216LBEAUFORTSAMPLE26WATER04CSTATION07096B00218LBEAUFORTSAMPLE26WATER04CSTATION07097B00219LBEAUFORTSAMPLE26WATER04CSTATION07098B00220LBEAUFORTSAMPLE26WATER04CSTATION07099B00221LBEAUFORTSAMPLE26WATER04CSTATION070 | | | | | | | | |
| 90B00212LBEAUFORTSAMPLE26WATER04CSTATION07091B00213LBEAUFORTSAMPLE26WATER04CSTATION07092B00214LBEAUFORTSAMPLE26WATER04CSTATION07093B00215LBEAUFORTSAMPLE26WATER04CSTATION07094B00216LBEAUFORTSAMPLE26WATER04CSTATION07095B00217LBEAUFORTSAMPLE26WATER04CSTATION07096B00218LBEAUFORTSAMPLE26WATER04CSTATION07097B00219LBEAUFORTSAMPLE26WATER04CSTATION07098B00220LBEAUFORTSAMPLE26WATER04CSTATION07099B00221LBEAUFORTSAMPLE26WATER04CSTATION070 | | | | | | | | |
| 91B00213LBEAUFORTSAMPLE26MATER04CSTATION07092B00214LBEAUFORTSAMPLE26MATER04CSTATION07093B00215LBEAUFORTSAMPLE26MATER04CSTATION07094B00216LBEAUFORTSAMPLE26MATER04CSTATION07095B00217LBEAUFORTSAMPLE26MATER04CSTATION07096B00218LBEAUFORTSAMPLE26MATER04CSTATION07097B00219LBEAUFORTSAMPLE26MATER04CSTATION07098B00220LBEAUFORTSAMPLE26MATER04CSTATION07099B00221LBEAUFORTSAMPLE26MATER04CSTATION070 | 89 | B00211L | BEAUFORT | SAMPLE | | | | |
| 91B00213LBEAUFORTSAMPLE26MATER04CSTATION07092B00214LBEAUFORTSAMPLE26WATER04CSTATION07093B00215LBEAUFORTSAMPLE26WATER04CSTATION07094B00216LBEAUFORTSAMPLE26WATER04CSTATION07095B00217LBEAUFORTSAMPLE26WATER04CSTATION07096B00218LBEAUFORTSAMPLE26WATER04CSTATION07097B00219LBEAUFORTSAMPLE26WATER04CSTATION07098B00220LBEAUFORTSAMPLE26WATER04CSTATION07099B00221LBEAUFORTSAMPLE26WATER04CSTATION070 | 90 | 890212L | BEAUFORT | SAMPLE | 26 | HATER | 04C | STATION070 |
| 92B00214LBERUFORTSAMPLE26WATER04CSTATION07093B00215LBEAUFORTSAMPLE26WATER04CSTATION07094B00216LBEAUFORTSAMPLE26WATER04CSTATION07095B00217LBEAUFORTSAMPLE26WATER04CSTATION07096B00218LBEAUFORTSAMPLE26WATER04CSTATION07097B00219LBEAUFORTSAMPLE26WATER04CSTATION07098B00220LBEAUFORTSAMPLE26WATER04CSTATION07099B00221LBEAUFORTSAMPLE26WATER04CSTATION070 | | | REBUFORT | SAMPLE | 26 | MATER | 04C | STATION070 |
| 93B00215LBEAUFORTSAMPLE26WATER04CSTATION07094B00216LBEAUFORTSAMPLE26WATER04CSTATION07095B00217LBEAUFORTSAMPLE26WATER04CSTATION07096B00218LBEAUFORTSAMPLE26WATER04CSTATION07097B00219LBEAUFORTSAMPLE26WATER04CSTATION07098B00220LBEAUFORTSAMPLE26WATER04CSTATION07099B00221LBEAUFORTSAMPLE26WATER04CSTATION070 | | | | | | | | |
| 94B00216LBEAUFORTSAMPLE26WATER04CSTATION07095B00217LBEAUFORTSAMPLE26WATER04CSTATION07096B00218LBEAUFORTSAMPLE26WATER04CSTATION07097B00219LBEAUFORTSAMPLE26WATER04CSTATION07098B00220LBEAUFORTSAMPLE26WATER04CSTATION07099B00221LBEAUFORTSAMPLE26WATER04CSTATION070 | | | | | | | | |
| 95B00217LBEAUFORT SAMPLE 26 WATER 04C STATION07096B00218LBEAUFORT SAMPLE 26 WATER 04C STATION07097B00219LBEAUFORT SAMPLE 26 WATER 04C STATION07098B00220LBEAUFORT SAMPLE 26 WATER 04C STATION07099B00221LBEAUFORT SAMPLE 26 WATER 04C STATION070 | | | | | | | | |
| 96B00218LBEAUFORT SAMPLE 26WATER 04C STATION07097B00219LBEAUFORT SAMPLE 26WATER 04C STATION07098B00220LBEAUFORT SAMPLE 26WATER 04C STATION07099B00221LBEAUFORT SAMPLE 26WATER 04C STATION070 | | | | | | | | |
| 97B00219LBEAUFORT SAMPLE 26 WATER 04C STATION07098B00220LBEAUFORT SAMPLE 26 WATER 04C STATION07099800221LBEAUFORT SAMPLE 26 WATER 04C STATION070 | | | | | | | | |
| 98 B00220L BEAUFORT SAMPLE 26 WATER 04C STATION070 99 B00221L BEAUFORT SAMPLE 26 WATER 04C STATION070 | | | | | | | | |
| 98B80220LBEAUFORT SAMPLE 26 WATER 04C STATION07099800221LBEAUFORT SAMPLE 26 WATER 04C STATION070 | 97 | B00219L | BEAUFORT | | | | | |
| 99 800221L BEAUFORT SAMPLE 26 WATER 04C STATION070 | | | BEAUFORT | SAMPLE | 26 | MATER | 04C | STATION070 |
| | | | | | | | | |
| al offer all of or becken becken and all and the second second second second second second second second second | | | | | | | | |
| | a | ata" an' an' kaon laon laon laon | and and the first | | 1.01.0 | | | |

| 101 | F99553F | BEAUFORT | SAMPLE | 26 | MATER | 04C | STATION070 |
|-----|---------|----------|--------|-----|-------|-----|------------|
| 102 | 866224L | BEAUFORT | SAMPLE | 26 | MATER | 04C | STATION070 |
| 193 | 399278L | BEAUFORT | SAMPLE | 11 | MATER | 04C | STATION030 |
| 104 | D99289L | BERUFORT | | | | -, | STATION030 |
| 195 | B30281L | BEAUFORT | SAMPLE | 19 | MATER | 04C | STRTION001 |
| 196 | B90585F | REAUFORT | SAMPLE | 19 | MATER | 04C | STATION001 |
| 197 | 800283L | BEAUFORT | SAMPLE | 1) | MATER | 04C | STATION001 |
| 198 | E00284L | BEAUFORT | SAMPLE | 19 | MATER | 04C | STATION001 |
| 109 | B00291L | BEAUFORT | SAMPLE | | MATER | 04C | STATION002 |
| 110 | B90595L | BEAUFORT | SAMPLE | 36 | MATER | 04C | STATION002 |

EMD FORM

.

| | والعوال ومعروفهم والارداد والدا | | And the second second second | (D) (D) | | 040 | CONTRACTOR CONTRACTOR |
|------------|---------------------------------|---------------------|--|------------|--|------|--------------------------|
| ية. | 209 826L | BEAUFORT | SAMPLE | 03 | SEDIMENT | 04C | STATION010 |
| Ë | 800027L | BEAUFORT | SAMPLE | 03 | SEDIMENT | 04C | STATION010 |
| 3 | 800028L | BEAUFORT | SAMPLE | 63 | SEDIMENT | 04C | STATION010 |
| 라 | B00029L | BEAUFORT | SAMPLE | 63 | SEDIMENT | 04C | STATION010 |
| 5 | 800030L | BEAUFORT | SAMPLE | 03 | SEDIMENT | 04C | STATION010 |
| ÷ | B00031L | BEAUFORT | SAMPLE | 03 | SEDIMENT | 94C | STATION010 |
| 7 | 800032L | BEAUFORT | SAMPLE | ЮЗ | SEDIMENT | Ø4C | STATION010 |
| 8 | 800033L | BEAUFORT | SAMPLE | 83 | SEDIMENT | 04C | STATION010 |
| 9 | B99934L | BEAUFORT | SAMPLE | 03 | SEDIMENT | 94C | STATION010 |
| 10 | 800035L | BEAUFORT | SAMPLE | 03 | SEDIMENT | 04C | STATION010 |
| 11 | B90036L | BEAUFORT | SAMPLE | 03 | SEDIMENT | 04C | STATION010 |
| 12 | B00037L | BEAUFORT | SAMPLE | 83 | SEDIMENT | 04C | STATION010 |
| 13 | 800038L | BEAUFORT | SAMPLE | 03 | SEDIMENT | 04C | STATION010 |
| 14 | 800039L | BERUFORT | SEMPLE | 03 | SEDIMENT | 04C | STATION010 |
| 15 | BOOD40L | BEAUFORT | SAMPLE | 03 | SEDIMENT | 04C | STATION010 |
| 16 | B00041L | BEAUFORT | SAMPLE | 03 | SEDIMENT | 04C | STATION010 |
| $10 \\ 17$ | B00042L | BEAUFORT | SAMPLE | õ3 | SEDIMENT | 04C | STATION010 |
| 18 | B00042L | BEAUFORT | SAMPLE | 03 | SEDIMENT | 04C | STATION010 |
| | B00043L | BEAUFORT | SAMPLE | 03 03 | SEDIMENT | 04C | STATION010 |
| 19 | | BEAUFORT | SAMPLE | 03 03 | SEDIMENT | 04C | STATION010 |
| 20 | 800046L | | SAMPLE | 03 | SEDIMENT | 04C | STATION010 |
| 21 | B00047L | BEAUFORT | SAMPLE | | SEDIMENT | 04C | STATION010 |
| 22 | B00048L | BEAUFORT | | | | 04C | STATION010 |
| 23 | B00049L | BEAUFORT | SAMPLE | 03 | SEDIMENT | | STATION010 |
| 24 | 800050L | BERUFORT | SAMPLE | 63 | SEDIMENT | 04C | |
| 25 | B00076L | BEAUFORT | SAMPLE | 16 | SEDIMENT | 04C | STATION002 |
| 26 | B00077L | BEHUFORT | SAMPLE | 16 | SEDIMENT | 040 | STATION002 |
| 27 | B00078L | BEAUFORT | SAMPLE | 16 | SEDIMENT | 04C | STATION002 |
| 28 | 800079L | BEAUFORT | SAMPLE | 16 | SEDIMENT | 04C | STATION002 |
| 29 | 300080L | BEAUFORT | SAMPLE | 16 | SEDIMENT | 04C | STATION002 |
| 30 | B00082L | BEAUFORT | SAMPLE | 16 | SEDIMENT | 04C | STATION002 |
| 31 | 800083L | BEAUFORT | SAMPLE | 16 | SEDIMENT | 04C | STATION002 |
| 32 | B00084L | BEAUFORT | SAMPLE | 16 | SEDIMENT | 04C | STATION002 |
| 33 | B00085L | BEAUFORT | SAMPLE | 16 | SEDIMENT | 04C | STATION002 |
| 34 | B00086L | BEAUFORT | SAMPLE | 16 | SEDIMENT | 04C | STATION002 |
| 35 | 800087L | BEAUFORT | SAMPLE | 16 | SEDIMENT | 040 | STATION002 |
| 36 | B0008SL | BEAUFORT | SAMPLE | 16 | SEDIMENT | 04C | STATION002 |
| 37 | B00089L | BEAUFORT | SAMPLE | 16 | SEDIMENT | 04C | STATION002 |
| 38 | B00091L | BEAUFORT | SAMPLE | 16 | SEDIMENT | 04C | STATION002 |
| 39 | B00092L | BEAUFORT | SAMPLE | 16 | SEDIMENT | 04C | STATION002 |
| 40 | B00093L | BEAUFORT | SAMPLE | 16 | SEDIMENT | 04C | STATION002 |
| 游览 | 800094L | BEAUFORT | SAMPLE | 16 | SEDIMENT | 04C | STATION002 |
| 42 | B80095L | BEAUFORT | SAMPLE | 16 | SEDIMENT | 04C | STATION002 |
| 43 | 800096L | BEAUFORT | SAMPLE | 16 | | 94C | |
| 44 | B00097L | BEAUFORT | SAMPLE | 16 | | 04C | |
| 45 | 800098L | BEAUFORT | SAMPLE | 16 | SEDIMENT | 04C | |
| 46 | 800099L | BEAUFORT | SAMPLE | 16 | SEDIMENT | 04C | |
| 47 | B00100L | BEAUFORT | SAMPLE | 16 | SEDIMENT | 64C | |
| 48 | B00126L | BERUFORT | SAMPLE | 22 | SEDIMENT | 04C | STATION071 |
| 49 | B00127L | BERUFORT | SAMPLE | 22 | SEDIMENT | 04C | STATION071 |
| 50 | B90128L | BEAUFORT | | 22 | SEDIMENT | 04C | |
| 00 | an shi ta ka ka ƙalar | antine states to be | ······································ | 6 6 | and the state of the little of the little state of the little stat | UTU- | an e e e e unare pare da |

| · · | | | م ، مرد و مرب | | an a gener men an tha an an an an an an an | | ي ويعدرها و يوند به مهدرت موريد. |
|-----|---------|----------|---------------|----|--|------|----------------------------------|
| 51 | B90129L | BEAUFORT | SAMPLE | | | | |
| 52 | 800130L | BEAUFORT | SAMPLE | 22 | SEDIMENT | 940 | STATION071 |
| 53 | B90131L | BEAUFORT | SAMFLE | 55 | SEDIMENT | -04C | STATION071 |
| 54 | 890132L | BEAUFORT | SAMPLE | 55 | SEDIMENT | 04C | STATION071 |
| 55 | E99133L | BEAUFORT | SAMPLE | 22 | SEDIMENT | | STATION071 |
| 56 | B00134L | BEAUFORT | SAMPLE | 22 | SEDIMENT | 04C | STATION071 |
| 57 | 800135L | BEAUFORT | SAMPLE | 22 | SEDIMENT | 04C | STATION071 |
| 58 | B00136L | BEAUFORT | SEMPLE | 22 | SEDIMENT | 04C | STATION071 |
| 59 | 800137L | BEAUFORT | SAMPLE | 22 | SEDIMENT | 04C | STATION071 |
| 60 | B00138L | BEAUFORT | SAMPLE | 22 | SEDIMENT | 04C | STATION071 |
| 61 | B00140L | BEAUFORT | SAMPLE | 22 | SEDIMENT | 04C | STATION071 |
| 62 | B00141L | BEAUFORT | SAMPLE | 55 | SEDIMENT | 04C | STATION071 |
| 63 | B00143L | BEAUFORT | SAMPLE | 22 | SEDIMENT | 04C | STATION071 |
| 64 | B00144L | BEAUFORT | SAMPLE | 22 | SEDIMENT | 04C | STATION071 |
| 65 | 880145L | BEAUFORT | SAMPLE | 22 | SEDIMENT | 04C | STATION071 |
| 66 | 800146L | BEAUFORT | SAMPLE | 22 | SEDIMENT | 04C | STATION071 |
| 67 | B00147L | BEAUFORT | SAMPLE | 22 | SEDIMENT | 04C | STATION071 |
| 68 | 800148L | BERUFORT | SAMPLE | 22 | SEDIMENT | 04C | STATION071 |
| 69 | B00149L | BEAUFORT | SAMPLE | 22 | SEDIMENT | 04C | STRTION071 |
| 70 | 800150L | BEAUFORT | SAMPLE | 22 | SEDIMENT | Ø40 | STATION071 |
| 71 | B00176L | BEAUFORT | SAMPLE | 20 | SEDIMENT | 04C | STATION055 |
| 72 | B00178L | BEHUFORT | SAMPLE | 20 | SEDIMENT | 94C | STATION055 |
| 73 | E00179L | BEAUFORT | SAMPLE | 20 | SEDIMENT | 04C | STATION055 |
| 74 | B00180L | BEAUFORT | SAMPLE | 20 | SEDIMENT | 04C | STATION055 |
| 75 | B00181L | BEAUFORT | SAMPLE | 20 | SEDIMENT | 94C | STATION055 |
| 76 | B00182L | BEAUFORT | SAMPLE | ΞĐ | SEDIMENT | Ø4C | STATION055 |
| 77 | B00183L | BEAUFORT | SAMPLE | 20 | SEDIMENT | 04C | STATION055 |
| 78 | B90184L | BEAUFORT | SAMPLE | 20 | SEDIMENT | 04C | STATION055 |
| 79 | 800185L | BEAUFORT | SAMPLE | 20 | SEDIMENT | 04C | STATION055 |
| 80 | B00186L | BEAUFORT | SAMPLE | 20 | SEDIMENT | 04C | STATION055 |
| 81 | 899187L | PERUFORT | SAMPLE | 80 | SEDIMENT | 04C | STATION055 |
| 82 | 800188L | BERUFORT | SAMPLE | 29 | SEDIMENT | 04C | STATION055 |
| 83 | B00189L | BEAUFORT | SAMPLE | 20 | SEDIMENT | 04C | STATION055 |
| 84 | 800190L | BEAUFORT | SAMPLE | 20 | SEDIMENT | 04C | STATION055 |
| 85 | B00191L | BEAUFORT | SAMPLE | 20 | SEDIMENT | 04C | STATION055 |
| 86 | 800192L | BEAUFORT | SAMPLE | 50 | SEDIMENT | 04C | STATION055 |
| 87 | B00194L | SEAUFORT | SAMPLE | 20 | SEDIMENT | 04C | STATION055 |
| 88 | B99195L | BEFUFORT | | | | | STATION055 |
| 89 | B00196L | BERUFORT | | | SEDIMENT | 04C | |
| 90 | 899198L | BEAUFORT | SAMPLE | | SEDIMENT | 04C | |
| 91 | 800199L | BEAUFORT | SAMPLE | | SEDIMENT | 04C | STATION055 |
| 92 | 800200L | BEAUFORT | | | SEDIMENT | | |
| 93 | B00559F | BERUFORT | SAMPLE | | SEDIMENT | 04C | STATION070 |
| 94 | 809227L | BERUFORT | SAMPLE | | SEDIMENT | 04C | STATION070 |
| 95 | 609228L | BEAUFORT | SAMPLE | 21 | SEDIMENT | 04C | STATION070 |
| 96 | B00229L | BEAUFORT | SAMPLE | 21 | SEDIMENT | 04C | STATION070 |
| 97 | 866536L | BEAUFORT | SAMPLE | | | 04C | STATION070 |
| 98 | 899232L | BEAUFORT | SAMPLE | | | 04C | |
| 99 | B00233L | BEAUFORT | SAMPLE | | | | |
| 100 | 300234L | BERUFORT | SAMPLE | 21 | SEDIMENT | 04C | STATION070 |
| | | | | | | | |

| | 101 | B00235L | BEAUFORT | | | SEDIMENT | 04C | |
|-----|--------------|---------|----------|--------|----------|-----------|------------|------------|
| | 102 | B00236L | BEAUFORT | SAMPLE | ≥ 1 | SEDIMENT | -04C | STATION070 |
| | 103 | B00237L | BEAUFORT | SAMPLE | 21 | SEDIMENT | 04C | STATION070 |
| | 104 | 800238L | BEAUFORT | SAMPLE | 21 | SEDIMENT | 04C | STATION070 |
| | 105 | B00240L | BEAUFORT | SAMPLE | 21 | SEDIMENT | 04C | STATION070 |
| | | | | | 21 | | | STATION070 |
| 4 | 106 | B00241L | BEAUFORT | SAMPLE | | SEDIMENT | -04C | |
| 107 | | 242L | | | | IMENT 04C | | TION070 |
| | 108 | 800243L | BEAUFORT | SAMPLE | 21 | SEDIMENT | 04C | STATION070 |
| | 109 | B00244L | BEAUFORT | SAMPLE | 21 | SEDIMENT | 04C | STATION070 |
| | 110 | B00245L | BEAUFORT | SAMPLE | 21 | SEDIMENT | 04C | STATION070 |
| | 111 | B00246L | BEAUFORT | SAMPLE | 21 | SEDIMENT | 04C | STATION070 |
| | 112 | B00247L | BEAUFORT | SAMPLE | 21 | SEDIMENT | 04C | STATION070 |
| | 113 | 800248L | BEAUFORT | SAMPLE | 21 | SEDIMENT | 04C | STATION070 |
| | 114 | 800249L | BEAUFORT | SAMPLE | 21 | SEDIMENT | 04C | STATION070 |
| | $115 \\ 115$ | B00250L | BEAUFORT | SAMPLE | 21 | SEDIMENT | 04C | STATION070 |
| | | | | | | | | |
| | 116 | B00251L | BEAUFORT | SAMPLE | Ø9 | SEDIMENT | 04C | STATION030 |
| | 117 | 800252L | BEAUFORT | SAMPLE | 09 | SEDIMENT | 04C | STATION030 |
| | 118 | B00253L | BEAUFORT | SAMPLE | 69 | SEDIMENT | 04C | STATION030 |
| | 119 | 800254L | BEAUFORT | SAMPLE | 69 | SEDIMENT | 04C | STATION030 |
| | 120 | B00256L | BEAUFORT | SAMPLE | 89 | SEDIMENT | 04C | STATION030 |
| | 121 | 800257L | BEAUFORT | SAMPLE | 09 | SEDIMENT | 04C | STATION030 |
| | 122 | 800258L | BERUFORT | SAMPLE | 09 | SEDIMENT | 04C | STATION030 |
| | 123 | 800259L | BEAUFORT | SAMPLE | 09 | SEDIMENT | 04C | STATION030 |
| | 124 | 880261L | BEAUFORT | SAMPLE | 09 | SEDIMENT | 04C | STATION030 |
| | 125 | 800262L | BEAUFORT | SAMPLE | 09 | SEDIMENT | 04C | STATION030 |
| | 126 | B00263L | BEAUFORT | SAMPLE | 09 | SEDIMENT | 04C | STATION030 |
| | 127 | B99264L | BEAUFORT | SAMPLE | 09 09 | SEDIMENT | 04C | STATION030 |
| | | | | | | | | |
| | 128 | B00265L | BEAUFORT | SAMPLE | 69 | SEDIMENT | <u>840</u> | STATION030 |
| | 129 | B00266L | BEAUFORT | SAMPLE | 69 | SEDIMENT | 04C | STATION030 |
| | 130 | B99267L | BEAUFORT | SAMPLE | 09 | SEDIMENT | 04C | STATION030 |
| | 131 | B00268L | BEAUFORT | SAMPLE | 69 | SEDIMENT | 04C | STATION030 |
| | 132 | B99269L | BEAUFORT | SAMPLE | 09 | SEDIMENT | 04C | STATION030 |
| | 133 | B00271L | BEAUFORT | SAMPLE | 69 | SEDIMENT | 04C | STATION030 |
| | 134 | B00272L | BEAUFORT | SAMPLE | 69 | SEDIMENT | 04C | STATION030 |
| | 135 | 800273L | BEAUFORT | SAMPLE | 69 | SEDIMENT | 04C | STATION030 |
| | 136 | B89274L | BEAUFORT | SAMPLE | õ9 | SEDIMENT | 04C | STATION030 |
| | 137 | B30275L | BEAUFORT | SAMPLE | 09 09 | SEDIMENT | 04C | STATION030 |
| | | | | | | SEDIMENT | | |
| | 138 | B00286L | BEAUFORT | SAMPLE | 15 | | | STATION001 |
| | 139 | B00287L | BEAUFORT | SAMPLE | 15 | SEDIMENT | 04C | |
| | 140 | F96588F | BEAUFORT | SAMPLE | 15 | | 04C | STATION001 |
| | 141 | B90289L | BEAUFORT | SAMPLE | 15 | SEDIMENT | 04C | STATION001 |
| | 142 | B00290L | BERUFORT | SAMPLE | 15 | SEDIMENT | 04C | STATION001 |
| | 143 | B90296L | BEAUFORT | SAMPLE | 32 | SEDIMENT | 04C | STATION002 |
| | 144 | B00297L | BERUFORT | SAMPLE | 32 | SEDIMENT | 04C | STATION002 |
| | 145 | B00298L | BEAUFORT | SAMPLE | 32 | SEDIMENT | 04C | STATION002 |
| | 146 | B00299L | BEAUFORT | SAMPLE | | SEDIMENT | 04C | |
| | | | | | | | . r.m. | L |

END FORM 146 STRAINS

| 1 | B00001H | BEAUFORT | SAMPLE | Ø3 | MATER | 280 | STATION010 |
|----|---------|----------|--------|------------|-------|------------|--------------------------|
| 2 | B00002H | BEAUFORT | SAMPLE | 03 | MATER | 20C | STATION010 |
| 3 | B00003H | BEAUFORT | SAMPLE | 03 | MATER | 200 | STATION010 |
| 4 | B00004H | BEAUFORT | SAMPLE | 63 | WATER | 200 | STATION010 |
| 5 | 800005H | BEAUFORT | SAMPLE | 63 | MATER | 200 | STATION010 |
| ŕ. | B00006H | BEAUFORT | SAMPLE | 03 | WATER | 200 | STATION010 |
| 7 | B00007H | BEAUFORT | SAMPLE | 03 | MATER | 200 | STATION010 |
| ė | BOODOBH | BEAUFORT | SAMPLE | ē3 | MATER | 200 | STATION010 |
| ġ | B00009H | BEAUFORT | SAMPLE | 63 | MATER | 200 | STATION010 |
| 10 | B00010H | BEAUFORT | SAMPLE | ē3 | MATER | 200 | STATION010 |
| i1 | B00011H | BEAUFORT | SAMPLE | 03 | WATER | 200 | STATION010 |
| 12 | B00012H | BEAUFORT | SAMPLE | <u>өз</u> | WATER | 20C | STATION010 |
| 13 | B00013H | BEAUFORT | SAMPLE | 03 | MATER | 200 | STATION010 |
| 14 | B00014H | BEAUFORT | SAMPLE | ē3 | MATER | 200 | STATION010 |
| 15 | B00015H | BEAUFORT | SAMPLE | 63 | MATER | 200 | STATION010 |
| 16 | B00010H | BEAUFORT | SAMPLE | <u>0</u> 3 | WATER | 200 | STATION010 |
| | B00017H | BEAUFORT | SAMPLE | 03 | MATER | 200 | STATION010 |
| 17 | | BEAUFORT | SAMPLE | 03 | MATER | 200 | STATION010 |
| 18 | B00018H | BEAUFORT | SAMPLE | 03 | WATER | 200 | STATION010 |
| 19 | B00019H | BEAUFORT | SAMPLE | 03 | WATER | 200 | STATION010 |
| 20 | 800020H | BEAUFORT | SAMPLE | 03 | MATER | 200 | STATION010 |
| 21 | 800021H | | SAMPLE | 03 | WATER | 200 | STATION010 |
| 22 | 800022H | BEAUFORT | SAMPLE | 03 | WATER | 200 | STATION010 |
| 23 | 800023H | | SAMPLE | 03 | WATER | 200 | STATION010 |
| 24 | B00024H | BEAUFORT | SAMPLE | 20 | WATER | 200 | STATION020 |
| 25 | B00051H | BEAUFORT | | 20 | WATER | 200 | STATION020 |
| 26 | E00052H | BEAUFORT | SAMPLE | | WATER | 200 | STATION020 |
| 27 | E00053H | BEAUFORT | SAMPLE | 20 | WATER | 200 | STATION020 |
| 23 | B00054H | BEAUFORT | SAMPLE | 20 | WATER | 200 | STATION020 |
| 29 | 800055H | BEAUFORT | SAMPLE | 20 03 | MATER | 200 | STATION020 |
| 30 | B00056H | BEAUFORT | SAMPLE | 20 | WATER | 200 | STATION020 |
| 31 | 390057H | BEAUFORT | SAMPLE | 20 | WATER | 200 | STATION002 |
| 32 | B00058H | BEAUFORT | SAMPLE | 20 | | | STATION002 |
| 33 | B00059H | BEAUFORT | SAMPLE | 20 | WATER | 200 200 | STATION002 |
| 34 | B00060H | BEAUFORT | SAMPLE | 20 | WATER | | STATION002 |
| 35 | B00061H | BEAUFORT | SAMPLE | 20 | WATER | 20C | STATION002 |
| 36 | B00062H | BEAUFORT | SAMPLE | 20 | WATER | 200 | STATION002 |
| 37 | B00063H | BEAUFORT | SAMPLE | | | | |
| 38 | B00064H | BEAUFORT | | | | | STATION002 STATION002 |
| 39 | 800065H | BEAUFORT | SAMPLE | | | | |
| 40 | B99966H | BEAUFORT | SAMPLE | | | | |
| 41 | B90067H | BEAUFORT | SAMPLE | | WATER | | STATION002 |
| 42 | B00068H | BEAUFORT | SAMPLE | | MATER | | STATION002 |
| 43 | B00069H | BEAUFORT | SAMPLE | | WATER | | |
| 44 | B00070H | BEAUFORT | SAMPLE | | NATER | | STATION002 |
| 45 | B00071H | BEAUFORT | SAMPLE | | | | STATION002 |
| 46 | B00072H | BEAUFORT | SAMPLE | | | | STATION002 |
| 47 | B00073H | BEAUFORT | SAMPLE | | WATER | | |
| 48 | B00075H | BEAUFORT | SAMPLE | | WATER | | STATION002 |
| 49 | B00101H | BEAUFORT | SAMPLE | | | | |
| 50 | 800102H | BEAUFORT | SAMPLE | 27 | MHTER | 200 | STATION071 |
| | | | | | | | |

| 51 | B00103H | BEAUFORT SAMPLE 27 WATER 200 STATION071 |
|---------|---------|---|
| 52 | B00104H | BEAUFORT SAMPLE 27 WATER 200 STATION071 |
| 53 | B00106H | BEAUFORT SAMPLE 27 WATER 20C STATION071 |
| 54 | B00109H | BEAUFORT SAMPLE 27 WATER 20C STATION071 |
| | | |
| 55 | B00110H | |
| 56 | B00111H | BEAUFORT SAMPLE 27 WATER 20C STATION071 |
| 57 | B00112H | BEAUFORT SAMPLE 27 WATER 20C STATION071 |
| 58 | 800113H | BEAUFORT SAMPLE 27 WATER 20C STATION071 |
| 59 | B00114H | BEAUFORT SAMPLE 27 WATER 20C STATION071 |
| 60 | B00115H | BEAUFORT SAMPLE 27 WATER 20C STATION071 |
| 61 | 800116H | BEAUFORT SAMPLE 27 WATER 20C STATION071 |
| | B00117H | BEAUFORT SAMPLE 27 WATER 200 STATION071 |
| 62 | | |
| 63 | B00118H | BEAUFORT SAMPLE 27 WATER 20C STATION071 |
| 64 | B00119H | BEAUFORT SAMPLE 27 WATER 20C STATION071 |
| 65 | B00120H | BEAUFORT SAMPLE 27 WATER 200 STATION071 |
| 66 | B00121H | BEAUFORT SAMPLE 27 WATER 20C STATION071 |
| 67 | B00122H | BEAUFORT SAMPLE 27 WATER 200 STATION071 |
| 68 | B00123H | BEAUFORT SAMPLE 27 WATER 20C STATION071 |
| 69 | B00151H | BEAUFORT SAMPLE 24 WATER 20C STATION055 |
| 70 | | BEAUFORT SAMPLE 24 WATER 200 STATION055 |
| | 800152H | |
| 71 | B00153H | |
| 72 | B00154H | BEAUFORT SAMPLE 24 WATER 20C STATION055 |
| 73 | B00155H | BEAUFORT SAMPLE 24 WATER 20C STATION055 |
| 74 | B00156H | BEAUFORT SAMPLE 24 WATER 200 STATION055 |
| 75 | 800157H | BEAUFORT SAMPLE 24 WATER 200 STATION055 |
| 76 | B00158H | BEAUFORT SAMPLE 24 WATER 20C STATION055 |
| 77 | B00159H | BEAUFORT SAMPLE 24 WATER 20C STATION055 |
| 78 | B00160H | BEAUFORT SAMPLE 24 WATER 200 STATION055 |
| 79 | B00161H | BEAUFORT SAMPLE 24 WATER 20C STATION055 |
| | | |
| 89 | B00162H | BEAUFORT SAMPLE 24 WATER 20C STATION055 |
| 81 | 800163H | BEAUFORT SAMPLE 24 WATER 20C STATION055 |
| 82 | B00164H | BEAUFORT SAMPLE 24 WATER 200 STATION055 |
| 83 | B00165H | BEAUFORT SAMPLE 24 WATER 20C STATION055 |
| 84 | B00166H | BEAUFORT SAMPLE 24 WATER 20C STATION055 |
| 85 | 800168H | BEAUFORT SAMPLE 24 WATER 20C STATION055 |
| 86 | B00169H | BEAUFORT SAMPLE 24 WATER 20C STATION055 |
| 87 | B00170H | BEAUFORT SAMPLE 24 WATER 20C STATION055 |
| | | BEAUFORT SAMPLE 26 WATER 200 STATION070 |
| 88 | B00201H | |
| 89 | B90202H | BEAUFORT SAMPLE 26 WATER 200 STATION070 |
| 90 | B00203H | BEAUFORT SAMPLE 26 WATER 20C STATION070 |
| 91 | B00204H | BEAUFORT SAMPLE 26 WATER 20C STATION070 |
| - 2 - 2 | B00205H | BEAUFORT SAMPLE 26 WATER 20C STATION070 |
| 93 | B00206H | BEAUFORT SAMPLE 26 WATER 20C STATION070 |
| 94 | B00207H | BEAUFORT SAMPLE 26 WATER 20C STATION070 |
| 95 | B00208H | BEAUFORT SAMPLE 26 WATER 20C STATION070 |
| 96 | B00210H | BEAUFORT SAMPLE 26 WATER 20C STATION070 |
| 97 | B00211H | BEAUFORT SAMPLE 26 WATER 200 STATION070 |
| | | BEAUFORT SAMPLE 26 WATER 200 STATION070 |
| 98 | B00212H | |
| 99 | B00213H | BEAUFORT SAMPLE 26 WATER 200 STATION070 |
| 100 | B00216H | BEAUFORT SAMPLE 26 WATER 20C STATION070 |
| | | |

| $\begin{array}{c} 101\\ 102\\ 103\\ 104\\ 105\\ 106\\ 107\\ 108\\ 109\\ 110\\ 112\\ 113\\ 116\\ 117\\ 118\\ 120\\ 122\\ 123\\ 124\\ 125\\ 122\\ 122\\ 125\\ 126\\ 126\\ 126\\ 126\\ 126\\ 126\\ 126\\ 126$ | B00217H B00221H B00222H B00223H B00223H B00252H B00253H B00253H B00255H B00255H B00255H B00255H B00256H B00259H B00259H B00260H B00262H B00263H B00265H B00265H B00265H B00269H B00269H B00269H B00270H B00270H | BEAUFORT | SAMPLE | 26666611111111111111111111111111111111 | WATER | 200 200 200 200 200 200 200 200 200 200 | STATION070 STATION070 STATION070 STATION070 STATION070 STATION030 STATION030 STATION030 STATION030 STATION030 STATION030 STATION030 STATION030 STATION030 STATION030 STATION030 STATION030 STATION030 STATION030 STATION030 STATION030 STATION030 STATION030 STATION030 |
|--|--|--|--|--|---|--|--|
| | B00270H | BEAUFORT | SAMPLE | 11 | MATER | 200 | STATION030 |
| 126 | 800272H | BEAUFORT BEAUFORT BFAUFORT | SAMPLE SAMPLE | 11 11 11 | | 2002 | STATION030 STATION030 |
| 127 128 | B00273H B00275H | BEAUFORT | SAMPLE | 11 | WATER | 200 | STATION030 |

EMD FORM 128 STRAINS

Strains isolated from sediment at 20C capable of growth at pH 8 or pH 9.

-

| i. | B90056H | BEAUFORT | | Ø3. | SEDIMENT | 200 | STATION010 |
|----------|--------------------------|-------------|--------------------------|------------|--|-----------------|---|
| È | 300027H | BEAUFORT | SAMPLE | 03 | SEDIMENT | 20C | STATION010 |
| 3 | B00028H | BEAUFORT | SAMPLE | 63 | SEDIMENT | 200 | STATION010 |
| 4 | B00029H | BEAUFORT | SAMPLE | 63 | SEDIMENT | 200 | STATION010 |
| 5 | 699930H | BEAUFORT | | <u>өз</u> | SEDIMENT | 200 | STATION010 |
| 6 | B00031H | BEAUFORT | •••••=•= | <u>0</u> З | SEDIMENT | 200 | STATION010 |
| 7 | B00032H | BERUFORT | | 03 03 | SEDIMENT | 200 | STATION010 |
| | | | | 03 03 | SEDIMENT | 200 | STATION010 |
| 8 | B00033H | BEAUFORT | | 03 03 | SEDIMENT | 200 | STATION010 |
| .9 | B00035H | BEAUFORT | | | | | STATION010 |
| 10 | B00036H | BEAUFORT | | 03 | SEDIMENT | 200 | |
| 11 | B00037H | BEAUFORT | | 03 | SEDIMENT | 200 | STATION010 |
| 12 | B00038H | BEAUFORT | # ···· — — | 03 | SEDIMENT | 200 | STATION010 |
| 13 | B00039H | BEAUFORT | | 03 | SEDIMENT | 200 | STATION010 |
| 14 | B00040H | BEAUFORT | | 03 | SEDIMENT | 200 | STATION010 |
| 15 | B00041H | BEAUFORT | SAMPLE | 03 | SEDIMENT | 20C | STATION010 |
| 16 | B00042H | BEAUFORT | SAMPLE | 03 | SEDIMENT | 200 | STATION010 |
| 17 | B00043H | BEAUFORT | SAMPLE | Ø3 | SEDIMENT | 200 | STATION010 |
| 18 | B00044H | BEAUFORT | SAMPLE | 03 | SEDIMENT | 200 | STATION010 |
| 19 | B00045H | BEAUFORT | SAMPLE | 03 | SEDIMENT | 200 | STATION010 |
| 20 | B00047H | BEAUFORT | | 03 | SEDIMENT | 200 | STATION010 |
| 21 | B00048H | BEAUFORT | | Θŝ. | SEDIMENT | 200 | STATION010 |
| 22 | B00076H | BEAUFORT | | 16 | SEDIMENT | 20Č | STATION002 |
| 23 | B00077H | BEAUFORT | - | 16 | SEDIMENT | 200 | STATION002 |
| 24 24 | B00078H | BEAUFORT | | 16 | SEDIMENT | 200 | STATION002 |
| 25 | B00079H | BEAUFORT | | 16 | SEDIMENT | 200 | STATION002 |
| | B00081H | BEAUFORT | | 16 | SEDIMENT | 200 | STATION002 |
| 26 | | | | 16 | SEDIMENT | 200 | STATION002 |
| 27 | B00082H | BEAUFORT | | $16 \\ 16$ | SEDIMENT | 200 | STATION002 |
| 28 | B00083H | BEAUFORT | | | SEDIMENT | 200 | STATION002 |
| 29 | B00084H | BEAUFORT | | 16 | SEDIMENT | | |
| 30 | B00085H | BEAUFORT | | 16 | | 200 | STATION002 |
| 31 | B00086H | BEAUFORT | | 16 | SEDIMENT | 200 | STATION002 |
| 35 | B00087H | BEAUFORT | | 16 | SEDIMENT | 200 | STATION002 |
| 33 | B00088H | BEAUFORT | | 16 | SEDIMENT | 200 | STATION002 |
| 34 | B00089H | BEAUFORT | | 16 | SEDIMENT | 20C | STATION002 |
| 35 | B00091H | BEAUFORT | | 16 | SEDIMENT | 200 | STATION002 |
| 36 | 800092H | BEAUFORT | | 16 | SEDIMENT | 200 | STATION002 |
| 37 | 800093H | BEAUFORT | SAMPLE | 16 | SEDIMENT | 200 | STATION002 |
| 38 | B00094H | BEAUFORT | SAMPLE | 16 | SEDIMENT | | STATION002 |
| 39 | B00095H | BEAUFORT | SAMPLE | 16 | SEDIMENT | 200 | STATION002 |
| 40 | B00096H | BEAUFORT | SAMPLE | 16 | SEDIMENT | | STATION002 |
| 41 | B00097H | BEAUFORT | SAMPLE : | 16 | SEDIMENT | 200 | STATION002 |
| 42 | B00098H | BEAUFORT | SAMPLE : | 16 | SEDIMENT | 200 | STATION002 |
| 43 | 800099H | BEAUFORT | SAMPLE 1 | 16 | SEDIMENT | 20C | STATION002 |
| 44 | B00126H | BEAUFORT | | | SEDIMENT | 200 | STATION071 |
| 45 | B00127H | BEAUFORT | | | SEDIMENT | 20C | STATION071 |
| 46 | B00128H | BEAUFORT | | | SEDIMENT | 200 | STATION071 |
| 40 47 | B00129H | BEAUFORT | | | SEDIMENT | 200 | STATION071 |
| 48 | B00120H | BEAUFORT | | | SEDIMENT | 200 | STATION071 |
| 49 | B00130H | BEAUFORT | SAMPLE 2 | | SEDIMENT | 200 | STATION071 |
| 49 50 | B00132H | BEAUFORT | SAMPLE 2 | | SEDIMENT | | STATION071 |
| - | and and an an and a fill | DEROF USE I | | 6 | and and the states of the stat | <u>الم</u> والم | alle en el esta de la compañía de la |

| 51 | B00133H | BEAUFORT | SAMPLE 22 | SEDIMENT | 20C STATION071 |
|----------|-------------------------------|----------|-----------|----------|----------------|
| 52 | B00135H | BEAUFORT | SAMPLE 22 | SEDIMENT | 20C STATION071 |
| | B00136H | BEAUFORT | SAMPLE 22 | SEDIMENT | 20C STATION071 |
| 53 | | BEAUFORT | SAMPLE 22 | SEDIMENT | 20C STATION071 |
| 54 | B00138H | BEAUFORT | SAMPLE 22 | SEDIMENT | 20C STATION071 |
| 55 | B00139H | | SAMPLE 22 | SEDIMENT | 20C STATION071 |
| 56 | B00140H | BEAUFORT | | SEDIMENT | 20C STATION071 |
| 57 | B00141H | BEAUFORT | SAMPLE 22 | SEDIMENT | 20C STATION071 |
| 58 | B00142H | BEAUFORT | SAMPLE 22 | | 20C STATION071 |
| 59 | B00143H | BEAUFORT | SAMPLE 22 | SEDIMENT | |
| 60 | B00144H | BEAUFORT | SAMPLE 22 | SEDIMENT | |
| 61 | B00145H | BEAUFORT | SAMPLE 22 | SEDIMENT | |
| 62 | B00146H | BEAUFORT | SAMPLE 22 | SEDIMENT | 20C STATION071 |
| 63 | E90147H | BEAUFORT | SAMPLE 22 | SEDIMENT | 20C STATION071 |
| 64 | B00148H | BEAUFORT | SAMPLE 22 | SEDIMENT | 20C STATION071 |
| 65 | B00149H | BEAUFORT | SAMPLE 22 | SEDIMENT | 20C STATION071 |
| 66 | B00150H | BEAUFORT | SAMPLE 22 | SEDIMENT | 20C STATION071 |
| 67 67 | B00176H | BEAUFORT | SAMPLE 20 | SEDIMENT | 20C STATION055 |
| | B90177H | BEAUFORT | SAMPLE 20 | SEDIMENT | 20C STATION055 |
| 68 | | BEAUFORT | SAMPLE 20 | SEDIMENT | 20C STATION055 |
| 69 | B00178H | BEAUFORT | SAMPLE 20 | SEDIMENT | 20C STATION055 |
| 70 | B00179H | | SAMPLE 20 | SEDIMENT | 20C STATION055 |
| 71 | B00180H | BEAUFORT | | SEDIMENT | 20C STATION055 |
| 72 | E00181H | BEAUFORT | | SEDIMENT | 20C STATION055 |
| 73 | B00183H | BEAUFORT | SAMPLE 20 | ••••• | 20C STATION055 |
| 74 | B00184H | BEAUFORT | SAMPLE 20 | SEDIMENT | |
| 75 | B00185H | BEAUFORT | SAMPLE 20 | SEDIMENT | |
| 76 | B00186H | BEAUFORT | SAMPLE 20 | SEDIMENT | 20C STATION055 |
| 77 | B00187H | BEAUFORT | SAMPLE 20 | SEDIMENT | 20C STATION055 |
| 78 | B00188H | BEAUFORT | SAMPLE 20 | SEDIMENT | 20C STATION055 |
| 79 | B00189H | BEAUFORT | SAMPLE 20 | SEDIMENT | 20C STATION055 |
| 80 | B00190H | BEAUFORT | SAMPLE 20 | SEDIMENT | 20C STATION055 |
| 81 | B00191H | BEAUFORT | SAMPLE 20 | SEDIMENT | 20C STATION055 |
| 82 | B00192H | BEAUFORT | SAMPLE 20 | SEDIMENT | 20C STATION055 |
| 83 | B00193H | BEAUFORT | SAMPLE 20 | SEDIMENT | 20C STATION055 |
| | B00194H | BEAUFORT | SAMPLE 20 | SEDIMENT | 200 STATION055 |
| 84 of | B00195H | BEAUFORT | SAMPLE 20 | SEDIMENT | 20C STATION055 |
| 85 04 | B00196H | BEAUFORT | SAMPLE 20 | SEDIMENT | 20C STATION055 |
| 86 07 | | BEAUFORT | SAMPLE 20 | SEDIMENT | 20C STATION055 |
| 87 | B00197H | BEAUFORT | SAMPLE 20 | | |
| 88 | B00198H | BEAUFORT | | | |
| 89 | B00199H | | | | |
| 90 | B00500H | BEAUFORT | | SEDIMENT | |
| 91 | B00556H | BEAUFORT | | SEDIMENT | |
| 95 | B00227H | BEAUFORT | | | |
| 93 | B00558H | BEAUFORT | | SEDIMENT | |
| 94 | B99553H | BEAUFORT | | SEDIMENT | |
| 95 | B00230H | BEAUFORT | | SEDIMENT | |
| 96 | B00231H | BEAUFORT | | SEDIMENT | |
| 97 | B00232H | BEAUFORT | | SEDIMENT | |
| 98 | B00233H | BEAUFORT | | SEDIMENT | |
| 99 | B00234H | BEAUFORT | SAMPLE 21 | | |
| 100 | B00235H | BEAUFORT | | SEDIMENT | 20C STATION070 |
| 1 6161 | ا الأسيانية معلانية الية اليل | | - | | |

| 191 | B00236H | BEAUFORT SAMPLE 21 SEDIMENT 20C STATION070 |
|-----------|---------|---|
| 102 | | BEAUFORT SAMPLE 21 SEDIMENT 20C STATION070 |
| 103 | | BEAUFORT SAMPLE 21 SEDIMENT 20C STATION070 |
| 104 | B00239H | BEAUFORT SAMPLE 21 SEDIMENT 200 STATION070 |
| 105 | B00240H | BEAUFORT SAMPLE 21 SEDIMENT 200 STATION070 |
| 106 | B00241H | BEAUFORT SAMPLE 21 SEDIMENT 200 STATION070 |
| 107 | B00242H | BEAUFORT SAMPLE 21 SEDIMENT 200 STATION070 |
| 198 | B00243H | BEAUFORT SAMPLE 21 SEDIMENT 200 STATION070 |
| 109 | B00244H | BEAUFORT SAMPLE 21 SEDIMENT 200 STATION070 |
| 110 | B00245H | BEAUFORT SAMPLE 21 SEDIMENT 200 STATION070 |
| 111 | B00246H | BEAUFORT SAMPLE 21 SEDIMENT 200 STATION070 |
| 112 | B00247H | BEAUFORT SAMPLE 21 SEDIMENT 200 STATION070 |
| 113 | B00248H | BEAUFORT SAMPLE 21 SEDIMENT 20C STATION070 |
| 114 | B00249H | BEAUFORT SAMPLE 21 SEDIMENT 20C STATION070 |
| 115 | 800250H | BEAUFORT SAMPLE 21 SEDIMENT 200 STATION070 |
| 116 | B00276H | BEAUFORT SAMPLE 09 SEDIMENT 200 STATION030 |
| 117 | B00277H | BEAUFORT SAMPLE 09 SEDIMENT 20C STATION030 |
| 118 | 800278H | BEAUFORT SAMPLE 09 SEDIMENT 200 STATION030 |
| 119 | B00279H | BEAUFORT SAMPLE 09 SEDIMENT 200 STATION030 |
| $1 \ge 9$ | B00280H | BEAUFORT SAMPLE 09 SEDIMENT 200 STATION030 |
| 121 | B00281H | BEAUFORT SAMPLE 09 SEDIMENT 20C STATION030 |
| 122 | B00282H | BEAUFORT SAMPLE 09 SEDIMENT 200 STATION030 |
| 123 | B00283H | BEAUFORT SAMPLE 09 SEDIMENT 200 STATION030 |
| 124 | B00284H | BEAUFORT SAMPLE 09 SEDIMENT 20C STATION030 |
| 125 | B00285H | BEAUFORT SAMPLE 09 SEDIMENT 200 STATION030 |
| 126 | B00286H | BEAUFORT SAMPLE 09 SEDIMENT 20C STATION030 |
| 127 | B00287H | BEAUFORT SAMPLE 09 SEDIMENT 20C STATION030 |
| 128 | 800288H | BEAUFORT SAMPLE 09 SEDIMENT 20C STATION030 |
| 129 | B00289H | BEAUFORT SAMPLE 09 SEDIMENT 200 STATION030 |
| 130 | B00290H | BEAUFORT SAMPLE 09 SEDIMENT 200 STATION030 |
| 131 | B00292H | BEAUFORT SAMPLE 09 SEDIMENT 200 STATION030 |
| 132 | B00293H | BEAUFORT SAMPLE 09 SEDIMENT 200 STATION030 |
| 133 | B00294H | BEAUFORT SAMPLE 09 SEDIMENT 200 STATION030 |
| 134 | B00295H | DECLEOPE CONTRACT CONTRACTOR OF CONTRACTOR |
| 135 | B00296H | THE REPORT OF THE PARTY AND A |
| 136 | B00297H | BEAUFORT SAMPLE 09 SEDIMENT 20C STATION030 BEAUFORT SAMPLE 09 SEDIMENT 20C STATION030 |
| 137 | B00298H | BEAUFORT SAMPLE 09 SEDIMENT 200 STATION030 |
| 138 | B00299H | DECURCE CONTRACT LOC OTHINDS |
| 139 | B00300H | BEAUFORT SAMPLE 09 SEDIMENT 20C STATION030 BEAUFORT SAMPLE 09 SEDIMENT 20C STATION030 |
| | | CONTRACTOR OF CEDITIENT COU STATION030 |

END FORM 139 STRAINS

Strains isolated from water at 4C capable of utilizing any of the following carbohydrates: arabinose, ribose, xylose, rhamnose, fructose, galactose, glucose, mannose, sorbose, cellobiose, lactose, maltose, sucrose, trehalose, raffinose, salicin.

| 1 | 800005L | BEAUFORT | SAMPLE | 03 | MATER | 04C | STATION010 |
|----|---------|----------|--------|---------------|--------|-------------|------------|
| ē | B00006L | BEAUFORT | SAMPLE | 03 | WATER | 04C | STATION010 |
| З | B00013L | BEAUFORT | SAMPLE | 63 | MATER | Ø4C | STATION010 |
| | 800014L | BEAUFORT | SAMPLE | 03 | WATER | 04C | STATION010 |
| | B00024L | BEAUFORT | SAMPLE | ЮЗ | MATER | 04C | STATION010 |
| 5 | | BEAUFORT | SAMPLE | 03 | WATER | 04C | STATION010 |
| 6 | B00025L | | SAMPLE | 20 | WATER | 04C | STATION002 |
| 7 | B00052L | BEAUFORT | | | WATER | 04C | STATION002 |
| 8 | B00054L | BEAUFORT | SAMPLE | 20 | | | STATION002 |
| 9 | B00057L | BEAUFORT | SAMPLE | 20 | WATER | 04C | |
| 10 | R00058L | BEAUFORT | SAMPLE | 50 | WATER | 04C | STATION002 |
| 11 | B00059L | BEAUFORT | SAMPLE | 20 | WATER | 04C | STATION002 |
| 12 | B00060L | BEAUFORT | SAMPLE | 20 | WATER | 04C | STATION002 |
| 13 | 300062L | BEAUFORT | SAMPLE | 20 | MATER | 04C | STATION002 |
| 14 | B00063L | BEAUFORT | SAMPLE | 20 | WATER | 04C | STATION002 |
| 15 | B00071L | BEAUFORT | SAMPLE | 20 | WATER | 04C | STATION002 |
| 16 | B00073L | BEAUFORT | SAMPLE | 20 | WATER | 04C | STATION002 |
| 17 | B00074L | BEAUFORT | SAMPLE | 20 | WATER | 04C | STATION002 |
| 18 | B00075L | BEAUFORT | SAMPLE | 20 | WATER | 04C | STATION002 |
| 19 | B90102L | BEAUFORT | SAMPLE | 27 | MATER | 04C | STATION071 |
| | | BEAUFORT | SAMPLE | 27 | WATER | 04C | STATION071 |
| 20 | B00103L | BEAUFORT | SAMPLE | 27 | WATER | 04C | STATION071 |
| 21 | 800104L | BEAUFORT | SAMPLE | 27 | WATER | 04C | STATION071 |
| 22 | B00106L | •••• | | 27 | WATER | 04C | STATION071 |
| 23 | 800107L | BEAUFORT | SAMPLE | | | 04C | STATION071 |
| 24 | 800108L | BEAUFORT | SAMPLE | 27 | WATER | | STATION071 |
| 25 | B00109L | BEAUFORT | SAMPLE | 27 | WATER | 04C | |
| 26 | B00111L | BEAUFORT | SAMPLE | 27 | MATER | 04C | STATION071 |
| 27 | B00112L | BEAUFORT | SAMPLE | 27 | WATER | 04C | STATION071 |
| 28 | B00113L | BEAUFORT | SAMPLE | 27 | MATER | 04C | STATION071 |
| 29 | B00114L | BEAUFORT | SAMPLE | 27 | WATER | 04C | STATION071 |
| 30 | B00115L | BEAUFORT | SAMPLE | 27 | WATER | 04C | STATION071 |
| 31 | B00116L | BEAUFORT | SAMPLE | 27 | WATER | Ø4C | STATION071 |
| ΞĒ | B00117L | BEAUFORT | SAMPLE | 27 | WATER | 04C | STATION071 |
| 33 | B00119L | BEAUFORT | SAMPLE | 27 | WATER | 04C | STATION071 |
| 34 | B00120L | BEAUFORT | SAMPLE | 27 | WATER | 04C | STATION071 |
| 35 | B00121L | BEAUFORT | SAMPLE | 27 | WATER | 04C | STATION071 |
| 36 | B90122L | BEAUFORT | SAMPLE | 27 | WATER | 04C | STATION071 |
| 37 | B00123L | BEAUFORT | | | | | STATION071 |
| | B00125L | PERIFORT | SAMPLE | 27 | WATER | й4 <u>г</u> | STATION071 |
| 38 | | BEAUFORT | | a | HATER | 04C | STATION055 |
| 39 | 800151L | BEAUFORT | COMPLE | 24 | UNTER | ñ4C | STATION055 |
| 40 | B00152L | BEAUFORT | | 0.4 | LETTE | 040 | STATION055 |
| 41 | B00153L | | | C.~ | LIGTED | 040 040 | STATION055 |
| 42 | B00154L | BEAUFORT | | C.44 -75 4 | | | STATION055 |
| 43 | 800155L | BEAUFORT | OHNFLL | 64 04 | HEILER | | STATION055 |
| 44 | B00156L | BEAUFORT | | ۲ 4 | | | STATION055 |
| 45 | B00157L | BEAUFORT | SAMPLE | | | | |
| 46 | B00159L | BEAUFORT | | <u>c</u> 4 | MHIER | | STATION055 |
| 47 | B00160L | BEAUFORT | | 24 | WHITER | U4C | STATION055 |
| 48 | 800163L | BEAUFORT | SAMPLE | 24 | MATER | 04C | STATION055 |
| 49 | B00164L | BEAUFORT | SAMPLE | 24 | WHTER | 04C | STATION055 |
| 50 | B00165L | BEAUFORT | SAMPLE | 24 | WATER | 04C | STATION055 |
| | · | | | | | | |

| 51 | B00166L | BEAUFORT | SAMPLE | 24 | WATER | 04C | STATION055 |
|----|---------|----------|--------|-----------|-------|-----|------------|
| 52 | B00167L | BEAUFORT | SAMPLE | 24 | WATER | 04C | STATION055 |
| 53 | B00169L | BEAUFORT | SAMPLE | 24 | WATER | 040 | STATION055 |
| 54 | B00170L | BEAUFORT | SAMPLE | 24 | WATER | 04C | STATION055 |
| 55 | B00171L | BEAUFORT | SAMPLE | 24 | WATER | 04C | STATION055 |
| 56 | B00173L | BEAUFORT | SAMPLE | 24 | WATER | 04Č | STATION055 |
| 57 | 800174L | BEAUFORT | SAMPLE | 24 | WATER | 04C | STATION055 |
| S8 | B00175L | BEAUFORT | SAMPLE | 24 | WATER | 04C | STATION055 |
| 59 | B00201L | BEAUFORT | SAMPLE | 26 | WATER | 04C | STATION070 |
| 60 | B00202L | BEAUFORT | SAMPLE | 26 | WATER | 04C | STATION070 |
| 61 | B00203L | BEAUFORT | SAMPLE | 26 | MATER | 04C | STATION070 |
| 62 | B00205L | BEAUFORT | SAMPLE | 26 | MATER | 04C | STATION070 |
| 63 | B00206L | BEAUFORT | SAMPLE | 26 | WATER | 04C | STATION070 |
| 64 | B00207L | BEAUFORT | SAMPLE | 26 | WATER | 04C | STATION070 |
| 65 | B00208L | BEAUFORT | SAMPLE | 26 | WATER | 04C | STATION070 |
| 66 | B00210L | BEAUFORT | SAMPLE | 26 | WATER | 04C | STATION070 |
| 67 | B00211L | BEAUFORT | SAMPLE | 36 | WATER | Ø4C | STATION070 |
| 68 | B00212L | BEAUFORT | SAMPLE | 26 | WATER | 04C | STATION070 |
| 69 | B00213L | BEAUFORT | SAMPLE | 26 | WATER | 04C | STATION070 |
| 70 | B00216L | BEAUFORT | SAMPLE | 26 | WATER | 04C | STATION070 |
| 71 | B00217L | BEAUFORT | SAMPLE | 56 | WATER | 04C | STATION070 |
| 72 | B00218L | BEAUFORT | SAMPLE | 26 | WATER | 04C | STATION070 |
| 73 | 800550F | BEAUFORT | SAMPLE | 26 | WATER | 04C | STATION070 |
| 74 | B00221L | BEAUFORT | SAMPLE | 26 | WATER | 04C | STATION070 |
| 75 | B00222L | BEAUFORT | SAMPLE | 26 | WATER | 04C | STATION070 |
| 76 | B00223L | BEAUFORT | SAMPLE | 26 | WATER | 04C | STATION070 |
| 77 | B00278L | BEAUFORT | SAMPLE | 11 | WATER | 04C | STATION030 |
| 78 | B00280L | BEAUFORT | SAMPLE | 11 | WATER | 04C | STATION030 |
| 79 | B00281L | BEAUFORT | SAMPLE | 19 | WATER | 04C | STATION001 |
| 80 | B00282L | BEAUFORT | SAMPLE | 19 | WATER | 04C | STATION001 |
| 81 | B00283L | BEAUFORT | SAMPLE | 19 | WATER | 04C | STATION001 |
| 32 | B00291L | BEAUFORT | SAMPLE | 36 | WATER | 04C | STATION002 |
| 83 | B00294L | BEAUFORT | SAMPLE | 36 | WATER | 04C | STATION002 |
| 84 | B00295L | BEAUFORT | SAMPLE | 36 | WATER | 04C | STATION002 |

END FORM

Strains isolated from sediment at 4C capable of utilizing any of the following carbohydrates: arabinose, riboxe, xylose, rhamnose, fructose, glactose, glucose, mannose, sorbose, cellobiose, lactose, maltose, sucrose, trehalose, raffinose, salicin.

| 4 | B99056L | BEAUFORT | SAMPLE 03 | SEDIMENT | 04C STATION010 |
|---------------|--------------------|----------|-----------|---------------------------------------|----------------|
| 1. | | BEAUFORT | SAMPLE 03 | | 04C STATION010 |
| 2 | B00027L | | SAMPLE 03 | | 04C STRTION010 |
| З | B00028L | BEAUFORT | SAMPLE 03 | | 04C STATION010 |
| 4 | B99959L | BEAUFORT | | | 04C STATION010 |
| 5 | 800030L | BEAUFORT | SAMPLE 03 | | 04C STATION010 |
| 6 | B99031L | BEAUFORT | SAMPLE 03 | | 04C STATION010 |
| 1 | 300032L | BEAUFORT | SAMPLE 03 | | |
| 8 | B00035L | BEAUFORT | SAMPLE 03 | | |
| Ģ | B00039L | BEAUFORT | SAMPLE 03 | | |
| 10 | B00040L | BEAUFORT | SAMPLE 03 | | 04C STATION010 |
| 11 | B00041L | BEAUFORT | SAMPLE 03 | | 04C STATION010 |
| 12 | 300044L | BEAUFORT | SAMPLE 03 | | 04C STATION010 |
| 13 | B00047L | BEAUFORT | SAMPLE 03 | | 04C STATION010 |
| 10 14 | B80048L | BEAUFORT | SAMPLE 03 | SEDIMENT | 04C STATION010 |
| | B00049L | BEAUFORT | SAMPLE 03 | SEDIMENT | 04C STATION010 |
| 15 | 500045C 500076L | BEAUFORT | SAMPLE 16 | SEDIMENT | 04C STATION002 |
| 16 | | BEAUFORT | SAMPLE 16 | | 04C STATION002 |
| 17 | B00077L | BEAUFORT | SAMPLE 16 | | 04C STATION002 |
| 18 | B00078L | BEAUFORT | SAMPLE 10 | | 04C STATION002 |
| 19 | E00030L | | SAMPLE 10 | | 04C STATION002 |
| 20 | E00082L | BEAUFORT | SAMPLE 10 | | 04C STATION002 |
| $\mathbb{E}1$ | 800084L | BEAUFORT | | | 04C STATION002 |
| 22 | B00086L | BEAUFORT | | | 04C STATION002 |
| 23 | B00087L | BEAUFORT | | | 04C STATION002 |
| $\mathbb{C}4$ | B00089L | BEAUFORT | SAMPLE 10 | | 04C STATION002 |
| 25 | B00091L | BEAUFORT | SAMPLE 1 | · · · · · · · · · · · · · · · · · · · | 04C STATION002 |
| 26 | B00092L | BEAUFORT | SAMPLE 1 | | - |
| 27 | E00094L | BEAUFORT | SAMPLE 1 | | |
| 88 | B00095L | BEAUFORT | SAMPLE 1 | | |
| 29 | B90096L | BEAUFORT | SAMPLE 1 | | |
| 30 | B00097L | BEAUFORT | SAMPLE 1 | · · · · · · · · · · · · · · · · · · · | |
| Зī | B00098L | BEAUFORT | SAMPLE 1 | | |
| 32 | B00099L | BEAUFORT | SAMPLE 1 | | |
| 33 | B00100L | BEAUFORT | SAMPLE 1 | | |
| 34 | B00126L | BEAUFORT | SAMPLE 2 | 2 SEDIMENT | 04C STATION071 |
| 35 | B00127L | BEAUFORT | SAMPLE 2 | | |
| 36 | B00129L | BEAUFORT | SAMPLE 2 | 2 SEDIMENT | 04C STATION071 |
| | B00131L | BEAUFORT | SAMPLE 2 | 2 SEDIMENT | 04C STATION071 |
| 37 | B00133L | BEAUFORT | | | 94C STATION071 |
| 38 | B00135L | BEAUFORT | | | 04C STATION071 |
| 39 | | BEAUFORT | | | |
| 40 | B00137L | BEAUFORT | | | |
| 41 | 800138L | | | | |
| 42 | B00140L | BEAUFORT | | | |
| 43 | B00141L | BEAUFORT | | | |
| 44 | B00143L | BEAUFORT | | | |
| 45 | B00144L | BEAUFORT | | 2 SEDIMENT | |
| 40 | B00145L | BEAUFORT | | 2 SEDIMENT | |
| 47 | B00146L | BEAUFORT | | 2 SEDIMENT | |
| 48 | B00148L | BEAUFORT | | 2 SEDIMENT | |
| 49 | B00149L | BEAUFORT | | | |
| 50 | B00176L | BEAUFORT | SAMPLE 2 | 0 SEDIMENT | 04C STATION055 |
| | | | | | |

| 51 | B00178L | BEAUFORT SAMPLE 20 SEDIMENT 04C STATION055 |
|----------|---------|--|
| 52 | B00181L | BEAUFORT SAMPLE 20 SEDIMENT 04C STATION055 |
| 53 | B00184L | BEAUFORT SAMPLE 20 SEDIMENT 04C STATION055 |
| | | |
| 54 | B00185L | BEAUFORT SAMPLE 20 SEDIMENT 04C STATION055 |
| 55 | B00187L | BEAUFORT SAMPLE 20 SEDIMENT 04C STATION055 |
| 56 | B00190L | BEAUFORT SAMPLE 20 SEDIMENT 04C STATION055 |
| 57 | B00191L | BEAUFORT SAMPLE 20 SEDIMENT 04C STATION055 |
| | | |
| 58 | B00192L | BEAUFORT SAMPLE 20 SEDIMENT 04C STATION055 |
| 59 | B00193L | BEAUFORT SAMPLE 20 SEDIMENT 04C STATION055 |
| 60 | B00194L | BEAUFORT SAMPLE 20 SEDIMENT 04C STATION055 |
| 61 | B00195L | BEAUFORT SAMPLE 20 SEDIMENT 04C STATION055 |
| 62 | B00198L | BEAUFORT SAMPLE 20 SEDIMENT 04C STATION055 |
| | | |
| 63 | B00199L | BEAUFORT SAMPLE 20 SEDIMENT 04C STATION055 |
| 64 | B00226L | BEAUFORT SAMPLE 21 SEDIMENT 04C STATION070 |
| 65 | B00227L | BEAUFORT SAMPLE 21 SEDIMENT 04C STATION070 |
| 66 | B00228L | BEAUFORT SAMPLE 21 SEDIMENT 04C STATION070 |
| 67 | B00229L | BEAUFORT SAMPLE 21 SEDIMENT 04C STATION070 |
| | | |
| 68 | B00230L | BEAUFORT SAMPLE 21 SEDIMENT 04C STATION070 |
| 69 | E00231L | BEAUFORT SAMPLE 21 SEDIMENT 04C STATION070 |
| -70 | B00232L | BEAUFORT SAMPLE 21 SEDIMENT 04C STATION070 |
| 71 | B00233L | BEAUFORT SAMPLE 21 SEDIMENT 04C STATION070 |
| 72 | B00234L | BEAUFORT SAMPLE 21 SEDIMENT 04C STATION070 |
| | | |
| 73 | B00236L | BEAUFORT SAMPLE 21 SEDIMENT 04C STATION070 |
| 74 | B00237L | BEAUFORT SAMPLE 21 SEDIMENT 04C STATION070 |
| 75 | B00238L | BEAUFORT SAMPLE 21 SEDIMENT 04C STATION070 |
| 76 | B90243L | BEAUFORT SAMPLE 21 SEDIMENT 04C STATION070 |
| 77 | B00244L | BEAUFORT SAMPLE 21 SEDIMENT 04C STATION070 |
| 78 | B00245L | BEAUFORT SAMPLE 21 SEDIMENT 04C STATION070 |
| | | |
| 79 | B00246L | BEAUFORT SAMPLE 21 SEDIMENT 04C STATION070 |
| 80 | B00247L | BEAUFORT SAMPLE 21 SEDIMENT 04C STATION070 |
| 81 | B00251L | BEAUFORT SAMPLE 09 SEDIMENT 04C STATION030 |
| 82 | 800252L | |
| 83 | B00253L | |
| | | |
| 84 07 | B00254L | BEAUFORT SAMPLE 09 SEDIMENT 04C STATION030 |
| 85 | B00263L | BEAUFORT SAMPLE 09 SEDIMENT 04C STATION030 |
| 86 | B00264L | BEAUFORT SAMPLE 09 SEDIMENT 04C STATION030 |
| 87 | B00265L | BEAUFORT SAMPLE 09 SEDIMENT 04C STATION030 |
| 88 | B00266L | |
| 89 | B00269L | |
| 90 | | |
| | B00270L | BEAUFORT SAMPLE 09 SEDIMENT 04C STATION030 |
| 91 | B00274L | BEAUFORT SAMPLE 09 SEDIMENT 04C STATION030 |
| 92 | B00286L | BEAUFORT SAMPLE 15 SEDIMENT 04C STATION001 |
| 93 | B00287L | BEAUFORT SAMPLE 15 SEDIMENT 04C STATION001 |
| 94 | B00288L | |
| 95 | B00289L | |
| | | BEAUFORT SAMPLE 15 SEDIMENT 04C STATION001 |
| 96 | B00290L | BEHUFORT SAMPLE 15 SEDIMENT 04C STATION001 |
| 97 | B00296L | BEAUFORT SAMPLE 32 SEDIMENT 04C STATION002 |
| 98 | B00297L | BEAUFORT SAMPLE 32 SEDIMENT 04C STATION002 |
| 99 | B00299L | |
| | | BEAUFORT SAMPLE 32 SEDIMENT 04C STATION002 |
| | | |

END FORM 99 STRAINS

Strains isolated from water at 20C capable of utilizing any of the following carbohydrates: arabinose, ribose, xylose, rhamnose, fructose, galactose, glucose, mannose, sorbose, cellobiose, lactose, maltose, sucrose, trehalose, raffinose, salicin.

| _ | و و فهر بندر بندر بنور بنور | | and a state of the | | 1. 1 | | |
|----------|-----------------------------|----------|--------------------|----|---------|-----|------------|
| 1 | B00001H | BEAUFORT | SAMPLE | | WATER | 200 | STATION010 |
| <u>.</u> | B00002H | BEAUFORT | SAMPLE | | MATER | 29C | STATION010 |
| | Booodsh | BEAUFORT | SAMPLE | 03 | HATER | 200 | STATION010 |
| 4 | B00004H | BEAUFORT | SAMPLE | 03 | WATER | 200 | STATION010 |
| 5 | B99005H | BEAUFORT | SAMPLE | 03 | WATER | 200 | STATION010 |
| É | B00006H | BEAUFORT | SAMPLE | 03 | WATER | 200 | STATION010 |
| 7 | B00007H | BEAUFORT | SAMPLE | 63 | MATER | 200 | STATION010 |
| 8 | B00008H | BEAUFORT | SAMPLE | 03 | MATER | 200 | STATION010 |
| 9 | B00009H | BEAUFORT | SAMPLE | õ3 | WATER | 200 | STATION010 |
| 10 | B00010H | BEAUFORT | SAMPLE | 03 | WATER | 200 | STATION010 |
| | | | SAMPLE | 03 | WATER | 200 | STATION010 |
| 11 | B00012H | BEAUFORT | SAMPLE | 03 | WATER | 200 | STATION010 |
| 12 | B00013H | BEAUFORT | | | | | |
| 13 | B00014H | BEAUFORT | SAMPLE | Ø3 | WATER | 200 | STATION010 |
| 14 | B00016H | BEAUFORT | SAMPLE | 03 | WATER | 200 | STATION010 |
| 15 | B00017H | BEAUFORT | SAMPLE | 03 | WATER | 200 | STATION010 |
| 16 | B00018H | BEAUFORT | SAMPLE | 03 | WATER | 200 | STATION010 |
| 17 | 800020H | BEAUFORT | SAMPLE | 03 | WATER | 20C | STATION010 |
| 18 | B00022H | BEAUFORT | SAMPLE | 03 | WATER | 200 | STATION010 |
| 19 | B00023H | BEAUFORT | SAMPLE | 63 | MATER | 200 | STATION010 |
| 20 | B00024H | BEAUFORT | SAMPLE | 03 | WATER | 20C | STATION010 |
| 21 | B00051H | BEAUFORT | SAMPLE | 20 | WATER | 200 | STATION020 |
| 22 | B00052H | BEAUFORT | SAMPLE | 20 | WATER | 200 | STATION020 |
| 23 | B00053H | BEAUFORT | SAMPLE | 20 | WATER | 20C | STATION020 |
| 24 | B00054H | BEAUFORT | SAMPLE | 20 | WATER | 200 | STATION020 |
| 25 | 899955H | BEAUFORT | SAMPLE | 20 | WATER | 200 | STATION020 |
| 26 | B90056H | BEAUFORT | SAMPLE | 20 | WATER | 200 | STATION020 |
| 27 | B00057H | BEAUFORT | SAMPLE | 20 | WATER | 200 | STATION020 |
| 23 | B00058H | BEAUFORT | SAMPLE | 20 | WATER | 200 | STATION002 |
| 29 | B00059H | BEAUFORT | SAMPLE | 20 | WATER | 200 | STATION002 |
| 30 | B00060H | BEAUFORT | SAMPLE | 20 | WATER | 200 | STATION002 |
| 31 | B00061H | BEAUFORT | SAMPLE | 20 | MATER | 200 | STATION002 |
| ЗĒ | B00062H | BEAUFORT | SAMPLE | 20 | MATER | 200 | STATION002 |
| 33 | B00063H | BEAUFORT | SAMPLE | 20 | WATER | 200 | STATION002 |
| 34 | B00064H | BEAUFORT | SAMPLE | 20 | WATER | 200 | STATION002 |
| 35 | B00065H | BEAUFORT | SAMPLE | 20 | WATER | 200 | STATION002 |
| 36 | B00066H | BEAUFORT | SAMPLE | 20 | WATER | 200 | STATION002 |
| 37 | B00067H | BEAUFORT | SAMPLE | 20 | WHTER | 200 | STATION002 |
| | | | | | MATER | | STATION002 |
| 38 | B00068H | BEAUFORT | SHMPLE | 20 | WATER | 200 | STATION002 |
| 39 | B99969H | BEAUFORT | | | | 200 | STATION002 |
| 40 | B00070H | BEAUFORT | | | | | STATION002 |
| 41 | B00071H | BEAUFORT | | 20 | WATER . | 200 | |
| 42 | B00072H | BEAUFORT | SAMPLE | 20 | WATER | 200 | STATION002 |
| 43 | 800073H | BEAUFORT | | | | 200 | STATION002 |
| 44 | B00101H | BEAUFORT | SAMPLE | 27 | WATER | 200 | STATION071 |
| 45 | B00102H | BEAUFORT | SAMPLE | | WATER | | STATION071 |
| 46 | B00103H | BEAUFORT | SAMPLE | | WATER | | STATION071 |
| 47 | B00104H | BEAUFORT | SAMPLE | | WATER | | STATION071 |
| 48 | B00106H | BEAUFORT | SAMPLE | | | | STATION071 |
| 49 | B00109H | BEAUFORT | | | MATER | | STATION071 |
| 50 | B00110H | BEAUFORT | SAMPLE | 27 | MATER | 200 | STATION071 |
| | | | | | | | |

| 51 | B00111H | BEAUFORT | SAMPLE | 27 | WATER | | |
|----------|---------|----------|--------|----|-------|-----|------------|
| 52 | B90112H | BEAUFORT | SAMPLE | 27 | WATER | 200 | STATION071 |
| 53 | B00113H | BEAUFORT | SAMPLE | 27 | WATER | 200 | STATION071 |
| 54 | B00114H | BEAUFORT | SAMPLE | 27 | WATER | 200 | STATION071 |
| 55 | B00116H | BEAUFORT | SAMPLE | 27 | WATER | 200 | STRTION071 |
| 56 | B00117H | BEAUFORT | SAMPLE | 27 | WATER | 200 | STATION071 |
| 57 | B00118H | BEAUFORT | SAMPLE | 27 | WATER | 20C | STATION071 |
| 58 | B00119H | BEAUFORT | SAMPLE | 27 | WATER | 200 | STATION071 |
| 59 | B00120H | BEAUFORT | SAMPLE | 27 | WATER | 200 | STATION071 |
| | | BEAUFORT | SAMPLE | 27 | WATER | 200 | STATION071 |
| 60 | B00121H | | SAMPLE | 27 | WATER | 200 | STATION071 |
| 61 | B00122H | BEAUFORT | | | WATER | 200 | STATIONØ71 |
| 62 | B00123H | BEAUFORT | SAMPLE | 27 | | | |
| 63 | B00151H | BEAUFORT | SAMPLE | 24 | WATER | 200 | STATION055 |
| 64 | B00152H | BEAUFORT | SAMPLE | 24 | WATER | 200 | STATION055 |
| 65 | B00153H | BEAUFORT | SAMPLE | 24 | WATER | 200 | STATION055 |
| 66 | B00154H | BEAUFORT | SAMPLE | 24 | WATER | 200 | STATION055 |
| 67 | B00155H | BEAUFORT | SAMPLE | 24 | WATER | 200 | STATION055 |
| 68 | B00156H | BEAUFORT | SAMPLE | 24 | WATER | 200 | STATION055 |
| 69 | B00157H | BEAUFORT | SAMPLE | 24 | WATER | 200 | STATION055 |
| 70 | B00158H | BEAUFORT | SAMPLE | 24 | MATER | 20C | STATION055 |
| 71 | B00160H | BEAUFORT | SAMPLE | 24 | MATER | 200 | STATION055 |
| 72 | B00161H | BEAUFORT | SAMPLE | 24 | WATER | 200 | STATION055 |
| 73 | B00162H | BEAUFORT | SAMPLE | 24 | WATER | 200 | STATION055 |
| 74 | B00163H | BEAUFORT | SAMPLE | 24 | WATER | 200 | STATION055 |
| 75 | B00164H | BEAUFORT | SAMPLE | 24 | WATER | 200 | STATION055 |
| 76 | B00165H | BEAUFORT | SAMPLE | 24 | WATER | 200 | STATION055 |
| 77 | B00166H | BEAUFORT | SAMPLE | 24 | WATER | 200 | STATION055 |
| 78 | B00168H | BEAUFORT | SAMPLE | 24 | WATER | 200 | STATION055 |
| | B00169H | BEAUFORT | SAMPLE | 24 | WATER | 200 | STATION055 |
| 79 00 | B00201H | BEAUFORT | SAMPLE | 26 | WATER | 200 | STATION070 |
| 80 03 | B00202H | BEAUFORT | SAMPLE | 26 | WATER | 200 | STATION070 |
| 81 | | BEAUFORT | SAMPLE | 26 | WATER | 200 | STATION070 |
| 82 | B00204H | BEAUFORT | SAMPLE | 26 | WATER | 200 | STATION070 |
| 83 | 800205H | BEAUFORT | SAMPLE | 26 | WATER | 200 | STATION070 |
| 84 | B00206H | | | 26 | WATER | 200 | STATION070 |
| 85 64 | B00207H | BEAUFORT | SAMPLE | | WATER | | STATION070 |
| 86 | B00210H | BEAUFORT | SAMPLE | 26 | | 200 | STATION070 |
| 87 | B00211H | BEAUFORT | SAMPLE | 26 | WATER | 200 | |
| 88 | B00212H | BEAUFORT | SAMPLE | | | | STATION070 |
| 89 | 800213H | BEAUFORT | SAMPLE | | | 200 | STATION070 |
| 90 | B00216H | BEAUFORT | SAMPLE | 26 | | | STATION070 |
| 91 | B00217H | BEAUFORT | SAMPLE | 26 | | | STATION070 |
| 92 | B00219H | BEAUFORT | SAMPLE | 26 | | | STATION070 |
| 93 | B00221H | BEAUFORT | SAMPLE | 26 | | 200 | STATION070 |
| 94 | B00222H | BEAUFORT | SAMPLE | 56 | | 200 | STATION070 |
| 95 | B00251H | BEAUFORT | SAMPLE | 11 | WATER | | STATION030 |
| 96 | B00252H | BEAUFORT | SAMPLE | 11 | WATER | | STATION030 |
| 97 | BØØ254H | BEAUFORT | SAMPLE | 11 | WATER | 200 | STATION030 |
| 98 | B00255H | BEAUFORT | SAMPLE | 11 | MATER | | STATION030 |
| 99 | B00256H | BEAUFORT | SAMPLE | 11 | WATER | | STATION030 |
| 100 | B00257H | BEAUFORT | SAMPLE | 11 | NATER | 20C | STATION030 |
| | | | | | | | |

.

| 103 B0 104 B0 105 B0 106 B0 107 B0 108 B0 109 B0 110 B0 111 B0 112 B0 113 B0 114 B0 | 30260H 30261H 30263H 30263H 30265H 30265H 30265H 30265H 30269H 30279H 30271H 30272H 30273H | BEAUFORT BEAUFORT BEAUFORT BEAUFORT BEAUFORT BEAUFORT BEAUFORT BEAUFORT BEAUFORT BEAUFORT BEAUFORT BEAUFORT BEAUFORT | SAMPLE SAMPLE SAMPLE SAMPLE SAMPLE SAMPLE SAMPLE SAMPLE SAMPLE SAMPLE SAMPLE SAMPLE | | | 200 200 200 200 200 200 200 200 200 200 | STATION030 STATION030 STATION030 STATION030 STATION030 STATION030 STATION030 STATION030 STATION030 STATION030 STATION030 STATION030 STATION030 |
|---|--|--|--|--|--|--|--|
|---|--|--|--|--|--|--|--|

END FORM 115 STRAINS

Strains isolated from sediment at 20C capable of utilizing any of the following carbohydrates: arabinose, ribose, xylose, rhamnose, fructose, galactose, glucose, mannose, sorbose, cellobiose, lactose, maltose, sucrose, trehalose, raffinose, salicin.

| 4 | nacarti | | SAMPLE | 00 | over to a second | 000 | STATION010 |
|---------------|---------|----------|--------|----|------------------|-------|--------------------------|
| 1 | 890026H | BEAUFORT | | | | | |
| 2 | B00027H | BEAUFORT | | | SEDIMENT | | STATION010 |
| 3 | 500028H | BEAUFORT | | 03 | SEDIMENT | | STATION010 |
| 4 | B00029H | BEAUFORT | | 03 | SEDIMENT | | STATION010 |
| 5 | 800030H | BEAUFORT | | 03 | SEDIMENT | | STATION010 |
| 6 | B00031H | BEAUFORT | SAMPLE | 03 | SEDIMENT | | STATION010 |
| 7 | B00032H | BEAUFORT | SAMPLE | 03 | SEDIMENT | | STATION010 |
| 8 | R00036H | BEAUFORT | SAMPLE | 63 | SEDIMENT | 200 | STATION010 |
| 9 | B00038H | BEAUFORT | SAMPLE | 63 | SEDIMENT | 200 | STATION010 |
| 10 | B00044H | BEAUFORT | SAMPLE | 03 | SEDIMENT | 200 | STATION010 |
| 11 | B00045H | BEAUFORT | SAMPLE | 63 | SEDIMENT | 200 | STATION010 |
| 12 | B00047H | BEAUFORT | SAMPLE | 03 | SEDIMENT | 20C | STATION010 |
| 13 | B00048H | BEAUFORT | SAMPLE | 03 | SEDIMENT | 20C | STATION010 |
| 14 | B00085H | BEAUFORT | SAMPLE | 16 | SEDIMENT | 200 | STATION002 |
| 15 | B00086H | BEAUFORT | SAMPLE | 16 | SEDIMENT | 20C | STATION002 |
| 16 | B00091H | BEAUFORT | SAMPLE | 16 | SEDIMENT | 20C | STATION002 |
| 17 | 800093H | BEAUFORT | SAMPLE | 16 | SEDIMENT | 200 | STATION002 |
| 18 | B00098H | BEAUFORT | SAMPLE | 16 | SEDIMENT | 200 | STATION002 |
| 19 | B00099H | BEAUFORT | SAMPLE | 16 | SEDIMENT | 200 | STATION002 |
| 20 | B00130H | BEAUFORT | SAMPLE | 22 | SEDIMENT | 200 | STATION071 |
| $\mathbb{E}1$ | B00131H | BEAUFORT | SAMPLE | 22 | SEDIMENT | 20C | STATION071 |
| 22 | B00132H | BEAUFORT | SAMPLE | 22 | SEDIMENT | 200 | STATION071 |
| 23 | B00133H | BEAUFORT | SAMPLE | 22 | SEDIMENT | 20C | STATION071 |
| 24 | B00138H | BEAUFORT | SAMPLE | 22 | SEDIMENT | 200 | STATION071 |
| 25 | B00143H | BEAUFORT | SAMPLE | 22 | SEDIMENT | 20C | STATION071 |
| 26 | B00145H | BERUFORT | SAMPLE | 22 | SEDIMENT | | STATION071 |
| 27 | B00176H | BEAUFORT | SAMPLE | 20 | SEDIMENT | | STATION055 |
| 28 | B00177H | BERUFORT | SAMPLE | 20 | SEDIMENT | | STATION055 |
| 29 | B00178H | BEAUFORT | SAMPLE | 20 | SEDIMENT | | STATION055 |
| 30 | B00180H | BEAUFORT | SAMPLE | 20 | SEDIMENT | | STATION055 |
| 31 | B00182H | BEAUFORT | SAMPLE | 22 | SEDIMENT | | STATION071 |
| 32 | B00183H | BEAUFORT | SAMPLE | 20 | SEDIMENT | | STATION055 |
| 33 | B00184H | BEAUFORT | SAMPLE | 20 | SEDIMENT | | STATION055 |
| 34 | B00185H | BEAUFORT | SAMPLE | 20 | SEDIMENT | | STATION055 |
| 35 | B00186H | BEAUFORT | SAMPLE | 20 | SEDIMENT | | STATION055 |
| 36 | B00187H | BEAUFORT | SAMPLE | 20 | SEDIMENT | | |
| 37 | B00188H | BEAUFORT | SAMPLE | 20 | SEDIMENT | | STATION055 STATION055 |
| 38 | B00189H | BEAUFORT | | | SEDIMENT | | STATION055 |
| 39 | B00139H | BEAUFORT | | | | | |
| | B00190H | | | | SEDIMENT | | STATION055 |
| 40 | | BEAUFORT | SAMPLE | | SEDIMENT | 200 | STATION055 |
| 41 | B90192H | BEAUFORT | | | SEDIMENT | 200 : | STATION055 |
| 42 | B00193H | BEAUFORT | SAMPLE | 20 | SEDIMENT | 200 : | STATION055 |
| 43 | B00194H | BEAUFORT | SAMPLE | 20 | SEDIMENT | 200 : | STATION055 |
| 44 | B00195H | BEAUFORT | SAMPLE | 20 | SEDIMENT | 200 : | STATION055 |
| 45 | B00196H | BEAUFORT | SAMPLE | 20 | SEDIMENT | 200 : | STATION055 |
| 46 | B00197H | BEAUFORT | SAMPLE | | SEDIMENT | | STATION055 |
| 47 | B00198H | BEAUFORT | SAMPLE | | SEDIMENT | | STATION055 |
| 48 | B00199H | BEAUFORT | | | SEDIMENT | | STATION055 |
| 49 | 800200H | BEAUFORT | | | SEDIMENT | | STATION055 |
| 50 | B00226H | BEAUFORT | | | | | STATION070 |
| | | | | - | | | |

| 51 | B00228H | BEAUFORT | SAMPLE 21 | SEDIMENT | 20C STATION070 |
|----|---------|----------|-----------|----------|----------------|
| 52 | B00229H | BEAUFORT | SAMPLE 21 | SEDIMENT | 20C STATION070 |
| 53 | B00230H | BEAUFORT | SAMPLE 21 | SEDIMENT | 20C STATION070 |
| 54 | B00231H | BEAUFORT | SAMPLE 21 | SEDIMENT | 20C STATION070 |
| 55 | B00232H | BEAUFORT | SAMPLE 21 | SEDIMENT | 20C STATION070 |
| 56 | B00236H | BEAUFORT | SAMPLE 21 | SEDIMENT | 20C STATION070 |
| 57 | B00239H | BEAUFORT | SAMPLE 21 | SEDIMENT | 20C STATION070 |
| 58 | B00240H | BEAUFORT | SAMPLE 21 | SEDIMENT | 20C STATION070 |
| 59 | B00241H | BEAUFORT | SAMPLE 21 | SEDIMENT | 20C STATION070 |
| 60 | B00242H | BEAUFORT | SAMPLE 21 | SEDIMENT | 20C STATION070 |
| 61 | B00243H | BEAUFORT | SAMPLE 21 | SEDIMENT | 20C STATION070 |
| 62 | B00244H | BEAUFORT | SAMPLE 21 | SEDIMENT | 20C STATION070 |
| 63 | B00245H | BEAUFORT | SAMPLE 21 | SEDIMENT | 20C STATION070 |
| 64 | B00246H | BEAUFORT | SAMPLE 21 | SEDIMENT | 20C STATION070 |
| 65 | B00248H | BEAUFORT | SAMPLE 21 | SEDIMENT | 20C STATION070 |
| 66 | B00250H | BEAUFORT | SAMPLE 21 | SEDIMENT | 20C STATION070 |
| 67 | B00279H | BEAUFORT | SAMPLE 09 | SEDIMENT | 200 STATION030 |
| 68 | B00282H | BEAUFORT | SAMPLE 09 | SEDIMENT | 20C STATION030 |
| 69 | B00283H | BEAUFORT | SAMPLE 09 | SEDIMENT | 20C STATION030 |
| 70 | B00285H | BEAUFORT | SAMPLE 09 | SEDIMENT | 20C STATION030 |
| 71 | B00290H | BEAUFORT | SAMPLE 09 | SEDIMENT | 20C STATION030 |
| 72 | B00294H | BEAUFORT | SAMPLE 09 | SEDIMENT | 20C STATION030 |
| 73 | B00297H | BEAUFORT | SAMPLE 09 | SEDIMENT | 20C STATION030 |

END FORM

Strains isolated from water at 4C capable of utilizing any one of the following amino acids: alanine, Beta-alanine, Gamma-aminobutyric, arginine, asparagine, aspartic betaine, cysteine, cystine, glutamic, glycine, hippurate, histidine, leucine, iso-leucine, lysine, methionine, ornithine, phenylalanine, proline, sarcosine, serine, threonine, tryptophan, tyrosine, valine.

| 1 | 80 00 53L | BEAUFORT | SAMPLE | 20 | MATER | 04C | STATION002 |
|----|------------------|----------|--------|----------|-------|------------|--------------------------|
| ŝ | B00057L | BEAUFORT | SAMPLE | 20 | MATER | 04C | STATION002 |
| 3 | 300058L | BEAUFORT | SAMPLE | 20 | WHTER | 04C | STATION002 |
| 4 | B00059L | BEAUFORT | SAMPLE | 20 | WATER | 04C | STATION002 |
| 5 | B90063L | BEAUFORT | SAMPLE | 20 | WATER | 04C | STATION002 |
| ě | B00067L | BEAUFORT | SAMPLE | 20 | WATER | 04C | STATION002 |
| 7 | B00071L | BEAUFORT | SAMPLE | 20 | WATER | 04C | STATION002 |
| 8 | 300072L | BEAUFORT | SAMPLE | 20 | WATER | 04C | STATION002 |
| 9 | B00073L | BEAUFORT | SAMPLE | 20 | WATER | 04C | STATION002 |
| 10 | B00074L | BEAUFORT | SAMPLE | 20 | WATER | Ø4C | STATION002 |
| 11 | B00075L | BEAUFORT | SAMPLE | 20 | WATER | Ø4C | STATION002 |
| 12 | B00101L | BEAUFORT | SAMPLE | 27 | WATER | 04C | STATION071 |
| 13 | B00103L | BEAUFORT | SAMPLE | 27 | WATER | 04C | STATION071 |
| 14 | B00106L | BEAUFORT | SAMPLE | 27 | MATER | 04C | STATION071 |
| 15 | B00108L | BEAUFORT | SAMPLE | 27 | MATER | 04C | STATION071 |
| 16 | 800109L | BEAUFORT | SAMPLE | 27 | MATER | 04C | STATION071 |
| 17 | B00111L | BEAUFORT | SAMPLE | 27 | WATER | 04C | STATION071 |
| 18 | B00114L | BEAUFORT | SAMPLE | 27 | MATER | 04C | STATION071 |
| 19 | 300116L | BERUFORT | SAMPLE | 27 | MATER | 04C | STATION071 |
| 20 | B00117L | BEAUFORT | SAMPLE | 27 | MATER | 04C | STATION071 |
| 21 | B00118L | BEAUFORT | SAMPLE | 27 | WATER | 04C | STATION071 |
| 22 | B00119L | BEAUFORT | SAMPLE | 27 | WATER | Ø4C | STATION071 |
| 23 | B00120L | BEAUFORT | SAMPLE | 27 | WATER | 04C | STATION071 |
| 24 | B00121L | BEAUFORT | SAMPLE | 27 | WATER | 04C | STATION071 |
| 25 | B00122L | BEAUFORT | SAMPLE | 27 | MATER | 04C | STATION071 |
| 26 | B00123L | BEAUFORT | SAMPLE | 27 | WATER | 04C | STATION071 |
| 27 | 800151L | BEAUFORT | SAMPLE | 24 | WATER | 04C | STATION055 |
| 28 | B00152L | BEAUFORT | SAMPLE | 24 | WATER | 04C | STATION055 |
| 29 | B00153L | BEAUFORT | SAMPLE | 24 | WATER | 04C | STATION055 |
| 30 | B00154L | BEAUFORT | SAMPLE | 24 | WATER | 04C | STATION055 |
| 31 | B00156L | BEAUFORT | SAMPLE | 24 | MATER | 04C | STATION055 |
| 32 | B00157L | BEAUFORT | SAMPLE | 24 | WATER | 04C | STATION055 |
| 33 | B00164L | BEAUFORT | SAMPLE | 24 | WATER | 04C | STATION055 |
| 34 | B00166L | BEAUFORT | SAMPLE | 24 | WATER | 04C | STATION055 |
| 35 | B00167L | BEAUFORT | SAMPLE | 24 | WATER | 04C | STATION055 |
| 36 | B00169L | BEAUFORT | SAMPLE | 24 | WATER | 04C | STATION055 STATION055 |
| 37 | B00170L | BEAUFORT | SAMPLE | 24 24 | WATER | 04C 94C | STATION055 |
| 38 | B00171L | BEAUFORT | SAMPLE | 24 24 | WATER | 04C 04C | STATION055 |
| 39 | 800174L | BEAUFORT | SAMPLE | 24 26 | WATER | 04C 94C | STATION070 |
| 40 | B00201L | BEAUFORT | SAMPLE | сb | WATER | 04C | STRUTURO/0 |

| 41 | 800202L | BEAUFORT | SAMPLE | 26 | MATER | 040 | STATION070 |
|----------|-----------------|----------|--------|----|-------|-----|------------|
| 42 | B00203L | BEAUFORT | SAMPLE | 26 | WATER | 04C | STATION070 |
| 43 | 800205L | BEAUFORT | SAMPLE | 26 | MATER | 04C | STATION070 |
| 44 | 500212L | BEAUFORT | SAMPLE | 95 | MATER | 04C | STATION070 |
| 43 | B00213L | BEAUFORT | SAMPLE | 26 | WATER | 04C | STATION070 |
| 46 47 | 899216L | BEAUFORT | SAMPLE | 26 | WATER | 04C | STATION070 |
| -11 | B00221L | BEAUFORT | SAMPLE | 26 | WATER | 04C | STATION070 |
| 48 | B9 9222L | BEAUFORT | SAMPLE | 26 | HATER | 04C | STATION070 |
| 49 | 300223L | BEAUFORT | SAMPLE | 26 | MATER | 04C | STATION070 |
| 50 | B00225L | BEAUFORT | SAMPLE | 26 | WATER | 04C | STATION070 |
| 51 | B99281L | BEAUFORT | SAMPLE | 19 | MATER | 04C | STATION001 |
| 52 | 800282L | BEAUFORT | SAMPLE | 19 | WATER | 04C | STATION001 |
| 53 | B00283L | BEAUFORT | SAMPLE | 19 | MATER | 04C | STATION001 |
| 54 | B00291L | BEAUFORT | SAMPLE | 36 | WATER | 04C | STATION002 |
| 55 | B00294L | BEAUFORT | SAMPLE | 36 | WATER | 04C | STATION002 |
| 56 | B00295L | BEAUFORT | SAMPLE | 36 | MATER | 04C | STATION002 |

END FORM OS STRAINS

Strains isolated from sediment at 4C capable of utilizing any of the following amino acids: asparagine, aspartic, gamma-aminobutyric, cysteine, cystine, glutamic, clycine, histidine, leucine, iso-leucine, lysine, methionine, ornithine, phenylalanine, proline, serine, threonine, tryptophan, tyrosine, valine.

| 1 | 899926L | BEAUFORT | SAMPLE | 03 | SEDIMENT | 04C | STATION010 |
|----|--------------------|----------|---------------------------------------|----------|----------|-----|------------|
| Ē | 899927L | BEAUFORT | SAMPLE | 03 | SEDIMENT | 04C | STATION010 |
| 3 | B00029L | BEAUFORT | | 03 | SEDIMENT | 04C | STATION010 |
| | B00031L | BEAUFORT | | 03 | SEDIMENT | Ø4C | STATION010 |
| 4 | | BEAUFORT | | 03 | SEDIMENT | 04C | STATION010 |
| S | 300035L | • | | 03 03 | SEDIMENT | 04C | STATION010 |
| 6 | B00042L | BEAUFORT | ••••• | | | | STATION002 |
| 7 | B00077L | BEAUFORT | | 16 | SEDIMENT | 04C | |
| 8 | B00078L | BEAUFORT | +- + ··· ··· ···· | 16 | SEDIMENT | 04C | STATION002 |
| 9 | B00084L | BEAUFORT | | 16 | SEDIMENT | 04C | STATION002 |
| 10 | B00087L | BEAUFORT | | 16 | SEDIMENT | 04C | STATION002 |
| 11 | B00089L | BEAUFORT | · · · · · · · · · · · · · · · · · · · | 16 | SEDIMENT | 04C | STATION002 |
| 12 | B00091L | BEAUFORT | SAMPLE | 16 | SEDIMENT | 04C | STATION002 |
| 13 | B00092L | BEAUFORT | SAMPLE | 16 | SEDIMENT | 04C | STATION002 |
| 14 | 800093L | BEAUFORT | SAMPLE | 16 | SEDIMENT | 04C | STATION002 |
| 15 | 800094L | BEAUFORT | SAMPLE | 16 | SEDIMENT | 04C | STATION002 |
| 16 | 860095L | BEAUFORT | | 16 | SEDIMENT | 04C | STATION002 |
| 17 | B00097L | BEAUFORT | | 16 | SEDIMENT | 04C | STATION002 |
| | 800098L | REAUFORT | | 16 | SEDIMENT | 04C | STATION002 |
| 18 | | BEAUFORT | | 16 | SEDIMENT | 04C | STATION002 |
| 19 | B00099L | BEAUFORT | | 16 | SEDIMENT | 04C | STATION002 |
| 20 | BOO100L | | | 22 | SEDIMENT | 04C | STATION071 |
| 21 | B00126L | BEAUFORT | | | | | STATION071 |
| 22 | B90127L | BEAUFORT | | 22 | SEDIMENT | 04C | |
| 23 | B90128L | BEAUFORT | | 22 | SEDIMENT | 04C | STATION071 |
| 24 | B00130L | BEAUFORT | | 55 | SEDIMENT | 04C | STATION071 |
| 25 | B00131L | BEAUFORT | | 22 | SEDIMENT | Ø4C | STATION071 |
| 26 | B00133L | BEAUFORT | SAMPLE (| 22 | SEDIMENT | 04C | STATION071 |
| 27 | B00144L | REAUFORT | SAMPLE | 22 | SEDIMENT | 04C | STATION071 |
| 85 | 800145L | BEAUFORT | SAMPLE : | 22 | SEDIMENT | 04C | STATION071 |
| 29 | B00146L | BEAUFORT | SAMPLE : | 22 | SEDIMENT | 04C | STATION071 |
| 30 | B00149L | BEAUFORT | SAMPLE | 22 | SEDIMENT | 04C | STATION071 |
| 31 | B00150L | BEAUFORT | SAMPLE | 22 | SEDIMENT | 04C | STATION071 |
| 32 | B00178L | BEAUFORT | SAMPLE : | 20 | SEDIMENT | 04C | STATION055 |
| 33 | 800184L | BEAUFORT | SAMPLE : | 20 | SEDIMENT | Ø4C | STATION055 |
| 34 | B00185L | BEAUFORT | | 20 | SEDIMENT | 04C | STATION055 |
| 35 | B00186L | BEAUFORT | + | 20 | SEDIMENT | 04C | STATION055 |
| 36 | B00187L | BEAUFORT | | 20 | SEDIMENT | 04C | STATION055 |
| 37 | B00189L | BEAUFORT | | 20 | SEDIMENT | Ø4C | STATION055 |
| 38 | B00190L | BEAUFORT | | | SEDIMENT | | STATION055 |
| | B00191L | BEAUFORT | | | | | STATION055 |
| 39 | | BEAUFORT | | | | | STATION055 |
| 40 | B00192L B00193L | | | | SEDIMENT | | STATION055 |
| 41 | | | SAMPLE | | SEDIMENT | | STATION055 |
| 42 | B00194L | BEAUFORT | SAMPLE : | | | 04C | STATION055 |
| 43 | 800195L | | | | SEDIMENT | 04C | STATION055 |
| 44 | B00198L | BEAUFORT | SAMPLE : | | | 04C | STATION055 |
| 45 | B00199L | BEAUFORT | SAMPLE : | | | | |
| 46 | B00226L | BEAUFORT | SAMPLE : | | SEDIMENT | | STATION070 |
| 47 | B00227L | BEAUFORT | SAMPLE | | SEDIMENT | 04C | |
| 48 | 800230L | BEAUFORT | SAMPLE | | SEDIMENT | | STATION070 |
| 49 | B00232L | BEAUFORT | SAMPLE | | SEDIMENT | | STATION070 |
| 50 | 800233L | BEAUFORT | SAMPLE : | 21 | SEDIMENT | 04C | STATION070 |

| | | | | | | | |
|-------------|---------|----------|----------------------------|-----|----------|-----|------------|
| 51 | B00234L | BEAUFORT | SAMPLE S | 21 | SEDIMENT | 04C | STATION070 |
| 52 | B00235L | BEAUFORT | SAMPLE 2 | 21 | SEDIMENT | Ø4C | STATION070 |
| 53 | B00237L | BEAUFORT | SAMPLE 8 | 21 | SEDIMENT | Ø4C | STATION070 |
| 54 | B00238L | BEAUFORT | | 21 | SEDIMENT | 04C | STATION070 |
| 55 | B00239L | BEAUFORT | SAMPLE 2 | 21 | SEDIMENT | Ø4C | STATION070 |
| 56 | B00240L | BEAUFORT | SAMPLE 8 | 21 | SEDIMENT | 04C | STATION070 |
| 57 | B00241L | BEAUFORT | SAMPLE a | 21 | SEDIMENT | 04C | STATION070 |
| 58 | B00242L | BEAUFORT | SAMPLE 2 | 21 | SEDIMENT | 04C | STATION070 |
| 59 | B00243L | BEAUFORT | SAMPLE & | - 1 | SEDIMENT | 04C | STATION070 |
| 60 | B00244L | BEAUFORT | SAMPLE 2 | 21 | SEDIMENT | 04C | STATION070 |
| 61 | B00245L | BEAUFORT | SAMPLE 8 | 21 | SEDIMENT | 04C | STATION070 |
| 62 | B00246L | BEAUFORT | | 21 | SEDIMENT | 04C | STATION070 |
| 63 | 800247L | BEAUFORT | SAMPLE 2 | 21 | SEDIMENT | 04C | STATION070 |
| 64 | 800250L | BEAUFORT | SAMPLE a | 21 | SEDIMENT | 04C | STATION070 |
| 65 | B00251L | BEAUFORT | SAMPLE 0 | 39 | SEDIMENT | 04C | STATION030 |
| 66 | B00252L | BEAUFORT | | 99 | SEDIMENT | 04C | STATION030 |
| 67 | B00257L | BEAUFORT | SAMPLE 0 | 39 | SEDIMENT | 04C | STATION030 |
| 68 | B00259L | BEAUFORT | SAMPLE 0 | 39 | SEDIMENT | 04C | STATION030 |
| 69 | B00261L | BEAUFORT | SAMPLE 0 | 39 | SEDIMENT | 04C | STATION030 |
| 70 | B00263L | BEAUFORT | - The second second second | 39 | SEDIMENT | 04C | STATION030 |
| 71 | B00265L | BEAUFORT | | 39 | SEDIMENT | 04C | STATION030 |
| 72 | 890267L | BEAUFORT | | 39 | SEDIMENT | Ø4C | STATION030 |
| 73 | 300268L | BEAUFORT | SAMPLE 0 | 39 | SEDIMENT | 04C | STATION030 |
| 74 | B00270L | BEAUFORT | | 39 | SEDIMENT | 04C | STATION030 |
| 75 | B00271L | BEAUFORT | SAMPLE 0 | 39 | SEDIMENT | 04C | STATION030 |
| 76 | B00272L | BEAUFORT | | 39 | SEDIMENT | Ø4C | STATION030 |
| 77 | B00273L | BEAUFORT | | 39 | SEDIMENT | 04C | STÁTION030 |
| 78 | B00274L | BEAUFORT | | 99 | SEDIMENT | 04C | STATION030 |
| 79 | B00286L | BEAUFORT | SAMPLE 1 | 15 | SEDIMENT | 04C | STATION001 |
| 80 | B00287L | BEAUFORT | | 15 | SEDIMENT | 04C | STATION001 |
| $\bar{\$1}$ | B00289L | BEAUFORT | | 15 | SEDIMENT | 04C | STATION001 |
| 82 | B00290L | BEAUFORT | SAMPLE 1 | 15 | SEDIMENT | 04C | STATION001 |
| 83 | B00296L | BEAUFORT | | 32 | SEDIMENT | 04C | STATION002 |
| 84 | B00299L | BEAUFORT | SAMPLE 3 | 32 | SEDIMENT | 04C | STATION002 |
| | | | | | | | |

- ---

END FORM

Strains isolated from water at 20C capable of utilizing any one of the following amino acids: alanine, Beta-alanine, Gamma-aminobutyric, arginine, asparagine, aspartic, betaine, cysteine, cystine, glutamic, glycine, hippurate, histidine, leucine, iso-leucine, lysine, methionine, ornithine, phenylalanine, proline, sarcosine, serine, threonine, tryptophan, tyrosine, valine.

| 1 | B00001H | BEAUFORT | COMPLE" | 03 | Потер | 200 | STATION010 |
|----------|---------|----------|---------|--------------|-------|-----|------------|
| 1 | | | SAMPLE | | WATER | | |
| ĝ | BOOOO2H | BEAUFORT | | | WATER | | |
| 3 | BOOOOSH | BEAUFORT | SAMPLE | | | | STATION010 |
| 4 | B00004H | BEAUFORT | SAMPLE | 03 | WATER | 200 | STATION010 |
| 5 | B00005H | BEAUFORT | SAMPLE | 03 | MATER | 200 | STATION010 |
| 6 | B00006H | BEAUFORT | SAMPLE | 03 | WATER | 20C | STATION010 |
| 7 | B00007H | BEAUFORT | SAMPLE | 03 | WATER | 200 | STATION010 |
| 8 | BOOOOSH | BEAUFORT | SAMPLE | 03 | WATER | 200 | STATION010 |
| - Ģ | B00009H | BEAUFORT | SAMPLE | 03 | WATER | 200 | STATION010 |
| 10 | B00010H | BEAUFORT | SAMPLE | 03 | WATER | 200 | STATION010 |
| 11 | B00013H | BEAUFORT | SAMPLE | õ3 | WATER | 200 | STATION010 |
| 12 | B00014H | BEAUFORT | SAMPLE | 03 | WATER | 200 | STATION010 |
| 13 | B00014H | BEAUFORT | SAMPLE | 03 | WATER | 200 | STATION010 |
| 14 | B00017H | BEAUFORT | SAMPLE | - 93 - 93 | | 200 | STATION010 |
| | | | | | WATER | | |
| 15 | B00018H | BEAUFORT | SAMPLE | 03 | WATER | 200 | STATION010 |
| 16 | B00020H | BEAUFORT | SAMPLE | 03 | WATER | 200 | STATION010 |
| 17 | B00021H | BEAUFORT | SAMPLE | 63 | WATER | 200 | STATION010 |
| 18 | B00022H | BEAUFORT | SAMPLE | 03 | WATER | 20C | STATION010 |
| 19 | B00023H | BEAUFORT | SAMPLE | 03 | WATER | 20C | STATION010 |
| 20 | B00024H | BEAUFORT | SAMPLE | 63 | WATER | 20C | STATION010 |
| 21 | B00051H | BEAUFORT | SAMPLE | 20 | MATER | 200 | STATION020 |
| 22 | B90052H | BEAUFORT | SAMPLE | 20 | WATER | 20C | STATION020 |
| 23 | B00053H | BEAUFORT | SAMPLE | 20 | MATER | 200 | STATION020 |
| 24 | B00054H | BEAUFORT | SAMPLE | 20 | WATER | 200 | STATION020 |
| 25 | B00055H | BEAUFORT | SAMPLE | 20 | MATER | 20C | STATION020 |
| 26 | B00058H | BEAUFORT | SAMPLE | 20 | WATER | 200 | STATION002 |
| 27 | B00059H | BEAUFORT | SAMPLE | Ξø | WATER | 200 | STATION002 |
| 28 | B00060H | BEAUFORT | SAMPLE | 20 | WATER | 200 | STATION002 |
| 29 | B00061H | BEAUFORT | SAMPLE | 20 | WATER | 200 | STATION002 |
| 30 | B00063H | BEAUFORT | SAMPLE | 20 | WATER | 200 | STATION002 |
| 31 | B00064H | BEAUFORT | SAMPLE | 20 | MATER | 200 | STATION002 |
| 32 | B00065H | BEAUFORT | SAMPLE | 20 | WATER | 200 | STATION002 |
| 33 | B00066H | BEAUFORT | SAMPLE | 20 | WATER | 200 | STATION002 |
| 34 34 | | BEAUFORT | SAMPLE | 27 | WATER | 200 | STATION071 |
| | B00101H | | | | | | |
| 35 | B00102H | BEAUFORT | SAMPLE | 27 | WATER | 200 | STATION071 |
| 36 | B00103H | BEAUFORT | SAMPLE | 27 | WATER | 200 | STATION071 |
| 37 | B00104H | BEAUFORT | SAMPLE | 27 | WATER | 200 | STATION071 |
| 38 | B00106H | BEAUFORT | SAMPLE | 27 | WATER | | STATION071 |
| 39 | B00109H | BEAUFORT | SAMPLE | | WATER | | STATION071 |
| 40 | 300110H | BEAUFORT | | 27 | WATER | | STATION071 |
| -11 | B00111H | BEAUFORT | SAMPLE | 27 | WATER | 200 | STATION071 |
| 42 | B00112H | BEAUFORT | SAMPLE | 27 | WATER | 20C | STATION071 |
| 43 | B00113H | BEAUFORT | SAMPLE | 27 | WATER | 200 | STATION071 |
| 44 | B00114H | BEAUFORT | SAMPLE | 27 | WATER | 200 | STATION071 |
| 45 | B00115H | BEAUFORT | SAMPLE | 27 | WATER | 200 | STATION071 |
| 46 | B00116H | BEAUFORT | SAMPLE | 27 | WATER | 200 | STATION071 |
| 47 | B00117H | BEAUFORT | SAMPLE | 27 | WATER | 200 | STATION071 |
| 48 | B00118H | BEAUFORT | SAMPLE | 27 | WATER | 200 | STATION071 |
| 49 | B00119H | BEAUFORT | SAMPLE | 27 | WATER | | STATION071 |
| 50 | B00120H | BEAUFORT | | 27 | WATER | | STATION071 |
| - | | | | | | | |

| 51 | B00121H | BEAUFORT S | AMPLE | 27 | WATER | 200 | STATION071 |
|------|---|---------------------|-------------|-----|--------------|-----|------------|
| 52 | B90122H | BEAUFORT S | AMPLE | 27 | WATER | 200 | STATION071 |
| | | | | 27 | WATER | 200 | STATION071 |
| 53 | B00123H | | | | | | |
| 54 | B00124H | | AMPLE | 27 | WATER | 200 | STATION071 |
| 55 | B00151H | BEAUFORT S | AMPLE | 24 | WATER | 200 | STATION055 |
| 56 | B00152H | BEAUFORT S | AMPLE | 24 | WATER | 200 | STATION055 |
| 57 | B00153H | | AMPLE | 24 | WATER | 200 | STATION055 |
| | | | | | WATER | 200 | STATION055 |
| 58 | B00154H | | AMPLE | 24 | | | |
| 59 | B00155H | | | 24 | WATER | 200 | STATION055 |
| 60 | B00156H | BEAUFORT S | AMPLE | 24 | WATER | 20C | STATION055 |
| 61 | B00158H | BEAUFORT S | AMPLE | 24 | WATER | 200 | STATION055 |
| 62 | B00159H | BEAUFORT S | AMPLE | 24 | WATER | 200 | STATION055 |
| 63 | B00160H | | | 24 | WATER | 200 | STATION055 |
| | | | | 24 | WATER | 200 | STATION055 |
| 64 | B00161H | | | | | | |
| 65 | B00162H | | | 24 | WATER | 200 | STATION055 |
| 66 | B00163H | BEAUFORT S | | 24 | WATER | 20C | STATION055 |
| 67 | B00164H | BEAUFORT S | AMPLE | 24 | WATER | 200 | STATION055 |
| 68 | B00166H | BEAUFORT S | AMPLE | 24 | WATER | 20C | STATION055 |
| 69 | B00168H | | | 24 | WATER | 200 | STATION055 |
| | | | | 24 | WATER | 200 | STATION055 |
| 70 | B00169H | | | | | | - · · · |
| 71 | B00201H | | | 26 | WATER | 20C | STATION070 |
| 72 | B00202H | BEAUFORT S | AMPLE | 86 | WATER | 200 | STATION070 |
| 73 | B00204H | BEAUFORT S | AMPLE | 26 | WATER | 200 | STATION070 |
| 74 | B00205H | | | 26 | WATER | 20C | STATION070 |
| 75 | B00206H | | | 26 | WATER | 200 | STATION070 |
| | | | | 26 | WATER | 200 | STATION070 |
| 76 | B00207H | | | | | | |
| 77 | 800208H | | | 26 | MATER | 200 | STATION070 |
| 78 | B00210H | BEAUFORT S | AMPLE | 26 | WATER | 20C | STATION070 |
| 79 | B00211H | BEAUFORT S | AMPLE | 26 | WATER | 200 | STATION070 |
| 80 | B00212H | BEAUFORT S | AMPLE | 26 | WATER | 200 | STATION070 |
| 81 | B00213H | | | 26 | WATER | 200 | STATION070 |
| | | | | | WATER | 200 | STATION070 |
| 82 | B00216H | | | 26 | | | |
| 83 | B00217H | | | 26 | WATER | 20C | STATION070 |
| 84 | B00219H | BEAUFORT S | | 26 | MATER | 20C | STATION070 |
| 85 | B00221H | BEAUFORT S | AMPLE | 26 | WATER . | 200 | STATION070 |
| 86 | B00222H | BEAUFORT S | AMPLE | 26 | WATER | 200 | STATION070 |
| 87 | B90223H | | AMPLE | | WATER | 200 | STATION070 |
| 88 | B00251H | | AMPLE | 11 | WATER | 200 | STATION030 |
| | | | | 11 | WATER | 200 | STATION030 |
| 89 | B00252H | | | | | | |
| 90 | B00254H | | | 11 | WATER | 50C | STATION030 |
| 91 | B00255H | | | 11 | WATER | 20C | STATION030 |
| 92 | B00256H | BEAUFORT S | AMPLE | 11 | WATER | 200 | STATION030 |
| 93 | B00257H | BEAUFORT S | AMPLE | 11 | WATER | 200 | STATION030 |
| 94 | B00258H | | | 11 | WATER | 200 | STATION030 |
| 95 | B00259H | | | 11 | WATER | 200 | STATION030 |
| | | | | | WATER | 200 | STATION030 |
| 96 | 800260H | | | | | | |
| 97 | B00261H | | | | WATER | 20C | STATION030 |
| 98 | B0026 2H | | | | WATER | 200 | STATION030 |
| 99 | B90263H | BEAUFORT S | AMPLE | 11 | WATER | 206 | STATION030 |
| 100 | B00264H | BEAUFORT S | AMPLE | 11 | WATER | 200 | STATION030 |
| 101 | B00265H | | | | WATER | 200 | STATION030 |
| 102 | B00266H | | | | WATER | 200 | STATION030 |
| | | | | | | 200 | STATION030 |
| 103 | B00268H | | | | | | |
| 104 | B00269H | | | | | | STATION030 |
| 105 | 800270H | BEAUFORT SI | AMPLE | 11 | WATER | | STATION030 |
| 106 | B00271H | BEAUFORT S | AMPLE | 11 | WATER | 200 | STATION030 |
| 107 | B00273H | | | | | | STATION030 |
| 108 | B00275H | | | | | | STATION030 |
| オビビン | AND | avalenden og var av | 1111 houlea | * * | ent i Feally | | |

·····

END FORM

Strains isolated from sediment at 20C capable of utilizing any of the following amino acids: alanine, Beta-alanine, Gamma-aminobutyric, arginine, asparagine, aspartic, betaine, cysteine, cystine, glutamic, glycine, hippurate, histidine, leucine, iso-leucine, lysine, methionine, ornithine, phenylalanine, proline, sarcosine, serine, threonine, tryptophan, tyrosine, valine.

| | and the state of the state of the state | 90.000 and 1900 and 1000 and 100 | CONSTRUCT: | <i></i> | SEDIMENT | 200 | STATION010 |
|----------|---|----------------------------------|------------|---------|----------|------|------------|
| 1 | B00026H | BEAUFORT | | | | | |
| 2 | 300027H | BEAUFORT | SAMPLE | | SEDIMENT | 200 | STATION010 |
| З | B00028H | BEAUFORT | SAMPLE | | SEDIMENT | 200 | STATION010 |
| 4 | BOOOSOH | BEAUFORT | SAMPLE | 03 | SEDIMENT | 200 | STATION010 |
| 5 | B00031H | BEAUFORT | SAMPLE | 03 | SEDIMENT | 200 | STATION010 |
| ő | B00032H | BEAUFORT | SAMPLE | 03 | SEDIMENT | 200 | STATION010 |
| ž | B00036H | BEAUFORT | SAMPLE | 03 | SEDIMENT | 200 | STATION010 |
| ŝ | 800038H | BEAUFORT | SAMPLE | 03 | SEDIMENT | 200 | STATION010 |
| 9 | B99044H | BEAUFORT | SAMPLE | Ø3 | SEDIMENT | 200 | STATION010 |
| 10 | B00045H | BEAUFORT | SAMPLE | õ3 | SEDIMENT | 200 | STATION010 |
| | B00047H | BEAUFORT | SAMPLE | 03 | SEDIMENT | 200 | STATION010 |
| 11 | | BEAUFORT | SAMPLE | 03 | SEDIMENT | 200 | STATION010 |
| 12 | B00048H | | | | SEDIMENT | 200 | STATION002 |
| 13 | B00085H | BEAUFORT | SAMPLE | 16 | | | |
| 14 | B00086H | BEAUFORT | SAMPLE | 16 | SEDIMENT | 200 | STATION002 |
| 15 | B00097H | BEAUFORT | SAMPLE | 16 | SEDIMENT | 200 | STATION002 |
| 16 | B00098H | BEAUFORT | SAMPLE | 16 | SEDIMENT | 200 | STATION002 |
| 17 | B00130H | BEAUFORT | SAMPLE | 55 | SEDIMENT | 20C | STATION071 |
| 13 | B00131H | BEAUFORT | SAMPLE | 22 | SEDIMENT | 200 | STATION071 |
| 19 | B00135H | BEAUFORT | SAMPLE | 22 | SEDIMENT | 20C | STATION071 |
| 20 | B00143H | BEAUFORT | SAMPLE | 22 | SEDIMENT | 20C | STATION071 |
| 21 | B00145H | BEAUFORT | SAMPLE | 22 | SEDIMENT | 20C | STATION071 |
| 22 | B00147H | BEAUFORT | SAMPLE | 22 | SEDIMENT | 200 | STATION071 |
| 23 | B00178H | BEAUFORT | SAMPLE | 20 | SEDIMENT | 200 | STATION055 |
| 24 | B00180H | BEAUFORT | SAMPLE | 20 | SEDIMENT | 20C | STATION055 |
| 25 | B00181H | BEAUFORT | SAMPLE | 20 | SEDIMENT | 200 | STATION055 |
| | | BEAUFORT | SAMPLE | 20 | SEDIMENT | 200 | STATION055 |
| 26 | B00183H | | SAMPLE | 20 | SEDIMENT | 200 | STATION055 |
| 27 | B00184H | BEAUFORT | | | | 200 | STATION055 |
| 28 | B00186H | BEAUFORT | SAMPLE | 20 | SEDIMENT | | STATION055 |
| 29 | B00187H | BEAUFORT | SAMPLE | 20 | SEDIMENT | 200 | |
| 30 | B00188H | BEAUFORT | SAMPLE | 50 | SEDIMENT | 200 | STATION055 |
| 31 | B00189H | BEAUFORT | SAMPLE | 20 | SEDIMENT | 200 | STATION055 |
| 32 | B00190H | BEAUFORT | SAMPLE | 20 | SEDIMENT | 20C | STATION055 |
| 33 | BØØ192H | BEAUFORT | SAMPLE | 20 | SEDIMENT | 200 | STATION055 |
| 34 | B00193H | BEAUFORT | SAMPLE | 20 | SEDIMENT | 200 | STATION055 |
| 35 | B00194H | BEAUFORT | SAMPLE | 20 | SEDIMENT | 200 | STATION055 |
| 36 | B00198H | BEAUFORT | SAMPLE | 20 | SEDIMENT | 200 | STATION055 |
| 37 | B00199H | BEAUFORT | SAMPLE | 20 | SEDIMENT | 200 | STATION055 |
| 38 | B00200H | | | | | 200 | STATION055 |
| 39 39 | B00231H | BEAUFORT | | | SEDIMENT | 20C | STATION070 |
| 37 40 | B00232H | BEAUFORT | SAMPLE | | | | STATION070 |
| | | | OTHER L.L. | L., 1 | | 6.00 | CTH120HOLC |
| 41 | B00233H | BEAUFORT | SAMPLE | 21 | SEDIMENT | 200 | STATION070 |
| 42 | B00236H | BEAUFORT | SAMPLE | 21 | SEDIMENT | 200 | STATION070 |
| 43 | B00533H | BEAUFORT | SAMPLE | 21 | SEDIMENT | | STATION070 |
| 44 | B00240H | BEAUFORT | | | SEDIMENT | | STATION070 |
| 45 | B00241H | BEAUFORT | | | SEDIMENT | | STATION070 |
| 46 | B00242H | BEAUFORT | SAMPLE | | | | STATION070 |
| 47 | B00243H | BEAUFORT | | | | | STATION070 |
| 48 | B00244H | BEAUFORT | | | | | STATION070 |
| 49 | B00245H | BEAUFORT | | | | | STATION070 |
| 50 | B00246H | BEAUFORT | SAMPLE | | | | STATION070 |
| 00 | 1006-001 | AND FOUL OF T | | C L | SCDINENT | ೭೮೬ | 010010070 |

| 51 | B00248H | BEAUFORT | SAMPLE 2 | 1 SEDIMENT | 20C STATION070 |
|----|---------|----------|----------|-------------|----------------|
| 52 | B00249H | BEAUFORT | SAMPLE 2 | 1 SEDIMENT | 20C STATION070 |
| 53 | B00250H | BEAUFORT | SAMPLE 2 | 1 SEDIMENT | 20C STATION070 |
| 54 | B00276H | BEAUFORT | SAMPLE 0 | 9 SEDIMENT | 20C STATION030 |
| 55 | B00281H | BEAUFORT | | 9 SEDIMENT | 20C STATION030 |
| 56 | B00282H | BEAUFORT | SAMPLE 0 | 19 SEDIMENT | 20C STATION030 |
| 57 | B00283H | BEAUFORT | SAMPLE 0 | 9 SEDIMENT | 20C STATION030 |
| 58 | B00286H | BEAUFORT | SAMPLE 0 | 9 SEDIMENT | 20C STATION030 |
| 59 | B00295H | BEAUFORT | SAMPLE 0 | 9 SEDIMENT | 20C STATION030 |
| 60 | B00297H | BEAUFORT | SAMPLE 0 | 9 SEDIMENT | 20C STATION030 |
| 61 | 800300H | BEAUFORT | SAMPLE Ø | 9 SEDIMENT | 20C STATION030 |

END FORM 61 STRAINS

Strains isolated from water at 4C capable of utilizing any one of the following alcohols: D-arabitol, 1-butanol, 2-propanol, 1-propanol, D-mannitol, D-sorbitol, Meso-inositol, 1,2-propanediol, ethanol, glycerol, dulcitol.

| 1 | 300051 | BERUFORT | SAMPLE | 03 | HATER | 04C | STATION010 |
|----------|------------------|-----------|--------|-----------------|--------|-----|--------------------------|
| | 360996L | BERUFORT | SAMPLE | 63 | MATER | 04C | STATION010 |
| 3 | 3000541 | BEHUFORT | SAMPLE | 20 | NATER | Ø40 | STATION002 |
| | 1900558L | BERUFORT | SAMPLE | 20 | MATER | 04C | STATION002 |
| ٿ | B00059L | BEAUFORT | SAMPLE | 29 | WHITER | 04C | STATION002 |
| - | 889 966 1 | BEAUFORT | SAMPLE | 20 | MATER | 04C | STATION002 |
| Î. | B00067L | BEHUFORT | SAMPLE | 20 | MATER | 04C | STATION002 |
| 3 | 399971L | BEAUFORT | SAMPLE | 23 | WHTER | 04C | STATION002 |
| 9 | 390973L | BEAUFORT | SAMPLE | 20 | WATER | 04C | STATION002 |
| 10 | 800074L | BEIGUFORT | SAMPLE | 20 | WATER | 04C | STATION002 |
| 11 | 800075L | BEAUFORT | SAMPLE | 20 | WATER | 04C | STATION002 |
| 12 | 800109L | BEAUFORT | SAMPLE | 27 | MATER | 04C | STATION071 |
| 13 | B00114L | BEAUFORT | SAMPLE | 27 | MATER | 04C | STATION071 |
| 14 | 899117L | BEAUFORT | SAMPLE | $\overline{c7}$ | HATER | 04C | STATION071 |
| 15 | B00121L | BEAUFORT | SAMPLE | 27 | MATER | 04C | STATION071 |
| 16 | B00152L | BEAUFORT | SAMPLE | 24 | NATER | 04C | STATION055 |
| 17 | 290153L | BEAUFORT | SAMPLE | 24 | MATER | 04C | STATION055 |
| 18 | B00156L | BEAUFORT | SAMPLE | 24 | MATER | 04C | STATION055 |
| 19 | B99160L | BEAUFORT | SAMPLE | 24 | WATER | 04C | STATION055 |
| 20 | 200164L | BEAUFORT | SAMPLE | 24 | MATER | 04C | STATION055 |
| 21 | B00165L | BEAUFORT | SAMPLE | 24 | WATER | 04C | STATION055 |
| <u> </u> | B90166L | BEAUFORT | SAMPLE | 24 | WATER | 04C | STATION055 |
| 23 | 800167L | BEAUFORT | SAMPLE | 24 | WATER | 04C | STATION055 |
| 24 | B00169L | BERUFORT | SAMPLE | 24 | WATER | 040 | STATION055 |
| 25 | B00174L | BERUFORT | SAMPLE | 24 | WATER | 04C | STATION055 |
| 26 | B00201L | BEAUFORT | SAMPLE | 26 | WHTER | 04C | STATION070 |
| 27 | 2002 0 2L | BEAUFORT | SAMPLE | 26 | WATER | 04C | STATION070 |
| 28 | 300212L | BEAUFORT | SAMPLE | 26 | NATER | 04C | STATION070 |
| 29 | B00216L | BEAUFORT | SAMPLE | 26 | MATER | 04C | STATION070 |
| 30 | B99221L | BEAUFORT | SHMPLE | 26 | WATER | 04C | STATION070 |
| 31 | 800225L | BEAUFORT | SAMPLE | 26 | WATER | 04C | STATION070 |
| 32 | 899283L | REAUFORT | SAMPLE | 19 | MATER | 04C | STATION001 |
| 33 | 880294L | BEAUFORT | SAMPLE | 36 | MATER | 04C | STATION002 STATION002 |
| 34 | B00295L | BEAUFORT | SAMPLE | 36 | WATER | 04C | 0101100000 |

END FORM

34 STRAINS

100192

Strains isolated from sediment at 4C capable of utilizing any one of the following alcohols: D-arabitol, 1-butanol, 2-propanol, 1-propanol, D-mannitol, D-sorbitol, Meso-inositol, 1,2-propanediol, ethanol, glycerol, dulcitol.

| | | | | | | | and the state of the ball of the ball |
|----------|------------------|----------|---------|----|----------|------------|---------------------------------------|
| 1 | Hadia26L | BEAUFORT | SAMPLE | 63 | SEDIMENT | 840 840 | STATION010 |
| <u>.</u> | 860927L | DEADEORT | SAMPLE | 63 | SEDIMENT | 04C | STATION010 |
| З | 899959L | BEAUFORT | SAMPLE | 03 | SEDIMENT | 04C | STATION010 |
| ÷÷ | 200030L | BEAUFORT | SAMPLE | 63 | SEDIMENT | 04C | STATION010 |
| 5 | 386 831 L | BEHUFORT | SAMPLE | 03 | SEDIMENT | 04C | STATION010 |
| 6 | B660337 | BEAUFORT | SAMPLE | 03 | SEDIMENT | 04C | STATION010 |
| 7 | 3800 35L | BEAUFORT | SAMPLE | 63 | SEDIMENT | 040 | STATION010 |
| 8 | 899938L | BEAUFORT | SAMPLE | 63 | SEDIMENT | 04C | STATION010 |
| 9 | B00039L | BEAUFORT | SAMPLE | 03 | SEDIMENT | 04C | STATION010 |
| 10 | 800 0 44L | BEAUFORT | SAMPLE | 63 | SEDIMENT | 94C | STATION010 |
| 11 | 800048L | BEAUFORT | SAMPLE | 03 | SEDIMENT | 04C | STATION010 |
| 12 | <u>890049L</u> | BEAUFORT | SAMPLE | 63 | SEDIMENT | 04C | STATION010 |
| 13 | B00076L | BEAUFORT | SAMPLE | 16 | SEDIMENT | 04C | STATION002 |
| 上山 | 800077L | BERUFORT | SAMPLE | 16 | SEDIMENT | Ø4C | STATION002 |
| 15 | B66078L | BEAUFORT | SAMPLE | 16 | SEDIMENT | 04C | STATION002 |
| 16 | 8000 30 L | BEAUFORT | SAMPLE | 16 | SEDIMENT | 94C | STATION002 |
| 17 | B00084L | BEAUFORT | SAMPLE | 16 | SEDIMENT | 04C | STATION002 |
| 18 | B00087L | BEAUFORT | SAMPLE | 16 | SEDIMENT | 04C | STATION002 |
| 19 | B00089L | BEAUFORT | SAMPLE | 16 | SEDIMENT | 04C | STATION002 |
| 20 | B00091L | BEAUFORT | SAMPLE | 16 | SEDIMENT | 04C | STATION002 |
| 21 | B96092L | BEAUFORT | SAMPLE | 16 | SEDIMENT | Ø4C | STATION002 |
| 22 | 800094L | BEAUFORT | SAMPLE | 16 | SEDIMENT | 04C | STATION002 |
| 23 | B00095L | BEAUFORT | SAMPLE | 16 | SEDIMENT | 04C | STATION002 |
| 24 | 300096L | BEAUFORT | SAMPLE | 16 | SEDIMENT | 04C | STATION002 |
| 25 | 388 897L | BEAUFORT | SAMPLE | 16 | SEDIMENT | 04C | STATION002 |
| 26 | B00098L | BEAUFORT | SAMPLE | 16 | SEDIMENT | Ø4C | STATION002 |
| 27 | B00099L | BERUFORT | SAMPLE | 16 | SEDIMENT | 04C | STATION002 |
| 28 | 100100L | BEAUFORT | SAMPLE | 16 | SEDIMENT | 04C | STATION002 |
| 29 | 200126L | BEAUFORT | SAMPLE | 22 | SEDIMENT | 04C | STATION071 |
| 30 | 199127L | BEAUFORT | SAMPLE | 22 | SEDIMENT | 04C | STATION071 |
| Эт | 800129L | BEAUFORT | SAMPLE | 22 | SEDIMENT | 04C | STATION071 |
| 32 | B00131L | BEAUFORT | SAMPLE | 22 | SEDIMENT | 04C | STATION071 |
| 33 | B00133L | BEAUFORT | SAMPLE | 22 | SEDIMENT | 04C | STATION071 |
| 34 | B00135L | BEAUFORT | SAMPLE | 22 | SEDIMENT | 04C | STATICN071 |
| 35 | B00137L | BEAUFORT | SAMPLE | 22 | SEDIMENT | 04C | STATION071 |
| 36 | 300144L | BEAUFORT | SAMPLE | 22 | SEDIMENT | 04C | STATION071 |
| 37 | 390145L | BEAUFORT | SAMPLE | 22 | SEDIMENT | 04C | STATION071 |
| 38 | £90146L | BERUFORT | SAMPLE | 22 | SEDIMENT | 04C | STATION071 |
| 39 | 390148L | BEAUFORT | SAMPLE. | 22 | SEDIMENT | 04C | STATION071 |
| 40 | B90181L | BEAUFORT | SAMPLE | 20 | SEDIMENT | 04C | STATION055 |

| 41 800: | 184L | BERUFORT | SEMPLE | 20 | SEDIMENT | 04C | STATION055 |
|---------|--------------|----------|--------|----------------|----------|-----|------------|
| 42 8001 | | BEAUFORT | SAMPLE | 20 | SEDIMENT | 04C | STATION055 |
| | 186L | BEAUFORT | SAMPLE | 20 | SEDIMENT | 04C | STATION055 |
| 44 B002 | | BEAUFORT | SAMPLE | 21 | SEDIMENT | Ø4C | STATION070 |
| | 227L | BEAUFORT | SAMPLE | 21 | SEDIMENT | 04C | STATION070 |
| 46 8002 | | BEAUFORT | SAMPLE | 21 | SEDIMENT | 64C | STATION070 |
| • •• | 232L | BEAUFORT | SAMPLE | 21 | SEDIMENT | ø4Č | STATION070 |
| •• | | BEAUFORT | SAMPLE | 21 | SEDIMENT | 64C | STATION070 |
| | 237L | BEAUFORT | SAMPLE | 21 | SEDIMENT | 04C | STATION070 |
| | 243L | BERUFORT | SAMPLE | 21 | SEDIMENT | R4C | STATION070 |
| | 244L 54-3 | | SAMPLE | $\frac{1}{21}$ | SEDIMENT | 04C | STATION070 |
| | 2471 | BEAUFORT | SAMPLE | ст 69 | SEDIMENT | 04C | STATION030 |
| •• •• | 251L | BEAUFORT | _ / | 03 89 | SEDIMENT | 04C | STATION030 |
| | 266L | BEAUFORT | SAMPLE | | SEDIMENT | 04C | STATION030 |
| | 267L | BEAUFORT | SAMPLE | 09 00 | | 94C | STATION030 |
| •• • | 270L | BEAUFORT | SAMPLE | 69 | SEDIMENT | | STATION001 |
| •••• | 289L | REAUFORT | SAMPLE | 15 | SEDIMENT | 04C | |
| 57 8993 | 290L | BEAUFORT | SAMPLE | 15 | SEDIMENT | 04C | STATION001 |
| 53 600 | 599L | BERUFORT | SAMPLE | 32 | SEDIMENT | 04C | STAT10N002 |

SND FORM S8 STRAINS

Strains isolated from water at 20C capable of utilizing any one of the following alcohols: D-arabitol, l-butanol, 2-propanol, l-propanol, D-mannitol, D-sorbitol, Meso-inositol, l,2-propanediol, ethanol, glycerol, dulcitol.

| 1. | 399991H | BEAUFORT | SAMPLE | 03 | MATER | 200 | STATION010 |
|--------|---|----------------------------------|--------|----------|------------------|----------|------------|
| Ē | B99992H | BEAUFORT | SAMPLE | 63 | MATER | 200 | STATION010 |
| 3 | 800003H | BERUFORT | SAMPLE | 03 | MATER | 200 | STATION010 |
| 4 | B00005H | BEAUFORT | SAMPLE | 63 | MATER | 200 | STATION010 |
| 5 | B00006H | BEAUFORT | SAMPLE | 03 | WATER | 200 | STATION010 |
| 5 5 | B00007H | BEAUFORT | SAMPLE | 03 | WATER | 20C | STATION010 |
| 7 | BOOOOSH | BEAUFORT | SAMPLE | | WATER | 200 | STATION010 |
| 8 | B00009H | BEAUFORT | SAMPLE | 03 | WATER | 200 | STATION010 |
| 9 | B00002H | BEAUFORT | SAMPLE | 03 | WATER | 200 | STATION010 |
| - | B00012H | BEAUFORT | SAMPLE | õЗ | WATER | 200 | STATION010 |
| 10 | B00013H | BEAUFORT | SAMPLE | | WATER | 200 | STATION010 |
| 11 | 800014H 800016H | BEAUFORT | SAMPLE | 03 | MATER | 200 | STATION010 |
| 12 | | BEAUFORT | SAMPLE | 03 | MATER | 20C | STATION010 |
| 13 | B00017H | BEAUFORT | SAMPLE | őЗ | WATER | 200 | STATION010 |
| 14 | B00018H | BEAUFORT | SAMPLE | øЗ | WATER | 200 | STATION010 |
| 15 | 800020H | BEAUFORT | SAMPLE | 03 | WATER | 200 | STATION010 |
| 16 | B00021H | BEAUFORT | SAMPLE | 03 03 | WATER | 200 | STATION010 |
| 17 | B00022H | BEAUFORT | SAMPLE | 03 | WATER | 200 | STATION010 |
| 18 | B00024H | BEAUFORT | SAMPLE | 20 | WATER | 200 | STATION020 |
| 19 | B00051H | BEAUFORT | SAMPLE | 20 | WATER | 200 | STATION020 |
| 20 | B00052H | BEAUFORT | SAMPLE | 20 | WATER | 200 | STATION020 |
| 21 | 800053H | BEAUFORT | SAMPLE | 20 | WATER | 200 | STATION020 |
| 22 | B00054H | BEAUFORT | SAMPLE | 20 | WATER | 200 | STATION020 |
| 53 | 800055H | | SAMPLE | 20 | WATER | 200 | STATION002 |
| 24 | 800058H | BEAUFORT | SAMPLE | 20 | WATER | 200 | STATION002 |
| 25 | B00059H | BEAUFORT | | 20 | WATER | | STATION002 |
| 26 | B99960H | BEAUFORT | SAMPLE | | WATER | 200 | STATION002 |
| 27 | B00061H | BEAUFORT | SAMPLE | 20 | WATER | 200 | STATION002 |
| 28 | 300063H | BEAUFORT | SAMPLE | 20 | | 200 | STATION002 |
| 29 | B00064H | BEAUFORT | SAMPLE | 20 | WATER | | STATION002 |
| 30 | B00065H | BEAUFORT | SAMPLE | 20 | WATER | 200 | STATION002 |
| 31 | B00066H | BEAUFORT | SAMPLE | 20 | WATER | 200 | STATION002 |
| 32 | 800067H | BEAUFORT | SAMPLE | 20 | WATER | 200 | STATION002 |
| 33 | B00068H | BEAUFORT | SAMPLE | 20 | WATER | 200 | H |
| 34 | 800069H | BEAUFORT | SAMPLE | 20 | MATER | 200 | STATION002 |
| 35 | B00070H | BEAUFORT | SAMPLE | 20 | WATER | 200 | STATION002 |
| 36 | B00071H | BEAUFORT | SAMPLE | 20 | WATER | 200 | STATION002 |
| 37 | 800072H | BEAUFORT | SAMPLE | 20 | | 200 | STATION002 |
| 38 | B00073H | BEAUFORT | | | | | STATION002 |
| 39 | B00101H | BEAUFORT | | | | | |
| 40 | B90102H | BEAUFORT | SAMPLE | 27 | MATER | 20C | STATION071 |
| 41 | B69103H | BEAUFORT | SAMPLE | 27 | MATER | 200 | STATION071 |
| 42 | B00104H | BEAUFORT | SAMPLE | 27 | WATER | 200 | |
| 43 | 300106H | BEAUFORT | SAMPLE | | | | STATION071 |
| 44 | B00109H | BEAUFORT | SAMPLE | | | | STATION071 |
| 45 | B00110H | BEAUFORT | SAMPLE | | | | |
| 46 | B00112H | BEAUFORT | SAMPLE | | | | |
| 47 | 800113H | BEAUFORT | SAMPLE | | | | STATION071 |
| 48 | B00114H | BEAUFORT | SAMPLE | | | | |
| 49 | B00115H | BERUFORT | SAMPLE | | | | STATION071 |
| 50 | B00116H | BEAUFORT | SAMPLE | | | | STATION071 |
| | ,,,,'',,,'',,,'',,,,', and the "and"3 € | and man i dian 1 manifest in the | | | a ne e f mentile | - | |

| • | | |
|-----|---------|---|
| 51 | B00118H | BEAUFORT SAMPLE 27 WATER 20C STATION071 |
| 52 | B00119H | BEAUFORT SAMPLE 27 WATER 20C STATION071 |
| | 300120H | |
| 53 | | BEAUFORT SAMPLE 27 WATER 20C STATION071 |
| 54 | B00121H | BEAUFORT SAMPLE 27 WATER 20C STATION071 |
| 55 | B00122H | BEAUFORT SAMPLE 27 WATER 20C STATION071 |
| 56 | B00123H | |
| | | BEAUFORT SAMPLE 27 WATER 20C STATION071 |
| 57 | B00151H | BEAUFORT SAMPLE 24 WATER 20C STATION055 |
| 58 | B00152H | BEAUFORT SAMPLE 24 WATER 20C STATION055 |
| 59 | B00153H | |
| | | |
| 60 | B00154H | BEAUFORT SAMPLE 24 WATER 20C STATION055 |
| 61 | B00155H | BEAUFORT SAMPLE 24 WATER 20C STATION055 |
| 62 | B00156H | BEAUFORT SAMPLE 24 WATER 20C STATION055 |
| | | |
| 63 | B00158H | BEAUFORT SAMPLE 24 WATER 20C STATION055 |
| 64 | B00160H | BEAUFORT SAMPLE 24 WATER 200 STATION055 |
| 65 | B00161H | BEAUFORT SAMPLE 24 WATER 20C STATION055 |
| 66 | B00163H | |
| | | |
| 67 | B00164H | BEAUFORT SAMPLE 24 WATER 20C STATION055 |
| 68 | B00165H | BEAUFORT SAMPLE 24 WATER 200 STATION055 |
| 69 | B00166H | BEAUFORT SAMPLE 24 WATER 20C STATION055 |
| 70 | B00168H | |
| | | BEAUFORT SAMPLE 24 WATER 20C STATION055 |
| 71 | B00169H | BEAUFORT SAMPLE 24 WATER 20C STATION055 |
| 72 | B00201H | BEAUFORT SAMPLE 26 WATER 20C STATION070 |
| 73 | B00202H | BEAUFORT SAMPLE 26 WATER 20C STATION070 |
| | | |
| 74 | B00204H | BEAUFORT SAMPLE 26 WATER 20C STATION070 |
| 75 | B00205H | BEAUFORT SAMPLE 26 WATER 20C STATION070 |
| 76 | B00206H | BEAUFORT SAMPLE 26 WATER 20C STATION070 |
| 77 | B00207H | |
| | | |
| 78 | B00208H | BEAUFORT SAMPLE 26 WATER 20C STATION070 |
| 79 | B00210H | BEAUFORT SAMPLE 26 WATER 20C STATION070 |
| 80 | B00211H | BEAUFORT SAMPLE 26 WATER 20C STATION070 |
| | | |
| 81 | B00212H | BEAUFORT SAMPLE 26 WATER 20C STATION070 |
| 82 | B00213H | BEAUFORT SAMPLE 26 WATER 20C STATION070 |
| 83 | B00216H | BEAUFORT SAMPLE 26 WATER 20C STATION070 |
| 84 | B00217H | |
| | | |
| 85 | B00219H | BEAUFORT SAMPLE 26 WATER 20C STATION070 |
| 86 | B00221H | BEAUFORT SAMPLE 26 WATER 20C STATION070 |
| 87 | B00222H | BEAUFORT SAMPLE 26 WATER 20C STATION070 |
| | | |
| 88 | B00251H | BEAUFORT SAMPLE 11 WATER 20C STATION030 |
| 89 | B00252H | BEAUFORT SAMPLE 11 WATER 20C STATION030 |
| 90 | B00254H | BEAUFORT SAMPLE 11 WATER 20C STATION030 |
| 91 | B00255H | |
| | | |
| 92 | B00256H | BEAUFORT SAMPLE 11 WATER 20C STATION030 |
| 93 | BØØ257H | BEAUFORT SAMPLE 11 WATER 20C STATION030 |
| 94 | B00258H | BEAUFORT SAMPLE 11 WATER 20C STATION030 |
| 95 | B00260H | BEAUFORT SAMPLE 11 WATER 20C STATION030 |
| 96 | | |
| | B00261H | BEAUFORT SAMPLE 11 WATER 20C STATION030 |
| 97 | B00262H | BEAUFORT SAMPLE 11 WATER 20C STATION030 |
| 98 | B00263H | BEAUFORT SAMPLE 11 WATER 20C STATION030 |
| 99 | B00264H | |
| | | |
| 100 | B00265H | BEAUFORT SAMPLE 11 WATER 20C STATION030 |
| 101 | B00266H | BEAUFORT SAMPLE 11 WATER 20C STATION030 |
| 192 | B00268H | BEAUFORT SAMPLE 11 WATER 20C STATION030 |
| 103 | B00269H | |
| | | |
| 104 | B00270H | BEAUFORT SAMPLE 11 WATER 20C STATION030 |
| 105 | B00271H | BEAUFORT SAMPLE 11 WATER 20C STATION030 |
| 106 | B00272H | BEAUFORT SAMPLE 11 WATER 20C STATION030 |
| 107 | B00273H | |
| | | |
| 108 | 800275H | BEAUFORT SAMPLE 11 WATER 20C STATION030 |
| | | |

.

END FORM 108 STRAINS

Strains isolated from sediment at 20C capable of utilizing any one of the following alcohols: D-arabitol, 1-butanol, 2-propanol, 1-propanol, D-mannitol, D-sorbitol, Meso-inositol, 1,2-propanediol, ethanol, glycerol, dulcitol.

| | | | | ምሳም ዋና የ እ ተጠ እ ሆን | 20C STATION010 |
|----|----------------------------|----------|-----------|---------------------------|----------------|
| Ĵ. | 3999826H | BEAUFORT | SAMPLE 03 | SEDIMENT | |
| 2 | B00027H | BEAUFORT | SAMPLE 03 | SEDIMENT | 20C STATION010 |
| З | 800028H | BEAUFORT | SAMPLE 03 | SEDIMENT | 20C STATION010 |
| 4 | 800029H | BEAUFORT | SAMPLE 03 | SEDIMENT | 20C STATION010 |
| 5 | B90030H | BEAUFORT | SAMPLE 03 | SEDIMENT | 20C STATION010 |
| 6 | B00032H | BEAUFORT | SAMPLE 03 | SEDIMENT | 20C STATION010 |
| 7 | B00033H | BEAUFORT | SAMPLE 03 | SEDIMENT | 20C STATION010 |
| ŝ | B90836H | BEAUFORT | SAMPLE 03 | SEDIMENT | 20C STATION010 |
| 9 | B00038H | BEAUFORT | SAMPLE 03 | SEDIMENT | 20C STATION010 |
| | B99939H | BEAUFORT | SAMPLE 03 | SEDIMENT | 20C STATION010 |
| 10 | | BEAUFORT | SAMPLE 03 | SEDIMENT | 20C STATION010 |
| 11 | B00044H | BEAUFORT | SAMPLE 03 | SEDIMENT | 20C STATION010 |
| 12 | B00045H | | SAMPLE 03 | SEDIMENT | 20C STATION010 |
| 13 | B00048H | BEAUFORT | | SEDIMENT | 200 STATION002 |
| 14 | B00085H | BERUFORT | •••••• | SEDIMENT | 200 STATION002 |
| 15 | B00086H | BEAUFORT | SAMPLE 16 | | |
| 16 | B00130H | BEAUFORT | SAMPLE 22 | SEDIMENT | |
| 17 | B00131H | BEAUFORT | SAMPLE 22 | SEDIMENT | |
| 18 | B00132H | BEAUFORT | SAMPLE 22 | SEDIMENT | 20C STATION071 |
| 19 | B00136H | BEAUFORT | SAMPLE 22 | SEDIMENT | 20C STATION071 |
| 20 | B00139H | BEAUFORT | SAMPLE 22 | SEDIMENT | 20C STATION071 |
| 21 | B00140H | BEAUFORT | SAMPLE 22 | SEDIMENT | 20C STATION071 |
| 22 | B00143H | BEAUFORT | SAMPLE 22 | SEDIMENT | 20C STATION071 |
| 23 | B90145H | BEAUFORT | SAMPLE 22 | SEDIMENT | 20C STATION071 |
| 24 | B00146H | BEAUFORT | SAMPLE 22 | SEDIMENT | 20C STATION071 |
| 25 | B00178H | BEAUFORT | SAMPLE 20 | SEDIMENT | 20C STATION055 |
| 26 | B00180H | BEAUFORT | SAMPLE 20 | SEDIMENT | 20C STATION055 |
| 27 | B00182H | BEAUFORT | SAMPLE 22 | SEDIMENT | 20C STATION071 |
| 28 | B00183H | BEAUFORT | SAMPLE 20 | SEDIMENT | 20C STATION055 |
| 29 | B00184H | BEAUFORT | SAMPLE 20 | SEDIMENT | 20C STATION055 |
| 30 | B00187H | BEAUFORT | SAMPLE 20 | SEDIMENT | 20C STATION055 |
| 31 | B00188H | BEAUFORT | SAMPLE 20 | SEDIMENT | 20C STATION055 |
| 35 | B00189H | BEAUFORT | SAMPLE 20 | SEDIMENT | 20C STATION055 |
| 33 | B00190H | BEAUFORT | SAMPLE 20 | SEDIMENT | 20C STATION055 |
| | | BEAUFORT | SAMPLE 20 | SEDIMENT | 20C STATION055 |
| 34 | B00191H | BEAUFORT | SAMPLE 20 | SEDIMENT | 20C STATION055 |
| 35 | 800193H | | SAMPLE 20 | SEDIMENT | 20C STATION055 |
| 36 | B00196H | BEAUFORT | SAMPLE 20 | SEDIMENT | 20C STATION055 |
| 37 | B00198H | BEAUFORT | | | |
| 38 | B00200H | BEAUFORT | | SEDIMENT | |
| 39 | B00230H | BEAUFORT | SAMPLE 21 | | |
| 40 | B00535H | BEAUFORT | SAMPLE 21 | SEDIMENT | |
| 41 | B00234H | BEAUFORT | SAMPLE 21 | SEDIMENT | 20C STATION070 |
| 42 | B00239H | BEAUFORT | SAMPLE 21 | SEDIMENT | 20C STATION070 |
| 43 | B99240H | BEAUFORT | SAMPLE 21 | SEDIMENT | 20C STATION070 |
| 44 | B00241H | BEAUFORT | SAMPLE 21 | SEDIMENT | 20C STATION070 |
| 45 | B00242H | BEAUFORT | SAMPLE 21 | SEDIMENT | 20C STATION070 |
| 46 | B00243H | BEAUFORT | SAMPLE 21 | SEDIMENT | 20C STATION070 |
| 47 | B00244H | BEAUFORT | SAMPLE 21 | SEDIMENT | 20C STATION070 |
| 48 | B00246H | BEAUFORT | SAMPLE 21 | SEDIMENT | 20C STATION070 |
| 49 | B00250H | BEAUFORT | SAMPLE 21 | SEDIMENT | 20C STATION070 |
| 50 | B00283H | BEAUFORT | SAMPLE 09 | SEDIMENT | 20C STATION030 |
| 51 | B00297H | BEAUFORT | SAMPLE 09 | SEDIMENT | 20C STATION030 |
| | ang "nga "na bana di 7 8 9 | | | | |

END FORM

1 BOO299L BEAUFORT SAMPLE 32 SEDIMENT 04C STATION002

THD FORM

1 STPAINS

Strains isolated from water or sediment at 20C capable of utilizing phenol.

1 B00007H BEAUFORT SAMPLE 03 WATER 20C STATION010

END FORM 1 STRAIMS Strains isolated from water at 4C capable of utilizing any one of the following carboxylic acids: succinic, fumaric, malonic, a-ketuglutaric, citric acids.

| 1 | BOODSSL | BERUFORT | SAMPLE | 20 | WATER | 04C | STATION002 |
|----------|--------------------|----------|----------|-----|----------------|------------|--------------------------|
| Ē | 899958L | BEAUFORT | | 20 | MATER | 04Č | STATION002 |
| 3 | B00059L | BEAUFORT | | 20 | MATER | 04C | STATION002 |
| 4 | BOODEOL | BEAUFORT | | 20 | WATER | õ4č | STATION002 |
| 5 | B00067L | BERUFORT | | 20 | MATER | 04C | STATION002 |
| 6 | 200069L | BEAUFORT | | 20 | WATER | 04C | STATION002 |
| 77 | B00071L | BEAUFORT | SAMPLE | 20 | MATER | 04C | STATION002 |
| 8 | 300072L | BEAUFORT | SAMPLE | 20 | NATER | 04C | STATION002 |
| 9 | 800073L | BEAUFORT | SAMPLE | 20 | WATER | 04C | STATION002 |
| 10 | E00074L | BEAUFORT | SAMPLE | 20 | MATER | 04C | STATION002 |
| 11 | B00075L | BEAUFORT | SAMPLE | 29 | WATER | Ø4C | STATION002 |
| 12 | B00101L | BEAUFORT | SAMPLE | 27 | WATER | 04C | STATION071 |
| 13 | B99103L | BEAUFORT | SAMPLE | 27 | WATER | 04C | STATION071 |
| 14 | B99106L | BEAUFORT | SAMPLE | 27 | MATER | 04C | STATION071 |
| 15 | B00108L | BEAUFORT | SAMPLE | 27 | WATER | 04C | STATION071 |
| 16 | B00109L | BEAUFORT | SAMPLE | 27 | WATER | 04C | STATION071 |
| 2. s | 800114L | BEAUFORT | | 27 | WATER | 04C | STATION071 |
| 18 | 300116L | BEAUFORT | SAMPLE | 27 | MATER | 04C | STATION071 |
| 19 | 309117L | BEAUFORT | SAMPLE | 27 | MATER | 04C | STATION071 |
| 20 | 800119L | BEAUFORT | | 27 | HATER | 04C | STATION071 |
| i i | B00120L | BEHUFORT | | 27 | MATER | 04C | STATION071 |
| | B00122L | BEAUFORT | | 27 | MATER | 04C | STATION071 |
| 23 | D00152L | BEAUFORT | | 24 | MATER | 04C | STATION055 |
| | E60153L | BEAUFORT | | 24 | HATER | 04C | STATION055 |
| 25 | B00154L | BEAUFORT | | 24 | MATER | 04C | STATION055 |
| 26 | 500156L | BEAUFORT | | 24 | HATER | 04C | STATION055 |
| 27 | B00164L | BERUFORT | | | MATER | 04C | STATION055 |
| 28 | 599165L | BERUFORT | | | HATER | 04C | STATION055 |
| 29 | 300167L | BEAUFORT | | | WATER | 04C | STATION055 |
| 30 | 300169L | BEAUFORT | | | MATER | 04C | STATION055 |
| Bi | B50174L | BEAUFORT | | | NATER . | 04C | STATION055 |
| 32 33 | 800201L 800202L | BEAUFORT | | | MATER | 64C | STATION070 |
| 34 | 230212L | | | | WATER . | 94C | STATION070 |
| 35 35 | B00216L | BEAUFORT | | | WATER NATER | 04C 04C | STATION070 STATION070 |
| 36 | B00221L | BEAUFORT | | | NATER | 04C | STATION070 |
| эр 37 | B00225L | BEAUFORT | | | WHTER | 04C | STATION070 |
| 38 | 300278L | BEAUFORT | | | WATER | 04C | STATION030 |
| 39 | 899283L | BEAUFORT | | | WATER | 04C | STATION001 |
| 40 | B90294L | BEAUFORT | | | MATER | 04C | STATION002 |
| 41 | 200295L | | | | | | |
| г., | aasoosta ahadaa | BEAUFORT | SAMPLE S | яĘ, | HATER | 04C | STATION002 |

EHD FORM

A1 STRAINS

Strains isolated from sediment at 4C capable of utilizing any of the following carboxylic acids: succinic, fumaric, malonic, a-ketoglutaric, citric acids.

| | | | | | | | and the second residues to the second |
|---------------|------------------|------------|--------|----|----------|-------------|---------------------------------------|
| ÷. | 380026L | BEHUFORT | SAMPLE | 03 | SEDIMENT | | STATION010 |
| £ | 3090271 | BEAUFORT | SAMPLE | 83 | SEDIMENT | 94C | STATIONØ10 |
| 3 | 599929L | BEAUFORT | SAMPLE | 63 | SEDIMENT | 04C | STATION010 |
| | 839931L | BEAUFORT | SAMPLE | 63 | SEDIMENT | 04C | STATION010 |
| | BeeeseL | BEAUFORT | SAMPLE | θă | SEDIMENT | 04C | STATION010 |
| S | | | | | SEDIMENT | 04C | STATION010 |
| 6 | 500035L | BEAUFORT | SAMPLE | 03 | | | |
| 1 | 330044L | BEAUFORT | SAMPLE | 63 | SEDIMENT | 04C | STATION010 |
| 3 | 388847L | BEAUFORT | SAMPLE | 83 | SEDIMENT | 04C | STATIONØ10 |
| | B20049L | BEAUFORT | SAMPLE | 03 | SEDIMENT | 04C | STATION010 |
| 10 | 800050L | BEAUFORT | SAMPLE | 03 | SEDIMENT | 04C | STATION010 |
| 11 | 800076L | BEAUFORT | SAMPLE | 16 | SEDIMENT | 04C | STATION002 |
| iê | 809077L | BEAUFORT | SAMPLE | 16 | SEDIMENT | 04C | STATION002 |
| | | BEAUFORT | SAMPLE | 16 | SEDIMENT | 04C | STATION002 |
| 13 | B99978L | | | | | | STATION002 |
| L 4 | 899984L | BEAUFORT | SAMPLE | 16 | SEDIMENT | 04C | |
| 1.5 | 599987L | BEAUFORT | SAMPLE | 16 | SEDIMENT | 04C | STATION002 |
| 16 | B00089L | BEAUFORT | SAMPLE | żΒ | SEDIMENT | 04C | STATION002 |
| 17 | B00091L | BEAUFORT | SAMPLE | 16 | SEDIMENT | 04C | STATION002 |
| i S | 300092L | BEAUFORT | SAMPLE | 16 | SEDIMENT | 04C | STATION002 |
| 19 | 899 9 93L | BEAUFORT | SAMPLE | 16 | SEDIMENT | 94C | STATION002 |
| 20 | 800094L | BEAUFORT | SAMPLE | 16 | SEDIMENT | <u>04</u> 0 | STATION002 |
| | B88895L | SEAUFORT | SAMPLE | 16 | SEDIMENT | 04C | STATION002 |
| 21 | | BEAUFORT | SAMPLE | 16 | SEDIMENT | 04C | STATION002 |
| 22 | 800096L | | | | | 04C | STATION002 |
| 23 | 300097L | BEAUFORT | SAMPLE | 16 | SEDIMENT | | |
| 24 | B00098L | BEAUFORT | SAMPLE | 16 | SEDIMENT | 04C | STATION002 |
| 25 | B00099L | BEAUFORT | SAMPLE | 16 | SEDIMENT | 04C | STATION002 |
| 26 | <u>900100L</u> | BEAUFORT | SAMPLE | 16 | SEDIMENT | 04C | STATION002 |
| 27 | 300126L | BEAUFORT | SAMPLE | 22 | SEDIMENT | 040 | STATION071 |
| 88 | B90127L | BEAUFORT | SAMPLE | 22 | SEDIMENT | 040 | STAT10M071 |
| 20 | 539129L | BERUFORT | SAMPLE | 22 | SEDIMENT | 04C | STATION071 |
| 39 | 889139L | BEAUFORT | SAMPLE | 22 | SEDIMENT | 04C | STATION071 |
| 31 | 600131L | BEAUFORT | SAMPLE | 22 | SEDIMENT | 04C | STATION071 |
| | | BEAUFORT | SAMPLE | 22 | SEDIMENT | 04C | STATION071 |
| | B00132L | | | | SEDIMENT | | STATION071 |
| 33 | 500133L | BEAUFORT | SAMPLE | 22 | | 04C | |
| 34 | B00134L | BEAUFORT | SAMPLE | 22 | SEDIMENT | 04C | STATION071 |
| 35 | 800135L | BEAUFORT | SAMPLE | 22 | SEDIMENT | 04C | STATION071 |
| 35 | B00137L | SEAUFORT | SAMPLE | 22 | SEDIMENT | 04C | STATION071 |
| 37 | B99141L | BEAUFORT | SAMPLE | 22 | SEDIMENT | 04C | STATION071 |
| 38 | 800144L | BEAUFORT | SAMPLE | 22 | SEDIMENT | 04C | STATION071 |
| 39 | 800145L | BEAUFORT | SAMPLE | 22 | SEDIMENT | 04C | STATION071 |
| 40 | B99146L | BEAUFORT | SAMPLE | 22 | SEDIMENT | 04C | STATION071 |
| HAR L | 200148L | BEAUFORT | SAMPLE | 22 | SEDIMENT | 04C | |
| | B00181L | BERUFORT | SAMPLE | 20 | SEDIMENT | 94C | STATION055 |
| 42 | | BEAUFORT | SAMPLE | 20 | SEDIMENT | 04C | STATION055 |
| 43 | B00184L | | | | | | STATION055 |
| 나라 | 890185L | BEAUFORT | SAMPLE | 20 | SEDIMENT | 04C | |
| 40 | 390186L | BEAUFORT | SAMPLE | 56 | SEDIMENT | 04C | STATION055 |
| 46 | 800187L | BEAUFORT | SAMPLE | 20 | SEDIMENT | 04C | STATION055 |
| 47 | B00189L | BEAUFORT | SAMPLE | 20 | SEDIMENT | 04C | STATION055 |
| -j) | 308191L | BEAUFORT | SAMPLE | 20 | SEDIMENT | 04C | STATION055 |
| s e St | 690193L | BEAUFORT | SAMPLE | 20 | SEDIMENT | 64C | STATION055 |
| 50 | 800197L | BEFILIFORT | SAMPLE | 20 | SEDIMENT | 04C | STATION055 |
| | | | | | | | |

| 51 | 399226L | BEAUFORT | SAMPLE | 21 | SEDIMENT | 04C | STATION070 |
|-----|------------------|-----------|----------|-----------------|----------|-----|------------|
| 52 | B00227L | BEAUFORT | SAMPLE | 21 | SEDIMENT | 04C | STATION070 |
| 53 | 89923 9 L | BEAUFORT | SAMPLE | 21 | SEDIMENT | 04C | STATION070 |
| 54 | 900232L | BEAUFORT | SAMPLE | 21 | SEDIMENT | 04C | STATION070 |
| 55 | 800234L | BEAUFORT | SAMPLE | 21 | SEDIMENT | 04C | STATION070 |
| 56 | B00235L | BEAUFORT | SAMPLE | 21 | SEDIMENT | 04C | STATION070 |
| 57 | B96536F | BEAUFORT | SAMPLE | ε_1 | SEDIMENT | 04C | STATION070 |
| 58 | B00237L | BEAUFORT | SAMPLE | 21 | SEDIMENT | 04C | STATION070 |
| 59 | 800241L | BEAUFORT | SAMPLE : | ≥ 1 | SEDIMENT | 04C | STATION070 |
| 60 | B00243L | BEAUFORT | SAMPLE : | 21 | SEDIMENT | 04C | STATION070 |
| 61 | B00247L | BEAUFORT | SAMPLE a | 21 | SEDIMENT | 04C | STATION070 |
| 62 | B00251L | BEAUFORT | SAMPLE (| 89 | SEDIMENT | 04C | STATION030 |
| 63 | 800252L | BEAUFORT | SAMPLE (| 09 | SEDIMENT | 04C | STATION030 |
| 64 | B00253L | BEAUFORT | SAMPLE (| 09 | SEDIMENT | 04C | STATION030 |
| 5 | B00257L | BEAUFORT | SAMPLE (| 99 | SEDIMENT | 04C | STATION030 |
| 66 | B00258L | BEAUFORT | SAMPLE (| 09 | SEDIMENT | 04C | STATION030 |
| 67. | B00261L | BERUFIORT | SAMPLE (| 99 | SEDIMENT | 04C | STATION030 |
| 68 | 800265L | BERUFORT | SAMPLE (| 99 | SEDIMENT | 04C | STATION030 |
| 69 | B00267L | BEAUFORT | SAMPLE (| 99 | SEDIMENT | 04C | STATION030 |
| 70 | B00270L | BEAUFORT | SAMPLE (| 99 | SEDIMENT | 04C | STATION030 |
| 71 | 800271L | BEAUFORT | SAMPLE 0 | 39 | SEDIMENT | 04C | STATION030 |
| 72 | 30 0273L | BEAUFORT | SAMPLE 0 | 99 | SEDIMENT | 04C | STATION030 |
| 73 | B00274L | BEAUFORT | SAMPLE 0 | 39 | SEDIMENT | 04C | STATION030 |
| 1 4 | 800275L | BERUFORT | SAMPLE 0 | 39 | SEDIMENT | 04C | STATION030 |
| | B00289L | BERUFORT | SAMPLE 1 | 15 | SEDIMENT | 04C | STATION001 |
| 76 | B80299L | BEAUFORT | SAMPLE | 32 | SEDIMENT | 04C | STATION002 |

END FORM

Strains isolated from water at 20C capable of utilizing any one of the following carboxylic acids: succinic, fumaric, malonic, a-ketuglutaric, citric acids.

| 1 | 80 0001H | BEAUFORT | SAMPLE | 03 | WATER | 20C | STATION010 |
|------------|-----------------|-------------------|--------|------------|-------|-----|---|
| 2 | 899992H | BEAUFORT | SAMPLE | 03 | MATER | 200 | STATION010 |
| | BOODDEN | BEAUFORT | SAMPLE | 03 | WATER | 200 | STATION010 |
| 3 | | BEAUFORT | SAMPLE | <i>6</i> 3 | WATER | 200 | STATION010 |
| ं। | B00006H | | SAMPLE | 03 03 | WATER | 200 | STATION010 |
| 5 | 800007H | BEAUFORT | SAMPLE | 03 | WATER | 200 | STATION010 |
| 6 | 800013H | BEAUFORT | | | WATER | 200 | STATION010 |
| 7 | B00014H | BEAUFORT | SAMPLE | 03 | | | STATION010 |
| 8 | B00016H | BEAUFORT | SAMPLE | 03 | WATER | 200 | • |
| 9 | B00017H | BEAUFORT | SAMPLE | 63 | WATER | 200 | STATION010 |
| 10 | <u>800018H</u> | BEAUFORT | SAMPLE | Ø3 | MATER | 200 | STATION010 |
| 11 | B00020H | BEAUFORT | SAMPLE | | WATER | 200 | STATION010 |
| 12 | B00023H | BEAUFORT | SAMPLE | 03 | WATER | 200 | STATION010 |
| 13 | B00024H | BEAUFORT | SAMPLE | 03 | WATER | 200 | STATION010 |
| 14 | B00051H | BEAUFORT | SAMPLE | 20 | MATER | 200 | STATION020 |
| 15 | B00052H | BEAUFORT | SAMPLE | 20 | MATER | 200 | STATION020 |
| 16 | B00053H | BEAUFORT | SAMPLE | 20 | WATER | 280 | STATION020 |
| 17 | B00054H | BEAUFORT | SAMPLE | 20 | MATER | 200 | STATION020 |
| | B00055H | BEAUFORT | SAMPLE | 20 | MATER | 200 | STATION020 |
| 18 | B00057H | BEAUFORT | SAMPLE | 20 | MATER | 280 | STATION020 |
| 19 | | BEAUFORT | SAMPLE | Ξõ | MATER | 200 | STATION002 |
| 20 | 800058H | BEAUFORT | SAMPLE | 20 | WATER | 200 | STATION002 |
| 21 | B00059H | BEAUFORT | SAMPLE | 20 | MATER | 200 | STATION002 |
| 22 | B99960H | ··· ··· · · · · · | | 20 | MATER | 200 | STATION002 |
| 23 | B90961H | BEAUFORT | SAMPLE | | WATER | 200 | STATION002 |
| 24 | B00064H | BEAUFORT | SAMPLE | 20 | | | STATION002 |
| 25 | B00065H | BEAUFORT | SAMPLE | 20 | WATER | 200 | |
| 26 | 300066H | BEAUFORT | SAMPLE | 80 | WATER | 20C | STATION002 |
| 27 | 200067H | BEAUFORT | SAMPLE | | MATER | 200 | STATION002 |
| 28 | B00068H | BEAUFORT | SAMPLE | | WATER | 20C | STATION002 |
| 29 | B00069H | BEAUFORT | SAMPLE | 20 | WATER | 200 | STATION002 |
| 30 | B00070H | BEAUFORT | SAMPLE | 20 | WATER | 20C | STATION002 |
| 31 | B00071H | BEAUFORT | SAMPLE | 20 | MATER | 200 | STATION002 |
| 32 | B00072H | BEAUFORT | SAMPLE | 20 | MATER | 200 | STATION002 |
| 33 | B00073H | BEAUFORT | SAMPLE | 20 | WATER | 20C | STATION002 |
| 33 34 | B00075H | BEAUFORT | SAMPLE | | WATER | 200 | STATION002 |
| | B00101H | BEAUFORT | SAMPLE | | WATER | 200 | STATION071 |
| 35 | | BEAUFORT | SAMPLE | | WRTER | 200 | STATION071 |
| 36 | B00102H | BEAUFORT | | | WATER | 200 | STATION071 |
| 37 | B00103H | BEAUFORT | | | | 200 | STATION071 |
| 38 | B00104H | BEAUFORT | | | | | STATION071 |
| 39 | B00106H | | | | | | STATION071 |
| 40 | B00109H | BEAUFORT | | | | | |
| 4 <u>1</u> | B90110H | BEAUFORT | | | | | ••••••••••••••••••••••••••••••••••••••• |
| 42 | B00111H | BEAUFORT | | | | | |
| 43 | B00112H | BEAUFORT | | | | | |
| 44 | 800113H | BEAUFORT | | | | | |
| 45 | B00114H | BEAUFORT | | | | | |
| 46 | B00115H | BEAUFORT | | | | | |
| 47 | B09116H | BEAUFORT | | | | | |
| 48 | B00117H | BEAUFORT | | | | | |
| 49 | B90118H | BEAUFORT | | 27 | MATER | | |
| 50 | 800119H | BEAUFORT | | | | 200 | STATION071 |
| · | | | | | | | |

| 51 | B00120H | BEAUFORT SAMPLE 27 WATER 200 STATION071 |
|------|-----------------|--|
| 52 | B00121H | BEAUFORT SAMPLE 27 WATER 20C STATION071 |
| 53 | B00122H | BEAUFORT SAMPLE 27 WATER 200 STATION071 |
| | | |
| 54 | B00123H | BEAUFORT SAMPLE 27 WATER 20C STATION071 |
| 55 | B00151H | BEAUFORT SAMPLE 24 WATER 200 STATION055 |
| 56 | B00152H | BEAUFORT SAMPLE 24 WATER 20C STATION055 |
| 57 | B00153H | BEAUFORT SAMPLE 24 WATER 200 STATION055 |
| | | |
| 53 | B00154H | BEAUFORT SAMPLE 24 WATER 20C STATION055 |
| 59 | B00155H | BEAUFORT SAMPLE 24 WATER 20C STATION055 |
| 60 | B00156H | BEAUFORT SAMPLE 24 WATER 20C STATION055 |
| 61 | B00157H | BEAUFORT SAMPLE 24 WATER 20C STATION055 |
| 62 | B00158H | BEAUFORT SAMPLE 24 WATER 20C STATION055 |
| 63 | B00160H | BEAUFORT SAMPLE 24 WATER 200 STATION055 |
| | | |
| 64 | B00161H | BEAUFORT SAMPLE 24 WATER 20C STATION055 |
| 65 | B00162H | BEAUFORT SAMPLE 24 WATER 20C STATION055 |
| 66 | B00163H | BEAUFORT SAMPLE 24 WATER 20C STATION055 |
| 67 | B00164H | BEAUFORT SAMPLE 24 WATER 20C STATION055 |
| 68 | B00165H | BEAUFORT SAMPLE 24 WATER 20C STATION055 |
| 69 | B00166H | BEAUFORT SAMPLE 24 WATER 200 STATION055 |
| | | |
| 70 | B00168H | BEAUFORT SAMPLE 24 WATER 20C STATION055 |
| 71 | B00169H | BEAUFORT SAMPLE 24 WATER 20C STATION055 |
| 72 | B00201H | BEAUFORT SAMPLE 26 WATER 20C STATION070 |
| 73 | B00202H | BEAUFORT SAMPLE 26 WATER 20C STATION070 |
| 74 | B00204H | BEAUFORT SAMPLE 26 WATER 20C STATION070 |
| 75 | B00205H | BEAUFORT SAMPLE 26 WATER 20C STATION070 |
| | | |
| 76 | B00206H | BEAUFORT SAMPLE 26 WATER 20C STATION070 |
| 77 | B00207H | BEAUFORT SAMPLE 26 WATER 20C STATION070 |
| 78 | B00208H | BEAUFORT SAMPLE 26 WATER 20C STATION070 |
| 79 | B00210H | BEAUFORT SAMPLE 26 WATER 20C STATION070 |
| 80 | B00211H | BEAUFORT SAMPLE 26 WATER 20C STATION070 |
| 81 | 399212H | BEAUFORT SAMPLE 26 WATER 20C STATION070 |
| sa | B00213H | BEAUFORT SAMPLE 26 WATER 200 STATION070 |
| , | | |
| 83 | B00216H | BEAUFORT SAMPLE 26 WATER 20C STATION070 |
| 84 | B99217H | BEAUFORT SAMPLE 26 WATER 20C STATION070 |
| 85 | B00219H | BEAUFORT SAMPLE 26 WATER 20C STATION070 |
| 86 | B00221H | BEAUFORT SAMPLE 26 WATER 20C STATION070 |
| 87 | B00222H | BEAUFORT SAMPLE 26 WATER 20C STATION070 |
| 88 | B00251H | BEAUFORT SAMPLE 11 WATER 200 STATION030 |
| 89 | B00252H | • |
| | | |
| 90 | B00254H | BEAUFORT SAMPLE 11 WATER 200 STATION030 |
| 91 | 800255H | BEAUFORT SAMPLE 11 WATER 20C STATION030 |
| 92 | 89 9256H | BEAUFORT SAMPLE 11 WATER 20C STATION030 |
| 93 | 800257H | BEAUFORT SAMPLE 11 WATER 200 STATION030 |
| 94 | B00258H | BEAUFORT SAMPLE 11 WATER 20C STATION030 |
| 95 | B99260H | BEAUFORT SAMPLE 11 WATER 20C STATION030 |
| 96 | 800261H | BEAUFORT SAMPLE 11 WATER 200 STATION030 |
| | | |
| 97 | 800262H | BEAUFORT SAMPLE 11 WATER 20C STATION030 |
| 98 | B00263H | BEAUFORT SAMPLE 11 WATER 20C STATION030 |
| 99 | B99264H | BEAUFORT SAMPLE 11 WATER 20C STATION030 |
| 100 | 899265H | BEAUFORT SAMPLE 11 WATER 20C STATION030 |
| 101 | B00266H | BEAUFORT SAMPLE 11 WATER 20C STATION030 |
| 102 | B00268H | BEAUFORT SAMPLE 11 WATER 200 STATION030 |
| 103 | B00269H | |
| | | |
| 104 | B00270H | BEAUFORT SAMPLE 11 WATER 20C STATION030 |
| 195 | B00271H | BEAUFORT SAMPLE 11 WATER 20C STATION030 |
| 106 | B00272H | BEAUFORT SAMPLE 11 WATER 20C STATION030 |
| 1.07 | B90273H | BEAUFORT SAMPLE 11 WATER 20C STATION030 |
| 108 | B00274H | BEAUFORT SAMPLE 11 WATER 20C STATION030 |
| 189 | B00275H | BEAUFORT SAMPLE 11 WATER 200 STATION030 |
| • | ·• • • • • | and and a set of the set |

END FORM

Strains isolated from sediment at 20C capable of utilizing any one of the following carboxylic acids: succinic, fumaric, malonic, a-ketuglutaric, citric acids.

| 1 | B00026H | BEAUFORT | SAMPLE | 03 | SEDIMENT | 200 | STATION010 |
|--------|--------------------|----------|--------|-----------|----------|------|------------|
| Ē | 800027H | BEAUFORT | SAMPLE | 03 | SEDIMENT | 200 | STATION010 |
| 3 | 869928H | BERUFORT | SAMPLE | 03 | SEDIMENT | 280 | STATION010 |
| 4 | 800029H | BEAUFORT | SAMPLE | 03 | SEDIMENT | 200 | STATION010 |
| 5 | B20030H | BEAUFORT | SAMPLE | 03 | SEDIMENT | 200 | STATION010 |
| - 6 | 899932H | BEAUFORT | SAMPLE | øŝ. | SEDIMENT | 290 | STATION010 |
| 7 | B80033H | BEAUFORT | SAMPLE | ē3 | SEDIMENT | 200 | STATION010 |
| ŝ | B00036H | BEAUFORT | SAMPLE | <u>63</u> | SEDIMENT | 200 | STATION010 |
| 9 | 899933H | BEAUFORT | SAMPLE | 03 | SEDIMENT | 200 | STATION010 |
| 10 | 800043H | BEAUFORT | SAMPLE | <u>өз</u> | SEDIMENT | 200 | STATION010 |
| 11 | 800040H | BEAUFORT | SAMPLE | 63 | SEDIMENT | 200 | STATION010 |
| 12 | B80045H | BEAUFORT | SAMPLE | 63 | SEDIMENT | 200 | STATION010 |
| 13 | B90047H | BEAUFORT | SAMPLE | йЗ | SEDIMENT | 200 | STATION010 |
| | £90948H | BEAUFORT | SAMPLE | 83 | SEDIMENT | 200 | STATION010 |
| 14 | | BEAUFORT | SAMPLE | 16 | SEDIMENT | 200 | STATION002 |
| 15 | 800085H | BEAUFORT | SAMPLE | 16 | SEDIMENT | 200 | STATION002 |
| 16 | 800086H | BEAUFORT | SAMPLE | 16 | SEDIMENT | 200 | STATION002 |
| 17 | RODO93H | BEAUFORT | SAMPLE | 22 | SEDIMENT | 200 | STATION071 |
| 18 | 800130H 800131H | BEAUFORT | SAMPLE | 22 | SEDIMENT | 200 | STATION071 |
| 19 | B00132H | BEAUFORT | SAMPLE | 22 | SEDIMENT | 200 | STATION071 |
| 20 | | BEAUFORT | SAMPLE | 22 | SEDIMENT | 200 | STATION071 |
| 21 | B00135H | BERUFORT | SAMPLE | 22 | SEDIMENT | 200 | STATION071 |
| 22 | B00136H | | SAMPLE | 22 | SEDIMENT | 200 | STATION071 |
| 23 | B00143H | BEAUFORT | SAMPLE | 22 | SEDIMENT | 200 | STATION071 |
| 24 | B00145H | BEAUFORT | | 22 | SEDIMENT | 200 | STATION071 |
| 25 | B00147H | BEAUFORT | SAMPLE | | | 200 | STATION055 |
| 26 | B00176H | BEAUFORT | SAMPLE | 20 | SEDIMENT | 200 | STATION055 |
| 27 | B00177H | BEAUFORT | SAMPLE | 20 | SEDIMENT | 200 | STATION055 |
| 28 | B00178H | BEAUFORT | SAMPLE | 20 | SEDIMENT | 200 | STATION055 |
| 29 | B90180H | BEAUFORT | SAMPLE | 20 | SEDIMENT | | STATION071 |
| 30 | 800182H | BEAUFORT | SAMPLE | 22 | SEDIMENT | 200 | STATION055 |
| 31 | 600183H | BEAUFORT | SAMPLE | 20 | SEDIMENT | 200 | STATION055 |
| 32 | B00184H | BEAUFORT | SAMPLE | 20 | SEDIMENT | 280 | STATION055 |
| 33 | B00185H | BEAUFORT | SAMPLE | 20 | SEDIMENT | 200 | |
| 34 | E90187H | BEHUFORT | SAMPLE | 20 | SEDIMENT | 200 | STATION055 |
| 35 | 690188H | BEAUFORT | SAMPLE | 20 | SEDIMENT | 200 | STATION055 |
| 36 | B00189H | BEAUFORT | SAMPLE | 20 | SEDIMENT | 200 | STATION055 |
| 37 | B00190H | BEAUFORT | | 20 | SEDIMENT | 200 | STATION055 |
| 38 | 690191H | BEAUFORT | | | | | STATION055 |
| 39 | B00192H | BEAUFORT | | | SEDIMENT | | STATION055 |
| 46 | 890193H | BEAUFORT | | | SEDIMENT | | |
| 41 | 800198H | | | | | | STATION055 |
| 42 | 200200H | BERUFORT | | | | | STATION055 |
| 43 | B00231H | BEAUFORT | | | | | STATION070 |
| 44 | 890232H | BEAUFORT | | 21 | | | STATION070 |
| 45 | 800233H | BEAUFORT | | | | | |
| 46 | 600239H | BEAUFORT | | | | | |
| 47 | B00240H | BEAUFORT | | | | 200 | |
| 43 | B00241H | BEAUFORT | | 21 | | | |
| 49 | 800242H | BEAUFORT | SAMPLE | | | | |
| 50 | 800243H | BEAUFORT | SAMPLE | 21 | SEDIMENT | 2010 | STATION070 |
| | | | | | | | |

| 51 | B00244H | BEAUFORT | SAMPLE 2 | I SEDIMENT | 20C | STATION070 |
|----|-----------------|----------|-----------|------------|-----|------------|
| 52 | B00245H | BEAUFORT | SAMPLE 2 | SEDIMENT | | STATION070 |
| 53 | B00246H | BEAUFORT | SAMPLE 2 | SEDIMENT | 200 | STATION070 |
| 54 | B00248H | BEAUFORT | SAMPLE 2 | L SEDIMENT | 200 | STATION070 |
| 55 | B00250H | BEAUFORT | SAMPLE 2: | SEDIMENT | 200 | STATION070 |
| 56 | B00276H | BEAUFORT | SAMPLE 09 | 9 SEDIMENT | 200 | STATION030 |
| 57 | B00282H | BEAUFORT | SAMPLE 09 | 9 SEDIMENT | 200 | STATION030 |
| 58 | E00283H | BEAUFORT | SAMPLE 09 | SEDIMENT | 20C | STATION030 |
| 59 | B00286H | BEAUFORT | SAMPLE 09 | SEDIMENT | 200 | STATION030 |
| 69 | B00295H | BEAUFORT | SAMPLE 09 | SEDIMENT | 200 | STATION030 |
| 61 | 800297H | BEAUFORT | SAMPLE 09 | SEDIMENT | 200 | STATION030 |
| 62 | 800300 H | BEAUFORT | SAMPLE 03 | SEDIMENT | 20C | STATION030 |

END FORM 62 STRAINS

Strains isolated from water at 4C capable of utilizing any of the following fatty acids: proprionic, butyric, caproic, caprylic, lauric, palmitic, stearic, oleic, valeric, isovaleric.

| 1 | 800053L | BEAUFORT | SAMPLE | 20 | WATER | 04Č | STATION002 |
|---------|-----------------|----------|--------|----|-------|-----|------------|
| â | B00058L | BEAUFORT | SAMPLE | 20 | MATER | 04C | STATION002 |
| 3 | B00059L | BEAUFORT | SAMPLE | 20 | WATER | 04C | STATION002 |
| 4 | B00067L | BEAUFORT | SAMPLE | 20 | MATER | 04C | STATION002 |
| 5 | B00071L | BERUFORT | SAMPLE | 20 | MATER | 04C | STATION002 |
| 6 | E00072L | BEAUFORT | SAMPLE | 20 | WATER | 04C | STATION002 |
| ~ | B00073L | BEAUFORT | SAMPLE | 20 | MATER | 04C | STATION002 |
| ė | B00074L | BEAUFORT | SAMPLE | 20 | WATER | 04C | STATION002 |
| ģ | 800075L | BEAUFORT | SAMPLE | 20 | WATER | 040 | STATION002 |
| រៀ | 500101L | BEAUFORT | SAMPLE | 27 | WATER | 04C | STATION071 |
| 11 | B00109L | BEAUFORT | SAMPLE | 27 | MATER | 04C | STATION071 |
| 12 | B00111L | BEAUFORT | SAMPLE | 27 | WATER | 04C | STATION071 |
| 13 | B00114L | BEAUFORT | SAMPLE | 27 | WATER | 04C | STATION071 |
| 14 | B00117L | BEAUFORT | SAMPLE | 27 | WATER | 94C | STATION071 |
| 15 | B00152L | BEAUFORT | SAMPLE | 24 | WATER | 04C | STATION055 |
| 16 | B00153L | BEAUFORT | SAMPLE | 24 | WATER | 04C | STATION055 |
| 17 | £00156L | BEAUFORT | SAMPLE | 24 | WATER | 04C | STATION055 |
| 18 | B00160L | BEAUFORT | SAMPLE | 24 | MATER | 04C | STATION055 |
| 19 | B00164L | BEAUFORT | SAMPLE | 24 | WATER | 04C | STATION055 |
| 20 | B00167L | BERUFORT | SAMPLE | 24 | WATER | 04C | STATION055 |
| ≥ 1 | B00169L | BEAUFORT | SAMPLE | 24 | WATER | 04C | STATION055 |
| 22 | 800174L | BERUFORT | SAMPLE | 24 | WATER | 04C | STATION055 |
| 23 | B00201L | BEAUFORT | SAMPLE | 26 | MATER | 04C | STATION070 |
| 24 | B995 93L | BEAUFORT | SAMPLE | 26 | WATER | 04C | STATION070 |
| 25 | 800212L | BEAUFORT | SAMPLE | 26 | WATER | 04C | STATION070 |
| 26 | B00216L | BEAUFORT | SAMPLE | 26 | WATER | 04C | STATION070 |
| 27 | B00221L | BEAUFORT | SAMPLE | 26 | MATER | 04C | STATION070 |
| 23 | B00225L | BEAUFORT | SAMPLE | 26 | WATER | 04C | STATION070 |
| 29 | B00585F | BEAUFORT | SAMPLE | 19 | WATER | 040 | STATION001 |
| 30 | B00294L | BEAUFORT | SAMPLE | 36 | WATER | 04C | STATION002 |
| 31 | B00295L | BEAUFORT | SAMPLE | 36 | WATER | 04C | STATION002 |

100192

END FORM

SI STRAINS

Strains isolated from sediment at 4C capable of utilizing any of the following fatty acids: proprionic, butyric, caproic, caprylic, lauric, palmitic, stearic, oleic, valeric, iso-valeric.

| i | 890023L | BERUFORT | SAMPLE | 03 | SEDIMENT | - 04C | STATION010 |
|--------------|-------------------------------|---------------|--------|-----------------|-------------------|----------|--|
| 2 | B90031L | BEAUFORT | | | | | |
| 3 | B99935L | BEAUFORT | SAMPLE | 03 | | | |
| 4 | BBBBBBL | BEAUFORT | SAMPLE | 03 | | | |
| 5 | 800042L | BERUFORT | SAMPLE | 03 | SEDIMENT | 040 | |
| 6 | B99978L | BEAUFOR1 | SAMPLE | 16 | | | STATION002 |
| | B99984L | BEAUFORT | SAMPLE | 16 | SEDIMENT | | STATION002 |
| 8 | B00093L | BEAUFORT | SAMPLE | 16 | SEDIMENT | 04C | STATION002 |
| 9 | B00127L | BEAUFORT | SAMPLE | 22 | SEDIMENT | 04C | STATION071 |
| 10 | 890128L | BEAUFORT | SAMPLE | : 22 | SEDIMENT | 04C | STATION071 |
| 1.1 | B00146L | BEAUFORT | SAMPLE | 22 | SEDIMENT | 04C | STATION071 |
| 12 | 800149L | BEAUFORT | SAMPLE | 22 | SEDIMENT | 04C | STATION071 |
| 13 | B00186L | BEAUFORT | | 20 | SEDIMENT | 04C | STATION055 |
| 14 | 800190L | BEAUFORT | SAMPLE | | SEDIMENT | 04C | STATION055 |
| 15 | B00191L | BEAUFORT | SAMPLE | | SEDIMENT | 04C | STATION055 |
| 16 | B00195L | BEAUFORT | | | SEDIMENT | 04C | STATION055 |
| 17 | B00197L | BEAUFORT | | | SEDIMENT | 04C. | STATION055 |
| 18 | B00226L | BEAUFORT | | 21 | SEDIMENT | 04C | STATION070 |
| 19 | B00227L | BEAUFORT | | | SEDIMENT | 04C | STATION070 |
| 29 | B99232L | BEAUFORT | SAMPLE | 21 | SEDIMENT | 04C | STATION070 |
| 21 | 800235L | BEAUFORT | | | SEDIMENT | 04C | STATION070 |
| 82 | B00236L | BEAUFORT | SAMPLE | 21 | SEDIMENT | 04C | STATION070 |
| 23 | 800237L | BEAUFORT | SAMPLE | 21 | SEDIMENT | 04C | STATION070 |
| 24 | B00241L | BEAUFORT | SAMPLE | 21 | SEDIMENT | 04C | STATION070 |
| 25 | B00242L | BEAUFORT | SAMPLE | 21 | SEDIMENT | 04C | STATION070 |
| 26 | B00243L | BEAUFORT | SAMPLE | 21 | SEDIMENT | 04C | STATION070 |
| 27 | B00251L | BEAUFORT | SAMPLE | 09 | SEDIMENT | 04C | STATION030 |
| 28 | 800252L | BEAUFORT | SAMPLE | <u>6</u> 9 | SEDIMENT | 04C | STATION030 |
| 29 | 800257L | BEAUFORT | SAMPLE | 69 | SEDIMENT | 04C | STATION030 |
| 30 | B00258L | BEAUFORT | SAMPLE | 69 | SEDIMENT | 04C | STATION030 |
| 31 | 800261L | BEAUFORT | SAMPLE | 69 | SEDIMENT | 04C | STATION030 |
| 32 | B00265L | BEAUFORT | SAMPLE | 09 | SEDIMENT | 04C | STATION030 |
| 33 34 | B00267L | BEAUFORT | SAMPLE | 09 | SEDIMENT | 040 | STATION030 |
| | B00268L | BEAUFORT | SAMPLE | 09 | SEDIMENT | 04C | STATION030 |
| 35 36 | B00270L | BEAUFORT | SAMPLE | 09 | SEDIMENT | 84C | STATION030 |
| oc 37 | 800271L | BEAUFORT | SAMPLE | Ø9 00 | SEDIMENT | 04C | STATION030 |
| ал 38 | 800272L 800273L | BERUFORT | SAMPLE | 09 00 | SEDIMENT | 04C | STATION030 |
| 39 39 | B00274L | BEAUFORT | SAMPLE | 09 00 | SEDIMENT | | STATION030 |
| دی 40 | 800287L | BEAUFORT | SAMPLE | 09 15 | SEDIMENT | | STATION030 STATION001 |
| 49 41 | 800287L 800290L | BEAUFORT | SAMPLE | $\frac{10}{15}$ | SEDIMENT SEDIMENT | | STATION001 |
| 42 | B00299L | BEAUFORT | SAMPLE | | SEDIMENT | | STATION002 |
| 1 L _ | and the first factors and the | THE DOL OW: 1 | | -215- | | 070 | an i i i i i i i i i i i i i i i i i i i |

END FORM

Strains isolated from water at 20C capable of utilizing any of the following fatty acids: proprionic, butyric, caproic, caprylic, lauric, palmitic, stearic, oleic, valeric, isovaleric.

| <u>1</u> | 800001H | BERUFORT | SAMPLE | 63 | MATER | 200 | STATION010 |
|----------|----------|----------------|--------|----------|--------------|---------------|------------|
| Ê | 800002H | BEAUFORT | SAMPLE | 03 | MATER | 20C | STATION010 |
| 3 | 809003H | BEAUFORT | SAMPLE | 03 | NATER | 20C | STATION010 |
| ಚಿ. | B00005H | BEAUFORT | SAMPLE | 03 | WATER | 200 | STATION010 |
| 5 | B80806H | BEAUFORT | SAMPLE | 03 | WATER | 200 | STATION010 |
| | 2000000H | BEAUFORT | SAMPLE | 03 | WATER | 200 | STATION010 |
| 6 | | BEAUFORT | SAMPLE | 03 | WATER | 200 | STATION010 |
| 7 | 200008H | BEAUFORT | SAMPLE | 03 | WATER | 200 | STATION010 |
| 8 | B00009H | BEAUFORT | SAMPLE | 63 | WATER | 200 | STATION010 |
| 9 | 800010H | BEAUFORT | SAMPLE | 03 | WATER | 200 | STATION010 |
| 10 | B00013H | BEAUFORT | SAMPLE | 03 | WATER | 200 | STATION010 |
| 11 | B00014H | | SAMPLE | 03 | WATER | 200 | STATION010 |
| 12 | B00016H | BEAUFORT | SAMPLE | 03 | WATER | 200 | STATION010 |
| 13 | E00017H | BEAUFORT | SAMPLE | 03 03 | MATER | 200 | STATION010 |
| 14 | B00018H | BEAUFORT | SAMPLE | | WATER | 200 | STATION010 |
| 15 | B00020H | BEAUFORT | | | WATER | 200 | STATION010 |
| 16 | B00021H | BEAUFORT | SAMPLE | 03 03 | WATER | 200 | STATION010 |
| 17 | E00055H | BEAUFORT | SAMPLE | | WATER | 200 | STATION010 |
| 18 | 800023H | BEAUFORT | SAMPLE | | WATER | 200 | STATION010 |
| 19 | B00024H | BEAUFORT | SAMPLE | 03 | WATER | 200 | STATION020 |
| 20 | B00051H | BEAUFORT | SAMPLE | 20 | | 200 | STATION020 |
| 21 | B00052H | BEAUFORT | SAMPLE | 20 | WATER | | STATION020 |
| 22 | 800053H | BEAUFORT | SAMPLE | 20 | WATER | 20C | STATION020 |
| 23 | B00054H | BEAUFORT | SAMPLE | 20 | MATER | 200 | STATION020 |
| 24 | B99955H | BEAUFORT | SAMPLE | | MATER | 200 | STATION002 |
| 25 | B80058H | BEAUFORT | SAMPLE | 20 | WATER | 200 | |
| 26 | B00059H | BEAUFORT | SAMPLE | | WATER | 200 | STATION002 |
| a7 | B00060H | BEAUFORT | SAMPLE | 20 | | 200 | STATION002 |
| 28 | B99961H | BEAUFORT | SAMPLE | 20 | | 200 | STATION002 |
| 29 | E00064H | BEAUFORT | SAMPLE | | WATER | 200 | STATION002 |
| 30 | 800065H | BEAUFORT | SAMPLE | 20 | | 590 | STATION002 |
| 31 | 890066H | BERUFORT | SAMPLE | 20 | | 200 | STATION002 |
| 32 | B00067H | BEAUFORT | SAMPLE | 20 | | 500 | STATION002 |
| 33 | B90068H | BEAUFORT | SEMPLE | | | 200 | STATION002 |
| 34 | B99969H | BEAUFORT | SAMPLE | 20 | | 200 | STATION002 |
| 35 | B00070H | BEAUFORT | SAMPLE | 20 | | 200 | STATION002 |
| 36 | B00071H | BEAUFORT | SAMPLE | | | | STATION002 |
| 37 | B99972H | BEAUFORT | SAMPLE | 20 | WATER | 200 | |
| 38 | B00073H | BEAUFORT | SAMPLE | 20 | MATER | 200 | STATION002 |
| 39 | B00075H | BEAUFORT | | | | 200 | STATION002 |
| 40 | B00101H | BEAUFORT | | | | | |
| 41 | B00102H | BEAUFORT | SAMPLE | 27 | WATER | 200 | STATION071 |
| 42 | B99193H | BEAUEORT | SAMPLE | -27 | WATER | 200 | STATION071 |
| 43 | B99104H | BEAUFORT | SAMPLE | 27 | MATER | 200 | STATION071 |
| 44 | B00106H | BEHILFORT | SAMPLE | 27 | WATER | 200 | STATION071 |
| 45 | B00109H | REALEORT | SRMPLE | 27 | WATER | 200 | STATION071 |
| 46 | B00110H | REPUEDRT | SAMPLE | 27 | WHTER | 200 | STATION071 |
| 47 | B00113H | BEBLENET | SAMPLE | 27 | NATER | 200 | STATION071 |
| 48 48 | B00114H | REALFORT | SAMPLE | 27 | MATER | 200 | STATION071 |
| 49 49 | B90115H | PERMENET | CAMELE | 27 | UATER | PAC | STATION071 |
| 47 50 | B00116H | DERUCIÓN DE T | CAMPLE | 27 | WATER | 260 | STATION071 |
| الياني. | 5001100 | THE ROLE MAY 1 | | L., 1 | rns i f 6-1% | Br. "willing" | |

| 51 | B00118H | BEAUFORT SAMPLE 27 WATER 200 STATION071 |
|-------------|----------------------------------|--|
| 52 | : B00119H | BEAUFORT SAMPLE 27 WATER 20C STATION071 |
| 53 | B00120H | BEAUFORT SAMPLE 27 WATER 20C STATION071 |
| 54 | B00121H | BEAUFORT SAMPLE 27 WATER 20C STATION071 |
| 55 | B00123H | BEAUFORT SAMPLE 27 WATER 20C STATION071 |
| 56 | B00151H | BEAUFORT SAMPLE 24 WATER 200 STATION055 |
| 57 | | BEAUFORT SAMPLE 24 WATER 20C STATION055 |
| 58 | | BEAUFORT SAMPLE 24 WATER 200 STATION055 |
| 59 | | BEAUFORT SAMPLE 24 WATER 200 STATION055 |
| 60 | | BEAUFORT SAMPLE 24 WATER 20C STATION055 |
| 61 | B00156H | BEAUFORT SAMPLE 24 WATER 200 STATION055 |
| 62 | B00158H | BEAUFORT SAMPLE 24 WATER 200 STATION055 |
| 63 | | BEAUFORT SAMPLE 24 WATER 200 STATION055 |
| 64 | B00161H | BEAUFORT SAMPLE 24 WATER 200 STATION055 |
| 65 | B00162H | BEAUFORT SAMPLE 24 WATER 200 STATION055 |
| 66 | B00163H | BEAUFORT SAMPLE 24 WATER 200 STATION055 |
| 67 | B00164H | BEAUFORT SAMPLE 24 WATER 20C STATION055 |
| 68 | B00166H | BEAUFORT SAMPLE 24 WATER 20C STATION055 |
| 69 | B00168H | BEAUFORT SAMPLE 24 WATER 20C STATION055 |
| 70 | B00169H | BEAUFORT SAMPLE 24 WATER 20C STATION055 |
| 71 | B00202H | BEAUFORT SAMPLE 26 WATER 20C STATION070 |
| 72 | B00203H | BEAUFORT SAMPLE 26 WATER 200 STATION070 |
| 73 | B00204H | BEAUFORT SAMPLE 26 WATER 20C STATION070 |
| 74 | B00205H | BEAUFORT SAMPLE 26 WATER 20C STATION070 |
| 75 | B00206H | BEAUFORT SAMPLE 26 WATER 200 STATION070 |
| $7\ddot{6}$ | B00207H | BEAUFORT SAMPLE 26 WATER 20C STATION070 |
| 77 | B00208H | BEAUFORT SAMPLE 26 WATER 200 STATION070 |
| 78 | B00210H | BEAUFORT SAMPLE 26 WATER 20C STATION070 |
| Ż9 | B00211H | BEAUFORT SAMPLE 26 WATER 200 STATION070 |
| 80 | B00212H | BEAUFORT SAMPLE 26 WATER 20C STATION070 |
| 81 | B00213H | BEAUFORT SAMPLE 26 WATER 200 STATION070 |
| 82 | B00216H | BEAUFORT SAMPLE 26 WATER 200 STATION070 |
| 83 | B00217H | BEAUFORT SAMPLE 26 WATER 200 STATION070 |
| 84 | B00219H | BEAUFORT SAMPLE 26 WATER 200 STATION070 |
| 85 | B00221H | BEAUFORT SAMPLE 26 WATER 200 STATION070 |
| 86 | B00222H | BEAUFORT SAMPLE 26 WATER 200 STATION070 |
| 87 | B00251H | BEAUFORT SAMPLE 11 WATER 200 STATION030 |
| 88 | B00252H | |
| 89 | B00254H | BEAUFORT SAMPLE 11 WATER 20C STATION030 BEAUFORT SAMPLE 11 WATER 20C STATION030 |
| 90 | B00255H | BEAUFORT SAMPLE 11 WATER 200 STATION030 |
| 91 91 | B00256H | BEAUFORT SAMPLE 11 WATER 200 STATION030 |
| 92 | B00257H | BEAUFORT SAMPLE 11 WATER 200 STATION030 |
| 93 | B00258H | BEAUFORT SAMPLE 11 WATER 200 STATION030 |
| 94 | B00260H | BEAUFORT SAMPLE 11 WATER 200 STATION030 |
| 95 | B00261H | BEAUFORT SAMPLE 11 WATER 200 STATION030 |
| 96 | B00262H | BEAUFORT SAMPLE 11 WATER 200 STATION030 |
| 97 | 800263H | BEAUFORT SAMPLE 11 WATER 200 STATION030 |
| 98 | B00264H | BEAUFORT SAMPLE 11 WATER 20C STATION030 |
| 99 | B00265H | BEAUFORT SAMPLE 11 WATER 200 STATION030 |
| 100 | B00266H | BEAUFORT SAMPLE 11 WATER 200 STATION030 |
| 101 | B00268H | BEAUFORT SAMPLE 11 WATER 200 STATION030 |
| 192 | B00269H | BEAUFORT SAMPLE 11 WATER 200 STATION030 |
| 103 | B00270H | BEAUFORT SAMPLE 11 WATER 200 STATION030 |
| 104 | B00271H | BEAUFORT SAMPLE 11 WATER 200 STATION030 |
| 105 | B00272H | BEAUFORT SAMPLE 11 WATER 200 STATION030 |
| 106 | B00273H | BEAUFORT SAMPLE 11 WATER 200 STATION030 |
| 107 | B00275H | BEAUFORT SAMPLE 11 WATER 200 STATION030 |
| · · | and for the the second stands of | WERE ON AND FE II WHILE COU STRUIDINGN |

END FORM 107 STRAINS

Strains isolated from sediment at 20C capable of utilizing any of the following fatty acids: proprionic, butyric, caproic, caprylic, lauric, palmitic, stearic, oleic, valeric, isovaleric.

| 1 | B00026H | BEAUFORT | SAMPLE | 03 | SEDIMENT | 200 | STATION010 |
|----------------|---------|----------|--------|----|----------|------|------------|
| ź | B00027H | BEAUFORT | | | | | |
| ā | B00028H | BEAUFORT | | | SEDIMENT | | |
| 4 | B00029H | BEAUFORT | SAMPLE | | SEDIMENT | 200 | |
| S | BOOOSOH | BEAUFORT | SAMPLE | 03 | SEDIMENT | 200 | |
| ē | B00032H | BEAUFORT | | | SEDIMENT | | |
| 7 | B00033H | BEAUFORT | SAMPLE | | SEDIMENT | 200 | |
| 8 | B00036H | BEAUFORT | SAMPLE | 03 | SEDIMENT | 200 | |
| 9 | B00038H | BEAUFORT | SAMPLE | Ø3 | SEDIMENT | 200 | |
| 10 | B00043H | BEAUFORT | SAMPLE | 03 | SEDIMENT | 200 | STATION010 |
| 11 | B00044H | BEAUFORT | SAMPLE | 03 | SEDIMENT | 200 | STATION010 |
| 12 | B00045H | BEAUFORT | SAMPLE | 03 | SEDIMENT | 200 | STATION010 |
| 13 | B00047H | BEAUFORT | SAMPLE | 03 | SEDIMENT | .200 | STATION010 |
| 14 | B00048H | BEAUFORT | SAMPLE | 03 | SEDIMENT | 200 | STATION010 |
| 15 | B00077H | BEAUFORT | SAMPLE | 16 | SEDIMENT | 200 | STATION002 |
| 16 | B00085H | BEAUFORT | SAMPLE | 16 | SEDIMENT | 200 | STATION002 |
| 17 | B00086H | BEAUFORT | SAMPLE | 16 | SEDIMENT | 200 | STATION002 |
| 18 | B00098H | BEAUFORT | SAMPLE | 16 | SEDIMENT | 200 | STATION002 |
| 19 | B00131H | BEAUFORT | SAMPLE | 22 | SEDIMENT | 200 | STATION071 |
| 20 | B00135H | BEAUFORT | SAMPLE | 22 | SEDIMENT | 20C | STATION071 |
| 21 | B00136H | BEAUFORT | SAMPLE | 22 | SEDIMENT | 200 | STATION071 |
| 33 | B00143H | BEAUFORT | SAMPLE | 22 | SEDIMENT | 20C | STATION071 |
| 23 | B00145H | BEAUFORT | SAMPLE | 22 | SEDIMENT | 20C | STATION071 |
| \mathbb{R}^4 | E00147H | BEAUFORT | SAMPLE | 22 | SEDIMENT | 200 | STATION071 |
| 25 | B00178H | BEAUFORT | SAMPLE | 20 | SEDIMENT | 200 | STATION055 |
| 26 | B00180H | BEAUFORT | SAMPLE | 20 | SEDIMENT | 20C | STATION055 |
| 27 | B00182H | BEAUFORT | SAMPLE | 22 | SEDIMENT | 200 | STATION071 |
| 28 | B00183H | BEAUFORT | SAMPLE | 20 | SEDIMENT | 200 | STATION055 |
| 29 | B00184H | BEAUFORT | SAMPLE | 20 | SEDIMENT | 200 | STATION055 |
| 30 | B00187H | BEAUFORT | SAMPLE | 20 | SEDIMENT | 200 | STATION055 |
| 31 | B00188H | BEAUFORT | SAMPLE | 20 | SEDIMENT | 20C | STATION055 |
| 32 | B00189H | BEAUFORT | SAMPLE | 20 | SEDIMENT | 200 | STATION055 |
| 33 | B00190H | BEAUFORT | SAMPLE | 20 | SEDIMENT | 20C | STATION055 |
| 34 | B00191H | BEAUFORT | SAMPLE | 20 | SEDIMENT | 200 | STATION055 |
| 35 | B00192H | BEAUFORT | SAMPLE | 20 | SEDIMENT | 200 | STATION055 |
| 36 | B00193H | BEAUFORT | SAMPLE | 20 | SEDIMENT | 200 | STATION055 |
| 37 | B00198H | BEAUFORT | SAMPLE | 20 | SEDIMENT | 200 | STATION055 |
| 38 | 800200H | BEAUFORT | SAMPLE | 20 | SEDIMENT | 200 | STATION055 |
| 39 40 | B00233H | BEAUFORT | SAMPLE | 21 | SEDIMENT | 200 | STATION070 |
| 40 | B00239H | BEAUFORT | SAMPLE | 21 | SEDIMENT | 20C | STATION070 |

| 41 | B00240H | BEAUFORT | SAMPLE 2 | I SEDIMENT | 200 | STATION070 |
|------|---------|----------|----------|------------|-----|------------|
| 42 | B00241H | BEAUFORT | SAMPLE 2 | SEDIMENT | 20C | STATION070 |
| 43 | B00243H | BEAUFORT | SAMPLE 2 | L SEDIMENT | 20C | STATION070 |
| 44 | B00244H | BEAUFORT | SAMPLE 2 | I SEDIMENT | 20C | STATION070 |
| 45 | B00248H | BEAUFORT | SAMPLE 2 | SEDIMENT | 200 | STATION070 |
| 46 | B00249H | BEAUFORT | SAMPLE 2 | SEDIMENT | 200 | STATION070 |
| 47 | B00250H | BEAUFORT | SAMPLE 2 | SEDIMENT | 200 | STATION070 |
| 48 . | B00276H | BEAUFORT | SAMPLE 0 | 9 SEDIMENT | 200 | STATION030 |
| 49) | B00279H | BEAUFORT | SAMPLE 0 | 9 SEDIMENT | 200 | STATION030 |
| 50 | B00282H | BEAUFORT | SAMPLE 0 | 9 SEDIMENT | 20C | STATION030 |
| 51 | B00283H | BEAUFORT | SAMPLE 0 | 9 SEDIMENT | 200 | STATION030 |
| 52 | B00285H | BEAUFORT | SAMPLE 0 | 9 SEDIMENT | 20C | STATION030 |
| 53 | B00286H | BEAUFORT | SAMPLE 0 | 9 SEDIMENT | 20C | STATION030 |
| 54 | B00295H | BEAUFORT | SAMPLE 0 | SEDIMENT | 200 | STATION030 |
| 55 | B00297H | BEAUFORT | SAMPLE 0 | 9 SEDIMENT | 200 | STATION030 |
| 56 | B00300H | BEAUFORT | SAMPLE 0 | 9 SEDIMENT | 20C | STATION030 |

END FORM 56 STRAINS

Strains isolated from water at 4C capable of utilizing pyruvic acid.

.

| j. | 800009L | BEAUFORT | SAMPLE | ́ ЙЗ | MATER | 84C | STATION010 |
|--------|------------------|----------|--------|------|-------|------|------------|
| Ē | 800012L | BEAUFORT | | | MATER | 040 | |
| 3 | 399953L | BEAUFORT | SAMPLE | | HATER | 04C | STATION002 |
| | B00057L | BEAUFORT | SAMPLE | | MATER | 04C | STATION002 |
| 5 | B90058L | BEAUFORT | SAMPLE | 20 | WATER | 04C | STATION002 |
| ő | B99959L | BEAUFORT | SAMPLE | 20 | MATER | 04C | STATION002 |
| 2 | 880067L | BEAUFORT | SAMPLE | 20 | WATER | 04C | STATION002 |
| Э | B00071L | BEAUFORT | SAMPLE | 20 | WATER | 04Č | STATION002 |
| 9 | B90973L | BEAUFORT | SAMPLE | 20 | WATER | 04C | STATION002 |
| 10 | B00074L | BEAUFORT | SAMPLE | 20 | WATER | -04C | STATION002 |
| 11 | B00075L | BEAUFORT | SAMPLE | 20 | MATER | 04C | STATION002 |
| 12 | 300109L | BERUFORT | SAMPLE | 27 | WATER | 04C | STATION071 |
| 13 | B00112L | BERUFORT | SAMPLE | 27 | WATER | 04C | STATION071 |
| 1 - | 800114L | BEAUFORT | SAMPLE | 27 | WATER | 04C | STATION071 |
| 15 | B00117L | BEAUFORT | SAMPLE | 27 | MATER | 04C | STATION071 |
| 16 | 300151L | BEAUFORT | SAMPLE | 24 | MATER | 04C | STATION055 |
| 17 | B00152L | BEAUFORT | SAMPLE | 24 | WATER | 04C | STATION055 |
| 18 | B00153L | BEAUFORT | SAMPLE | 24 | WATER | 04C | STATION055 |
| 19 | B00156L | BEAUFORT | SAMPLE | 24 | MATER | 04C | STATION055 |
| 20 | B00164L | BEAUFORT | SAMPLE | 24 | MATER | 04C | STATION055 |
| 21 | B00166L | BEAUFORT | SAMPLE | 24 | MATER | 04C | STATION055 |
| 22 | B00167L | BEAUFORT | SRMPLE | 24 | MATER | 04C | STATION055 |
| 23 | B30174L | BEAUFORT | SAMPLE | 24 | MATER | 04C | STATION055 |
| 근다 | B00201L | BEAUFORT | SAMPLE | 26 | MATER | 04C | STATION070 |
| | 800202L | BEAUFORT | SAMPLE | 26 | MATER | 04C | STATION070 |
| 26 | 200212L | BEAUFORT | SAMPLE | 26 | MATER | 04C | STATION070 |
| 27 | B00216L | BEAUFORT | SAMPLE | 26 | MATER | 04C | STATION070 |
| 28 | B00551F | BEAUFORT | SAMPLE | 26 | MATER | 04C | STATION070 |
| -52-59 | B0 9255 F | BEAUFORT | SAMPLE | 26 | MATER | 04C | STATION070 |
| 30 | B99553F | BERUFORT | SAMPLE | 26 | WATER | 040 | STATION070 |
| 31 | 800225L | BEAUFORT | SAMPLE | 26 | MATER | 04C | STATION070 |
| 32 | B30278L | BEHUFORT | SAMPLE | 11 | MATER | 04C | STATION030 |
| 33 | B00282L | BEAUFORT | SHIPLE | 19 | WATER | 04C | STATION001 |
| 34 | B00283L | BEAUFORT | SAMPLE | 19 | MATER | 04C | STATION001 |
| 35 | B00294L | BEAUFORT | SAMPLE | 36 | MATER | 04C | STATION002 |
| 36 | B99295L | BEAUFORT | SAMPLE | 36 | WATER | 04C | STATION002 |

END FORM

Strains isolated from sediment at 4C capable of utilizing pyruvic acid.

| | | | | | | ~ ~ ~ | المراجع والمراجع والمحاصر والمحاصر والمحاصر |
|----------|-----------------|--------------|---------------|-------------|--|-----------------|--|
| 1 | _B00026L | BEAUFORT | SAMPLE | | SEDIMENT | | |
| 2 | <u>800027L</u> | BEAUFORT | SAMPLE | 03 | SEDIMENT | Ø4C | STATION010 |
| З | 300028L | BEAUFORT | SAMPLE | 03 | SEDIMENT | 04C | STATION010 |
| 4 | 800030L | BEAUFORT | SAMPLE | 03 | SEDIMENT | 04C | STATION010 |
| 5 | B00031L | BEAUFORT | SAMPLE | 03 | SEDIMENT | 04C | STATION010 |
| 6 | BUODSEL | BEAUFORT | SAMPLE | ē3 | SEDIMENT | Ø4C | STATION010 |
| 7 | B00035L | BEAUFORT | SAMPLE | йЗ | SEDIMENT | 04Č | STATION010 |
| | B00038L | BEAUFORT | SAMPLE | ĕЗ | SEDIMENT | 04Č | STATION010 |
| 8 | | | SAMPLE | 03 | SEDIMENT | 04C | STATION010 |
| 9 | 800040L | BEAUFORT | | 03 | SEDIMENT | 04C | STATION010 |
| 10 | 800041L | BEAUFORT | SAMPLE | | | | |
| 11 | B00042L | BEAUFORT | SAMPLE | <u>03</u> | SEDIMENT | 04C | STATION010 |
| 12 | 800043L | BEAUFORT | SAMPLE | 03 | SEDIMENT | 04C | STATION010 |
| 13 | 300044L | BEAUFORT | SAMPLE | 03 | SEDIMENT | 04C | STATION010 |
| 14 | B00046L | BEAUFORT | SAMPLE | <u>Ю</u> З | SEDIMENT | 04C | STATION010 |
| 15 | B00049L | BEAUFORT | SAMPLE | 03 | SEDIMENT | 04C | STATION010 |
| 16 | 800050L | BEAUFORT | SAMPLE | 63 | SEDIMENT | 94C | STATION010 |
| 17 | B00076L | BERUFORT | SAMPLE | 16 | SEDIMENT | Ø4C | STATION002 |
| 13 | B00077L | BEAUFORT | SAMPLE | 16 | SEDIMENT | 04C | STATION002 |
| 19 | B00078L | BEAUFORT | SAMPLE | 16 | SEDIMENT | 04C | STATION002 |
| 20 | B00084L | BEAUFORT | SAMPLE | 16 | SEDIMENT | 04C. | STATION002 |
| 21 | B00093L | BEAUFORT | SAMPLE | 16 | SEDIMENT | 04C | STATION002 |
| 22 | B00096L | BEAUFORT | SAMPLE | 16 | SEDIMENT | 04C | STATION002 |
| | | BEAUFORT | SAMPLE | 22 | SEDIMENT | 04C | STATION071 |
| 23 | B00126L | | | | | | |
| 24 | 800127L | BEAUFORT | SAMPLE | 22 | SERIMENT | 04C | STATION071 |
| 25 | 800129L | BEAUFORT | SAMPLE | 55 | SEDIMENT | 04C | STATION071 |
| 26 | E00131L | BEAUFORT | SAMPLE | 22 | SEDIMENT | 04C | STATION071 |
| 27 | B60134L | BEAUFORT | SAMPLE | 55 | SEDIMENT | | STATION071 |
| 28 | B90135L | BEAUFORT | SAMPLE | 22 | SEDIMENT | 04C | STATION071 |
| 29 | 800144L | BEHUFORT | SAMPLE | 22 | SEDIMENT | 04C | STATION071 |
| 30 | 100145L | BERUFORT | SAMPLE | 22 | SEDIMENT | 04C | STATION071 |
| 31 | B00146L | BEAUFORT | SAMPLE | 22 | SEDIMENT | 04C | STATION071 |
| 32 | 300149L | BEAUFORT | SAMPLE | 22 | SEDIMENT | 04C | STATION071 |
| 33 | B00150L | BEAUFORT | SAMPLE | 22 | SEDIMENT | 04C | STATION071 |
| 34 | B00176L | BEAUFORT | SAMPLE | 20 | SEDIMENT | 04C | STATION055 |
| 35 | B001-34L | BEAUFORT | SAMPLE | 20 | SEDIMENT | 04C | STATION055 |
| 36 | B00185L | BEAUFORT | SAMPLE | 20 | SEDIMENT | 04C | STATION055 |
| 36 37 | B00186L | BEAUFORT | SAMPLE | 20 | SEDIMENT | 04C | STATION055 |
| | | | | | | | STATION055 |
| 38 | B00187L | | | <u></u> | SEDIMENT | ore Gae | STATION055 |
| 39 | B00189L | BEAUFORT | | | | | |
| 40 | 80019 0L | BEAUFORT | SAMPLE | 20 | SEDIMENT. | | |
| 计主 | B00191L | BEAUFORT | SAMPLE | 20 | SEDIMENT | 04C | STATION055 |
| 42 | B00195L | BEAUFORT | SAMPLE | 20 | SEDIMENT | | STATION055 |
| 43 | B00197L | BEAUFORT | SAMPLE | 20 | SEDIMENT | | |
| 44 | B00226L | BEAUFORT | SAMPLE | 21 | | | STATION070 |
| 45 | B00227L | BEAUFORT | SAMPLE | 21 | SEDIMENT | | |
| 46 | 800230L | BEAUFORT | SAMPLE | 21 | SEDIMENT | Ø4C | STATION070 |
| 47 | B00232L | BEAUFORT | SAMPLE | 21 | SEDIMENT | | |
| 48 | B00233L | BEAUFORT | SAMPLE | | SEDIMENT | | STATION070 |
| 49 | 800234L | BEAUFORT | SAMPLE | | SEDIMENT | | |
| 50 | B00235L | BEAUFORT | SAMPLE | | SEDIMENT | | STATION070 |
| | 3700 QHL (7 UHL | DEDIROF OP/1 | ավերի հետանու | բ | and the second | ••• • •• | and the state of t |

| 51 52 53 | B00236L B00237L B00241L B00242L | BEAUFORT BEAUFORT BEAUFORT | SAMPLE | 21 21 | SEDIMENT | 04C 04C | STATION070 STATION070 |
|----------------|--|----------------------------------|-----------------------------|-------------|----------|------------|--------------------------|
| | B00241L | | **** | 21 | SEDIMENT | 04C | STATION070 |
| 53 | | BERUFORT | and an in the second second | | | | |
| | 800242L | | SAMPLE | 21 | SEDIMENT | 04C | STATION070 |
| 54 | | BERUFORT | SAMPLE | 21 | SEDIMENT | 04C | STATION070 |
| 55 | £00243L | BEAUFORT | SAMPLE | 21 | SEDIMENT | Ø4C | STATION070 |
| | B00247L | BEAUFORT | SAMPLE | 21 | SEDIMENT | 04C | STATION070 |
| 57 | B00251L | BEAUFORT | SAMPLE | Ø9 | SEDIMENT | 04C | STATION030 |
| 58 | B00252L | BEAUFORT | SAMPLE | 09 | SEDIMENT | 04C | STATION030 |
| 59 | B00253L | BEAUFORT | SAMPLE | 09 | SEDIMENT | 04C | STATION030 |
| 60 | 600257L | BEAUFORT | SAMPLE | 69 | SEDIMENT | 04C | STATION030 |
| 61 | B00258L | BERUFORT | SAMPLE | 69 | SEDIMENT | 04C | STATION030 |
| 62 | 800260L | BEAUFORT | SAMPLE | 09 | SEDIMENT | 04C | STATION030 |
| -63 | B00261L | BEAUFORT | SAMPLE | 09 | SEDIMENT | 04C | STATION030 |
| 64 | 800263L | BEAUFORT | SAMPLE | 09 | SEDIMENT | 04C | STATION030 |
| 65 | B00265L | BEAUFORT | SAMPLE | 09 | SEDIMENT | 04C | STATION030 |
| 66 | 260267L | BEAUFORT | SAMPLE | 09 | SEDIMENT | 04C | STATION030 |
| 57 | B90268L | BEAUFORT | SAMPLE | 09 | SEDIMENT | 04C | STATION030 |
| 68 | 800270L | BEAUFORT | SAMPLE | 09 | SEDIMENT | 04C | STATION030 |
| 69 | 800271L | BEAUFORT | SAMPLE | 09 | SEDIMENT | 04C | STATION030 |
| 79 | B00272L | BEAUFORT | SAMPLE | Ø9 | SEDIMENT | 04C | STATION030 |
| 71. | B00273L | BEAUFORT | SAMPLE | <u>09</u> - | SEDIMENT | 04C | STATION030 |
| 78 | B00274L | BEAUFORT | SAMPLE | 09 | SEDIMENT | 04C | STATION030 |
| 73 | 390275L | BEAUFORT | SAMPLE | 69 | SEDIMENT | 04C | STATION030 |
| 7 | B00287L | BEAUFORT | SAMPLE | 15 | SEDIMENT | 04C | STATION001 |
| 75 | B00290L | BEAUFORT | SAMPLE | 15 | SEDIMENT | 04C | STATION001 |
| 76 | 300297L | BEAUFORT | SAMPLE | 35 | SEDIMENT | 04C | STATION002 |
| 17 | 300299L | BEAUFORT | SAMPLE | 32 | SEDIMENT | 04C | STATION002 |

END FORM 77 STRAIMS

Strains isolated from water at 20C capable of utilizing pyruvic acid.

| Ĵ. | 800001H | BEAUFORT | SAMPLE | 63 | MATER | 200 | STATION010 |
|------------|--|-------------------------|---------------|--------------|----------------------------|---|--|
| 2 | B90002H | BEAUFORT | SAMPLE | 03 | MATER | 200 | STATION010 |
| . 3 | 800003H | BEAUFORT | SAMPLE | 03 | WATER | 200 | STATION010 |
| | and the second | | SAMPLE | 03 | WATER | 200 | STATION010 |
| } | 800005H | BEAUFORT | | | | | |
| <u> </u> | B00006H | BEAUFORT | SAMPLE | 63 | MATER | 200 | STATION010 |
| 6 | B00007H | BEAUFORT | SAMPLE | 03 | WATER | 20C | STATION010 |
| 7 | B00008H | BEAUFORT | SAMPLE | Ø3 | WATER | 200 | STATION010 |
| 8 | B00009H | BEAUFORT | SAMPLE | Ø3 | WATER | 200 | STATION010 |
| ē | B00010H | BEAUFORT | SAMPLE | 83 | WATER | 200 | STATION010 |
| . – | B00013H | BEAUFORT | SAMPLE | 03 | WATER | 200 | STATION010 |
| 10 | | •··· · | SAMPLE | 03 | MATER | 200 | STATION010 |
| 11 | B00014H | BEAUFORT | | | | | |
| 12 | B00016H | BEAUFORT | SAMPLE | 03 | MATER | 20C | STATION010 |
| 13 | B00017H | BEAUFORT | SAMPLE | Ø3 | HATER | 200 | STATION010 |
| 14 | B00018H | BEAUFORT | SAMPLE | 03 | WATER | 20C | STATION010 |
| 15 | B00020H | BEAUFORT | SAMPLE | ЮЗ | WATER | 290 | STATION010 |
| 16 | B00022H | BEAUFORT | SAMPLE | 03 | MATER | 200 | STATION010 |
| 17 | 200023H | BEAUFORT | SAMPLE | 03 | WATER | 200 | STATION010 |
| | | | SAMPLE | 03 | NATER | 200 | STATION010 |
| 18 | B30024H | BEAUFORT | | | | | |
| 19 | B00051H | BEAUFORT | SAMPLE | 20 | WATER | 200 | STATION020 |
| 20 | B00052H | BEAUFORT | SAMPLE | 20 | WATER | 20C | STATION020 |
| 21 | B00053H | BEAUFORT | SAMPLE | 20 | WATER | 200 | STATION020 |
| 22 | B00054H | BEAUFORT | SAMPLE | 20 | WATER | 20C | STATION020 |
| 23 | B00055H | BEAUFORT | SAMPLE | 20 | MATER | 200 | STATION020 |
| 24 | E00057H | BEAUFORT | SAMPLE | 20 | WATER | 200 | STATION020 |
| | | | | 20 | WATER | 200 | STATION002 |
| 25 | B90058H | BEAUFORT | SAMPLE | | | | |
| 26 | 80006 0H | BEAUFORT | SAMPLE | 20 | WATER | 200 | STATION002 |
| 27 | E00064H | BEAUFORT | SAMPLE | 50 | WATER | 200 | STATION002 |
| 28 | B00065H | BEAUFORT | SAMPLE | 20 | MATER | 20C | STATION002 |
| 29 | 300066H | BEAUFORT | SAMPLE | 20 | WATER | 200 | STATION002 |
| 30 | B00067H | BEAUFORT | SAMPLE | 20 | WATER | 200 | STATION002 |
| 31 | 800068H | BEAUFORT | SAMPLE | 20 | MATER | 200 | STATION002 |
| 32 | 300069H | BEAUFORT | SAMPLE | 20 | WATER | 200 | STATION002 |
| 33 | B00070H | BEAUFORT | SAMPLE | 20 | WATER | 200 | STATION002 |
| | | | | 20 | WATER | 200 | STATION002 |
| 34 | B00071H | BEAUFORT | SAMPLE | | | | STATION002 |
| 35 | 800072H | BEAUFORT | SAMPLE | 20 | WATER | 200 | |
| 36 | B00073H | BEAUFORT | SAMPLE | 20 | WATER | 200 | STATION002 |
| 37 | B00075H | BEAUFORT | SAMPLE | 20 | MATER | 200 | STATION002 |
| 38 | B00104H | BEAUFORT | SAMPLE | 27 | MATER | 20C | STATION071 |
| 39 | B00106H | BEAUFORT | SAMPLE | 27 | WATER | 200 | STATION071 |
| 40 | 800109H | BEAUFORT | SAMPLE | 27 | MATER | 200 | STATION071 |
| 41 | 800110H | BEAUFORT | SAMPLE | | WATER | | STATION071 |
| 42 | B00111H | BEAUFORT | SAMPLE | 27 | MATER | 200 | STATION071 |
| | | | | | | | |
| 43 | B00112H | BEAUFORT | SAMPLE | | WATER | 200 | STATION071 |
| द द | B90114H | BEAUFORT | SAMPLE | | WATER | | STATION071 |
| 45 | B00115H | BEAUFORT | SAMPLE | | MATER | | STATION071 |
| 46 | 800120H | BEAUFORT | SAMPLE | 27 | MATER | 200 | STATION071 |
| 47 | 800121H | BEAUFORT | SEMPLE | 27 | WATER | 200 | STATION071 |
| 48 | B00122H | BEAUFORT | SAMPLE | 27 | MATER | 200 | STATION071 |
| 49 | B00123H | BEAUFORT | SAMPLE | | MATER | 200 | STATION071 |
| 50 | B00151H | BEAUFORT | SAMPLE | | WATER | 200 | STATION055 |
| | 7667018 | 3.2 mail 19676 167876 1 | աններին հանգա | ь - т | €41.1.1 L _{au} 1% | 6 ¹ 6 ¹³ ¹ | 1999 B. B. B. B. 1999 B. |

| 51 | B90152H | BEAUFORT | SAMPLE | 24 | MATER | | STATION055 |
|----|----------------|----------|--------|----|-------|-----|------------|
| 52 | B00154H | BEAUFORT | SAMPLE | 24 | WATER | 200 | STATION055 |
| 53 | B30156H | BEAUFORT | SAMPLE | 24 | WATER | 200 | STATION055 |
| | | | | 24 | WATER | 200 | STATION055 |
| ៍4 | B00158H | BEAUFORT | SAMPLE | | | | |
| 55 | B99160H | BEAUFORT | SAMPLE | 24 | MATER | 20C | STATION055 |
| 56 | B00161H | BEAUFORT | SAMPLE | 24 | WATER | 290 | STATION055 |
| 57 | B00162H | BEAUFORT | SEMPLE | 24 | WATER | 200 | STATION055 |
| 58 | B00163H | BEAUFORT | SAMPLE | 24 | WATER | 200 | STATION055 |
| | | | | 24 | WATER | 200 | STATION055 |
| 59 | B00164H | BEAUFORT | SAMPLE | | | | |
| 60 | B00166H | BEAUFORT | SAMPLE | 24 | WATER | 200 | STATION055 |
| 61 | B00168H | BEAUFORT | SAMPLE | 24 | MATER | 200 | STATION055 |
| 62 | B00169H | BEAUFORT | SAMPLE | 24 | MATER | 200 | STATION055 |
| 63 | B00201H | BEAUFORT | SAMPLE | 26 | MATER | 200 | STATION070 |
| | | | | | | | STATION070 |
| 64 | B00202H | BEAUFORT | SAMPLE | 26 | WATER | 200 | |
| 65 | 800203H | BEAUFORT | SAMPLE | 26 | HATER | 200 | STATION070 |
| 66 | 300204H | BEAUFORT | SAMPLE | 26 | MATER | 200 | STATION070 |
| 67 | B00205H | BEAUFORT | SAMPLE | 26 | WATER | 20C | STATION070 |
| | | - | SAMPLE | 26 | WATER | 200 | STATION070 |
| 68 | B00208H | BEAUFORT | | | | | |
| 69 | B00210H | BEAUFORT | SAMPLE | 26 | WATER | 200 | STATION070 |
| 70 | B00211H | BEAUFORT | SAMPLE | 26 | WATER | 200 | STATION070 |
| 71 | B00212H | BEAUFORT | SAMPLE | 26 | NATER | 20C | STATION070 |
| | B00213H | BEAUFORT | SAMPLE | 26 | WATER | 200 | STATION070 |
| 72 | | | SAMPLE | 26 | WATER | 200 | STATION070 |
| 73 | B00216H | BEAUFORT | | | | | |
| 74 | B00217H | BEAUFORT | SAMPLE | 26 | MATER | 20C | STATION070 |
| 75 | B00219H | BEAUFORT | SAMPLE | 26 | WATER | 200 | STATION070 |
| 76 | B00221H | BEAUFORT | SAMPLE | 26 | WATER | 200 | STATION070 |
| 77 | B00222H | BEAUFORT | SAMPLE | 26 | WATER | 200 | STATION070 |
| | | | SAMPLE | 11 | MATER | 200 | STATION030 |
| 78 | B00251H | BEAUFORT | | | | | STATION030 |
| 79 | B00252H | BEAUFORT | SAMPLE | 11 | MATER | 200 | |
| 80 | B00254H | BEAUFORT | SAMPLE | 11 | MATER | 200 | STATION030 |
| 81 | B00255H | BEAUFORT | SAMPLE | 11 | WATER | 200 | STATION030 |
| 82 | B00256H | BEAUFORT | SAMPLE | 11 | WATER | 20C | STATION030 |
| 83 | B00257H | BEAUFORT | SAMPLE | 11 | WATER | 200 | STATION030 |
| | B00258H | BEAUFORT | SAMPLE | 11 | WATER | 200 | STATION030 |
| 84 | | | | | | 200 | STATION030 |
| 85 | B00260H | BEAUFORT | SAMPLE | 11 | WATER | | |
| 86 | B00261H | BEAUFORT | SAMPLE | 11 | WATER | 50C | STATION030 |
| 87 | B00262H | BEAUFORT | SAMPLE | 11 | WATER | 200 | STATION030 |
| 88 | B00263H | BEAUFORT | SAMPLE | 11 | WATER | 200 | STATION030 |
| 89 | B00264H | BEAUFORT | | 11 | WATER | 200 | STATION030 |
| | | | | 11 | WATER | 200 | |
| 99 | B00265H | BEAUFORT | | | | | |
| 91 | B00266H | BEAUFORT | | 11 | MATER | 200 | |
| 92 | B00269H | BEAUFORT | SAMPLE | 11 | MATER | 200 | STATIONØ30 |
| 93 | B00270H | BEAUFORT | SAMPLE | 11 | WATER | 20C | STATION030 |
| 94 | B00271H | BEAUFORT | SAMPLE | 11 | WATER | 200 | STATION030 |
| | | BEAUFORT | SAMPLE | 11 | WATER | 200 | STATION030 |
| 95 | B00272H | | | | | | |
| 96 | B00273H | BEAUFORT | SAMPLE | | MATER | 200 | STATION030 |
| 97 | <u>800275H</u> | BEAUFORT | SAMPLE | 11 | WATER | 200 | STATION030 |
| - | | | | | | | |

END FORM 97 STRAINS

| İ. | 300026H | BEAUFORT | SAMPLE | 03 | SEDIMENT | 200 | STATION010 |
|--------|------------------|---------------|-----------|------------|-----------------|-----|------------|
| 2 | B00027H | BEAUFORT | SAMPLE | 03 | SEDIMENT | 20C | STATION010 |
| 3 | B90028H | BEAUFORT | SAMPLE | 03 | SEDIMENT | 200 | STATION010 |
| 4 | B00029H | BEAUFORT | | ө <u>э</u> | SEDIMENT | 200 | STATION010 |
| | B00020H | BEAUFORT | | 03. | SEDIMENT | 200 | STATION010 |
| 5 | | | | | | | |
| 6 7 | B00032H | BEAUFORT | | 03 | SEDIMENT | 200 | STATION010 |
| | B0 003 3H | BEAUFORT | | 03 | SEDIMENT | 50C | STATION010 |
| 8 | B00036H | BEAUFORT | SAMPLE | 63 | SEDIMENT | 20C | STATION010 |
| 9 | 800038H | BEAUFORT | SAMPLE | 63 | SEDIMENT | 200 | STATION010 |
| 10 | B00043H | BEAUFORT | SAMPLE | 03 | SEDIMENT | 200 | STATION010 |
| 11 | B00044H | BEAUFORT | | <u>й</u> з | SEDIMENT | 20C | STATION010 |
| îΞ | B00045H | BEAUFORT | | õ3 | SEDIMENT | 200 | STATION010 |
| 13 | 300047H | BEAUFORT | | 03. | SEDIMENT | 200 | STATION010 |
| | | | | 03 03 | SEDIMENT | 200 | STATION010 |
| 14 | B00048H | BEAUFORT | | | | | |
| 15 | 800085H | BEAUFORT | | 16 | SEDIMENT | 500 | STATION002 |
| 16 | B00086H | BEAUFORT | | 16 | SEDIMENT | 20Ç | STATION002 |
| 17 | B00131H | BEAUFORT | | 22 | SEDIMENT | 20C | STATION071 |
| 18 | B00132H | BEAUFORT | SAMPLE : | 22 | SEDIMENT | 200 | STATION071 |
| 19 | B00135H | BEAUFORT | SAMPLE | 22 | SEDIMENT | 200 | STATION071 |
| 20 | B00136H | BEAUFORT | SAMPLE (| 22 | SEDIMENT | 200 | STATION071 |
| 21 | B00141H | BEAUFORT | | 22 | SEDIMENT | 20C | STATION071 |
| Ξŝ | B00143H | BEAUFORT | | 22 | SEDIMENT | 200 | STATION071 |
| 23 | B00145H | BEAUFORT | | 22 | SEDIMENT | 200 | STATION071 |
| | | | | 22 | SEDIMENT | 200 | STATION071 |
| 24 | B00147H | BEAUFORT | | | | | |
| 25 | B00178H | BEAUFORT | | 20 | SEDIMENT | 200 | STATION055 |
| 26 | B00180H | BEAUFORT | | 20 | SEDIMENT | 200 | STATION055 |
| 27 | B00182H | BEAUFORT | | 22 | SEDIMENT | 200 | STATION071 |
| 28 | B00183H | BEAUFORT | SAMPLE & | 20 | SEDIMENT | 200 | STATION055 |
| 29 | B00184H | BEAUFORT | SAMPLE (| 20 | SEDIMENT | 200 | STATION055 |
| 38 | B00185H | BEAUFORT | SAMPLE & | 20 | SEDIMENT | 200 | STATION055 |
| 31 | B00187H | BEAUFORT | | 20 | SEDIMENT | 200 | STATION055 |
| 32 | B00188H | BEAUFORT | | 20 | SEDIMENT | 200 | STATION055 |
| 33 | B00189H | BEAUFORT | | ΞÕ | SEDIMENT | 200 | STATION055 |
| | | BEAUFORT | | | SEDIMENT | 200 | STATION055 |
| 34 | B00190H | | | | | 200 | STATION055 |
| 35 | B00192H | BEAUFORT | | 20 | SEDIMENT | | |
| 36 | B00193H | BEAUFORT | | | SEDIMENT | 200 | STATION055 |
| 37 | B00198H | BEAUFORT | | | SEDIMENT | 200 | STATION055 |
| 38 | 800200H | BEAUFORT | | 20 | SEDIMENT | 20C | STATION055 |
| 39 | B00231H | BEAUFORT | SAMPLE 2 | 21 | SEDIMENT | 200 | STATION070 |
| 40 | B00232H | BEAUFORT | SAMPLE 2 | 21 | SEDIMENT | 200 | STATION070 |
| 41 | B00233H | BEAUFORT | | | SEDIMENT | 200 | STATION070 |
| 42 | B00239H | BEAUFORT | | | SEDIMENT | 200 | STATION070 |
| 43 | B00240H | BEAUFORT | | | SEDIMENT | 200 | STATION070 |
| 44 | B00241H | BEAUFORT | | | SEDIMENT | 200 | STATION070 |
| | B00242H | BEAUFORT | | | SEDIMENT | 200 | STATION070 |
| 45 | | | | | | | |
| 46 | B00243H | BEAUFORT | | | SEDIMENT | 200 | STATION070 |
| 47 | B00248H | BEAUFORT | | | SEDIMENT | 50C | STATION070 |
| 48 | B00249H | BEAUFORT | | | SEDIMENT | 200 | STATION070 |
| 49 | B00276H | BEAUFORT | | | SEDIMENT | 20C | STATIONØ30 |
| 50 | B00282H | BEAUFORT | SAMPLE 0 | 39 | SEDIMENT | 200 | STATION030 |
| 51 | B00283H | BEAUFORT | SAMPLE 0 | 39 | SEDIMENT | 200 | STATION030 |
| 52 | B00286H | BEAUFORT | | | SEDIMENT | 200 | STATION030 |
| 53 | B00295H | BEAUFORT | | | SEDIMENT | 200 | STATION030 |
| 54 | B00297H | BEAUFORT | | | SEDIMENT | 200 | STATION030 |
| 55 | B00300H | BEAUFORT | | | SEDIMENT | 200 | STATION030 |
| 00 | noacada | DELFIOR UP. 1 | OFTITIE E | 22 | oelota niela di | | 010110000 |

END FORM

| | | | | | | . | an an an an an an a lan an an |
|------------|-----------------|----------|--------|----|-------|----------|-------------------------------|
| <u>ب</u> د | 800058L | BEAUFORT | SAMPLE | 20 | MATER | 04C | STATION002 |
| 2 | 800 059L | BEAUFORT | SAMPLE | 20 | WATER | 04C | STATION002 |
| 3 | B09973L | BEAUFORT | SAMPLE | 20 | MATER | 04C | STATION002 |
| <u>د</u> | 300074L | BEAUFORT | SAMPLE | 20 | MATER | 64C | STATION002 |
| 5 | 800075L | BEAUFORT | SAMPLE | 20 | WATER | 04C | STATION002 |
| é | 800109L | BEAUFORT | SEMPLE | 27 | WATER | 04C | STATION071 |
| , i | B00114L | BEAUFORT | SAMPLE | 27 | WATER | 04C | STATION071 |
| 3 | B99117L | BEAUFORT | SAMPLE | 27 | WATER | 04C | STATION071 |
| 9 | B93152L | BEAUFORT | SAMPLE | 24 | MATER | 04C | STATION055 |
| 19 | 800153L | BEAUFORT | SAMPLE | 24 | WATER | 04C | STATION055 |
| 11 | B99156L | BEAUFORT | SAMPLE | 24 | MATER | 04C | STATION055 |
| 12 | B00160L | BEAUFORT | SAMPLE | 24 | MATER | 04C | STATION055 |
| 13 | 500164L | BERUFORT | SAMPLE | 24 | WATER | 04C | STATION055 |
| <u>j</u> 4 | B00167L | BERUFORT | SAMPLE | 24 | MATER | 04C | STATION055 |
| 15 | B00169L | BEAUFORT | SAMPLE | 24 | WHTER | 04C | STATION055 |
| 16 | 890174L | BEAUFORT | SAMPLE | 24 | MATER | 04C | STATION055 |
| 17 | B00201L | BERUFORT | SAMPLE | 26 | MATER | 04C | STATION070 |
| 18 | B90 202L | BEAUFORT | SAMPLE | 26 | MATER | 04C | STATION070 |
| 19 | B99212L | BEAUFORT | SAMPLE | 26 | MATER | 04C | STATION070 |
| 20 | B99221L | BEAUFORT | SAMPLE | 26 | MATER | 84C | STATION070 |
| 21 | 300225L | BEAUFORT | SAMPLE | 26 | MATER | 04C | STATION070 |
| 22 | B00282L | BEAUFORT | SAMPLE | 19 | MATER | 04C | STATION001 |
| 23 | B90294L | BEAUFORT | SAMPLE | 36 | WATER | 04C | STATION002 |
| | 320295L | BERUFORT | SAMPLE | 36 | WATER | 04C | STATION002 |
| | | | | | | | |

END FORM

Strains isolated from sediment at 4C capable of utilizing acetic acid.

| | Ĩ. | 800026L | BEAUFORT | SEMPLE | 03 | SEDIMENT | 04C | STATION010 |
|-----|------------|---------|---------------|--------------------------|---------|----------|------|------------|
| | 2 | B00027L | BEAUFORT | SAMPLE | 63 | SEDIMENT | 04C | STATION010 |
| | 3 | 80003SL | BEAUFORT | SAMPLE | 63 | SEDIMENT | ១40 | STATION010 |
| | 4 | 200078L | BEAUFORT | SAMPLE | 16 | SEDIMENT | 04C | STATION002 |
| | 80 - 19 | B00084L | BEAUFORT | SAMPLE | 16 | SEDIMENT | 04C | STATION002 |
| | 6 | BOOGSL | BEAUFORT | SAMPLE | $1 \in$ | SEDIMENT | 04C | STATION002 |
| | 7 | B00127L | BEAUFORT | SAMPLE | 22 | SEDIMENT | 04C | STATION071 |
| | 8 | B00128L | BEAUFORT | SAMPLE | 22 | SEDIMENT | 04C | STATION071 |
| | Э | B99146L | BEAUFORT | SEMPLE | 22 | SEDIMENT | 04C | STATION071 |
| | 18 | B00149L | BEAUFORT | SAMPLE | 22 | SEDIMENT | 04C | STATION071 |
| | 11 | 300184L | BEHUFORT | SAMPLE | 29 | SEDIMENT | 04C | STATION055 |
| | iΞ | B00185L | BEAUFORT | SAMPLE | 20 | SEDIMENT | 04C | STATION055 |
| | 13 | B90186L | BEAUFORT | SAMPLE | 20 | SEDIMENT | 04C | STATION055 |
| | 14 | B00191L | BEAUFORT | SAMPLE | 80 | SEDIMENT | 04C | STATION055 |
| | 15 | B00559F | BEAUFORT | SAMPLE | 21 | SEDIMENT | 04C | STATION070 |
| | 16 | B00227L | BEAUFORT | SAMPLE | 21 | SEDIMENT | 04C | STATION070 |
| | 17 | B00232L | BEAUFORT | SAMPLE | 21 | SEDIMENT | 04C | STATION070 |
| | 18 | B00236L | BEAUFORT | SAMPLE | 21 | SEDIMENT | 94C | STATION070 |
| | 19 | B00237L | BEAUFORT | | 21 | SEDIMENT | 04C | STATION070 |
| | 20 | B00243L | BEFUFORT | SAMPLE | 21 | SEDIMENT | 04C | STATION070 |
| e i | | 251L | BEAUFORT SAMP | Bernillers featient feat | EDI | MENT 04C | STAT | TON030 |
| | 22 | 800252L | BERUFORT | SAMPLE | 69 | SEDIMENT | 04C | STATION030 |
| | 23 | B00265L | BEAUFORT | and the fit there have | 09 | SEDIMENT | 04C | STATION030 |
| | 64 | 890270L | BEAUFORT | | 69 | SEDIMENT | 04C | STATION030 |
| | 20 | B00287L | BEAUFORT | | 15 | SEDIMENT | 04C | STATION001 |
| | 26 | P90533F | BEAUFORT | SAMPLE | 32 | SEDIMENT | 04C | STATION002 |
| | | | | | | | | |

END FORM 26 STRAINS

| 1 | B00001H | BEAUFORT SAMPLE 03 WATER 20C STATION010 |
|----------|-------------------|---|
| 2 | 800002H | BEAUFORT SAMPLE 03 NATER 20C STATION010 |
| 3 | 8000 05H | BEAUFORT SAMPLE 03 WATER 20C STATION010 |
| 4 | 800006H | REALFORT SAMPLE 03 WATER 20C STATION010 |
| | 899007H | BEAUFORT SAMPLE 03 WATER 20C STATION010 |
| 5 | | BEAUFORT SAMPLE 03 WATER 20C STATION010 |
| 6 | B99008H | DEROF ON THE SECOND AND CTATIONALS |
| 7 | 800013H | DEFECT OF THE REPORT OF A CONTRACTOR OF A CONTRACTOR |
| 3 | B00014H | DENOTORY OF THE SECOND AND ADDRESS OF TAXABLE |
| 9 | B00016H | |
| 10 | 800017H | |
| 11 | B00018H | |
| 12 | B00020H | BEAUFORT SAMPLE 03 WATER 20C STATION010 |
| 13 | B00055H | BEAUFORT SAMPLE 03 WATER 20C STATION010 |
| 14 | 800023H | BEAUFORT SAMPLE 03 WATER 20C STATION010 |
| 15 | B00024H | BEAUFORT SAMPLE 03 WATER 20C STATION010 |
| 16 | B00051H | BEAUFORT SAMPLE 20 WATER 20C STATION020 |
| 17 | B00052H | BEAUFORT SAMPLE 20 WATER 20C STATION020 |
| 18^{1} | B80053H | BEAUFORT SAMPLE 20 WATER 200 STATION020 |
| 10 19 | 800054H | BEAUFORT SAMPLE 20 WATER 20C STATION020 |
| | B00055H | BEAUFORT SAMPLE 20 WATER 20C STATION020 |
| 20 | B00058H | BEAUFORT SAMPLE 20 WATER 20C STATION002 |
| 21 | | BEAUFORT SAMPLE 20 WATER 200 STATION002 |
| 22 | 800059H | BEAUFORT SAMPLE 20 WATER 200 STATION002 |
| 23 | B00060H | BEAUFORT SAMPLE 20 WATER 200 STATION002 |
| 24 | B00061H | DETENDED TO THE STREET OF CTOTIONORD |
| 25 | B00064H | DENOLOGY OTHER DE PARTER DOD CTOTIONOGO |
| 26 | B00065H | |
| 27 | B00066H | |
| 28 | B00067H | |
| 29 | B00068H | BEHOROW, OTHER DE MARTER AND CTOTIONAGO |
| 30 | B00069H | DEPENDING OF A STATIC CONCERNMENT OF A STATICHORO |
| 31 | 800070H | DEFICIENCE OF A CONTRACT ON A CONTRACT. |
| 32 | B00071H | DEMONDARY CARACTER DATA AND AND AND AND AND AND AND AND AND AN |
| 33 | B00072H | DEPOY ON A SAM LE MARTIN AND AND ATOTIONOGO |
| 34 | B00073H | |
| 35 | B00101H | BEAUFORT SAMPLE 27 WATER 20C STATION071 |
| 36 | B00102H | BEAUFORT SAMPLE 27 WATER 20C STATION071 |
| 37 | B00103H | BEAUFORT SAMPLE 27 WATER 20C STATION071 |
| 38 | B00104H | BEAUFORT SAMPLE 27 WATER 20C STHILUMU/1 |
| 39 | B00106H | BEAUFORT SAMPLE 27 WATER 20C STATION071 |
| 40 | 800109H | BEAUFORT SAMPLE 27 WATER 200 STATION071 |
| 41 | B00110H | BEAUFORT SAMPLE 27 WATER 200 STATION071 |
| 42 | B00111H | BEAUFORT SAMPLE 27 WATER 20C STATION071 |
| 43 | B00113H | BEAUFORT SAMPLE 27 WATER 20C STATION071 |
| 44 | B00114H | BEAUFORT SAMPLE 27 WATER 20C STATION071 |
| 45 | B00115H | BEAUFORT SAMPLE 27 WATER 20C STATION071 |
| 46 | B00116H | BEAUFORT SAMPLE 27 WATER 200 STATION071 |
| 47 | B00118H | BEAUFORT SAMPLE 27 WATER 20C STATION071 |
| 48 | B00119H | BEAUFORT SAMPLE 27 WATER 200 STATION071 |
| 49 | B00120H | BEAUFORT SAMPLE 27 WATER 200 STATION071 |
| 50 | B90121H | BEAUFORT SAMPLE 27 WATER 200 STATION071 |
| 11_1 | 754567 T PT T () | partmants stands for a construction of the second second second second second second second second second second |

Strains isolated from water at 20C capable of utilizing acetic acid.

| $\mathbb{D}1$ | B00123H | BEAUFORT SAMPLE 27 WATER 20C STATION071 |
|---------------|------------------|---|
| 32 | B00151H | BEAUFORT SAMPLE 24 WATER 20C STATION055 |
| 53 | B00152H | BEAUFORT SAMPLE 24 WATER 20C STATION055 |
| 54 | B00153H | BEAUFORT SAMPLE 24 WATER 20C STATION055 |
| 55 | B00154H | BEAUFORT SAMPLE 24 WATER 20C STATION055 |
| 56 | B90155H | BEAUFORT SAMPLE 24 WATER 200 STATION055 |
| 57 | B00156H | BEAUFORT SAMPLE 24 WATER 200 STATION055 |
| 58 | B00158H | |
| 59 | B00160H | |
| | | |
| 60 | B00161H | BEAUFORT SAMPLE 24 WATER 20C STATION055 |
| 61 | B00163H | BEAUFORT SAMPLE 24 WATER 20C STATION055 |
| 62 | B00164H | BEAUFORT SAMPLE 24 WATER 20C STATION055 |
| 63 | B90166H | BEAUFORT SAMPLE 24 WATER 20C STATION055 |
| 64 | B99168H | BEAUFORT SAMPLE 24 WATER 20C STATION055 |
| 65 | B00169H | BEAUFORT SAMPLE 24 WATER 20C STATION055 |
| 66 | B00202H | BEAUFORT SAMPLE 26 WATER 20C STATION070 |
| 67 | 89 92 94H | BEAUFORT SAMPLE 26 WATER 20C STATION070 |
| 68 | 800205H | BEAUFORT SAMPLE 26 WATER 20C STATION070 |
| 69 | B00206H | BEAUFORT SAMPLE 26 WATER 20C STATION070 |
| 70 | B00207H | BEAUFORT SAMPLE 26 WATER 20C STATION070 |
| 71 | B00208H | BEAUFORT SAMPLE 26 WATER 20C STATION070 |
| 72 | B00210H | BEAUFORT SAMPLE 26 WATER 20C STATION070 |
| 73 | B00211H | BEAUFORT SAMPLE 26 WATER 20C STATION070 |
| 74 | B00212H | BEAUFORT SAMPLE 26 WATER 200 STATION070 |
| 75 | B00213H | BEAUFORT SAMPLE 26 WATER 200 STATION070 |
| 76 | B00216H | BERUFORT SAMPLE 26 WATER 200 STATION070 |
| 77 | B00217H | BEAUFORT SAMPLE 26 WATER 200 STATION070 |
| 78 | B90219H | |
| 79 | B00221H | |
| 80 | B00222H | |
| 81 | B00251H | |
| 82 | | BEAUFORT SAMPLE 11 WATER 200 STATION030 |
| | B00252H | BEAUFORT SAMPLE 11 WATER 20C STATION030 |
| 83 | B00254H | BEAUFORT SAMPLE 11 WATER 20C STATION030 |
| 84 | 800255H | BEAUFORT SAMPLE 11 WATER 20C STATION030 |
| 85 86 | B00256H | BEAUFORT SAMPLE 11 WATER 20C STATION030 |
| <u>86</u> | B00258H | BEAUFORT SAMPLE 11 WATER 20C STATION030 |
| 87 | B00260H | BEAUFORT SAMPLE 11 WATER 20C STATION030 |
| <u>88</u> | B00261H | BEAUFORT SAMPLE 11 WATER 20C STATION030 |
| 89 | B00262H | BEAUFORT SAMPLE 11 WATER 20C STATION030 |
| 90 | B00263H | BEAUFORT SAMPLE 11 WATER 20C STATION030 |
| 91 | B00264H | BEAUFORT SAMPLE 11 WATER 20C STATION030 |
| 92 | B00265H | BEAUFORT SAMPLE 11 WATER 20C STATION030 |
| 93 | B00266H | BEAUFORT SAMPLE 11 WATER 20C STATION030 |
| 94 | B00268H | BEAUFORT SAMPLE 11 WATER 20C STATION030 |
| 95 | B90269H | BEAUFORT SAMPLE 11 WATER 20C STATION030 |
| 96 | B00270H | BEAUFORT SAMPLE 11 WATER 200 STATION030 |
| 97 | B00271H | BEAUFORT SAMPLE 11 WATER 200 STATION030 |
| 98 | B90273H | BEAUFORT SAMPLE 11 WATER 200 STATION030 |
| 99 | 800275H | BEAUFORT SAMPLE 11 WATER 200 STATION030 |
| | | |

END FORM 99 STRAINS

| -1 | የህመታ መስከተኛ አብቶ ቶ | | | | ለማስ በማሻ ምርስ ዋይ በአስ የማሻ እና በማሻ | | |
|------------|------------------|--------------------------------------|-----------------------|-----|-------------------------------|--|--------------------------------------|
| 1 | 200026H | BEAUFORT | | | | | |
| 2 | B00028H | BEAUFORT | SAMPLE | . – | | | |
| 3 | B00029H | BEAUFORT | SAMPLE | | | | |
| 석 | B00030H | BEAUFORT | SAMPLE | | | 200 | |
| 5 | 800032H | BEAUFORT | SAMPLE | 63 | | - 200 | |
| 6 | B00033H | BEAUFORT | SAMPLE | 03 | | 200 | |
| 2 | B00036H | BEAUFORT | SAMPLE | 03 | SEDIMENT | 500 | |
| 3 | B99938H | BEAUFORT | SAMPLE | | SEDIMENT | 200 | |
| 9 | B99942H | BEAUFORT | SAMPLE | 03 | SEDIMENT | 200 | |
| 10 | 800043H | BEAUFORT | SAMPLE | 03 | SEDIMENT | 200 | |
| 11 | B00044H | BEAUFORT | SAMPLE | 03 | SEDIMENT | 200 | STATION010 |
| 12 | B00045H | BEAUFORT | SAMPLE | 03 | SEDIMENT | 20C | STATION010 |
| 13 | B00047H | BEAUFORT | SAMPLE | 03 | SEDIMENT | 200 | STATION010 |
| 14 | B00048H | BEAUFORT | SAMPLE | 03 | SEDIMENT | 200 | STATION010 |
| 15 | 200085H | BEAUFORT | SAMPLE | 16 | SEDIMENT | 200 | STATION002 |
| 16 | B00086H | BEAUFORT | SAMPLE | 16 | SEDIMENT | 200 | STATION002 |
| 17 | B30130H | BEAUFORT | SAMPLE | 22 | SEDIMENT | 200 | STATION071 |
| 18 | B00135H | BEAUFORT | SAMPLE | 22 | SEDIMENT | 200 | STATION071 |
| 19 | B00143H | BEAUFORT | SAMPLE | 22 | SEDIMENT | 290 | STATION071 |
| 20 | B00145H | BEROFFORT | SAMPLE | 22 | SEDIMENT | 200 | STATION071 |
| 21 | B00178H | BEAUFORT | SAMPLE | 20 | SEDIMENT | 200 | STATION055 |
| 22 | B00180H | BEAUFORT | SAMPLE | 20 | SEDIMENT | 200 | STATION055 |
| 23 | B00182H | BERUFORT | SAMPLE | 22 | SEDIMENT | 200 | STATION071 |
| 24 | 800184H | BEAUFORT | SAMPLE | 20 | SEDIMENT | 200 | STATION055 |
| 25 | B00187H | BEAUFORT | SAMPLE | 20 | SEDIMENT | 200 | STATION055 |
| 26 | B00188H | BEAUFORT | SAMPLE | 20 | SEDIMENT | 200 | STATION055 |
| 27 | B00189H | BEAUFORT | SAMPLE | 20 | SEDIMENT | 200 | STATION055 |
| 28 | B00190H | BEAUFORT | SAMPLE | 20 | SEDIMENT | 200 | STATION055 |
| 29 | B00192H | BEAUFORT | SAMPLE | 20 | SEDIMENT | 200 | STATION055 |
| 30 | B00193H | BEAUFORT | SAMPLE | 20 | SEDIMENT | 200 | STATION055 |
| 31 | B00198H | BEAUFORT | SAMPLE | Ξē | SEDIMENT | 200 | STATION055 |
| 32 | 800200H | BEAUFORT | SAMPLE | 20 | SEDIMENT | 200 | STATION055 |
| 33 | B99233H | BEAUFORT | SAMPLE | 21 | SEDIMENT | 200 | STATION070 |
| 34 | B00240H | BEAUFORT | SAMPLE | 21 | SEDIMENT | 200 | STATION070 |
| 35 | B00241H | BEAUFORT | SAMPLE | 21 | SEDIMENT | 200 | STATION070 |
| 36 | B00243H | BERUFORT | SAMPLE | 21 | SEDIMENT | 200 | STATION070 |
| 37 | B00244H | BEAUFORT | SAMPLE | 21 | SEDIMENT | 200 | STATION070 |
| 38 | B00250H | BEAUFORT | SAMPLE | 21 | SEDIMENT | 200 | STATION070 |
| 39 | B00276H | BEAUFORT | SAMPLE | 69 | SEDIMENT | 200 | STATION030 |
| 40 | B00283H | BEAUFORT | SAMPLE | 09 | SEDIMENT | 200 | STATION030 |
| | (Y/M):N | ader entrett standigt i fandigt is f | -ma-7 23 72 Anna Anna | - | rain Heriden de Fried III | 60 m ¹ 60 ¹ ¹ 60 ¹ | naan ah bola da aa naata dhadhadhaat |
| ing time t | | | | | | | |

END FORM

Strains isolated from water at 20C capable of utilizing benzoic acid.

| 1 | 800002H | BEAUFORT | SAMPLE | 03 | MATER | 200 | STATION010 |
|---|-----------------|----------|--------|----|-------|-----|------------|
| 2 | B00007H | BEAUFORT | SAMPLE | 03 | WATER | 200 | STATION010 |
| З | 8000 20H | BEAUFORT | SAMPLE | 03 | WATER | 200 | STATION010 |
| 4 | B00115H | BEAUFORT | SAMPLE | 27 | MATER | 280 | STATION071 |
| 5 | B90123H | BEAUFORT | SAMPLE | 27 | MATER | 200 | STATION071 |
| 6 | 800161H | BEAUFORT | SAMPLE | 24 | MATER | 200 | STATION055 |

END FORM

| 2 3 4 | 800030H 800032H 200044H | BEAUFORT BEAUFORT BEAUFORT | SAMPLE SAMPLE SAMPLE | 03 03 03 | SEDIMENT SEDIMENT SEDIMENT | 200 200 200 | STATION010 STATION010 STATION010 STATION010 STATION010 |
|-------------|-------------------------------|----------------------------------|----------------------------|----------------|----------------------------------|-------------------|--|
|-------------|-------------------------------|----------------------------------|----------------------------|----------------|----------------------------------|-------------------|--|

END FORM 5 STRAINS

Strains isolated from water at 4C capable of utilizing any of the following hydrocarbons: pentadecane, hexadecane, octadecane, dotriacontane, pristane, dodecylbenzene, 1-phenyltridecane, 2-ethylnaphthalene, phenanthrene.

1 B00117L BEAUFORT SAMPLE 27 WATER 04C STATION071

SHD FORM STRAINS

99.99

Strains isolated from sediment at 4C capable of utilizing any of the following hydrocarbons: pentadecane, hexadecane, octadecane, dotriacontane, pristane, dodecylbenzene, l-phenyltridecane,2-ethylnaphthalene, phenanthrene.

| ~ | 800251L | BEAUFORT | SAMPLE | 09 | SEDIMENT | 04C | STATION030 |
|---|---------|----------|--------|----|----------|-----|------------|
| | 800299L | BEAUFORT | SAMPLE | 32 | SEDIMENT | 04C | STATION002 |

EHD FORM

Strains isolated from water at 20C capable of utilizing any of the following hydrocarbons: pentadecane, hexadecane, octadecane, dotriacontane, pristane, dodecylbenzene, 1-phenyltridecane, 2-ethylnaphthalene, phenanthene.

1 B00002H BEAUFORT SAMPLE 03 WATER 20C STATION010 \mathbb{Z} B00007H BEAUFORT SAMPLE 03 WATER 20C STATION010 З B00020H BEAUFORT SAMPLE 03 WATER 20C STATION010 4 BEAUFORT SAMPLE 27 WATER 20C STATION071 B00106H 5 B00161H BEAUFORT SAMPLE 24 WATER 20C STATION055 6 B00203H BEAUFORT SAMPLE 26 WATER 20C STATION070

END FORM

Strains isolated from sediment at 20C capable of utilizing any of the following hydrocarbons: pentadecane, hexadecane, octadecane, dotriacontane, pristane, dodecylbenzene, 1-phenyltridecane, 2-ethylnaphthalene, phenanthene.

| 1 | B80028H | BEAUFORT | SAMPLE | 03 | SEDIMENT | 200 | STATION010 |
|---|---------|----------|--------|----|----------|-----|------------|
| 2 | B00044H | BEAUFORT | SAMPLE | 03 | SEDIMENT | 200 | STATION010 |
| 3 | B00048H | BEAUFORT | SAMPLE | 03 | SEDIMENT | 20C | STATION010 |

END FORM

3 STRAINS

_

Strains isolated from water at 4C capable of growth at 5C with 3% NaCl, and utilizing any of the following hydrocarbons: pentadecane, hexadecane, octadecane, dotriacontane, pristane, dodecylbenzene, l-phenyltridecane, 2-ethylnaphthalene, phenanthrene.

1 B00117L BEAUFORT SAMPLE 27 WATER 04C STATION071

END FORM

199192

Strains isolated from sediment at 4C capable of growth at 5C with 3% NaCl and utilizing any of the following hydrocarbons: pentadecane, hexadecane, octadecane, dotriacontane, pristane, dodecylbenzene, l-phenyltridecane, 2-ethylnaphthalene, phenanthene.

1 B00251L BEAUFORT SAMPLE 09 SEDIMENT 04C STATION030 2 B00299L BEAUFORT SAMPLE 32 SEDIMENT 04C STATION002

END FORM 2 STRAINS

Strains isolated from water at 20C capable of growth at 5C with 3% NaCl and utilizing any one of the following hydrocarbons: pentadecane, hexadecane, octadecane, dotriacontane, pristane, dodecylbenzene, l-phenyltridecane, 2-ethylnaphthalene, phenanthene.

| 1 | B00002H | BEAUFORT | SAMPLE 03 | WATER | 200 | STATION010 |
|---|---------|----------|-----------|-------|-----|------------|
| З | E99997H | BEAUFORT | SAMPLE 03 | WATER | 200 | STATION010 |
| Э | B00020H | BEAUFORT | SAMPLE 03 | WATER | 200 | STATION010 |
| 4 | B00106H | BEAUFORT | SAMPLE 27 | WATER | 20C | STATION071 |
| 5 | B00161H | BEAUFORT | SAMPLE 24 | WATER | 200 | STATION055 |

END FORM

Strains isolated from sediment at 20C capable of growth at 5C with 3% NaCl and utilizing any of the following hydrocarbons: pentadecane, hexadecane, octadecane, dotriacontane, pristane, dodecylbenzene, 1-phenyltridecane, 2-ethylnaphthalene, phenanthene.

| 1 | B99928H | BEAUFORT | SAMPLE | 03 | SEDIMENT | 200 | STATION010 |
|---|---------|----------|--------|----|----------|-----|------------|
| 2 | | | | | | | STATION010 |
| З | B90048H | BEAUFORT | SAMPLE | 03 | SEDIMENT | 20C | STATION010 |

END FORM

Strains isolated from water at 4C which require at least one growth factor for growth.

| ÷. | BECHER | BEAUFORT | SAMPLE | 63 | MATER | 04C | STATION010 |
|-------------------|--------------------|-----------|---------|----------|-------|------------|------------|
| â | 1990005L | BERUFORT | SAMPLE | 63 | MATER | 04C | STATION010 |
| 3 | B20006L | BEAUFORT | SAMPLE | 03 | MATER | 04C | STATION010 |
| . 1 | BUOGUOL | BEAUFORT | SAMPLE | 03 | WHTER | 04C | STATION010 |
| 5 | E00012L | BERUFORT | SAMPLE | 63 | MATER | 040 | STATION010 |
| 6 | B99913L | BEAUFORT | SAMPLE | 83 | MATER | 04C | STATION010 |
| 77 | 889014L | BEAUFORT | SAMPLE | 03 | MATER | 04C | STATION010 |
| à | B00015L | BEAUFORT | SAMPLE | 03 | WATER | 04C | STATION010 |
| 9 9 | B00021L | BEAUFORT | SAMPLE | 03 | WATER | 04C | STATION010 |
| 10 | BOODELL | BEAUFORT | SAMPLE | 03 | MATER | 04C | STATION010 |
| 11 | B00023L | BEAUFORT | SAMPLE | 03 | WATER | 04C | STATION010 |
| 12 | BOODESE BOOD24L | BEAUFORT | SAMPLE | 03 | MATER | 04C | STATION010 |
| 13 | 8000251 | BERUFORT | SAMPLE | 03 | MATER | 04C | STATION010 |
| | 8090511 | BEAUFORT | SAMPLE | 20 | MATER | 04C | STATION002 |
| 14 15 | 800052L | BEAUFORT | SAMPLE | 20 | WATER | 04C | STATION002 |
| 16 | 800053L | BEAUFORT | SAMPLE | 20 | WATER | 04C | STATION002 |
| 10 17 | 889854L | BEAUFORT | SAMPLE | 20 | WATER | 04C | STATION002 |
| 18 | R00055L | BEAUFORT | SAMPLE | 20 | WATER | 04C | STATION002 |
| 19 | 809057L | BEAUFORT | SAMPLE | 20 20 | WATER | 04C | STATION002 |
| | B00058L | | SAMPLE | 20 | WATER | | STATION002 |
| 20 | | BERUFORT | SAMPLE | 20 20 | WATER | 04C 04C | STATION002 |
| <u>- 1</u> | B20059L | BEAUFORT | | | | | STATION002 |
| 22 | RECENCED | BEAUFORT | SAMPLE | 20 | WATER | 04C | STATION002 |
| 83 | B36061L | BEAUFORT | SAMPLE | 20 | WATER | 040 040 | |
| 24 | 800062L | BEAUFORT | SAMPLE | 20 | MATER | 04C | STATION002 |
| 20 | BOODEEL | DERUFORT | SAMPLE | 20 | WATER | 04C | STATION002 |
| 26 | 800067'L | BERUFORT | SAMPLE | 20 | MATER | 04C | STATION002 |
| 27 | B00968L | BEAUFORT | SAMPLE | 20 | MATER | 040 | STATION002 |
| 28 | Baaas | BEFUFORT | SAMPLE | 20 | WATER | 040 | STATION002 |
| 29 | 300070L | BEAUFORT | SAMPLE | 20 | MATER | 84C | STATION002 |
| 30 | B99971L | BEAUFORT | SAMPLE | 20 | MATER | 04C | STATION002 |
| 31 | B90972L | BEAUFORT | SHIPLE | 20 | MATER | 04C | STATION002 |
| 32 | 399973L | BEAUFORT | SAMPLE | 20 | MATER | 04C | STATION002 |
| 33 | B99974L | BEAUFORT | SAMPLE | 20 | MATER | 04C | STATION002 |
| 34 | 80007'5L | BERUFORT | SAMPLE | 20 | MATER | 040 | STATION002 |
| 30 | 899101L | BEAUFORT | SAMPLE | 87 | MATER | 04C | STATION071 |
| 36 | 699192L | BEAUFORT | SAMPLE | 27 | MATER | 04C | STATION071 |
| 37 | 830103L | BEAUFORT | SAMPLE | 27 | HALLE | 04C | STATION071 |
| | 809104L | BEAUFORT | SAMPLE | 27 | MATER | 04C | STATION071 |
| 39 | 800105L | GERUFORT | SAMPLE | 27 | MATER | 04C | STATION071 |
| ୍ୟମ୍ | 899196L | BEAUFORT | SAMPLE | 27 | MATER | 04C | STATION071 |
| 41 | 830107L | BEAUFORT | SAMPLE | 2.7 | MATER | 04C | STATION071 |
| 4 | 800108L | BEAUFORT | SAMPLE | 27 | MATER | 04C | STATION071 |
| 43 | 899109L | BEAUFORT | SAMPLE | Č í | MATER | 04C | STATION071 |
| اند ان م منابع | B99110L | BEFUFORT | SAMPLE | 27 | WATER | 04C | STATION071 |
| 15 | B99111L | BEAUFORT | SAMPLE | 27 | WATER | 04C | STATION071 |
| 4.5 | 830112L | BEAUFORT | SAMPLE | 27 | MATER | 04C | STATION071 |
| 47 | 390113L | BEFILFORT | SAMPLE | 27 | MATER | 04C | STATION071 |
| 48 | 800114L | BEAUFORT | SAMPLE | 27 | MATER | 04C | STATION071 |
| 49 | B00115L | BEAUFORT | Sempl.E | 27 | HATER | 04C | STATION071 |
| 59 | B99116L | BEAUFORT | SAMPLE | 27 | WATER | 94C | STATION071 |
| | | | | | | | |

| | | | | | 2. 10% TO 100 TO 1 | 04C | STATION071 |
|----------------------|-----------------|------------|-----------|----------------|--|--------|---|
| 51 | 300118L | | SAMPLE | | the state of the s | | STATION071 |
| 52 | B00119L | | SAMPLE | | | ** * - | STATION071 |
| 53 | B00128L | | SAMPLE | | Fill C. Calle C | | |
| 54 | B00121L | BERUFORT | SAMPLE | 27 | | | STATION071 |
| | B00122L | BEAUFORT | SAMPLE | 27 | Fight Comments in | | STATION071 |
| 05 | | BEAUFORT | SAMPLE | 27 | MATER | | STATION071 |
| | 889123L | BEAUFORT | SPIMPLE | 27 | MATER | 04C | STATION071 |
| 57 | 800124L | BEAUFURT | SAMPLE | 27 | | 04C | STATION071 |
| 08 | B00125L | | SAMPLE | 24 | MATER | 04C | STATION055 |
| 99 | B90151L | REAUFORT | SAMPLE | 24 | MATER | 04C | STATION055 |
| 60 | B00152L | BEAUFORT | | 24 | WATER | 04C | STATION055 |
| 61 | 800153L | BEAUFORT | SAMPLE | | MATER | 04C | STATION055 |
| $\odot \tilde{c}$ | 800154L | REAUFORT | SAMPLE | 24 | | 04C | STATION055 |
| 6.3 | 320155L | BERUFORT | SAMPLE | 24 | MATER | | STATION055 |
| 64 | B00156L | BEAUFORT | SAMPLE | 24 | WATER | 04C | |
| 65 | B90157L | BERUFORT | SAMPLE | 24 | MATER | 04C | STATION055 |
| r i | 899159L | BEAUFORT | SAMPLE | 24 | MATER | 04C | STATION055 |
| 67 | BOOIGOL | BEAUFORT | SAMPLE | 24 | MATER | 04C | STATION055 |
| | 300162L | BERUFORT | SEMPLE | 24 | WHITER | 04C | STATION055 |
| 63 | | BEAUFORT | SAMPLE | 24 | WHITER | 04C | STATION055 |
| 69 | 300163L | BEFILIFURT | SAMPLE | 24 | NATER | 04C | STATION055 |
| 70 | B90164L | BEAUFORT | SAMPLE | | MATER | 04C | STATION055 |
| 71 | 800165L | | SAMPLE | | WATER | 04C | STATION055 |
| 72 | B00166L | BEAUFORT | | | MATER | 04C | STATION055 |
| 5 | _899167L | BEAUFORT | SAMPLE | | MATER | 04C | STATION055 |
| 74 | 200168L | BERUFORT | SAMPLE | | | | STATION055 |
| (²⁹¹⁷⁷) | 380169L | BEAUFORT | SAMPLE | | MATER | 04C | STATION055 |
| 76 | B00170L | BEAUFORT | SAMPLE | | MATER | 04C | |
| | 800171L | BEAUFORT | SAMPLE | | MATER | 04C | STATION055 |
| 78 | 300172L | BEAUFORT | SAMPLE | 24 | WHTER | 04C | STATION055 |
| 79 | 300173L | BEAUFURT | SAMPLE | 24 | MATER | 04C | STATION055 |
| | B30174L | BEAUFORT | SAMPLE | 24 | MATER | 04C | STATION055 |
| <u>- 1</u> -1 | 820175L | BEAUFORT | STREE | | интер | 04C | STRTI0H055 |
| 81 | | BERUFORT | BENTPLE | | | 04C | STATION070 |
| 82 | 399291L | BEAUFORT | SAMPLE | | | 04C | STATION070 |
| 83 | BOORDEL | | SAMPLE | | | 04C | STATION070 |
| 34 | BOOGOGL | BEAUFORT | | | | 04C | STATION070 |
| 85 | 890204L | BEAUFORT | SEMPLE | | | 04C | STATION070 |
| ыb | 1666265L | BERUFURT | SAMPLE | | | | STATION070 |
| | BOORDEL | BEAUFORT | SEMPLE | | | | |
| 8.0 | 200207L | BEAUFORT | SAMPLE | | . WATER | 0.40 | STATION070 |
| 39 | 1893208L | BEAUFORT | | | MATER | | |
| 90 | 389 209L | BEAUFORT | | . ct | . ИНТЕR | []+i _ | |
| 91 | 200210L | BEAUFORT | | | LATER | 640 | STATION070 |
| 92 | B00211L | BERUFORT | SAMPLE | | NATER | | |
| 93 | 399212L | BERUFORT | | 26 | , MATER | | |
| - i; | 800213L | BEAUFORT | | | MATER | 04C | |
| | B00214L | BERUFORT | | | | | |
| 95 | | BEAUFORT | | | | | |
| Эњ, | 800215L | BERUFORT | | | MATER | | |
| - | B00216L | | | | | - 64C | |
| 98 | 500217L | BEAUFORT | | | HETER | | |
| 99 | B00218L | BERUFURT | | . 1 | 2 PALISEN 1 11887050 | - 0C | STATION070 |
| 199 | B00219L | BERUFORT | ora'ur Lt | | a i na sta na mara si na si Na si na s | | o o <u>u</u> n a eleciti autorita teneralita. |
| | | | | | | | |

| 191 192 | 800220L 800221L | BEAUFORT BEAUFORT | SAMPLE SAMPLE | | | 94C 94C | STATION070 STATION070 |
|--------------|--------------------|----------------------|------------------|------------|----------------|------------|--------------------------|
| 193 | BOOREL | BEAUFORT | SAMPLE | 26 | WATER | | |
| 104 105 | 800223L 800224L | BEAUFORT | SAMPLE | 26 | WATER | | |
| 106 | 800225L | BEAUFORT | SAMPLE | -26 -26 | WATER WATER | 04C 04C | STATION070 STATION070 |
| 107 | 800278L | BEAUFORT | SAMPLE | 11 | WATER | | STATION030 |
| 108 169 | 800280L 800281L | BERUFORT | SAMPLE | 11 | WATER | 04C | STATION030 |
| 1105 | 800283L | BEAUFORT | SAMPLE SAMPLE | 19 | WATER | | STATION001 |
| 111 | 590284L | BEAUFORT | SAMPLE | 19 | WATER | | STATION001 STATION001 |
| 112 | B00291L | BEAUFORT | SAMPLE | 36 | MATER | | STATION002 |
| $113 \\ 114$ | B00292L B00294L | BEAUFORT | | 36 | WATER | | STATION002 |
| 115 | B00295L | BEAUFORT | SAMPLE SAMPLE | 36 36 | WATER WATER | | STATION002 STATION002 |

END FORM 115 STRAINS

..

| | | | | es en las de la difició da est | 04C STATION010 |
|-------------------|-------------------|----------|-----------|-------------------------------------|----------------|
| 1. | BIDDZSL | BEAUFORT | SAMPLE 03 | SEDIMENT | |
| c. | 1999 929 1 | BEAUFORT | SAMPLE 03 | SEDIMENT | 04C STATION010 |
| 3 | MERCER | BEAUFORT | SAMPLE 03 | SEDIMENT | 04C STATION010 |
| 나 | 500031L | BEAUFORT | SAMPLE 03 | SEDIMENT | 04C STRTION010 |
| 5 | 3999932L | BERUFORT | SEMPLE 03 | SEDIMENT | 04C STATION010 |
| 6 | B00933L | DEPUFORT | SAMPLE 03 | SEDIMENT | 04C STATION010 |
| C3 | B00034L | BEAUFORT | SAMPLE 03 | SEDIMENT | 04C STATION010 |
| | | BEAUFORT | SAMPLE 03 | SEDIMENT | 04C STATION010 |
| -23 | 899936L | BERUFORT | SAMPLE 03 | SEDIMENT | 04C STATION010 |
| 9 | 899937L | | SAMPLE 03 | SEDIMENT | 04C STATION010 |
| | 800033L | BERUFORT | SAMPLE 83 | SEDIMENT | 04C STATION010 |
| 11 | .3999939L | BERUFORT | | SEDIMENT | 04C STATION010 |
| 12 | 80004 0 L | BEHUFUET | SAMPLE 63 | SEDIMENT | 04C STATION010 |
| 13 | B00041L | BEAUFORT | SAMPLE 03 | | 04C STATION010 |
| 1 4 | 366042L | BEAUFORT | SAMPLE 03 | SEDIMENT | |
| - <u>1</u> | 200043L | BEAUFORT | SAMPLE 03 | SEDIMENT | |
| 15 | B00046L | BEAUFORT | SAMPLE 03 | SEDIMENT | |
| 1. 1 ² | BERNOSER | BERUFORT | SAMPLE 03 | SEDIMENT | 04C STATION010 |
| 18 | D99676L | BEAUFORT | SEMPLE 16 | SEDIMENT | 04C STATION002 |
| 19 | 360678L | BEAUFORT | SEMPLE 16 | SEDIMENT | 04C STATION002 |
| 29 | 300079L | BEAUFORT | SAMPLE 16 | SEDIMENT | 84C STATION002 |
| 21 | 800081L | BEFUFORT | SAMPLE 16 | SEDIMENT | 04C STATION002 |
| er. | BOOGSEL | BERUFORT | SAMPLE 16 | SEDIMENT | 04C STATION002 |
| | Research | BERUFORT | SHIPLE 16 | SEDIMENT | 04C STATION002 |
| 23 | 800084L | BEAUFORT | SAMPLE 16 | SEDIMENT | 040 STATION002 |
| 24 | 899985L | BERUFORT | SAMPLE 16 | SEDIMENT | 04C STATION002 |
| - 5 | | BERUFORT | SAMPLE 16 | | 04C STATION002 |
| 26 | 3093861 | BERUFORT | SAMPLE 16 | | 04C STATION002 |
| <u> </u> | 809087L | BERUFORT | SAMPLE 16 | | 04C STATION002 |
| 20 | 200088L | BEAUFORT | SAMPLE 16 | | 04C STATION002 |
| <u> </u> | 899989L | BERUFORT | SAMPLE 16 | and the second second second second | 64C STATION002 |
| 39 | BOOD91L | BEAUFORT | SAMPLE 16 | | 04C STATION002 |
| 31 | 339692L | BERUFORT | SAMPLE 16 | | 84C STATION002 |
| 32 | 3889994L | BEAUFORT | SAMPLE 16 | | 84C STATION002 |
| 33 | 1880995L | | SAMPLE 18 | | 04C STATION002 |
| 34 | 300096L | BERUFORT | SAMPLE 16 | | |
| 30 | 808097L | BEAUFORT | SAMPLE 16 | | 04C STATION002 |
| 3.H- | Bagaase | BEAUFORT | | | |
| | 800 099L | BERUFORT | |) <u>CEUUU</u> CETTENEINI | 04C STATION002 |
| | 800100L | BEHUFORT | | SEDIMENT | |
| 99 | 830127L | BEAUFORT | | SEDIMENT | |
| 40 | 800129L | BEAUFORT | | | |
| - <u> </u> -], | B99130L | BEAUFORT | | SEDIMENT | |
| 42 | 200132L | BERUFURT | | SEDIMENT | |
| 43 | 390133L | BEAUFORT | | SEDIMENT | |
| -i -i | 800134L | REAUFORT | | | |
| 45 | 800136L | BEAUFORT | | | |
| 46 | B99138L | BERUFORT | | | |
| 47 | 800139L | BEAUFORT | | | |
| 48 | B00140L | BEAUFORT | | | |
| 49 | BOULAIL | BERUFORT | | SEDIMENT | |
| 59 | B00143L | BEAUFORT | SAMPLE 28 | SEDIMENT | 04C STATION071 |
| | | | | | |

| 51 | . Ref146L | BEAUFORT SAMPLE 22 SETTMENT 020 STATIONATI |
|--|-----------|--|
| د میں محبو 11_ | | The second s |
| 55 | | |
| | | BEAUFORT SAMPLE 22 SEDIMENT 04C STATION071 |
| 1997 - 1997 1977 - 1977 1977 - 1977 - 1977 | | BEAUFORT SAMPLE 22 SEDIMENT 040 STATION071 |
| nt. Ng | | BEAUFORT SAMPLE 20 SEDIMENT 040 STATION055 |
| 1942 1943 1943 | | BEAUFORT SAMPLE 20 SEDIMENT 040 STATION055 |
| | | BERUFORT SAMPLE 20 SEDIMENT 04C STATION055 |
| | | BEAUFORT SAMPLE 20 SEDIMENT 040 STATION055 |
| e. Stj | | BEAUFORT SAMPLE 20 SEDIMENT 04C STATIOM055 |
| 51 51 | 509181C | BEAUFORT SAMPLE 28 SEDIMENT 04C STATION055 |
| 698 698 | | BEAUFORT SAMPLE 20 SEDIMENT 04C STATION055 |
| 53 | | BEAUFORT SAMPLE 20 SEDIMENT 04C STATION055 |
| | | BEAUFORT SAMPLE 20 SEDIMENT 04C STATION055 BEAUFORT SAMPLE 20 SEDIMENT 04C STATION055 |
| 60 | | Engling the Electronic methods are as seen and an and an and and a seen and a second se |
| ė6 | T | |
| 67 | B00193L | C. Schlarter M. Barrishter and A. Santar and M. Martin and M. Martin and M. Santar and M Santar and M. Santar and Santar and M. Santar and |
| 68 | BU9194L | BEAUFORT SAMPLE 20 SEDIMENT 040 STATION055 BEAUFORT SAMPLE 20 SEDIMENT 040 STATION055 |
| 59 69 | B00195L | |
| 79 | 999196L | The PERCENT AND AND AND AND AND AND AND AND AND AND |
| 71 | 839198L | արկողությունը կերերիները, այս է երկանությունը է երկանությունը է երկանությունը է երկանությունը է երկանությունը կե |
| 72 | 800199L | The second second second second second second second second second second second second second second second s |
| 73 | BUUE DE | mannana berenenana ana ana ana ana ana ana ana ana |
| 74 | 399226L | |
| | 899227L | The The Astronomy and the second second second second second second second second second second second second s |
| 76 | BOORESL | The second s |
| 77 | 8002291 | |
| 78 | BOORSOL | |
| 79 | B00231L | |
| 30 | 800232L | 1.2.2.2.2.2.1.1.1.2.2.2.2.2.2.2.2.2.2.2 |
| <u>.</u> | BOSCHEL | |
| 82 | 809234L | Exercise and the second s |
| 33 | 200236L | Construction and the second second second second second second second second second second second second second |
| 84 | B00237L | |
| 85 | 630238L | |
| 85 | 309239L | ընդությունը կուրեներինը հետ հետ հետ հետությունը ու երանի հետ հետությունը հետ հետությունը էրանի էրանի էրանի էրան |
| ŝ? | BOO240L | The structure and the second second second second second second second second second second second second second |
| 33 | BOOD42L | 10.00 Turner (month) and the state of the st |
| 39 | 300243L | |
| 99 | 390245L | |
| E9.j | BHORAGE | |
| 92 | 8892471 | |
| 93 | B39248L | An and a second se |
| 94 | 899249L | BEAUFORT SAMPLE 21 SEDIMENT 04C STATION070 BEAUFORT SAMPLE 21 SEDIMENT 04C STATION070 |
| 95 | B00250L | BEAUFURT SAMPLE 21 SEDIMENT 040 STATION070 |
| 96 | 800251L | BEAUFORT SAMPLE 09 SEDIMENT 04C STATION030 |
| 97 | B00254L | BEAUFORT SAMPLE 09 SEDIMENT 04C STATION030 |
| 98 | B00256L | REAUFORT SAMPLE 09 SEDIMENT 04C STATION030 |
| 99 | B00258L | BEAUFORT SAMPLE 09 SEDIMENT 04C STATION030 |
| 100 | 300260L | BEAUFORT SAMPLE 09 SEDIMENT 04C STATION030 |
| | | 1.000 m 1.00 |

| | B00262L B00263L B00266L B00266L B00266L B00266L B00266L B00267L B00275L B00225L B00225L B00225L B00225L | BERUFURT BERUFURT BERUFURT BERUFURT BERUFURT BERUFURT BERUFURT BERUFURT BERUFURT BERUFURT BERUFURT BERUFURT | 全部連邦 市部連邦 市部連邦 市部 市部 市部 市部 市部 市部 市部 市 市 市 市 市 市 市 市 市 市 市 市 市 | SE DIMENT SEDIMENT SEDIMENT SEDIMENT SEDIMENT SEDIMENT SEDIMENT SEDIMENT SEDIMENT SEDIMENT SEDIMENT | 040 040 040 040 040 | STATION030 STATION030 STATION030 STATION030 STATION030 STATION030 STATION030 STATION030 STATION030 STATION031 STATION001 STATION001 STATION001 |
|-----|---|--|---|---|--|--|
| 112 | B862391 | REPUTIONT | BARPLE SARPLE SARPLE SAPPLE | | 840 840 840 840 840 940 | STATICH001 |

EMD FORM 113 STRATE

Strains isolated from water at 20C which require at least one growth factor for growth.

| 4 | 300003H | BEAUFORT | SAMPLE | es en | 110700 | നമന | CONTRACTOR OF A CO |
|-------------------|------------------|----------|--------|-----------|--------|-----|--------------------|
| 1 2 | | | | | | | |
| | 8999 94 H | BEAUFORT | | | WATER | 200 | |
| 3 | 888885H | BEAUFORT | SAMPLE | | WATER | 200 | |
| 2 <u>3</u> 5.7 | 800006H | BEAUFORT | SAMPLE | | WATER | 200 | STATION010 |
| 5 | 800008H | BEAUFORT | SAMPLE | | WATER | 200 | STATION010 |
| 6 | B00010H | BEAUFORT | SAMPLE | | WATER | 200 | STATION010 |
| 7 | B00011H | BEAUFORT | SAMPLE | 63 | WATER | 200 | STATION010 |
| 8 | 866612H | BEAUFORT | SAMPLE | 83 | WATER | 20C | STATION010 |
| 9 | 899913H | BEAUFORT | SAMPLE | 63 | WATER | 200 | STATION010 |
| 10 | B99914H | BEAUFORT | SAMPLE | 63 | MATER | 20C | STATION010 |
| 11 | B00015H | BEAUFORT | SAMPLE | 63 | WATER | 200 | STATION010 |
| 12 | B00016H | BEAUFORT | SAMPLE | 63 | MATER | 50C | STATION010 |
| 13 | B00017H | BEAUFORT | SAMPLE | 03 | MATER | 59C | STATION010 |
| 14 | B00018H | BEAUFORT | SAMPLE | 03 | WATER | 200 | STATION010 |
| 15 | 300019H | BEAUFORT | SAMPLE | 63 | MATER | 200 | STATION010 |
| 16 | B00021H | BEAUFORT | SAMPLE | 03 | HATER | 20C | STATION010 |
| 1.7 | R00055H | BERUFORT | SAMPLE | 03 | WATER | 20C | STATION010 |
| 13 | 800023H | BEAUFORT | SAMPLE | 63 | WATER | 20C | STATION010 |
| 19 | B00051H | BEAUFORT | SAMPLE | 20 | MATER | 200 | STATION020 |
| 20 | B00052H | BEAUFORT | SAMPLE | 20 | NATER | 200 | STATION020 |
| 21 | B00053H | BEAUFORT | SAMPLE | 20 | MATER | 20C | STATION020 |
| 22 | B00054H | BEAUFORT | SAMPLE | 20 | MATER | 290 | STATION020 |
| 23 | B00056H | BEAUFORT | SAMPLE | 20 | NATER | 290 | STATION020 |
| 24 | B00057H | BEAUFORT | SAMPLE | 20 | MATER | 200 | STATION020 |
| 25 | B30058H | BEAUFORT | SAMPLE | 20 | MATER | 20C | STATION002 |
| 26 | B99959H | BEAUFORT | SAMPLE | 20 | WATER | 200 | STATION002 |
| 27 | 899960H | BEHUFORT | SAMPLE | 20 | MATER | 200 | STATION002 |
| 28 | B00061H | BEAUFORT | SAMPLE | 20 | MATER | 20C | STATION002 |
| 29 | B00062H | BEAUFORT | SAMPLE | 20 | WATER | 200 | STATION002 |
| 39 | 800063H | BEAUFORT | SAMPLE | 2θ | MATER | 200 | STATION002 |
| 31 | 800064H | BEAUFORT | SAMPLE | 20 | MATER | 28C | STATION002 |
| 32 | 800065H | BERUFORT | SAMPLE | 20 | MATER | 200 | STATION002 |
| 33 | 800066H | BEAUFORT | SAMPLE | 20 | MATER | 20C | STATION002 |
| 34 | B00067H | BEAUFORT | SAMPLE | 20 | NATER | 290 | STATION002 |
| 35 | 800068H | BEAUFORT | SAMPLE | 20 | MATER | 200 | STATION002 |
| 36 | B00069H | BEAUFORT | SAMPLE | 20 | MATER | 280 | STATION002 |
| 37 | 300070H | BEAUFORT | SAMPLE | 20 | MATER | 20C | STATION002 |
| 38 | B00071H | BEAUFORT | SAMPLE | 20 | NHTER | 200 | STATION002 |
| 39 | B00072H | BEAUFORT | SAMPLE | 20 | MATER | 200 | STATION002 |
| 40 | 800073H | BEAUFORT | SAMPLE | 20 | MATER | 200 | STATION002 |
| 41 | 800101H | BERUFORT | SAMPLE | 27 | MATER | 20C | STATICN071 |
| 42 | B00102H | BEAUFORT | SAMPLE | 27 | MATER | 200 | STATION071 |
| 43 | B00103H | BEAUFORT | SAMPLE | 27 | MATER | 200 | STATION071 |
| 하다 | E90194H | BEAUFORT | SAMPLE | 27 | MATER | 200 | STATION071 |
| 45 | E90109H | BEAUFORT | SAMPLE | | MATER | 280 | STATION071 |
| 46 | 800110H | BERUFORT | SAMPLE | | WATER | 280 | STATICN071 |
| 47 | B00113H | BEAUFORT | SAMPLE | | WATER | 200 | STATION071 |
| 48 | 800114H | BEAUFORT | SAMPLE | 27 | MATER | 200 | STATION071 |
| 49 | B00115H | BERUFORT | SAMPLE | | | 28C | STATION071 |
| 59 | B00116H | BEAUFORT | | | | | STATION071 |
| | | | | | | | - |

| 51 | 200117H | BEAUFORT | SAMPLE | 27 | MATER | | STATION071 |
|---|---------------------------------------|----------|---------|------------|-------|-------|------------|
| | | BEAUFORT | SAMPLE | 27 | WATER | 200 | STATION071 |
| 100 miles 100 miles | | BEAUFORT | SAMPLE | 27 | WATER | 200 | STATION071 |
| | | BEAUFORT | SAMPLE | 27 | MATER | 20C | STATION071 |
| 811 101 | | BEAUFORT | SEMPLE | 27 | WATER | 200 | STATION071 |
| | | BEAUFORT | SAMPLE | 24 | UATER | 20C | STATION055 |
| Ξ. | | BEAUFORT | SAMPLE | 24 | MATER | 290 | STATION055 |
| -11 | | BEAUFORT | SAMPLE | | | 200 | STATION055 |
| 2017 - 2017 - 2017 - 2017 - 2017 - 2017 - 2017 - 2017 - 2017 - 2017 - 2017 - 2017 - 2017 - 2017 - 2017 - 2017 - 2017 - 2017 | | BEAUFORT | SAMPLE | | WATER | 200 | STATION055 |
| | | BEAUFORT | SAMPLE | | MATER | 200 | STATION055 |
| 6E | | | SAMPLE | 24 | WATER | 200 | STATION055 |
| 61 | | BEAUFORT | SAMPLE | 24 | MATER | 200 | STATION055 |
| őā | | BEAUFORT | SAMPLE | 24 | WATER | 200 | STATION055 |
| 64 | · · · · · · · · · · · · · · · · · · · | BEAUFORT | SAMPLE | 24 | WATER | 200 | STATION055 |
| É. | | BEAUFORT | - | 24 | WATER | 200 | STATION055 |
| 65 | | BEAUFORT | SAMPLE | | | 200 | STATION055 |
| 6É | | BEAUFORT | SAMPLE | 24 | WATER | 200 | STATION055 |
| 67 | 7 B00164H | BEAUFORT | SAMPLE | | WATER | | STATION055 |
| 68 |) <u>800165H</u> | BEAUFORT | SAMPLE | | WATER | 200 | STATION055 |
| 69 |) <u>B</u> 80166H | BEAUFORT | SAMPLE | | WATER | 200 | |
| 76 |) B00168H | BEAUFORT | SAMPLE | | MATER | 500 | STATION055 |
| 71 | | BEAUFORT | SAMPLE | | WATER | 200 | STATION055 |
| 78 | • | BEAUFORT | SFIMPLE | | MATER | 200 | STATION055 |
| 7- | | BEAUFORT | SAMPLE | | MATER | 20C | STATION070 |
| 74 | | BEAUFORT | SAMPLE | 26 | WATER | 290 | STATION070 |
| 1 - | - | BEAUFORT | SAMPLE | 26 | WATER | 20C | STATION070 |
| 76 | | BEAUFORT | SAMPLE | 26 | MATER | 200 | STATION070 |
| (0 | | BEAUFORT | SAMPLE | 26 | WATER | 200 | STATION070 |
| | | BEAUFORT | SAMPLE | 26 | | 200 | STATION070 |
| 72 | | BEAUFORT | SAMPLE | | | 200 | STATION070 |
| 75 | | BEAUFORT | SAMPLE | | | 200 | STATION070 |
| 80 | | | | | | | otottoko20 |
| 31 | B00210H | BEAUFORT | SAMPLE | | WATER | 20C | STATION070 |
| 3 | 2 B00211H | BEAUFORT | SAMPLE | | WATER | 20C | STATION070 |
| 83 | 3 B00212H | BEAUFORT | SAMPLE | | WATER | 50C | STATION070 |
| | 1 B00213H | BERUFORT | SAMPLE | | MATER | 200 | STATION070 |
| 85 | 5 B00216H | BEAUFORT | SAMPLE | | WATER | 590 | STATION070 |
| | 5 B00217H | BEAUFORT | SAMPLE | | | 200 | STATION070 |
| 87 | 7 B00219H | BEAUFORT | | | MATER | | STATION070 |
| 38 | | BEAUFORT | SAMPLE | | MATER | | |
| 89 | | BEAUFORT | SAMPLE | | MATER | | STATION070 |
| 96 | | BEAUFORT | SAMPLE | 11 | MATER | | STATION030 |
| 91 | | BEAUFORT | SAMPLE | 1 1 | MATER | | STATION030 |
| 92 | | BEAUFORT | SAMPLE | 11 | MATER | 200 | STATION030 |
| 90 | | BEAUFORT | SAMPLE | 11 | MATER | 200 | |
| Ģa | | BEAUFORT | SAMPLE | 11 | MATER | 200 | STATIONØ30 |
| | | BEAUFORT | SAMPLE | 11 | WATER | 280 | |
| 96 | | BEAUFORT | SAMPLE | 11 | MATER | 20C | |
| 91 | | BEAUFORT | SAMPLE | 11 | MATER | 200 | STATION030 |
| | | BEAUFORT | SHMPLE | | WATER | 200 | STATION030 |
| | | BEAUFORT | SAMPLE | | MATER | | |
| | | BERUFORT | SAMPLE | | MATER | | STATION030 |
| 100 | | BEAUFORT | SAMPLE | 11 | | | |
| 181 | | BEAUFORT | SAMPLE | | WATER | | |
| 1617 | | BEAUFORT | SAMPLE | | WATER | 200 | |
| 10 | | | | 11 | MATER | | |
| 18- | | BEAUFORT | SAMPLE | | | | |
| 193 | | BEAUFORT | SAMPLE | | MATER | | |
| 196 | | BEAUFORT | SAMPLE | | WATER | | |
| 10] | | BEAUFORT | SAMPLE | | WATER | | |
| 108 | | BEAUFORT | SAMPLE | | MATER | | |
| 189 | | BEAUFORT | SAMPLE | | WATER | | |
| 11 | 8 B00275H | BEAUFORT | SAMPLE | 11 | WATER | C EIL | STATION030 |
| | | | | | _ | | |

END FORM

Strains isolated from sediment at 20C which require at least one growth factor for growth.

| | 75/56/2010 | |
|----------|-------------------|---|
| 1 | | BEAUFORT SAMPLE 03 SEDIMENT 20C STATION010 |
| Ē | | BEAUFORT SAMPLE 03 SEDIMENT 20C STATION010 |
| - | | BEAUFORT SAMPLE 03 SEDIMENT 20C STATION010 |
| 4 | | BEAUFORT SAMPLE 03 SEDIMENT 200 STATION010 |
| 107 | | BEAUFORT SAMPLE 03 SEDIMENT 20C STATION010 |
| 6 | | BEAUFORT SAMPLE 03 SEDIMENT 20C STATION010 |
| 7 | | BEAUFORT SAMPLE 03 SEDIMENT 20C STATION010 |
| 8 | | BEAUFORT SAMPLE 03 SEDIMENT 200 STATION010 |
| 9 | | BEAUFORT SAMPLE 03 SEDIMENT 20C STATION010 |
| 10 | B09037H | BEAUFORT SAMPLE 03 SEDIMENT 20C STATION010 |
| 11 | 800038H | BEAUFORT SAMPLE 03 SEDIMENT 20C STATION010 |
| 12 | 200039H | BEAUFORT SAMPLE 03 SEDIMENT 200 STATION010 |
| 13 | 800040H | BEAUFORT SAMPLE 03 SEDIMENT 200 STATION010 |
| 14 | B90041H | BEAUFORT SAMPLE 03 SEDIMENT 200 STATION010 |
| 15 | 800042H | BEAUFORT SAMPLE 03 SEDIMENT 200 STATION010 |
| 16 | 888843H | BEAUFORT SAMPLE 03 SEDIMENT 200 STATION010 |
| 17 | 8899945H | BEAUFORT SAMPLE 03 SEDIMENT 200 STATION010 |
| 18 | B00047H | |
| 19 | B00076H | |
| 20 | B00077H | |
| 21 | B00078H | |
| 22 | B00079H | |
| 23 | B30080H | |
| 24 | B00081H | |
| 25 | B00082H | Letter the second second second second second second second second second second second second second second se |
| 26 | B00083H | |
| 27 | 800030 800034H | BEAUFORT SAMPLE 16 SEDIMENT 200 STATION002 |
| | | BEAUFORT SAMPLE 16 SEDIMENT 200 STATION002 |
| 28 | 800085H | BEAUFORT SAMPLE 16 SEDIMENT 200 STATION002 |
| 29 33 | 800086H | BEAUFORT SAMPLE 16 SEDIMENT 20C STATION002 |
| 30 | B00087H | BEAUFORT SAMPLE 16 SEDIMENT 200 STATION002 |
| 31 | 800088H | BEAUFORT SAMPLE 16 SEDIMENT 200 STATION002 |
| 32 | B00089H | BEAUFORT SAMPLE 16 SEDIMENT 200 STATION002 |
| 33 | B00091H | BEAUFORT SAMPLE 16 SEDIMENT 200 STATION002 |
| 34 | B00092H | BEAUFORT SAMPLE 16 SEDIMENT 200 STATION002 |
| 35 | BOODOSH | BEAUFORT SAMPLE 16 SEDIMENT 20C STATION002 |
| 36 | B00094H | BEAUFORT SAMPLE 16 SEDIMENT 200 STATION002 |
| 37 | B00095H | BEAUFORT SAMPLE 16 SEDIMENT 200 STATION002 |
| 38 | B00096H | BEAUFORT SAMPLE 16 SEDIMENT 200 STATION002 |
| 39 | B88897H | BEAUFORT SAMPLE 16 SEDIMENT 20C STATION002 |
| 40 | 800098H | BEAUFORT SAMPLE 16 SEDIMENT 200 STATION002 |
| - 1 | 8000 99H | BEAUFORT SAMPLE 16 SEDIMENT 200 STATION002 |
| 42 | B00126H | BEAUFORT SAMPLE 22 SEDIMENT 200 STATION071 |
| 43 | B00128H | BEAUFORT SAMPLE 22 SEDIMENT 200 STATION071 |
| 나라 | B00129H | BEAUFORT SAMPLE 22 SEDIMENT 200 STATION071 |
| 45 | B00130H | BEAUFORT SAMPLE 22 SEDIMENT 200 STATION071 |
| 46 | B00131H | BEAUFORT SAMPLE 22 SEDIMENT 20C STATION071 |
| 47 | B00132H | BEAUFORT SAMPLE 22 SEDIMENT 20C STATION071 |
| 48 | B00133H | BEAUFORT SAMPLE 22 SEDIMENT 200 STATION071 |
| 49 | B00136H | BEAUFORT SAMPLE 22 SEDIMENT 200 STATION071 |
| 59 | B00138H | BEAUFORT SAMPLE 22 SEDIMENT 200 STATION071 |
| | | THE AND CHARLE RE OFFICIENT FOR STATIONAL |

| 51 | Terrara 4 crama a | DECURADE COMOUE DO CEDIMENT DOC CEDITONOD. |
|----------|-------------------|--|
| | B00139H | BEAUFORT SAMPLE 22 SEDIMENT 20C STATION071 |
| 52 | B00140H | BEAUFORT SAMPLE 22 SEDIMENT 20C STATION071 |
| 53 | B00141H | BEAUFORT SAMPLE 22 SEDIMENT 200 STATION071 |
| 54 | B00142H | BEAUFORT SAMPLE 22 SEDIMENT 20C STATION071 |
| 55 | B00144H | BEAUFORT SAMPLE 22 SEDIMENT 20C STATION071 |
| 56 | B00145H | BEAUFORT SAMPLE 22 SEDIMENT 20C STATION071 |
| 57 | 800146H | BEAUFORT SAMPLE 22 SEDIMENT 200 STATION071 |
| 58 | B00148H | BEAUFORT SAMPLE 22 SEDIMENT 20C STATION071 |
| 59 | B00149H | BEAUFORT SAMPLE 22 SEDIMENT 200 STATION071 |
| 60 60 | B00150H | |
| | | BEAUFORT SAMPLE 22 SEDIMENT 20C STATION071 |
| 61 | B00176H | BEAUFORT SAMPLE 20 SEDIMENT 20C STATION055 |
| 62 | B00177H | BEAUFORT SAMPLE 20 SEDIMENT 20C STATION055 |
| 63 | B00178H | BEAUFORT SAMPLE 20 SEDIMENT 20C STATION055 |
| 64 | 800179H | BEAUFORT SAMPLE 20 SEDIMENT 20C STATION055 |
| 65 | E90180H | BEAUFORT SAMPLE 20 SEDIMENT 200 STATION055 |
| 66 | B00181H | BEAUFORT SAMPLE 20 SEDIMENT 20C STATION055 |
| 67 | B00184H | BEAUFORT SAMPLE 20 SEDIMENT 20C STATION055 |
| 68 | B00185H | BEAUFURT SAMPLE 20 SEDIMENT 20C STATION055 |
| 69 | B00186H | BEAUFORT SAMPLE 20 SEDIMENT 200 STATION055 |
| 70 | B00188H | BEAUFORT SAMPLE 20 SEDIMENT 200 STATION055 |
| 71 | B00189H | BEAUFORT SAMPLE 20 SEDIMENT 20C STATION055 |
| 72 | B00190H | |
| 73 | | |
| | B00191H | BEAUFORT SAMPLE 20 SEDIMENT 20C STATION055 |
| 74 | 800192H | BEAUFORT SAMPLE 20 SEDIMENT 20C STATION055 |
| | 300193H | BEAUFORT SAMPLE 20 SEDIMENT 20C STATION055 |
| 76 | 800194H | BEAUFORT SAMPLE 20 SEDIMENT 20C STATION055 |
| 77 | B00195H | BEAUFORT SAMPLE 20 SEDIMENT 20C STATION055 |
| 78 | B00196H | BEAUFORT SAMPLE 20 SEDIMENT 20C STATION055 |
| 79 | B00197H | BEAUFORT SAMPLE 20 SEDIMENT 20C STATION055 |
| 80 | B00198H | BEAUFORT SAMPLE 20 SEDIMENT 200 STATION055 |
| 81 | E00199H | BEAUFORT SAMPLE 20 SEDIMENT 200 STATION055 |
| 82 | B00200H | |
| | | BEAUFORT SAMPLE 20 SEDIMENT 200 STATION055 |
| 83 | B90226H | BEAUFORT SAMPLE 21 SEDIMENT 20C STATION070 |
| 84 | B00227H | BEAUFORT SAMPLE 21 SEDIMENT 20C STATION070 |
| 85 | B00228H | BEAUFORT SAMPLE 21 SEDIMENT 20C STATION070 |
| 86 | B90229H | BEAUFORT SAMPLE 21 SEDIMENT 20C STATION070 |
| 87 | 800231H | BEAUFORT SAMPLE 21 SEDIMENT 20C STATION070 |
| 88 | B00232H | BEAUFORT SAMPLE 21 SEDIMENT 20C STATION070 |
| 89 | B00234H | BEAUFORT SAMPLE 21 SEDIMENT 20C STATION070 |
| 96 | B00235H | BEAUFORT SAMPLE 21 SEDIMENT 200 STATION070 |
| 91 | B00236H | BEAUFORT SAMPLE 21 SEDIMENT 20C STATION070 |
| 92 | B00237H | BEAUFORT SAMPLE 21 SEDIMENT 200 STATION070 |
| 93 | 800238H | BERUFORT SAMPLE 21 SEDIMENT 200 STATION070 |
| 실력 | B99240H | BEAUFORT SAMPLE 21 SEDIMENT 20C STATION070 |
| 95 | B00241H | |
| | 800242H | |
| 96 | | BEAUFORT SAMPLE 21 SEDIMENT 200 STATION070 |
| 97 00 | 800243H | BEAUFORT SAMPLE 21 SEDIMENT 20C STATION070 |
| 93 | B00244H | BEAUFORT SAMPLE 21 SEDIMENT 20C STATION070 |
| 99 | B90245H | BEAUFORT SAMPLE 21 SEDIMENT 20C STATION070 |
| 199 | 200246H | BEAUFORT SAMPLE 21 SEDIMENT 20C STATION070 |
| | | |

| 101 | B00247H | BEAUFORT | SAMPLE | ≥ 1 | SEDIMENT | 200 | STATION070 |
|--------------|---------|-------------------|-------------------|----------|----------------------------------|------------------|------------|
| 102 | B00248H | BEAUFORT | SAMPLE | 21 | SEDIMENT | 200 | STATION070 |
| 103 | B00250H | BEAUFORT | SAMPLE | 21 | SEDIMENT | 200 | STATION070 |
| $100 \\ 104$ | B00277H | BEAUFORT | | 69 | SEDIMENT | 200 | STATION030 |
| | H | | | | SEDIMENT | 200 | STATION030 |
| 1.05 | B00278H | BEAUFORT | | 69 | | | |
| 106 | B00279H | BEAUFORT | SAMPLE | 69 | SEDIMENT | 260 | STATION030 |
| 107 | B90280H | BEAUFORT | SAMPLE | Ø9 | SEDIMENT | 20C | STATION030 |
| 108 | B00281H | BEAUFORT | SAMPLE | Ø9. | SEDIMENT | 200 | STATION030 |
| 109 | 800282H | BEAUFORT | SAMPLE | Ø9 | SEDIMENT | 200 | STATION030 |
| 110 | B00283H | BEAUFORT | SAMPLE | 09 | SEDIMENT | 200 | STATION030 |
| 111 | B00284H | BEAUFORT | | 09 | SEDIMENT | 200 | STATION030 |
| | | | | | | 200 | STATION030 |
| 112 | B90287H | BEAUFORT | | 69 | SEDIMENT | | |
| 113 | B00388H | BEAUFORT | SAMPLE | 69 | SEDIMENT | 290 | STATION030 |
| 114 | B00289H | BEAUFORT | SAMPLE | 09 | SEDIMENT | 200 | STATION030 |
| 115 | B00290H | BEAUFORT | SAMPLE | Ø9 | SEDIMENT | 20C | STATION030 |
| 116 | B90595H | BEAUFORT | SAMPLE | Ø9 | SEDIMENT | 200 | STATION030 |
| 117 | B00293H | BEAUFORT | SAMPLE | 09 | SEDIMENT | 200 | STATION030 |
| 118 | B00294H | BEAUFORT | SAMPLE | й9 | SEDIMENT | 200 | STATION030 |
| 119 | E90295H | BEHUFORT | | 09 | SEDIMENT | PAC | STATION030 |
| | | BEAUFORT | | а9 1 | SEDIMENT | 200 | STATION030 |
| 120 | B00296H | | ominin L.C. | 6122 | OF DIVIEND | <u>20</u> 0 | |
| $1 \ge 1$ | B30297H | BERUFORT | SAMPLE | 99 | SEDIMENT | 290 | STATION030 |
| 122 | 680298H | BEAUFORT | SAMPLE | 69 | SEDIMENT | 200 | STATION030 |
| 123 | B00299H | BEAUFORT | SAMPLE | ติ9 | SEDIMENT | 200 | STATION030 |
| | | ACTING THE SECTOR | and an of Another | | and marine and the filles of the | 10. p. 10. 1 10. | |

END FORM 123 STRAINS

Strains isolated from water at 4C which require yeast extract and amino acids as growth factors.

| ; | 3999913L | BEAUFORT | SAMPLE | 03 | MATER | | STATION010 |
|---------|----------|-----------|--------|-----|---------|------------|--------------------------|
| Ē | B39915L | BEAUFORT | SAMPLE | 03 | MATER | 04C | STATION010 |
| 3 | B00021L | BERUFORT | SAMPLE | ūЗ | MATER | 04C | STATION010 |
| ناب | B00055L | BERUFORT | SAMPLE | 20 | MATER | 04C | STATION002 |
| 5 | 800061L | BEAUFORT | SAMPLE | 20 | MATER | 04C | STATION002 |
| 6 | RADOG6L | BERUFORT | SAMPLE | 20 | MATER | 04C | STATION002 |
| ~ | B00068L | BEAUFORT | SAMPLE | 20 | NHTER | 04C | STATION002 |
| ŝ | 899969L | BEAUFORT | SAMPLE | 20 | WATER | 04C | STATION002 |
| ġ | 800070L | BEAUFORT | SAMPLE | 20 | MATER | 04C | STATION002 |
| 10 | 600072L | BEAUFORT | SAMPLE | 20 | NATER | 04C | STATION002 |
| 11 | B00101L | BEAUFORT | SAMPLE | 27 | MATER | 04C | STATION071 |
| 12 | B00102L | BEAUFORT | SAMPLE | 27 | NATER | 04C | STATION071 |
| 13 | 800105L | BEAUFORT | SAMPLE | 27 | MATER | 04C | STATION071 |
| 14 | B00110L | BEAUFORT | SAMPLE | 27 | MATER | 04C | STATION071 |
| 15 | B00118L | BEAUFORT | SAMPLE | 27 | MATER | 04C | STATION071 |
| iθ | B00123L | BEFLIFORT | SAMPLE | 27 | WATER | 04C | STATION071 |
| 17 | 800124L | BERUFORT | SAMPLE | 27 | MATER | 04C | STATION071 |
| iΞ | B90125L | BEAUFORT | SAMPLE | 27 | WATER | 04C | STATION071 |
| 19 | 209162L | BEAUFORT | SAMPLE | 24 | MATER | 04C | STATION055 |
| 20 | 300168L | BEAUFORT | SAMPLE | 24 | MATER | 04C | STATION055 |
| Ξi | B00172L | BEAUFORT | SAMPLE | 24 | MATER | 04C | STATION055 STATION070 |
| 22 | B00204L | BEAUFORT | SAMPLE | 26 | MATER | 04C | STATION070 |
| 23 | B00207L | BEAUFORT | SAMPLE | 26 | WATER | 040 640 | STATION070 |
| 24 | 800209L | BEAUFORT | SAMPLE | 26 | NATER | 64C | STATION070 |
| 25 | B00214L | BEAUFORT | SAMPLE | 26 | MATER | 04C 04C | STATION070 |
| 26 | B00215L | BEAUFORT | SAMPLE | 26 | WATER | 04C | STATION070 |
| 27 | B00219L | BEAUFORT | SAMPLE | -26 | WATER | | STATION070 |
| 28 | B00224L | BERUFORT | SAMPLE | 26 | MATER | 94C 94C | STATION001 |
| 29 | R00281L | BEAUFORT | SAMPLE | 19 | WATER | 04C 04C | STATION002 |
| 39 | B00292L | BEAUFORT | SAMPLE | 36 | MUT LEW | 인탁다 | |

EHD FORM 30 STRAINS

Strains isolated from sediment at 4C which require yeast extract and amino acids as growth factors.

| 1 | B00033L | BEAUFORT | SAMPLE | 03 | SEDIMENT | 04C | STATION010 |
|----|---------|----------|--------|----|----------|------|------------|
| 2 | B00034L | BEAUFORT | SAMPLE | 83 | SEDIMENT | Ø4C | STATION010 |
| 3 | 800036L | BEAUFORT | SAMPLE | 63 | SEDIMENT | 04C | STATION010 |
| 4 | B99937L | BEAUFORT | SAMPLE | 03 | SEDIMENT | 04C | STATION010 |
| 5 | 888079L | BEAUFORT | SAMPLE | 16 | SEDIMENT | 04C | STATION002 |
| 6 | B00083L | BEAUFORT | SAMPLE | 16 | SEDIMENT | Ø4C | STATION002 |
| 7 | B00085L | BEAUFORT | SAMPLE | 16 | SEDIMENT | £94C | STATION002 |
| 8 | B00132L | BEAUFORT | SAMPLE | 22 | SEDIMENT | 04C | STATION071 |
| 9 | B00139L | BEAUFORT | SAMPLE | 22 | SEDIMENT | Ø4C | STATION071 |
| 10 | B00141∟ | BEAUFORT | SAMPLE | 22 | SEDIMENT | 04C | STATION071 |
| 11 | B00143L | BEAUFORT | SAMPLE | 22 | SEDIMENT | 04C | STATION071 |
| iΞ | B00147L | BEAUFORT | | 22 | SEDIMENT | 04C | STATION071 |
| 13 | B00179L | BEAUFORT | SAMPLE | 20 | SEDIMENT | 04C | STATION055 |
| 14 | B00180L | BEAUFORT | SAMPLE | 20 | SEDIMENT | 04C | STATION055 |
| 15 | B00182L | BEAUFORT | | 20 | SEDIMENT | 04C | STATION055 |
| 16 | B00183L | BEAUFORT | SAMPLE | 20 | SEDIMENT | 04C | STATION055 |
| 17 | B00188L | BEAUFORT | | 20 | SEDIMENT | 04C | STATION055 |
| 18 | B00196L | BEAUFORT | | 20 | SEDIMENT | 04C | STATION055 |
| 19 | 800200L | BEAUFORT | | 20 | SEDIMENT | 04C | STATION055 |
| 29 | 800240L | BEAUFORT | | 21 | SEDIMENT | 04C | STATION070 |
| 21 | B00246L | BEAUFORT | SAMPLE | 21 | SEDIMENT | 04C | STATION070 |
| 22 | B00248L | BEAUFORT | | 21 | SEDIMENT | 04C | STATION070 |
| 23 | B00249L | BEAUFORT | | 21 | SEDIMENT | 04C | STATION070 |
| 24 | 800250L | BEAUFORT | | 21 | SEDIMENT | 04C | STATION070 |
| 25 | BØØ256L | BEAUFORT | SAMPLE | 09 | SEDIMENT | 04C | STATION030 |
| 26 | B00259L | BEAUFORT | | 09 | SEDIMENT | 04C | STATION030 |
| 27 | B00263L | BEAUFORT | | 09 | SEDIMENT | 04C | STATION030 |
| 28 | B00298L | BEAUFORT | | 32 | SEDIMENT | 04C | STATION002 |
| 59 | B00300L | BEAUFORT | SAMPLE | 32 | SEDIMENT | 04C | STATION002 |

END FORM

29 STRAINS

Strains isolated from water at 20C which require yeast extract and amino acids as growth factors.

_

| <u>‡</u> . | 200011H | BEAUFORT | SAMPLE | 03 | UNTER | 280 | STATION010 |
|------------|---------|----------|--------|-----|-------|-----|------------|
| ĉ | 800015H | BEAUFORT | SAMPLE | Ø3 | MATER | 200 | STATION010 |
| Э | B00019H | BEAUFORT | SAMPLE | 83 | MATER | 200 | STATION010 |
| 4 | 800159H | BEAUFORT | SAMPLE | 24 | MATER | 290 | STATION055 |
| 5 | B00170H | BEAUFORT | SAMPLE | 24 | MATER | 200 | STATION055 |
| 6 | B00223H | BEAUFORT | SAMPLE | 26 | MATER | 290 | STATION070 |
| 7 | 800253H | BEAUFORT | SAMPLE | 11 | MATER | 200 | STATION030 |
| 8 | B00259H | BEAUFORT | SAMPLE | i 1 | MATER | 200 | STATION030 |

END FORM

S STRAINS

....

Strains isolated from sediment at 20C which require yeast extract and amino acids as growth factors.

| | | | ះគឺធំរាំ | at 9 | 82 |
|------------|--------------------|----------|--|------------|----------------|
| 53 | B00299H | BEAUFORT | | 9 SEDIMENT | |
| 52 | B00298H | BEAUFORT | SAMPLE 0 | 9 SEDIMENT | 20C STATION030 |
| 51 | B00296H | BEAUFORT | | 9 SEDIMENT | |
| 50 | B00294H | BEAUFORT | •••••••••••••••••••••••••••••••••••••• | 9 SEDIMENT | |
| 49 | E00293H | BEAUFORT | _ | 9 SEDIMENT | |
| 43 | B90292H | BEAUFORT | | 9 SEDIMENT | |
| 47 | B00290H | BEAUFORT | | 9 SEDIMENT | |
| 46 | B00289H | BEAUFORT | | | |
| 45 | B00288H | BEAUFORT | | | |
| 44 | B00287H | BEAUFORT | | 9 SEDIMENT | |
| 43 | B00284H | BEAUFORT | | 9 SEDIMENT | |
| 42 | B00200H | BEAUFORT | L | 9 SEDIMENT | |
| <u>. 1</u> | 800278H | BERUFORT | | | |
| 40 | B00277H | BEAUFORT | SAMPLE 0 | | |
| 39 | B00247H | BEAUFORT | | | |
| 38 | B00245H | BEAUFORT | SAMPLE 2 | | |
| 37 | B00237H | BEAUFORT | SAMPLE 2 | | |
| 36 | B00236H | BEAUFORT | | | |
| 35 | B00235H | BEAUFORT | | | |
| 34 | B00234H | BEAUFORT | SAMPLE 2 | | |
| 33 | B00228H | BEAUFORT | SAMPLE 2 | | |
| 32 | B00199H | BEAUFORT | SAMPLE 2 | - | 20C STATION070 |
| 31 | B00196H | BEAUFORT | SAMPLE 21 | | 200 STATION055 |
| 39 | B00186H | BEAUFORT | SAMPLE 21 | | 20C STATION055 |
| 29 | B00181H | | SAMPLE 2 | | 200 STATION055 |
| 28 | B00179H | BEAUFORT | SAMPLE 2 | | 20C STATION055 |
| 27 | B00176H | BEAUFORT | SAMPLE 2 | | 200 STATION055 |
| 26 | 800150H | BEAUFORT | SAMPLE 2 | | 20C STATION055 |
| 25 | 800149H | BEAUFORT | SAMPLE 2 | | 20C STATION071 |
| 24 25 | | BEAUFORT | SAMPLE 2 | | 20C STATION071 |
| | E00144H | BEAUFORT | SAMPLE 2 | | 20C STATION071 |
| 23 23 | B00142H B00144H | BEAUFORT | SAMPLE 21 | | 20C STATION071 |
| 21 22 | B00138H B00142H | BEAUFORT | SAMPLE 2 | | 20C STATION071 |
| 20 | B00133H | BEAUFORT | SAMPLE 20 | | 20C STATION071 |
| 19 20 | B00133H | BEAUFORT | SAMPLE 22 | + | 20C STATION071 |
| 18 | B00128H | BEAUFORT | SAMPLE 22 | | 20C STATION071 |
| | 600127H | BEAUFORT | SAMPLE 22 | | 20C STATION071 |
| 16 17 | B00126H | BEAUFORT | SRMPLE 2 | | 20C STATION071 |
| | вөөөэсн вөө100н | BEAUFORT | SAMPLE 16 | | 200 STATION002 |
| 14 15 | 800095H | BEAUFORT | SAMPLE 16 | | 200 STATION002 |
| 13 14 | B00092H B00094H | BEAUFORT | SAMPLE 16 | | 200 STATION002 |
| 12 | 800091H 800092H | BEAUFORT | SAMPLE 16 | | 200 STATION002 |
| 11 | B00089H B00091H | BEAUFORT | SAMPLE 16 | | 200 STATION002 |
| 10 | 800089H | BEAUFORT | SAMPLE 16 | | 200 STATION002 |
| | 800087H | BEAUFORT | SAMPLE 16 | | 200 STATION002 |
| 8 9 | 800083H | BEAUFORT | SAMPLE 16 | | 200 STATION002 |
| 8 | B00083H | BEAUFORT | SAMPLE 16 | | 20C STATION002 |
| 7 | B00082H | BEAUFORT | SAMPLE 16 | | 200 STATION002 |
| 6 | E00081H | BEAUFORT | SAMPLE 16 | | 200 STATION002 |
| 5 | B00030H | BEAUFORT | SAMPLE 16 | | 200 STATION002 |
| 4 | 600077H | BEAUFORT | SAMPLE 16 | | 20C STATION002 |
| 3 | B00039H | BEAUFORT | SAMPLE 03 | | 20C STATION010 |
| â | E00037H | BEAUFORT | SAMPLE 03 | SEDIMENT | 200 STATION010 |
| i. | 800035H | BEAUFORT | SAMPLE 03 | SEDIMENT | 20C STATION010 |
| | | | | | |

END FORM

53 STRAINS

| 1 | BOOODSL | BEAUFORT | SAMPLE | 03 | MATER | 04C | STATION010 |
|----------|---------|----------|--------|----|-------|-----|------------|
| 2 | 800022L | | | | | | STATION010 |
| 3 | 800023L | | | | | | STATION010 |
| 4 | B00051L | BEAUFORT | SAMPLE | 20 | WATER | 04C | STATION002 |
| <u> </u> | B00064L | BEAUFORT | SAMPLE | 20 | WATER | 04C | STATION002 |
| 6 | 800065L | BEAUFORT | SAMPLE | 20 | MATER | 04C | STATION002 |

END FORM

| | 800081L 800088L 800136L 800138L 800140L 800147L 800231L 800239L | BEAUFORT BEAUFORT BEAUFORT BEAUFORT | SAMPLE SAMPLE SAMPLE SAMPLE SAMPLE SAMPLE | 16 22 22 20 20 20 20 21 | SEDIMENT | 04C 04C 04C 04C 04C 04C | STATION002 STATION002 STATION071 STATION071 STATION071 STATION055 STATION070 STATION070 |
|--|--|--|--|--|----------|--|--|
|--|--|--|--|--|----------|--|--|

END FORM & STRAINS 100192

284 A195 Strains isolated from water at 20C which require unknown growth factors.

| - A (A) | 800124H 800215H 800220H | BEAUFORT | SAMPLE SAMPLE | 26 26 | NATER NATER | 200 200 | STATION071 STATION070 STATION070 |
|---------|-------------------------------|----------|------------------|----------|----------------|------------|--|
| | 899267H | BEAUFORT | SAMPLE | 11 | WATER | 200 | STATION030 |
| 5 | B90274H | BEAUFORT | SAMPLE | 11 | WATER | 200 | STATION030 |

END FORM

5 STRAINS

Strains isolated from sediment at 20C which require unknown growth factors.

| 123456789914345 | B00034H B00040H B00076H B00076H B00079H B00079H B00088H B00096H B00097H B00129H B00129H B00129H B00129H B00226H B00226H B00238H B00238H | BEAUFORT BEAUFORT BEAUFORT BEAUFORT BEAUFORT BEAUFORT BEAUFORT BEAUFORT BEAUFORT BEAUFORT BEAUFORT BEAUFORT BEAUFORT | SAMPLE SAMPLE SAMPLE SAMPLE SAMPLE SAMPLE SAMPLE SAMPLE SAMPLE SAMPLE SAMPLE SAMPLE SAMPLE | 03 03 16 16 16 16 22 21 21 09 | SEDIMENT SEDIMENT SEDIMENT SEDIMENT SEDIMENT SEDIMENT SEDIMENT SEDIMENT SEDIMENT SEDIMENT SEDIMENT | 200 200 200 200 200 200 200 200 200 200 | STATION002 STATION002 STATION002 STATION071 STATION055 |
|-----------------|---|--|--|--|--|--|--|
|-----------------|---|--|--|--|--|--|--|

END FORM

15 STRAINS

100191

286

A197

ANNUAL REPORT

Assessment of Potential Interactions of Microorganisms and Pollutants Resulting from Petroleum Development on the Outer Continental Shelf in the Gulf of Alaska

April 1, 1976

Submitted by:

Ronald M. Atlas Principal Investigator Department of Biology University of Louisville Louisville, Kentucky 40208

Prepared for:

Outer Continental Shelf Energy Assessment Program National Atmospheric and Oceanographic Administration Juneau Project Office Juneau, Alaska

SCIENTIFIC PERSONNEL

Dr. Ronald M. Atlas - Principal Investigator Project Coordinator, Hydrocarbon degradation

Dr. Lois Cronholm - Co-principal Investigator, Human pathogens associated with shellfish

Dr. James D. Hauxhurst - Post Doctoral Associate, Isolation and characterization of microorganisms from water and sediment

Mr. Charles Pennington - Research Assistant, Isolation and characterization of microorganisms from shellfish

Two parttime technicians - Support of the above activities

INTRODUCTION

Microorganisms are essential components of all ecosystems. Changes in microbial populations may greatly alter the characteristics of an ecosystem. Human activities often modify the environment for microorganisms. In some cases microorganisms respond to such changes in a way that lessens the human impact. For example, microorganisms are capable of biodegrading many pollutants that man adds to various ecosystems, often maintaining environmental quality in such situations. In some cases, microorganisms are unable to biodegrade polluting materials and undesirable accumulations of the pollutants occur. In still other situations, microorganisms carry out tranformations of the pollutants that produce undesirable toxic products. Microorganisms also carry out metabolic activities essential for ecologic balance. Human modification of an environment may alter the ability of microorganisms to carry out key elemental cycling activities. Some microorganisms cause disease in man or other organisms. Human activities may change the populations of such pathogenic microorganisms, altering the incidence of a particular disease.

This project was designed to investigate the potential interactions of microorganisms and pollutants that may result from development of petroleum resources in the outer continental shelf of the Gulf of Alaska. Knowledge about the naturally occurring microorganisms is essential for such an assessment. Studies have been begun on establishing a baseline description of microbial communities in the Gulf of Alaska. This baseline description includes quantitative information on the occurrence of different physiological groups of microorganisms and on the qualitative taxonomic characteristics

of dominant species of microorganisms. It includes information on the ability of the indigenous microorganisms to transform petroleum hydrocarbons that might enter the ecosystem from outer continental shelf petroleum development. Also, information is included on the natural incidence of potential human pathogens in shellfish in the Gulf of Alaska.

MATERIALS AND METHODS

Literature Review

A review of existing literature on microorganisms in the Gulf of Alaska including microorganisms related to petroleum pollutants and pathogenic microorganisms was conducted using the computer search facilities OASIS and of the Lockheed data base. Data bases searched include National Technical Information Service, Biological Abstracts, Bioresearch Index, Oceanic Index, Selected Water Research Abstracts and Chemical Titles. Abstracts were reviewed and appropriate articles obtained from NTIS or the original source.

Sample Collection

Water and sediment samples were collected during October in the western Gulf of Alaska. Samples were collected from the NOAA vessel <u>Discoverer</u>. Water samples were collected with a Niskin sterile water sampler. Sediment samples were collected with a VanVeem grab or Haps corer. Sediment samples were removed aseptically from the top 2 cm of the core or grab sample. Samples were collected at Gulf of Alaska Shelf Study Stations Nos. 101, 102, 103, 104, 105, 106, 119, 121, 124, 133, 134, 137, 145, 146, 148, 156, and 159. The actual location and depth of each samples has been supplied by Discoverer personnel (Fig.1, Table I and II).

Both Dungeness and Tanner crab samples were supplied for analysis of associated microorganisms that are potentially pathogenic for man by the Alaska Department of Fish and Game, Kodiak, and by the National Marine

Fisheries Laboratory, Seattle. Approximately 10 crabs per month have been received since October. The location of the crab collection is supplied by the collecting parties (Fig.2). Most of the crabs were collected in the western Gulf of Alaska. Some Tanner crabs also have been supplied from a cruise of the Miller Freeman in the Bering Sea.

Abiotic Sample Parameters

Salinity, temperature, and depth determinations were made by <u>Discoverer</u> personnel using a STD rosette sampler. The readings from the STD cases are to be supplied after readout of the computer storage. Aliquots of samples were frozen and sent to Dr. Vera Alexander for analysis of phosphate, ammonium, nitrate and silicate concentrations.

Enumeration of Microbial Populations

<u>Direct counts from water</u>. A sample of water was immediately preserved upon collection by addition of formaldehyde 1:1 v/v.

One-tenth to five-tenth milliliters of sample was mixed with one milliliter of 0.1% acridine orange in sterile tris buffer pH 7. One minute after mixing, the stained sample was filtered through a 0.22 μ m Sartorius black filter. The filters were immediately viewed with an Olympus epifluorescence microscope, with a BG 12 plus blue exciter filter and a 480 nm blue barrier filter. Cells fluorescing orange or green were counted. Ten fields were counted for each aliquot filtered. Two aliquots from each sample were counted. Counts were converted to number per ml.

292

Indirect plate counts from water and sediment. Viable microorganisms were enumerated as different physiological groups using different microbiological media and incubation conditions. Two non-selective media, marine agar 2216 and MSWYE, were used for enumeration of total viable microorganisms. Several selective media were also used for enumeration of different groups of microorganisms. TCBS agar was used for enumeration of <u>Vibrio</u> species. Pseudosel agar was used for enumeration of <u>Pseudomonas</u> species. EMB agar was used for enumeration of enteric bacteria. SS agar was used for enumeration of <u>Salmonella-Shigella</u> species. Saboraud dextrose agar was used for enumeration of fungi. Oil agar (Bushnell Haas Agar plus 0.5% Prudhoe crude oil plus marine salts) was used for enumeration of oil-utilizing microorganisms. Counts of oil-degrading microorganisms were corrected for organisms that could grow on Bushnell Haas agar without added oil. These media were either incubated at 5C for enumeration of viable psychrophilic and psychrotrophic microorganisms or at 20C for enumeration of viable mesophilic microorganisms.

Depending on the concentrations of microorganisms in the samples counts were either from surface-spread plates of serial dilutions or from Millipore-filtered (0.45 μ m) samples. Counts for 20C plates were done after 10 days of incubation; counts for 5C plates were done after 21 days of incubation. Triplicate plates were used for all counts.

Indirect plate counts from crab samples. Tissue from crab muscle, gill or gut was macerated in sterile water, l g tissue to 10 ml water. Serial dilutions were surface-spread in triplicate onto either marine agar 2216 for enumeration of total heterotrophs; McConkey's agar for enumeration of gram negative enteric bacteria, and TCBS agar for enumeration of <u>Vibrio</u> species. Plates were incubated at 35C aerobically for enumeration of mesophilic

293

populations. Replicate marine agar plates were also incubated anaerobically using a Gas Pak system for enumeration of mesophilic anaerobes.

Qualitative Characterization and Identification of Microorganisms from

Water and Sediment Samples

Colonies that developed on marine agar 2216 were restreaked for purification. Colonies isolated at 4C and 20C from different samples were selected at random for taxonomic studies. Colonies were also selected at random from 4C and 20C oil agar plates for characterization of range of hydrocarbon metabolism.

For taxonomic characterization an extensive series of tests were run on each organism. A complete list of tests being used is shown in Table III. Not all organisms are characterized with every test. The tests examine three broad areas: morphology; physiology and biochemistry; and nutritional. Tests from each broad area are needed to characterize and classify a microorganism. Morphological tests include size, shape and specific morphological features. Some of these specific features are shown by staining reactions, the key taxonomic staining test being the gram stain. Other specific features, such as motility, presence of endospores, acid-fast stain reaction, arrangement of cells, etc., are keyed to classical bacterial taxonomy. Physiological and biochemical tests include relation to oxygen, temperature, growth range, salt tolerance, presence of specific enzymes, sensitivity to antibiotics, presence of specific metabolic pathways, etc. These tests can be used both in taxonomic identification of the organisms and in understanding the ecological distribution and role within the ecosystem of these organisms. Nutritional tests include the ability to utilize many different substrates including the ability to metabolize different classes of compounds such as amino acids,

carbohydrates, amines, carboxylic acids, alcohols, nucleic acids, and hydrocarbons. Extensive hydrocarbon utilization tests were run for organisms isolated from oil agar.

Identification of microorganisms from crab samples. Tanner crabs were sent from the field frozen; Dungeness crabs were sent from the field alive. For analysis the crabs were separated into muscle and gill tissues. In one case eggs were also recovered. The aseptically removed tissues were macerated and immediately added to tubes of enrichment media. Four different enrichment media were used to maximize the probability of isolating any microorganisms present that were capable of causing human disease. The initial enrichment media used were Trypticase Soy Broth with and without 3% marine salts added, and Brilliant Green Bile Broth with and without 3% marine salts added. Incubation of replicate initial enrichments was for 24 hours aerobically at 25C and at 35C. Additionally incubated plates of Trypticase Soy Agar were incubated at 35C under anaerobic conditions using a Gas Pak anaerobic system.

The enrichment cultures were then streaked onto isolation media. The isolation media used were Trypticase Soy Agar, marine agar 2216, EMB agar, EMB agar with 3% marine salts, SS agar, SS agar with 3% marine salts and TCBS agar. The EMB, SS and TCBS media are designed for the isolation of enteric bacteria, <u>Salmonella-Shigella</u> species and <u>Vibrio</u> species respectively. All of these are gram negative bacterial species. Trypticase Soy Agar and marine agar 2216 are considered non-selective media.

All distinguishable colonies were isolated for identification. All isolates were capable of growth on Trypticase Soy Agar and were therefore maintained on this medium. Gram negative rods were identified using the API 20E

identification system. Gram positive cocci were identified by morphology, mannitol salt reaction, catalase production, reaction on blood agar, growth in SF medium, and optochin and/or bacitracin sensitivity tests. Gram positive rods were examined for presence of endospores and relation to oxygen. In vivo Pathogenicity Studies

Cultures of <u>Versinia</u>, <u>Klebsiella</u>, and <u>Staphylococcus</u> isolated from the crabs were prepared for administration to mice by intraperitoneal, intravenous or oral routes. The cells were washed free of medium by centrifugation and resuspended in non-pyrogenic sterile physiological saline. Replicate cells were also suspended in saline without washing. For intraperitoneal administration, the cells are injected with a 26g hypodermic needle. For oral administration, the cell suspension is added to the drinking bottles of animals who have been deprived of water overnight. The test animals were adult CFW male mice, 6 to 8 weeks old. Each test was performed in triplicate. The animals were observed for one week after treatment, or until death occurred, for behavioral symptoms. Animals that survived one week were killed by etherization and an autopsy performed. The lung, liver, mesentery, intestine, and spleen were examined for gross pathology. Animals that died during the week were immediately examined.

Analysis of data. In order to analyse the data generated from taxonomic testing, an agreement was made with Dr. Micah Krichevsky, National Institute of Health, for use of the NIH computer programs and facilities. The data is arranged in a searchable form so that organisms with any tested characteristic of interest, e.g. ability to metabolize hydrocarbons, can be identified by source of isolation. When testing of organisms is completed, the programs allow for comparison to other organisms including known organisms with generation

296

of similarity coefficients. The API 20E system was used for identification of isolates from crabs.

RESULTS AND DISCUSSION

Literature Review

A review of the literature showed that while a large number of studies have been reported on distribution of microorganisms in marine environments, on the microbial degradation of petroleum hydrocarbons and on the occurrence of microorganisms in shellfish that cause human disease, only a few studies have been conducted in or near the Gulf of Alaska. A bibliographic listing of those reports directly applicable to the Gulf of Alaska is shown in Table IV. This table also includes reference to some major reviews of the field.

Abiotic Sample Parameters

It was only possible to complete nutrient analysis on a few of the water samples collected (Table V). Nitrogen in most samples was equally proportioned between NO₃ and NH₃. The average total inorganic nitrogen was approximately 13 μ g at -N/1. Phosphate-P was present in lower concentrations than nitrogen, averaging 2 μ g at -P/1. Only at Station 133 were phosphate concentrations high, 6.7 μ g at P/1. Silicates ranged from 9 to 14 μ g at Si/1..

Enumeration of Microorganisms

<u>Direct counts from water samples</u>. The direct counts on water samples ranged from 1×10^5 to $5 \times 10^5/1$ (Table VI). All counts were of the order 10^5 organisms per ml. The highest counts were found at Stations 156 and 159 which were nearest to the Bering Sea.

Indirect counts from water and sediment. The indirect plate counts of

aerobic heterotrophic microorganisms (Tables VII-X) from water were statistically significantly lower than the direct counts. Counts on marine agar 2216 (Tables VII-VIII) were higher than on MSWYE media (Tables IX-X). Therefore it was decided to use only marine agar 2216 in future work for total viable counts. The counts of mesophilic microorganisms were higher in almost all cases than the counts of psychrophiles and psychrotrophs. The total viable mesophilic counts from water ranged from 10^1 to 10^3 /ml. The total viable psychrophilic-psychrotrophic counts from water ranged from 10^1-10^2 /ml. The highest total viable counts from water were found at Stations 156 and 159 nearest the Bering Sea.

The indirect plate counts of heterotrophs from sediment samples were several orders of magnitude higher than comparable counts from water. Heterophic counts in sediment ranged from 10^4-10^6 /gm dry wt. Mesophilic counts from sediment samples were slightly higher than psychrophilic-psychrotrophic counts.

Counts of fungi in sediments (Tables XI-XII) were 1-2 orders of magnitude lower than the total heterotrophic count. Some bacteria are capable of growing on the media used to select for fungi and may appear in these counts. Although only a few mesophilic fungal counts were performed, the comparable psychrophilic-psychrotrophic counts were higher. Counts of fungi in water showed generally less than 10/ml.

Counts of specific bacterial groups were very low. No mesophilic <u>Pseudomonas</u> sp. were detected in any of the water or sediment samples indicating if such organisms were present, they were in very low concentrations (Table XIII). Organisms that developed on the media selective for <u>Salmonella</u>-Shigella genera were also low with no colonies from sediment samples and less

than 1/ml from water samples (Table XIV). Counts of "enteric" bacteria were similarly low (Table XV). Mesophilic <u>Vibrio</u> species, on the other hand, were detected in all samples tested and showed counts as high as $10^4/gm$ dry wt. in sediment samples (Table XVIII). With the exception of the Pseudomonas counts such results are consistent with other marine areas.

Oil-utilizing microorganisms were not detected in most samples tested (Tables XVII-XVIII). Only in one case at Station 124 were counts in excess of 10/ml. In most cases the numbers of oil-degrading microorganisms were less than 1/ml. These counts are consistent with other non-polluted marine areas.

<u>Plate counts from crab samples</u>. The microbial counts from crab samples are shown in Table XIX. The counts show that the greatest concentration of bacteria occurred in the gills of the crabs and that muscle tissue had relatively few bacteria per gram. There were also significant differences between the counts from crabs collected from different regions. The lowest counts were for the crabs collected from the Bering Sea. The highest counts were from the Dungeness crabs collected near Kodiak City. <u>Characterization of Microbial Isolants from Water and Sediment Samples</u>

Only the morphological characteristics of 206 of the 370 heterotrophic isolants from Gulf of Alaska water and sediment samples have been completed and processed for computer analysis. A summary of some of the key morphological characteristics is shown in Table XX. Clearly, the majority of organisms isolated from both sediment and water samples were gram negative and were rod-shaped (Table XXI). Only 5.3% of the organisms were gram positive and only 1.6% of all organisms were coccoid-shaped. Almost twothirds of all organisms were motile. There was a significant difference

in motility between organisms isolated at 4C (75.8% motile) and those isolated at 20C (50.5% motile).

Although only a limited amount of data presently is stored in the computer for searching, it was decided to test the versatility of the data retrieval system and analyse some of the data that was stored. Examples of computer output are shown in Tables XXII and XXIII. In Table XXII the data was searched for the source of all of the gram positive isolants and the output showed that the distribution of these organisms is sparce but not restricted to one location. The data was searched for endospore-forming bacteria. Gram positive aerobic endospore-forming bacteria are members of the genus <u>Bacillus</u>. Endospore production is important because it is associated with heat resistance. Only one such organism was found, it having been isolated from sediment at 20C from Station 137. In Table XXIII the data was searched for positive reaction on acid fast staining. Most such isolants were from Station 133. Acid fast staining is a characteristic test for the genus <u>Mycobacterium</u> which contains several pathogenic species. Other searches of the data were used to generate Tables XX and XXI.

Several organisms isolated from oil agar plates have been tested for their ability to utilize 50 different hydrocarbons.

Identification of Microbial Isolants from Crab Samples

The species of bacteria that have been isolated from Dungeness and Tanner crabs are shown in Tables XXIV and XXV respectively. Examination of the data shows that the Dungeness crabs collected nearest Kodiak Island harbor in October had the greatest number of microbial species. In these Dungeness crabs many gram negative microorganisms were found in gill and muscle tissue as well as gram positive isolants. Many of these gram negative bacteria are considered

301

as indicators of human pollution. In the gill and muscle tissues of Tanner crabs isolated in Ugak Bay in December away from human activity there were fewer species of gram negative isolants. The frequency of occurrence of the isolants in muscle of Dungeness crabs was <u>Staphylococcus</u> ><u>Sarcina</u> ><u>Acinetobacter</u> >all others. In Dungeness crab gill tissue the isolation frequency was <u>Streptococcus</u> ><u>Pseudomonas</u> ><u>Alcaligenes</u> ><u>Moraxella</u> = <u>Acinetobacter</u> = <u>Aeromonas</u> = <u>Citrobacter</u> = <u>Enterobacter</u> ><u>Sarcina</u> = <u>Yersinia</u> = <u>Staphylococcus</u> = <u>Klebsiella</u>. In Tanner crab muscle and gill <u>Staphylococcus</u> was isolated more frequently than <u>Micrococcus</u>. In the eggs of Tanner crabs <u>Staphylococcus</u> was also most frequently isolated.

Pathogenicity Studies

Three mice injected with coagulose negative <u>Staphylococcus</u> intravenously developed behavioral symptoms, lethargy, and disinterest in food, 24 hours after injection. The symptoms lasted for 3 days after which the animals recovered. Autopsy failed to show any pathological abnormalities.

Of six mice exposed to the <u>Yersinia</u> <u>enterocolytica</u>, 2 by iv, 2 by ip, and 2 orally, all showed behavioral symptoms 24 hours after inoculation. Symptoms included staggering, lethargy, and lack of responsiveness. One mouse died 5 days after intravenous injection.

Of 12 mice inoculated with <u>Klebsiella</u> all showed overt symptoms and 4 of the mice died. The greatest death occurred with intraperitoneal injection. It was possible to recover <u>Klebsiella</u> <u>pneumoniae</u> of the same biotype as the culture used for inoculation from blood, liver, spleen, and kidney of these dead mice. No deaths occurred following oral inoculation.

It appears from these results that serious potential human pathogens are associated with crabs collected from near Kodiak harbor. Further studies

14

should immediately be conducted to assess the safety of commercial fishing for these crabs and consideration should be given to condemning such contaminated fishing areas. TABLES

and

FIGURES

Table I

SAMPLE DESCRIPTION

| // // // // // // // // // // // | | · · · · · · · · · · · · · · · · · · · |
|----------------------------------|-----------------------|---------------------------------------|
| SAMPLE NO. | DAY MOYR LOCATION | STATION TYPE |
| *GW0101201 | 14 1075GULF OF ALASKA | STATIONIOL WATER |
| *GW01J2?01 | 14 LO75GULF OF ALASKA | STATION102 WATER |
| *GWU103?01 | 14 1075GULF OF ALASKA | STATION103 WATER |
| *GW0104701 | 15 1075GULF OF ALASKA | STATION104 WATER |
| *GW0105?01 | 15 IU75GULH OF ALASKA | STATION105 WATER |
| *GW0106?01 | 15 1075GULF OF ALASKA | STATION106 WATER |
| *GW0119?01 | 14 1075GULF OF ALASKA | STATION119 WATER |
| *GWJ124?U1 | 13 1075GULF OF ALASKA | STATION124 WATER |
| *GW0133?01 | 12 1075GULF OF ALASKA | STATION133 WATER |
| *GW0133?01 | 12 1075GULF OF ALASKA | STATION137 WATER |
| *GW0145?01 | 11 1075GULF CF ALASKA | STATION145 WATER |
| *GWU148?01 | 11 1075GULF OF ALASKA | STATION148 WATER |
| *GW0156?U1 | 10 1075GULF OF ALASKA | STATION156 WATER |
| *GW0159?01 | IN 1075GULF OF ALASKA | STATION159 WATER |
| | | |
| *GB0101?01 | 14 1075GULF OF ALASKA | STATIONIO1 SEDIMENT |
| *GB0121?01 | 13 LO75GULF OF ALASKA | STATION121 SEDIMENT |
| *GB0134?01 | 12 1075GULF OF ALASKA | STATION134 SEDIMENT |
| *GB0137?01 | 12 1075GULF OF ALASKA | STATION137 SEDIMENT |
| *GBU146?01 | 11 1U75GULF OF ALASKA | STATION146 SEDIMENT |
| *G8J148?01 | 11 1075GULF OF ALASKA | STATION148 SEDIMENT |

Table II

| | | | ······ | |
|------------|-----------|------------|----------|---------------------------------------|
| SAMPLE NU. | LATITUDE | LCNGITUDE | DEPTH(M) | TEMP(C) |
| *Gw0101?02 | 59-18.60N | 152-23.48W | CC2.0 | +9.1 |
| *GW0102?02 | 59-10.10N | 152-04-45W | ()2.0 | +9.2 |
| *GW0103?U2 | | 151-48.15W | | +9.3 |
| *GW0104?02 | | 151-26.15W | | +8.4 |
| *GW0105?02 | | 151-07.32W | | +8.4 |
| *GW0106?02 | 58-28.74N | 150-49.28W | 002.0 | +7.7 |
| *GWJ119?02 | | 156-00.58W | | +8.6 |
| GW0124702 | 56-07.CIN | 154-39.93W | 002.0 | +8.3 |
| GW0133702 | 55-44.82N | 158-49.33W | 002.0 | +8.8 |
| ≠GWJ137?J2 | 54-55.03N | 157-58.54W | 002.0 | +8.6 |
| GW0145?02 | 55-01.00N | 161-19.8 W | 002.0 | +8.0 |
| ¥GW0148?02 | 54-23.69N | 160-49.24W | C02.J | +7.8 |
| *GW0155?02 | 54-29.96N | 165-11.4 W | 632.6 | +6.4 |
| ¥GWŭ159?∪2 | 53-51.98N | 164-33.71W | 002.0 | +7.5 |
| GBJ101202 | 59-18-60N | 152-23.48% | 091 0 | |
| GB0121702 | | 155-27.98W | | _ |
| GB0134?02 | | 158-39.95W | | |
| GBU1372U2 | | 157-58.54W | | - |
| GBU146?02 | | 161-11.77W | | · · · · · · · · · · · · · · · · · · · |
| GB0148?02 | | 160-49.24W | | |

Table III

ATLAS QUESTION SET SEQUENTIAL

```
003001: Cells are spherical.
003005: Cells are pear-shaped.
003008: Cells are rod-shaped.
003011: Rod axis is curved in one plane.
003013: Rod axis is helical (spiral).
003016: Rods have tapered ends.
003017: Rods have rounded ends.
003018: Rods have square ends.
003023: Pleomorphic cells are characteristic.
003026: Longer axis of rod is less than twice the shorter
        axis (cocco-bacillary).
004001: Longest axis of each cell is less than 0.5 micrometer.
004002: Longest axis of each cell is 0.5 - 1 micrometer.
004003: Longest axis of each cell is 1.1 - 2.0 micrometers.
004004: Longest axis of each cell is 2.1 - 3.0 micrometers.
004005: Longest axis of each cell is 3.1 - 4.0 micrometers.
004006: Longest axis of each cell is 4.1 - 5.0 micrometers.
004007: Longest axis of each cell is 5.1 - 10 micrometers.
004008: Longest axis of each cell is 11 - 15 micrometers.
004009: Longest axis of each cell is 16 - 100 micrometers.
004011: Shortest axis of each cell is less than 0.5 micrometer.
004012: Shortest axis of each cell is 0.5 - 1 micrometer.
004013: Shortest axis of each cell is 1.1 - 2.0 micrometers.
004014: Shortest axis of each cell is 2.1 - 3.0 micrometers.
004015: Shortest axis of each cell is 3.1 - 4.0 micrometers.
004016: Shortest axis of each cell is 4.1 - 5.0 micrometers.
005004: Poly beta-hydroxybutyric acid inclusions in the cell.
005006: Poly metaphosphate inclusions (volutin) in the cell.
006001: Endospores produced (any refractile intracellular body capable
        of germination into a new vegetative cell).
006007: Endospore(s) central in sporangium.
006008: Endospore(s) terminal.
006014: Endospores wider than the vegetative cell (sporangium swollen).
008001: Cells branch.
011001: Capsule is present.
012009: Cells are acid fast by Ziehl-Neelsen method.
012014: Sudan black B reveals intracellular lipids (fat bodies) (also
        see Sections 5 and 21).
012021: Gram positive.
012022: Gram negative.
012023: Gram variable.
013001: Cells motile.
013004: Cells demonstrate creeping or gliding motility on a
        solid surface.
013009: Cells have flagella.
013010: Flagella polar.
013022: Flagella peritrichous.
013023: Two or more flagella of distinctly different appearance in
        different locations on the cell.
015001: Cells occur singly.
015002: Cells occur in pairs.
015003: Cells arranged in angular fashion after division (snapping).
015004: Cells occur in chains.
015005: Cells arranged in irregular aggregates.
```

307

```
015006: Cells arranged in two-dimensional tetrads.
015007: Cells arranged in cubical packets (three-dimensional).
015017: Organisms filamentous, greater than 10 micrometers, if
        multicellular the organism has little or no indentation at each
        septum (For branched filaments also see Section 8).
016005: Agar macro-colonies are translucent.
016006: Agar macro-colonies are transparent.
016007: Agar macro-colonies are opaque.
016008: Agar macro-colony margin is entire.
016009: Agar macro-colony margin is erose.
016010: Agar macro-colony margin is filamentous (rhizoid).
016015: Agar macro-colony is convoluted.
016016: Agar macro-colony is flat (membranous).
016017: Agar macro-colony is raised but not convex.
016018: Agar macro-colony is umbonate.
016019: Colony swarming is exhibited on agar (dispersion of
        individual members of a population due to active motility).
016023: Colony consistency is viscid (mucoid).
016027: Colony surface is glistening.
016028: Colony surface is dull (matte).
016030: Colony surface is smooth.
016031: Colony surface is rough.
016043: Floccular growth in liquid culture.
016044: Ring growth on the wall of the tube in liquid culture.
016046: Pellicle in liquid culture.
016053: Growth takes place at an initial pH of 9.0.
016054: Growth takes place at an initial pH of 7.0.
016055: Growth takes place at an initial pH of 6.0.
016056: Growth takes place at an initial pH of 5.0.
016057: Growth takes place at an initial pH of 4.0.
016060: In 1.5-2.0% previously solidified agar, inoculated by stab,
        growth is confined to the surface or a depth from the surface
        of approximately no greater than 1 mm. (i.e., an obligate
        aerobe)
016062: In 1.5-2.0% previously solidified agar, inoculated by stab,
        growth begins BELOW THE SURFACE when incubated in air.
016063: In 1.5-2.0% previously solidified agar, inoculated by
        seeding or by stab, incubated in air, growth is largely
        confined to a linear dimension of approximately 5 cm from
        the bottom of the tube in a 16 x 150 mm tube filled with medium
        to a depth of 9-10 cm.
                                (i.e., obligate anaerobe)
016136: Molecular nitrogen can be used as the sole source of nitrogen.
016137: Ammonium salts can serve as the sole source of nitrogen
        for growth.
016138: Nitrate can serve as the sole source of nitrogen for growth.
016139: Nitrite can serve as the sole source of nitrogen for growth.
016187: Growth takes place at an initial pH of 8.0.
016189: Agar macro-colony is convex.
016190: Turbidity of liquid culture is evenly dispersed.
016194: Growth takes place at an initial pH of 10.0.
016206: Maximum turbidity in liquid cultures is slight.
016207: Maximum turbidity in liquid cultures is moderate.
016208: Maximum turbidity in liquid cultures is heavy.
016212: At least one vitamin (growth factor) is required for growth.
016249: Urea can be used as the sole source of nitrogen.
016347: Urea can be used as the sole source of carbon and nitrogen.
016357: Isolated agar colonies are less than 1 mm. diameter within
        ten days.
016358: Isolated agar colonies are 1-2 mm diameter within ten days.
016359: Isolated agar colonies are 2-6 mm diameter within ten days.
016361: Agar macro-colony margin is lobate.
```

```
016362: Agar macro-colony margin is undulate.
016363: Colony spreading is exhibited on agar (growth extends
        several millimeters or more beyond the point of innoculation).
016369: Gelling agent (eg., agar) is required for growth.
017011: Growth at 0 C.
017012: Growth at 10 C.
017013: Growth at 15 C.
017014: Growth at 25 C.
017015: Growth at 37 C.
017032: Growth at 5 C.
017037: Growth at 20 C.
017045: Growth at 43 C.
018003: Growth in the presence of 0.5% NaCl.
018004: Growth in the presence of 3% NaCl.
018006: Growth in the presence of 5% NaCl.
018008: Growth in the presence of 10% NaCl.
018009: Growth in the presence of 15% NaCl.
018022: Growth in the presence of 7.5% NaCl.
018028: Added NaCl is required for growth.
019001: Sensitive to ampicillin concentration (disc) 2 ugm.
019021: Sensitive to bacitracin concentration (disc) 2 units.
019043: Sensitive to chloromycetin (chloramphenicol) concentration
        (disc) 5 ugm.
019044: Sensitive to chloromycetin (chloramphenicol) concentration
         (disc) 30 ugm.
019063: Sensitive to chlortetracycline (aureomycin) concentration
        (disc) 30 ugm.
019064: Sensitive to colistin concentration (disc) 2 ugm.
019065: Sensitive to colistin concentration (disc) 10 ugm.
019084: Sensitive to 2,4-diamino-6,7-diisopropylpteridine
         (0/129 vibriostat) crystals on agar.
019085: Sensitive to erythromycin (ilotycin) concentration (disc)
        2 ugm.
019086: Sensitive to erythromycin (ilotycin) concentration (disc)
        15 ugm.
019105: Sensitive to kanamycin concentration (disc) 5 ugm.
019106: Sensitive to kanamycin concentration (disc) 30 ugm.
019129: Sensitive to nalidixic acid concentration (disc) 30 ugm.
019148: Sensitive to neomycin (mycifradin) concentration (disc) 5 ugm.
019149: Sensitive to neomycin (mycifradin) concentration (disc) 30 ugm.
019168: Sensitive to nitrofurantoin concentration (disc) 100 ugm.
019169: Sensitive to nitrofurantoin concentration (disc) 300 ugm.
019188: Sensitive to novobiocin (albamycin) concentration (disc) 30 ugm.
019208: Sensitive to oxytetracycline (tetramycin, terramycin)
        concentration (disc) 30 ugm.
019210: Sensitive to penicillin G concentration (disc) 2 units.
019211: Sensitive to penicillin G concentration (disc) 10 units.
019230: Sensitive to polymyxin B (aerosporin) concentration
         (disc) 50 units.
019231: Sensitive to polymyxin B (aerosporin) concentration
         (disc) 300 units.
019233: Sensitive to streptomycin concentration (disc) 2.0 ugm.
019235: Sensitive to streptomycin concentration (disc) 10 ugm.
019274: Sensitive to tetracycline (achromycin) concentration (disc)
         5 ugm.
019275: Sensitive to tetracycline (achromycin) concentration
         (disc) 30 ugm.
019294: Sensitive to triple sulfa (sulfadiazine/sulfamethazine/
        sulfamerazine) concentration (disc) 1 mgm.
019297: Sensitive to vancocyn (vancomycin) concentration (disc) 30.0 ugm.
019374: Sensitive to gentamicin concentration (disc) 10 ugm.
```

019430: Sensitive to ampicillin concentration (disc) 10 ugm. 019484: Sensitive to chlortetracycline (aureomycin) concentration (disc) 5 uqm. 019486: Sensitive to novobiocin (albamycin) concentration (disc) 5 ugm. 020001: Colonies are pure (paper) white on solid medium. 020002: Colonies are gray on solid medium. 020007: Colonies luminescent in the dark. 020019: Diffusible (water-soluble) pigments are produced. 020020: Diffusible blue pigments are produced. 020021: Diffusible yellow pigments are produced. 020022: Diffusible green pigments are produced. 020023: Diffusible red pigments are produced. 020024: Diffusible orange pigments are produced. 020025: Diffusible violet (purple) pigments are produced. 020026: Diffusible brown pigments are produced. 020027: Diffusible black pigments are produced. 020038: Non-diffusible red pigments are produced. 020039: Non-diffusible brown pigments are produced. 020040: Non-diffusible green pigments are produced. 020041: Non-diffusible violet (purple) pigments are produced. 020042: Non-diffusible blue pigments are produced. 020043: Non-diffusible golden (yellow) pigments are produced. 020044: Non-diffusible orange pigments are produced. 020057: Non-diffusible black pigments are produced. 020058: Colonies fluoresce with short wavelength ultraviolet light (ca. 260 nm.). 020060: Fluorescent pigment observable with short wavelength ultraviolet light (ca. 260 nm.). 020080: Non-diffusible pigment occurs only in the center of the colony. 020081: Non-diffusible pigment occurs in concentric rings within the colony. 024004: Agar is hydrolyzed (liquefied). 024005: Carrageenin is degraded. 024007: Casein is hydrolyzed (peptonized). 024009: Gelatin is hydrolyzed (liquefied). 024011: Pectin is hydrolyzed. 024014: D-Glucose catabolized aerobically. 024015: D-Glucose catabolized anaerobically. 024114: Tryptophan yields indole. 024135: Ammonia is produced. 024138: Nitrate is reduced. 024139: Nitrate is reduced to nitrite. 024140: Nitrite is reduced to nitrogen gas. 024149: Thiosulfate is reduced to hydrogen sulfide. 024154: Hydrogen sulfide is produced from cysteine. 024164: Hydrogen peroxide is decomposed. 024185: Methyl red test is positive. 024191: Voges-Proskauer test positive (also see question 35). 024199: Sheep blood hemolysis is beta. 024210: Nitrite is reduced. 024212: L-Arginine utilization results in basic endproducts (medium becomes alkaline). 024248: Kovacs' oxidase test positive (smear from colony turns dark purple with tetramethylparaphenylenediamine dihydrochloride). 024251: Hydrogen sulfide is produced from peptones. 024448: Nitrite is reduced to nitrous oxide. 024449: Nitrate is reduced to nitric oxide. 025007: L-Arabinose is utilized. 025010: D-Ribose is utilized. 025012: D-Xylose is utilized. 310025017: L-Rhamnose is utilized.

025019: D-Fructose is utilized. 025020: D-Galactose is utilized. 025021: D-Glucose is utilized (also see Section 24). 025022: D-Mannose is utilized. 025023: L-Sorbose is utilized. 025036: Salicin is utilized. 025037: Cellobiose is utilized. 025038: Lactose is utilized. 025039: Maltose is utilized. 025041: Sucrose is utilized. 025042: Trehalose is utilized. 025044: Raffinose is utilized. 025053: Alginic Acid is utilized. 025184: Acid produced from D-Ribose. 025193: Acid produced from D-Fructose. 025194: Acid produced from D-Galactose. 025195: Acid produced from D-Glucose (also see Section 24). 025196: Acid produced from D-Mannose. 025211: Acid produced from Cellobiose. 025212: Acid produced from Lactose. 025213: Acid produced from Maltose. 025215: Acid produced from Sucrose. 025216: Acid produced from Trehalose. 025242: Gas produced from D-Ribose. 025251: Gas produced from D-Fructose. 025252: Gas produced from D-Galactose. 025253: Gas produced from D-Glucose (also see Section 24). 025254: Gas produced from D-Mannose. 025269: Gas produced from Cellobiose. 025270: Gas produced from Lactose. 025271: Gas produced from Maltose. 025273: Gas produced from Sucrose. 025274: Gas produced from Trehalose. 025300: D-Ribose can be used as the sole source of carbon. 025309: D-Fructose can be used as the sole source of carbon. 025311: D-Glucose can be used as the sole source of carbon (also 025312: Mannose can serve as the sole source of carbon. see Section 24). 025351: Cellulose is hydrolyzed. 025352: Chitin is hydrolyzed. 025357: Starch is hydrolyzed. 026002: Allyl Alcohol is utilized. 026003: 1-Butanol is utilized. 026005: Ethanol is utilized. 026014: 1-Propanol is utilized. 026015: 2-Propanol is utilized. 026039: D(-) 1, 2-Propanediol is utilized. 026045: 1,2,3-Propanetriol (Glycerol) is utilized. 026052: D-Arabitol is utilized. 026057: Dulcitol is utilized. 026065: D-Mannitol is utilized. 026068: D-Sorbitol is utilized. 026075: Cyclohexanol is utilized. 026079: Meso-Inositol is utilized. 026089: Phenol is utilized. 026351: Acid is produced from 1,2,3-Propanetriol (Glycerol). 026363: Acid is produced from Dulcitol. 026371: Acid is produced from D-Mannitol. 026453: Gas is produced from 1,2,3-Propanetriol (Glycerol). 311026465: Gas is produced from Dulcitol. 026473: Gas is produced from D-Mannitol.

026555: 1,2,3-Propanetriol (Glycerol) can be used as the sole source of carbon. 026625: 2-Phenylethanol is utilized. 026631: 1-Hexadecanol is utilized. 028002: Acetic acid is utilized. 028003: Butyric acid is utilized. 028004: Caproic acid is utilized. 028005: Caprylic acid is utilized. 028008: Isovaleric acid is utilized. 028009: Lauric acid is utilized. 028011: Palmitic acid is utilized. 028013: Propionic acid is utilized. 028016: Valeric acid (pentanoic acid) is utilized. 028021: Glutaric acid is utilized. 028022: Malonic acid is utilized. 028027: Succinic acid is utilized. 028037: Oleic acid is utilized. 028045: Fumaric acid is utilized. 028046: Itaconic acid is utilized. 028047: Maleic acid is utilized. 028052: DL-Glyceric acid is utilized. 028054: Beta-hydroxybutyric acid is utilized. 028057: DL-Lactic acid is utilized. 028061: Mucic acid is utilized. 028064: L(+) Tartaric acid is utilized. 028066: Citric acid is utilized. 028068: 2-Ketogluconic acid is utilized. 028071: Pyruvic acid is utilized. 028072: Alpha-ketoglutaric acid is utilized. 028078: Benzoic acid is utilized. 028079: Meta-Hydroxybenzoic acid is utilized. 028080: Para-Hydroxybenzoic acid is utilized. 028097: Ascorbic acid is utilized. 028099: Galacturonic acid is utilized. 028101: D-Gluconic acid is utilized. 028105: Ortho-Hydroxybenzoic acid is utilized. 028107: Saccharic acid acid is utilized. 028109: Acetic acid can be used as the sole source of carbon. 028134: Succinic acid can be used as the sole source of carbon. 028152: Fumaric acid can be used as the sole source of carbon. 028161: Beta-hydroxybutyric acid can be used as the sole source of carbon. 028164: DL-Lactic acid can be used as the sole source of carbon. 028178: Pyruvic acid can be used as the sole source of carbon. 028179: Alpha-ketoglutaric acid can be used as the sole source of carbon. 028208: D-Gluconic acid can be used as the sole source of carbon. 028662: Stearic acid is utilized. 028668: Cyclohexane carboxylic acid is utilized. 029003: L-Alanine is utilized. 029004: Beta-Alanine is utilized. 029008: Gamma-Aminobutyric Acid is utilized. 029013: L-Arginine is utilized. 029015: L-Asparagine is utilized. 029016: L-Aspartic Acid is utilized. 029017: Betaine is utilized. 029020: L-Cysteine is utilized. 029021: L-Cystine is utilized. 029023: L-Glutamic Acid is utilized. 029024: Glycine is utilized. 312029025: Hippurate is utilized.

029026: L-Histidine is utilized. 029030: L-Leucine is utilized. 029032: L-Iso-Leucine is utilized. 029035: L-Lysine is utilized. 029036: L-Methionine is utilized. 029037: L-Ornithine is utilized. 029039: L-Phenylalanine is utilized. 029041: L-Proline is utilized. 029042: Sarcosine is utilized. 029044: L-Serine is utilized. 029045: L-Threonine is utilized. 029047: L-Tryptophan is utilized. 029049: L-Tyrosine is utilized. 029051: L-Valine is utilized. 029118: L-Aspartic Acid can be used as the sole source of carbon. 029125: L-Glutamic Acid can be used as the sole source of carbon. 029137: L-Lysine can be used as the sole source of carbon. 029149: L-Tryptophan can be used as the sole source of carbon. 029156: L-Alanine can be used as the sole source of nitrogen. 029166: L-Arginine can be used as the sole source of nitrogen. 029168: L-Asparagine can be used as the sole source of nitrogen. 029169: L-Aspartic Acid can be used as the sole source of nitrogen. 029173: L-Cysteine can be used as the sole source of nitrogen. 029174: L-Cystine can be used as the sole source of nitrogen. 029176: L-Glutamic Acid can be used as the sole source of nitrogen. 029177: Glycine can be used as the sole source of nitrogen. 029179: L-Histidine can be used as the sole source of nitrogen. 029183: L-Leucine can be used as the sole source of nitrogen. 029185: L-Iso-Leucine can be used as the sole source of nitrogen. 029188: L-Lysine can be used as the sole source of nitrogen. 029189: L-Methionine can be used as the sole source of nitrogen. 029192: L-Phenylalanine can be used as the sole source of nitrogen. 029194: L-Proline can be used as the sole source of nitrogen. 029197: L-Serine can be used as the sole source of nitrogen. 029198: L-Threonine can be used as the sole source of nitrogen. 029200: L-Tryptophan can be used as the sole source of nitrogen. 029202: L-Tyrosine can be used as the sole source of nitrogen. 029204: L-Valine can be used as the sole source of nitrogen. 029294: L-Phenylalanine is deaminated. 029302: L-Tryptophan is deaminated. 029319: L-Arginine is decarboxylated. 029341: L-Lysine is decarboxylated. 029343: L-Ornithine is decarboxylated. 029620: DL-Carnitine is utilized. 030003: Alpha-Amylamine is utilized. 030012: Ethanolamine is utilized. 030015: Histamine is utilized. 030025: Putrescine is utilized. 030028: Tryptamine is utilized. 030031: Allantoin is utilized. 030144: Ethanolamine can be used as the sole source of nitrogen. 030147: Histamine can be used as the sole source of nitrogen. 030162: Allantoin can be used as the sole source of nitrogen. 030377: N-Acetylglucoseamine is utilized. 030399: Guanine is utilized. 030401: Guanine can be used as the sole source of nitrogen. 030413: Thymine is utilized. 030415: Thymine can be used as the sole source of nitrogen. 030474: Taurine is utilized. 031093: Cyclohexanone can be used as the sole source of carbon. 031101: N-Decane is utilized.

031102: N-Docosane is utilized. 031103: N-Dodecane is utilized. 031104: N-Eicosane is utilized. 031106: N-Heptadecane is utilized. 031107: N-Heptane is utilized. 031108: N-Hexadecane is utilized. 031111: N-Nonadecane is utilized. 031112: N-Nonane is utilized. 031113: N-Octadecane is utilized. 031114: N-Octane is utilized. 031115: N-Pentadecane is utilized. 031118: N-Tetradecane is utilized. 031119: N-Tridecane is utilized. 031120: N-Undecane is utilized. 031127: 3-Methyl Hexane is utilized. 031136: Cyclohexane is utilized. 031137: Cis-Decalin is utilized. 031144: 1-Octadecene is utilized. 031158: Anthracene is utilized. 031160: N-Butylbenzene is utilized. 031161: P-Cymene is utilized. 031162: N-Dodecylbenzene is utilized. 031163: Ethylbenzene is utilized. 031165: 2-Methylnapththalene is utilized. 031166: 1-Methylnapththalene is utilized. 031169: Naphthalene is utilized. 031171: Phenanthrene is utilized. 031172: Omega-Phenyldecane is utilized. 031174: 3-Phenyleicosane is utilized. 031175: Omega-Phenyloctadecane is utilized. 031176: Pseudocumene is utilized. 031178: Toluene is utilized. 031179: Xylene is utilized. 031590: Pristane (2,6,10,14-Tetra-methylpentadecane) is utilized. 031602: Pentadecylcyclohexane is utilized. 031608: N-Triacontane is utilized. 031614: N-Dotriacontane is utilized. 031620: N-Hexatriacontane is utilized. 031626: 2-Methylbutane is utilized. 031632: 2, 2, 4-Trimethylpentane is utilized. 031638: 2,2,4,4,6,8,8-Heptamethylnonane is utilized. 031644: 2-Methylundecane is utilized. 031650: Methylcyclohexane is utilized. 031656: Methylcyclopentane is utilized. 031662: 1, 2-Dimethylcyclohexane is utilized. 031668: 1,4-Dimethylcyclohexane is utilized. 031674: Ethylcyclohexane is utilized. 031680: Octylcyclohexane is utilized. 031686: Dicyclohexyl is utilized. 031692: 4-Tert Butylbenzene is utilized. 031698: 1,2,3,4-Tetramethylbenzene (prehnitene) is utilized. 031704: 1-Phenyltridecane is utilized. 031710: Diphenylmethane is utilized. 031716: 1,3,5-Triphenylbenzene is utilized. 031722: 2-Ethylnaphthalene is utilized. 031728: 2,3-Dimethylnaphthalene is utilized. 031734: 2,6-Dimethylnaphthalene is utilized. 031740: 1,2,3,4-Tetrahydronaphthalene is utilized. 031746: Acenaphthalene is utilized. 031752: 9-Methylanthracene is utilized. 314031758: 1-Methylphenanthrene is utilized.

031764: N-Tetracosane is utilized. 031770: 1-Pentadecene is utilized. 031776: 2,2,4,6,6-Pentamethylheptane is utilized. 031782: 1-Phenylheptane is utilized. 031788: N-Octocosane is utilized. 031794: 2,2,4,6,6-Pentamethyl-3-heptene is utilized. 031800: 1-Phenyl-3,4 dihydronaphthalene is utilized. 031806: 1-Phenylnaphthalene is utilized. 031812: 1-Phenyl-1-cyclohexene is utilized. 031818: Chrysene (1,2-Benzphenanthrene) is utilized. 031824: Pyrene (Benzo-phenanthrene) is utilized. 031830: Triphenylene (9,10 Benzphenanthrene) is utilized. 031836: Isopropylcyclohexane is utilized. 032020: Tween 20 is hydrolyzed. 032023: Tween 80 is hydrolyzed. 034137: Alkaline phosphatase (3.1.3.1) is produced. 034143: Urease (3.5.1.5) is produced. 040331: Sensitive to oxytetracycline (tetramycin, terramycin) concentration (disc) 5 ugm. 098001: Non-diffusible pink pigments are produced. 098002: D-Ribose is utilized when yeast extract and amino acids are added. 098003: D-Glucose is utilized when yeast extract and amino acids are added. 098004: D-Fructose is utilized when yeast extract and amino acids are added. 098005: D-Gluconate is utilized when yeast extract and amino acids are added. 098006: Pyruvate is utilized when yeast extract and amino acids are added. 098007: Acetate is utilized when yeast extract and amino acids are added. 098008: Succinate is utilized when yeast extract and amino acids are added. 098009: Lactate is utilized when yeast extract and amino acids added. 098010: Alpha-Ketoglutarate is utilized when yeast extract and amino acids are added. 098011: Glycerol is utilized when yeast extract and amino acids are added. 098012: Beta-Hydroxybutyrate is utilized when yeast extract and amino acids are added. 098013: L-Aspartate is utilized when yeast extract and amino acids are added. 098014: L-Glutamate is utilized when yeast extract and amino acids ARE ADDED. 098015: L-Tryptophan is utilized when yeast extract and amino acids are utilized. 098016: L-Lysine is utilized when yeast extract and amino acids are utilized. 098017: Peptone is utilized. 098018: Proteose peptone #3 is utilized. 098019: Tryptone is utilized. 098020: Phytone is utilized. 098021: Peptone is utilized when yeast extract and amino acids are added. 098022: Proteose peptone #3 is utilized when yeast extract and amino acids are added. 098023: Tryptone is utilized when yeast extract and amino acids are utilized.

098024: Peptone can serve as sole source of carbon. 315

098025: Proteose peptone #3 can serve as sole source of carbon.
098026: Tryptone can sere as sole source of carbon.
098027: Unknown growth factors are required.
098028: Yeast extract plus amino acids plus vitamins serve as growth factors.

098029: Vitamins can serve as growth factor.

Table IV

LITERATURE REVIEW

Marine Microorganisms - General

Colwell, R.R. 1974. Effect of the Ocean Environment on Microbial Activities. University Park Press, University Park, Pa.

Symposium on Marine Microbiology. 1963. Carl H. Oppenheimer [ed.] Charles C. Thomas, Publisher, Springfield, Ill.

Wood, F.E. 1967. Microbiology of Oceans and Estuaries. Oceanography Series, Vol.3. American Elsevier, New York.

Microorganisms - Gulf of Alaska

- Hidaka, T. 1965. Studies on the marine bacteria. Kagoshima University, Faculty of Fisheries, Memoirs 14:127-180.
- Ogura, N. 1970. The relations between dissolved organic carbons and apparent oxygen utilization in the western Northern Pacific. Deep Sea Res. 17:221-231.
- Seki, H. 1970. Biomass in the Euphotic Zone of the North Pacific Subarctic water. Pac. Sci. 24:269-274.
- Seki, H., I. Koike, E. Matsumoto, and A. Hattori. 1972. A study on the distribution of total bacteria, bacterial aggregates and heterotrophic bacteria in the sea - I. In the subarctic Pacific region and the western north Pacific central region. J. Oceanog. Soc. Jap. 28:103-108.
- Takahashi, M., A. Nagai, Y. Yamaguchi, and S. Ichimura. 1974. The distribution of chlorophyll A, protein, RNA and DNA in the north Pacific Ocean. J. Oceanog. Svc. Japan 30:137-150.

Petroleum Biodegradation - General

- Atlas, R.M., and R. Bartha. 1973. Fate and effects of polluting petroleum on the marine environment. Residue Reviews 49:49-85.
- Beerstecher, E. 1954. Petroleum Microbiology. Elsevier Press, Inc., New York.
- Davis, J.B. 1967. Petroleum Microbiology. Elsevier Publ. Co., New York.
- Forster, J.W. 1962. Hydrocarbons as substrates for microorganisms. Antonie von Leeuwenhoek 28:251-274.
- McKenna, E.J., and R.E. Kallio. 1965. Biology of hydrocarbons. Ann. Rev. Microbiol. 19:183-206.
- National Academy of Science. 1975. Petroleum on the Marine Environment. Workshop on Inputs, Fates and the Effects of Petroleum on the Marine Environment, May 21-25, 1975, under the auspices of the Ocean Affairs Board, Commission on Natural Resources, National Research Council, National Academy of Science, Washington, D.C.
- ZoBell, C.E. 1946. Action of microorganisms on hydrocarbons. Bacteriol. Reviews 10:1-49.
- ZoBell, C.E. 1973. Microbial degradation of oil: present status, problems, and perspectives. In The Microbial Degradation of Oil Pollutants, D.G. Ahearn and S.P. Meyers [eds.]. Louisiana State University, Center for Wetland Resources, Publication No. LSU-SG-73-01. Baton Rouge, La. pp.3-60.

Table IV (cont'd)

Petroleum Biodegradation - Gulf of Alaska

- Atlas, R.M., and Schofield, E.A. 1975. Petroleum biodegradation in the Arctic. In Impact of the Use of Microorganisms on the Aquatic Environment. Ecological Research Series, EPA-660/3-75-001. Environmwental Protection Agency, Corvallis, Ore. pp.183-198.
- Kinney, P.J., D.K. Button, and D.M. Schell. 1969. Kinetics of dissapation and biodegradation of crude oil in Alaska's Cook Inlet. In API/FWPCA Joint Conference on Prevention and Control of Oil Spills, API Publication No.4040. American Petroleum Institute, Washington, D.C. pp.333-340.
- Robertson, B., S. Arhelger, P.J. Kinney, and D.K. Button. 1973. Hydrocarbon biodegradation in Alaskan waters. In The Microbial Degradation of Oil Pollutants, D.G. Ahearn and S.P. Meyers [eds.]. Louisiana State University, Center for Wetland Resources. Publication No. LSU-SG-73-01, Baton Rouge, La. pp.171-184.

Microorganisms Associated with Fish and Shellfish - General

- Dolman, C.E. 1960. Type E botulism: a hazard of the North. Arctic 13:230-256.
- Dubovsky, Bertha, and K.F. Meyer. 1922. The distribution of the spores of B. botulinos in the territory of Alaska and the Dominion of Canada. J. Inf. Dis. 31:595-599.
- Farber, L., and P. Lerhe. 1961. Studies on the evaluation of freshness and on the estimation of the storage lifes of raw fishery products. Food Technol. 15:191-196.
- Lee, J.S., and D.K. Pfeiffer. 1974. Influence of recovery media and incubation temperatures on the types of microorganisms isoalted from seafoods. J. Milk Food Technol. 37:553-556.
- Miller, Lawrence G., Paell S. Clark, and George A. Konkle. 1972. Possible origin of <u>Clostridium botulinum</u> contamination of Eskimo food in northwestern Alaska. Appl. Microbiol. 23:427-428.
- Shewan, J.M. 1971. The microbiology of fish and fishery products a progress report. J. Appl. Bacteriol. 34:299-315.

Microorganisms Associated with Fish and Shellfish - Gulf of Alaska

- Baross, J., and J. Liston. 1968. Isolation of Vibrio parahemolyticus from the northwestern Pacific. Nature 217:1263-1264.
- Craig, J.M. S. Hayes, and K.S. Pilcher. 1968. Incidence of <u>Clostridium</u> botulinum type E in salmon and other marine fish in the Pacific Northwest. Appl. Microbiol. 16:553-557.
- Itoughtby, Gary A., and Charles A. Kaysner. 1969. Incidence of <u>Clostri</u>dium botulinum type E in Alaskan salmon. Appl. Microbiol. 18:950-951.
- Lee, J.S., and D.K. Pfeiffer. 1975. Microbial characteristics of Dungeness crab. Appl. Microbiol. 30:72-78.
- Vasconcelos, C.C., W.J. Stang, and R.H. Laidlow. 1975. Isolation of Vibrio parahemolyticus and Vibrio alginolyticus from estuarine areas of southeaster Alaska. Appl. Microbiol. 29:557-559.

Table V

NUTRIENT ANALYSES

| SAMPLE NO. | P04-P | NH3-N | NC 3-N | \$102-\$I |
|--|--|--|--|--|
| *GWU119?05 *GWU124?U3 *GWU133?U5 *GWU133?U5 *GWU145?U3 *GWU145?U3 *GWU148?U3 *GWU156?U3 *GWU156?U3 | 05.95 07.82 06.52 07.30 07.30 07.93 07.72 08.49 | 02.2 C2.2 C6.7 C2.3 C1.4 02.2 C1.2 02.7 | C8.5 C7.8 C5.9 C7.9 C5.C C5.9 C7.1 C7.1 | C13.0 CC9.0 014.0 C10.0 CC9.0 CC8.0 010.0 010.0 |

Table VI

DIRECT COUNT

| WATER | COUNT | |
|------------|---------------------------------------|---|
| *GW0101?04 | 1.265 | |
| *GW0102?04 | 3.0E 5 | |
| *G#0103?04 | 1.465 | |
| *GW0104?04 | 4.355 | |
| *GWJ105?04 | 3.8E5 | |
| *GWU106?04 | 1.865 | |
| *GW0119?04 | 3.6E5 | ······································ |
| *GW0124?04 | 3.3E5 | |
| *GW0133?04 | 3.85 | ••••••••••••••••••••••••••••••••••••••• |
| ≠GW0137?04 | 1.055 | |
| *GWU145?04 | 2.8E5 | · · · · · · · · · · · · · · · · · · · |
| *Gw0143?04 | 2.185 | |
| *GW0155?04 | 5.055 | |
| *GWu159?U4 | 4.7E5 | |
| | | |
| SEDIMENT | · · · · · · · · · · · · · · · · · · · | |
| *GBU1J1204 | - | |
| #GB0121?04 | | |
| *G80134?04 | | |
| #GB0137?04 | | · · · · · · · · · · · · · · · · · · · |
| *G80146?04 | <u> </u> | |
| *GBJ148?J4 | | · · · · · · · · · · · · · · · · · · · |

Table VII

AEROBIC HETERCTROPHIC PSYCHPUPHILES AND PSYCHROTROPHS

| 5.0E1 2.0E1 | 04C 04C | CNEITIC AEPCBIC AEPCBIC | <u>.</u> <u>S</u> | MARINE | 2216 | | |
|----------------|--|---|--|--|--|---|---|
| 5.0E1 2.0E1 | 04C | | | MARINE | 2216 | | |
| 2.0 <u>1</u> | | AFPEBIC | | | | | |
| | 145 | | S | MARINE | 22.16 | | |
| | 540 | ABREBIC | S | MARINE | 2216 | | · · ·································· |
| 5.0F1 | 10 A 10 | AFRURIC | - | MARINE | 2216 | | |
| 6.CEl | <u>040</u> | AFROBIC | | | 2216 | | |
| 6.5E1 | | | | | | | |
| 3.5-1 | <u>04</u> C | AFRCBIC | <u> S</u> | MARINE | 2216 | | ····· · · · · · · · · · · · · · · · · |
| 9.751 | 04C | AFRGBIC | S | MAPINE | 2216 | | |
| 9.2E1 | <u>040</u> | AFRCBIC | S | MARINE | 2216 | | · · ···· |
| 1.282 | 04C | AERCHIC | S | MARINE | 2216 | | |
| 1.352 | | | - Statement of the stat | | 2216 | | |
| 1.9E2 | 04C | AERCHIC | S | MARINE | 2216 | | |
| 2.552 | 04C | AFRCBIC | S | MARINE | 2216 | | |
| 2.2E2 | 04C | AERCBIC | S | MARINE | 2216 | | |
| | | | | | | | |
| | | | | | | | |
| 1.344 | 34C | AFREBIC | S | MARINE | 2216 | - | |
| | | · · · · • | | MARINE | 2216 | | |
| | | | | MAPINE | 2216 | | |
| | | | | MARINE | 2216 | | |
| | 040 | | | | | | |
| 2.05,4 | | AFREBIC | . \$ | MARINE | 2216_ | | |
| | 6.5E1 3.5E1 9.7E1 9.2E1 1.2E2 1.3E2 2.5E2 2.2E2 1.3E4 1.1E6 1.4E6 6.2E5 | 6.5E1 04C 3.5E1 04C 9.7E1 04C 9.2E1 04C 1.2E2 04C 1.3E2 04C 2.5E2 04C 2.2E2 04C 2.2E2 04C 1.1E6 04C 1.1E6 04C 1.4E6 04C 1.4E6 04C 04C 04C | 6.5E1 U4C AERCBIC 3.5E1 04C AERCBIC 9.7E1 04C AERCBIC 9.2E1 04C AERCBIC 1.2E2 04C AERCBIC 1.3E2 04C AERCBIC 2.5E2 04C AERCBIC 2.2E2 04C AERCBIC 2.2E2 04C AERCBIC 1.0E4 04C AERCBIC 1.1E6 04C AERCBIC 1.4E6 04C AERCBIC 04C AERCBIC 04C AERCBIC | 6.5E1 U4C AERCBIC S 3.5E1 04C AERCBIC S 9.7E1 04C AERCBIC S 9.2E1 04C AERCBIC S 1.2E2 04C AERCBIC S 1.3E2 04C AERCBIC S 1.9E2 04C AERCBIC S 2.5E2 04C AERCBIC S 2.2E2 04C AERCBIC S 1.1E6 04C AERCBIC S 1.4E6 04C AERCBIC S 1.4E6 04C AERCBIC S 6.2E5 04C AERCBIC S 04C AERCBIC S | 6.5E1 U4C AERCBIC S MARINE 3.5E1 04C AERCBIC S MARINE 9.7E1 04C AERCBIC S MARINE 9.2E1 04C AERCBIC S MARINE 1.2E2 04C AERCBIC S MARINE 1.3E2 04C AERCBIC S MARINE 1.9E2 04C AERCBIC S MARINE 2.5E2 04C AERCBIC S MARINE 2.2E2 04C AERCBIC S MARINE 2.2E2 04C AERCBIC S MARINE 1.1E6 04C AERCBIC S MARINE 1.4E6 04C AERCBIC S MARINE 6.2E5 04C AERCBIC S MARINE 04C AERCBIC S MARINE | 6.5E1 04C AERCBIC S MARINE 2216 3.5E1 04C AERCBIC S MARINE 2216 9.7E1 04C AERCBIC S MARINE 2216 9.2E1 04C AERCBIC S MARINE 2216 1.2E2 04C AERCBIC S MARINE 2216 1.3E2 04C AERCBIC S MARINE 2216 1.9E2 04C AERCBIC S MARINE 2216 2.5E2 04C AERCBIC S MARINE 2216 2.2E2 04C AERCBIC S MARINE 2216 2.2E2 04C AERCBIC S MARINE 2216 1.1E6 04C AERCBIC S MARINE 2216 1.4E6 04C AERCBIC S MARINE 2216 6.2E5 04C AERCBIC S MARINE 2216 04C AERCBIC S MARINE 2216 04C AERCBIC S MARINE 2216 | 6.5E1 U4C AERCBIC S MARINE 2216 3.5E1 04C AERCBIC S MARINE 2216 9.7E1 04C AFROBIC S MARINE 2216 9.2E1 04C AFROBIC S MARINE 2216 1.2E2 04C AERCBIC S MARINE 2216 1.3E2 04C AERCBIC S MARINE 2216 1.9E2 04C AERCBIC S MARINE 2216 2.5E2 04C AERCBIC S MARINE 2216 2.2E2 04C AERCBIC S MARINE 2216 1.1E6 04C AERCBIC S MARINE 2216 1.4E6 04C AERCBIC S MARINE 2216 1.4E6 04C AERCBIC S MARINE 2216 04C AERCBIC S MARINE 2216 |

Table VIII

AFROBIC HETERUTROPHIC MESOPHILES

| WATER | COUNT | CONDITIONS |
|--------------------|---------------|---------------------------|
| *GWJ1J1?J6 | | 200 AFREBIC S MARINE 2216 |
| *Gw0102?06 | | 200 AERCBIC S MARINE 2216 |
| *GWU133735 | | 200 AEROBIC S MARINE 2216 |
| #GWU104?Q6 | | 200 AFFEBIC S MARINE 2216 |
| *GW0105206 | · · · · · | 200 AFRONIC S MARINE 2216 |
| *GWU100?05 | <u></u> | 200 AEROBIC S MARINE 2216 |
| *GWJ119?06 | 4.3E1 | 2CC AERCHIC S MARINE 2216 |
| *GW0124?u6 | 8.CE1 | 200 AEROBIC S MARINE 2216 |
| *GWJ133?J6 | 1.182 | 200 AERCHIC S MARINE 2216 |
| *GWJ137?U5 | | 200 AEROBIC S MARINE 2216 |
| *GW0145?06 | 3.1E2 | 200 AERCBIC S MARINE 2216 |
| *Gw0148?06 | 5.782 | 200 AEROBIC S MARINE 2216 |
| ∀Gw0156?0 o | 2.053 | 200 AFRCBIC S MARINE 2216 |
| *GW0159?06 | 5.6E2 | 200 AERORIC S MARINE 2216 |
| | | |
| | | |
| SEDIMENT | | |
| *GB0101?06 | | 20C ALREBIC S MARINE 2216 |
| ¥GBU121?06 | 8.485 | 200 AFROBIC S MARINE 2216 |
| *G8J134?J6 | 1. 266 | 200 AEPOPIC S MARINE 2216 |
| *G80137200 | 3.555 | 200 AFRONIC S MARINE 2216 |
| *G80140?Jó | | 200 AEROBIC S MARINE 2216 |
| *GBJ148?00 | | 200 AEROBIC S MARINE 2216 |
| | | |

Table IX

.

. . .

AEROBIC HETERCTROPHIC PSYCHPOPHILES AND PSYCHRCTROPHS

| WATER | COUNT | | CONDITIC | NS | | |
|--------------------|------------|------|----------|----------|--|---------------|
| *GW0101?07 | | -540 | AERCBIC | S | , MSWYE | |
| *GWULUZ?U7 | | 640 | AERCBIC | Ś | MSWYE | |
| *GW0103?07 | | 040 | AEROBIC | | MSWYF | |
| *GW0104?07 | | | AERCBIC | | MSWYE | • • • • • • • |
| *GW0105207 | - | Ű4C | AERCBIC | s | MSWYE | |
| *GWU106?07 | ······ | 04C | | | | |
| *GW0119?07 | | 04C | | ŝ | | |
| *GW0124?07 | | Ú4C | | <u>-</u> | | |
| *Gw0133?J7 | | 04C | | ŝ | | |
| *GW0107?07 | | 040 | | Š | | |
| ≭GWJ1 45?J7 | 3.JP1 | 04C | | ŝ | | |
| #GW0140?07 | 5.0F1 | | AERCHIC | ŝ | T i - T | |
| *GW0156207 | 7.0日1 | 040 | AERCBIC | ŝ | | |
| *GWJ159?J7 | 5.081 | 04C | AERCBIC | Š | and the second second second second second second second second second second second second second second second | |
| SEDIMENT | ····- | ··· | | | | |
| *GS0101207 | | 04C | AERCBIC | S | MSWYE | |
| *GBU121?J7 | ···· ··· . | 040 | AFRCBIC | ŝ | MSWYE | |
| *GR0134707 | | 040 | AFREBIC | ŝ | | |
| *GBJ137?J7 | 7.353 | 040 | AERCBIC | S | MSWYE | • |
| *GBJ146?U7 | | 04C | AERCBIC | S | MSWYE | |
| * GB0148?07 | 2.574 | 04C | AERCHIC | S | MSWYE | |

Table X

AEROBIC HETERGTPEPHIC MESOPHILES

| | | CONDITIONS. |
|--------------------|--------|---------------------|
| WATER | CIDUNT | CONCITIONS |
| ¥GWJ101203 | | 200 AERCBIC S MSWYE |
| ≄GWƏLJZ?US | | ZOC AFFCBIC S MSWYE |
| *GWJ1J3?J3 | | 20C AEFCBIC S MSWYE |
| *GNU104200 | | 200 AERCBIC S MSWYE |
| *GW0105?08 | | 200 AEROBIC S MSWYE |
| ≪GWU1 06208 | | 200 AEPCBIC S MSWYE |
| *GW0119?08 | | 20C AFRCBIC S MSWYF |
| *GWJ124?J8 | | 20C AERCBIC S MSWYE |
| *GW0133?03 | | 200 AEPCHIC S MSWYE |
| *GWJ137?08 | 5.080 | 200 AFROBIC S MSWYE |
| *GWJ145?J0 | 2.022 | 200 AERCHIC S MSWYE |
| #GW0143708 | 2.GE2 | 200 AERCHIC S MSWYE |
| *GWJ156?J8 | 5.052 | 200 AERCBIC S MSWYE |
| *GW0159208 | 2.0E1 | 200 AERCBIC S MSWYE |
| | | |
| SEDIMENT | | |
| *GB0101?08 | | 200 AFROBIC S MSWYE |
| *GB0121?03 | - | 200 AERCHIC S MSWYE |
| *GBU134?J8 | | 200 AEREBIC S MSWYE |
| *GB0137203 | 2.354 | 200 AFROBIC S MSWYF |
| #GB)146?∪8 | | 200 AEROBIC S MSWYE |
| *GB0148208 | | 200 AEPEBIC S MSWYE |
| | | |

324

Table XI

PSYCHROPHILIC AND PSYCHKETROPHIC FUNGI

| WATER | ີ່ເປັນທີ | Ċ | ÓNDITIC | ١S | - |
|-------------------|------------------------|-------------|---------|----|-------|
| *GW0101?15 | <1.)E) | 040 | AFROBIC | М | SD 4 |
| *GNU112?15 | | 34C | AERCHIC | М | SCA |
| *GWU103?10 | | <u>े</u> 40 | AEROBIC | Μ | SCA |
| *GNU1U4?15 | | <u>े</u> 4C | AERCHIC | М | SDA |
| *GW0105?10 | | 040 | AERCHIC | М | SEA · |
| *GW0105715 | ····· · · · | 340 | AFREBIC | M | SCA |
| *GWU119?15 | 1.JEJ | 340 | AEROBIC | M | SDA - |
| *GR0124?15 | 8.7E0 | 04C | AEROBIC | М | SEA |
| *GW0133?15 | 1.3E1 | 040 | AEROBIC | М | SDA |
| *GWU137?1> | 4.0E) | 340 | AERCHIC | M | SCA |
| *GwJ145?15 | 2.050 | 040 | AEPCBIC | M | SCA |
| *GWJ148?15 | R1.0EJ | 04C | AFROBIC | М | SDA |
| *GWU106?10 | <1.JED | 04C | AERCHIC | М | SEA ' |
| *GW0159?15 | | 040 | AFPCBIC | М | SEA |
| +0NJI)),I) | (1. oc u | C 10 | | | - |
| | | | | | |
| SEDIMENT | | | | | |
| *GBJ1J1?15 | 3.5E2 | 04.C | AEROBIC | Ş | SDA |
| *GB0121215 | 2.884 | 04C | AEROBIC | S | SCA |
| *630134?15 | 2.5E4 | J4C | AEROBIC | S | SUA |
| ≭G3J137?15 | 6.553 | 34C | AFROBIC | S | SDA |
| *G50140?15 | | 040 | AERCBIC | S | SCA |
| *GBC143?15 | 9.383 | 040 | AFRGBIC | S | SDA |
| | | | | | |

Table XII

.

MESCPHILIC "FUNGI"

| WATER | COUNT | CONDITIONS | |
|--------------------|---|--|--|
| *GWJ101?16 | | 200 AFROBIC M SDA | |
| *GW0102?15 | | 200 AERCHIC M SDA | |
| *GWU103?16 | | 200 AEROBIC M SCA | |
| *GW0104?16 | | 200 AEROBIC M SDA | |
| *GWU1J5?16 | | 200 AEROBIC M SDA | |
| *GW0106716 | | 200 AEROBIC M SCA | |
| .#GW0119?16 | 7.CE 0 | 200 AERCHIC M SDA | |
| | | | |
| *GW0124?10 | 1.2E1 | 200 AEROBIC M SEA | |
| *GW0133?1 6 | 7.CEC | 20C AERCHIC M SDA | |
| *GW0137?16 | 1.250 | 200 AEROBIC M SCA | |
| *GW0145?16 | 1.681 | 200 AERCHIC M SEA | |
| *GWU148?15 | 2.0E0 | 200 AERCBIC M SDA | |
| *GWJ155?16 | | 20C- AERCBIC M SCA | |
| *GW0159?16 | 1.0E1 | 200 AERCHIC M SCA | |
| | | ······································ | |
| | | | |
| SEDIMENT | • | | |
| ¥GBU101?16 | | 200 AEROBIC S SDA | |
| *GB0121?16 | 1.554 | 20C AEROBIC S SDA | |
| *GBJ134?16 | 3.181 | 200 AERCBIC S SDA | |
| *GB0137?16 | | 200 AEPOBIC S SDA | |
| *GBU143?16 | - | 20C AFREBIC S SEA | |
| *GB0148716 | • • | 20C AFROBIC S SCA | |
| | | | |

326

Table XIII

"PSEUDOMONADS"

| | | ····· |
|-----------------------------|-------------|---------------------------------------|
| WATER | COUNT | CONDITIONS |
| *GW0101?12 | | 20C AERCBIC M PSEUDOSEL |
| *GW01 02?12 | | 200 AERCHIC M PSEUDOSEL |
| *GW0103?12 | | 20C AERCBIC M PSEUDOSEL |
| *GW0104?12 | | 200 AERCUIC M PSFUDOSEL |
| *GW0105?12 | | 20C AEROBIC M PSEUDOSEL |
| *GW0106?12 | | 200 AERCBIC M PSEUDOSEL |
| *GW0119?12 | <1.0E-1 | 200 AEROBIC M PSEUDOSEL |
| *GWJ124?12 | <1.08-1 | 20C AERCHIC M PSEUDOSEL |
| *GW0133?12 | <1.0E-1 | 20C AFRCBIC M PSEUDOSEL |
| *GW0137?12 | <1.0F-1 | 20C AERCHIC M PSEUDOSEL |
| *GW0145?12 | <1.0E-1 | 200 AERCBIC M PSEUDOSEL |
| *GW0148?12 | <1.0E-1 | 20C AERCBIC M PSEUDOSEL |
| *GW0155712 | <1.08-1 | 2CC AFROBIC M PSEUDOSEL |
| *GW0159?12 | <1.0E-1 | 20C AERCBIC M PSEUCOSEL |
| | | • |
| | | · · · · · · · · · · · · · · · · · · · |
| SEDIMENT | | |
| *GB0101?12 | | 200 AERCBIC M PSEUDOSEL . |
| * GB 0121?1 2 | <1.CE2 | 200 AERCBIC M PSEUDOSEL |
| *GB0134?12 | <1.JE2 | 20C AEROBIC M PSEUDOSEL |
| #GB0137?12 | <1.0F2 | 200 AERCBIC M PSEUDUSEL |
| *GB0146?12 | | 20C AFROBIC M PSEUDOSEL |
| *G80148?12 | ~~~~ | 200 AERCHIC M PSEUDOSEL |

Table XIV

SALMCNELLA-SHIGELLA

| WATER *GW0101?11 *GW0103?11 *GW0103?11 *GW0103?11 *GW0105?11 *GW0105?11 *GW0106?11 *GW0124?11 *GW0124?11 *GW0133?11 *GW0145?11 *GW0148?11 *GW0155?11 | COUNT 20C AEROBIC M SS 2CC AEROBIC M SS 2CC AEROBIC M SS 2CC AEROBIC M SS 2UC AEPOBIC M SS 2UC AEPOBIC M SS 2UC AEPOBIC M SS 1.0FD 2CC AEROBIC M SS <1.0E-1 20C AEROBIC M SS <1.0E-1 20C AEROBIC M SS 0.2EU 20C AEROBIC M SS 0.2EU 20C AEROBIC M SS <1.0E-1 20C AEROBIC M SS 0.2EU 20C AEROBIC M SS <1.0E-1 20C AEROBIC M SS 0.2EU 20C AEROBIC M SS <1.0E-1 20C AEROBIC M SS 0.2EU 20C AEROBIC M SS <1.0E-1 20C AEROBIC M SS <1.0E-1 20C AEROBIC M SS <1.0E-1 20C AEROBIC M SS <1.0E-1 20C AEROBIC M SS <1.0E-1 20C AEROBIC M SS <1.0E-1 20C AEROBIC M SS <1.0E-1 20C AEROBIC M SS <1.0E-1 20C AEROBIC M SS <1.0E-1 20C AEROBIC M SS <1.0E-1 20C AEROBIC M SS <1.0E-1 20C AEROBIC M SS <1.0E-1 20C AEROBIC M SS <1.0E-1 20C AEROBIC M SS <1.0E-1 20C AEROBIC M SS <1.0E-1 20C AEROBIC M SS <1.0E-1 20C AEROBIC M SS <1.0E-1 20C AEROBIC M SS <1.0E-1 20C AEROBIC M SS <1.0E-1 20C AEROBIC M SS <1.0E-1 20C AEROBIC M SS <1.0E-1 20C AEROBIC M SS <1.0E-1 20C AEROBIC M SS <1.0E-1 20C AEROBIC M SS <1.0E-1 20C AEROBIC M SS <1.0E-1 20C AEROBIC M SS <1.0E-1 20C AEROBIC M SS <1.0E-1 20C AEROBIC M SS <1.0E-1 20C AEROBIC M SS <1.0E-1 20C AEROBIC M SS <1.0E-1 20C AEROBIC M SS <1.0E-1 20C AEROBIC M SS <1.0E-1 20C AEROBIC M SS <1.0E-1 20C AEROBIC M SS <1.0E-1 20C AEROBIC M SS <1.0E-1 20C AEROBIC M SS <1.0E-1 20C AEROBIC M SS <1.0E-1 20C AEROBIC M SS <1.0E-1 20C AEROBIC M SS <1.0E-1 20C AEROBIC M SS <1.0E-1 20C AEROBIC M SS <1.0E-1 20C AEROBIC M SS <1.0E-1 20C AEROBIC M SS <1.0E-1 20C AEROBIC M SS <1.0E-1 20C AEROBIC M SS <1.0E-1 20C AEROBIC M SS <1.0E-1 20C AEROBIC M SS <1.0E-1 20C AEROBIC M SS <1.0E-1 20C AEROBIC M SS <1.0E-1 20C AEROBIC M SS <1.0E-1 20C AEROBIC M SS <1.0E-1 20C AEROBIC M SS <1.0E-1 20C AEROBIC M SS <1.0E-1 20C AEROBIC M SS <1.0E-1 20C AEROBIC M SS <1.0E-1 20C AEROBIC M SS <1.0E-1 20C AEROBIC M SS <1.0E-1 20C AEROBIC M SS <1.0E-1 20C AEROBIC M SS <1.0E-1 20C AEROBIC M SS <1.0E-1 20C AEROBIC M SS <1.0E-1 20C AEROBIC M SS <1.0E-1 20C AEROBIC M SS <1.0E-1 20C AEROBIC M SS < |
|---|--|
| *GWJ159?11 SEDIMENT *GBJ1J1?11 *GBJ121?11 *GBJ134?11 *GBJ137?11 *GBJ148?11 *GBJ148?11 | 1.CEO20CAERCBICMSS20CAERCBICMSS<1.CE2 |

.

.

Table XV

MENTERIC BACTERIAM

| WATER | COUNT | · · · · · · · | CNEITICN | , S | |
|-------------|---------|---------------|----------|-----|----------|
| *GW0101?17 | | 200 | AERCBIC | М | EMB |
| | | 200 | AEROBIC | м | ЕМВ |
| *Gwu1u2?17 | | 200 | | М | EMB |
| *GWU103217 | | 200 | AERCOIC | М | EMB |
| *GWJ104?17 | | 200 | AERCBIC | м | EMB |
| *GWJ105?17 | | | | M | EMB |
| *GW0156?17 | | 20C | AERCBIC | | |
| *GW0119217 | <1.0E-1 | | AEROBIC | M | EMB |
| *GW0124?17 | <1.0E-1 | | AERCBIC | Μ | EMB |
| *GW0133?17 | 1.0F0 | <u>200</u> | AERCOIC | M | EMB |
| *GWU137217 | <1.CE-1 | 2 G C | AERCBIC | м | EMB |
| *GWJ145?17 | 2.050 | 200 | AERCBIC | Μ | EMB |
| *GW0148?17 | 1.3F1 | 200 | AFECBIC | Μ | FMB |
| *GW01156?17 | <1.0回-1 | | AERCBIC | М | ENB |
| *GWu159?17 | <1.0E-1 | | AERCHIC | Μ | EMB |
| | | | <u>,</u> | | <u> </u> |
| SEDIMENT | | | AEROBIC | M | EMB |
| *GB0101?17 | | 200 | | | |
| *G30121?17 | <1.052 | 200 | AERCBIC | M | EMB |
| *G80134?17 | <1.052 | 200 | AEROBIC | M | - ·· |
| *G80137?17 | <1.0E2 | 200 | | M | |
| *G80146?17 | | 200 | | M | |
| | | 200 | AERCBIC | M | ENB |

Table XVI

.

"VIBRIO" MESOPHILES

| WATER | "COUNT | CONCITIONS |
|--------------------|----------------|--------------------|
| *GW0101?10 | | 20C AERCEIC M TOBS |
| *GWU102?10 | | 200 AEROBIC M TOBS |
| *GWJ1J3?10 | | 200 AERCHIC M TOBS |
| *GN0104?10 | | 20C AERCBIC M TOBS |
| # G₩G105?10 | <u> </u> | 20C AERCHIC M TOBS |
| *GW0106?10 | · | 200 AERCBIC M TOBS |
| *GW0119?10 | 1.5E1 | 200 AFREBIC M TCES |
| *GWJ124?10 | 1.251 | 200 AEPCHIC M TCHS |
| *GW0133?10 | <u>4.CEC</u> | 20C AERCBIC M TCBS |
| *GW0137?1J | 5.480 | 20C AERCHIC M TCBS |
| *GW01+5?10 | 8• 7 50 | 20C AERCBIC M TCBS |
| *GW0148?10 | 4.9EQ | 200 AFPEBIC M TCHS |
| *GW0156?1 0 | <u>1.CF1</u> | 20C AFROBIC M TOBS |
| *GW0159?10 | J.9E∪ | 20C AFREBIC M TEBS |
| SED IMENT | | |
| #GB0101?1J | | 200 AEDCOLC M TCOC |
| • *GB0121?10 | 6 01 6 | 20C AERCHIC M TCBS |
| *GB0134?10 | 4.0E4 | 20C AERCHIC M TCBS |
| *GB0137?10 | 4.2F4 | 20C AEROBIC M TCBS |
| *GB0137710 | 2.483 | 20C AERCBIC M TCBS |
| *GBU1+8?1U | | 20C AEROBIC M TOBS |
| | | 200 AERCBIC M TCBS |

330

Table XVII

DIL UTILIZING PSYCHROPHILES AND PSYCHROTROPHS

-

| WATER | COUNT | CUNCITIC | <u>NS</u> . |
|--------------------|---------|-------------|-------------|
| *GWU101?13 | <1.0E-1 | | |
| #GWJ1J2?13 | | U4C AERCBIC | |
| *GWU103?13 | | CAC AEROBIC | |
| ₩GWU104?13 | | D4C AERCBIO | C M CIL |
| *GWU1U5?13 | | 04C AERCBI | · · · · |
| *GW0106?13 | | 04C AERCBI | C M CIL |
| *GW0119?13 | Č.5€0 | 04C AEROBIC | C M CIL |
| *GWU124?1J | 1.551 | U4C AERCEIC | C M CIL |
| . *GWU133?13 | <1.08-1 | 34C AERCHIC | C M CIL |
| *GWU137?13 | <1.CE-1 | 04C AERCHIC | C M CIL |
| * G₩0145?13 | <1.0E0 | 04C AERCBIO | C M CIL |
| *GWU148?13 | <1.050 | 04C AEPUBIC | C M CIL |
| ≭G ₩0156?13 | C.5F0 | C4C AERCBIC | C M CIL |
| *GW0159713 | 0.1E0 | 04C AERCBIO | C M CIL |
| SEDIMENT | | _ | |
| *GBU101?15 | <1.082 | 94C AERCOIC | C S CIL |
| *GB0121?13 | <1.0E2 | U4C AEROBI | C S GIL |
| *GB0134?13 | <1.CE2 | 04C AERCBI | C S CIL |
| *GBU137?13 | <1.CE2 | 04C AERCBI | C S CIL |
| *GB0140?13 | | 04C AERCBIO | |
| *G30148?13 | <1.0E2 | 04C AEPOBI | C S CIL |
| | | | |

Table XVIII

OIL UTILIZING MESOPHILES

......

| WATER *GW0101?14 *GW0103?14 *GW0103?14 *GW0103?14 *GW0105?14 *GW0105?14 *GW0105?14 *GW0124?14 *GW0123?14 *GW0137?14 *GW0145?14 *GW0148?14 | COUNT CONDITIONS 2 OC AFROBIC M CIL 2 OF -1 2 OC AFROBIC M CIL 1. OE -1 2 OC AFROBIC M CIL 41. OE -1 2 OC AFROBIC M CIL |
|---|--|
| ¥G₩J156?14 ≠G₩J159?14 | <1.0F-1 20C AFRCBIC M CIL 2CC AFRCBIC M CIL |
| SEDIMENT *GB0101?14 *GB0121?14 *GB0134?14 *GB0137?14 | 20C AERCHIC S CIL <1.0E2 20C AERCBIC S CIL <1.0F0 20C AERCBIC S OIL 20C AERCBIC S CIL 20C AERCBIC S CIL 20C AERCBIC S CIL 20C AERCBIC S CIL |
| <u>+GB0145?14</u> +GB0148?14 | 20C AERCHIC S CIL |

43

Table XIX

PLATE COUNTS

| Туре | Area | <u> </u> | Organisms/gram tissue wet wt. | | | | | | | |
|-----------|-------------|------------|-------------------------------|--|-----------------|--------------------------------------|------------|------------------|----------------------------|--|
| of | of | t | Marine | e Agar 🛛 | TCBS (Vibrio) M | | McConk | * | Anaerobic Marine Agar | |
| Crab | Collection | 1 | Muscle | Gill | Muscle | Gill | Muscle | Gill | Muscle | Gill |
| Dungeness | Chiniak Bay | | ~400 | 1.66x10 ⁵ | <50 | <10 ³ | <50 | <103 | <50 | <50 |
| Tanner | Chiniak Bay | (1) | <50 | 1.7x10 ⁴ | <50 | <10 ³ | <50 | <10 ³ | <50 | 2.5x10 ⁴ |
| | | (2) | <50 | 4.3x10 ⁴ | <50 | <10 ³ | <50 | <103 | <50 | 1.2x10 ³ |
| | Bering Sea | (1) | <50 | <10 ³ | <50 | <10 ³ | <50 | <10 ³ | <50 | 5.5x10 ² |
| | | (2) | <50 | <10 ³ | <50 | <10 ³ | <50 | <10 ³ | <50 | <50 |
| | Ugak Bay | (1) (2) | <50 <50 | 6.0x10 ³ 5.2x10 ⁴ | <50 <50 | <10 ³ <10 ³ | <50 <50 | <10 ³ | <50 3.8x10 ³ | 9.0x10 ² 3.6x10 ⁴ |
| | | (2) | | J.2AIU | | -10 | | -10 | | |

Table XX

Number of Isolants

| | 2.0 |)C | 4 |] | |
|----------------|-------|----------|-------|----------|-------|
| | Water | Sediment | Water | Sediment | Total |
| TOTAL ISOLATED | 60 | 49 | 73 | 24 | 206 |
| Gram Positive | 4 | 2 | 4 | 0 | 10 |
| Gram Negative | 49 | 38 | 67 | 24 | 178 |
| Coccoid-shaped | 2 | 1 | 0 | 0 | 3 |
| Rod-shaped | 49 | 40 | 68 | 24 | 181 |
| Non-motile | 23 | 25 | 15 | 8 | 71 |
| Motile | 31 | 18 | 56 | 16 | 121 |

Table XXI

PERCENTAGE OF ORGANISMS TESTED

| | Gram ⁺ | Gram | Coccoid | Rođ | Non-motile | Motile |
|-------------------------|-------------------|------|---------|-------|------------|--------|
| Total 20C Isolants | 6.5 | 93.5 | 3.2 | 96.8 | 49.5 | 50.5 |
| Total 4C Isolants | 4.2 | 95.8 | 0 | 100.0 | 24.2 | 75.8 |
| Total Water Isolants | 6.5 | 93.5 | 1.7 | 98.3 | 30.4 | 69.6 |
| Total Sediment Isolants | 3.1 | 96.9 | 1.5 | 98.5 | 47.6 | 52.4 |
| TOTAL ORGANISMS | 5.3 | 94.7 | 1.6 | 98.4 | 37.0 | 63.0 |

FORM HUMBER =100190

| F.14 | TIDDER STORT | 그년 | | | |
|------|--------------|---------|--------|------------|------------|
| | 6999976 | GULF OF | BLASKA | MATER 200 | STATION133 |
| | 6000082 | | | | STATION133 |
| | 688883 | GULF OF | ALASKA | WATER 200 | STATION133 |
| | 6000094 | GULF OF | ALASKA | WATER 200 | STRTION133 |
| | G000152 | GULF OF | ALASKA | WATER- 200 | STRTION148 |
| 6 | 6999582 | GULF_OF | ALASKA | WATER 04C | STRTION124 |
| • | • | | | | |

100190

6 STRAINS

END FORM

Table XXII

ACID FAST STAINS

-

END FORM 10 STRAINS

FORM NUMBER =100190

100190

| V.95.1.1 | 1101.10516 | | | | | | | | |
|----------|------------|---------|----|---------------|-------|-----|------|--------|--------------|
| 1 | 688988 | GULF | ŪF | ALASKA | WATER | 290 | STAT | ION133 | 3 |
| 2 | 688882 | GULF | ŪF | ALASKA | WATER | 200 | STAT | ION133 | 3 |
| Э | G00015 | ie GULF | ÛF | ALASKA | Hater | 200 | STAT | IQN148 | 3 |
| 4 | 600021 | 2 GULF | ÛF | ALASKA | MATER | 200 | STAT | IQN159 |) |
| 5 | 600025 | | | ALASKA | | | | | |
| 6 | G00027 | | | ALASKA | | | | | |
| 7 | 600052 | | | ALASKA | | | | | |
| 8 | G00057 | 7 GULF | ŨÊ | ALASKA | WATER | 04C | STAT | ION124 | ŀ |
| 9 | 600058 | | | ALASKA | | | | | |
| 10 | G00068 | 1 GULF | 0F | ALASKA | NATER | 04C | STAT | ION148 | 3 |
| | | | | | | | | | |

GRAM POSITIVE STAINS

Table XXIII

Table XXIV

Microorganisms isolated from: DUNGENESS CRABS

Gill

Muscle

Table XXV

Microorganisms isolated from: TANNER CRABS

| Gill | Muscle | Eggs |
|---|--|--|
| Staphylococcus epidermidis Micrococcus spp. Alcaligenes spp. Moraxella spp. Acinetobacter calcoaceticus | Staphylococcus epidermidis Micrococcus spp. | Staphylococcus epidermidis Micrococcus spp. Sarcina spp. Alcaligenes spp. Acinetobacter calcoaceticus Pseudomonas fluorescens |

Fig. 1 Map showing sampling locations for water and sediment samples.

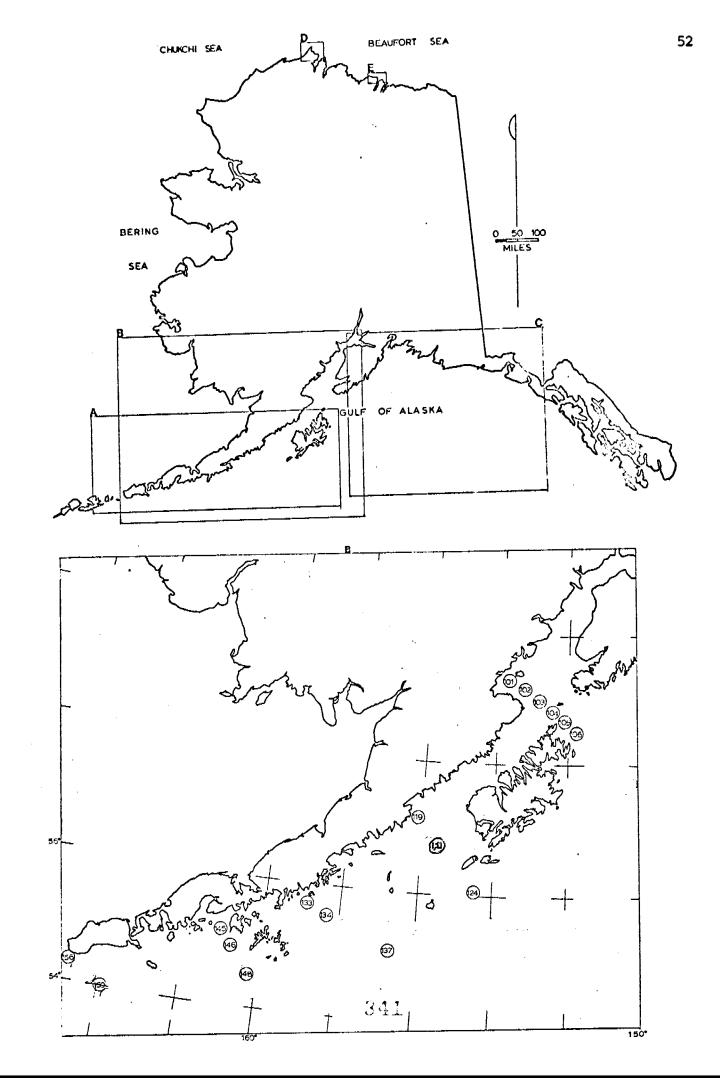
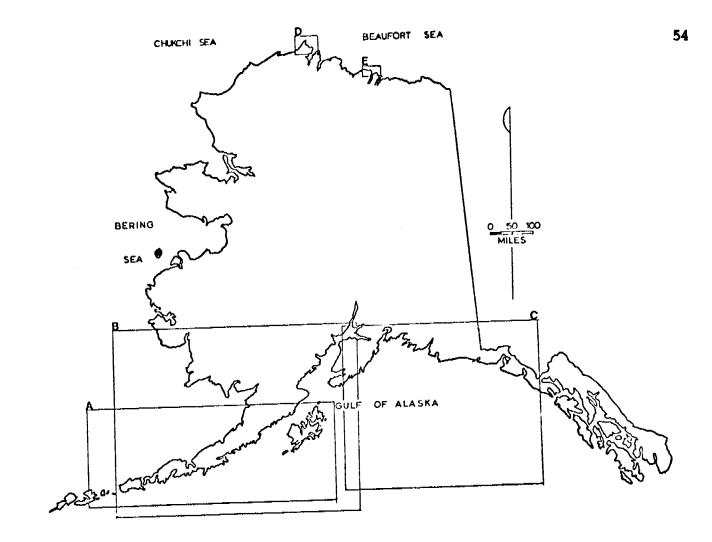
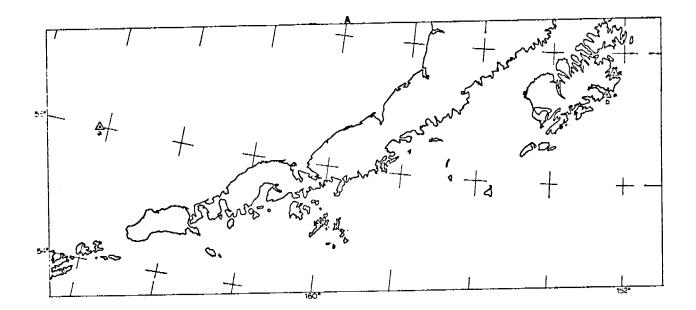


Fig. 2 Map showing locations for crab collections.

- a. Bering Sea b. Ugak Bay c. Chiniak Bay





Future Work

During the remainder of the contract two more cruises are scheduled aboard the <u>Discoverer</u> for sampling. One of these cruises is presently in the northeast Gulf of Alaska. Additionally, beach samples are being collected. These samples will be processed for enumeration of microorganisms and compared to the previous samples. Microorganisms will be isolated from these samples for taxonomic characterization. It is anticipated that taxonomic characterization should be completed on microorganisms isolated from the October cruise as well as the April cruise by October 1976. Isolants from the August 1976 cruise will not be completed by that date.

Crab samples will continue to be examined for analysis of potential pathogens. Additionally, some clam and salmon specimens should be received for analysis.

As planned, assays will be made during the forthcoming cruises for rates of hydrocarbon biodegradation and bioemulsification. Assay should be completed by October. A complete proposal for future work during a second contract year is being prepared.

344

ANNUAL REPORT

Contract #01-6-022-11469 Research Unit #43/44/45

Reporting Period July 1, 1975 - March 15, 1976 34 Pages

Stephen N. Chesler Barry H. Gump Harry S. Hertz Willie E. May Trace Organic Analysis Group Bioorganic Standards Section Analytical Chemistry Division National Bureau of Standards Washington, D.C. 20234

April 1, 1976

I. SUMMARY OF OBJECTIVES, CONCLUSIONS AND IMPLICATIONS WITH RESPECT TO OCS OIL AND GAS DEVELOPMENT

The objectives of this study are to assure the quality of the chemical data reported to NOAA and to develop accurate and precise methods for chemical analysis of the marine environment. Specific conclusions can be found in the body of this report. Of maximum interest is the development of new liquid chromatographic procedures which enhance both the selectivity and sensitivity of analysis of hydrocarbons in biological tissue samples and polynuclear aromatic hydrocarbons in all matrices. The first sediment intercalibration study, while small in scope, nevertheless shows the advantages of such studies.

II. INTRODUCTION

- A. General Nature and Scope of Study
 - Quality assurance program for trace hydrocarbon analysis
 - 2) Methods development for analysis of individual high molecular weight aromatic hydrocarbons by LC-fluorescence techniques
 - 3) Methods development for trace hydrocarbon analysis in the sea ice and at the sea ice-water interface
- B. Specific Objectives

The objectives of the proposed research are 1) to serve as a quality assurance laboratory for hydrocarbon analysis in sediments, tissue and water, 2) to develop methodology for identification and quantitation of individual 3-, 4-, 5-, and 6-condensed ring aromatic hydrocarbons at ng/kg (part per trillion) levels; 3) to develop methodology for sampling the sea ice-water interface and analyzing it for its organic content; and 4) to continue methodology development for the determination of trace hydrocarbons in marine tissue. C. Relevance to Problems of Petroleum Development

With the large number of environmental analyses being performed, the need for quality assurance (i.e., accurate and precise measurements) is great. Clearly, accuracy is far more difficult and costly to achieve than precision, and indeed, even precision is not easily achieved on an interlaboratory scale. Until such time as standard reference materials are available, a quality control function is essential to assure the comparability of numbers obtained by different laboratories.

With increasing petroleum development, serious consideration must be given to the presence of toxic polynuclear aromatic hydrocarbons arising from petroleum in the marine environment. In order to assess the biological effect of these molecules it is first necessary to develop chemical methodology for their analyses at very low levels (ng/kg). The liquid chromatographic (LC) technique described in this report permits ng/kg (ppt) analyses.

The NOAA task of primary emphasis in this research is:

A-33--Determination of total content and chemical species of hydrocarbons in the water column, in selected marine organisms, in sea ice and in the sea ice-water interface.

The results of the proposed research could have secondary influence on the following NOAA tasks:

A-31--Determine the relationship of living resources to the ice environment.

B-8--Examine the processes which determine the fate of hydrocarbons introduced into the environment.

B-14--Develop means to predict possible interactions between ice and oil and other contaminant discharges.

347

- 2 -

III. CURRENT STATE OF KNOWLEDGE

Due to the unavailability of standard reference materials and the lack of intercalibration samples no concerted laboratory intercomparison program exists to date. Current methodologies for determination of hydrocarbons in marine tissues and polynuclear aromatic hydrocarbons are not sensitive enough for the Gulf of Alaska study.

- 3 -

IV. STUDY AREAS

A. Gulf of Alaska

B. Bering Sea

V. SOURCE METHODS AND RATIONALE OF DATA COLLECTION

N/A

VI-VII. RESULTS AND DISCUSSION

Technical Note 889 titled "Trace Hydrocarbon Analysis: National Bureau of Standards Prince William Sound/ Northeastern Gulf of Alaska Baseline Study" has been released. This technical note describes in detail the NBS procedures for hydrocarbon analysis of the marine ecosystem and presents partial results of the baseline study. A less detailed, but complete, summary of the methodology was recently published in the Journal of Chromatographic Science. Copies of these two publications are appended to this annual report.

The hydrocarbon content (including polynuclear aromatic hydrocarbons [PAH's]) in water samples collected in spring 1975 were reported for all the baseline sites. Results were also reported for sediment samples collected in spring 1975 and water samples collected jointly with Dr. D. Shaw in October 1975. The tabulated data and a detailed discussion of these results are contained in the December 1975 semi-annual report. Several new methods of analysis are reported below in the summary of fourth quarter operations. A procedure has been developed for the sensitive determination (\geq 1 ng) of PAH's. This technique utilizes liquid chromatography with both UV and fluorescence detection. Progress has been made in optimizing the procedure for determining the trace hydrocarbon content of marine tissue.

As previously reported, studies are underway to determine if the Katalla River sediment would be suitable as a petroleum-in-sediment intercalibration material. Frozen samples of this sediment have been sent to J.A. Calder, Florida State University, and J.S. Warner, Battelle Columbus Laboratories, for trace hydrocarbon analysis by their respective analytical methodologies. In addition, we retained and analyzed four bottles of the sediment by headspace sampling and GC/GC-MS. The contents of a fifth bottle were Soxhlet extracted and cleaned up by LC to give the water content of the sediment and a total extractable hydrocarbon value. A complete discussion of results is found in the summary of fourth quarter activities.

VIII. CONCLUSIONS

The water and sediment data determined for the spring 1975 collection is consistent with prior water and sediment data. The results of our first limited sediment sample split are encouraging. The results of the analysis of the water samples collected jointly with Dr. D. Shaw indicated no difference (within experimental error) between the two water sampling devices used. Differences in the results, based on analytical methodology, cannot be assessed until we receive Dr. Shaw's results.

IX. NEEDS FOR FURTHER STUDY

Since the sea ice-water interface project was severely cut back this year, next year's efforts will have to be enlarged. Funding was not sufficient for us to collect samples this year and although the University of Alaska had agreed to collect samples for us, they have not as yet supplied us with samples.

We expect the quality assurance program to grow in the next year. During this period we should complete a sediment and tissue round robin. We expect all NOAA contractors involved in trace organic analysis to participate in this study. Of relevance to the quality assurance program are the recommendations of the NBS/EPA Workshop on SRM's for Offshore Drilling of Petroleum. A summary of this Workshop is appended to this annual report.

X SUMMARY OF FOURTH QUARTER ACTIVITIES

A. Sediment Intercalibration Study

As stated above, a small sediment intercalibration study was initiated. To date we have received data and results from Dr. John Calder of Florida State University. His results and ours are summarized in Table 1. Dr. Calder's analytical procedure involved multiple ultrasonic bath extractions of the sediment with methanol and methylene chloride followed by saponification of the lipids. The extracted non-saponifiables were subsequently chromatographed on alumina: silica gel, reduced to a small volume for GC analysis and then taken to dryness for weighing. A single sediment sample was analyzed at NBS by Soxhlet extraction (48 hours with ethyl ether). The ether extract was passed through anhydrous Na_2SO_4 and reduced to 2 ml; the hydrocarbons were isolated by liquid chromatography on a μ Bondapak NH₂ column, reduced to a small volume for GC analysis and then taken to dryness for weighing. We have shown µBondapak NH₂ columns to be efficient in the removal of organic compounds of biological origin from sediment extracts. These columns also yield more efficient class

- 5 -

separations of the various compounds of interest (aliphatics, aromatics, thiophenes) than do the alumina:silica gel columns commonly used.

- 6 -

Although the results obtained from this intercalibration experiment are quite limited, they show that a more extensive intercalibration exercise using the Katalla River sediment would be valuable.

Homogeneity studies of the sediment from four different sample bottles (analyzed using headspace sampling-GC) gave values listed in Table 2. Statistical analysis indicates that, at a 99% confidence level the results from the 1Q series do not belong to the same population as the results of the other series. A possible explanation for this may be the following. Examination of the GC data of the 1Q series shows a much larger recovery of the first two internal standard compounds than normal for headspace sampled sediment. Inasmuch as the bulk of the hydrocarbons elute in the GC region of the first two internal standards, the high recovery of these standards causes the calculated analytical results to be low.

The data from the sediment in the three sample bottles, 9P, 10P, and 3N, indicate that with a sample size of ~ 40 g the relative bottle-to-bottle precision is of the same order of magnitude ($\sim 10\%$ relative standard deviation of the mean) as that obtained for three replicate analyses from the same bottle ($\sim 6\%$ average relative standard deviation of the mean). A more extensive intercalibration exercise will be preceded by more efficient homogenization of the bulk sediment; thus the bottle-to-bottle precision should improve.

In comparing the gas chromatographic results of both laboratories several comments may be made. The overall agreement between the résults (.97 μ g/kg vs 3.5 μ g/kg) is quite good

considering the present state-of-the-art of hydrocarbon analyses in sediment samples. It is evident from the list of four most abundant compounds that the extraction methods appear to emphasize the recovery of the aliphatic hydrocarbons at the expense of the substituted two-condensed ring aromatic hydrocarbons. The substituted naphthalenes, of interest due to their high toxicity to marine life, elute chromatographically in the \underline{n} - C_{11} - \underline{n} - C_{13} range. An examination of Calder's and the NBS Soxhlet extraction GC data and the quantitative amounts of the various n-alkanes indicates some losses of compounds (presumably during the evaporation-concentration step) up to $n-C_{15}$. The four largest peaks from Calder's aromatic fraction are listed in Table 1. These peaks, while unidentified, do elute in the range of the substituted naphthalenes $(\underline{n}-C_{11})$ - \underline{n} -C₁₃) and would be subject to losses during the evaporationconcentration step.

The difference in GC elution profiles from solvent extracted and headspace sampled sediment samples is made further evident by comparing histograms of concentration vs time corresponding to the respective gas chromatograms (Fig. 1). While the n-aliphatics are more prominent in the extracted sediment (Fig. 1A), the substituted naphthalenes are more prominent in the headspace sampled sediment. The GC-MS total ion chromatogram and m/e 43 and m/e 142, 156 and 170 single ion records (Fig. 2) confirm the latter. It appears, then, that while both the solvent extraction and headspace sampling methods yield essentially the same value for low level hydrocarbon contamination in a sediment sample, they emphasize different aspects of that contamination. Solvent extraction methods primarily provide information about the aliphatic hydrocarbons, in the \underline{n} -C₁₂ - \underline{n} -C₃₀ molecular weight range, in contrast to the headspace sampling method which additionally provides information about the toxic substituted naphthalenes. The latter technique can be complemented by the NBS extraction-LC-fluorescence detection method which provides information about the PAH concentration of the sample.

- 7 -

In the near future an NBS sampling party will collect ~100 kg each of two Alaska intertidal sediments (Katalla River and a control site) for a more extensive intercalibration exercise. These sediments will be homogenized, have their homogeneity evaluated and be sent to the laboratories participating in the exercise.

- 8 -

B. Hydrocarbon Analysis in a Tissue Bound Matrix

Work is continuing on the development of an analytical method for the determination of petroleum hydrocarbons in various marine tissue samples. Initial efforts have been previously reported; in short, they involve dynamic headspace sampling of the tissue homogenate followed by liquid chromatographic removal of the biogenic polar components extracted. High resolution gas chromatography is then used for quantitation of the petroleum hydrocarbons present in the headspace extract. Two main areas of concern are currently being pursued. (1) Since most of the organic compounds being removed from the tissue homogenate are of biological origin, a substantial effort is being concentrated on the liquid chromatographic cleanup and removal of these biogenic compounds from the total extract. Effective cleanup should permit a reduction of the biogenic background in the gas chromatogram used for quantitation, and allow greater sensitivity (sub-microgram per kilogram) than now possible for individual components. (2) The determination of the relative recoveries of the petroleum hydrocarbons incorporated in the tissue sample is also of great concern. It is necessary to establish the level of recovery of the various classes of petroleum hydrocarbons from tissue so that appropriate sample sizes can be used for desired sensitivity levels. It is also imperative to know whether the internal standard compounds added to the tissue for quantitation purposes are recovered to the same extent as these components would be if incorporated in the tissue matrix.

As previously reported (July 15, 1975 Quarterly Report), a number of liquid chromatographic packing materials have been investigated for their ability to separate the petroleum hydrocarbons of interest from the biogenic compounds simultaneously headspace extracted from mussel tissue homogenate.

- 9 -

µBondapak NH₂ is an LC packing material currently being investigated for its ability to separate hydrocarbons from common biogenic compounds as a clean up step prior to GC analysis. When using a nonpolar mobile phase such as pentane, the μ Bondapak NH₂ column provides a class separation similar to that obtained using a silica column, i.e., saturated hydrocarbons elute before unsaturated hydrocarbons and aromatics, and the elution volume for the aromatics increases with the number of condensed rings. Retention volume data for some hydrocarbons and some alcohols (Table 3) indicate that alcohols are strongly retained on the μ Bondapak NH₂ column when a nonpolar mobile phase is used. The alcohols (possible biogenic compounds) can be eluted from the column by increasing the polarity of the mobile phase. Using the µBondapak NH2 column to achieve a class separation eliminates the major difficulty encountered when using silica columns: loss of resolution due to deactivation caused by the presence of traces of water in the sample.

In a previous report (July 1975) a partial LC cleanup of the biogenic background headspace-sampled from mussels was reported using a copolymer (styrene/divinylbenzene/ methacrylic acid) packing material. Figure 3 compares the hydrocarbon separations achieved using this acid column (A) and the μ Bondapak NH₂ column (B). Clearly, the μ Bondapak NH₂ provides a more efficient separation of the test mixtures. In addition the copolymer packing material was available only in a limited quantity. Further investigations using this material were abandoned to pursue the more promising

 μ Bondapak NH₂ column. Figure 4 compares the gas chromatogram obtained from a headspace-sampled mussel TENAX GC column (A) and the gas chromatogram of the 3-13 ml fraction (evaporated to ca. 200 µl) collected from a µBondapak NH₂ column (B).

The very efficient class separation and biogenic cleanup provided by the μ Bondapak NH₂ column will allow the collection and subsequent GC analysis of narrow fractions according to hydrocarbon class, such as aliphatics, unsaturated hydrocarbons, benzenes, naphthalenes, 3-ring aromatics, and higher PAH's (i.e., those having 4,5, and 6 rings). The possibility exists for using the μ Bondapak NH₂ column to achieve the class separation and then using a μ Bondapak C₁₈ column to separate the various collected fractions according to solubility. Investigations of the μ Bondapak NH₂ column for cleanup and class separation of the headspace sampled mussels are continuing.

In the LC cleanup procedure the LC TENAX column (3 cm in length as compared to 6.5 cm for the GC TENAX column) which contains the extract from the headspace-sampled mussel, is stripped with pentane onto the μ Bondapak NH₂ column and a 10 ml fraction of the eluent is collected. The fraction is evaporated to ca. 200 μ l and subsequently transferred to a GC TENAX column for high resolution GC analysis. Pentane is vented from the TENAX column by allowing the carrier gas to flow through it for about 5 minutes prior to connection to the capillary GC column.

Various experiments were performed in order to determine the extent of hydrocarbon losses which occur in the various steps of this LC cleanup procedure. Losses of the internal standard hydrocarbons due to the venting of excess pentane from the GC TENAX prior to GC analysis were found to be minimal (<10%). In the evaporation of the 10 ml pentane fraction to 200 μ l and subsequent GC, some losses of lower molecular weight hydrocarbons were observed (\sim 75% for Me₅C₇, \sim 25% for MeC₁₄ and \sim 10% for MeC₁₆). These losses are assumed to have occurred during the evaporation-concentration step. In order to determine the overall recovery of hydrocarbons using the headspace sampling-LC cleanup procedure, a water blank containing known amounts of various hydrocarbons was analyzed. The overall hydrocarbon recoveries observed were 69% for MeC_{14} , 84% for MeC_{16} , 20% for phenanthrene and 93% for MeC_{18} . The low recovery of phenanthrene is consistent with previous headspace sampling results from water, indicating minimal losses during the LC cleanup procedure. Recoveries of the aliphatic hydrocarbons are quite comparable to those obtained above from the evaporation-concentration process. In summary, the losses of hydrocarbons during the LC cleanup procedure are quite acceptable (~25% for MeC_{14} and less for higher molecular weight compounds), and it will be utilized further in our experimentation with tissue.

We had previously determined that <u>aromatic</u> hydrocarbons utilized as internal standards in headspace analysis of <u>Mytilus</u> tissue homogenate can be recovered to the following extent (no LC cleanup): naphthalene 61 ± 20 %, trimethylnaphthalene $31 \pm$ 22% and phenanthrene, 16 ± 14 % (NBS Technical Note 889). Experiments conducted with <u>Mytilus</u> exposed to ¹⁴C-naphthalene showed a recovery of 78 ± 12% by the same headspace analysis technique. This indicated that, at least in the case of naphthalene, the aromatic internal standard added to the mussel tissue homogenate could be recovered to the same extent as that aromatic hydrocarbon incorporated into the live mussel.

Subsequent experimentation confirmed the previously determined recoveries of the aromatic hydrocarbons (18 ± 16% recovery for trimethylbenzene, 76 ± 31% for naphthalene, 47 ± 19% for trimethylnaphthalene and 12 ± 7% for phenanthrene) but indicated that aliphatic hydrocarbons added as internal standards show much lower recoveries from tissue homogenate (12 ± 6% for methyl-C₁₁, 11 ± 4% for methyl-C₁₄, 4 ± 0.5% for methyl-C₁₆ and 2 ± 0.8% for methyl-C₁₈). It was assumed that the aliphatic hydrocarbons were being retained in the lipid fraction in the tissue homogenate and the partition coefficient for these hydrocarbons between the headspace sampling gas

- 11 -

(He or N_2) and the organophilic lipid fraction was quite unfavorable. A series of experiments were conducted using KOH, KCl, KOH+KCl, squalane and caffeine, as additives to the tissue homogenate, to determine whether the presence of these additives would cause the recoveries of the aliphatic compounds to increase.

Results of these preliminary experiments show some improvement in the recoveries of the aliphatic hydrocarbons when the homogenate was made 0.1F in KOH and 1F in KC1 (9% for methy1-C₁₁, 19% for methyl- C_{14} , 17% for methyl- C_{16} and 13% for methyl- C_{18}). Some marginal improvement was noted with the use of squalane (\sim 20 mg in 30 g of tissue) and no improvement for the other additives tried. At the same time 0.1F KOH appeared to increase the recovery of the aromatic hydrocarbons added to the tissue (especially for trimethylnaphthalene and phenanthrene) while caffeine and 1F KC1 appeared to reduce these recoveries. The combination of KCl and KOH appeared to have minimal effect on the aromatic hydrocarbon recoveries. Work is continuing on the problem of hydrocarbon recovery from tissue with the use of longer headspace sampling times (at 70 °C) being investigated alone and in conjunction with the KC1+KOH additives.

C. Liquid Chromatography of PAH's

The coupled column liquid chromatographic technique developed in this laboratory (see attached Tech Note #889) has been shown to be an effective means of preconcentrating and separating polynuclear aromatic hydrocarbons (PAH's). The extraction efficiency of the pre-column, and the elution order from the chromatographic system appear to be inversely related to the solubilities of these compounds in water (see Table 4). However, actual recoveries of PAH's from water samples are maximum for compounds with molar solubilities on the order of 1x10⁻⁷. More soluble compounds such as benzene and naphthalene are not efficiently extracted by the pre-column. Recoveries of compounds with smaller molar solubilities in water suffer from adsorption losses on glass surfaces and

transport tubing.

The effects of a 0.1% solution of caffeine on the solubility of various PAH's has been determined. It has been postulated that caffeine forms water soluble complexes with PAH's. (See Eisenbrand, J., and Bawmann, K., Z. Lebensm-Unters. Forsch. 1970, 144(5), 312-317). Our experimental results indicate that this complex is broken on the pre-column with the PAH being trapped and the bulk of the water soluble caffeine passing through unretained. Glucose and barbital have also been investigated as adsorption suppressants. It is evident from Table 5 that substantial losses of PAH's occur in untreated aqueous systems even after relatively short time periods (0-4 hours). The relative effectiveness of caffeine as a complexing agent in keeping the PAH's in solution is also quite evident. While some losses do occur, the test solutions appeared to be stable and suffer no further losses of PAH's after 16-20 hours. Neither glucose nor barbital approached the effectiveness of caffeine in these studies. Work to determine the minimum amount of caffeine needed to achieve this enhancement in recovery is underway.

During the past year we have investigated the use of fluorescence as a tool for obtaining added sensitivity and selectivity, and also as a tool to aid in the identification of PAH fractions as they elute from the chromatographic system. All photoelectric instruments for measuring fluorescence are termed fluorometers. Every fluorometer or fluorescence spectrometer, no matter how simple or complicated contains three basic items: 1) a source of radiant energy to irradiate the sample; 2) a sample cell; and 3) a detector to measure the fluorescence. They are designated filter fluorometers or fluorescence spectrometers (spectrofluorometers), according to the method of selecting the exciting and fluorescence wavelengths. The <u>filter fluorometer</u> uses optical filters for selection of the optimum spectral ranges for maximum emission - 14 -

intensity for a given class of compounds. The <u>spectrofluorometer</u> employs two monchromators for this purpose. With dual monochromators the wavelength of excitation and fluorescence may be determined and utilized selectively. These monochromators which provide a narrow spectral bandpass to increase selectivity, cause a loss in sensitivity. Thus, although filter fluorometers provide more sensitivity, spectrofluorometers allow us to obtain both excitation and emission spectra permitting compound identification.

We have briefly evaluated the fluorescence detectors of three commercial manufacturers and compared their performance to that of the Model 44D UV detector manufactured by Waters The data obtained during this limited study appear Associates. in Table 6 where the detection limits reported refer to the amounts of material represented by a given peak and not the amount of material actually in the detector flow cell at any given time. The most sensitive filter photometer evaluated offers only one order of magnitude increase in sensitivity over the UV photometer. The detection limits reported for the UV photometer and the spectrofluorometer are comparable. However, the spectrofluorometer may be used as a selective detector for a given PAH family (utilizing specific excitation and fluorescence wavelengths) or to obtain spectra on the various fractions as they elute from the chromatograph.

In order for the Jasco FP-4 spectrofluorometer to function both qualitatively and quantitatively as we desired several modifications were made to the instrument by Mr. Richard Christensen of NBS.

1) Modifications to Cell and Holder

It was noted that the holder for the 6 μ l-flow cylindrical cell was constructed in such a way as to reduce the aperture of both the excitation and emission beams (Figure 5). The original holder was modified to admit the whole beam to the cell and another cylindrical cell of

slightly larger dimensions was tried (Figure 5B). These modifications provided some performance advantages, but the sensitivity seemed to be limited by the small volume of the cell. In addition, considerable scattering from the excitation beam arose from the tubular geometry of the cell. Therefore it was decided to adopt a 36-µl cell of square cross-section. This cell and its holder are shown in Figure 5C; it has proven to be quite satisfactory except for some difficulties in clearing bubbles from some solvent systems.

2) Modifications to the Monochromator

In order to gain sensitivity, the manufacturer had fitted the monochromators with slits which gave a 10 nm spectral bandpass. It was therefore very difficult to obtain spectra from which identifications could be made (Figure 6A). Since the emission monochromator is readily accessible in the instrument, it was decided to sacrifice some sensitivity and fit it with smaller slits. The 1.0 mm slits were replaced with 0.5 mm slits, resulting in the improved spectrum shown in Figure 6b.

3) Modifications to the Flow System

In order to obtain spectra of peaks of interest, it was necessary to trap a part of that peak in the cell. (Total peak widths range from 0.5-2.00 cc depending upon the conditions under which the run is made.) This may be done in either of two ways:

a) stop flow; or

b) use a value to shunt the flow from the chromatograph around the cell after the peak of interest has been trapped.

The latter method was selected since it does not cause any disruption in the chromatographic run. With the use of a three-way valve a spectrum may be taken every 1.5 minutes. Under normal run conditions, (flow rate 2 cc/min) peaks

must be separated by 3 cc. However, the flow rate may be slowed to the point that each peak need only be resolved by 2 cc. Figure 7 shows the LC fluorescence analysis of the ether extract of a sediment sample collected in the Bahamas. A library of reference spectra is being compiled and several other sediment samples are being analyzed by this LC-fluorescence procedure. The results of these analyses plus analyses of water samples by coupled column and an extraction LC-fluorescence technique will be given in a future quarterly report.

| Laboratory _ | Total Hydr (µg/g dry weig Gravimetry | rocarbons ght basis) GC | Pristane/Phytane Ratio | Sample Size (dry weight) | Percent water | Four most abundant compounds/amounts (µg/kg) |
|---------------------------------------|--|--|---------------------------|-----------------------------|---------------|--|
| J.A. Calder | 33.0 | 3.5 (C ₁₂ -C ₂₅ range) | 3.37 ± 0.44* (n=2) | 207 g | 20 | pristane/270, n-C ₁₉ /178; n-C ₂₀ /178; <u>n</u> -C ₂₁ /I70 **four largest peaks from aro- matic fraction (retention time/amount) |
| - 17 - | | | | | | 3.09 min/100; 2.61 min/82; CV 3.92 min/74; CP 3.33 min/59 CC |
| NBS-Headspace sampling GC/GC-MS | | 0.97 ± 0.07* (n=8) (C ₁₁ -C ₂₂ rang | e) 2.34 ± 0.08* (n=5) | 25-35 g | | CH_3 -naphthalene/ 40 ³ ; $(CH_3)_2$ -naph- thalene/28; $(CH_3)_2$ naphthalene/27; $(CH_3)_2$ -naphthalene/ 26 |
| NBS-Soxhlet extraction | 85.5 | 3.5 (C ₁₁ -C ₂₂ range) | 1.56 (n=1) | 190 g | 24 | $\frac{n-C_{14}^{+}(CH_{3})}{naphthalene/247}; \\ \frac{n-C_{13}/105; n-C_{17}}{77; \underline{n}-C_{15}/68}.$ |

Table 1. Results of an interlaboratory study of a Katalla River sediment.

* Standard deviation of replicate values from the mean of n replicate values.

** Identity of peaks not provided with data; see text for further discussion.

| <u>Analysis #</u> | Number of Replicates | Concentration (µg/g dry weight) |
|-------------------|----------------------|------------------------------------|
| 10P | 3 | $1.04 \pm 0.03*$ |
| 9P | 3 | 0.77 ± 0.03 |
| 1Q | 3 | 0.27 ± 0.02 |
| 3N | 2 | 1.18 ± 0.25 |
| | | |

Table 2. Homogeneity studies on Katalla River sediment.

*Standard deviation of replicate values from the mean of n replicate values.

- 18 -

| | | uBondapak NH ₂ | | µBondapak CN | uBondapak_C ₁₈ | |
|----------------------------------|-------------|---|--|--------------|--|--|
| Compound | Cyclohexane | 2% CH ₂ Cl ₂ Cyclohexane | 10% CH ₂ Cl ₂ Cyclohexane | Cyclohexane | 60% CH ₃ CN 40% H ₂ O | |
| Benzene | 4,4 | 4.2 | 4.1 | 3,3 | 6.9 | |
| m-xylene | 4.4 | 4.2 | 4.0 | 3.3 | 11.5 | |
| mesitylene | 4.4 | 4.2 | 3.9 | 3,3 | 15.2 | |
| naphthalene | 6.0 | 5.3 | 4.4 | 3,6 | 10.9 | |
| 2-methyl naphi 2,3-dimethyl | thalene 6.0 | 5.3 | 4.4 | * | 14.4 | |
| naphthalene | 6.0 | 5.3 | 4,4 | 3,6 | 18.3 | |
| anthracene | 8.7 | 7.3 | 5.2 | 3.9 | 19.1 | |
| anenhacene | | 7.3 | 5.1 | | 26.6 | |
| , phenanthrene | | 7.4 | 5.3 | 4.0 | 18.2 | |
| p-terpheny1 T,3,5-tripheny | 10.1 | 7.4 | | | | |
| benzene | 12.6 | 8.5 | 5.3 | 4.0 | | |
| pyrene | 12.2 | 8.9 | 5.8 | 4.0 | | |
| fluoranthene | 14.2 | 9.6 | 6.1 | | 24.7 | |
| 1,2-benzanthra | | 11.8 | | 4.2 | 29.1 | |
| chrysene | 19.8 | 12.4 | 6.6 6.8 | 4.5 | 35.0 | |
| 20-methyl chol | lan- | | | 4.5 | 33.0 | |
| thene | 22.0 | 13.2 | 6.9 | 4.6 | | |
| benz(a)pyrene | | 16.3 | 8,9 | 4.8 | 50.0 | |
| 3,4-benzopyrer | ne 26.6 | 15.9 | 8.9 | 4.8 | | |
| perylene indeno[1,2,3-c | cd] | | 8.8 | 5.0 | | |
| pyrene | | 22.5 | 9.5 | 5.4 | | |
| benzo[GHI]pery dibenzo(DEF,P) | vlene | | 10.1 | 5.3 | *** m | |
| chrysene | | 32.4 | 11.9 | | | |
| ruberene | | | 16.6 | 6.2 | | |
| n-pentanol | >175 | | | | | |
| n-undecano1 | >175 | | | | | |
| n-hexadecanol | >175 | | | | | |
| p-cresr" | >175 | | | | | |

| Table 3. | Chromatographic Retention Volumes chromatographic packing materials | (in milliliters) | for a number of hydrocarbons a | and alcohols on three liquid |
|----------|--|------------------|--------------------------------|------------------------------|
|----------|--|------------------|--------------------------------|------------------------------|

| | Elution* Volume (ml) | Coupled Column LC Recovery From H ₂ O | <u>Solubility (</u> | <u>mo1/1)</u> |
|-------------------------------|-------------------------|--|----------------------|---------------|
| Benzene | 6.9 | <5 | 2.3×10^{-2} | а |
| Naphthalene | 10.9 | 19 ± 2 | 8×10^{-4} | b |
| Phenanthrene | 18.2 | 92 ± 12 | 9×10^{-6} | с |
| Pyrene | 24.7 | 78 ± 17 | 9×10^{-7} | с |
| Fluoranthrene | 29.1 | | 1.2×10^{-6} | d |
| Chrysene | 33.0 | | 7×10^{-9} | с |
| 1,2 Benzanthracene | 35.0 | 58 ± 12 | 5×10^{-8} | с |
| 3,4 Benzpyrene | 50.0 | | 1.6×10^{-9} | Ъ |
| 1,2,5,6 Dibenzanthra- cene | 66.0 | 14 ± 8 | 2.0×10^{-9} | c · |

Table 4. Retention of polynuclear aromatic hydrocarbons on µBondapak C18

* Chromatographic Conditions

- 20 -

column - µBondapak C18 mobile phase: 60% CH₃CN, 40% H₂O temp - ambient

- a) McAuliffe, C., J. Phy. Chem. 70, 1267 (1966).
- b) Eisenbrand, J., Deut. Lebensm. Rundsch. 67, 435 (1971).
- c) Davis, W.W., Krahl, M.E. and Clowes, G.H.A., J. Am. Chem. Soc. <u>64</u>, 108 (1942).
- d) Eisenbrand, J.Z. Lebensm. Untersuch. Forsch. 144, 312 (1970); Chem. Abstracts, 74, 46153h.

| | | | | Perce | nt Recovery** | |
|------------|-----------------------|-----------------------------|----------|----------|---------------|------------------|
| Experiment | Complexing Agent | Experimental Conditions | Pyrene | Chrysene | Benz(a)pyrene | Dibenzanthracene |
| 1 | 0.1% caffeine None | Stir ∿4 hr, then analyze | 90 71 | 90 39 | 90 32 | 56 22 |
| 2 | 0.1% caffeine None | Stir 16-20 hr, then analyze | 75 26 | 71 28 | 68 14 | 39 15 |
| 3 | 0.1% caffeine None | Stir, 40 hr and analyze | 88 4 | 78. 7 | 75 4 | 39 3 G |
| 4 | 0.1% glucose | Stir 40 hr, then analyze | 3 | 20 | 5 | 20 00 |
| 5 | 0.1% barbital | Stir 40 hr, then analyze | 29 | 28 | 6 | 28 |

Table 5. Recoveries of various PAH's during coupled column LC analysis of aqueous solutions containing complexing agents.

* 0.5 µg of each PAH present in 500 ml of distilled water.

** % recovery compared to an on-column spike of the PAH's onto a C₁₈-µBondapak reverse phase LC column.

| | Waters ¹ | Jasco ² FP-4 (as received) | Aminco ³ | Schoffel ⁴ |
|-------------------------------|---------------------|--|---------------------|-----------------------|
| Naphthalene | 4 | 13 | x | Х |
| Phenanthrene | 0.04 | 1.5 | Х | Х |
| Pyrene | 0.09 | 0.19 | Х | Х |
| Chrysene | 0.10 | 0.14 | Х | X |
| 3,4 Benzpyrene | 0.06 | 0.05 0.02* | 0.02 | 0.007 |
| 1,2,5,6 Dibenzanthra- cene | 0.51 | 0.20 | 1.55 | No measurement made |

Table 6. Detection limits ** (in ng) of PAH's on various commercial LC detectors

1 Waters 440 UV photometer - absorbance at 254 nm monitored.

2 Jasco FP-4 Spectrofluorometer - excitation and emission λ 's optimized for each compound.

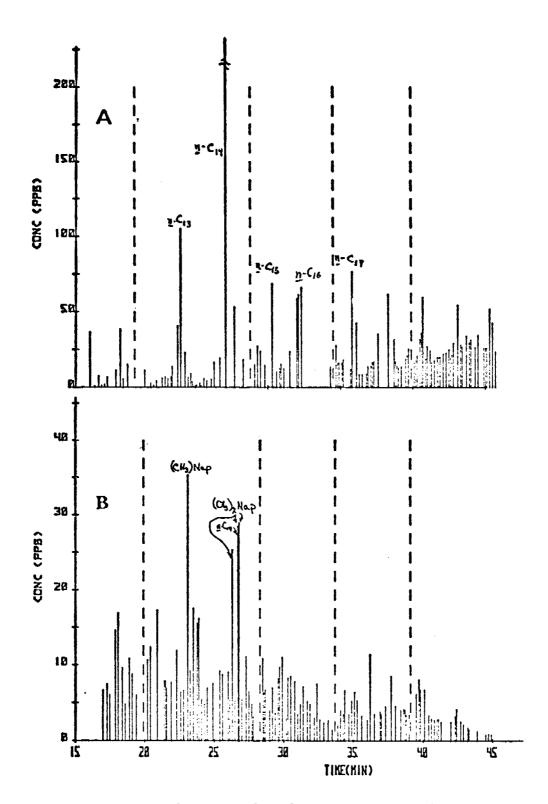
3 Aminco-Bowman Fluoro-monitor - primary filter: Corning #7-51, Secondary filter: Wratten #8.

4 Schoffel Model 970 Fluorescence monitor - excitation - 254 nm; emission: filter, max transmission at 418 nm

X Spectral region for detection of these compounds excluded by secondary filter employed. By selecting other filters, these compounds could be detected.

* Detection limit for 3,4 benzpyrene after flow cell and optical modifications.

** Detection limit defined as that amount of material that must be injected onto column to give a detector response twice that of noise.



- 23 -

Figure 1. Concentration vs time histograms of (A) Soxhlet extracted and (B) headspace sampled Katalla River sediment. Peak heights from the respective gas chromatograms have been plotted as single species concentrations (reduced relative to the internal standards). The retention times of the internal standards are denoted by dashed lines.

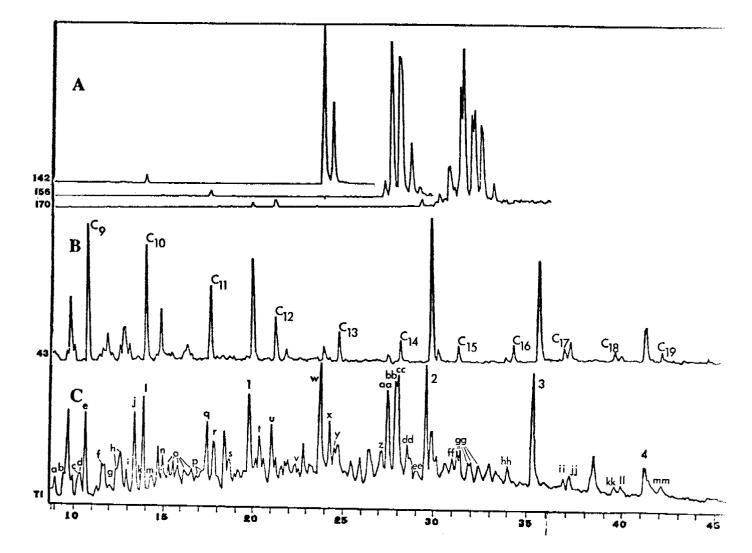


Figure 2. GC-MS analysis of Katalla River sediment: (A) composite m/e 142, 156 and 170 single ion records indicating presence of C_1 , C_2 , and C_3 -naphthalenes, respectively, (B) m/e 43 single ion record, (C) total ion chromatogram. C_2 -alkane containing x carbon atoms. C_2 -Ø=benzene substituted with x carbon atoms (e.g. C_3 -Ø could be trimethyl-, propyl-, isopropylbenzene, etc.) Peaks labeled 1,2,3,4 are the internal standards methyl- C_{14} , methyl- C_{14} , methyl- C_{16} , and methyl- C_{18} , respectively Identifications followed by "?" are not definite due to incompletely resolved spectra.

| b c | C₂-Ø C₃-thiophene | j k 1 m n o p q r s | C ₃ -Ø & C ₄ -thiophene C ₄ -thiophene $n-C_{10}$ C ₃ -Ø C ₄ -cyclohexane C ₄ -Ø C ₅ -thiophene ? $n-C_{11}$ C ₄ -Ø C ₅ -cyclohexane | v w x y z aa bb | C ₂ -decalin $n-C_{12}$ C ₆ -cyclohexane C ₁ -naphthalene C ₁ -naphthalene $n-C_{13}$ ethyl-naphthalene C ₂ -naphthalene $n-C_{14} \notin C_2$ -naphthalene C ₂ -naphthalene | ee ff gg | C_2 -naphthalene ethyl-naphthalene $n-C_{15}$ $\overline{C_3}$ -naphthalene $n-C_{16}$ $\overline{n}-C_{17}$ pristane $n-C_{18}$ phytane $\underline{n}-C_{19}$ |
|--------|----------------------|-----------------------------------|--|-----------------------------------|---|----------------|--|
|--------|----------------------|-----------------------------------|--|-----------------------------------|---|----------------|--|

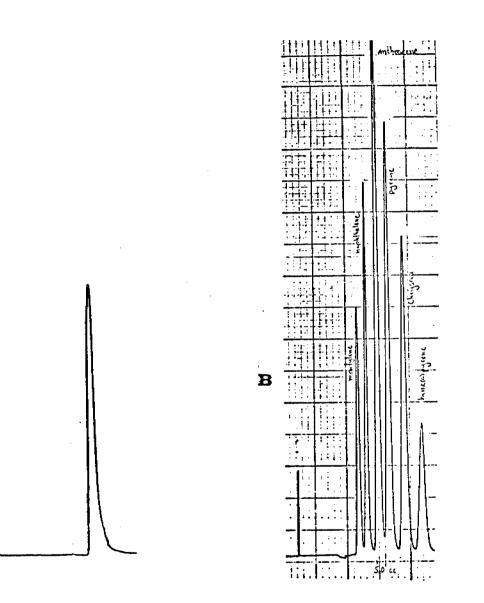
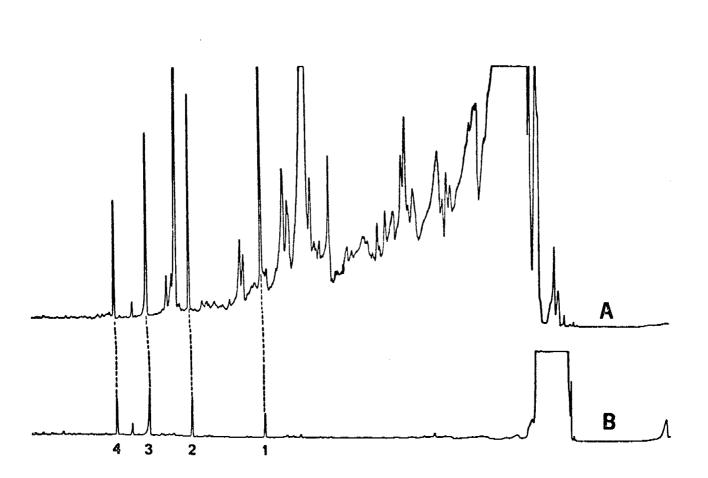


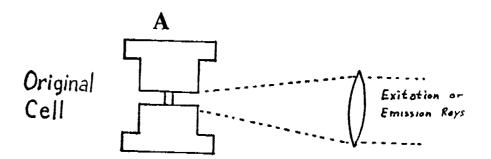
Figure 3. (A) Liquid chromatogram on copoly(styrene/divinylbenzene/ methacrylic acid) packing material; hydrocarbon test mixture: mesitylene, naphthalene, trimethylnaphthalene, phenanthrene and 9-methylnonadecane; (B) chromatogram on µBondapak NH₂, test mixture: mesitylene, naphthalene, anthracene, pyrene, chrysene, benz(a)pyrene

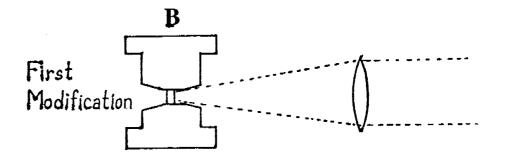
A



- 26 -

Figure 4. Gas chromatograms of headspace sampled whole mussels (A) with no LC cleanup of sample and (B) with LC cleanup using µBondapak NH₂ column. Both samples were spiked with (1) 5-methyl-tetradecane, (2) 7-methyl hexadecane, (3) phenanthrene, and (4) 2-methyl-octadecane.





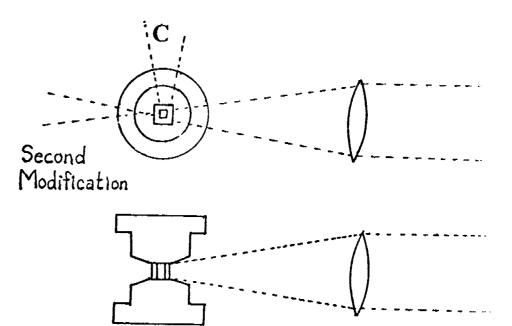


Figure 5. Modifications on Jasco FP-4 flow cell.

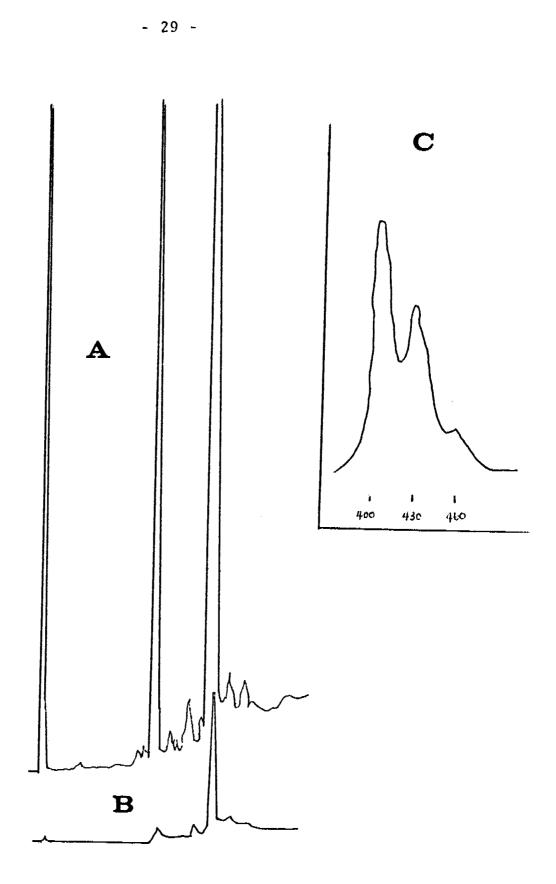


Figure 7. A. UV (254 nm) monitored chromatogram of an ether extract of a sediment sample collected in the Bahamas; B. Fluorescence monitored (ex 290 nm; em 405 nm) chromatogram of the same extract; C. Fluorescence emission spectrum of the major component in both chromatograms.

Workshop on SRM's for Offshore Drilling - Petroleum Santa Barbara, California, October 6-7, 1975

Summary

There are currently nine offshore platforms along the coast of Santa Barbara, California. These platforms contain as many as 70 wells each. In the near future the number of offshore drilling rigs will probably drastically increase. This increase is being preceded by a large number of environmental baseline studies and will require significant efforts in environmental monitoring once offshore drilling begins. In 1973 the Bureau of Land Management contracted \$400,000 for the purpose of offshore baseline studies; in 1975 baseline studies were funded at the level of \$50,000,000. These baseline studies require many measurements and yield large volumes of data. For all these data to be meaningful they must be made comparable to data obtained by other researchers, at other times and in other geographic locations. One means of providing comparability is through intercalibration efforts between laboratories. NBS Standard reference Materials (SRM's) are designed to be tools for insuring meaningful measurement and hence, comparability of results. SRM's are defined as well-characterized materials, produced in quantity and certified by NBS to help: calibrate instruments, develop reference methods of measurements, and provide long-term quality control in measurement systems. It was the aim of this workshop to determine what SRM's are desired for analyses related to offshore oil drilling, what problems must be solved before these SRM's can be made available, and what interim calibration materials are desired to serve the time period until SRM's are released.

I. Summary of Suggestions and Viewpoints Expressed at the Workshop

A. General Comments

Several people presented background material on prior intercalibration studies. The ASTM has run round robin experiments on its oil and grease method. This technique is sensitive to high levels of hydrocarbons (mg/1) and is based on the 2930 $\rm cm^{-1}$ infrared adsorption band of freon extractable hydrocarbons. The method does not differentiate recent biogenic from non-biogenic material. ASTM is currently working on a technique to solve this problem. As part of IDOE-5 a round robin experiment has been organized on hydrocarbons added to cod liver oil. Results of this experiment indicate that aliphatic hydrocarbons in the range \underline{n} -C₁₆ to \underline{n} -C₂₈ are apparently stable over a two-year period if stored frozen with intermittent thawing for sample removal. There is currently a proposal for funding of a joint USSR-USA intercalibration program as part of IDOE. An SRM has already been issued by NBS for trace elements in fuel oil; trace elements in a sediment are currently being certified. A tuna fish research material is available from NBS for trace element intercalibration. This material has also been used by some laboratories for hydrocarbon intercalibration, but no hydrocarbon homogeneity check has been performed on the material by NBS.

Numerous problems exist in releasing even a research material for hydrocarbon intercalibration purposes. First, microorganisms can degrade crude oil, so they must be carefully excluded from any intercalibration material to avoid a change in its composition with time. Second, there are many laboratories performing hydrocarbon analyses and each laboratory has a different objective and different analytical method. The parameters determined are as variable as source identification of waterborne oil, $\mu g/kg$ (baseline) hydrocarbon determination with or without single compound identification and quantitation, polynuclear aromatic hydrocarbon determination and volaile hydrocarbons (C_1 - C_{10}) determination. The analytical methods differ in sample preparation

- 2 -

and instrumentation. The end result is determined by any one of the following means: IR, UV, GC, LC, GC-MS, colorimetry and gravimetry. Given the current state of the art each method has a different bias and hence, yields somewhat different answers. It was suggested at the workshop that NBS specify acceptable or advisable techniques when sending out samples. It was further suggested that in all cases two samples would be desirable - a synthetic sample (SRM) certified for hydrocarbon content and a natural sample certified only for homogeneity. A suggested source for natural samples was Coal Oil Point, a known seep site near Santa Barbara.

B. Matrix-free SRM's

Several people expressed desires for matrix-free hydrocarbon SRM's. These requests fell into two classes: a) pure compounds and b) reference oils. Included in the first category were: pure <u>n</u>-octadecane, pure phytane, and pure representative aromatic hydrocarbons. Also included in this group were requests for mixtures of pure, representative compounds in an organic solvent (\sim 10 ppm) and a synthetic oil composed of a mixture of pure compounds. Requests in the second category included: reference oils for "fingerprinting" purposes, weathered oils from controlled weathering experiments (1 day and 3 day), and a series of oils such as the API "reference oils." Finally, since oil concentrates metals and pesticides, it was suggested that an oil certified for these constituents be considered as a candidate SRM.

- C. Matrix-bound SRM's
 - 1. Water SRM

There was considerable interest in trace organics in water SRM's. However, the general consensus was that the release of this SRM would be extremely difficult due to problems in stabilizing the SRM, probable large volume of the SRM and adsorption on container walls of trace constituents. Interests included drinking and waste water standards, and ocean water standards (several salinities) spiked with a reference petroleum at different concentrations (1, 5, 10 μ g/l and 100 ng/l, suggested).

If one can produce a standard with the $C_1 - C_{10}$ hydrocarbons present, HgCl₂ should be added to prevent biodegradation. Due to possible adsorption losses, user made dilutions of the most concentrated standard would not be an acceptable means for making the more dilute standards. If a water sample is released it was suggested that one specify acceptable sampling techniques and analytical techiques, as well as blank handling procedures.

2. Sediment SRM

Although there was great interest in a sediment SRM, the only request for a specific material came from BLM. They would desire two standards, one at 200 ppb and one at 1000 ppm. Several people presented results of their research which would be helpful in feasibility studies for a sediment SRM. It is not currently known how hydrocarbons are held onto sediments. Possible means of stabilizing a sediment SRM include freeze-drying, radiation sterilization, and shipping under N2. There is some evidence that dry sediments decompose faster than wet sediments. At 60 °C there is a finite amount of decomposition over a period of weeks. If one uses solvent extraction procedures, freeze-drying will not affect the hydrocarbon content of the sediment sample (since both freeze-drying and solvent concentration result in loss of the more volatile hydrocarbons). Finally, sediment acidification enhances the yield of solvent extractable material.

3. Tissue SRM

The requests for tissue SRM's also fell into two classes: a) compounds spiked into a lipid matrix and b) marine tissue containing trace level petroleum constituents. The IDOE-5 study has shown that a distillate crude is stable in cod liver oil for 3 years when stored frozen with occasional thawing for sample removal. A proposal was made that NBS release a lipid SRM containing hydrocarbons, as well as some of the characteristic nitrogen and sulfur compounds from petroleum. As far as actual tissue SRM's are concerned, there is no known ideal bioindicator species, but <u>Mytilus</u> seems to be the best currently available. Most people considered it important to have the whole tissue

SRM so that all the interfering biogenic compounds would be present. There was disagreement over issues such as release of whole organism vs individual organs, frozen vs freeze-dried tissue material, and biological incorporation vs laboratory spiking of marine tissue. As far as hydrocarbon concentration in a tissue SRM is concerned, the Bureau of Land Management recommended two standards, one at 4 ppm and one at 2000 ppm (total extractable hydrocarbons, including biogenics).

II. Recommendation Resulting from the Workshop

At the conclusion of the workshop, five SRM's were recommended by the participants for NBS consideration. These SRM's in order of decreasing priority are as follows:

- natural sediment certified for trace elements and hydrocarbons;
- biological tissue certified for trace elements and hydrocarbons;
- a synthetic mixture of pure organic compounds contained in a pure lipid or an organic solvent.
- 4) a reference crude oil;
- 5) sea water certified for trace elements and hydrocarbons.

The sea water SRM was given lowest priority because of the presumed difficulty in preparing it, not because it was necessarily the least desired SRM.

> NOTE: This report has been formally printed as Natonal Bureau of Standards Technical Note #889. Since the annual reports are in press the formal edition is not included.

ANNUAL REPORT July 1975 to April 1976 Environmental Assessment of Alaskan Waters -Trace Element Methodology-Inorganic Elements

A. Introduction

The research reported here is directly related to Task A-33, to determine the content of selected trace metals in the water column, suspended particulate matter and bottom sediments. A part of this includes Task A-32, a survey of the available literature (including an evaluation for data on the concentration and distribution of selected trace elements.

A portion of the acquired data may be used as a part of Task B-11, to characterize chemically sediment influx and deposition and all of the data may be used as a part of Task E-2, to predict possible short and long-term environmental effects of possible oil and gas development.

For practical purposes the progress reported here is divided into three main areas:

- 1. The results of the literature survey and the evaluation of this survey.
- The collection of samples and the analyses of these. This section includes data obtained on sample containers and the cleaning of these.
- 3. Data on the possible determination of speciation in ocean water and sediments. This was not a part of the original proposal but was discovered during this research and has been pursued as time permitted.

B. Progress

Literature Survey and Evaluation.
 As described in our original proposal, a literature

survey as well as an examination of existing sample collections was in progress as a part of a program entitled "The National Environmental Specimen Bank", sponsored by the Environmental Protection Agency and This survey has been completed and an evaluation NBS. completed. The general evaluation and references are included as appendix A. A summary of the results are as follows: Nearly all previous results of the concentration of trace elements in ocean waters, suspended particulate matter and sediments must be treated as suspect. Most of these results are probably This is the result both of the lack of trace worthless. element methodology of sufficient accuracy as well as a general lack of knowledge of the concentration of trace elements in the reagents used, in the containers used for collection and storage and in the laboratory environment used for sampling and analysis. Fortunately, this state has improved greatly in the past year. Improvements in the methodology and instrumentation have increased the precision and, most important, the accuracy which may be obtained. This is true for the three most commonly used analytical techniques, Graphite Furnace Atomic Absorption, (AAS), Anodic Stripping Voltammetry (ASV) and Activation Analysis (NAA). As an example of this, we have recently analyzed a water sample of known trace element concentration by AAS. The concentrations of 17 elements were determined either directly, or for three elements, with a ten-fold concentration (i.e. 10 µl total sample) with results that were accurate to ±3%. All elements were in the low ppb range.

The greatest remaining problem lies in contamination by the sample containers and/or the analytical environment. As a result of a study of the content of trace elements in containers and cleaning methods we are able to suggest both suitable containers and cleaning procedures that are adequate. This is treated in detail in Section 2 below. It is now evident that contamination from the laboratory environment can only be prevented by the use of the most stringent precautions inlcuding the use of class 100 laboratory space either as complete laboratory facilities or by means of small portable laboratory benches. 2. Collection of Samples and Analyses.

a. Sample Collection

One sample collection consisting of about 38 samples was made by NBS personnel near Glacier Bay. These samples were all acidified and frozen within one hour of collection, shipped frozen and kept frozen at NBS until analyses time. We had intended that part of this collection be filtered at the time of collection but unfortunately the filtering devices would not work properly in the cold conditions and there was not time to either repair the units or to use an alternate system we had prepared.

We received a second set of 8 samples hand-carried by Dr. D. Burrell. These had been acidified but not frozen. Additional samples sent to arrive coincident with Dr. Burrell were delayed by the airline and were ultimately received in bad condition. The worst of these were discarded, the rest used only for testing of various analytical techniques.

An additional set of samples sent by Dr. Burrell were received in good condition, still frozen and have been kept frozen until analysis time. The list

of samples is shown as Table one.

These samples are being analyzed by AAS and NAA. The analyses are not yet complete but are on schedule. We plan to cross check several analyses by isotope dilution mass spectrometry.

b. Container and Cleaning Study

A complete report of the study of suitable containers and a suggested cleaning procedure is shown as Appendix B. We recommend that teflon or <u>conventional</u> polyethylene bottles be used and that the bottles be cleaned according to the method given. In addition, to prevent the loss of moisture from the polyethylene bottles or the transport of volatile metals (i.e. mercury) into the containers that they be kept either frozen or in bags made of polyethylene coated-aluminized mylar. This material is readily available, inexpensive and may be easily heat sealed.

3. Speciation Studies

During the course of the analytical program we analyzed several samples by a new method called Dual Plasma Emission Spectrometry developed in our laboratories. The details of this method and the instrumentation used is shown in Appendix C. During the analysis we discovered that we can identify at least two forms of mercury and chromium in varying amounts in the sediment and sea water samples. We believe that one of the mercury forms is methylmercury and the other is inorganic (probably mercuric chloride). The chromium species are as yet unidentified. We believe that it is possible with future work to identify and quantitatively determine these species and possibly others.

C. Suggestions for Future Work.

1. Storage, Analyses and Standards.

We believe that, given the present state of knowledge

of the trace element concentration in ocean water and

382

sediments, research should be conducted into the proper methods of collecting and preserving samples. We have initiated some work in this area and are currently preparing to collect several hundred gallons of clean sea water. We will study the effects of freezing, freeze-drying and additions of acids and noble metal preservatives on the loss of trace elements. The goal of this work would be a recommended method of collection and storage and, most important, to provide standards for analyses.

2. Speciation

Additional work should be done to determine the speciations of as many metals as possible but particularly mercury, chromium and tin in water and sediment samples. This will have important effects on our knowledge of the ultimate fate of trace element contamination of the natural environment.

Table 1

Alaskan Samples from University of Alaska

| Sample | Size | Container | Description |
|--------|----------|---------------------|--|
| Water | l liter | Polyethylene bottle | NBS-000-25 |
| Water | TI | ** ** | Duplicate W.G.A. Station 146 Bottom 10/11/75 Filtered, Acidified |
| Water | 11 | 98 99 | NBS - 000 - 5 |
| Water | ** | 88 4A | NBS - 0 00 - 50 |
| Water | ** | ¥7 ++ | NBS - 000 - 0 |
| Water | ** | ¥T TT | NBS Duplicate W.G.A. Station 133 Bottom 10/12/75 Filtered, Acidified |
| Water | 17 | 4î ti | NBS Duplicate W.G.A. Station 120 Surface 10/13/75 W.A. |
| Water | ** | ¥7 ¥1 | NBS Duplicate W.G.A. Station 121 Surface 10/13/75 Filtered, Acidified |
| Water | 250 ml | TT TT | MB 69 Surface OF Duplicate |
| Water | 11 | TT TÎ | #59 30M Filtered, Duplicate |
| Water | ** | TI TI | 046 Surface, Filtered Du plicate |
| Water | ** | tt t | 046 Surface Unfiltered, Duplicate |
| Water | ** | ¥\$ ¥5 | #59 30M Unfiltered, Duplicate |
| Water | l gallon | Poly-"Cube tainer" | W.G.A. 158-5 Unfiltered, Acidified |

| Sample | Size | Container | Description |
|----------------------------------|----------|---------------------------|---|
| Water ^a | l gallon | Poly-"Cube Tainer" | Bering Sea MB-46-0 M NBS Duplicate |
| Water ^a | ** | . 88 - 88 - | Beri ng Sea MB59-5 30 M NBS Duplicate |
| Water ^b | l liter | Polyethylene bottle | EGA 15 11/27/75 1500 M Filtered, Acidified |
| Water ^b | ** | 44 68 | WGA 110 11/30/75 173 M Unfiltered, Acidified |
| Water ^b | " | ¥9 ¥9 | EGA 24 11/25/75 410 M Unfiltered, Acidified |
| Water ^b | 17 | 46 48 | EGA 11 11/29/75 1350 Filtered, Acidified |
| Water ^b | ** | 47 7 9 | 1500 M 11/27/75 Unfiltered, Acidified |
| Water ^b | ** | 46 66 | WGA 110 11/30/75 173 M Filtered, Acidified |
| Water ^b | ** | ** ** | EGA 24 11/25/75 410 M Filtered, Acidified |
| Water ^b | ŦŦ | TY T Y | EGA 11 11/29/75 1350 M Unfiltered, Acidified |
| Sediment ^b | 500 m1 | Wide Mouth Poly Btl | Bering Sea Station 54 |
| Sediment ^b | ** | 17 17 17 17 . | Burrell Station 32-2-6C Eastern Gulf |
| $\texttt{Sediment}^{\texttt{b}}$ | 11 | 77 27 39 93 | Bering Sea Station 19 |
| Sediment ^b | 11 | ¥¥ ¥¥ ¥¥ ¥¥ | 119 M EGA 55 Burrell Station 55 Eastern Gulf 11/29/75 |

| Sample | Size | | Conta | iner | | Description |
|----------------------------------|--------|------|-------|------|-----|--|
| Sediment ^b | 500 ml | Wide | Mouth | Poly | Bt1 | Eastern Gulf Station 25-1-6C Silas Bend |
| $\texttt{Sediment}^{\texttt{b}}$ | ** | ** | ** | 11 | ** | Bering Sea, Station 60 |
| ${\tt Sediment}^{\tt b}$ | ŦŦ | ** | ** | ** | ** | Bering Sea Station 63 |
| Sediment ^b | ** | ** | ** | ** | ** | Burrell, Eastern Gulf Silas Bend |
| Sediment ^a | 250 ml | • • | ** | ** | ** | Station 42 HAPS Cove 0-6 cm Gulf of Alaska 42-1-6C |

a Presently being used by Dr. Hanamura.

b Stored in freezer.

APPENDIX A

APPENDIX I

Literature Survey on Sampling, Sample Handling, and Storage for

The National Environmental Specimen Bank

E. J. Maienthal and D. A. Becker
 Analytical Chemistry Division
 National Bureau of Standards
 Washington, D. C. 20234

Approximately 660 of the returned survey forms sent out by ORNL for the NESB have been studied and evaluated at least two times with regard to the suitability of the specimen collection for sample integrity after long term storage. Few of the survey respondents answered the questions in sufficient detail to give a definitive answer, but most of the collections appear to be of use largely for taxonomical purposes.

In order to develop a consistent and comprehensive set of guidelines for the evaluation of this survey, a large portion of the recent literature concerning sampling and storage of environmental specimens has been examined. This has been done both manually and by use of bibliographical retrieval services such as Medline, Chemcon, Biosis, Cain, Defense Documentation Center and others. Also, the advice and opinion of workers in various aspects of the field has been obtained. A summary of the results of this survey is found below, separated into the various areas of concern.

Trace Elements

For trace elements there is an abundance of reports on sampling and storage (which should also apply to radionuclides);

however, many of them are contradictory and should be further resolved by careful experimental work. Much of the published analytical data apparently is inaccurate because of such problems as gross sampling contamination or subsequent procedural contamination and failure to make proper blank corrections. Richards states that some oceanographers have permitted the perpetuation of the notion that the concentrations of the sea are well known, when, in fact, they are not (1).

Patterson and Settle (2) report that the great mass of published lead data in plants, animal tissues and water is in error because of gross positive errors, and that the relatively large blanks usually present with lead concentrations less than a few $\mu g/g$ often makes the value obtained meaningless. Many trace element analysts, particularly in the field of oceanography and marine biology, believe that much of the previously published work is unreliable as a result of sample contamination. The values being reported are progressively lower as techniques are being improved. Hume reports that if a synthetic sea water were prepared from the purest reagent chemicals available, it would still be higher in many trace elements than natural sea water (3). Whitnack also has evidence to show that the reagents used are more contaminated than sea water (4). Speecke, et al. state that many chances exist for a biological material to be contaminated before it is analyzed (5); but few authors give the impression of the awareness of this and that meaningless phrases are used, such as "metal-free" containers, "chemically clean" glass, etc., with no evidence to back it up. Berman states that one must never assume anything is acceptably free from trace metal contaminants until it has been tested (6).

It is felt that the materials, techniques, and expertise exist to provide viable long-term stored samples for most trace elements in most matrices; however, few in the field are using these techniques, partially because as Boutwell says, "...validity is an expensive commodity" (7).

The first consideration is the choice of the container and sampler composition and the method of cleaning and sampling. Murphy, Robertson, Thiers, Patterson, Tölg, and many others show results which indicate that rubber, neoprene, wycor, polyvinyl chloride, polystyrene, glass, polypropylene, linear polyethylene, platinum, etc., will introduce contamination in sampling and storage (8, 9, 10, 10a, 2, 11). Patterson recommends first, FEP Teflon, then ultrapure quartz, conventional polyethylene or TFE Teflon containers. All cleaning and sample treatment should be done in laminar flow hoods or a clean room. He recommends cleaning with hot concentrated HNO3 for three days, rinsing with high purity distilled water, followed by hot dilute 0.05 percent HNO3 (both water and acid, prepared as described by Kuehner, et al. (12)) for one day, rinsing and heating with 0.05 percent HNO3 five days, rinsing, then storing filled with 0.05 percent HNO3, wrapped in cleaned polyethylene until ready for use. (The two dilute HNO3 leachings have not been found necessary by some other workers). When ready for use, the containers can be thoroughly rinsed and dried in laminar flow hoods. Cleaned plastic gloves are worn in all phases of cleaning, sampling, etc. (2). Berman found that even after thorough cleaning and scrubbing of fingers, 0.1 to 0.4 µg of lead could still be washed off. Washings from a chain smoker give results of $0.3-4 \ \mu g$ of lead (6).

Karin, et al. report a three-day leach of polyethylene in either 8 or 16 M HNO_3 was necessary to remove certain trace metal contaminants (13).

Sampling implements Patterson recommends are either Teflon or Teflon-encased, except for frozen tissue sampling where a series of HNO_3 -acid cleaned stainless steel blades are used with very elaborate sampling procedures to remove areas contaminated by the blade (2). All of these type operations should be done in laminar flow hoods or clean room conditions.

Deionized water which has not been followed by distillation should not be used in any stages of the cleaning, sampling, or analysis as organic breakdown products may be formed, complexing some of the trace elements (8).

Numerous types of water samplers have been devised. Segar, <u>et al</u>. have described water sampling with Niskin bottles with rubber coated springs, Teflon coated coil springs and a new design Niskin bottle without internal closures. All gave trace metal contamination except the latter (14). Since Teflon is rather porous, apparently some metal diffusion through the spring coating must have occurred.

Harrison, et al. have designed a Teflon cylindrical sampler with a mechanism for opening both ends after submersion to the desired depth to avoid contamination from the water surface (15). It is attached to a metal frame and rudder which have a baked-on Teflon coating. It is also adapted so that the sample may be filtered immediately in an attached container holding a precleaned polyethylene bag in which the sample can be immediately sealed and frozen in liquid nitrogen. If the water sample is to be filtered, Morrison and Pierce, and many others suggest that it is best to do it immediately (16). The filter must be thoroughly precleaned, rinsed, and stored in cleaned polyethylene bags. The sample chamber used by Patterson (2) consists of accordion pleated Teflon tubing, the entry port being protected by a bath of ultra pure water (prepared as already mentioned). At the deep water sampling depth desired, a trigger retracts the water bath shroud and ruptures the end diaphragm which contains the pure water. The water sampler is lowered continuously so that it is continually dropping into virgin water. After a short interval to allow the bath water to be washed away, a second trigger expands the sample accordion bag and seals the entry port.

The storage of aqueous samples presents an even greater challenge as most samples start undergoing changes the instant they are sampled. Pre-aging the sampler and sample container with some of the same sample would be desirable whenever possible. Amore states that losses as high as 50 percent can occur during one hour of storage (17). An EPA manual on methods of water analysis says that complete and unequivocal preservation of samples is a practical impossibility, that complete stability can never be obtained, and that preservation techniques only retard the chemical and biological changes that continue after the sample is taken (18). The methods of preservation are intended to retard biological action, retard hydrolysis of chemical compounds and reduce the volatility of the components. Their recommended methods include pH control, chemical addition, refrigeration, and freezing.

Although there is much in the literature on relatively short term storage of different aqueous (non-frozen) solutions under varying conditions, there are many disagreements and most of the results do not look favorable for long term storage. A USGS manual for water analysis says that the shorter the time that elapses between the collection of a sample and its analysis, the more reliable will be the results (19).

Pettis and Phillip give an excellent review of the literature on trace metal analysis in sea water. They discuss sampling and cleaning procedures, sample pretreatment, standard reference materials, and analytical method of determination of the trace metals (19a).

6

Robertson found that sea water adjusted to pH 8 stored in polyethylene resulted in a 90 percent indium loss in 20 days and a 90 percent loss of iron in 55 days (20). Hummel found that 75 percent of the gold in sea water was lost after three weeks in polyethylene (21). King, et al. found that less than 3 percent of the cadmium was lost to polyethylene at pH's of 3 to 10 after two weeks storage (22). West, et al. (23) found more silver adsorption on glass at pH 4 than at pH 7, a significant decrease occurring at pH 7, and a rise at pH 8, and they also state that pyrex showed more erratic adsorption patterns than polyethylene or siliconecoated containers. Struempler (24) states that acidification with nitric acid to pH 2 prevents adsorption of silver, lead, cadmium, and zinc on pyrex, and silver on polyethylene. Dyck (25) reports lack of confirmation with the work of West, et al. with silver, and states there is a direct increase in silver adsorbed on glass with increase in pH. He also states that for periods over several months, plastic adsorbed more silver than glass. Lai and Weiss (26) found no silver loss when sea water was stored in polyethylene and acidified to a pH of 3.5 to 4.0 with acetic acid. King, et al. (22) found losses as high as 75 percent for cadmium when stored in glass at pH 9. Eichholz, et al. (27) compared adsorption of a number of elements on pyrex and polyethylene and state that pyrex is preferable to polyethylene; however,

they found less contamination for cesium, ruthenium, and zirconium when using polyethylene. Smith (28) studied stability of a number of ions including cadmium, antimony, tin, and lithium, and states that of the elements studied only lithium was stable over the pH range of one to 11. He therefore recommends acidification to pH one. In another report (29), he states that freezing the liquid samples as soon as they are collected is an excellent solution for the adorption problem. The losses may be due to adsorption or also to precipitation or particulate formation. Salman also states that freezing can be used to preserve the water samples at the collection site (29a).

Rattonetti examined the stability of a large number of trace metals in a variety of water matrices stored in polyethylene at differing pH's and concluded that loss to container walls is insignificant compared to losses to the particles present in natural aqueous systems (30).

Moody, <u>et al</u>. have prepared two mercury in water Standard Reference Materials at the 1 ppm and 1 ppb level which have been stable for over a year in both glass and polyethylene (31). This was achieved by the addition of 10 ng/g of Au⁺³ and 0.5 N nitric acid. Lo and Wai verified this for shorter term storage with 0.2 μ g/g Au⁺³ and nitric acid at pH 0.5 (32), but were unable to confirm Feldman's stabilization with potassium dichromate (33) or the report of Issaq and Zielinski with hydrogen peroxide (34). Avotins and Jenne state that the biological effects have been overlooked in many of the mercury in water investigations, and that as a result of the unpredictable growth of bacterial and yeast populations, with production of metabolites, mercury may either vaporize, bind to the walls of the vessel or be stabilized in

solution (35). Huey, et al. have reported that cadmium can be volatilized from its inorganic salts by a microorganism **through** conversion to a volatile organic compound (36). The **volatilization** is stimulated by vitamin B₁₂. Methylmercury formation by this organism is also stimulated by B_{12} , the absence of which causes the organism to form metallic mercury from inorganic mercuric salts. In samples where this type of reaction occurs, freeze-drying is not advisable as a method of sample preservation. For long term preservation for trace-element analysis, freezing and possibly freezedrying for most elements (probably followed by radiosterilization), would seem to be the most likely alternatives. Morrison and Pierce state that freezing may be a suitable preservation technique for trace elements but has not been adequately tested to date (16). Allen, et al. recommend immediate freezing at -10 to -15°C to prevent microbiological changes in soluble mineral and silica concentrations (37); however, for long term storage, immediate freezing in liquid nitrogen as recommended by Harrison, et al. (15) and others (29), followed by freeze-drying for most trace elements (and radiosterilization) or storage at -70° to -80°C would seem preferable. Low temperature (oxygen plasma) ashing and dry ashing are also possibilities in some cases.

Harrison, <u>et al</u>. (38) and Filby, <u>et al</u>. (38a), have reported that radioisotope studies of the volatile elements such as arsenic, antimony, selenium, bromide, and mercury have shown no significant losses in water samples which have been freeze-dried.

Heron studied the determination of phosphate in lake water before and after freezing (39). It was expected that rapid freezing would cause cell rupture resulting in higher phosphate values, but this did not occur. Varying phosphate

values were found whenever growth of bacteria was occurring. **This** was prevented by pre-cleaning the sample bottle with a **solution** which is 5 percent in iodine and 8 percent in **potassium** iodide and immediate freezing of the water sample.

Philbert found that in freezing lake water samples soluble reactive silica and phosphorus concentrations were decreased in the thawed samples (40). A decrease in total alkalinity and dissolved chloride was also observed. Inconsistent changes were observed for ammonia and the various forms of nitrogen.

A USGS manual on methods of water sampling recommends that water samples for inorganic analysis should not be frozen (19); however, there is sufficient reason to expect that if the process is performed properly, freezing is acceptable for most trace elements. The samples should be subsampled before freezing, because once thawed, they should not be refrozen. The entire subsample should then be taken for analysis. They should be frozen in one of the container materials already discussed, under a gas such as nitrogen or argon to prevent sample oxidation. They should be sealed in at least 2 and possibly 3 [as Patterson recommends (2)] series of plastic bags. Since most plastics are porous (41), they should then be placed in a tightly sealed glass container containing nitrogen or argon with minimum void space, followed by storage in the dark at -70°C. Bothner and Robertson (42) have reported that sea water samples stored in polyethylene containers have picked up mercury from being stored in a room contaminated with metallic mercury. This has been verified in a closed chamber with pools of clean mercury surrounding a mercury solution in Teflon and polyethylene **bottles**, but has not as yet been verified in an ordinary laboratory atmosphere where spilled mercury would probably

be covered with dust, thus effectively diminishing its vapor pressure (43).

When the frozen water sample is used, the whole sample should be used because of possible selective ion incorporation in the ice (44). The walls of the inner container will probably have to be washed with acid to remove any hydrolyzed or adsorbed material.

The possibility of losing organic or inorganic mercury during freeze-drying of biological materials was investigated by LaFleur, as Pillay, <u>et al</u>. had published data indicating losses (45). LaFleur found no losses for inorganic or naturally bound methyl- or phenylmercury in tissue and blood; however, for aqueous solutions, losses of up to 90 percent could occur for organic and up to 10 percent for metallic mercury (46).

Biological-Tissue and Fluids

For tissue and biological fluid sampling, the sampling device presents considerably more difficulties. The use of a laser beam for cutting bone by Hislop and Parker (47) offers many interesting possibilities. Some loss of trace elements on the surface may occur but would be negligible with regard to the entire sample. A quartz or glass knife should also be suitable for many kinds of tissue. Montgomery, et al. used a glass knife to cut fish in small pieces for the determination of iron, zinc, lead, cadmium, copper, and manganese (48). A problem here is the chipping of the cutting edge; weighing the knife before and after use may indicate if this is a problem.

Most workers use stainless steel implements. However, this is frought with dangers of contamination for many trace elements even when done as carefully as described by Patterson

earlier (2). Versieck, et al. report on the contamination introduced during needle biopsies of liver (49). They state that steel surgical blades lead to somewhat less contamination, but are not suitable for some trace elements such as chromium and nickel. The needle biopsies resulted in contaminations of as much as 1.7 ppm of copper, 0.64 ppm of manganese, 11 ppm of chromium, 12 ppm of nickel, 20 ppm of iron, 0.24 ppm of cobalt, 0.012 ppm of silver, 0.46 ppm of tin, 0.069 ppm of antimony and 1.2 ppm of tantalum. Speecke, et al. have reported on the sampling and storage of biological materials for contamination by chromium, manganese, nickel and cobalt by drawing 4 series of 20 ml portions of blood using disposable needles (5). For manganese, the first 20 ml showed contamination of 0.2 ppb, the fourth, 0.02 ppb; for chromium, the first 85 ppb, the fourth 15 ppb; for nickel, the first 71 ppb, the fourth 12 ppb; for cobalt the first 0.9 ppb, and the fourth 0.2 ppb. They also compared contamination introduced in another series of liver samples using Meneghini biopsy needles and surgical blades. For the needles, they found contaminations of as much as 600 ppb of manganese, 9000 ppb of chromium, 12,000 ppb of nickel and 230 ppb of cobalt; for the surgical blades, 3 ppb of manganese, 15 ppb of chromium, 60 ppb of nickel, and 1 ppb of cobalt. They discuss the possibility of using laser beams on hard and soft tissues and platinum-rhodium alloy needles; however, it is preferable that the platinum needles have Kel-F hubs to avoid contamination. For storage, Speecke, et al. recommend immediate, rapid freeze-drying, but point out that some volatile materials may be lost. All the work should be done in a clean-room type laboratory with no exposed metal parts which might cause contamination.

Fisher, et al. (50) also reported that serum samples should be quickly frozen with as little air space as possible (as described earlier, the air should be displaced with nitrogen or argon). They also checked storage at room temperature, 8°C and -15°C. No differences for calcium, magnesium, copper, zinc, sodium, and potassium were noticed up to 16 days. Essentially no changes were observed in the refrigerated and frozen samples up to 50 days, but changes did occur in the samples stored at room temperature. Longer term storage would probably also result in changes in the refrigerated samples. Some microorganisms can grow in a temperature as low as -6°C (51).

In a discussion of sampling for clinical chemistry, Ibbott recommends separating the serum from the clot as soon as possible to avoid contamination from cell leakage (52). He also states that the majority of the serum components are stable indefinitely in dry ice (about -70°C), and that the samples exhibit concentration gradients due to freezing and must be thoroughly mixed after thawing. Omang and Vellar also point out the concentration gradients obtained after freezing and thawing serum, sweat, and urine. They found top-bottom differences of thawed samples of up to one hundred (53).

Museum Specimens

The futility of trace element analysis of museum type specimens stored in preservatives has been pointed out by a number of authors. Bowen and Sutton in analysis of marine sponges found that nickel accumulation in the preservative occurs quite frequently in these types of samples (54). Gibbs, <u>et al</u>. investigated the effects of time and preservatives in museum fish specimens and found no evidence to

support the theory that preserved museum specimens can provide reliable estimates of heavy metal concentrations (55). They tested many types of preservatives such as ethanol, formalin, isopropyl alcohol, etc., and found interaction with the specimens in all cases. They may either leach trace metals from the specimen or contaminate the specimens by heavy metals contained in the preservatives or container. In many cases, metal identification tags are placed in with the preservative, which contribute even further to the contamination of the sample. In some instances, the trace metal content increased over the years and in other cases, decreased from leaching even in a short period of time, such as a month.

A possible exception for the museum type specimens are those which have been stored in relatively clean, dry areas not subject to leaching or contamination. Cockburn, <u>et</u> <u>al</u>. (56) describe the autopsy of an Egyptian mummy, Pum II, which included the analysis of some trace elements in bone by R. G. Smith (57). He found 0.6 ppm of lead and 0.43 ppm of mercury. The lead content of modern bone averages 6.55 to 18 ppm (58). Assuming no leaching has occurred, it would appear that man's environment has contributed considerably to his lead body burden. The mercury level is relatively unchanged, that of modern bone averaging about 0.45 ppm (59).

Crustal and Botanical Materials

The sampling and storage of soils, rocks, minerals, sediments, and plants does not present quite as many problems as the matrices already discussed, but more precautions should be taken then are generally observed. Morrison and Pierce (16) state that the use of a spade to sample soil is preferable to a soil auger and that dry samples can be collected in a clean cloth bag, but this procedure would certainly lead to contamination for some trace metals. Clean Teflon encased tools as recommended by Patterson and Settle (2) should be used except for most plants which can be picked with clean plastic gloves. It appears that soils and sediments with any significant water content (especially sediment samples) should be frozen in such a way that no water loss can occur, and stored as recommended for water samples.

14

There are many papers in the literature which indicate that soils and sediments undergo changes in structure and chemical state even when dried at room temperature. This should not have a great effect on the total trace element content in most cases, but if speciation, organic extractable trace elements, etc., are of interest, any form of drying may invalidate the sample. Attoe (60) reports that potassium may be fixed in a nonexchangeable form when a potassiumfertilized soil is air-dried. Air drying of unfertilized soils resulted in a 4-90 percent increase in exchangeable potassium when the soils are remoistened. Schalsha, et al. (61) state that air drying produces significant irreversible changes in volcanic ash soils. For instance, soil samples with a clay-type texture in the field, change to a sandy texture with air drying. Air drying also reportedly markedly affects cation exchange capacity, soluble phosphorus and iron, and decreases the pH slightly. Air drying decreased the total exchangeable and acid soluble iron, but increased the chelatable iron extracted by salicylate. The mechanical and chemical analysis of volcanic ash soils more accurately indicate field conditions when samples contain the original moisture at field capacity.

Barrow (62) found when soils were dried, inorganic sulfate immediately increased (probably as a result of decomposing organic sulfates in the soil becoming immediately available to the plants). Even when two different soils are dried at the same temperature, the relative availability of the sulfur may be no indication of the relative availability when they were fresh.

Harpstead and Brage (63) reported that the drying and storage of soils leads to a pronounced increase in their nitrifying ability because of the changes in the relative numbers of various microorganisms in the soil. Birch found that when remoistening dried soil, the first rapid decomposition slows down and this pattern is repeated during successive dryings and wettings (64). The magnitude of the decomposition depends on the amount of carbon in the soil and on the drying conditions, air drying being less effective than oven drying. Vacuum drying and oven drying gave the same moisture loss results, but oven drying gave a much greater amount of decomposition on rewetting.

Birch (65,66) also states that the longer a soil is kept air dried, the greater the amount of water-soluble and organic material that can be extracted, even though it does not lose additional moisture, and also the greater the amounts of carbon and nitrogen are mineralized on remoistening. He also finds greater effects if the soil is dried at 100°C, possibly because of increased gel porosity and surface area, and possibly because of increased microbiological activity occurring during the remoistening of the dried soil.

Nevo and Hagin (67) state that the changes occurring after three months of air drying storage was independent of microorganisms. The major factor is the change in the physical structure of the organic fraction. They found a

good correlation between the nitrification rate and the **surf**ace area of particles of an organic soil.

Hesse (68) states that oven drying a soil, despite its reproducibility, should not be recommended, because of the profound changes caused. Also he says that storing a soil in a moist state has the effect of incubating it, but without temperature or moisture control, resulting in a build-up of carbon dioxide at the expense of oxygen. As such treatment **results** in many complicated reactions, it is most undesirable to keep a soil in a moist state for any length of time for the purpose of analysis. He also reports on investigations of J. M. Coleman (private communication) that moist soil samples stored in plastic containers can result in fundamental changes in clay minerals. It is thought that an organic complex passes from plastic into the clay mineral. All these references seem to point out that drying or freezedrying may result in irreversible changes which will affect also the complexation state of the trace metals and that freezing at -70°C to -80°C as recommended earlier should be the method of storage.

Plant sampling can probably be done by picking with plastic gloves and storing by freezing in containers as already mentioned, with care to avoid moisture loss.

Arkeley, et al. (69) state that trace elements such as carried by peat dust deposited on plants are easily washed off (high purity distilled water should be used) but those deposited by sprays are not, because of partial absorption in the leaf. Lagerwerff (70) found increases in absorption of cadmium, zinc, and lead on leaf surfaces probably enhanced by drying.

Work by Koeppe and Miller (71) showed a much higher uptake of lead by maize roots than in the stems or leaves.

Washing with distilled water removed little lead, but washing with EDTA solution removed about 90 percent of the lead, indicating the lead is largely retained on the exterior surface of the roots.

For sampling of air particulates, Patterson and Settle (2) recommend cleaning Millipore or Nucleopore filters by soaking in cold 6N HCl two days, rinsing on a cleaned polyethylene Buchner funnel with high purity distilled water, soaking two days at 55°C with 1 percent NH₄F (prepared by neutralizing high purity NH₄OH with high purity HF) followed by rinsing with high purity water. These operations, of course, are carried out in a clean room atmosphere or laminar flow hoods. The filters are then stored in cleaned polyethylene bags or boxes. The lead blank on these filters was found to be less than 1 ng/47 mm filter.

Organics and Pesticides

With the exception of the use of plastic gloves for sampling to avoid contamination from body oils (72), storage containers and implements for trace organics and pesticides must definitely not be plastic of any kind with the possible exception of Teflon, as plastic is known to both introduce interferences and sorb pesticides (and organics) (73,73a). Many examples are given in the literature which show that additives such as plasticizers, organo-metallic or other stabilizer antioxidants, colorants or other components are leached from the plastic and contaminate the sample (74).

Some polyvinyl chloride tubings were shown to release a constituent to some systems containing alcohol, propylene glycol or polyethylene glycols (75). Gibbs found that asbestos fiber was highly contaminated by 3,3'-5, 5'-tetratertiary butyl diphenoquinone after storage in

polyethylene bags (76). Lipids in soil samples stored in standard plastic lined canvas bags were found to take up phthalate esters and other contaminants from the plastic (77).

Most workers in the field recommend storage in glass containers with Teflon or aluminum foil lined caps (72,73,73a,78); however, it has been reported that Teflon sheet and aluminum foil have been found to contain up to 400 and 300 ppb, respectively, of di-2 ethylbutyl phthalate (79,80).

Hertz, et al. (81) recommended cleaning the glassware with soap and water, then in concentrated H₂SO₄ at 100°C for 30 min and finally rinsing with specially prepared distilled water made by redistilling the house distilled water over KMnO₄-KOH. The distillate is then passed through an XAD-2 column, and the water is redistilled to remove any particulates from the XAD-2 resin. Finally, the bottles are then rinsed with methanol and triple-distilled pentane, and filled with nitrogen from a liquid nitrogen source and sealed.

Others recommend wrapping the cleaned glassware in aluminum foil and heating at 625°C for four hours (82). The maintenance of high quality distilled water can be a problem as some microorganisms can grow rapidly in distilled water and some chemical reagents (82,83,84). It is reported by Hamilton and Myoda (82) that the amino acids, proteins and bacteria often found in some laboratory reagent solutions and distilled water, are probably airborne and enter the outlet of the stills or deionizing systems where they multiply. A method of catalytic pyrodistillation has been reported to remove organic impurities not removed by ordinary or oxidative distillation because of the steam volatility of the compounds or their derivatives (85).

It has been recommended in sampling that "an analyst or person directly concerned with the particular study should

collect the samples. Inexperienced personnel should never be allowed to collect the samples unless they are very closely supervised" (78). This, of course, is true to all types of environmental sampling.

When sampling marine organisms and sediments for organics or pesticides, most workers recommend freezing immediately in dry ice or liquid nitrogen (72,81) and final storage at about -70° to -80°C (86) in the dark. Breakdown of pp'-DDT to pp'-TDE in Bengalese finch liver, and breakdown due to other biological processes have been reported at home freezer storage conditions (approximately -14°C) (87,88).

Bristol reported in a study of pesticide residues in potatoes that metabolically incorporated 2,4-D untreated potato samples stored whole at 4°C decreased over a period of 15 months, while those of 2,4-DCP remained constant. Recoveries of 2,4-D from frozen samples were constant over a 15-month period, but those of 2,4-DCP decreased slowly from 88 to 47 percent. The 2,4-DCP samples stored in plastic bags gave a characteristic odor, indicating the losses were due to volatilization from the frozen samples (89).

It is reported by the Federal Working Group on Pest Management that increased knowledge of sample contact with various kinds of synthetic wraps and containers demonstrates the necessity for glass and perhaps aluminum foil to preserve the integrity of wet samples. Immediate freezing and maintenance of the frozen sample until analysis is the best way to protect samples and prevent degradation and loss of pesticide residues (73). (This also is undoubtedly true for all organic components.) They also state that pesticides can migrate to the walls of a container and be adsorbed; hence, even with a glass container, after the sample is poured out,

the walls should be rinsed with the solvent in case the extraction is not made in the container itself (this should also apply to any organics).

There is evidence in the literature that samples to be analyzed for organics or pesticides cannot be dried or freeze-dried without danger of some loss. One study showed 79 percent loss of lindane, 37 percent for dieldrin, 57 percent for p,p'-DDT and 31 percent in o,p'-DDT-DDD on whole eggs and 50 percent for lindane in egg yolk when samples were frozen at -23°C, freeze-dried for 24 hr, and transferred and stored in sealed glass vials at 4°C, so that there was no volatility loss in storage (90).

Morris found that preservation of zooplankton in formalin and methanol resulted in hydrolysis of the animals' lipid and degradation of polyunsaturated fatty acids (90a). He found that the samples were stable up to nine months if stored deep frozen under nitrogen.

Smith reports that changes in nonstructural carbohydrate concentrations occur during the storage of either heat or freeze-dried tissues and concluded that no preservation method is as good as the immediate analysis of fresh tissue; however, he did not investigate straight freezing (91). Other workers found losses in higher fatty acids under either oven or freeze-drying conditions after storage for nine months (92).

Dessicants for tissue preservation are used by some workers who are unable to freeze their samples. The samples are chilled, homogenized, and blended with a combination of sodium sulfate and powdered silica. It is stated that the resulting mixture is a dry, free-flowing powder wherein the pesticide residues are stable for 15 days or more at room temperature (73).

Microbiologicals

Microbiologicals or cellular organisms consist of many -different types such as algae, protozoa, fungi (molds or yeasts), bacteria, submicroscopic viruses and other (microscopic nematodes, some insects and some crustaceans), necessitating a wide variety of different sampling and storage conditions. Most preservation has been done through culturing and subculturing. With care, these have been maintained for 5-8 years (93). The sampling implements and containers should obviously be sterile and glass is preferred to plastic, since bacteria tends to grow on plastic surfaces. Since all known life forms require water in the liquid state, this automatically limits the temperature range for microorganisms. Both bacteria and viruses can be freeze-dried to maintain culture collections and to preserve them for use as vaccines. Insects have been supercooled to -30°C without apparent damage; however, they die if ice crystals are formed. Mouse embryos have survived deep freezing to -196°C. Freezing is accompanied by the removal of water, so the cell is subject to damage by both freezing and drying. Mechanical injury is caused by ice crystals and the removal of the water causes an increase in dissolved substances. Biochemically debilitated cells may show a reduction or complete loss of some enzymes, and ice-damaged cells may have leaky membranes or an altered structure. The damage from freezing, drying, and thawing can range from essentially none to 100 percent, depending on the specific organism and conditions. Spores are resistant to both cold and drying. Rapid freezing is reported to be usually better with bacteria, whereas slow freezing is better for animal cell survival. It has been stated that rapid thawing gives better survival than slow thawing (51). Fleischer and Kervina report in studies on

long-term preservation of liver for subcellular fractionation **that** rapid freezing and thawing minimizes the time in which **degra**dation can occur (94). Repeated freezing and thawing **is** more harmful. Freeze-dried bacteria are better kept at **refri**gerator temperature than at room temperature (51).

22

McPeak and Camp (94a) have reported on work of Valeri, et al. (95), Meryman and Hornblower (96), and Gibson, et al. (97). Their studies on storage of red blood cells show that if the samples are stored at a higher temperature than -60°C, they deteriorate within a few weeks. If glycerol is used as a cryoprotective agent and the cells are frozen rapidly in liquid nitrogen and stored at -80°C, the cells are reported to be stable for over 10 years. Fluctuations in storage temperatures of not more than 10°C above or below -80°C are reported to have no adverse effect. Farrant, et al. (98) report that improved recovery of frozen cells can be obtained by interrupting rapid cooling with a timed exposure to a single subzero temperature.

There is a vast amount of additional information in the literature on the subjects of sampling, handling, and storage for microbiologicals, blood, and other biological samples. Since there are so many different types of species and the related optimum handling appropriate to each specie, it is difficult to summarize; however, a number of additional references are given below to indicate the type of problems that are encountered as well as some additional references concerning other subjects discussed above.

References

- F. A. Richards, On the State of Our Knowledge of Trace Elements in the Ocean, Geochim. Cosmochim Acta, <u>10</u>, 241-243 (1950).
- 2. C. C. Patterson and D. M. Settle, The Reduction of Orders of Magnitude Errors in Lead Analyses of Biological Materials and Natural Waters by Evaluating and Controlling the Extent and Sources of Industrial Lead Contamination Introduced During Sample Collecting, Handling, and Analysis, NBS, TS.*
- D. N. Hume, "Pitfalls in the Determination of Environmental Trace Metals," in Progress in Analytical Chemistry, Vol. V, Ed. S. Ahuja, E. M. Cohen, T. J. Kneip, J. L. Lambert, and Gunter Zweig, pp. 3-16, Plenum Press, New York, London (1973).
- G. C. Whitnack, Application of Single-Sweep Polarography to the Analyses of Trace Elements in Sea Water, Polarography, 641-651 (1964).
- A. Speecke, J. Hoste, and J. Versieck, Sampling of Biological Materials, NBS, TS.*
- 6. E. Berman, The Challenge of Getting the Lead Out, NBS, TS.
- 7. J. H. Boutwell, Jr., Accuracy and Quality Control in Trace Element Analysis, NBS, TS.*
- 8. T. J. Murphy, The Role of the Analytical Blank in Accurate Trace Analysis, NBS, TS.*
- 9. D. E. Robertson, Role of Contamination in Trace Element Analysis of Sea Water, Anal. Chem., 40, 1067-1072 (1968).
- 10. R. E. Thiers, Separation, Concentration and Contamination in Trace Analysis, Ed. J. H. Yoe and H. J. Koch, Jr., pp. 637-666, Wiley, New York (1957).
- 10a. R. E. Thiers, Contamination in Trace Element Analysis and Its Control in Methods of Biochemical Analysis, Ed., D. Glick, Vol. V, pp. 273-333, Interscience Inc., New York (1957).

- 11. G. Tölg, Extreme Trace Analysis of the Elements-I, Methods and Problems of Sample Treatment Separation and Enrichment, Talanta, <u>19</u>, 1489-1521 (1972).
- 12. E. C. Kuehner, R. Alvarez, P. J. Paulsen, and T. J. Murphy, Production and Analysis of Special High-Purity Acids Prepared by Sub-Boiling Distillation, Anal. Chem., <u>44</u>, 2050-2056 (1972).
- 13. R. W. Karin, J. A. Buono, and J. L. Fasching, Removal of Trace Elemental Impurities from Polyethylene by Nitric Acid, Anal. Chem., 47, 2296-2299 (1975).
- 14. D. A. Segar and G. A. Berberian, Comparisons of Sample Contamination by Pumping Systems, Niskin Bottles with Rubber and Teflon Coated Coil Springs, and New Niskin Bottles Without Internal Closures, Paper presented at the 168th ACS National Meeting held in Atlantic City, N. J., September 1974.
- 15. S. H. Harrison, P. D. LaFleur, and W. Zoller, Sampling and Sample Handling for Activation Analysis of River Water, NBS, TS.*
- 16. G. H. Morrison and J. O. Pierce, Sampling, Sample Preparation and Storage for Analysis, in Geochemistry and the Environment, Vol. I, pp. 90-97, National Academy of Sciences, Washington, D. C. (1974).
- 17. F. Amore, Losses, Interferences and Contamination in Trace Metal Analysis - Some Examples, NBS, TS.*
- 18. U. S. Environmental Protection Agency, Methods for Chemical Analysis of Water and Wastes, p. VI, Office of Technology Transfer, EPA (1974).
- 19. Federal Interagency Work Group on Designation of Standards for Water Data Acquisition, Recommended Methods for Water Data Acquisition, p. V-10, U. S. Department of the Interior, Geological Survey, Office of Water Data Acquisition (1972).
- 19a. R. W. Pettis and A. T. Phillip, Trace Analysis of Heavy Metals in the Marine Environment, Rept. 619, Australian Defence Scientific Service, Materials Research Laboratories, Maribyrnong, Victoria, December 1974.

- 20. D. E. Robertson, The Adsorption of Trace Elements in Sea Water on Various Container Surfaces, Anal. Chim. Acta, <u>42</u>, 533-536 (1968).
- **21.** R. W. Hummel, Determination of Gold in Sea Water by **Radioactivation** Analysis, Analyst, <u>82</u>, 483-488 (1957).
- 22. W. G. King, J. M. Rodriguez, C. M. Wai, Losses of Trace Concentrations of Cadmium from Aqueous Solution during Storage in Glass Containers, Anal. Chem., <u>46</u>, 771-773 (1974).
- 23. F. K. West, P. W. West, and F. A. Iddings, Adsorption of Traces of Silver on Container Surfaces, Anal. Chem., 38, 1566-1570 (1966).
- 24. A. W. Struempler, Adsorption Characteristics of Silver, Lead, Cadmium, Zinc, and Nickel on Borosilicate Glass, Polyethylene, and Polypropylene Container Surfaces, Anal. Chem., 45, 2251-2254 (1973).
- 25. W. Dyck, Adsorption of Silver on Borosilicate Glass-Effect of pH and Time, Anal. Chem., <u>40</u>, 454-455 (1968).
- 26. M. G. Lai and H. V. Weiss, Determination of Silver in Sea Water, Anal. Chem., 34, 1012-1015 (1962).
- 27. G. G. Eichholz, A. E. Nagel, and R. B. Hughes, Adsorption of Ions in Dilute Aqueous Solutions on Glass and Plastic Surfaces, Anal. Chem., 37, 863-868 (1965).
- 28. A. E. Smith, A Study of the Variation with pH of the Solubility and Stability of Some Metal Ions at Low Concentrations in Aqueous Solution, Part II, Analyst, 98, 209-212 (1973).
- 29. Ibid., A Study of the Variation with pH of the Solubility and Stability of Some Metal Ions at Low Concentrations in Aqueous Solution, Part I, <u>98</u>, 65-68 (1973).
- 29a. H. A. Salman, Trace Element Analyses in Waters Combining Solvent Extraction with the Atomic Absorption Microsampling Boat, Rept. Ch. E-102, Bureau of Reclamation, U. S. Department of the Interior, Denver, CO, July 1969.
- 30. A. Rattonetti, Stability of Metal Ions in Aqueous Environmental Samples, NBS, TS.*

- 31. J. R. Moody, P. J. Paulsen, T. C. Rains, and H. L. Rook, The Preparation and Certification of Trace Mercury in Water Standard Reference Materials, NBS, TS.*
- 32. J. M. Lo and C. M. Wai, Mercury Loss from Water During Storage: Mechanisms and Prevention, Anal. Chem., <u>47</u>, 1869-1870 (1975).
- 33. C. Feldman, Preservation of Dilute Mercury Solutions, Anal. Chem., <u>46</u>, 99-102 (1974).
- 34. H. J. Issaq and W. L. Zielinski, Jr., Loss of Lead from Aqueous Solution During Storage, Anal. Chem., <u>46</u>, 1328-1329 (1974).
- 35. P. Avotins and E. A. Jenne, The Time Stability of Dissolved Mercury in Water Samples, J. Environ. Quality (1975, in press).
- 36. C. W. Huey, F. Brinckman, W. Iverson, and S. O. Grim, Bacterial Volatilization of Cadmium, Proceedings of the International Conference on Heavy Metals in the Environment, October 27-31, 1975, Toronto (June 1976, in press).
- 37. S. E. Allen, H. M. Grimshaw, J. A. Parkinson, and C. Quarmby, p. 99 in Chemical Analysis of Ecological Materials, S. E. Allen, Ed. (Halstead Press), John Wiley and Sons, New York (1974).
- 38. S. H. Harrison, P. D. LaFleur, and W. H. Zoller, Evaluation of Lyophilization, for the Preconcentration of Natural Water Samples Prior to Neutron Activation Analysis, Anal. Chem., 47, 1685-1688 (1975).
- 38a. R. H. Filby, K. R. Shah, and W. H. Funk, Role of Neutron Activation Analysis in the Study of Heavy Metal Pollution of a Lake-River System, Proc. of the 2nd International Conference on Nuclear Methods in Environmental Res., J. R. Vogt and W. Meyer, Ed., U. of Missouri, Columbia, MO (1974).
- **39.** J. Heron, Determination of Phosphate in Water After Storage in Polyethylene, Limnol. Oceanogr., <u>7</u>, 316-321 (1962).

- 40. F. J. Philbert, The Effect of Sample Preservation by Freezing Prior to Chemical Analysis of Great Lake Waters, Proc. 16th Conf. Great Lakes Res., 282-293, International Association Great Lakes Res. (1973).
- 41. E. C. Kuehner and D. H. Freeman, Containers for Pure Substances, 297-306, in Purification of Inorganic and Organic Materials, M. Zief, Ed., Marcel Dekker, New York, NY (1969).
- 42. M. H. Bothner and D. E. Robertson, Mercury Contamination of Sea Water Samples Stored in Polyethylene Containers, Anal. Chem., <u>47</u>, 592-595 (1975).
- 43. J. Moody, T. Rains, and M. Epstein (private communication).
- 44. B. A. Malo and R. A. Baker, Cationic Concentration by Freezing, in Trace Inorganics in Water, Advances in Chemistry, Series 73, 149-163, Ed., R. F. Gould, American Chemical Society, Washington, DC (1968).
- 45. K. K. S. Pillay, C. C. Thomas, Jr., J. A. Sondel, and C. M. Hyche, Determination of Mercury in Biological and Environmental Materials by Neutron Activation Analysis, Anal. Chem., <u>43</u>, 1419-1425 (1971).
- **46.** P. D. LaFleur, Retention of Mercury When Freeze-Drying Biological Materials, Anal. Chem., <u>45</u>, 1534-1536 (1973).
- 47. J. S. Hislop and A. Parker, The Use of a Laser for Cutting Bone Samples Prior to Chemical Analysis, Analyst, <u>98</u>, 694 (1973).
- 48. J. R. Montgomery, S. E. Kolehmainen, M. D. Banus,
 B. J. Bendien, J. L. Donaldson, and J. A. Ramirez,
 Individual Variation of Trace Metal Content in Fish,
 NBS, TS.^{*}
- J. Versieck, A. Speecke, J. Hoste, and F. Barbier, Trace Contamination in Biopsies of the Liver, Clin. Chem., <u>19</u>, 472-475 (1973).
- 50. G. L. Fisher, L. G. Davies, and L. S. Rosenblatt, The Effects of Container Composition, Storage Duration, and Temperature on Serum Mineral Levels, NBS, TS.
- 51. W. G. Walter, R. A. McBee, and K. L. Temple, Introduction to Microbiology, D. Van Nostrand Co., NY (1973).

- 52. F. A. Ibbott, Sampling for Clinical Chemistry, NBS, TS.
- 53. S. H. Omang and O. D. Vellar, Concentration Gradients in Biological Samples During Storage, Freezing and Thawing,
 Z. Anal. Chem., 269, 177-181 (1974).
- 54. V. T. Bowen and D. Sutton, Comparative Studies of Mineral Constituents of Marine Sponges, Journal of Marine Research, 10, 153-167 (1951).
- 55. R. H. Gibbs, Jr., E. Jarosewich, and H. L. Windom, Heavy Metal Concentrations in Museum Fish Specimens: Effects of Preservatives and Time, Science, <u>184</u>, 475-477 (1974).
- 56. A. Cockburn, R. A. Barraco, T. A. Reymann, and W. H. Peck, Autopsy of an Egyptian Mummy, Science, <u>187</u>, 1155-1160 (1975).
- 57. R. G. Smith, Department of Environmental and Industrial Health, University of Michigan, Ann Arbor, MI.
- 58. R. A. Kehoe, J. Res. Publ. Health Hyg., 24, 1 (1961).
- 59. L. J. Goldwater, Mercury: A History of Quicksilver, York, Baltimore (1972).
- 60. O. J. Attoe, Potassium Fixation and Release in Soils Occurring Under Moist and Drying Conditions, Soil Sci. Soc. Proc., <u>11</u>, 145-149 (1946).
- 61. E. B. Schalscha, C. Gonzalez, I. Vergara, G. Galindo, and A. Schatz, Effect of Drying on Volcanic Ash Soils in Chile, Soil Sci. Soc. Proc., 29, 481-482 (1965).
- 62. N. J. Barrow, Studies on the Mineralization of Sulphur from Soil Organic Matter, Aust. J. Agric. Res., <u>12</u>, 306-319 (1961).
- 63. M. I. Harpstead and B. L. Brage, Storage of Soil Samples and Its Effect on the Subsequent Accumulation of Nitrate Nitrogen During Controlled Incubation, Proc. Soil Sci. Soc. Am., 22, 326-328 (1958).
- 64. H. F. Birch, The Effect of Soil Drying on Humus Decomposition and Nitrogen Availability, Plant and Soil, <u>10</u>, 9-30 (1958).

- **55.** H. F. Birch, Further Observations on Humus, Decomposition and Nitrification, Plant and Soil, <u>11</u>, 262-286 (1959).
- **66.** H. F. Birch, Nitrification in Soils After Different **Periods** of Dryness, Plant and Soil, <u>12</u>, 81-96 (1960).
- 47. Z. Nevo and J. Hagin, Changes Occurring in Soil Samples During Air-Dry Storage, Soil Science, <u>102</u>, 157-160 (1966).
- **68.** P. R. Hesse, p. 12 in A Textbook of Soil Chemical Analysis, John Murray Publishers, Ltd., London (1971).
- 69. T. H. Arkely, D. N. Munns, and C. M. Johnson, Preparation of Plant Tissues for Micronutrient Analysis: Removal of Dust and Spray Contaminants, J. Agric. Food Chem., <u>8</u>, 318-321 (1960).
- 70. J. V. Lagerwerff, Uptake of Cadmium, Lead, and Zinc by Radish from Soil and Air, Soil Sci., 111, 129-133 (1971).
- 71. D. E. Koeppe and R. J. Miller, p. 207 in Environmental Pollution by Lead and Other Metals, Progress Rept. to NSF-RANN, May 1971 - April 1972, Univ. of Illinois.
- 72. H. E. Bruce and S. P. Cram, Sampling Marine Organisms and Sediments for High Precision Gas Chromatographic Analysis of Aromatic Hydrocarbons, pp. 181-182 in Marine Pollution Monitoring, Proc. of a Workshop held at NBS, Gaithersburg, MD, NBS Spec. Publ. 409 (1974).
- 73. Federal Working Group on Pest Management, Guidelines on Sampling and Statistical Methodologies for Ambient Pesticide Monitoring, Washington, DC (1974).
- 73a. Ibid. (1975).
- 74. W. H. Lawrence, J. L. Mitchell, W. L. Guess, and
 J. Autian, Toxicity of Plastics Used in Medical Practice I, J. Pharm. Sciences, <u>52</u>, 958-963 (1963).
- 75. J. Autian and A. J. Kapadia, The Leaching of a Constituent from Medical-Grade Plastic Tubings, Drug Std., <u>28</u>, 101-103 (1960).

- 76. G. W. Gibbs, Asbestos Contamination by Storage in Polyethylene Bags, a report which is included in a paper accepted for publication by the American Industrial Bygiene Assoc. Journal.
- 77. A. J. Bauman, R. E. Cameron, G. Kritchevsky, and
 G. Rouser, Detection of Phthalate Esters as Contaminants of Lipid Extracts from Soil Samples Stored in
 Standard Soil Bags, Lipids, 2, 85-86 (1967).
- 78. D. F. Goerlitz and E. Brown, Methods for the Analysis of Organic Substances in Water, in Techniques of Water-Resources Investigations, USGS Cat. #19:15/5: Bk 5, Chap. A3 (1972).
- 79. C. S. Giam and H. S. Chan, Control of Blanks in the Analysis of Phthalates in Air and Ocean Samples, NBS, TS.
- C. S. Giam, H. S. Chan, and G. S. Neff, Sensitive Method for Determination of Phthalate Ester Plasticizers in Open-Ocean Biota Samples, Anal. Chem., 47, 2225-2229 (1975).
- 81. H. S. Hertz, S. N. Chesler, W. E. May, B. H. Gump, D. P. Enagonio, and S. P. Cram, Methods for Trace Organic Analysis in Sediments and Marine Organisms, pp. 197-199 in Marine Pollution Monitoring, Proc. of a Workshop held at NBS, Gaithersburg, MD, NBS Spec. Publ. 409 (1974).
- 82. P. B. Hamilton and T. T. Myoda, Contamination of Distilled Water, HCl, and NH₄OH with Amino Acids, Proteins, and Bacteria, Clin. Chem., <u>20</u>, 687-691 (1974).
- 83. M. S. Favero, L. A. Carson, W. W. Bond, and N. J. Peterson, <u>Pseudomonas aeruginosa</u>: Growth in Distilled Water from Hospitals, Science, 173, 836-838 (1971).
- 84. Y. Wolman and S. L. Miller, Amino Acid Contamination of Aqueous Hydrochloric Acid, Nature, 234, 548-549 (1971).
- 85. B. E. Conway, H. Angerstein-Kozlowska, W. B. A. Sharp, and E. E. Criddle, Ultrapurification of Water for Electrochemical and Surface Chemical Work by Catalytic Pyrodistillation, Anal. Chem., 45, 1331-1336 (1973).

- 86. D. Straughan, Field Sampling Methods and Techniques for Marine Organisms and Sediments, Marine Pollution Monitoring, Proc. of a Workshop held at NBS, Gaithersburg, MD, NBS Spec. Publ. 409 (1974).
- 87. D. J. Jeffries and C. H. Walker, Uptake of pp'-DDT and its Post-Mortem Breakdown in the Avian Liver, Nature, <u>212</u>, 533-534 (1966).
- 88. M. C. French and D. J. Jeffries, The Preservation of Biological Tissue for Organochlorine Insecticide Analysis, Bull. of Environ. Contam. and Tox., 6, 460-463 (1971).
- 89. D. Bristol, Effects of Storage Conditions on Residues of 2,4-D and 2,4-DCP in Potatoes, NBS, TS.*
- 90. M. E. Zabik and L. Dugan, Jr., Potential of Freeze Drying for Removal of Chlorinated Hydrocarbon Insecticides from Eggs, Jour. Food Sci., 36, 87-88 (1971).
- 90a. Robert J. Morris, The Preservation of Some Oceanic Animals for Lipid Analyses, J. Fish. Res. Board Canada, 29, 1303-1307 (1972).
- 91. D. Smith, Influence of Drying and Storage Conditions on Nonstructural Carbohydrate Analysis of Herbage Tissue - A Review, J. Br. Grassld. Soc., <u>28</u>, 129-134 (1973).
- 92. L. F. Molloy, D. J. Giltrap, T. W. Collie, and A. J. Metson, Degradation of Higher Fatty Acids in Perennial Rye Grass and White Clover Following Drying and Storage, J. Sci. Food and Agric., 25, 595-606 (1974).
- 93. W. P. Iverson, Private Communication.
- 94. S. Fleischer and M. Kervina, Long-Term Preservation of Liver for Subcellular Fractionation, Methods in Enzymology, 31, Pt. A, 3-6 (1974).
- 94a. D. W. McPeak and F. R. Camp, Jr., Frozen Blood Shipping, Military Medicine, 140, 468-470 (1975).
- 95. C. R. Valeri, A. H. Runck, and L. E. McCallum, Observations on Autologous, Previously Frozen, Deglycerolyzed, Agglomerated Resuspended Red Cells. I. Effect of Storage Temperatures. II. Effect of Adenine Supplementation of Glycerolized Red Cells Prior to Freezing, Transfusion, 7, 105-116 (1967).

- **96.** H. T. Meryman and M. Hornblower, A Method for Freezing and Washing Red Blood Cells Using a High Glycerol Concentration, Transfusion, <u>12</u>, 145-156 (1972).
- 97. J. G. Gibson, J. L. Tullis, R. J. Tinch, W. R. Ryan, and S. Diforte, The Post-Thaw Viability of ACD and CPD Blood Preserved in the Frozen State With and Without Added Adenine, Transfusion, 12, 198-207 (1972).
- 98. J. Farrant, S. C. Knight, L. E. McGann, J. O'Brien, Optimal Recovery of Lymphocytes and Tissue Culture Cells Following Rapid Cooling, Nature, <u>249</u>, 452-453 (1974).

Symposium on Accuracy in Trace Analysis: Sampling, Sample Handling, and Analysis, Proc. of the 7th IMR Symp., P. D. LaFleur, Ed., NBS Special Publ. 422 (in press, 1975).

Bibliography Addendum A - Microbiologicals

- A-1 W. M. Abbott and J. S. Hembree, Absence of Antigenicity in Freeze-Dryed Skin Allografts, Cryobiol., <u>6</u>, 416-418 (1970).
- A-2 M. D. Alur and N. Grecz, Mechanism of Injury of Escherichia coli by Freezing and Thawing, Biochem. and Biophys. Res. Commun., 62, 308-312 (1975).
- A-3 H. Bank, Freezing Injury in Tissue Cultured Cells as
 Visualized by Freeze-Etching, Exptl. Cell Res., <u>85</u>, 367-376 (1974).
- A-4 J. B. Bateman, P. A. McCaffrey, R. J. O'Connor, and
 G. W. Monk, Relative Humidity and the Killing of
 Bacteria, Appl. Microbiol., 6, 567-571 (1961).
- A-5 S. Berman, P. L. Altieri, A. Groffinger, and J. P. Lowenthal, Freeze Drying Various Attenuated Strains of <u>Pasteurella</u> <u>Pestis</u>, Cryobiol., <u>7</u>, 40-43 (1970).
- A-6 S. Berman, P. L. Altieri, A. Groffinger, J. P. Lowenthal,
 and S. B. Formal, Freeze Drying Various Strains of
 Shigella, Appl. Microbiol., <u>16</u>, 1779-1781 (1968).
- A-7 H. L. Braid, R. F. Hagerty, and W. H. Lee, Jr., Preservation of Cellular Viability of Human Cartilage at Low Temperature, Transpl., 4, 94-99 (1966).
- A-8 B. L. Brown, S. C. Nagle, Jr., J. D. Lehmann, and
 C. D. Rapp, Preservation of Insect Cells in Liquid
 Nitrogen, Tech. Manuscript 590, Dept. of the Army,
 Fort Detrick, Frederick, MD (1970).
- A-9 B. L. Brown, S. C. Nagle, Jr., J. D. Lehmann, and
 C. D. Rapp, Storage of <u>Aedes Aegypti</u> and <u>Aedes Albopictus</u>
 Cells Under Liquid Nitrogen, Cryobiol., <u>7</u>, 249-251 (1971).
- A-10 M. S. Brown and F. W. Reuter, Freezing of Nonwoody
 Plant Tissues. III. Videotape Micrography and the
 Correlation between Individual Cellular Freezing Events
 and Temperature Changes in the Surrounding Tissue,
 Cryobiol., <u>11</u>, 185-191 (1974).

- A-11 W. Brüschweller and W. Gehring, A Method for Freezing Living Ovaries of <u>Drosophila melanogaster</u> Larvae and Its Application to the Storage of Mutant Stocks, Separatum Experientia, 29, 135 (1973).
- A-12 W. A. Cassel and K. M. McCaskill, Ehrlich Ascites Tumor Preservaton for 15 Years - A Simple Method, Appl. Microbiol., 28, 726 (1974).
- A-13 W. H. J. Crombach, Deep-Freezing of Bacterial DNA for Thermal Denaturation and Hybridization Experiments, J. Microbiol. and Serology, <u>39</u>, 249-255 (1973).
- A-14 R. Digirolamo, J. Liston, and J. Matches, The Effects of Freezing on the Survival of <u>Salmonella</u> and <u>E. coli</u> in Pacific Oysters, J. Food Sci., <u>35</u>, 13-16 (1970).
- A-15 J. Farrant, Mechanism of Cell Damage During Freezing and Thawing and its Prevention, Nature, 205, 1284-1287 (1965).
- A-16 J. Farrant, S. Knight, L. E. McGann, J. O'Brien, Optimal Recovery of Lymphocytes and Tissue Cells Following Rapid Cooling, Nature, 249, 452-453 (1974).
- A-17 W. N. Fishbein, Mechanism of Freezing Damage to Mouse Liver Using a Mitochondrial Enzyme Assay. III. Cryophyllaxis with DMSO and Enzyme Localization, Cryobiol., 8, 293-299 (1971).
- A-18 W. N. Fishbein and R. E. Stowell, Studies of the Mechanism of Freezing Damage to Mouse Liver Using a Mitochondrial Enzyme Assay, I. Temporal Localization of the Injury Phase During Slow Freezing, Cryobiol., <u>4</u>, 283-289 (1968).
- A-19 Ibid, II. Comparison of Slow and Rapid Cooling Rates, 6, 227-234 (1969).
- A-20 M. P. Garber and P. L. Steponkus, Alterations in Chloroplast Membranes during Cold Acclimation and Freezing, Cryobiol., <u>10</u>, 532 (1973).
- A-21 L. J. Goatcher, S. E. Engler, D. C. Wagner, and
 D. C. Westhoff, Effect of Storage at 5°C on Survival of Vibrio Parahaemolyticus in Processed Maryland
 Oysters, J. Milk Food Tech., 37, 74-77 (1974).

- A-22 R. Gomez, M. Takano, and A. J. Sinskey, Characteristics of Freeze-Dried Cells, Cryobiol., <u>10</u>, 368-374 (1973).
- A-23 E. Griffiths and H. F. Birch, Microbiological Changes in Freshly Moistened Soil, Nature, <u>189</u>, 424 (1961).
- A-24 D. F. Hiltz, L. J. Bishop, and W. J. Dyer, Accelerated Nucleotide Degradation and Glycolysis During Warming to and Subsequent Storage at -5°C of Prerigor, Quick-Frozen Adductor Muscle of the Sea Scallop (Placopecten magillanicus), J. Fish Res. Board of Canada, <u>31</u>, 1181-1187 (1974).
- A-25 International Atomic Energy Agency, Reference Methods for Marine Radioactivity Studies, Tech. Rept. Series 118, IAEA, Vienna, pp. 26, 28 (1970).
- A-26 E. Israeli and A. Kohn, Protection of Lyophilized E. coli by Colicin El Treatment, FEBS Letters, <u>26</u>, 323-<u>326</u> (1972).
- A-27 E. Israeli, A. Kohn, and J. Gitelman, The Molecular Nature of Damage by Oxygen to Freeze-Dried Escherichia <u>coli</u>, Cryobiol., <u>12</u>, 15-25 (1975).
- A-28 D. W. Janssen and F. F. Busta, Influence of Milk Components on the Injury, Repair of Injury and Death of Salmonella anatum Cells Subjected to Freezing and Thawing, Appl. Microbiol., <u>26</u>, 725-732 (1973).
- A-29 B. Kirsop, The Stability of Biochemical, Morphological and Brewing Properties of Yeast Cultures Maintained by Subculturing and Freeze-Drying, J. Inst. of Brew. (London), 80, 565-570 (1974).
- A-30 M. Kuzminska, A. Szdlowski, I. Werner, and L. Obrzut, Microbiological Analysis of Fish Dishes During Freezing and Subsequent Cold Storage at -22°C, International Institute of Refrigeration, 1972, 123-132.
- A-31 K. A. Lehner, Freezing Preservation of Foods with Carbon Dioxide and Dry Ice, Amer. Soc. Heat. Refrig. Air Cond. Eng. J., 13, 41-43 (1971).
- A-32 J. Lundy and W. G. Fitz-William, A Portable Dry-Ice Storage Chamber for Enhanced Preservation of Enzymes in Frozen Tissue Specimens, Stain Tech., <u>46</u>, 259-261 (1971).

- A-33 G. M. Martin, A Case for Regional Culture Collections of Microorganisms, Nature, 247, 431-433 (1974).
- A-34 T. Matsuhashi, Studies on Freezing and Drying of Agar Gel, Refrig., <u>49</u>, 966-973 (1974).
- A-35 D. E. McComb and C. I. Puzniak, Micro Cell Culture Method for Isolation of <u>Chlamydia</u> trachomatis, Appl. Microbiol., <u>28</u>, 727-729 (1974).
- A-36 J. Nath and J. O. Anderson, Some Biochemical Alterations Associated with the Freeze Preservation of Pollen, Cryobiol., <u>10</u>, 533 (1973).
- A-37 O. Novick, E. Israeli, and A. Kohn, Nucleic Acid and Protein Synthesis in Reconstituted Lyophilized Escherichia coli Exposed to Air, J. Appl. Bact., 35, 185-191 (1972).
- A-38 K. Ostrowski, Current Problems of Tissue Banking, Transpl. Proc., 1, 126-131 (1969).
- A-39 W. Partmann, Some Effects of Defined Conditions of Freezing and Thawing on Histological Changes in White Muscle of Carp, International Inst. of Refrig., 1972, 77-84.
- A-40 F. F. G. Rommerts, L. G. van Doorn, H. Galjaard,
 B. A. Cook, and H. J. van der Molen, Dissection of
 Wet Tissue and of Freeze-Dried Sections in the
 Investigation of Seminferous Tubules and Interstitial
 Tissue from Rat Testis, J. Histochem. and Cytochem.,
 21, 572-579 (1973).
- A-41 V. U. Schneider, J. Hahn, and H. Sulzer, Preliminary
 Results of Low Temperature Preservation in Mouse and
 Rabbit Ova, Dtsch. Tierarztl. Wschr., <u>81</u>, 470-472 (1974).
- A-42 T. H. Scholten and J. Yang, Evaluation of Unpreserved and Preserved Stools for the Detection and Identification of Parasites, Amer. J. of Clin. Path., <u>62</u>, 563-567 (1974).
- A-43 K. W. Sell, Viability Assay of Organized Tissues and Organs, Cryobiol., <u>4</u>, 133-135 (1967).
- A-44 E. M. Simon and M. V. Schneller, The Preservation of Ciliated Protozoa at Low Temperature, Cryobiol., <u>10</u>, 421-426 (1973).

- -A-45 R. B. Smittle, S. E. Gilliland, and M. L. Speck, Death of Lactobacillus bulgaricus Resulting from Liquid Nitrogen Freezing, Appl. Microbiol., 24, 551-554 (1972).
- A-46 J. Stadhousers, G. Hup, and L. A. Jansen, A Study of the Optimum Conditions of Freezing and Storing Concentrated Mesophilic Starters, Neth. Milk Dairy J., <u>25</u>, 229-239 (1971).
- A-47 P. L. Steponkus and S. C. Wiest, Freezing Injury of Plant Plasma Membranes, Cryobiol., <u>10</u>, 532 (1973).
- -A-48 M. Suzuki, Stability and Residual Moisture Content of Dried Vaccinia Virus, Cryobiol., <u>10</u>, 432-434 (1973).
- A-49 Ibid. Protectants in the Freeze-Drying and the Preservation of Vaccinia Virus, 435-439.
- A-50 M. Takano, J. Sado, T. Ogawa, and G. Terui, Freezing and Drying of <u>Spirulina</u> platensis, Cryobiol., <u>10</u>, <u>440-444</u> (1973).
- A-51 R. Todorova, On the Lyophilization of Viruses and Virus Vaccines, Vet. Med. Nauki, Sofia, <u>10</u>, 52-53, (1973).
- A-52 L. E. Towill, P. Mazur, and G. P. Howland, Plasmolysis Injury as a Factor in Freezing Injury in Plant Tissue Culture, Cryobiol., <u>10</u>, 532 (1973).
- A-53 S. Tsuru, Preservation of Marine and Fresh Water Algae by Means of Freezing and Freeze Drying, Cryobiol., 10, 445-452 (1973).
- A-54 S. Tsuru, Protection Mechanisms of Biological Materials During Freezing and Thawing, (Fermentation Research Institute, Agency of Industrial Science and Technology), 97-102, I.I.F.-I.I.R.-Commission CI-Sappors, 1973-5.
- A-55 K. J. Whittle, A Multiple Sampling Technique for Use with the Cell-Fragility Method of Determining Deteriorative Changes in Frozen Fish, J. Sci. Fd. Agric., 24, 1383-1389 (1973).
- A-56 G. L. Zink and H. C. Hines, The Freezing and Preservation of Bovine Erythrocytes in Liquid Nitrogen, Anim. Blood Grps. biochem. Genet., 1, 23-32 (1970).

Bibliography Addendum B - Blood

- B-1 J. Abramowitz, A. Stracher, and T. C. Detwiler, Proteolysis of Myosin during Platelet Storage, J. Clin. Investig., <u>53</u>, 1493-1496 (1974).
- B-2 O. Akerblom and C. F. Högman, Frozen Blood: A Method for Low-Glycerol, Liquid Nitrogen Freezing Allowing Different Post-Thaw Deglycerolization Procedures, Transf., <u>14</u>, 16-26 (1974).
- B-3 H. Chaplin, Jr., E. Beutler, J. A. Collins, E. R. Giblett, and H. F. Polesky, Current Status of Red-Cell Preservation and Availability in Relation to the Developing National Blood Policy, New Eng. J. Med., <u>291</u>, 68-74 (1974).
- B-4 D. G. Corby, K. A. Preston, and T. P. O'Barr, Adverse Effect of Gel Filtration on the Function of Human Platelets, Proc. Soc. Exptl. Biol. and Med., <u>146</u>, 96-98 (1974).
- B-5 J. P. Crowley, E. M. Skrabut, and C. R. Valeri, Immunocompetent Lymphocytes in Previously Frozen Washed Red Cells, Vox Sang., <u>26</u>, 513-517 (1974).
- B-6 E. Dobry, J. Fiala, and J. Livora, A Comparison of the Cryoprotective Effect of Glycerol and Dimethyl Sulfoxide in the Preservation of Murine Bone Marrow, Blut Zeitschr. Gesamte Blut., 23, 359-362 (1971).
- B-7 J. R. Geraci and F. R. Engelhardt, The Effects of Storage Time, Temperature, and Anticoagulants on Harp Seal, Phoca Groenlandica Hemograms: A Simulated Field Study, Physiol. Zool., <u>47</u>, 22-28 (1974).
- B-8 M. Hills, G. I. C. Ingram, and M. O. Matchett, Lyophilized Plasma as an Assay Standard for Factor VIII: Calibration and Control with Fresh Plasma Samples, Brit. J. Haemat., <u>18</u>, 617-624 (1970).
- B-9 M. S. Jacobson, R. Parkman, L. N. Button, R. J. Jaeger, and S. V. Kevy, The Toxicity of Human Serum Stored in Flexible Polyvinyl Chloride Containers on Human Fibroblast Cell Cultures: An Effect of Di-2-Ethylhexyl Phthalate, Res. Commun. Chem. Path. and Pharmacol., <u>9</u>, 315-323 (1974).

- B-10 S. M. Lewis and C. T. H. Stoddart, Effects of Anticoagulents and Containers (Glass and Plastic) on the Blood Count, Lab. Prac., 20, 787-792 (1971).
- B-11 S. Murphy, S. N. Sayar, N. L. Abdou, and F. H. Gardner, Platelet Preservation by Freezing. Use of Dimethylsulfoxide as Cryoprotective Agent, Transf., <u>14</u>, 139-144 (1974).
- B-12 J. Niedworok, Comparative Investigations of Plasma Lipids during the Blood Preservation at Ultra-Low Temperatures in Relation to the Preservative, Acta Haemat. Pol., 2, 172-173 (1971).
- **B-13 V. S. Seidl, Tiefkühlkonservierung von Blut, Blut** Zeitschr. Gesamte Blut., <u>25</u>, 145-149 (1972).
- B-14 L. Weatherbee, H. H. Spencer, C. T. Knorpp, S. M. Lindenauer, P. W. Gikas, and N. W. Thompson, Coagulation Studies after Transfusion of Hydroxyethyl Starch Protected Frozen Blood in Primates, Transf., <u>14</u>, 109-115 (1974).
- B-15 F. C. Wessling and P. L. Blackshear, The Effect of Gases on the Recovery of Human Red Blood Cells, Cryobiol., <u>7</u>, 265-273 (1971).
- B-16 A. E. Woolgar, Hemolysis of Human Red Blood Cells by Freezing and Thawing in Solutions Containing Polyvinylpyrrolidone: Relationship with Posthypertonic Hemolysis and Solute Movements, Cryobiol., <u>11</u>, 52-59 (1974).

Bibliography Addendum C - Biological Sample Preparation and Storage

- C-1 A. Abu-Samra, J. S. Morris, and S. R. Koirtyohann, Wet Ashing of Some Biological Samples in a Microwave Oven, Anal. Chem., 47, 1475-1477 (1975).
- C-2 D. Behne and P. A. Matamba, Drying and Ashing of Biological Samples in the Trace Element Determination by Neutron Activation Analysis, Z. Anal. Chem., 274, 195-197 (1975).
- C-3 F. R. Camp, F. R. Ellis, C. E. Shields, and M. M. Werline, Long-Term Preservation of Biologicals for the Forensic Laboratory and Their Areas of Application, J. Forensic Sci., <u>13</u>, 419-432 (1968).
- C-4 J. Chirife and M. Karel, Contribution of Adsorption to Volatile Retention in a Freeze-Dried Food Model Containing PVP, J. Food Science, 38, 768-771 (1973).
- C-5 J. Chirife and M. Karel, Volatile Retention During Freeze Drying of Protein Solutions, Cryobiol., <u>11</u>, 107-115 (1974).
- C-6 I. Y. Donev, Rapid Homogenization and Drying of Biological Material, in Accuracy in Trace Analysis: Sampling, Sample Handling, and Analysis, Proc. of the 7th IMR Symp., P. D. LaFleur, Ed., NBS Spec. Publ. 422 (in press 1975).
- C-7 N. El Bassam and F. Mertens, Influence of Various Storage and Drying Methods on the Chemical Composition of Sludge, Landbauforsch. Voelkenrode, 22, 41-44 (1972).
- C-8 J. Flink and M. Karel, Effects of Process Variables on Retention of Volatiles in Freeze-Drying, J. Food Sci., 35, 444-447 (1970).
- C-9 J. M. Flink and T. P. Labuza, Retention of 2-Propanol at Low Concentration by Freeze-Drying Carbohydrate Solutions, J. Food Sci., 37, 617-618 (1972).
- C-10 R. Gomez, M. Takano, and A. J. Sinskey, Characteristics of Freeze-Dried Cells, Cryobiology, 10, 368-374 (1973).

- C-11 T. T. Gorsuch, Dissolution of Organic Materials, in Accuracy in Trace Analysis: Sampling, Sample Handling, and Analysis, Proc. of the 7th Symp., P. D. LaFleur, Ed., NBS Spec. Publ. 422 (in press 1975).
- C-12 T. T. Gorsuch, The Destruction of Organic Matter, Pergamon Press, Oxford, New York, Toronto, Sydney (1970).
- C-13 G. J. Haas, S. Barnett, and H. E. Prescott, Jr., Pressure-Freezing -- A New Pretreatment Process to Prevent Shrivelling during Drying of Cellular Foods, in part in Cryobiol., 9, 101-106 (1972).and in part in J. Food Sci., <u>37</u> (1972).
- C-14 R. Hamm, K. Potthast, and L. Acker, Influence of Water Activity on Enzymatic Changes in Freeze-Dehydrated Muscle. I. The Breakdown of Adenosine Triphosphate, Z. Lebensm. Unters.-Forsch., 154, 73-79 (1974).
- C-15 J. A. Hesek and R. C. Wilson, Use of Microwave Oven in In-Process Control, Anal. Chem., 46, 1160 (1974).
- C-16 C. S. Huber, R. B. Harrington, and W. J. Stadelman, Effect of Freezing Rate and Freeze-Drying on the Soluble Proteins of Muscle. II. Turkey Muscle, J. Food Sci., <u>35</u>, 233-236 (1970).
- C-17 C. S. Huber and W. J. Stadelman, Effect of Freezing Rate and Freeze-Drying on the Soluble Proteins of Muscle. I. Chicken Muscle, J. of Food Sci., <u>35</u>, 229-232 (1970).
- C-18 B. M. Kilcullen and R. D. Harter, A Simple System for Freeze Drying, J. Chem. Ed., <u>5</u>1, 590 (1974).
- C-19 B. J. Longan, G. A. Hruzek, and E. E. Burns, Effect of Processing Variables on Volatile Retention of Freeze-Dried Carrots, J. Food Science, <u>39</u>, 1191-1194 (1974).
- C-20 H. A. Massaldi and C. J. King, Volatiles Retention During Freeze-Drying of Synthetic Emulsion, J. Food Sci., <u>39</u>, 438-444 (1974).

- C-21 J. Parker and H. M. Smith, Design and Construction of a Freeze Dryer Incorporating Improved Standards of Biological Safety, J. Appl. Chem. Biotechnol., 22, 925-932 (1972).
- C-22 H. Souzu, The Phospholipid Degradation and Cellular Death Caused by Freeze-Thawing or Freeze-Drying of Yeast, Cryobiol., <u>10</u>, 427-431 (1973).
- C-23 L. U. Thompson and O. Fennema, Effect of Freezing on Oxidation of L-Ascorbic Acid, J. Agric. Food Chem., <u>19</u>, 121-124 (1971).
- C-24 J. M. Tuomy, Freeze-Drying of Foods for the Armed Services, Tech. Rept. 72-28-FL, U. S. Army Natick Lab., Natick, Mass. (1971).
- C-25 V. L. Voznesenskii and L. A. Filippova, Instrument for Freeze-Drying Tissues, Soviet Plant Physiol., <u>16</u>, 793-794 (1969).
- C-26 J. W. Young and G. D. Christian, Simple Inexpensive Freeze-Drying Procedure, Anal. Chem., <u>45</u>, 1296 (1973).

APPENDIX B

Summary of Activities - Container Studies

The integrity of any sample can be no better than that of the container in which it is stored. The need for extremely clean containers for SRM's and other samples is obvious. Unfortunately, few subjects in chemistry are likely to provoke more disagreement than the choice of the proper container materials and the selection of the best method to clean them. Although Teflon remains the container of choice for most materials, its high cost prevents more general usage.

A number of investigations have been undertaken at NBS in an attempt to learn more about container materials. Among the materials investigated were Teflon (FEP, TFE, ETFE, PFA, and TFE Tape), conventional polyethylene (CPE) linear polyethylene (LPE), polycarbonate (PC), polypropylene (PP), polymethylpentane (PMP), polyvinylchloride (PVC), and polystyrene (PS). Four of these materials (CPE, LPE, PC, and FEP) were examined by isotope dilution mass spectrometry. The amount of lead leached from the container in one week of soaking in (1+1) HC1 was determined and then the amount of lead leached from the same containers was determined after the bottles were soaked for one week in (1+1) HNO₃. Only the Teflon bottle was heated, however, at the end of this preliminary treatment with HCl and HNO3, no further leaching was observed (except for PC) after long term leaching with dilute HNO₃ (0.5%).

Nineteen elements were examined using the spark source mass spectrometer. The leaching of the plastics was carried out in the same manner described for lead. Reports summarizing all of the mass spectrometric data are attached. It should be borne in mind that numbers at or below 1 ppb are essentially upper limit values. All concentrations are expressed in terms of ng/g of solution stored in the containers. Neutron activation analysis was employed to look at the impurity levels within the plastics themselves both before

and after a cleaning process. Nineteen plastics and twelve elements were examined when possible. Due to the uncertainty in the data, we were unable to correlate the amount of an element leached out of a plastic with the change in the concentration of that element within the plastic.

It should be noted that reactor irradiation changes to some extent the nature of the matrix. All samples absorbed considerable gamma radiation and were visibly browned by ratiation damage. Some materials, especially PVC and the Teflons, were further damaged by the absorption of beta radiation induced in the matrix itself. Furthermore those radioactive atoms that are detected in the leach solution are precisely those which have undergone Szilard-Chalmers recoil and hence may not be representative of the unactivated atoms of interest. The overall result may be summarized as follows. CPE, PFA, TFE, PP, and PS were generally clean. FEP contained large amounts of K and W while Teflon pipe tape contained very large amounts of Zn. Among the other plastics, LPE contained large amounts of Na, Zn, and Ca. PMP contained large amounts of Zn, PC contained large amounts of Br, and PVC contained large amounts of Na and Sn. Usually, the concentration of impurities in a plastic were not significantly changed by the cleaning process. This would seem to indicate that only the surfaces of the plastics are being cleaned.

The plastics were also examined from the point of view of moisture loss. Teflon and polypropylene breathe water vapor at an annual rate of <0.05 percent. Conventional polyethylene loses about 0.1 percent per year, PVC loses about 0.5 percent per year, polymethylpentane loses about 1 percent per year and polycarbonate loses about 2 percent per year. Considering these results, and eliminating all Teflon products by virtue of cost, one is left with only one choice, conventional polyethylene. Polymethylpentane and polypropylene have slightly greater contamination levels and the other plastics still more.

430

Based upon the experience of these studies, the following is the minimum suggested cleaning for conventional polyethylene. Remove surface contamination (wipe using a solvent), rinse, and soak for one week in (1+5) HCl followed by soaking for one week in (1+5) HNO₃. Rinse with best distilled water, fill with distilled water and allow to stand for several weeks to remove acid which has diffused into the container walls. Empty and air dry in a clean room. Containers cleaned in this manner have been used for the preparation of SRM 1643, Trace Elements in Water. To date, no evidence of contamination has been found in preliminary sample work and although long range data is not yet available previous experience with stability studies would indicate that contamination will not be a problem. These results are being prepared for presentation as a paper in Analytical Chemistry.



UNITED STATES DEPARTMENT OF COMMERCE National Bureau of Standards Washington, D.C. 20234

August 8, 1975

MEMORANDUM FOR T. J. Murphy

From: M. J. Seward and P. J. Paulsen Analytical Spectrometry Section

Subject: SSMS I.D. Analysis of Impurities Leached from Plastic Containers.

The analysis of the impurities in HCl and HNO, after leaching plastic containers is given in the attached tables. Please note that the volume of acid analyzed and amount of spike added are optimum for the analysis at the 3 to 10 ppb level. For this reason all values at or below approximately 1 ppb should be considered as upper limits. These elements were not necessarily actually detected in the samples.

Attachment

cc: P.D.LaFleur I.L.Barnes



| Impurities | Leached | from | Plastic | Containers |
|------------|---------|------|---------|------------|
| | | | | |

| | Teflor | n FEP | Linear Polyethylene | | | | |
|----------------------------|------------------------|---------------------------------|-------------------------------|--------------------------|--|--|--|
| Elements | (1+1) HNO ₃ | (1+1) HC1 | (1+1) HNO ₃ | (1+1) HCl | | | |
| | 1A | 1B | 2A | 2B | | | |
| Pb | 1 | 1 | 1 | | | | |
| Tl | ≤ 0.5 | ≤ 0.5 | < 0.5 | | | | |
| Ba | *2 | *1 | < 0.1 | | | | |
| Te | 0.3 | 1 | 0.1 | | | | |
| Sn | 0.5 | 0.7 | 0.6 | | | | |
| Cd Ag Sr Se Zn | | 0.3 < 3 < 0.5 0.4 2 | 0.1 0.1 0.5 0.2 4 | 0.1 0.1 0.2 4.7 | | | |
| Cu | 1 | 3 | 0.2 | 0.6 | | | |
| Ni | 1 | 0.4 | *0.8 | 0.4 | | | |
| Fe | *10 | *8 | *1.6 | 0.7 | | | |
| Cr | 0.4 | 2 | 0.1 | 0.4 | | | |
| Ca | 40 | 1 | 8 | 30 | | | |
| K | 1 | 0.8 | 1 | 0.5 | | | |
| Mg | 4 | 0.5 | 0.3 | 0.2 | | | |
| Al | 3 | 2 | 0.7 | 2 | | | |
| Na | 3 | 1 | 5 | 3 | | | |

* Positive presence in sample

Note: Samples are spiked for an optimum concentration of 3 to 10 ppb; don't take 1 ppb and lower numbers too seriously (i.e., < values).

| | Conventional | Polyethylene | Polycarb | carbamate | | | |
|----------------------------|--|--|----------------------------|-------------------|--|--|--|
| Elements | (1+1) HNO ₃ | (1+1) HCl | (1+1) HNO ₃ | (1+1) HCl | | | |
| | 3A | 3B | 4A | 4B | | | |
| Pb | 0.4 | 11 | 0.2 | 6 | | | |
| Tl | 0.8 | 2 | ≤ 0.5 | 0.4 | | | |
| Ba | 1 | 0.2 | 0.2 | 2 | | | |
| Te | < 0.3 | 0.4 | 0.2 | <u></u> | | | |
| Sn | < 0.5 | ≤ 0.5 | 0.1 | ≤ 8 | | | |
| Cd Ag Sr Se Zn | $ \begin{array}{c} 0.1 \\ \hline 0.1 \\ 2 \\ 1 \end{array} $ | $ \begin{array}{c} 0.2 \\ 0.1 \\ \leq 0.2 \\ 0.6 \end{array} $ | 0.2 ≤ 0.1 0.3 0.5 | ≤ 5 0.2 ≤ 3 | | | |
| Cu | 1 | 0.4 | 0.5 | | | | |
| Ni | 0.3 | 0.2 | 0.4 | | | | |
| Fe | *2 | 0.6 | *2 | | | | |
| Cr | 0.5 | 0.2 | 0.2 | | | | |
| Ca | 6 | 0.5 | 2 | | | | |
| K | 1 | 0.4 | 1 | | | | |
| Mg | 0.4 | 0.4 | 1 | | | | |
| Al | 7 | 6 | 3 | | | | |
| Na | 5 | 26 | 2 | | | | |

Impurities Leached from Plastic Containers ppb by weight

admaile Admaile 11. EF June 18, 1975

MEMORANDUM FOR I. L. Barnes, Chief Analytical Spectrometry Section

From: **/T. J.** Murphy and J. W. Gramlich Analytical Spectrometry Section

Subject: Cleaning of Plastic Containers

The cleaning of plastic bottles by the alternate use of hydrochloric and nitric acids has been investigated by monitoring the lead leached from the bottles by each acid cleaning. Four plastic container materials were investigated. They were FEP Teflon, linear polyethylene, conventional polyethylene, and polycarbonate. The bottles were filled with the appropriate acid and allowed to stand full for a minimum of one week. The FEP Teflon bottle was heated to about 80 °C and the others were kept at room temperature.

The total lead leached from each bottle was determined by spiking a 200 g aliquot with ²⁰⁶Pb, evaporating and determining the lead by mass spectrometry.

The results of these determinations are shown in Table 1. The results show that the bottles were essentially clean in regards to lead after the first cleaning with (1+1) HCL. The 0.5% HNO₃ was tried since Dr. Patterson of the California Institute of Technology claims that concentration of nitric acid is more efficient for cleaning Teflon Containers than (1+1) HNO₃. However, this was not confirmed in the present study. Even after two months standing, no further leaching of lead occurred.

2

aloners tilocul. Te 1 olyceation ale

train Petrona

TARE TEP

Attachment

cc: P. D. LaFleur

| 400 | ą | 3 | 5 |
|-----|---|---|---|
|-----|---|---|---|

1

No sheet. Louis

| Table | 1 | • | Lead | Leached | From | Containers |
|-------|---|---|------|---------|------|------------|
|-------|---|---|------|---------|------|------------|

| Bottle | Size | (1+1) HC1 | (1+1) HNO3 | 0.5% HNO3 | 0.5% HNO3 |
|---------------------------|-------------|-----------|------------|-----------|----------------------|
| | | 1 week | 1 week | 1 week | 2 months |
| | ml | ng Pb | ng Pb | ng Pb | ng Pb |
| Teflon FEP | 1000 | 203 | 7 | | |
| Linear Polyethylene | 1000 | 98 | | | |
| Conventions1 Polyethylene | 500 | 54 | | | متقربين و |
| Polycarbonate | 50 0 | 111 | 7 | 7 | مى يەت. |

.

--- No significant amount over blank level.

APPENDIX C

Summary of Activities - Speciation in Water, Air and Related Materials

Determining the chemical species or form of an inorganic element in water, air, sediments, etc., is a difficult, if not impossible, task using most analytical techniques. This is true since most methods require some chemical pretreatment of the sample which invariably alters the chemical species.

We have developed a method which can be used in many cases to examine samples "as-is" and looks very promising for the determinaiton of speciation where the various chemical forms have a different volatility. This method, which is called dual plasma emission spectrometry, utilizes a separate controlled temperature heating chamber connected to a capacitively-coupled plasma torch (CCP). The characteristic emission is then analyzed using one or more monochrometers with electron multiplier detectors. A diagram of the dual plasma torch unit is shown in figure 1. In this example the sample (which may be liquid or solid) is shown inside the coils of a small induction furnace which is programmed through a specific, and known, heating cycle. The evolved species are carried by the argon/nitrogen carrier directly into the CCP where emission of the characteristic wavelength takes place. For very refractory samples a high temperature plasma can be formed within the sample chamber. Alternately the induction furnace can be replaced with a simple resistance furnace and/or cooling coils to permit the sample to be taken through any desired heating, cooling cycle.

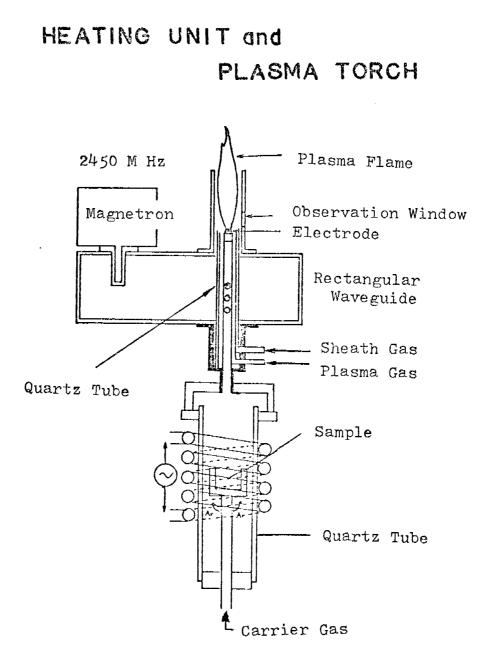
The unit has been used to date to examine air particulate filters, adsorption tubes with vapor samples and a variety of water, sediments, tissue, yeast and other samples to examine these for various species of lead, mercury, chromium and arsenic contained within the samples.

437

Two examples of the application of this method are shown here. In figure 2 is shown the change in intensity of the Hg line as a sample of lyophilized tuna fish is heated through the temperature cycle shown. The peak starting at 184 °C has been shown to be due to mercuric chloride and that starting at 353 °C is due to mercuric oxide. A typical working curve for mercuric chloride is shown in figure 3. Similar curves have been obtained for ocean sediments and sea water, both of which show a lower temperature peak determined to be methyl mercury, but this has not as yet been examined quantitatively.

A similar effect has been noted for chromium in yeast (figure 4). In this case the chromium line at 4289 Å has been repetively scanned as the temperature was increased to look for any possible changes in background. The low temperature peak is believed to be an organo-chromium compound although it has not as yet been identified. The higher temperature peak is inorganic chromium. In neither case have the amounts of chromium been determined quantitatively although this should be possible.

The potential of this method to determine chemical speciation in a wide variety of samples and for a number of elements has been demonstrated. Much work remains to be done to further identify organo-metallic species and to determine these quantitatively. This aspect is being explored for chromium in yeast and mercury in fresh fish, sediment and water. Other applications will be explored in the future.



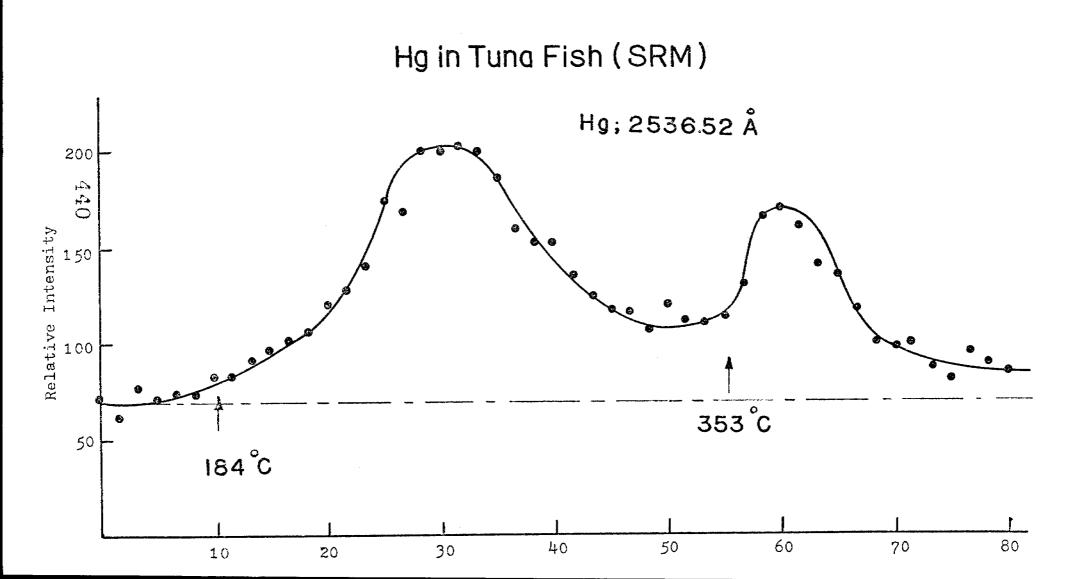
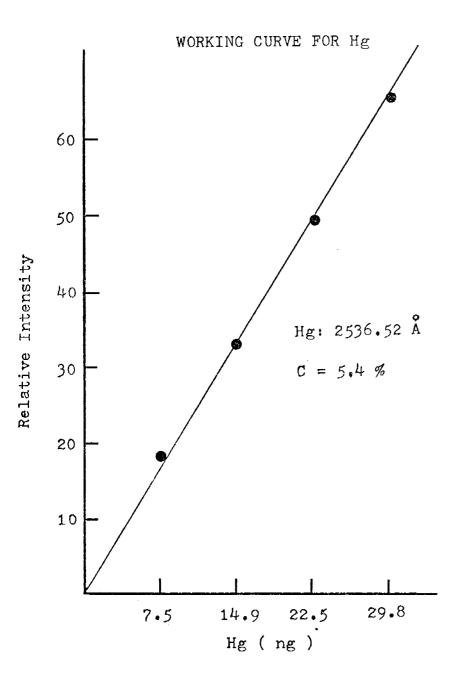
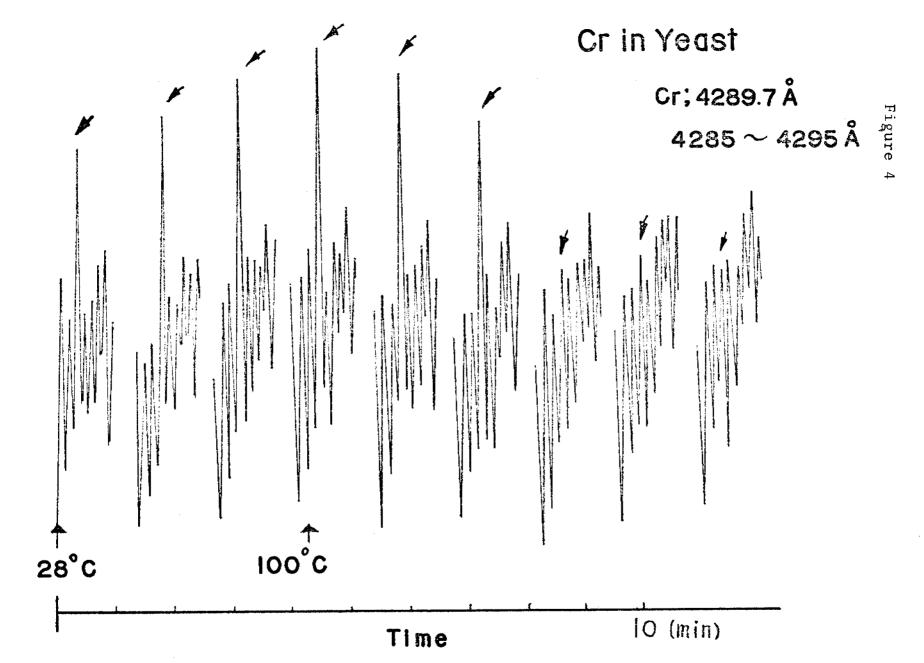


Figure 2

Figure 3





ANNUAL REPORT

Research Unit: #153/155 Reporting Period: 1 July 1975 thru 1 April 1976 Number of Pages: 99

> Distribution of Light Hydrocarbons, C_1-C_4 , in the Northeast Gulf of Alaska and the Southeastern Bering Shelf

> > Dr. Joel Cline Dr. Richard Feely

Pacific Marine Environmental Laboratory Seattle, Washington 98105

March 25, 1976

TABLE OF CONTENTS

| Chapter | <u> </u> | age |
|---------|---|-----|
| 1. | General Summary | 1 |
| | 1.1 Objectives | 1 |
| | 1.2 Conclusions | 1 |
| | 1.21 Bristol Bay | 2 |
| | 1.22 Northeast Gulf of Alaska | 2 |
| | 1.3 Implications to Oil and Gas Development | 4 |
| 2. | Introduction | 6 |
| | 2.1 General Nature of Study | 6 |
| | 2.2 Objectives | 8 |
| | 2.3 Relevance to OCSEAP | 8 |
| 3. (| Current Knowledge | 10 |
| 4. 5 | Study Areas | 11 |
| 4 | 4.1 Bering Sea | 11 |
| 4 | 4.2 Northeast Gulf of Alaska | 11 |
| 5. N | Methodology | 17 |
| 2 | 5.1 Sample Concentration | 17 |
| 5 | 5.2 Gas Chromatography | 17 |
| 5 | 5.3 Quality Control | 22 |
| | 5.31 Standardization and Accuracy | 22 |
| | 5.32 Precision | 23 |
| 1 | 5.4 Data Collection Rationale | 24 |

ii

| 6. | Results | 7 |
|-----|--|----|
| | 6.1 Bering Sea (Bristol Bay) | .7 |
| | 6.11 Areal Distribution of Methane | 7 |
| | 6.12 Areal Distribution of Ethane and Ethylene 3 | 0 |
| | 6.13 Areal Distribution of Propane, Propylene, Isobutane and n-butane | 5 |
| | 6.14 Time Series | 2 |
| | 6.15 Typical Vertical Profiles | 7 |
| | 6.2 Northeast Gulf of Alaska | 0 |
| | 6.21 Areal Distribution of Methane | 1 |
| | 6.22 Areal Distribution of Ethane and Ethylene 5 | 6 |
| | 6.23 Propane, Propylene, Isobutane and n-Butane 6 | 1 |
| | 6.24 Time Series | 6 |
| | 6.25 Typical Vertical Profile | 1 |
| | 6.26 Kayak Island Seep Study | 4 |
| 7. | Discussion | 6 |
| | 7.1 Sources of Hydrocarbons | 6 |
| | 7.11 Benthic Hydrocarbon Indicators | 6 |
| | 7.12 Atmospheric Exchange Processes 8 | 0 |
| | 7.2 Hydrocarbon Tracers | 31 |
| 8. | Conclusions and Summary | 57 |
| 9. | Future Research Endeavors | 0 |
| 10. | Summary of 4th Quarter Operations | 94 |
| | 10.1 Task Objectives | 94 |
| | 10.2 Field Activities from January 1 - April 1, 1976 9 | 94 |
| | 10.21 Laboratory Activities | 94 |
| | | |

Chapter

| 10.3 | Laboratory Pro | cedures. | • | | • | • • | • | • | • | • | • | • • | • | | 95 |
|------------|----------------|----------|---|-----|---|-----|-----|---|---|---|---|-----|---|---|-------|
| 10.4 | Sampling Proto | col | • | • • | ٠ | • | • | • | - | • | • | | • | | . 95 |
| 10.5 | Data Analysis. | | • | ••• | ٠ | | • | • | • | • | • | • • | • | | . 96 |
| 10.6 | Results | | • | | • | • • | • | • | • | • | - | | • | | . 96 |
| 10.7 | Financial Stat | ement | • | | • | • • | •• | ٠ | • | • | • | | • | | . 96 |
| References | | | • | • • | | • | •• | • | • | • | • | • • | | • | . 98 |
| Appendix I | | | • | ••• | • | • • | • • | • | • | • | • | | • | | . 100 |
| Appendix I | ι | | • | | • | • | •• | • | • | • | • | | | | . 102 |

Page

iii

LIST OF FIGURES

| Figure | | Page |
|--------|--|------|
| 4-1 | Station locations in the southeastern Bering Sea. The PMEL grid is denoted by 0; the IMS grid by . Surface stations near Izenbeck Lagoon are shown in lower case letters (i.e., a,b,c, etc.) | 12 |
| 4-2 | Station locations in the northeastern Gulf of Alaska. In- vestigations of gas-charged sediments near Kayak Island were conducted near station 22 | 14 |
| 5-1 | Low molecular weight hydrocarbon extraction system (Swin- nerton and Linnenbom, 1967; Swinnerton $et \ al.$, 1968). The extraction system shown is a recent modification given to us by Mr. R. Lamontagne of the Naval Research Laboratories, Wash. D.C | 18 |
| 5-2A | Chromatographic response for the C_1-C_4 aliphatic hydro- carbons. Retention times are given in minutes. The sample was a matheson certified standard containing methane (21.8 ppmv), ethane (1.3 ppmv), propane (1.25 ppmv), and n-butane (1.1 ppmv). Separation of the hydrocarbons was effected isothermally at 30°C on Poropak ^R Q (3/16" x 8') with a helium carrier flow of 60 ml/min. Integration was performed by a Hewlett Packard ^R model 3380 reporting integrator | 20 |
| 5-2B | Chromatographic response of the C_1-C_4 aliphatic and ole- finic hydrocarbons. Retention time in minutes is shown above the individual components. The sample was a Matheson certified standard containing methane (102.7 ppmv), ethane (5.0 ppmv), ethylene (1.9 ppmv), propane (5.0 ppmv), pro- pylene (2.0 ppmv), iso-butane (5.1 ppmv) and n-butane (2.0 ppmv). Separation of the hydrocarbons was carried out on a Poropak ^R Q column (3/16" x 8') in series with an acti- vated alumina column (3/16" x 2") impregnated with silver nitrate (1% by weight). Temperature programming between 110° - 150°C was used to accelerate the analysis. Integra- tion was performed on a Hewlett-Packard ^R model 3380 reporting integrator | 20 |
| 6-1 | Surface distribution of methane in Bristol Bay during Sept-Oct. 1975. Concentrations are given in nl/l (NPT) | 28 |

Figure

Page

v

| 6-2 | Areal distribution of methane 5 m from the bottom in Bristol Bay during Sept-Oct. 1975. Concentrations are given in nl/l (NPT) | 31 |
|------|---|----|
| 6-3 | Surface distribution of ethane in Bristol Bay during Sept-Oct. 1975. Concentrations are given in nl/l (NPT) | 33 |
| 6-4 | Areal distribution of ethane 5 m from the bottom in Bristol Bay during Sept-Oct. 1975. Concentrations are given in nl/l (NPT). | 36 |
| 6-5 | Methane versus ethane for all samples analyzed in Bristol Bay | 38 |
| 6-6 | Surface distribution of propane plus propylene in Bristol Bay during Sept-Oct. 1975. Concentrations are given in nl/l (NPT). Approximately 2/3 of the total is propylene, based on complete chromatographic analysis at selected stations | 40 |
| 6-7 | Areal distribution of propane plus propylene 5 m from the bottom in Bristol Bay during Sept-Oct. 1975. Concentra- tions are given in nl/l (NPT). Approximately 2/3 of the total is propylene, based on complete chromatographic analysis at selected stations | 43 |
| 6-8 | Diurnal variations in the concentration of methane at the surface and 5 m from the bottom at stations EB 037(A) and PM 046 (B) in Bristol Bay. Observations were conducted in late September 1975 | 45 |
| 6-9 | Vertical distributions of methane, ethane, ethylene, and propane plus propylene at stations PM 014(A) and PM 045 (B) in Bristol Bay during Sept-Oct. 1975 | 48 |
| 6-10 | Surface distribution of methane in the northeast Gulf of Alaska during Oct-Nov. 1975. Concentrations are given in nl/l (NPT) | 52 |
| 6-11 | Areal distribution of methane 5 m from the bottom in the northeast Gulf of Alaska during Oct-Nov. 1975. Concentra- tions are given in nl/l (NPT) | 54 |
| 6-12 | Surface distribution of ethane in the northeast Gulf of Alaska during Oct-Nov. 1975. Concentrations are given in $n\ell/\ell$ (NPT). | 57 |
| 6-13 | Methane versus ethane for all samples analyzed in the northeast Gulf of Alaska | 59 |

.

| 6- | -14 | Areal distribution of ethane 5 m from the bottom in the northeast Gulf of Alaska during Oct-Nov. 1975. Concentra- tions are given in nl/l (NPT) | 62 |
|----|-----|--|----|
| 6- | 15 | Areal distribution of ethylene 5 m from the bottom in the northeast Gulf of Alaska during Oct-Nov. 1975. Concentra- tions are given in nl/l (NPT) | 64 |
| 6- | 16 | Areal distribution of propane 5 m from the bottom in the northeast Gulf of Alaska during Oct-Nov. 1975. Concentrations are given in $n\ell/\ell$. | 67 |
| 6- | ·17 | Diurnal variations in the concentration of methane at the surface and 5 m from the bottom at stations PM 046(A) and PM 062(B). Observations were conducted in the northeast Gulf of Alaska during Oct-Nov. 1975 | 69 |
| 6- | 18 | Vertical distributions of methane, ethane, ethylene, and propane at two stations in the northeast Gulf of Alaska, PM 021(A) and PM 045(B). Observations were conducted during Oct-Nov. 1975 | 72 |
| 7- | 1 | The relationship between ethane and ethylene concentrations for all observations in the northeast Gulf of Alaska. The slope of the line is 0.45 ± 0.03 (r = 0.66) | 78 |
| 7- | -2 | The vertical distribution of methane along a north-south transect originating in Resurrection Bay (cf. Fig. 4-2). This line of stations (PM 001-PM 004) defines the western boundary of the survey region | 82 |
| 7- | •3 | The vertical distribution of methane along a north-south trans- ect originating in Yakutat Bay (cf. Fig. 4-2). This line of stations defines the eastern boundary of the survey region . | 84 |

Page

LIST OF TABLES

| Table | | Page |
|-------|--|------|
| 5-1 | Analysis of Matheson certified hydrocarbon standard by the National Bureau of Standards | 23 |
| 5-2 | Analytical precision of the LNWH analysis determined from replicate injection of standards | 24 |
| 5-3 | Replicate analysis at seven stations in the Bering Sea and Northeast Gulf of Alaska | 25 |
| 6-1 | Average concentrations of LMWH taken 2 and 4 m from the sea floor at six stations along the 10-fathom fault line south of Kayak Island | 74 |

vii

.

1. GENERAL SUMMARY

1.1 Objectives

The low molecular weight hydrocarbon program was initiated in the OCS of Alaska in response to the environmental guidelines set forth in the Environmental Study Plan for the Gulf of Alaska, Southeastern Bering Sea and the Beaufort Seas (January, 1975). Briefly, the purpose was to establish the spatial and temporal variations (seasonal and diurnal) in the dissolved hydrocarbon fraction composed of methane, ethane, ethylene, propane, propylene, isobutane and n-butane. These data are being collected in order to establish baseline levels of naturally-occurring hydrocarbons in the lease areas prior to exploration, development, and production of fossil fuel reserves. These components have proven to be valuable indicators of petroleum input arising from drilling, production, and transportation of crude oil and refined products.

In support of the basic objectives, attention is being given to natural hydrocarbon sources, namely gas and oil seeps, production of hydrocarbons from near-surface sediments, and biogenic sources within the euphotic zone.

1.2 Conclusions

Field studies were conducted in the Northeast Gulf of Alaska and the Southeastern Bering Sea (Bristol Bay) during the Fall of 1975. No seasonal data are yet available.

1.21 Bristol Bay

Dissolved methane is the dominant and most variable hydrocarbon observed in the waters of Bristol Bay. Near-bottom concentrations of methane ranged from 600 nL/L near Unimak Pass to 60 nL/L in the extreme northern and eastern extremities of Bristol Bay. Surface concentrations were less variable, averaging near atmospheric equilibrium values of 50-70 nL/L. Anomalous surface concentrations of methane were observed near Izenbeck Lagoon and Herendeen Bay.

The C_2 - C_3 fraction was much less variable, ranging from 0.3 nL/L to 1.5 nL/L. In general, ethane and ethylene increased with depth toward the bottom as did methane, indicating this region is a probable source. Propane and propylene were generally invariant with depth, averaging 0.5 nL/L for the sum. An apparent source of ethane exists near the Izenbeck Lagoon, but the data are inconclusive at this point.

Correlations between the near-bottom concentrations of methane, ethane, and ethylene and organic carbon concentration in surface sediments is apparent.

The concentrations of isobutane and n-butane was uniformly near or below the detection limit of 0.03 nl/l. Maximum values near 0.1 nl/l were observed in selected samples, but these results may be biased from shipboard contamination.

1.22 Northeast Gulf of Alaska

Not unlike the Bering Sea, methane is the dominant dissolved hydrocarbon at all depths, exceeding the concentration of all other components by a factor of 100 or more. Near-bottom concentrations of methane in the shelf region were uniformly greater than 200 $n\ell/\ell$ in sharp contrast to the

normal conditions observed in the Bering Sea. Extremely high concentrations of methane were observed in the Hinchinbrook Sea Valley just south of the island of the same name. Here, the concentration of methane reached a maximum of nearly 1600 $n\ell/\ell$ within 5 m of the bottom. The apparent plume of methane-rich water arising from this source could be traced toward the east, over Tarr Bank, to a point near the Copper River Delta. It is not certain whether the observed trajectory of methane is due to circulation or a bottom source of methane arising from the fine-grained sediments north of Tarr Bank (Molnia and Carlson, 1975).

Surface concentrations of methane were unusually high over the shelf, rarely falling below 100 nl/l. Surface concentrations exceeding 250 nl/l were observed near Kayak Island, although the source is not known. Accumulations of methane in surface waters are observed (Lamontagne *et al.*, 1971, 1973a), but the relationship to biological processes is obscure.

Concentrations and spatial variations of ethane, ethylene, propane and propylene were similar to those observed in Bristol Bay. Ethane and ethylene demonstrated a weak correlation with methane, although the methane/ ethane ratios observed were much larger in the Gulf of Alaska than in Bristol Bay. It is not known why this is true, however, it appears that increased methane production from shelf sediments in the Gulf of Alaska is not supported by increases in other hydrocarbons.

The concentrations of ethane, ethylene, propane, and propylene were generally less than 1 nl/l. Iso- and n-butane, were near or below the detection limit of 0.03 nl/l.

Without additional corroborating evidence, it would appear that the concentrations of hydrocarbons observed in the OCS study areas arose from the bottom and the immediate surface layers. Methane production from

3

organic-rich sediments is reasonably well understood, but the mechanisms leading to the production of ethane and ethylene from the same sediments is not clear. Increased concentrations of hydrocarbons in the mixed layer, not supported by a bottom source, appears to be biological in origin, although the mechanisms are not understood.

1.3 Implications to Oil and Gas Development

These studies were enacted as a part of the baseline characterization of dissolved natural hydrocarbons on the OCS of Alaska. The hope was to establish concentration levels, temporal and spatial variability of hydrocarbon components common to petroleum or natural gas prior to actual production. These measurements were felt to be an invaluable precursor to future monitoring efforts.

Measurements to date in the Bering Sea and Gulf of Alaska have established ambient concentration levels, and spatial variations, but have not addressed seasonal changes or source areas. The remainder of the field studies, largely to be completed in FY 1976, will address the remaining objectives outlined above, although somewhat incompletely.

A cursory examination of our present findings indicate that the LMWH will be excellent tracers of petroleum input in the Bering Sea because of their naturally low ambient concentrations. Surface methane concentrations in the northeast Gulf of Alaska are higher and more variable than those observed in the Bering Sea, which will reduce its effectiveness as a tracer of petroleum. On the other hand, the concentrations of the C_2-C_4 fractions are extremely low, providing a monitoring team with excellent tag of petroleum or natural gas containing these components. Our studies have also shown that normal production of methane from shelf sediments can be traced for distances greater than 100 km from known sources. Based on these preliminary 454

observations, it is concluded that surface exchange and *in situ* consumption of a low molecular weight hydrocarbons may be sufficiently slow so as to allow them to be used as tracers of the soluble fractions of crude oil. Of course, the value of these components as tracers will depend critically on the magnitude of the input, whether it is at depth or at the surface, and the prevailing hydrographic and meteorological conditions at the point of input. The extent to which microbial metabolism of the volatile hydrocarbon fractions is important is not clear at this time.

The distribution of methane may also serve as a qualitative or semiquantitative measure of local circulation. If benthic fluxes can be estimated, together with *in situ* consumption rates of methane, subtle nearbottom circulation processes may be characterized that are not resolved readily by routine velocity field observations. A case in point is the near-bottom methane plume observed near Tarr Bank and the Copper River Delta.

2. INTRODUCTION

2.1 General Nature of Study

The development of petroleum resources in the Gulf of Alaska may result in the release of toxic hydrocarbons to the marine environment with possible deleterious effects on the pelagic, benthic, and intertidal biota. increases in the natural levels of petroleum-derived hydrocarbons are likely to occur from the normal activities associated with exploration, production and transportation of crude and refined products within the region. Thus, it is of environmental importance that baseline levels of both naturally occurring and petroleum-derived hydrocarbons be established prior to the development of fossil fuel resources in the area.

Petroleum contains three broad classes of compounds: alkanes, cycloalkanes, and aromatics, but not olefinic hydrocarbons. The proportions of each varies in petroleum, depending on the geologic and geographic sources, but on the average paraffins represent about 30% of the total (Wilson, 1975). The low molecular weight hydrocarbons (LNWH) probably represent no more than 5% of the total, although the exact amount would depend on the natural gas content of the source rock.

It is presently believe that the most toxic fractions of crude oil are the low boiling point aliphatics and aromatics as well as the polynuclear aromatics (Blumer, 1971). Also associated with these complex fractions are the LMWH, in varying amounts. While these compounds are of lower toxicity than the aforementioned fractions (Sackett and Brooks, 1974), they are more soluble and hence are likely to be dispersed by normal mixing

processes. Although the evaporation rates of the low molecular weight compounds are quite rapid (McAuliffe, 1966), significant injection of these volatile hydrocarbons into the water column can occur under conditions of turbulence.

Because of their relatively high solubility and low natural abundance, the temporal and spatial distributions of C_1-C_4 hydrocarbons are valuable indicators of petroleum pollution arising from offshore drilling and production platforms, ballast tank discharge, and shipping and transfer operations involving petroleum and petrochemicals (Brooks and Sackett, 1973; Sackett and Brooks, 1974).

The occurrence of light hydrocarbons in the water column may arise from both petroleum production activities and natural marine sources. Gaseous hydrocarbons may exchange across the sea surface in response to a concentration gradient (Broecker and Peng, 1974) diffuse from underlying sediments (Frank *et al.*, 1970), escape in the form of bubbles from natural occurring gas and oil seeps (Link, 1952; Geyer and Sweet, 1973), or be produced by *in situ* biological processes (Lamontagne *et al.*, 1973b).

Methane (CH₄) is a significant component of natural gas and is also produced in anoxic sediments by bacterial CO_2 reduction and fermentation reactions (Claypool, 1974). Thus, the presence of excess methane in the water column overlying organic-rich sediments is not an unequivocal indicator of a petroleum source, unless viewed jointly with the distribution of the heavier fractions, C_2 -C₄ (Brooks and Sackett, 1973).

Above saturation values of methane, ethylene and propylene also have been observed in the surface layers of open ocean and are believed to be related to biological activity or photochemical reactions involving

457

organic matter (Swinnerton and Lamontagne, 1974; Lamontagne et al., 1973b).

2.2 Objectives

In conjunction with and in support of the OCSEAP program, the LMWH studies were carried out in the northeast Gulf of Alaska and the southeastern Bering Sea. The objectives of the program are to determine the distributions and natural sources of methane, ethane, ethylene, propane, propylene, isobutane and n-butane prior to drilling activity. Observational activities include areal and seasonal coverage to denote biological processes, benthic sources, as well as short-term time series to elucidate diurnal changes.

As a secondary objective, known offshore seeps were investigated to ascertain the composition of natural gas seeps and to evaluate the merits of naturally-injected LMWH as tracers of petroleum input. The successful implementation of this subprogram depends critically on seep composition and activity, depth of water and unconsolidated sediment cover, mean current fields, and topographic structures (Fischer and Stevenson, 1973).

2.3 Relevance to OCSEAP

The principal concern surrounding the distributions, sources, and sinks of LMWH is not their direct impact on biota, but rather as tracers of more toxic hydrocarbon fractions commonly found in crude oils. Of particular value is the use of LMWH to identify probable trajectories of the toxic dissolved fractions (e.g., PAH) during a spill or a well blowout. Because some of the hydrocarbons common to petroleum are also manufactured by marine organisms, it becomes necessary to evaluate the normal background levels of hydrocarbons before an accurate assessment of anthropogenic input can be made.

Accidental introduction of crude oil onto the surface of the ocean can be readily traced by a variety of visual techniques (e.g., remote sensing). However, the dispersion of soluble hydrocarbon fractions cannot be so easily traced, except with the expenditure of considerable time in sampling and laboratory analysis. In all likelihood, the results would not be available for days, or possibly weeks. The LMWH becomes valuable short-term tracers of dissolved hydrocarbon fractions because of the sensitivity of the method (i.e., parts per trillion), ease of the analysis, and real time data access. Utilizing a pumping system, sample processing, extraction and analysis can be readily accomplished in less than 10 minutes, or nearly in real time. This provides the monitoring team with the capability of ascertaining the time and space scales of the subsurface dispersion plume and to outline probable lateral boundaries for more detailed hydrocarbon sampling.

The success of the method depends on the nature of the accident, hydrographic and meteorological conditions, input concentration of hydrocarbons, and the natural ambient levels against which increases can be measured. Observations conducted in the Gulf of Mexico show that propane and butane are enriched by factors of 10^3 to 10^4 over ambient background levels in areas of known petroleum input (Brooks and Sackett, 1973).

The overall objective is to provide the criteria for an early warning detection of petroleum-derived hydrocarbons and to establish the feasibility of using light hydrocarbons as dispersion tracers, particularly in reference to near-bottom mixing and resuspension processes. In the event of a spill, it is likely that the C_1-C_4 fraction may be useful in guiding a sampling protocol for the relatively soluble toxic fractions of crude oil.

9

3. CURRENT KNOWLEDGE

Prior to these investigations, no observations had been made on the ambient concentrations of LMWH in the Gulf of Alaska or the Bering Sea (Rosenberg, 1972). In contrast, a few analyses are available from Cook Inlet (Kinney *et al.*, 1970). In this investigation elevated concentrations of methane were observed in the vicinity of the Forelands, north of Kalgin Island, but no definitive conclusions could be drawn as to the probable source. Gas seeps were cited as a possible source, but benthic methane production could not be ruled out. Unfortunately, the analysis of the C_2-C_4 fraction was not reliable, hence confirming data on the possible source of the methane was not available.

Recent studies carried out by us in the northeast Gulf of Alaska and the southeastern Bering Sea have determined characteristic LMWH distributions for the late fall season. Local hydrocarbon sources have been identified and some measure of the diurnal variability documented. Both vertical and horizontal distributions are available from our observations. Details of our findings to date will be presented in sections 6 and 7 of this report.

4. STUDY AREAS

4.1 Bering Sea

Observations for LMWH were conducted according to the station grid shown in Figure 4-1. The PMEL survey grid was developed primarily for the suspended particulate matter program, but because of its uniform coverage it was adopted as a preliminary operation grid for hydrocarbons as well. The PMEL grid was supplemented by observations from the Institute of Marine Science (IMS) cruise track, which increased the areal coverage toward the west. A total of 80 stations were occupied, 69 of which (51 PMEL and 18 EBBS stations) were sampled in vertical profile. Because of the shallow depths encountered in Bristol Bay, 3-4 nominal depths were selected at each station. The remaining 18 PMEL stations were involked to investigate the surface transport of LMWH from Izenbeck Lagoon. Only surface sample were acquired at these stations.

4.2 Northeast Gulf of Alaska

Observations for LMWH were conducted at the stations shown in Figure 4-2. The grid shown in Figure 4-2 was developed primarily to investigate the distributions of suspended particulate matter, but because of its uniform coverage it was adopted as a preliminary operational sampling grid for hydrocarbons as well. A total of 47 stations were occupied in vertical profile, usually 5-6 discrete depths being sampled at each station. Surface and near bottom samples (bottom -5 m) were taken uniformly at each station.

46.1

Figure 4-1 Station locations in the southeastern Bering Sea. The PMEL grid is denoted by 0; the IMS grid by **()**. Surface stations near Izenbeck Lagoon are shown in lower case letters (i.e., a,b,c, etc.)

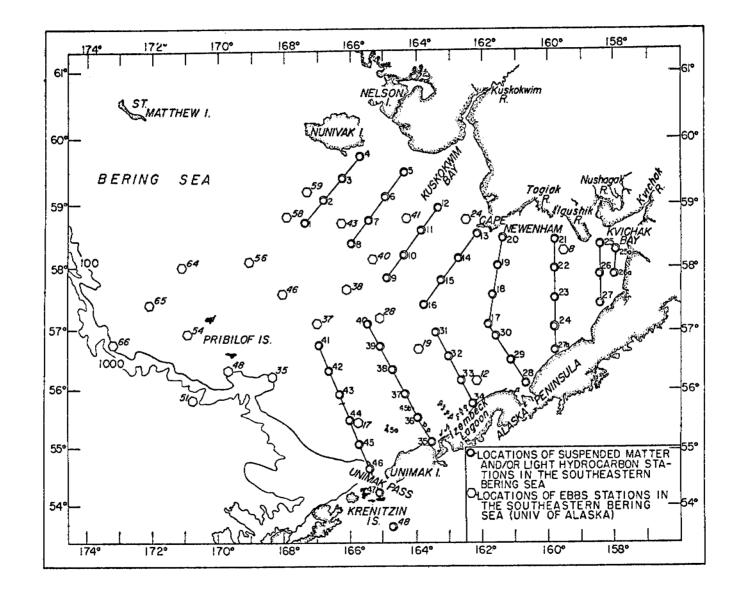
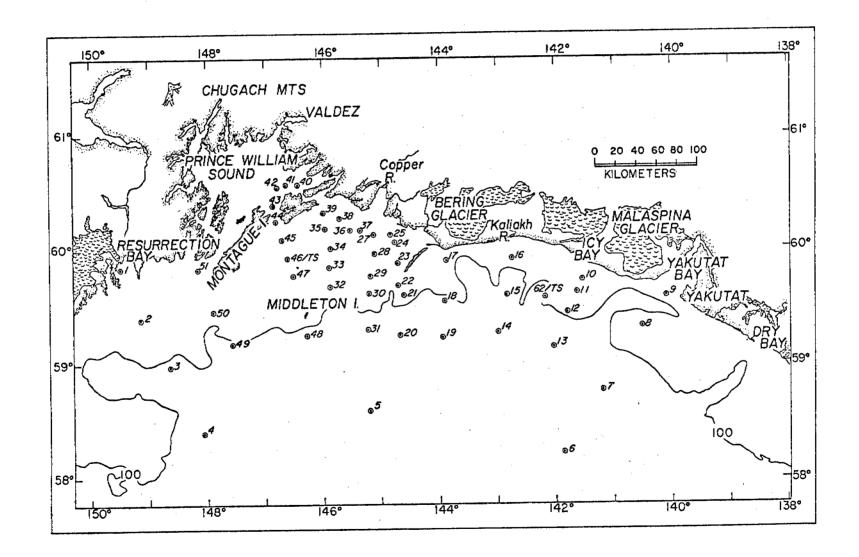


Figure 4-2 Station locations in the northeastern Gulf of Alaska. Investigations of gas-charged sediments near Kayak Island were conducted near station 22.



An attempt was made to identify gas seeps or gas-charged sediments along the southeast site of Kayak Island. However, the probable locations were in shallow, uncharted depths and it was not possible to sample the proposed sites without endangering the vessel (DISCOVERER).

5. METHODOLOGY

5.1 Sample Concentration

LMWH are stripped from 1 & volume of seawater using the procedure recommended by Swinnerton and Linnenbom (1967). A diagram of the gas phase equilibrator is shown in Figure 5-1. Although the system actually used in these studies is somewhat simpler in detail than that shown in Figure 5-1, the principle remains the same.

Hydrocarbons are removed in a stream of ultra-pure He (120 ml/min) and condensed on an activated alumina trap maintained at -196°C. Approximately 12 minutes of stripping are required to quantitatively remove the hydrocarbons (>98%) from solution, after which time the trap is warmed to 90-100°C and the absorbed gases are allowed to pass into the gas chromatograph (GS).

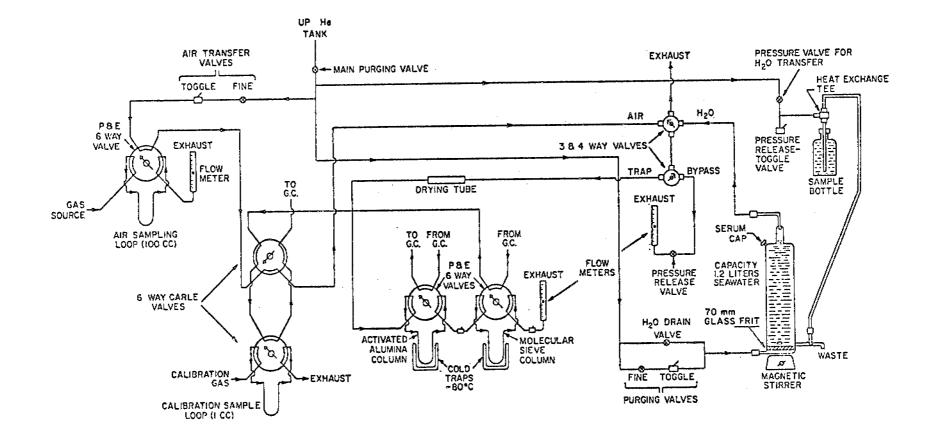
5.2 Gas Chromatography

The hydrocarbons are chromatographed on a column $(3/16" \times 8")$ of Poropak^(R) Q, 60-80 mesh, and detected sequentially with a flame ionization detector (FID) as they emerged from the column. The GC is a Hewlett packard model ^(R)5711, equipped with dual FID's. Analysis was carried out isothermally at 30°C with a GC He flow rate of 60 ml/min. Total chromatographic analysis time through the C₄'s was approximately 15 minutes. A typical chromatogram of aliphatic components is shown in Figure 5-2A.

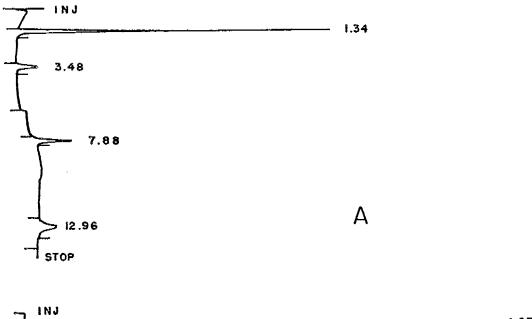
In order to be prepared for the 1975 field season, sufficient time was not available to adequately develop optimal GC analytical parameters

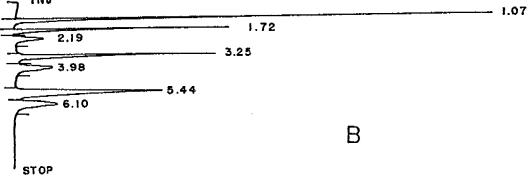
0.6.7

Figure 5-1 Low molecular weight hydrocarbon extraction system (Swinnerton and Linnenbom, 1967; Swinnerton *et al.*, 1968). The extraction system shown is a recent modification given to us by Mr. R. Lamontagne of the Naval Research Laboratories, Wash. D.C.



- Figure 5-2A Chromatographic response for the C_1 - C_4 aliphatic hydrocarbons. Retention times are given in minutes. The sample was a Matheson certified standard containing methane (21.8 ppmv), ethane (1.3 ppmv), propane (1.25 ppmv), and n-butane (1.1 ppmv). Separation of the hydrocarbons was effected isothermally at 30°C on Poropak^R Q (3/16" x 8') with a helium carrier flow of 60 ml/min. Integration was performed by a Hewlett Packard^R model 3380 reporting integrator.
- Figure 5-2B Chromatographic response of the C_1-C_4 aliphatic and olefinic hydrocarbons. Retention time in minutes is shown above the individual components. The sample was a Matheson certified standard containing methane (102.7 ppmv), ethane (5.0 ppmv), ethylene (1.9 ppmv), propane (5.0 ppmv), propylene (2.0 ppmv), iso-butane (5.1 ppmv) and n-butane (2.0 ppmv). Separation of the hydrocarbons was carried out on a Poropak^R Q column (3/16" x 8') in series with an activated alumina column (3/16" x 2") impregnated with silver nitrate (1% by weight). Temperature programming betwen 100° - 150°C was used to accelerate the analysis. Integration was performed on a Hewlett-Packard^R model 3380 reporting integrator.





(i.e., flow rates, solid supports, temperature programming, etc.). However, during the last 3 months, considerable effort has been given to the rapid chromatographic analysis of LMWH. The original Poropak ^(R) Q column has been supplemented with an activated alumina column $(3/16" \times 2")$ impregnated with 1% silver nitrate by weight. This modification, coupled with temperature programming from 110-150°C, has resulted in sharper peaks, better separation and reduced retention times for all components (Figure 5-2B). Although the total analysis time is now regulated by stripping time (i.e., 12 minutes), we are currently developing a vacuum extractor to reduce the stripping time to less than 3 minutes.

5.3 Quality Control

5.31 Standardization and Accuracy

The LMWH analysis was referenced to specially prepared hydrocarbon mixtures supplied and certified by Matheson Gas Products. The concentrations of the individual components were adjusted to meet the naturallyoccurring hydrocarbon levels expected in the OCS study areas, although concentrations less than 1 ppm could not be reliably prepared. To confirm the analysis, one of the standards was sent to NBS for LMWH analysis, the results of which are given in Table 5-1. The NBS analyzed standard will be used to calibrate the remaining hydrocarbon standards.

22

| Component | Matheson | NBS | | | | |
|-----------|-------------|-----------------|--|--|--|--|
| | Nominal Con | centration ppmv | | | | |
| methane | 23 ± 1 | 21.8 ± 0.8 | | | | |
| ethane | 1 ± 0.1 | 1.3 ± 0.1 | | | | |
| propane | 2 ± 0.2 | 1.25± 0.02 | | | | |
| n-butane | 1 ± 0.1 | 1.1 ± 0.02 | | | | |
| n-butane | 1 ± 0.1 | 1.1 ± 0.0 | | | | |

TABLE 5-1. Analysis of Matheson certified hydrocarbon standard by National Bureau of Standards

5.32 Precision

Precision of analysis was accomplished in two ways. First, precision errors associated with standard injection and GC response were determined by replicate injection of standard gases. Injection of gas standard was accomplished with the aid of a Carle^(R) sampling valve fitted with a calibrated 1 cm sample loop. The results of this experiment are depicted in Table 5-2, together with estimates of the relative error. It is readily seen that individual component precisions are better than 2.2%. Relative error increases as carbon number increases.

The overall error in precision, which includes water sampling, sample stripping, and GC response characteristics, was estimated from replicate analysis of near surface sea water. Water samples were taken in a 10 \pounds Niskin^(R) sampler and subdivided for replicate analyses. This experiment was repeated 7 times, 4 in the Bering Sea and the remainder in the northeast Gulf of Alaska. The results of this study are shown in Table 5-3 in terms of mean concentrations (\overline{X}), standard deviation (S), and the relative error in percent. A blank column indicates that hydrocarbon concentrations were too low to produce an integrated response. Ignoring spurious values, it may

be noted that the relative errors, except for n-butane, were generally less than 10%. Precise measurement of low concentrations of n-butane presented a problem, primarily because of inherent difficulties in obtaining quantitative stripping of the C_4 fraction.

The detection limit for each component was estimated from the nominal background noise. Interpreted peak areas less than 200 counts were considered insignificant, placing a defined lower limit on the detectability. The values are, based on the data shown in Table 5-2, methane - 0.12 nl/1, ethane - 0.06 nl/1, ethylene - 0.07 nl/1, propane - 0.04 ml/1, propylene - 0.04 nl/1, isobutane -0.03 nl/1, and n-butane - 0.03 nl/1.

| Component | Conc. ppmv | A Unit | σ A Areas | % Error | N No. Samples |
|-----------|---------------|-----------|--------------|---------|------------------|
| Methane | 102.7 | 173793 | 1160 | 0.7 | 8 |
| Ethane | 5.0 | 15804 | 102 | 0.6 | ** |
| Ethylene | 1.9 | 5254 | 77 | 1.5 | ** |
| Propane | 5.0 | 25085 | 229 | 0.9 | ¥r. |
| Propylene | 2.0 | 9980 | 186 | 1.8 | 11 |
| Isobutane | 5.1 | 30584 | 454 | 1.5 | ti |
| n-Butane | 2.0 | 11970 | 270 | 2.2 | ŦŦ |

TABLE 5-2. Analytical precision of the LMWH analysis determined from replicate injection of standards

5.4 Data Collection Rationale

The original scope of the baseline study was to determine horizontal, vertical, and seasonal variations of LMWH in the study areas as a precursor to petroleum development. Stress was placed on the distribution of propane and butanes as their presence in elevated amounts is much stronger evidence for petroleum hydrocarbon input. The investigation of seeps was only

| TABLE 5-3. | Replicate analyses at 7 stations in the Bering Sea and northeast Gulf of Alaska. The mean (X) and standard |
|------------|--|
| | deviation (S_) are based on 3 replicate analyses at each station. Relative error (R.E.) is the quotient of |
| | the standard deviation and the mean, given in percent. All concentrations are given in $n\ell/\ell$ (NPT). |

| Stations | Methane | | Ethane | | Ethylene | | Propane | | Propylene | | | n-Butane | | | | | | |
|------------|--------------|-----------------------|--------|------|----------------|---------|---------|----------------|-----------|------|----------------|----------|------|----------------|------|------|----------------|------|
| | x | s _x | R.E. | x | s _x | R.E. | x | s _x | R.E. | x | s _x | R.E. | x | s _x | R.E. | x | s _x | R.E. |
| Bering Sea | | · <u>····</u> ······· | | | | <u></u> | | | | | | | | | | | | |
| EBB 59 | 63.9 | 3.6 | 5.6 | 0.63 | 0.06 | 9.5 | 0.66 | 0.02 | 3.0 | - | - | - | - | - | - | 0.24 | 0.11 | 45.8 |
| PML 5 | 55.0 | 2.4 | 4.3 | 0.37 | 0.01 | 2.7 | 0.43 | 0.02 | 4.6 | - | - | - | - | - | - | 0.14 | 0.04 | 28.5 |
| EBB 43 | 60 .6 | 1.6 | 2.6 | 0.43 | 0.02 | 4.6 | 0.77 | 0.02 | 2.6 | 0.28 | 0.04 | 14.3 | 0.54 | 0.02 | 3.7 | 0.17 | 0.07 | 41.2 |
| EBB 41 | 66.3 | 3.7 | 5.6 | 0.41 | 0.10 | 24.3 | 0.33 | 0.13 | 39.4 | - | | - | 0.40 | 0.16 | 40.0 | - | - | - |
| NEGOA | | | - | | | | | | | | | | | | | | | |
| PML 1 | 173.1 | 0.86 | 0.5 | 0.53 | 0.10 | 18.8 | 1.0 | 0.10 | 10.0 | 0.17 | 0.01 | 5,9 | - | - | - | | - | - |
| PML 40 | 591.6 | 20.6 | 3.5 | 0.44 | 0.02 | 45 | 0.91 | 0.01 | 1.1 | 0.18 | 0.01 | 5.5 | 0.25 | 0.04 | 16.0 | - | - | - |
| PML 9 | 123.6 | 1.0 | 0.8 | 0.16 | 18.7 | 18.7 | 0.64 | 0.02 | 3.1 | 0.11 | 0.01 | 9.1 | 0.18 | 0.01 | 5.5 | - | - | - |

tangentially approached as our sampling grid was not "tight" enough to unequivocally locate seeps. We did, however, attempt to locate seeps along the 10-fathom fault line southeast of Kayak Island with a dedicated 12 hour study (Carlson *et al.*, 1975).

In addition to the baseline survey, two 36-hour time series stations were occupied in each area. The purpose of these investigations was to ascertain the short term temporal changes in hydrocarbons, and thereby establish normal ambient variability against which future observations might be compared.

Ethylene and propylene, while not characteristic components of natural gas, were determined routinely in conjunction with the normal aliphatic components. Chromatographic separation of the olefins from the parent aliphatics results in a more accurate assessment of the concentrations of the latter, since the unsaturates are usually found in greater amounts.

In addition to the investigations carried out on the distribution of LMWH, considerable effort was mounted to elucidate natural hydrocarbon sources. To accomplish this, surface and near bottom samples were taken. In the Gulf of Alaska, sampling of the surface layers was carried out in conjunction with the productivity observations to ascertain possible hydrocarbon input due to photosynthetic or related biological processes. Near bottom samples were taken to characterize hydrocarbon sources in sediments. The origin of natural hydrocarbons must be understood before effective monitoring measures can be effectively mounted.

6. RESULTS

6.1 Bering Sea (Bristol Bay)

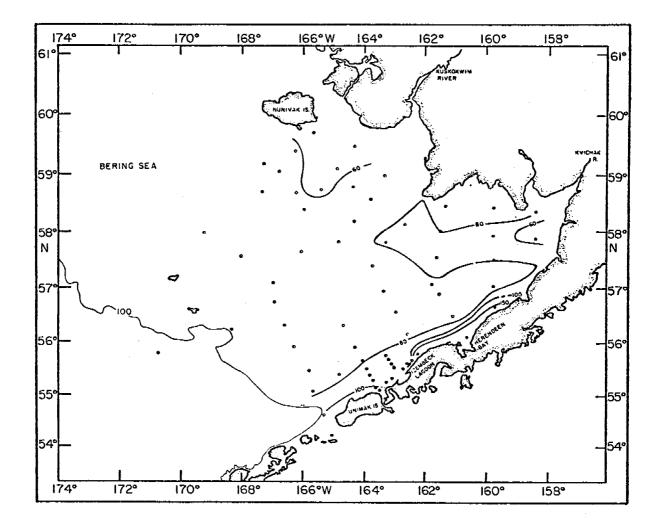
A total of 72 stations were occupied in Bristol Bay, comprising PMEL and IMS grids (see Figure 4-1). Usually 3 to 5 standard depths were sampled at each station, depending on the depth of water, hydrographic conditions, and sampling logistics. Analytical difficulties were encountered during segments of the cruise, resulting in an incomplete data record. Considerable difficulty was encountered with ship-induced petroleum contamination of the water samplers.

The results of our findings will be described in terms of areal distributions of significant hydrocarbon, their relationship to known source regions, and short term variability in concentrations brought about by tidal influences and/or meteorological events. Complete analysis of the hydrocarbon data in terms of hydrographic parameters has not been accomplished to date, but will be discussed in the final report (October 1976).

6.11 Areal Distributions of Methane

Surface methane concentrations in $n\ell/\ell$ are shown in Figure 6-1. A strong surface source of methane is indicated in the region of Izenbeck Lagoon and Herendeen Bay with normal equilibrium concentrations found elsewhere. Solubility calculations for methane have not been completed as yet, but surface sea water in equilibrium with the atmosphere should contain between 50-70 nl/L NPT of methane (Lamontagne *et al.*, 1973b). Values less than 60 nl/L were observed in the delta regions of the Kuskokwim and Kvichak

Figure 6-1 Surface distribution of methane in Bristol Bay during Sept-Oct. 1975. Concentrations are given in nl/l (NPT).



rivers, which presumably represent fresh water influence or the absence of a bottom methane source.

The distribution of methane in the near-bottom waters demonstrates the marked influence of benthic sources (Figure 6-2). Methane concentrations exceeding 700 n ℓ/ℓ were found north of Unimak Pass and presumably indicate localized organic-rich sediments. This observation is borne out by the surface sediment distribution of organic carbon (Sharma, 1974), which are significantly higher in this region as compared to eastern Bristol Bay. In contrast, regimes characterized by river discharge plumes reveal low methane concentrations indicative of coarse grained sediments low in organic carbon (Sharma, 1974).

The zonal plume of relatively high methane concentrations lying along 58°N latitude may be due in part to the intrusion of cold water from the north. Near bottom temperatures for stations EBBS 38, 46, and 56 were in the range 0-1°C, whereas higher temperatures in the range 3-6°C were observed both to the north and to the south. The origin of this water is not precisely known, but is thought to arise in the Gulf of Anadyr (Takenouti and Ohtani, 1974). The methane also may be of local origin, but sediment size frequency and organic carbon concentrations in surface sediments would suggest an advective source (Sharma, 1974). More detailed measurements are needed to clarify the issue, however.

6.12 Areal Distributions of Ethane and Ethylene

Surface concentrations of ethane are shown in Figure 6-3. The ethane distribution shows little horizontal variations; concentrations range from lows of 0.3 nl/l to highs near 0.6 nl/l. The average for all surface values was 0.5 nl/l. A lobe of relatively high ethane concentration appears to

30

Figure 6-2 Areal distribution of methane 5 m from the bottom in Bristol Bay during Sept-Oct. 1975. Concentrations are given in nl/l (NPT).

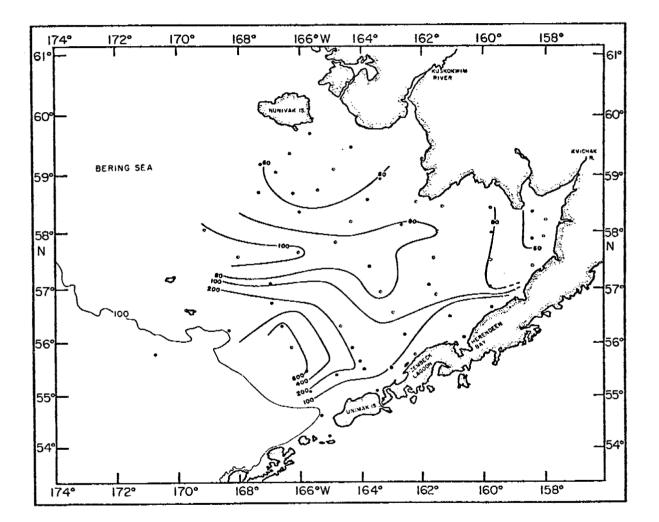
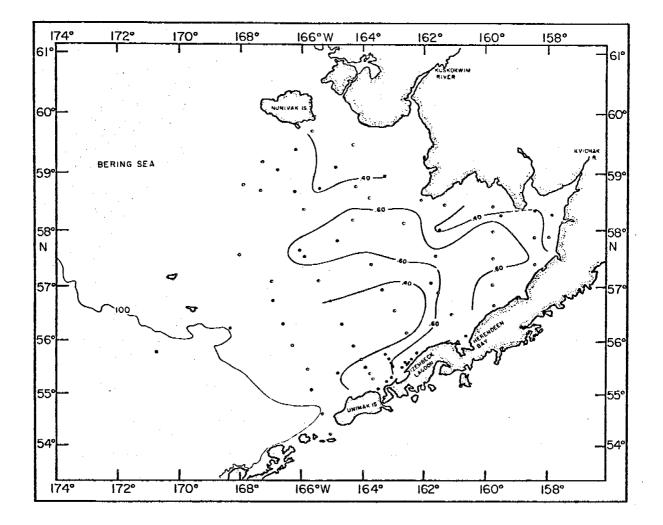


Figure 6-3 Surface distribution of ethane in Bristol Bay during Sept-Oct. 1975. Concentrations are given in nl/l (NPT).



emerge from the lagoon areas and move counterclockwise around the eastern Bering Sea. Because of low ambient concentrations of ethane and relatively high analytical uncertainty, it is difficult to predict at this time whether the observations are reliable. It is of interest, however, that the highest ethane values observed at the surface, occurred near Herendeen Bay.

Near bottom concentrations of ethane shown in Figure 6-4 revealed a pattern similar to that observed for methane, although the localized maxima and minima are highly attenuated. Vertical profiles near Izenbeck Lagoon and Herendeen Bay indicate that the sediments are probably not the source of the high ethane concentrations shown in Figure 6-3. The low contour frequency in Figure 6-3 simply reflects the rather uniform horizontal distribution of ethane.

Concentrations of ethylene showed no discernible spatial patterns. The range of values observed fell between 0.1 and 1.5 $n\ell/\ell$, the highest concentrations normally occurred near the bottom. Average surface values were identical to the ethane average of 0.5 $n\ell/\ell$.

In general, ethane and ethylene increased with depth and correlated with methane concentrations. This situation is graphically displayed in Figure 6-5 for all samples. Although the correlation is not good, the trend suggests a common source for these homologs.

6.13 Distributions of Propane, Propylene, Isobutane and n-Butane

The distribution of propane plus propylene in the surface waters of Bristol Bay shows little spatial variation (Figure 6-6). Concentrations range from a low of 0.3 nL/L to a high of 0.9 nL/L. The average for all samples is 0.5 nL/L. Because of incomplete chromatographic separation of propane and propylene during segments of the cruise, the integrated

35

Figure 6-4 Areal distribution of ethane 5 m from the bottom in Bristol Bay during Sept-Oct. 1975. Concentrations are given in nl/l (NPT).

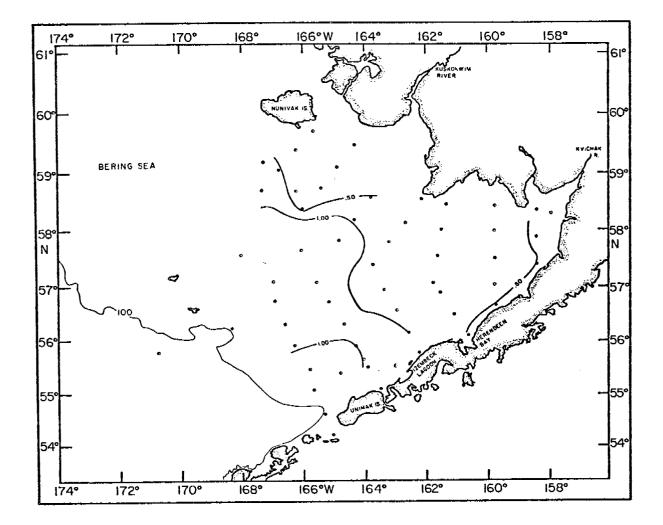


Figure 6-5 Methane versus ethane for all samples analyzed in Bristol Bay.

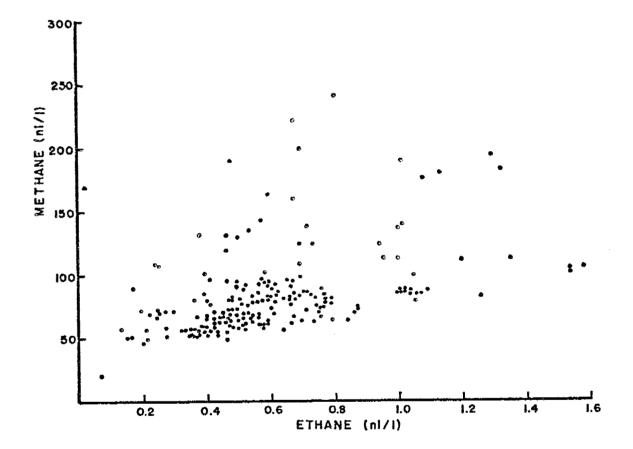
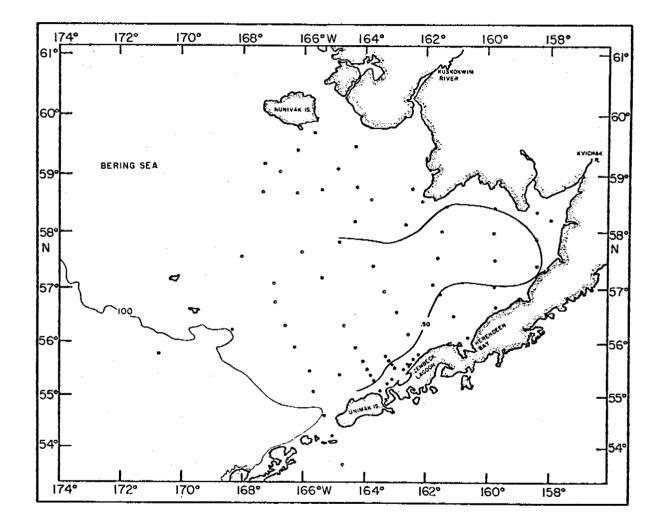


Figure 6-6 Surface distribution of propane plus propylene in Bristol Bay during Sept-Oct. 1975. Concentrations are given in $n\ell/\ell$ (NPT). Approximately 2/3 of the total is propylene, based on complete chromatographic analysis at selected stations.



responses for the two components were combined. From the analyses of samples in which separation was effected, it appears that propylene equals or exceeds the concentration of propane. Most samples showed an enrichment of propylene over propane by a factor of 2.

Near-bottom concentrations of propane plus propylene indicate two major source areas as depicted in Figure 6-7. One near Herendeen Bay, the other in the central portion of Bristol Bay. As cited above, approximately 2/3 of the total is propylene. The average for all bottom samples is near 0.4 nl/l, only slightly less than the surface values. The absence of a bottom source for propane and propylene, combined with strong vertical mixing would result in a homogeneous water column with respect to these components.

The concentrations of the C_4 's are not shown since their concentrations were everywhere near or below the detection limit. Normally, the concentrations of n-butane ranged from a trace (0.03 nl/l) to approximately 0.1 nl/l. Higher concentrations were observed during the initial phase of the cruise, but contaminated water samplers were thought to be the cause.

6.14 Time Series

Short-term temporal changes in hydrocarbons were monitored at stations EBBS-37 (36 hours) and PMEL-46 (24 hours). These results are shown in terms of the time variation of methane at the surface and near-bottom (Figure 6-8).

Station 37, located in central Bristol Bay, showed systematic variations in methane in the surface layers and almost none in the near-bottom layer. Variations seen in the bottom layer largely reflect analytical imprecision. The periodicity seen in the surface layers is probably related

42

Figure 6-7 Areal distribution of propane plus propylene 5 m from the bottom in Bristol Bay during Sept-Oct. 1975. Concentrations are given in $n\ell/\ell$ (NPT. Approximately 2/3 of the total is propylene, based on complete chromatographic analysis at selected stations.

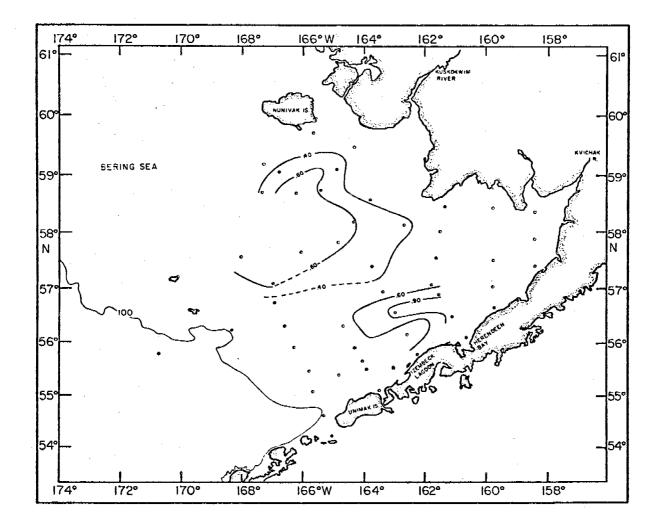
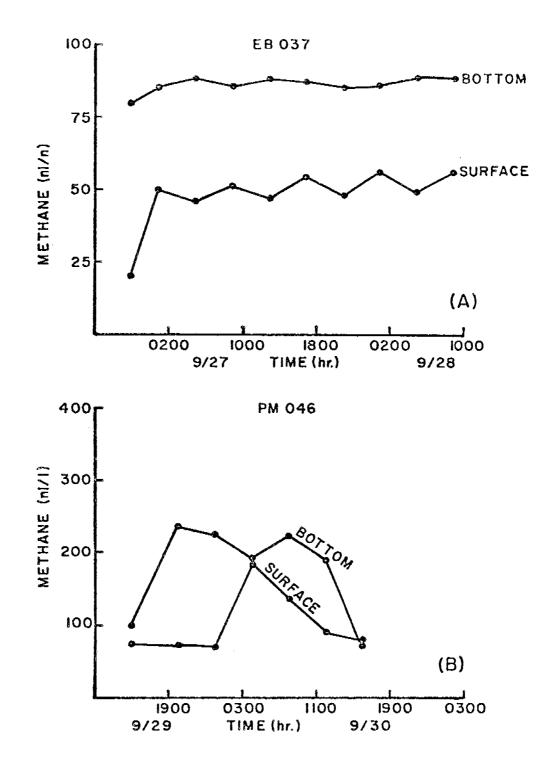


Figure 6-8 Diurnal variations in the concentration of methane at the surface and 5 m from the bottom at stations EB 037(A) and PM 046(B) in Bristol Bay. Observations were conducted in late September 1975.



to tidal components, although it is impossible at this time to be specific about the actual source of the perturbations.

In contrast to the rather static conditions at station 37, large perturbations were observed in the Unimak Pass area. Over a 24-hour period, bottom methane concentrations varied by more than a factor of 2 (Figure 6-8B). Again, the periodicity suggests tidal influences, but here the relationships between source areas and circulation become quite important (cf. Figures 6-1 and 6-2). We propose that the large perturbations seen in the near-bottom layer are related to the large benthic methane source to the north, whereas low concentrations of methane may represent additions of water depleted in methane. The source of this water is probably to the east or south.

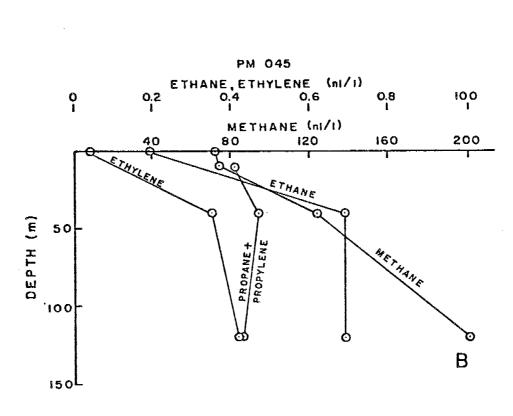
The maximum surface methane concentration noted at 0400 hrs may represent the biological production of methane in the upper layers. Complete analysis of the vertical profile taken at this time reveals that the water column was rather uniform with respect to methane, but not temperature. The concentration of methane increased from a surface concentration of 190 $n\ell/\ell$ to 260 $n\ell/\ell$ at 11 m, then decreased monitonically with depth to a nearbottom value of 185 $n\ell/\ell$. The intermediate maximum in methane concentration may be biologically related (Lamontagne *et al.*, 1973b).

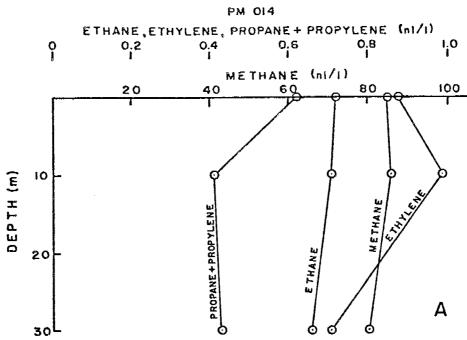
6.15 Typical Vertical Profiles

Typical vertical profiles of methane, ethanc, ethylene, and propane plus propylene are shown in Figure 6-9A,B for two stations in Bristol Bay. Although it is difficult to choose a typical profile from any of the regions, the occurrence of ethane and ethylene appears to correlate with methane concentrations as noted earlier. The two stations chosen represent

497

Figure 6-9 Vertical distributions of methane, ethane, ethylene, and propane plus propylene at stations PM 014(A) and PM 045 (B) in Bristol Bay during Sept-Oct. 1975.





diverse benthic environments in order to identify the importance of the oottom in regulating hydrocarbon concentrations. PMEL-14 (Figure 6-9A) is located near Cape Newenham and shows little bottom influence on the distributions of hydrocarbons. The sediments here are coarse-grained and the organic carbon concentrations is low (Sharma, 1974).

In contrast, station 45 (Figure 6-9B) located just to the north of Unimak Pass shows striking increases in methane, ethanc, and ethylene with water depth. Again, propane and propylene do not appear to be generated within the sediment column.

As new data become available, hydrocarbon distributions will be analyzed in terms of biological parameters and sedimentological provinces to clarify the significance of surface productivity and CO_2 reduction in sediments.

6.2 Northeast Gulf of Alaska

A total of 51 stations were occupied in the northeast Gulf of Alaska, including Prince William Sound. The station grid, shown in Figure 4-2, was developed for the survey of suspended particulate matter and was adopted for this program as well.

Sample analysis included 274 normal depths and 84 samples arising from time series at stations 46 and 62. These hydrocarbon analyses were supplemented by an intense near-bottom study off the southern tip of Kayak Island in which two 5-1 Niskin bottles were suspended 2 and 4 m above the bottom. Hydrocasting was conducted along the surface exposure of the 10-fathom fault line, which was suggested as a possible source of hydrocarbons (Dr. Bruce Molnia, USGS, Menlo Park).

The results of these findings will be described in terms of areal distributions of significant hydrocarbons, their relationship to known source regions, and their temporal variability. As mentioned above, complete analysis of the hydrocarbon data in terms of hydrographic parameters has not been completed, but will be included in the final report (October 1976).

6.21 Arcal Distribution of Methane

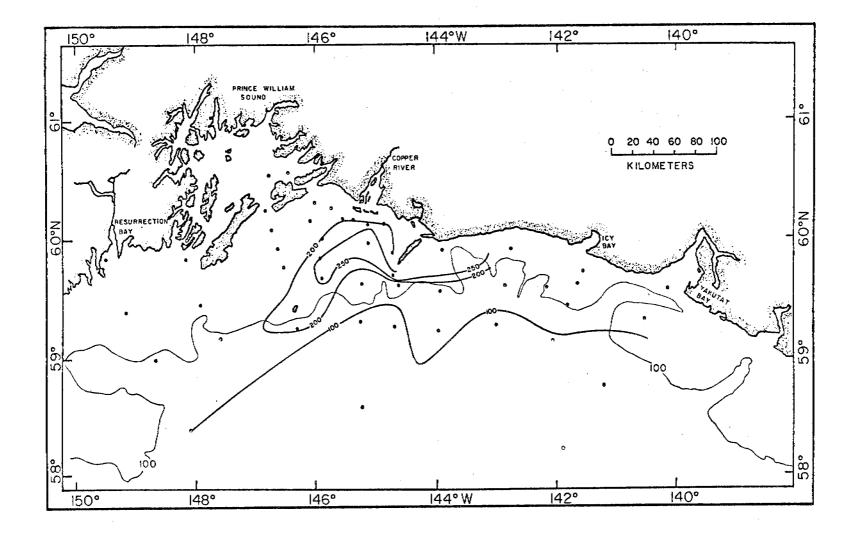
Surface methane concentrations over the shelf region were generally high. Concentrations of methane rarely fell below 100 n ℓ/ℓ except at stations seaward of the shelf break (Figure 6-10). Extremely high surface concentrations of methane were observed in the vicinity of Kayak Island as shown in Figure 6-10. The source of this methane may be the underlying sediments, but a cursory analysis of the vertical distributions at each of the stations often reveals a subsurface maximum in the concentrations of methane. It is indeed unusual to observe high concentrations of methane in surface waters where atmospheric exchange should rapidly reduce to the concentrations to 50-70 n ℓ/ℓ , particularly under conditions of intense wind mixing (Broecker and Peng, 1974).

It is possible that the high methane values observed near Kayak Island are due to gas seeps, however, as we shall see later; the ethane and propane components are not abnormal, at least not abnormally high compared to other shelf areas investigated.

In Figure 6-11 is shown the near-bottom distribution of methane. Concentrations of methane do not fall below 200 $n\ell/\ell$ in the survey region, with an intense maximum centered south of Hinchinbrook Entrance. Actual near-bottom methane concentration at station 45 was 1577 $n\ell/\ell$, the highest

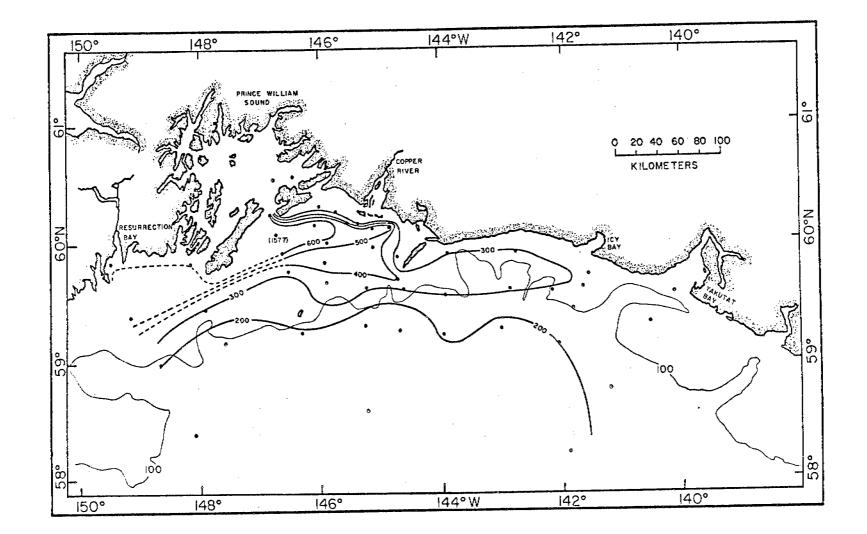
51

Figure 6-10 Surface distribution of methane in the northeast Gulf of Alaska during Oct-Nov. 1975. Concentrations are given in nl/l (NPT).



の (*) (3

Figure 6-11 Areal distribution of methane 5 m from the bottom in the northeast Gulf of Alaska during Oct-Nov. 1975. Concentrations are given in $n\ell/\ell$ (NPT).



SS

value measured anywhere to date on the OCS of Alaska, Because station positions near Montague Island were not sufficiently dense, the actual source of the methane is not known. Based on the observations made at stations 43 and 44, it would appear that Prince William Sound is not the source.

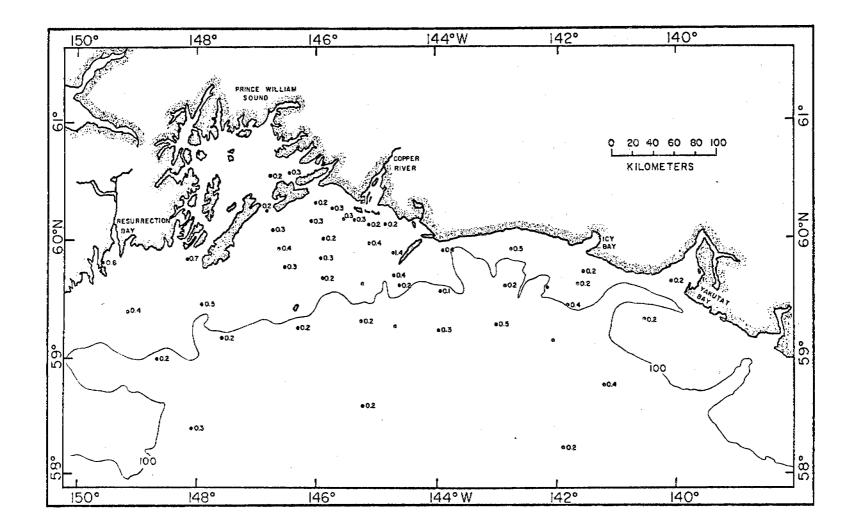
The trajectory of the methane plume is east across Tarr Bank, a topographic high consisting of coarse-grained relict Holocene sediments, toward the Copper River delta. Without knowledge of the magnitude of the benthic sources in the region, it would appear that methane generated near Montague Island moves under the Copper River plume in response to estuarine circulation. Sampling occurred in early November and it is presumed that river discharge was low at this time of the year, thereby reducing the normal estuarine driving mechanism. A methane source to the west and north of Tarr Bank is suggested because of the occurrence of clayey muds, presumably high in organic carbon. Methane distributions in the near-surface sediments are required to resolve the extent and magnitude of the bottom source.

6.22 Areal Distribution of Ethane and Ethylene

The surface distribution of ethane is shown in Figure 6-12. There is no discernible areal pattern except for highly localized maxima and minima. The average surface concentration is 0.3 nl/l with a standard deviation of $0\pm0.2 \text{ nl/l}$. A single high value of 1.4 nl/l was observed west of Kayak Island, but its significance is not known at this time. A plot of ethane vs. methane for all samples is shown in Figure 6-13. The correlation is poor, but the trend suggests a common source for methane and ethane. A low methane-ethane ratio would indicate a possible petroleum source.

506

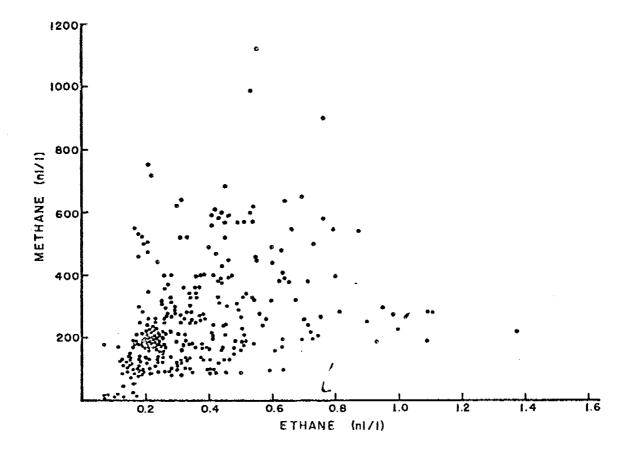
Figure 6-12 Surface distribution of ethane in the northeast Gulf of Alaska during Oct-Nov. 1975. Concentrations are given in nl/l (NPT).





S8

Figure 6-13 Methane versus ethane for all samples analyzed in the northeast Gulf of Alaska.



The surface distribution of ethylene is similar to that of ethane, showing localized maxima and minima. In general, the concentrations are higher than ethane and reveal larger spatial variability. The average surface value was 0.7 nl/l with a standard deviation of the mean of $\pm 0.20 \text{ nl/l}$.

Near-bottom ethane concentrations are presented in Figure 6-14. In general, the concentrations are greater than those observed at the surface, again indicating a sediment source. Slightly elevated concentrations of ethane were observed in the vicinity of Kayak Island, but the source of the ethane and its significance is not known at this time. Similarly, relatively high ethane values were observed south of Resurrection Bay. The average near-bottom ethane concentration is 0.5 nl/l, with a standard deviation of $\pm 0.2 \text{ nl/l}$.

Analogous to the ethane distribution, the near-bottom ethylene distribution is variable and correlative with distribution of methane. These observations are indicated in Figure 6-15.

In general, elevated ethylene concentrations are observed in the shallow shelf region, and in particular the area south of the Copper River and Kayak Island. The average near-bottom concentration of ethylene in the shelf area is 1.1 $n\ell/\ell$ with a standard deviation of the mean of $\pm 0.3 n\ell/\ell$. In general, lower concentrations are observed offshore at shelf depths and to the east in the region of Icy Bay and Yakutat Bay.

6.23 Propane, Propylene, Isobutane and n-Butane

Surface values of propane show little variation throughout the entire survey region, except in the vicinity of Kayak Island. The average surface value for all samples is 0.2 nl/l with a standard deviation of the mean of $\pm 0.1 \text{ nl/l}$. To the west and south of Kayak Island, surface propane concentrations are in the range 0.3-0.4 nl/l.

Figure 6-14 Areal distribution of ethane 5 m from the bottom in the northeast Gulf of Alaska during Oct-Nov. 1975. Concentrations are given in nl/l (NPT).

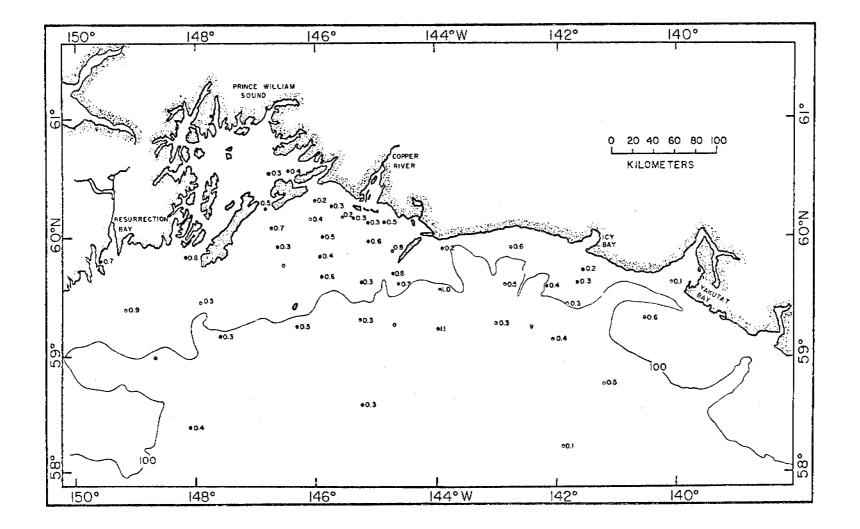
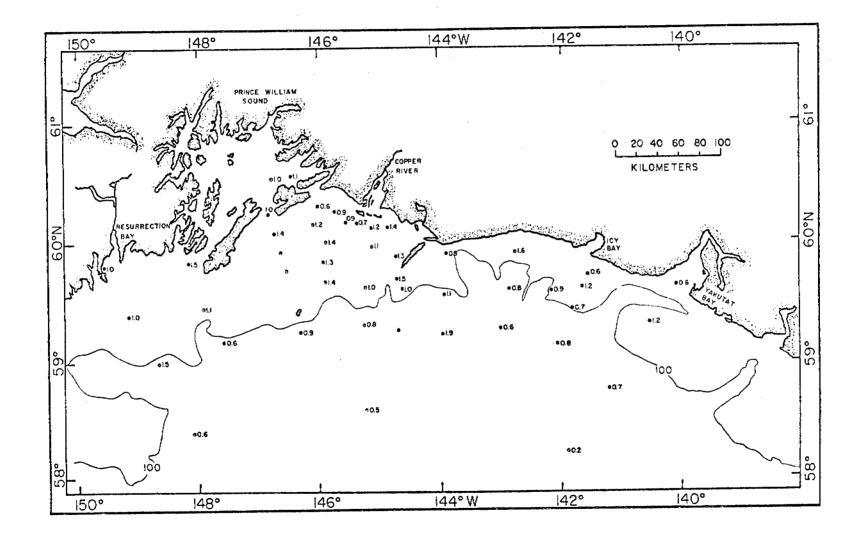




Figure 6-15 Areal distribution of ethylene 5 m from the bottom in the northeast Gulf of Alaska during Oct-Nov. 1975. Concentrations are given in $n\ell/\ell$ (NPT).

.



сл 21 Сп

The concentrations of propane 5 m above the bottom are shown in Figure 6-16. The distribution is spatially uniform with an average value of 0.2 nl/l and a standard deviation of the mean of ± 0.04 nl/l. The elevated propane values observed in the surface waters west and south of Kayak Island are not reflected in the near-bottom concentrations.

Propylene concentrations over the shelf were uniformly at or below the detection limit of 0.04 nl/l at both the surface and at depth. Again, west and south of Kayak Island, measurable concentrations were observed, the range being 0.2 to 0.3 nl/l. Chromatographic difficulties were encountered in the separation of propane and propylene, resulting in many incomplete peak integrations. Even so, it is apparent that the concentration of propylene was uniformly low throughout the region, which may have been caused by the late season and a corresponding reduction in photosynthetic activity (Lamontagne *et al.*, 1973a).

Isobutane and n-butane concentrations were everywhere below the detection limit of 0.03 nl/l.

6.24 Time Series

Two 36-hour time series were taken at stations 46 and 62 (Figure 4-2). The results of this study are depicted in Figure 6-17A, B. Station 46 is located on Tarr Bank, a region already shown to be characterized by high methane concentrations and strong lateral gradients. The bottom temporal sequence shows an eight-hour periodicity, characterized by assymetrical amplitudes (Figure 6-17A). It is unfortunate that a longer time sequence could not be taken in order to document the frequency of the major perturbations. Surface values were nearly invariant, suggesting little vertical exchange with water rich in methane from below.

66

Figure 6-16 Areal distribution of propane 5 m from the bottom in the northeast Gulf of Alaska during Oct-Nov. 1975. Concentrations are given in nl/l.

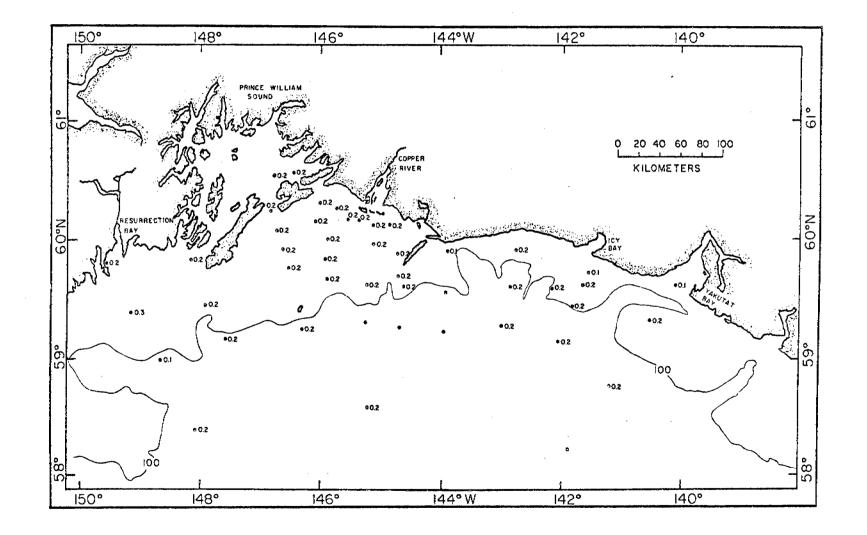
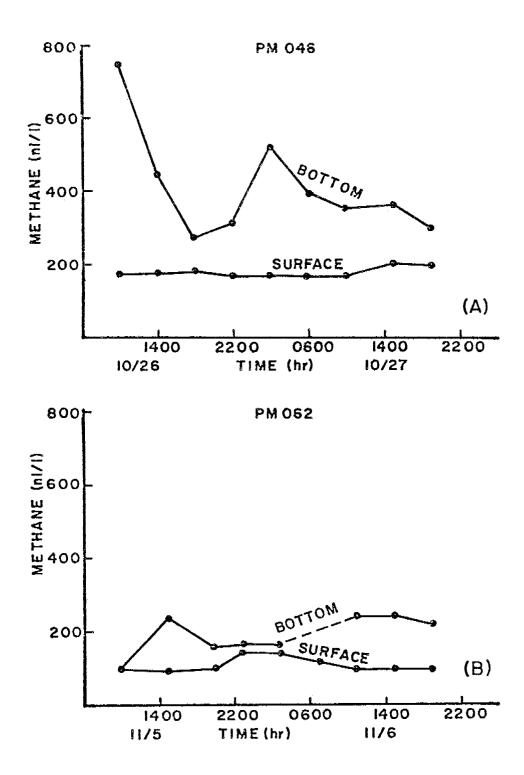


Figure 6-17 Diurnal variations in the concentration of methane at the surface and 5 m from the bottom at stations PM 046(A) and PM 062(B). Observations were conducted in the northeast Gulf of Alaska during Oct-Nov. 1975.



Temporal variability of methane at station 62 is depicted in Figure 6-17B. Unlike the near-bottom observations at station 46, only modest excursions in methane were observed during the time series. Complete analysis of the mean flow and tidal current measurements has not been completed, but the modest changes in the concentration of methane reflect the fact that no large localized sources of methane exist in close proximity of station 62. Assuming mean tidal velocities of 10 cm/sec over a time interval of 8 hours (Schumacher, personal communication, 1976), we estimate that a significant methane source would have to be closer than 3 km to register in the time sequence. Inspection of Figure 6-11 reveals a rather "flat" horizontal methane distribution over a space scale of 3 km; hence little variation would be expected. Most of the variation may be attributed to imprecise depth position of the sampling bottle.

During the time study at station 62, the mean flow (35 hr filter) at 177 m was weak and variable. Early in the period at was toward the north at 10 cm/sec, diminishing to less than 5 cm/sec for the remainder of the period. Current direction was variable.

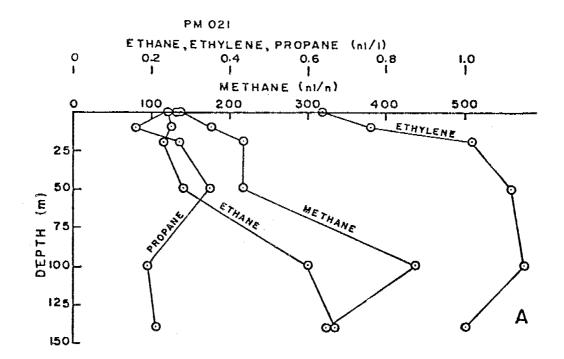
6.25 Typical Vertical Profiles

The vertical distributions of methane, ethane, ethylene and propane are shown for two stations in the Gulf of Alaska. Station 21 (Figure 6-18A) is located just south of Kayak Island, near the 100 fathom isobath. Methane, ethane, and ethylene concentrations increase monotonically with depth, suggesting a bottom source. There is an intermediate maximum in the concentration of methane and ethylene, which suggests lateral advection of hydrocarbon-rich water at 100 m or possible biological activity. The concentration of propane is uniform with depth, and appears not to be related to a bottom source.

71

Figure 6-18 Vertical distributions of methane, ethane, ethylene, and propane at two stations in the northeast Gulf of Alaska, PM 021(A) and PM 045(B). Observations were conducted during Oct-Nov. 1975.

.



PM 045 ETHANE, ETHYLENE, PROPANE 0.4 0.8 1.2 1 1 1 (ni/i) 0 1.6 1 20 METHANE (n1/1) 800 1200 400 0 800 1600 2000 रेग 25 F. T.H.S.N.E. (E) 50 H175 H1430 50 PROPANE 6 125 В 150L

73

Station 45 is located near Hinchinbrook Entrance and is characterized by extremely high concentrations of methane. Surface values are near 300 ml/l increasing to 1577 ml/l at depth. Corresponding increases in ethylene and ethane are also observed as the bottom is approached, with propane and propylene remaining invariant with depth.

6.26 Kayak Island Seep Study

Relying on verbal information from the U.S. Geological Survey at Menlo Park concerning the locations of gas-charged sediments, approximately 12 hours of ship time were dedicated to an intensive study of the 10 fathom fault exposure south and west of Kayak Island (Carlson *et al.*, 1975). We had hoped to investigate the fault along the eastern boundary of the island, but shallow, uncharter waters prevented a study of most of the fault. Approximately 7 hours were used to run detailed transects for navigational purposes. At the same time, continuous fathometer readings were taken to delineate the fault and at the same time scan the waters for gas bubbles. None were conclusively observed.

Sampling was carried out along the fault every hour by lowering 2 Niskin bottles to within 2 and 4 m of the bottom. Sample bottle positioning was established by the PDR trace and a fix was taken at the moment the bottle was tripped. The results of the study are shown in Table 6-1 as time averages.

TABLE 6-1. Average concentration of LMWH taken 2 and 4 m from the sea floor at six stations along the 10 fathom fault line south of Kayak Island. The numbers in parentheses are standard deviations.

| Distance | Methane | Ethane nl/l | Ethylene | Propane |
|----------|------------|--|-------------|--------------|
| 2 | 442 ± (90) | 0.4 ± (0.2) | 1.0 ± (0.1) | 0.2 ± (0.07) |
| 4 | 442 ± (91) | 0.4 ± (0.2) | 1.0 ± (0.3) | 0.2 ± (0.03) |
| ц | | <u>کې کې د او د د د د د د د د د د د د د د د د د </u> | 4 | |

No unusual concentrations of hydrocarbons were observed other than the normal variabilities in methane already discussed in section 6.24. Average and discrete methane, ethane, and propane concentrations were considered typical for the region near Kayak Island.

The failure to observe elevated concentrations of aliphatic hydrocarbons in the C_2 - C_4 range indicates that gas seep activities were small or absent. Actual seep activity for the Kayak Island region has never been reported, only the presence of gas-charged sediments. Our investigation along the southern exposure of the fault would suggest that the gases in the underlying sediments are of normal biogenic origin, but analysis of dissolved gases in the surface sediments would be most helpful to confirm our suspicions.

Efforts are continuing with USGS to establish more precisely the location of the gas charged sediments, and seeps, near Kayak Island.

7. DISCUSSION

7.1 Sources of Hydrocarbons

Natural levels of LNWH in the marine environment occur via enzyme catalyzed biochemical reactions and the low temperature cracking of more complex organic molecules (Frank *et al.*, 1970). Small, but significant, amounts of hydrocarbons are also produced in the surface layers of the ocean, presumably in response to photosynthetic activity there. The nature and extent of these processes in the surface layers of the ocean are not well understood, but seasonal correlations with productivity are apparent (Lamontagne *et al.*, 1973a).

7.11 Benthic Hydrocarbon Indicators

Methane is the dominant hydrocarbon observed in shelf waters; its concentration often exceeds other LMWH components by a factor of 100-1000. The production of methane is presumably through the biochemical reduction of CO_2 within anoxic sediments. CO_2 reduction is actually a complex series of microbial reactions, the sum of which results in the conversion of organic matter into carbon dioxide and methane (Claypool, 1974). This process is carried out by strict anaerobes and is indicative of organicrich sediments. Coarse-grained sediments, including the sand fraction, are usually low in organic matter and consequently do not support vigorous methane production. Similarly, river deltas characterized by coarse-grained sediments of low organic carbon content would not represent environments conducive to biogenic methane formation.

為26

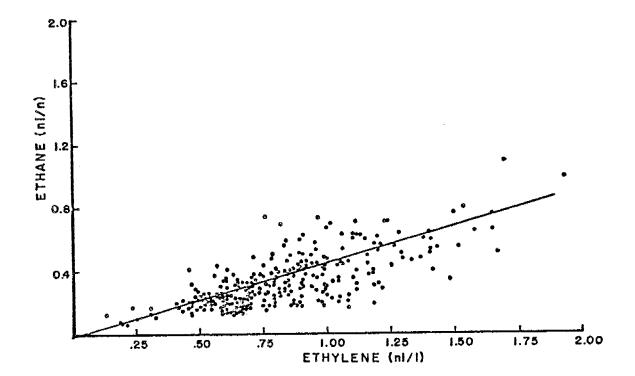
Our measurements in the Bering Sea and the Gulf of Alaska support the aforementioned generalizations. Although the sedimentary environments in the Gulf of Alaska have not been fully investigated as to their potential for the formation of biogenic methane, the conclusions arrived at in the Bering Sea will probably carry forward.

Near-bottom sampling in the Bering Sea and the Gulf of Alaska revealed a positive correlation between the methane concentrations and ethane (cf. Figures 6-5 and 6-13). In the Bering Sea the data are contained in an envelope delineated by methane-ethane ratios of 40 to 300, whereas the same ratios in the Gulf of Alaska range from 300 to 2000. The major difference between the two environments is the relatively larger methane concentrations in the Gulf of Alaska. Assuming equal solubilities for methane and ethane, it would appear that gas seeps would have to be characterized by ethane concentrations in excess of 2% in the Bering Sea and 0.3% in the Gulf of Alaska before environmental distinctions could be made. It is not clear at this time why the differences in the ratios for the two areas should be so great.

A more informative ratio to consider might be the ethylene-ethane ratio. An example of the relationship between ethane and ethylene is shown in Figure 7-1. The slope of the least-squares line is a 0.45 (ethane vs ethylene) or 2.6 if ethylene is regressed against ethane. The standard error of the slope is ± 0.03 . Because this relationship shows a much stronger correlation (r = 0.66) than that observed in the plot of methane vs ethane, small variations in the ratio might be indicative of the hydrocarbon source. The ratio between ethane and ethylene should be extremely sensitive to petroleum or natural gas contribution because of the near zero levels of the olefins in natural gas.

527

Figure 7-1 The relationship between ethane and ethylene concentrations for all observations in the northeast Gulf of Alaska. The slope of the line is 0.45 ± 0.03 (r = 0.66).



In both Bristol Bay and the Gulf of Alaska, concentrations of the C_3 and C_4 fractions were exceedingly low. Because of the pristine nature of the Alaskan shelf environment, these parameters may well show the largest perturbations in LNWH arising from accidental spillage. This is certainly the situation observed in the Gulf of Mexico, where 100-fold increases were observed in the concentrations of propane and butanes 100 km off the Mississippi River delta (Brooks and Sackett, 1973).

7.12 Atmospheric Exchange Processes

Volatile hydrocarbons produced in the marine environment or introduced through petroleum development will eventually escape to the atmosphere. An unknown fraction of the total will be microbially degraded by indigenous marine organisms. The relative magnitudes of the two processes are unknown, but atmospheric exchange should be the easier to estimate (Broecker and Peng, 1974). Microbial degradation will depend on many environmental parameters, including salinity, temperatures, nutrients, nature and surface area of particulate matter, bacterial flora, and possible microbial synergistic effects.

Our measurements conducted on the shelf region near Kayak Island reveal anomalous concentrations of methane in the surface waters (cf. Figure 6-10). In view of the intense mixing characterizing these waters, particularly in late fall, it is indeed surprising to observe these elevated amounts. Inspection of vertical profiles in the region suggest a source of methane at the surface, rather than at depth. Comparison of surface methane values with chlorophyll-A and primary productivity did not yield meaningful correlations (Jerry Larrance, personal communications). We assume that the observed concentrations are the result of biological activity, but the mechanisms or processes are unknown that produce methane in

530

well-oxygenated waters (Claypool, 1974).

7.2 Hydrocarbon Tracers

One of the objectives of this hydrocarbon program was to establish the criteria under which LMWH might be useful as tracers of the toxic soluble fraction of crude oil. Although no major scep areas were identified conclusively, the high concentrations of methane generated on the shelf were used to characterize the space scales over which LMWH might be useful as tracers in the event a significant source were present.

To illustrate the potential, two vertical methane sections were constructed normal to the coast of Alaska. The first of these was constructed from observations made along the line of stations commencing in Resurrection Bay (cf. Figure 4-2), the latter originating in Yakutat Bay. The results are shown in Figures 7-2 and 7-3.

It is apparent that methane generated on the shelf of the upper slope has been transported off the shelf more than 100 km. Because the mean flow in the upper layers at this time of year is largely parallel to the isobaths or with a significant onshore component (Galt and Royer, 1976), we conclude that the distributions of methane shown in Figures 7-2 and 7-3 have arisen largely from lateral diffusion or from episodic offshore advective transport. At the time the eastern section was being occupied (Nov. 7-8, 1975), current measurements were being taken at station 62, located approximately 120 km to the west. Current measurements taken at 175 m and filtered for a 6-hour interval, show a weak flow to the west on 7 Nov., shifting to an onshore component of 10-15 cm/sec on 8 Nov. Concurrent observations taken at 104 m show a continuous NNW component at 15-20 cm/sec (Schumacher, personal communication). At this point, the actual source of the methane cannot be

Figure 7-2 The vertical distribution of methane along a north-south transect originating in Resurrection Bay (cf. Fig. 4-2). This line of stations (PM 001-PM 004) defines the western boundary of the survey region.

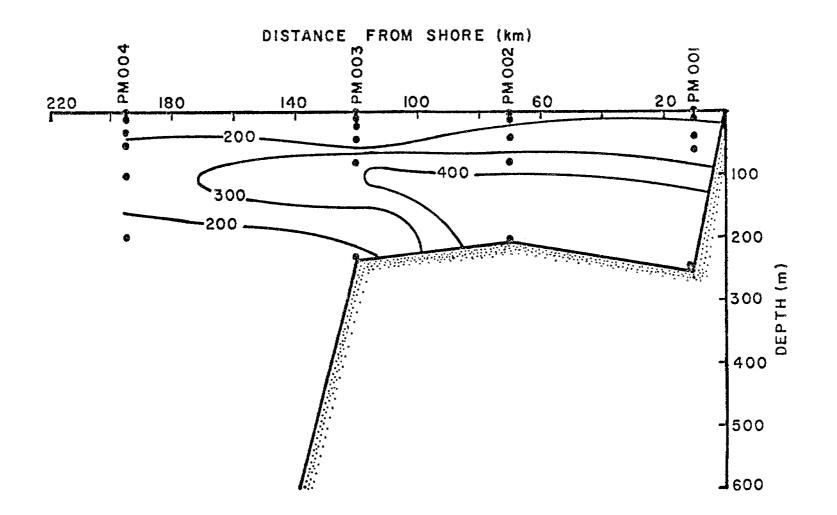
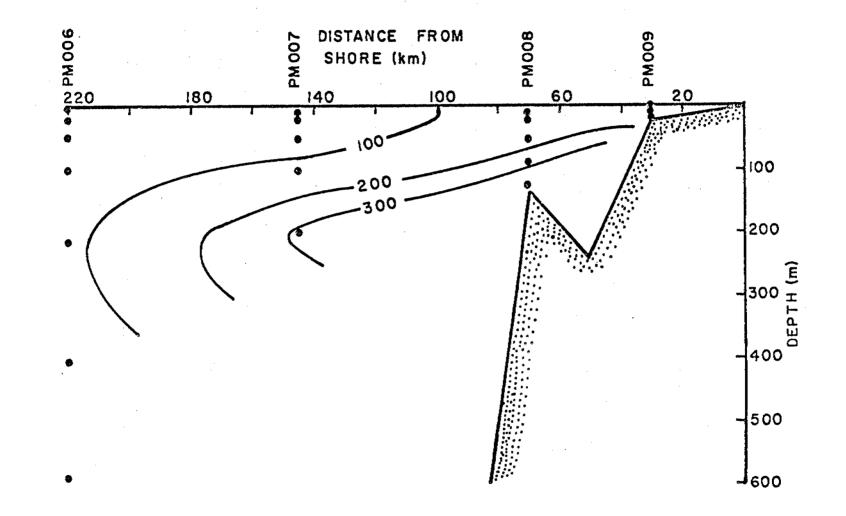


Figure 7-3 The vertical distribution of methane along a north-south transect originating in Yakutat Bay (cf. Fig. 4-2). This line of stations defines the eastern boundary of the survey region.



stated unequivocally. But it seems clear, based on a rather cursory examination of current meter data, that the apparent penetration of methane offshore may have resulted from advective transport of waters from the east enriched in methane. The expected attrition of methane in direction of mean flow due to *in situ* consumption would be supplemented by lateral diffusion from the shelf region. Ignoring for the moment the mechanism by which methane was transported off the shelf, it was unusual and totally unexpected to find high concentrations of methane in well-oxygenated water at relatively great distances from known sources.

Because of these observations, it would appear that the near-bottom methane plume observed to the west of and underlying the Copper River plumé may be the result of circulation and not a benthic source (cf. Figure 6-11). Seasonal observations and methane profiles in the sediment should assist in the clarification of the issue.

8. CONCLUSIONS AND SUMMARY

The low molecular weight hydrocarbons, including methane, ethane, ethylene, propane, propylene, isobutane and n-butane were determined in Bristol Bay and the northeast Gulf of Alaska. The measurements were carried out in vertical profile in order that sources and sinks might be more clearly defined. This report indicates conditions as they existed during the fall of 1975.

In general, strong bottom sources of methane were identified in both the Bering Sea and the Gulf of Alaska. Just to the north of Unimak Pass in the region called the "Golden Triangle", methane concentrations exceeding 600 nl/l were observed within 5 m of the bottom. Without confirming evidence on the distribution of methane in surface sediments, it is assumed that the methane arose from microbial degradation of organic matter with subsequent diffusion to the overlying water. Sediments characterized by lower concentrations of organic carbon generally reflected diminished nearbottom concentrations of methane.

In the Gulf of Alaska, extremely high concentrations of methane were observed south of Hinchinbrook Entrance; the origin is presently unknown. Concentrations of methane near the bottom were uniformly high (>200 nl/l) over the entire shelf area and presumably reflect sedimentary carbon concentrations, although corroborating evidence is not at hand.

In the Bering Sea, surface methane values were generally in the range of 50-70 nl/l, indicating a diminished bottom source and equilibration with the atmosphere. In contrast, the northeast Gulf of Alaska

revealed high concentrations of methane in the surface waters, presumably due to an underlying benthic source. In the region surrounding Kayak Island, surface concentrations were greater than 250 nl/l, indicating a sharp departure from equilibrium conditions. Again, the source of the methane is not readily apparent, but appears to be a surface generated phenomenon.

Time series measurements made in both the Bering Sea and the Gulf of Alaska suggest strong diurnal variations in the concentration of methane. The magnitude of the variations depends on short term current fluctuations and strong horizontal methane gradients. The periodicity of the fluctuations suggest tidal frequencies, but a complete analysis has not been made to date.

Correlations of ethane, ethylene, propane, and propylene have been made against methane. With the exception of propane and propylene, the others show a positive correlation with methane, suggesting a common origin. It is not known at this time whether the ethane and ethylene arose as the direct result of a biochemical process or as the result of low temperature cracking of organic matter. The former process seems more likely.

An analysis of ethane-methane ratios in the near-bottom waters of the Bering Sea and Gulf of Alaska suggests that ethane is never greater than 2% of the methane (Bering Sea) and is significantly lower than that in the Gulf of Alaska. There the ratio was highly variable, ranging from a low of 0.03% to a high of 0.2%. If we assume that natural gas contains more than 2% ethane by volume, we would conclude that no seep areas were unequivocally located in these surveys.

The differences observed in the ethane-methane ratio for the two environments may simply reflect a variable input of methane. As stated above, concentrations of methane in the Gulf of Alaska were significantly

88

higher than those observed at comparable depths in the Bering Sca, but the concentrations of the C_2 and C_3 fractions are nearly the same in both areas. This may indicate that a saturation effect in which increased production of methane beyond a certain limit is not reflected in the concentrations of other hydrocarbon species. Additional studies are required to unravel the complexities of hydrocarbon production in marine sediments and in surface layers.

89

The concentrations of the C_2 and C_3 hydrocarbons were uniformly low in both the Bering Sea and the Gulf of Alaska. Concentrations generally averaged less than 1 n2/2, with only a few notable exceptions. Ethylene and propylene concentrations were generally two-fold greater in concentration than their aliphatic homologs, and did not show the high surface concentrations that are normally indicative of photosynthetic activity.

Measurements for iso- and n-butanes were carried out, but the concentrations were uniformly low in both survey areas. Concentrations rarely exceeded 0.1 nl/l and were usually near or below the detection limit of 0.03 nl/l. Values greater than 0.1 nl/l were generally attributed to contamination arising from the ship.

9. FUTURE RESEARCH ENDEAVORS

The present research activity centers largely on the seasonal and spatial variations in low molecular weight hydrocarbons with some attention being given to significant source regions. It is estimated that present field scheduling in the Bering Sea, Norton Sound, Chukchi Sea and the northeast Gulf of Alaska will, for the most part, satisfy our commitment to the establishment of baseline levels of LAWH in these areas. Since some of the geographical areas will be visited 3 times, others only once, seasonal information will be limited in scope in some areas, absent altogether in others. It would be desirable from a scientific point of view to continue our studies on the distributions, sources and ultimate fate of natural marine hydrocarbons, but we recognize that all of these goals may not be in the best interest or within the capabilities and jurisdiction of the OCS program. For these reasons, we feel that future research activities concerning LNWH should be redirected toward local source areas.

Future research activities should concentrate on known hydrocarbon inputs, whether they be natural or man-made. Included in these categories would be: a) anomalous hydrocarbon sources, b) natural gas and oil seeps, and c) existing petroleum platforms and producing wells. The aim of these studies would be to ascertain the sources and composition of the hydrocarbons, their input rates, and their usefulness as tracers of soluble hydrocarbons.

Detailed measurements of anomalous hydrocarbon sources, such as those revealed near Hinchinbrook Entrance and the Herendeen Bay in Bristol Bay,

should be undertaken. Emphasis should be placed on near-bottom gradients and trajectories of the hydrocarbon plume. These efforts should be supported with detailed examination of the hydrocarbon content of the underlying sediments, particularly on surficial gradients from which flux calculations can be carried out. Attention should be given to the composition of the gases with particular regard for the C_2 - C_5 fraction. If the concentration of methane is sufficiently high, it should be extracted and analyzed isotopically for δ^{13} C composition. The isotopic composition of the methane should reveal its primary source, whether it be principally biogenic in origin or the result of the percolation of natural gas from underlying reservoir rocks.

Similar detailed studies of natural gas and petroleum seep would also be indicated. Here, the Geological Survey should be consulted as to the seep location, input activity, and possible hydrocarbon composition. We are continuing our dialogue with the Conservation Division and the Gas and Oil Branch of the USGS as to the location of promising seep areas in the OCS.

In the event that a hydrocarbon source appears to be derived from petroleum or natural gas, a supplementary program should be initiated to sample the higher molecular weight fractions, as appropriate for the source. For example, in the case of a conventional petroleum seep, the C_6-C_{12} (gasoline and kerosene fraction) may be of interest as confirming evidence.

Lastly, we feel that the current production of petroleum in upper Cook Inlet should be examined in terms of LMWH. The results of Kinney et al. (1970) indicated elevated levels near the Forelands, which they ascribed to possible gas seeps. Observations will be conducted this spring

541

in lower Cook Inlet and special attention will be given to the Forelands area. Based on these results, as well as geological data on the occurrence of seeps and sub-bottom geological structures, a study should be conducted into the sources of the hydrocarbons (i.e., platforms or natural seeps).

Sampling of localized sources of hydrocarbons should be carried out according to a high-density sampling grid. To be cost effective, sampling should be conducted with an *in situ* pumping system interfaced with a rapid gas extractor and chromatographic processor. Such a system has been built and will be field tested in May 1976.

Our findings in the Gulf of Alaska and the Bering Sea have shown interesting, but yet unexplained, relationships between methane, ethane, and ethylene. If the latter two components arise from the sediment, as we believe the bulk of the methane does, what are the processes that result in the formation of ethane and ethylene? Conceptually, we envision a biochemical origin for these gases, but the purely inorganic cracking of more complex organic molecules also may contribute significantly to their production. In the broadest context of the environmental assessment program, it seems that a knowledgeable understanding of the sources of natural hydrocarbons, the rates of input, and the ultimate fates are of paramount importance. Traditionally, it is the investigation of natural contaminants under natural environmental conditions that results in more reliable predictions concerning capacities, stress tolerances, and rates of recovery of a given system.

The production and escape of LMWH from sediments ought to be studied in the context of environmental and geochemical factors. Relationships between hydrocarbons and environmental characteristics, such as sediment type, size frequency, organic carbon content and origin, redox potential,

542

sedimentation rates, pore water chemistry, and microbial populations, should be emphasized. Because the LMWH fraction is volatile, special coring apparatus must be constructed to eliminate exchange of gases with the atmosphere during sampling. As a first step, surficial hydrocarbon gradients and the loci of hydrocarbon production should be investigated in the upper 2 m of the sediment column. Depending on the outcome of these observations in promising localized areas, additional experiments should be developed to elucidate mechanisms and environmental control parameters.

10. SUMMARY OF 4TH QUARTER OPERATIONS

10.1 Task Objectives

In accordance with the guidelines set down by OCSEAP, two field programs have been conducted in the Bering Sea (RP-4-DI-75B-III) and in the northeast Gulf of Alaska (RP-4-DI-75C-I). The principal focus of these operations was to evaluate the spatial and temporal variations in the concentrations of the low molecular weight hydrocarbons (LMWH), methane, ethane, ethylene, propane, propylene, iso- and n-butane. Emphasis was also placed on natural sources of hydrocarbons, short term temporal variations, and potential seep areas. A detailed description of the program is presented in work unit #153/155.

10.2 Field Activities from January 1 - April 1, 1976

No field observations were conducted during the last quarter.

10.21 Laboratory Activities

During the winter months, work has continued on the development of rapid hydrocarbon analysis to augment our future field endeavors. Work has continued on the development of a vacuum gas extraction system to facilitate rapid sample processing. To supplement our ability to degas water samples rapidly, progress has been made in the optimization of the chromatography of LMWH. We have augmented the Poropak Q column $(3/16" \times 8")$ with an activated alumina column $(3/16" \times 2")$ impregnated with 1% silver nitrate by weight. This modification, together with temperature programming, has achieved sharper peaks and reduced retention times for all

components. Chromatographic analysis has been reduced to under 7 minutes, compared to 15 minutes in the original procedure. Typical chromatographic responses are shown in Figure 5-2A,B of the annual report.

Plans are being initiated to develop, in cooperation with the biologists (J.D. Larrance and D.M. Damkaer), an *in situ* pumping system to which the vacuum extraction system will be interfaced. This will provide for increased mobility in the rapid and quantitative assessment of localized hydrocarbon inputs.

10.3 Laboratory Procedures

The procedure, originally developed by Swinnerton and Linnenbom (1967), has been modified slightly to facilitate field operations, including logistics. Samples are taken from either 5- or 10-1 Niskin^(R) samplers and stored temporarily in 1-1 glass-stoppered bottles, to which has been added 100 mg of sodium azide to retard bacterial metabolism. Within two hours of sampling, hydrocarbons are quantitatively stripped from solution with ultra-pure helium and adsorbed on activated alumina at -196°C. After 12 minutes of stripping at a He flow rate of 120 ml/min, the cold trap is warmed to 90-100°C, and the released hydrocarbons chromatographed on a column of Poropak^(R) Q (3/16" x 8'). Complete sample analysis of dissolved hydrocarbons including stripping, through C₄, requires less than 30 minutes.

10.4 Sampling Protocol

No field samples were taken during the reporting period.

10.5 Data Analysis

LMWH data collected during the aforementioned cruises were reduced and compiled according to the format designed by EDS/NODC. A copy of the format is shown in Appendix I.

Data for the cruises was submitted to Mr. Mauri Pelto, OCSEAP Data Manager, on February 12, 1976. Xerox copies of the data are included in Appendix II for your reference.

10.6 Results

The results of our field activities in late fall of 1975 are graphically displayed and discussed in sections 6 and 7 of the annual report and will not be reproduced here. Final data processing is continuing.

10.7 Financial Statement

The financial posture of the LMWH program, through April 1, 1976, is estimated on the following page. Because of salary overruns arising from unanticipated overtime commitments during scheduled cruises and the failure to carry forward FY 75 salary money, the anticipated salary shortages will be covered from existing supply and equipment funds. No hardship to the program is envisioned.

| | Allocated | Expended to Date | Balance |
|-----------------------|------------|------------------|---------|
| Salaries and overhead | 63.0 K | 42.8 K (b) | 20.2 K |
| Major equipment | 26.5 | 17.5 | 9.0 (a) |
| Expendable supplies | 17.5 | 8.4 | 9.1 (a) |
| Travel and per diem | 2.0 | 3.0 | 4.0 |
| Shipping | 4.0 | 1.5 | 2.5 |
| Publications | 4.0 | 0.0 | 4.0 |
| TOT | AL 122.0 K | 73.2 K | 48.8 K |

ESTIMATE OF FUNDS EXPENDED THROUGH 1 APRIL 1976

(a) reallocation necessary to pay future salaries

(b) 4K lost from FY 1975 (not carried over)

.

REFERENCES

- Blumer, M. 1971. Scientific aspects of the oil spill problem. Environ. Affairs, 1: 54-73.
- Broecker, W.S. and T.H. Peng. 1974. Gas exchange rates between air and sea. *Tellus*, 25: 21-35.
- Brooks, J.M. and W.M. Sackett. 1973. Sources, sinks, and concentrations of light hydrocarbons in the Gulf of Mexico. J. Geophys. Res., 78 5248-5258.
- Carlson, P.R., T.R. Bruns, and B.F. Molnia. 1975. Submarine slides and nearsurface faults, Northern Gulf of Alaska. U.S. Geol. Survey, Open File Map No. 75-504.
- Claypool, G.E. 1974. Anoxic diagenesis and bacterial methane production in deep sea sediments. *Ph.D. dissertation*, Univ. of California, Los Angeles, 276 p.
- Fischer, P.J. and A.J. Stevenson. 1973. Natural hydrocarbon seeps along the northern shelf of the Santa Barbara Basin, California. Offshore Technology Conference - V, Apr. 30 - May 2, 1973, Dallas Texas.
- Frank, D.J., W. Sackett, R. Hall, and H. Fredericks. 1970. Methane, ethane, and propane concentrations in the Gulf of Mexico. Amer. Ass. Petrol. Geol. Bull., 54: 1933-1938.
- Galt, J.A. and T.C. Royer. 1976. Physical oceanography and dynamics of the N.E. Gulf of Alaska. (In press)
- Geyer, R.A. and W.M. Sweet, Jr. 1973. Natural hydrocarbon seepage in the Gulf of Mexico. Trans. Gulf Coast Ass. Geol. Soc., 23: 158-169.
- Kinney, P.J., D.K. Button, D.M. Schell, B.R. Robertson, and J. Groves. 1970. Quantitative assessment of oil pollution problems in Alaska's Cook Inlet. Inst. Mar. Sci. Univ. Alaska, Rept. No. R69-16.
- Lamontagne, R.A., J.W. Swinnerton, and V.J. Linnenbom. 1971. Nonequilibrium of carbon monoxide and methane at the air-sea interface. J. Geophys. Res., 76: 5117-5123.
- Lamontagne, R.A., J.W. Swinnerton, and V.J. Linnenbom. 1973a. C₁-C₄ hydrocarbons in the North and South Pacific. *Tellus*, 26: 71-77.

- Lamontagne, R.A., J.W. Swinnerton, V.J. Linnenbom, and W.D. Smith. 1973b. Methane concentrations in various marine environments. J. Geophys. Res., 78: 5317-5324.
- Link, W.K. 1952. Significance of oil and gas seeps in world oil exploration. Amer. Ass. Petrol. Geol. Bull., 36: 1505-1540.
- McAuliffe, C. 1966. Solubility in water of paraffin, cycloparaffin, olefin, acetylene, cycloolefin, and aromatic hydrocarbons. J. Phys. Chem., 70: 1267-1275.
- Molnia, B.F. and P.R. Carlson. 1975. Surface sediment distribution map, Northern Gulf of Alaska. U.S. Geol. Survey, Open File Map No. 75-505.
- Rosenberg, D.H. 1972. A review of the oceanography and renewable resources of the northern Gulf of Alaska. Inst. Mar. Sci., Univ. Alaska, Rept. No. R72-23, p. 143-148.
- Sackett, W.M. and J.M. Brooks. 1974. Use of low-molecular weight hydrocarbon concentrations as indicators of marine pollution. Presented at Marine Pollution Monitoring (Petroleum) Symposium and Workshop, May 13-17, 1974, NBS, Gaithersburg, Maryland.
- Sharma, G.D. 1974. Contemporary sedimentary regimes of the eastern Bering Sea. In: Oceanography of the Bering Sea, (eds) D.W. Hood and E.J. Kelley, Inst. of Marine Science, Univ. Alaska, Fairbanks, pp. 517-540.
- Swinnerton, J.W., V.J. Linnenbom, and C.H. Cheek. 1968. A sensitive gas chromatographic method for determining carbon monoxide in sea water. *Limnol. Oceanogr.*, 13: 193-196.
- Swinnerton, J.W. and V.J. Linnenbom. 1967. Determination of C_1-C_4 hydrocarbons in seawater by gas chromatography. J. Gas Chromatogr., 5: 570-573.
- Swinnerton, J.W. and R.A. Lamontagne. 1974. Oceanic distribution of lowmolecular - weight hydrocarbons. Baseline measurements. Environ. Sci. and Technol., 8: 657-663.
- Takenouti, A.Y. and Y.K. Ohtani. 1974. Currents and water masses in the Bering Sea: A review of Japanese work. In: Oceanography of the Bering Sea, (eds) D.W. Hood and E.J. Kelley, Inst. of Marine Science, Univ. Alaska, Fairbanks. pp. 39-58.
- Wilson, E.B. 1975. Petroleum in the Marine Environment-Workshop on Inputs, Fates, and the Effects of Petroleum in the Marine Environment. p. 19. National Academy of Sciences, Wash. D.C. 107 pp.

Appendix 1 and 2 listed in the table of contents of this report are two sets of data not included here.

These data may be obtained by NAPIS # upon request from: Jim Audet NOAA/EDS/NODC 3300 Whitehaven St., N. W. Washinton, D. C. 20235

NAPIS # 76-0630 (Discoverer cruise, October 21-November 5, 1975) -- includes 500 punched cards

NAPIS # 76-0631 (Discoverer cruise, September 21-October 3, 1975) -- includes 700 punched cards

550

★ U.S. Government Printing Office: 1976-679-578/459 Region 8

