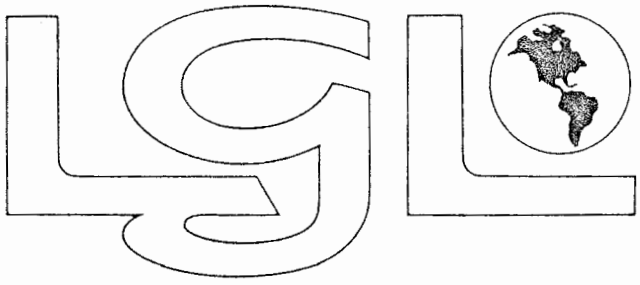

Ecological Research Associates

SPRING FISHERIES SURVEY AND PROVISIONAL LIST OF WATERBODIES ALONG THE ALASKAN GAS PIPELINE ROUTE (PRUDHOE BAY TO THE YUKON TERRITORY) PROPOSED BY NORTHWEST ALASKAN PIPELINE COMPANY

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FOR:
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SPRING FISHERIES SURVEY AND PROVISIONAL LIST OF WATERBODIES ALONG THE ALASKAN GAS PIPELINE ROUTE (PRUDHOE BAY TO THE YUKON TERRITORY) PROPOSED BY NORTHWEST ALASKAN PIPELINE COMPANY

Final Report

Prepared for and Funded by
Northwest Alaskan Pipeline Company

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ABSTRACT

The natural gas pipeline proposed by Northwest Alaskan Pipeline Company traverses hundreds of waterbodies in the Beaufort Sea and Yukon River Drainages. This report describes the spring status of fish in these waterbodies based on a review of available information and a field survey of streams selected for initial examination. Over fifty sources of information (including reports, unpublished documents, agency memoranda and personal communications) were examined for spring fisheries data at 492 crossings of waterbodies along the pipeline route. Results of field surveys and literature review indicate the majority of streams crossed by the pipeline are used by fish in the springtime for spawning, rearing and migration. An assessment of these data is listed in Appendix II.

This report describes the spring fish use of 80 waterbodies at 86 proposed crossings of the Northwest Alaskan Gas Pipeline in Alaska. Streams were surveyed between 12 May and 30 June 1979; biological, chemical and physical data gathered are listed in a stream catalogue. Fish species caught during the spring survey were: grayling, Dolly Varden, burbot, longnose sucker, humpback whitefish, round whitefish, lake chub, northern pike and slimy sculpin. Six streams surveyed were used by grayling for spring spawning, egg incubation and nursery areas (Gardiner Creek, Tok River, Berry Creek, Redmond Creek, Little Gerstle River and Shocker Creek); available data indicated that other streams were also used by spring spawning fish (Beaver Creek, Bitters Creek, Crystal Springs, Yerrick Creek, Bear Creek, Washington Creek and Unnamed creeks 6-227.02 and 6-193.01.

Fish used 22 of the waterbodies surveyed as feeding or rearing areas after spring breakup. No fish were caught in the remainder of the streams surveyed; 9 of these were considered to provide suitable springtime habitat for fish and 50 were considered unsuitable.

INTRODUCTION

Northwest Alaskan Pipeline Company proposes to construct the Alaskan segment of a buried pipeline which would transport chilled natural gas from the arctic to southern markets. The proposed routing of the Northwest Alaskan Pipeline (NAPLINE) parallels the Alyeska Oil Pipeline from Prudhoe Bay to Delta Junction with some minor variances, and then follows the Haines-Fairbanks Products pipeline right-of-way east from Delta Junction to the Alaska/Canada border.

On 4 January 1979, LGL Ecological Research Associates (LGL) was awarded a contract by Fluor Northwest, Inc., funded by Northwest Alaskan Pipeline Company, to conduct fisheries surveys along the NAPLINE route. The major purposes of these surveys were to identify the waterbodies crossed or potentially affected by the NAPLINE project and to assess the fish utilization of these waterbodies during winter, spring and fall seasons. This report presents the results of the spring program: (1) a provisional list of 492 waterbodies crossed or potentially affected by the NAPLINE with an evaluation of existing spring fisheries data for each; and (2) a spring assessment of waterbodies selected for field examination during the late spring period--12 May-30 June 1979.

Spring Studies

Objectives and Justification

The objectives of the 1979 spring fisheries study were to:

1) Investigate the presence, absence and species composition of fish in streams for which available fisheries data are inadequate,

2) Record fish use (spawning, rearing and migrating) of selected aquatic habitats, and

3) Record stream features which may affect fish utilization of the habitat (e.g., impassible natural barriers or drainage structures).

Fish populations along the NAPLINE route typically require a variety of aquatic habits to complete their life cycle. Several streams or sections of streams are required by these fish at specific times of the year. A common pattern, for example, is for fish to overwinter at one location, feed at another and spawn at still another. It therefore becomes necessary to investigate streams during each biologically-important season since fish utilization generally varies from stream to stream. The purpose of the present fisheries program is to document which streams are important to fish during the spring season. Many species common in the study area spawn at this time: grayling, northern pike, longnose sucker, slimy sculpin and lake chub.

Selection of Streams for Field Investigation

An evaluation of available spring information for the hundreds of streams crossed by the NAPLINE was based on an extensive literature survey, communication with state and federal agencies and professional experience. Primary sources for literature were published government and consultant reports and file data from the Joint Fish & Wildlife Advisory Team (JFWAT) in Anchorage. Agencies consulted included: State Pipeline Coordinators Office, Alaska Department of Fish and Game (Habitat, Commercial and Sport Fish Divisions) and U.S. Fish and Wildlife Service (Stream Alteration Division). Early in this review process, a list of criteria was developed to standardize the manner in which waterbodies were evaluated (Table 1).

During the course of the spring field survey and through continued literature review and agency contact, additional waterbodies requiring spring work were identified (Appendix II). It is recognized that additional spring sampling efforts will be needed if new streams are identified or alternative pipeline alignments are considered.

Sampling Strategy

Spring investigations were conducted during two time periods to optimize data collection and sampling efficiency. One group of southern streams was sampled in early spring, shortly after spring breakup (12-14 May 1979). Streams in this group were:

1) Robertson and Johnson rivers. These are large, braided glacial streams which remain low and clear under winter ice cover and for a short time in early spring; thereafter, they run high, swift and extremely turbid and sampling efficiency is very low.

2) Chief, Dry, Sawmill, Rhoads and Granite creeks. An early sampling period was recommended since these streams may become intermittent or dry by early summer (Ref. 6, 9 & 10), and fish use would be seasonally limited to early spring.

A valuable option for streams sampled during early spring was that some could be sampled again during the second survey effort.

The second group of streams was sampled in late spring (15-30 June 1979) after the spring freshet. Sampling efforts concentrated on the collection of recently-spawned fish and their newly emerged fry. An earlier sampling effort during breakup conditions at these streams was considered unnecessary and inefficient for the following reasons:

1) Presence of floating ice, logs and debris preclude the use of some sampling equipment and hamper the effectiveness of others,

2) High turbidity and flooding conditions often make it difficult to interpret stream morphology which is sometimes essential to effective sampling,

Table 1. Criteria for evaluating available fisheries data for the spring season.

Number*	Spring Criteria
1	Spring Use Area--Waterbody investigated and fish use in spring documented.
2	No Fish Use in Spring--Waterbody investigated and no fish use in spring documented.
3	No Fish Use in Spring Inferred--Absence of spring habitat inferred and supported by indirect evidence: Small drainage with negligible, intermittent or no spring time flow; or fish blockage present.
4	Additional Data Needed--Waterbody investigations incomplete or lacking for spring season: (A) waterbody has not been surveyed for fish use in springtime; or (B) previous data were inconclusive.

*Cited in Appendix II.

3) Some sampling locations are inaccessible due to high waters, and

4) Fish densities tend to be low due to increased stream discharge.

Report Format

This report combines historical information together with data generated during field surveys in order to provide an interim assessment of spring fish use of streams affected by the NAPLINE route. A provisional list of 492 waterbodies crossed or potentially affected by the NAPLINE along its route from Prudhoe Bay to the Canadian Border is presented in Appendix II. For each of these streams, sources of available spring fisheries data and the current status of this information are indicated.

Data gathered during the spring field survey are presented on a stream-by-stream basis ("Stream Catalogue"). In addition, assessments of spring use by fish are summarized for each stream in Table 2.

STUDY AREA

The study area addressed in this report extends along the NAPLINE route from Prudhoe Bay south to Fairbanks and then east to the Alaska/Yukon border (Figs. 1-3). For descriptive purposes, the route has been separated into two distinct regions: the northern segment and the southern segment.

The northern segment is aligned closely with the Trans-Alaska Pipeline System (TAPS) oil line and workpad and extends from Prudhoe Bay to Delta Junction. Between Prudhoe Bay and Atigun Pass, a distance of approximately 276 km, the proposed route crosses the arctic coastal plain, traverses the northern foothills of the Brooks Range and crests Atigun Pass--the highest point in the Alaska routing. Within this area, the NAPLINE alignment parallels most of the Sagavanirktok River and crosses numerous side channels. Larger streams like the Sagavanirktok characteristically are fast-flowing, clear and have wide, extensively braided, gravel floodplains. They support resident and anadromous fish at different times of year and are often used for overwintering. Smaller streams along this section are usually narrow, single-channel drainages with stained water and support fewer species of fish than larger streams. These drainages usually freeze to the bottom in winter. Primary vegetal types include willow penny birch and other dwarf tundra type plant cover.

South of Atigun Pass, the route continues through the Brooks Range where it crosses the Dietrich and Upper Koyukuk drainages. Most streams within the first 130 km south of Atigun Pass are wide, braided and fast-flowing throughout the summer. Floodplains are gravel and usually without meanders. Vegetative cover in this region changes from white spruce, lichens and dwarf willows in mountainous areas, to black spruce and birch, intermixed with tundra and muskeg in lower elevations.

Table 2. Results of spring survey (12 May-30 June) of selected streams in the vicinity of the NAPLINE route. Abbreviations used are: ? (suspected spawning), GR (grayling), NP (northern pike), DV (Dolly Varden), HW (humpback whitefish), RW (round whitefish), BB (burbot), LS (longnose sucker), LC (lake chub), CN (slimy sculpin), NPSI (Northwest Pipeline Stream Identification Number).

Waterbody	NPSI	Spring Migration or Movement	Spring Spawning (Species)	Feeding and Rearing (Species)	No Fish Captured but Good* Habitat Present	No Fish Captured and Habitat Marginal or Absent	Potential Barriers to Fish Movement	Text Page
Unnamed Creek	6-227.03					X		18
Unnamed Creek	6-227.02	X	NP?	HW,LS				20
Unnamed Pond	6-227.01			BB				22
Scottie Creek	6-227	X		BB				24
Desper Creek	6-226				X			26
Unnamed Creek	6-225.01					X	X	28
Sweetwater Creek	6-225					X		30
Unnamed Creek	6-224					X	X	32
Unnamed Creek	6-223					X	X	34
Unnamed Creek	6-222					X	X	36
Gardiner Creek	6-219	X	GR	GR,LS,CN				38
Tenmile Creek	6-218				X			40
Silver Creek	6-217				X			42
Unnamed Creek	6-216.01					X	X	44
Unnamed Creek	6-216					X	X	46
Beaver Creek	6-215	X	GR?	GR,LS,RW				48
Unnamed Creek	6-214.01					X	X	50
Bitters Creek	6-212	X	GR?,CN?	GR,LS,RW,CN			X	52
Tanana River	6-207A,B,&C							54
Tanana River	6-208	X		BB,NP,LS,HW,RW,CN,LC				54
Tok River	6-205	X	GR	GR,BB,LS,RW,CN,WF				57
Crystal Springs	6-203.03	X	GR?	GR,LS,CN				60
Unnamed Creek	6-203.02					X	X	62
Unnamed Creek	6-203					X		64
Yerrick Creek	6-201	X	GR?	GR,DV				66
Unnamed Creek	6-200				X			68
Unnamed Creek	6-193.01	X	NP?	NP,RW,LC			X	70
Unnamed Creek	6-192.01					X	X	73
Sheep Creek	6-191					X		75
Unnamed Creek	5-190					X	X	77
Robertson River	5-187	X		GR,WF				79
Unnamed Creek	5-185.03					X	X	82
Unnamed Creek	5-185.02					X		84
Unnamed Creek	5-185.01					X		86
Bear Creek	5-185	X	GR?	GR,LS,CN				88
Chief Creek	5-184				X			90
Unnamed Creek	5-183					X	X	92
Unnamed Creek	5-182					X	X	94
Unnamed Creek	5-181				X		X	96
Sam Creek	5-180					X	X	98
Unnamed Creek	5-179	X		GR,CN			X	100
Berry Creek	5-178	X	GR,LS?	GR,RW,LS,CN				102

Table 2 (cont'd).

Waterbody	NPSI	Spring Migration or Movement	Spring Spawning (Species)	Feeding and Rearing (Species)	No Fish Captured but Good* Habitat Present	No Fish Captured and Habitat Marginal* or Absent	Potential Barriers to Fish Movement	Text Page
Sears Creek	5-177	X		GR,LS			X	104
Unnamed Creek	5-176.01					X		106
Dry Creek	5-176					X		108
Johnson River	5-175				X			110
Little Gerstle River	5-174	X	GR	GR,RW,CN,LS				112
Gerstle River	5-172					X		114
Sawmill Creek	5-171					X		116
Rhoads Creek	5-170					X		118
Granite Creek	5-169					X		120
Delta Junction								
South Fork Minton Creek #4	5-161					X	X	122
South Fork Minton Creek #7	5-161	X		GR				124
North Fork Minton Creek #1	5-161					X	X	126
North Fork Minton Creek #2	5-161					X	X	128
Gold Run Creek	5-160					X	X	130
Small Creek	5-159.02					X	X	132
Tributary to Small Creek	5-159.01					X		134
Redmond Creek	5-159	X	GR	GR				136
Unnamed Tributary to Salcha River	5-158.03					X		138
TAPS Slough	4-158.02					X	X	140
Oxbow Slough	4-157.02					X	X	142
Two-Nineteen Creek	4-157.01					X		144
Tributary to Little Salcha River	4-156.05					X	X	146
Tributary to Million Dollar Creek	4-156.04					X		148
Bear Lake Outlet	4-148.01					X	X	150
Moose Creek #1	4-148	X		LS				152
Moose Creek #2	4-147	X		GR,HW,RW				154
Moose Creek #3	4-146	X		GR,LS				156
Unnamed Creek	4-145.04					X		158
Unnamed Creek	4-145.03					X		160
Seventeen-Twenty Slough	4-145.01					X	X	162
Seventeen-Thirty Slough	4-145					X	X	164
Isolated Slough	4-144.01					X	X	166
Steele Creek	4-143				X			168
Engineer Creek	4-142					X	X	170
Goldstream Creek	4-141				X			172
Treasure Creek	4-140					X	X	174
Shocker Creek	4-138	X	GR	GR				176
Unnamed Tributary to Shocker Creek #1	4-137.06					X		178
Unnamed Tributary to Shocker Creek #2	4-137.05					X		180
Unnamed Tributary to Shocker Creek #3	4-137.04					X		182
Washington Creek	4-137	X	GR?	GR				184
South Fork Aggie Creek	4-136					X	X	186
North Fork Aggie Creek	4-135					X	X	188

*Refer to p. 14.

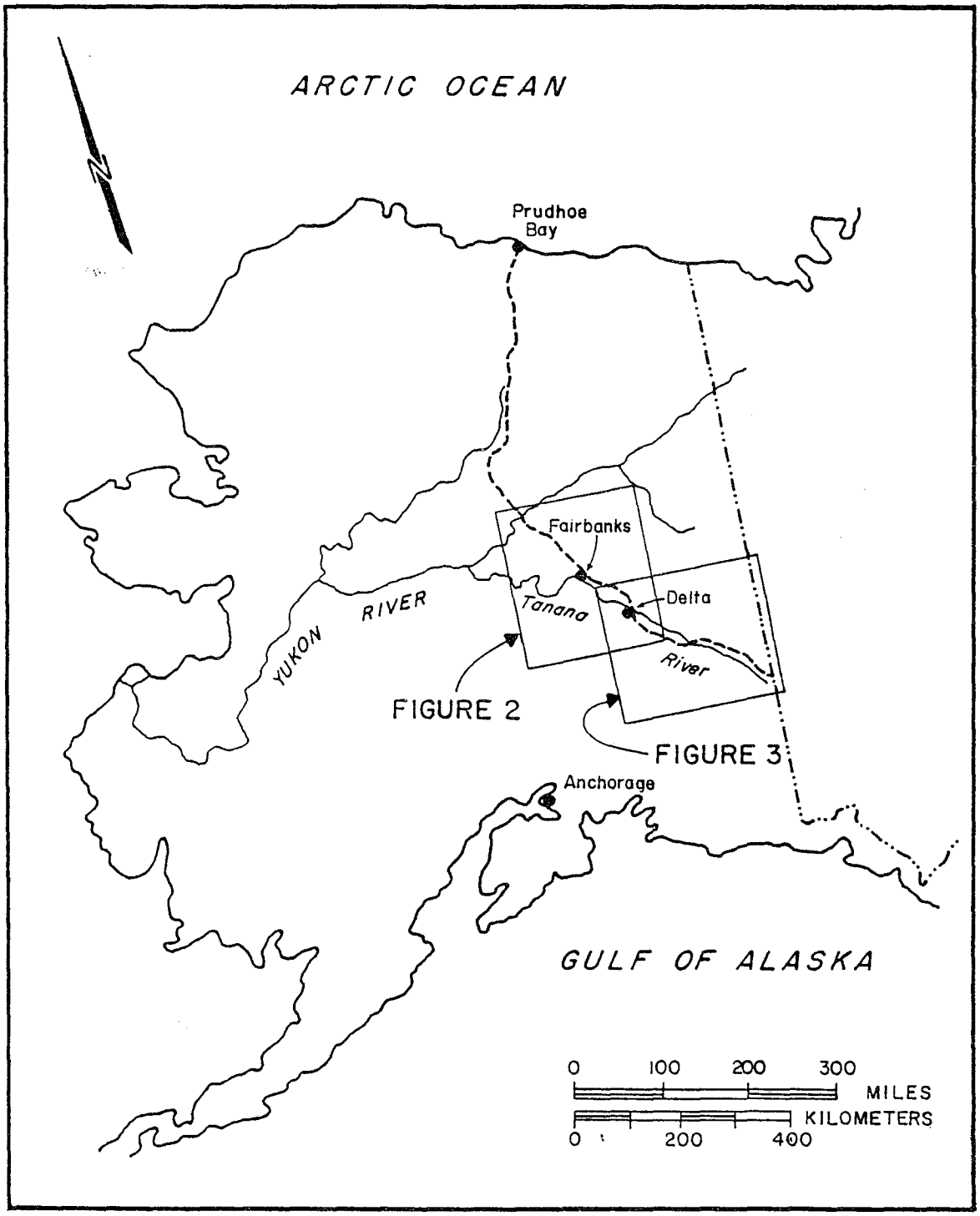

Fig. 1. Route of the proposed NAPLINE from Prudhoe Bay to the Alaska/Yukon border.

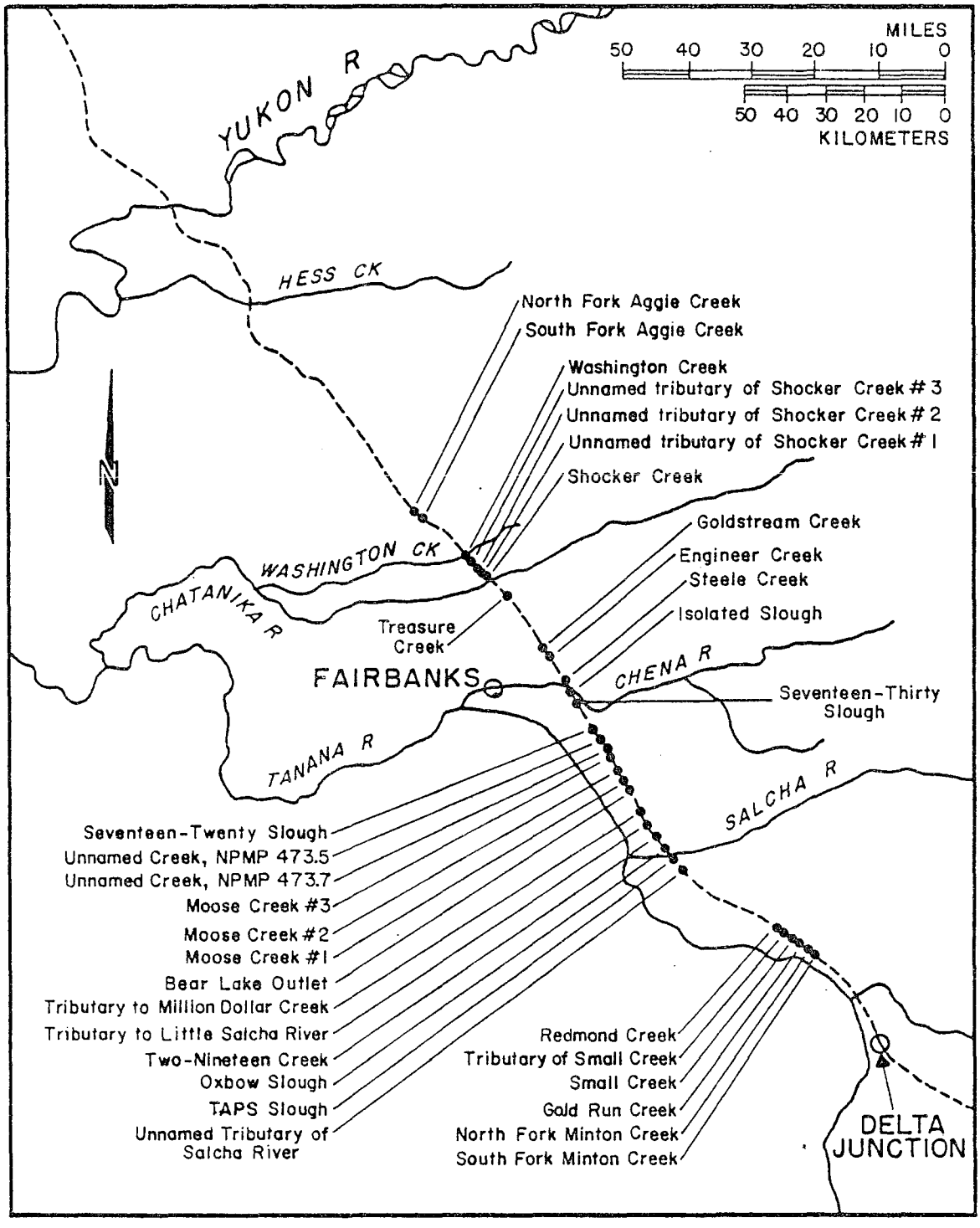

Fig. 2. NAPLINE route and sample sites from the Yukon River to Delta Junction.

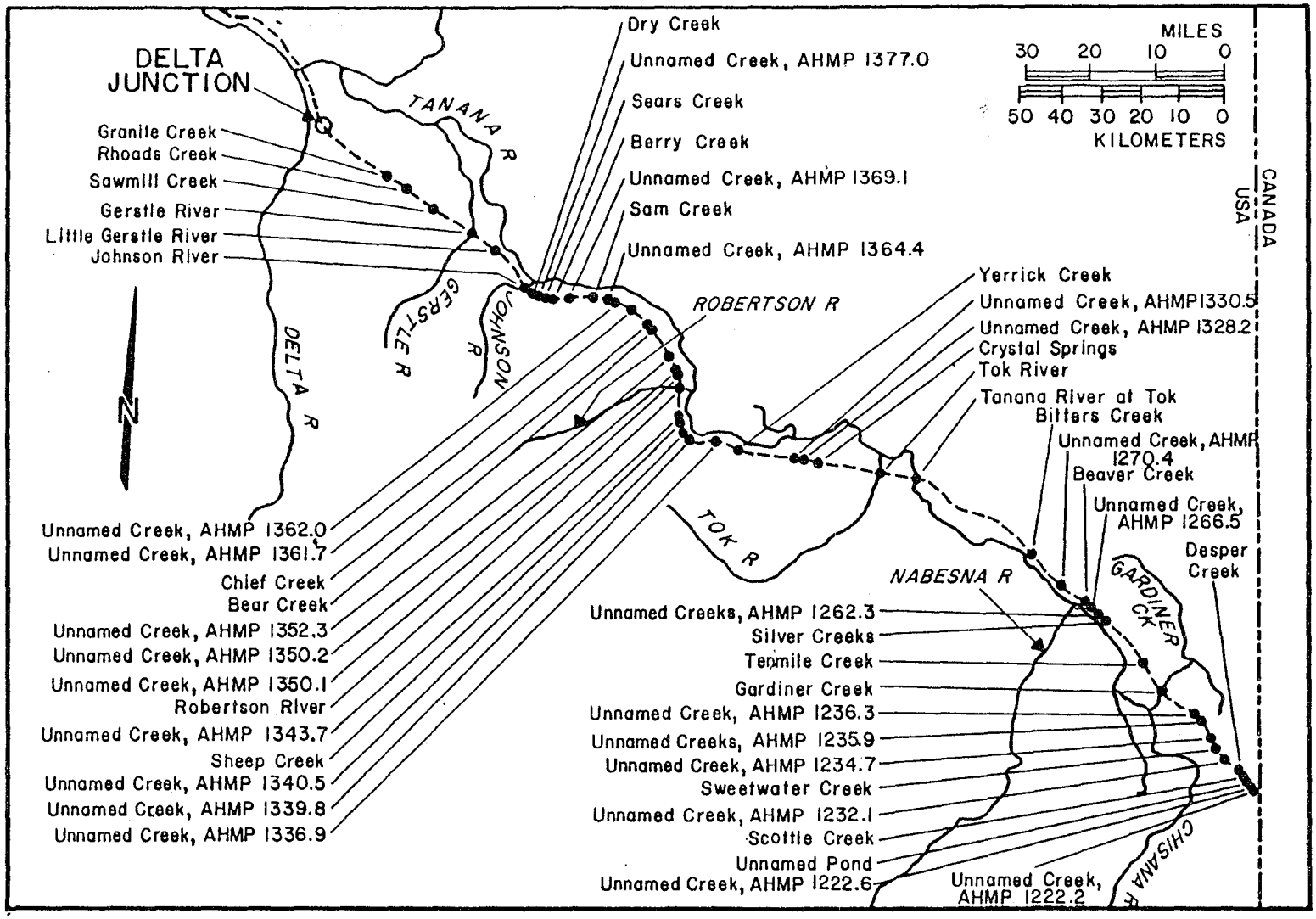

Fig. 3. NAPLINE route and sample sites from Delta Junction to the Alaska/Yukon border.

Approximately 100 km south of Atigun Pass, the NAPLINE route enters the Yukon drainage where most streams exhibit a high degree of meandering. Although some of the larger streams are clear, most are stained brown with tannins and lignins leached from muskeg areas. Many of the larger streams, like the Koyukuk and Jim River, support overwintering fish and provide habitat for fall spawning salmon. Although most small streams do not provide overwintering habitat, they are used by juvenile and young-of-the-year fish during summer. Dwarf spruce and willow are common in tundra areas compared to large spruce and birch in river bottoms.

After crossing the Yukon River, the NAPLINE continues to follow the TAPS oil line through the White Mountains and into the Fairbanks area. Here the northern segment routing turns southeasterly and travels up the Tanana River Valley to Big Delta.

The southern segment of the study area begins near Big Delta where the NAPLINE route diverges from the Trans-Alaska Oil Pipeline. The proposed gas line continues easterly from Big Delta, and parallels the Fairbanks-Haines pipeline to the Yukon border. Throughout most of the 313 km between Delta and the Yukon border, the route is within the broad, flat Tanana River Valley or in the northern foothills of the Alaska Range. This routing passes through alternating tundra or muskeg and mature stands of spruce, birch and willow.

Within the first 100 km east of Big Delta, the NAPLINE crosses four major rivers: Little Gerstle, Gerstle, Johnson and Robertson rivers. These are glacial rivers that are highly turbid and have extensively braided floodplains. Most other drainages crossed in this area are small tundra streams which are used by fish during summer but often freeze solid during winter.

The current alignment leaves the foothills of the northern Alaska Range near Tok, Alaska, and borders the Tetlin Flats. This is a wet muskeg area characterized by an abundance of lakes, ponds and small streams. During ice-free months, many lakes and most small streams are used by waterfowl and fish. During winter, the smaller waterbodies freeze solid and do not provide overwintering habitat. Larger streams on the southern section, like the Tanana and Chisana rivers, become clear in early winter and provide overwintering habitat. From Tetlin Flats, the NAPLINE alignment continues east through the Upper Tanana River drainage basin to the eastern boundary of the study area--the Alaska/Yukon border.

METHODS

Spring field surveys were conducted between 12 May and 30 June 1979, after spring runoff had occurred (see "Sampling Strategy"). An early survey was conducted in the southern section 12-14 May 1979; thereafter, two two-man field crews, assisted by a Fluor representative, surveyed streams generally from south to north along the proposed NAPLINE route. Fisheries surveys between the Alaska/Canadian border and Delta Junction were conducted 15-27 June; surveys between Delta Junction and the Yukon River were conducted 26-30 June 1979.

Existing public transportation routes (primarily the Richardson and Alaska highways) provided access to streams within the southern section. The northern section was surveyed by means of helicopter due to restricted workpad access.

The series of Northwest Pipeline route sheets used throughout this report to identify stream locations is indicated in Reference 42.

Field Samples

Streams were examined in the vicinity of each NAPLINE crossing selected for investigation. Field surveys were generally conducted within 100 m upstream and 100 m downstream of the proposed crossing. The habitats sampled were those most likely to be used by fish (i.e., calm backwater or eddys for juvenile and young-of-the-year fish, deep pools for adult fish and shallow gravel areas for bottom-dwelling fish). Where appropriate, data describing biological, chemical and physical conditions of streams were collected and are presented within this report.

Fish

A variety of techniques were used to sample fish. Within shallow waterbodies, the Smith-Root Type VIII-A backpack electroshocker was generally most effective. In addition, ¼-inch mesh beach seines also proved effective. In larger and deeper streams, monofilament gill nets, with 2.5 and 3.8 cm stretch mesh provided the primary means of sampling. Angling, dipnets, minnow traps, baited setlines and visual observation were also used where appropriate.

Captured fish were measured and then released if possible. Fork lengths were recorded for all species except burbot and slimy sculpin where total lengths were taken.

Physical and Chemical Measurements

Flow was measured with a Gurly Pigmy current meter. The lower detection limit of this meter is approximately 0.005 m/sec when stream flow is measured for a standard period of 60 sec. Stream discharge was calculated based on stream velocity and the cross-sectional area of water. The latter was calculated from measurements of velocity and depth at intervals which varied from 0.25 to approximately 2.5 m, depending on stream size. Depth profiles obtained in this manner were filed with Northwest Alaskan Pipeline Company and Fluor Northwest, Inc.

Dissolved oxygen (Hach Kit Model OX-2P), pH (Hach mini pH meter Model 17200), temperature (Taylor pocket thermometers) and conductivity (YSI Model 33 S-C-T) were measured when free water was present. A wide range color comparator pH kit (Hach Kit Model 17-N) and the YSI Model 33 S-C-T meter were also used to check pH and temperature measurements. Taylor pocket thermometers were calibrated prior to field season and Hach mini pH meters were standardized using known buffer solutions before use at each waterbody surveyed. With the exception of S-C-T meter

By far the largest category of streams now included in the provisional stream lists are those that are known to be used by fish during spring. It is also clear that only relatively minor spring fishery concerns relating to pipeline alignment remain. Nevertheless, insufficient data currently exist to establish the status of an additional 76 waterbodies.

General Results of Spring Field Survey

The spring survey was conducted along the NAPLINE route during early spring (12-14 May 1979) and late spring (15-30 June 1979) periods. The rationale for this sampling schedule is discussed in "Sampling Strategy" section of this report. During the spring surveys, waterbodies (some with multiple crossings) including streams, sloughs, a spring and pond were investigated. In all, 86 crossings were examined.

Nine species of fish were collected in 22 of the waterbodies sampled:

Arctic grayling (*Thymallus arcticus*)
Dolly Varden (*Salvelinus malma*)
northern pike (*Esox lucius*)
humpback whitefish (*Coregonus clupeaformis*)
round whitefish (*Prosopium cylindraceum*)
burbot (*Lota lota*)
longnose sucker (*Catostomus catostomus*)
lake chub (*Couesius plumbeus*)
slimy sculpin (*Cottus cognatus*)

The species caught and their use of streams along the NAPLINE route are summarized in Table 2 and presented in detail in the Stream Catalogue.

The 22 waterbodies found to support fish populations were used for feeding (rearing), migrating and/or spawning by one or more of the above-mentioned species. Streams utilized for spawning were identified by the presence of pre-spawning, ripe, or post-spawning adults and young-of-the-year of spring spawning species. Some streams were suspected of supporting spring spawners but no direct evidence was found. In these cases, indirect evidence (i.e., excellent spawning habitat and other life history stages of the species) warranted mention. During the spring field survey, six grayling spawning streams were identified: Gardiner Creek, Tok River, Berry Creek, Redmond Creek, Little Gerstle River and Shocker Creek. Beaver Creek, Bitters Creek, Crystal Springs, Yerrick Creek, Bear Creek and Washington Creek were considered to be used for grayling spawning, although young-of-the-year fish or post-spawning adults were not caught. Several streams were identified as possible spawning habitat for northern pike (Unnamed Creek 6-227.02 [NPSI] and Unnamed Creek 6-193.01), slimy sculpin (Bitters Creek) and longnose sucker (Berry Creek). The number of spring spawning streams identified will increase after completion of the fall survey due to late fry emergence. In view of this, the list of spring spawning streams will need to be updated.

temperature measurements, the degree of error in measurements was small and within the limits of precision for methods used (Appendix I). At low temperatures, temperature readings varied 2-3 degrees Celsius from the laboratory control.

Channel width, floodplain width, water depth, water color, turbidity, bottom type and distances surveyed were estimated in the field and should be considered approximations of conditions at the time of the observation.

Data Limitations

Although a variety of sampling gear were used to collect fish, it is recognized that each method is, to some degree, selective for sizes of fish. Gillnets do not capture young-of-the-year fish and minnow traps do not catch larger fish. Angling tended to catch only large fish in clear streams. Beach seining was effective in shallow water for juvenile and young-of-the-year fish but generally failed to catch larger fish. Electroshocking was the most effective means of collecting fish in the majority of streams sampled. This method collected bottom-dwelling fish, young-of-the-year fish and juvenile and adult fish. The most obvious limitation of this method was the depth to which the operator could work. Deep streams, which could not be waded and electroshocked, were sampled with gillnets, angling and/or aerial surveys. Despite these sampling variabilities, it was felt that by using the appropriate gear for the habitat sampled, the catch was representative of the fish present.

RESULTS AND DISCUSSION

Provisional List of Waterbodies

In a large-scale project such as pipeline construction, it is essential for reference purposes to maintain an updated list of waterbodies crossed or potentially affected by the pipeline. To date, the provisional list contains 492 entries (Appendix II). References 4, 11, 42, 43 and 48 provided the basis for this list which includes lotic and lentic habitats known to contain fish or having potential for fish utilization. Many waterbodies have multiple NAPLINE crossings--each crossing is treated as a separate entry in the list.

References that contain spring fisheries data are listed for each waterbody and the most recent evaluation of this information, according to the criteria listed in Table 1, is presented. The results indicate that data are insufficient to definitely classify 105 crossings of 76 waterbodies in relation to spring fish utilization. Most of these waterbodies (50) are located north of the Yukon River and many are characterized by having small drainage areas (greater than 50 percent have drainage basins of less than 5.0 m^2) and low potential for fish use during spring. However, they include 1) some major and minor drainages for which no data is available, 2) waterbodies previously investigated that are now suspected to support fish, 3) waterbodies with multiple crossings for which site-specific data at each crossing is not available, and 4) components of major river floodplains (Anabranch, side channel, etc.).

Spring migration or dispersal of fish was apparent in 22 streams surveyed. Movements probably varied from minor dispersal of fish from restricted overwintering areas to major upstream spawning migrations. Data regarding the magnitude, timing, and direction of runs are difficult to obtain without extensive monitoring beyond the scope of this program.

Thirty-four streams were found to have potential barriers to spring fish movement in the NAPLINE area. Barriers, both natural (log jams, beaver dams, waterfalls and dry areas) and artificial (highway culverts and improperly constructed low water crossings) varied greatly in permanency and effectiveness. Detailed decriptions of fish barriers are found in the appropriate stream assessments.

No fish were captured in 59 of the waterbodies surveyed during spring. Using the following guidelines, habitat was considered to be good in 9 waterbodies but marginal or absent in 50:

> Good fish habitat--generally had an adequate water depth (15-20 cm minimum), measurable flow (at least 0.1-0.3 m^3/sec or 0.5-1 fps), and high dissolved oxygen concentration (5 mg/ℓ minimum). These sites were typically characterized by a pH which ranged from 6.5-8.5, adequate cover and no major barriers to fish movement.
>
> Marginal fish habitat--generally had water depths less than 15-20 cm with negligible or intermittent flow. Potential barriers to fish movements were common at these sites.

Patterns of Fish Movements and Stream Usage

After breakup has occurred, fish are normally found in three general types of streams along the NAPLINE route: (1) small beaded tundra streams, (2) large-size creeks, and (3) large rivers. The small beaded tundra stream (e.g., Shocker Creek and S.F. Minton Creek) is usually frozen solid during winter and breaks up between late March and early June. These streams vary from 0.5-1.5 m in width and seldom exceed 1 m in depth. Substrates are variable but contain gravel, sand, silt and detritus. Although the water is usually clear, it is frequently stained from tannins and lignins leached from surrounding vegetation. Stream banks are often 0.5-1.5 m in height, undercut and vegetated with dwarf willow and birch.

Within the proposed NAPLINE corridor, small beaded tundra streams like Shocker Creek are used primarily by grayling, but round whitefish and/or char may occasionally be present depending on geographical location of the stream. Adult grayling may move into these streams at spring breakup, spawn and then move some distance back downstream. During the egg incubation period (early May to early July) juvenile grayling, juvenile whitefish and/or juvenile char may also move upstream into these areas. After the grayling eggs have hatched in late June to early July, emergent fry remain in the general vicinity until freeze-up. As fall approaches and water temperature drops, all fish begin moving downstream to overwintering areas.

The large creeks or small rivers (e.g., Prospect Creek, Moose Creek or Beaver Creek) are usually 5-10 m in width, with stained or clear water, and a substrate consisting primarily of gravel and sand. Banks, 0-2 m in height, are seldom incised. These drainages typically exhibit alternating stretches of deep, slow-moving water and shallow, rapid riffles. Some pools, especially in lower reaches, may be deep enough to provide overwintering habitat.

Within the proposed NAPLINE corridor, medium size streams receive more intense use by fish than small beaded tundra streams. Excluding overwintering, these drainages serve as spring migration routes for grayling, and some may be used for spring spawning. Many streams are used intensively as nursery areas throughout the open-water season by juvenile grayling, whitefish, sculpin, pike, chub, char and others. Emergent grayling fry may also be present after late June or early July. Adult fish of several species are commonly present throughout the season. Some of the most northerly medium-sized streams may also support an anadromous fish run during the open water season. As fall approaches, fish generally begin moving downstream to overwintering areas.

Large rivers similar to the Tanana, Yukon, Koyukuk and others vary from 100-1000 m in width and 1-10 m in depth. Floodplains are usually braided and consist of gravel, sand, and silt, depending on river origin. Large rivers usually do not freeze solid and so they provide year-round habitat for fish.

Large rivers are the primary migration pathways for all species of anadromous fish. During spring, many juvenile salmon migrate downstream to enter the ocean; others may remain in freshwater for one or two years, depending on the species. A variety of freshwater fish also use large rivers as migration routes, spawning sites and nursery areas during spring. Virtually all large rivers provide overwintering habitat for fish.

Stream Catalogue

The purpose of the following stream catalogue is to provide a ready access to fisheries data available for waterbodies examined during the spring survey (12 May to 30 June 1979). For each stream entered in this catalogue, the following information is provided:

Waterbody	- Location of waterbody, section surveyed and applicable identification numbers.
Assessment	- A brief description of the waterbody and assessment of its potential for fish in spring.
Fish	- Description and results of fish sampling efforts.

Physical Conditions - Description and results of chemical and physical measurements.

Several reference systems have been used to identify the location of each waterbody along the NAPLINE route:

NPSI - The Northwest Alaskan Pipeline Stream Identification (NPSI) numbering system.

Highway Milepost - Highway milepost numbers indicate the point of intersection between the waterbody and the indicated highway. When these do not intersect, milepost designations refer to the point on the highway which is closest to the sampling location.

Pipeline Milepost - Pipeline mileposts for the Northwest Alaskan Pipeline are indicated on the Fluor 1979 alignments sheet series (Reference 42).

USGS Map - United States Geological Survey maps are the 1:250,000 scale series. Township, range and section number of specific sampling locations are indicated.

Abbreviations used in the catalogue are listed:

Identification

NPSI - Northwest Alaskan Pipeline stream identification number

Milepost

AHMP - Alaska Highway Milepost
NPMP - Northwest Alaskan Pipeline Milepost (Reference 42)

Pipeline

NAPLINE - Northwest Alaskan Pipeline (Reference 42)
TAPS - Trans-Alaskan Pipeline System

Fishing Method

GN - Gillnet
SL - Setline
MT - Minnow Trap
EF - Electrofished
AN - Angler
DN - Dipnet

Units

km	-	Kilometer
m	-	Meter
h	-	Hour

Other

NA	-	Not applicable

Abbreviations have been combined to present a simple and concise means of representing sampling gear and fishing effort expended at a specific sampling location. The number or size and type of sampling gear is given first, followed by effort in parentheses. For example, a 15 m gillnet fished for 20 hours would be presented as follows: 15mGN(20h). Effort in parentheses is always given as a cumulative total; effort for electrofishing refers to the distance of stream fished.

SPRING SURVEY FORM

WATERBODY

Waterbody Unnamed Creek 1222.2

Main Drainage Scottie Creek Tributary to Unnamed Creek 1222.6

Figure 3 Northwest Alignment Sheet 131

Identification Nos: NPSI 6-227.03 NPMP 738.7

Alaska Highway Milepost AHMP 1222.2

USGS Map Reference Nabesna, Ak. T 10N R 23E Sec 25

Site Access On foot from Alaska Highway

Section Surveyed From 30 m upstream to 5 m downstream from Alaska Highway culvert

ASSESSMENT

Unnamed Creek 1222.2 is a small humic-stained stream which originates from a low muskeg area and flows across the Alaska Highway into a shallow lake less than 100 m downstream. The outlet of this lake drains into Scottie Creek. Stream access was limited to short distances on either side of the Alaska Highway due to land ownership complications.

Unnamed Creek 1222.2 provides potential fish habitat only downstream from the Alaska Highway. This stream has little to no potential for fish use at the NAPLINE crossing. Fish were absent from the area above the Alaska Highway. Based on visual observations however, fish appeared to be abundant in the shallow lake into which this small stream drains. The lake is a likely spawning and rearing area for northern pike and a rearing area for humpback whitefish.

Unnamed Creek 1222.2 was electrofished in June 1978 without success and characterized as unlikely fish habitat (Ref. 2).

FISH

Date 16 June 1979

Fish Present: None

Gear/Effort: EF (30 m)

Species Present:	Quantity		Size Range (mm)	
	Fry	Other	Fry	Other
None				

PHYSICAL CONDITION

Date	16 June 1979
Channel Width (m)	0.3-1.0
Floodplain Width (m)	NA
Water Depth (cm)	5-30
Discharge (m^3/s)	<0.06 (Est)
D.O. (mg/ℓ)	No measurement
Temperature (°C)	No measurement
Conductivity (µmhos/cm)	No measurement
pH	No measurement
Color	Humic-stained
Turbidity	Clear
Bottom Type	Gravel/cobble
Fish Block(s)	None

SPRING SURVEY FORM

WATERBODY

Waterbody Unnamed Creek 1222.6

Main Drainage Chisana River Tributary to Scottie Creek

Figure 3 Northwest Alignment Sheet 131

Identification Nos: NPSI 6-227.02 NPMP 738.3

Alaska Highway Milepost AHMP 1222.6

USGS Map Reference Nabesna, Ak. T 10N R 23E Sec 24

Site Access On foot from Alaska Highway

Section Surveyed 400 m of stream meander nearest the NAPLINE

ASSESSMENT

Unnamed Creek 1222.6 is a slow-flowing, humic-stained stream which meanders through a large marshland area before emptying into Scottie Creek. *Carex* is abundant along its low banks and throughout the marsh area. Willows lined the outer margins of the floodplain. This stream is not crossed by the proposed NAPLINE but flows within 50 m of current alignment and therefore has potential for impact by construction and/or operation of the NAPLINE.

Unnamed Creek 1222.6 is a rearing area for humpback whitefish and longnose sucker. Although only three humpback whitefish were captured, many were seen, sometimes in extremely shallow water with their backs exposed. Humpback whitefish were abundant in several habitats: shallow ponds connected to the stream, shallow inundated shelf areas along its banks and in the stream proper. This stream and associated wetlands appear to be excellent northern pike spawning habitat, although none were captured.

FISH

Date 16 June 1979

Fish Present: Yes

Gear/Effort: 2AN(0.5h)
EF(30m)
3mGN(0.25h); fish driven into gillnet

Species Present:	Quantity		Size Range (mm)	
	Fry	Other	Fry	Other
Humpback whitefish		3		358-403
Longnose sucker		1		367

PHYSICAL CONDITION

Date	16 June 1979
Channel Width (m)	2.5-3.0
Floodplain Width (m)	50
Water Depth (cm)	55-73
Discharge (m^3/s)	0.5
D.O. (mg/ℓ)	10
Temperature (°C)	13.0
Conductivity (μmhos/cm)	140
pH	7.4
Color	Humic-stained
Turbidity	Clear
Bottom Type	Mud
Fish Block(s)	None

SPRING SURVEY FORM

WATERBODY

Waterbody Unnamed Pond 1223.4

Main Drainage Chisana River Tributary to Scottie Creek

Figure 3 Northwest Alignment Sheet 131

Identification Nos: NPSI 6-227.01 NPMP 737.5

Alaska Highway Milepost AHMP 1223.4

USGS Map Reference Nabesna, Ak. T 10N R 23E Sec 24

Site Access On foot from Alaska Highway

Section Surveyed Perimeter of pond

ASSESSMENT

Unnamed Pond 1223.4 is a shallow (1.5 m) humic-stained pond with a surface area of approximately 150 m^2. It is bisected by the Haines pipeline and lies adjacent to the Alaska Highway. The pond is situated approximately 30 m south of Scottie Creek, separated only by that stream's high banks. This pond is inundated by Scottie Creek during periods of very high runoff but is otherwise isolated. The water level of Scottie Creek was several meters lower than the water level of the pond during present investigations.

Aquatic vegetation included *Carex* and *Potamogetan* species. Invertebrates were very abundant. Mayfly, dragonfly and beetle larvae and large zooplankton were noted.

Unnamed Pond 1223.4 was a rearing area for young-of-the-year burbot during present spring investigations. The burbot fry undoubtedly entered this pond from Scottie Creek during spring high water levels and became trapped when waters receded. Unless high water levels are repeated prior to freeze-up, the burbot fry will perish. Unnamed Pond 1223.4 has little to no overwintering potential and is a potential trap for other species as well.

This pond was electrofished without success during June 1978 (Ref. 2).

FISH

Date 16 June 1979

Fish Present: Yes

Gear/Effort: EF(15m)

Species Present:	Quantity		Size Range (mm)	
	Fry	Other	Fry	Other
Burbot	3		24-26	

PHYSICAL CONDITION

Date	16 June 1979
Channel Width (m)	NA
Floodplain Width (m)	NA
Water Depth (cm)	150 (Ref. 2)
Discharge (m^3/s)	NA
D.O. (mg/ℓ)	6
Temperature (°C)	16.0
Conductivity (μmhos/cm)	170
pH	6.8
Color	Humic-stained
Turbidity	Clear
Bottom Type	Mud
Fish Block(s)	NA

SPRING SURVEY FORM

WATERBODY

Waterbody Scottie Creek

Main Drainage Tanana River Tributary to Chisana River

Figure 3 Northwest Alignment Sheet 131

Identification Nos: NPSI 6-227 NPMP 737.5

Alaska Highway Milepost AHMP 1223.4

USGS Map Reference Nabesna, Ak. T 10N R 23E Sec 24

Site Access On foot from Alaska Highway, inflatable raft

Section Surveyed From 0.8 km upstream to 0.8 km downstream from NAPLINE

ASSESSMENT

Scottie Creek is a deep, slow-meandering stream 15-20 m wide. Its earthen banks are steep, grassy and lined with willow, alder and spruce. The channel is relatively uniform in size above and below the NAPLINE with sunken logs and abundant debris. Little aquatic vegetation was noted; mayfly nymphs were numerous along its banks.

Scottie Creek was a rearing area for burbot during present spring investigations. Burbot fry trapped in Unnamed Pond 1223.4 indicate that burbot spawning probably occurs in the immediate vicinity of the NAPLINE sometime between February and April. A single burbot was the only fish captured in Scottie Creek despite considerable effort. Although few fish appeared to be utilizing this stream during present investigations, Scottie Creek should be considered an important avenue of migration in early spring. Humpback whitefish were abundant and longnose suckers were present in Unnamed Creek 1222.6, a nearby tributary of Scottie Creek; northern pike are also reported to be present (Refs. 5, 6 & 7). Local residents reported large runs of grayling and humpback whitefish in Scottie Creek during spring and fall (Ref. 6; pers. comm.). The presence of excellent spawning habitat in upstream wetlands suggests an upstream migration trend in early spring for all of the aforementioned species.

FISH

Date 15-16 June 1979

Fish Present: Yes

Gear/Effort: 2AN(0.5h)
EF(160m); shoreline only
15mGN(20h)
2SL(24h)

Species Present:	Quantity Fry	Quantity Other	Size Range (mm) Fry	Size Range (mm) Other
Burbot		1		481

PHYSICAL CONDITION

Date	15 June 1979
Channel Width (m)	12-24
Floodplain Width (m)	12-24
Water Depth (cm)	150-400
Discharge (m^3/s)	12.6
D.O. (mg/ℓ)	9
Temperature (°C)	11.0
Conductivity (µmhos/cm)	70
pH	6.8
Color	Humic-stained
Turbidity	Slightly turbid
Bottom Type	Mud
Fish Block(s)	None

SPRING SURVEY FORM

WATERBODY

Waterbody Desper Creek

Main Drainage Chisana River Tributary to Scottie Creek

Figure 3 Northwest Alignment Sheet 130

Identification Nos: NPSI 6-226 NPMP 735.6

Alaska Highway Milepost AHMP 1225.6

USGS Map Reference Nabesna, Ak. T 10N R 23E Sec 11

Site Access On foot from Alaska Highway

Section Surveyed From Alaska Highway downstream 200 m; restricted access to upstream areas

ASSESSMENT

Desper Creek is a moderately deep (1.0 m) slow-flowing stream with a channel width of 5-7 m. Its humic-stained waters flow from Island Lake and into Scottie Creek approximately 2.5 km below the Alaska Highway. Snags and debris are abundant in the channel as well as aquatic vegetation including *Carex* and *Potamogetan* species.

Desper Creek appears to be excellent fish habitat. It probably serves as a migration route for grayling and whitefish during spring and fall and as a rearing area for northern pike during the open-water period. Local residents have reported that northern pike, grayling and whitefish are present in Desper Creek (Refs. 5, 6, 7, 10 & 26) but no specific biological data are available, and visual observations and/or sampling efforts have failed to identify fish use of this stream (Refs. 6, 9 & 54).

FISH

Date 17 June 1979

Fish Present: None

Gear/Effort: EF(60m)

Species Present:	Quantity		Size Range (mm)	
	Fry	Other	Fry	Other
None				

PHYSICAL CONDITION

Date	17 June 1979
Channel Width (m)	5-7
Floodplain Width (m)	7-12
Water Depth (cm)	45-90
Discharge (m^3/s)	0.2
D.O. (mg/ℓ)	10
Temperature (°C)	13.0
Conductivity (µmhos/cm)	90
pH	7.0
Color	Humic-stained
Turbidity	Clear
Bottom Type	Mud
Fish Block(s)	None

SPRING SURVEY FORM

WATERBODY

Waterbody Unnamed Creek 1232.1

Main Drainage Desper Creek Tributary to Island Lake

Figure 3 Northwest Alignment Sheet 129

Identification Nos: NPSI 6-225.01 NPMP 730.6

Alaska Highway Milepost AHMP 1232.1

USGS Map Reference Nabesna, Ak. T 11N R 23E Sec 29

Site Access On foot from Alaska Highway

Section Surveyed NAPLINE crossing

ASSESSMENT

In the vicinity of the NAPLINE crossing, this small stream seeps through muskeg vegetation or follows poorly-defined channels between tussocks. On the NAPLINE/Haines Products Pipeline corridor, water had accumulated in several pools with a maximum depth of 60 cm and a total surface area of 60 m^2. One and one-half km upstream from the NAPLINE, this stream is crossed by the Alaska Highway. At this point, it flows rapidly down a steep gradient making fish use unlikely.

Fish use in the NAPLINE area is unlikely although some pools may offer suitable habitat. No fish were seen or captured during present investigations--it is doubtful that fish are able to penetrate the 1.5 km of muskeg necessary to reach the NAPLINE crossing from Island Lake.

FISH

Date 17 June 1979

Fish Present: None

Gear/Effort: EF(60m); several pools and drainage ponds at NAPLINE

Species Present:	Quantity		Size Range (mm)	
	Fry	Other	Fry	Other
None				

PHYSICAL CONDITION

Date	17 June 1979
Channel Width (m)	<0.3
Floodplain Width (m)	NA
Water Depth (cm)	0-60
Discharge (m^3/s)	0.03 (Est)
D.O. (mg/ℓ)	8
Temperature (°C)	7.0
Conductivity (μmhos/cm)	50
pH	6.9
Color	Slightly humic-stained
Turbidity	Clear
Bottom Type	Mud
Fish Block(s)	Channel not well defined at NAPLINE, drains muskeg area which may impede fish movement during low water years.

SPRING SURVEY FORM

WATERBODY

Waterbody Sweetwater Creek

Main Drainage Tanana River Tributary to Chisana River

Figure 3 Northwest Alignment Sheet 129

Identification Nos: NPSI 6-225 NPMP 728.4

Alaska Highway Milepost AHMP 1234.2

USGS Map Reference Nabesna, Ak. T 11N R 22E Sec 13

Site Access On foot from Alaska Highway

Section Surveyed From NAPLINE downstream to 15 m below Alaska Highway crossing

ASSESSMENT

Sweetwater Creek is a small muskeg drainage which is crossed near its headwaters by the proposed NAPLINE. The slightly humic-stained water flows through muskeg vegetation, tussocks, and willow in an often poorly defined channel. Stream width averages less than 25 cm and the substrate varies from mud and detritus to some gravel below the Highway. A number of small pools exist between the Alaska Highway and the NAPLINE crossing.

Fish utilization in the NAPLINE area during spring appears to be low to non-existent. No fish were seen or captured in Sweetwater Creek during present investigations and previous surveys have confirmed the absence of fish in the vicinity of the NAPLINE (Ref. 2 & 9).

FISH

Date 17 June 1979

Fish Present: None

Gear/Effort: EF(30m)

Species Present:	Quantity		Size Range (mm)	
	Fry	Other	Fry	Other
None				

PHYSICAL CONDITION

Date	17 June 1979
Channel Width (m)	<0.03
Floodplain Width (m)	NA
Water Depth (cm)	15-60
Discharge (m^3/s)	<0.01
D.O. (mg/ℓ)	7
Temperature (°C)	9.0
Conductivity (μmhos/cm)	25
pH	6.2
Color	Slightly humic-stained
Turbidity	Clear
Bottom Type	Mud/detritus; some gravel below Alaska Highway
Fish Block(s)	None

SPRING SURVEY FORM

WATERBODY

Waterbody Unnamed Creek 1234.7

Main Drainage Chisana River Tributary to Sweetwater Creek

Figure 3 Northwest Alignment Sheet 129

Identification Nos: NPSI 6-224 NPMP 728.0

Alaska Highway Milepost AHMP 1234.7

USGS Map Reference Nabesna, Ak. T 11N R 22E Sec 12

Site Access On foot from Alaska Highway

Section Surveyed From 15 m upstream to 30 m downstream from NAPLINE crossing

ASSESSMENT

Unnamed Creek 1234.7 is a small, slightly stained stream which drains a low-lying muskeg area through a poorly defined channel. This drainage forms a small pond approximately 400 m^2 in surface area just before crossing the Alaska Highway. The poorly defined channel and pond margins contain primarily *Carex* and *Equisetum* species. Stream and pond bottoms are composed of mud and detritus.

Unnamed Creek 1234.7 provides marginal fish habitat during spring. No fish were seen or captured during present investigations or during other fish surveys in June 1978 (Ref. 2). Due to low flow, only very small fish could pass upstream through the Alaska Highway culvert. Any further drop in water level would make this drainage structure impassible.

FISH

Date 17 June 1979

Fish Present: None

Gear/Effort: EF(45m)

Species Present:	Quantity		Size Range (mm)	
	Fry	Other	Fry	Other
None				

PHYSICAL CONDITION

Date	17 June 1979
Channel Width (m)	<0.3
Floodplain Width (m)	NA
Water Depth (cm)	60-150
Discharge (m^3/s)	Negligible
D.O. (mg/ℓ)	8
Temperature (°C)	16.0
Conductivity (μmhos/cm)	60
pH	6.8
Color	Humic-stained
Turbidity	Clear
Bottom Type	Mud/detritus
Fish Block(s)	Low water levels in highway culvert might impede movement of large fish

SPRING SURVEY FORM

WATERBODY

Waterbody Unnamed Creek 1235.9

Main Drainage Chisana River Tributary to Sweetwater Creek

Figure 3 Northwest Alignment Sheet 129

Identification Nos: NPSI 6-223 NPMP 726.8

Alaska Highway Milepost AHMP 1235.9

USGS Map Reference Nabesna, Ak. T 11N R 22E Sec 2

Site Access On foot from Alaska Highway

Section Surveyed From 10 m upstream to 10 m downstream from NAPLINE; visual observation at Alaska Highway crossing

ASSESSMENT

Unnamed Creek 1235.9 crosses the Alaska Highway and flows southwest to Sweetwater Creek through a low muskeg and tussock area. Its narrow, poorly defined channel is bordered by willow and dwarf birch. This shallow, slightly stained stream has a mud and detritus bottom with very little aquatic vegetation. In the vicinity of the NAPLINE, the creek flows through a series of small ponds, probably the product of thermal erosion resulting from previous construction activities. These ponds provide the only significant accumulations of water on this section of the stream.

Another very small drainage approximately 80 m north of Unnamed Creek 1235.9 was also noted during the present survey. Only minor seepage was observed at the NAPLINE crossing. Apparently, this is the second crossing of Unnamed Creek 1235.9 mentioned by Ref. 2. Fish use of this drainage during spring is unlikely.

Present investigations of Unnamed Creek 1235.9 in the NAPLINE area did not verify the presence of fish, although water quality was good. This area was assessed to be poor fish habitat based on small drainage size, low stream discharge and a poorly defined channel in most areas which may act as an effective block to upstream fish migration.

FISH

Date 17 June 1979

Fish Present: None

Gear/Effort: EF(5m); electrofished ponded water at NAPLINE only

Species Present:	Quantity		Size Range (mm)	
	Fry	Other	Fry	Other
None				

PHYSICAL CONDITION

Date	17 June 1979
Channel Width (m)	<0.3
Floodplain Width (m)	NA
Water Depth (cm)	10-20
Discharge (m^3/s)	<0.01
D.O. (mg/ℓ)	9
Temperature (°C)	7.0
Conductivity (µmhos/cm)	120
pH	7.0
Color	Slightly humic-stained
Turbidity	Clear
Bottom Type	Mud/detritus
Fish Block(s)	Stream flows through muskeg which may be barrier to fish movement during low water years.

SPRING SURVEY FORM

WATERBODY

Waterbody Unnamed Creek 1236.3

Main Drainage Chisana River Tributary to Sweetwater Creek

Figure 3 Northwest Alignment Sheet 129

Identification Nos: NPSI 6-222 NPMP 726.5

Alaska Highway Milepost AHMP 1236.3

USGS Map Reference Nabesna, Ak. T 11N R 22E Sec 2

Site Access On foot from the Alaska Highway

Section Surveyed NAPLINE crossing

ASSESSMENT

Unnamed Creek 1236.3 is a shallow, slightly humic-stained stream that flows southwest into Sweetwater Creek through a poorly defined channel. The substrate of this stream consists primarily of mud and detritus. Dwarf birch and willow border the outer margin of the low-lying areas while white spruce and aspen are predominant on adjoining hillsides. Aquatic vegetation consists primarily of *Carex* species. Thermal erosion has created a small ponded area approximately 0.6 m deep and 90 m^2 in surface area at the NAPLINE.

No fish were seen or captured in Unnamed Creek 1236.3 during present investigations. Fish utilization during spring was considered low to nonexistent due to low measured discharge, small size of the drainage, relatively low dissolved oxygen and the often poorly defined channel which may serve to hamper fish movement. Other investigations considered Unnamed Creek 1236.3 to provide fair fish habitat but electrofished without result in June 1978 (Ref. 2).

FISH

Date 17 June 1979

Fish Present: None

Gear/Effort: EF(10m); ponded water at NAPLINE

Species Present:	Quantity		Size Range (mm)	
	Fry	Other	Fry	Other
None				

PHYSICAL CONDITION

Date	17 June 1979
Channel Width (m)	<0.3
Floodplain Width (m)	NA
Water Depth (cm)	20-40
Discharge (m^3/s)	<0.03 (Est)
D.O. (mg/ℓ)	6
Temperature (°C)	12.0
Conductivity (μmhos/cm)	90
pH	7.1
Color	Humic-stained
Turbidity	Clear
Bottom Type	Mud/detritus
Fish Block(s)	Terrain may act as fish block

SPRING SURVEY FORM

WATERBODY

Waterbody Gardiner Creek

Main Drainage Tanana River Tributary to Chisana River

Figure 3 Northwest Alignment Sheet 127

Identification Nos: NPSI 6-219 NPMP 716.8

Alaska Highway Milepost AHMP 1246.7

USGS Map Reference Nabesna, Ak. T 12N R 21E Sec 3

Site Access On foot from Alaska Highway

Section Surveyed From 600 m upstream to 400 m downstream from NAPLINE crossing

ASSESSMENT

Gardiner Creek is a deep (1-3 m) darkly stained, slow-flowing stream that meanders southwest across the Alaska Highway to the Chisana River through mature stands of spruce, birch and aspen. Steep banks of silt and sand 3 to 6 m high are vegetated primarily with willow and spruce. The channel is approximately 6 to 12 m wide with a mud and detritus substrate. Good cover is provided by sunken logs and long, deep pools help to make this stream excellent fish habitat. The macroinvertebrate fauna of Gardiner Creek includes black flies, stoneflies, mayflies and craneFly larvae (Ref. 5).

Gardiner Creek is an important grayling spawning stream. Grayling adults and young-of-the-year were captured throughout the NAPLINE area during present investigations. The stream is also a rearing area for juvenile longnose sucker and slimy sculpin. Other species reported to be present include northern pike, round and humpback whitefish (Ref. 6). Major upstream migrations by these species undoubtedly occur in spring.

Gardiner Creek is a high public use area. A state campground and excellent sport angling opportunities attract tourists and local residents to the stream. Numerous anglers were observed on this stream as well as evidence of their success (fish remains) during present investigations.

FISH

Date 18 June 1979

Fish Present: Yes

Gear/Effort: 2AN(1Dh)
EF(40m)

Species Present:	Quantity Fry	Quantity Other	Size Range (mm) Fry	Size Range (mm) Other
Longnose sucker		6		56-85
Grayling	21	7	19-21	250-312
Slimy sculpin		4		49-55

PHYSICAL CONDITION

Date	18 June 1979
Channel Width (m)	6-12
Floodplain Width (m)	12
Water Depth (cm)	100-300
Discharge (m^3/s)	1.5
D.O. (mg/ℓ)	8
Temperature (°C)	12.0
Conductivity (μmhos/cm)	50
pH	6.9
Color	Dark humic-stain
Turbidity	Clear
Bottom Type	Mud/detritus; sunken logs
Fish Block(s)	None

SPRING SURVEY FORM

WATERBODY

Waterbody Tenmile Creek

Main Drainage Tanana River Tributary to Chisana River

Figure 3 Northwest Alignment Sheet 126

Identification Nos: NPSI 6-218 NPMP 710.7

Alaska Highway Milepost AHMP 1252.8

USGS Map Reference Nabesna, Ak. T 13N R 20E Sec 11

Site Access *On foot from Alaska Highway*

Section Surveyed From 50 m upstream from Alaska Highway to 40 m downstream from NAPLINE crossing (approximately 300 m)

ASSESSMENT

Tenmile Creek is a small, humic-stained stream that flows southwest through a 0.5 to 4.0 m wide channel choked with *Equisetum*, *Carex* and other emergent vegetation. This stream is a tributary to the Chisana River and supports a number of macroinvertebrates including baetid mayflies, veliids and amphipods (Ref. 6). The gradually sloping vegetated banks of this mud channel are bordered by spruce and dense willow.

Tenmile Creek appeared to be good fish habitat, but no fish were seen or captured during present investigations. Previous investigators have suggested that Tenmile Creek may serve as a spawning area and migration pathway for northern pike (Ref. 6).

FISH

Date 18 June 1979

Fish Present: None

Gear/Effort: EF(80m)
8mGN(16h)

Species Present:	Quantity		Size Range (mm)	
	Fry	Other	Fry	Other
None				

PHYSICAL CONDITION

Date	18 June 1979
Channel Width (m)	0.5-4.0
Floodplain Width (m)	NA
Water Depth (cm)	20-60
Discharge (m^3/s)	0.04
D.O. (mg/ℓ)	9
Temperature (°C)	16.0
Conductivity (μmhos/cm)	70
pH	7.1
Color	Slightly humic-stained
Turbidity	Clear
Bottom Type	Mud
Fish Block(s)	None

SPRING SURVEY FORM

WATERBODY

Waterbody Silver Creek

Main Drainage Tanana River Tributary to Chisana River

Figure 3 Northwest Alignment Sheet 125

Identification Nos: NPSI 6-217 NPMP 704.8

Alaska Highway Milepost AHMP1258.7

USGS Map Reference Nabesna, Ak. T 14N R 20E Sec 17 & 20

Site Access On foot from the Alaska Highway

Section Surveyed 20 m upstream and downstream from NAPLINE crossing; Haines Products Pipeline corridor

ASSESSMENT

Silver Creek is a small, humic-stained stream that flows south into Eliza Lake on the Chisana River. The narrow channel of this stream is heavily vegetated with *Equisetum, Scirpus, Carex, Ranunculus,* and *Hippuris* species. The banks along Silver Creek are low to non-existent and bordered by bunch grass, willow, dwarf birch and spruce. This stream is reported to support numerous aquatic invertebrates including baetid and ephemerellid mayflies, chloroperlid stoneflies, nematodes and numerous blackfly larvae in the sand and gravel substrate (Ref. 6).

Fish utilization of Silver Creek in the NAPLINE area appears to be low, although sampling efforts were limited by access restrictions. A previous study cites Silver Creek as a probable avenue of migration for a few round whitefish and northern pike as well as nursery area for young pike in summer (Ref. 6).

FISH

Date 19 June 1979

Fish Present: None

Gear/Effort: EF(30m)

Species Present:	Quantity		Size Range (mm)	
	Fry	Other	Fry	Other
None				

PHYSICAL CONDITION

Date	19 June 1979
Channel Width (m)	0.5-2.0
Floodplain Width (m)	NA
Water Depth (cm)	25-40
Discharge (m^3/s)	0.01
D.O. (mg/ℓ)	5.0
Temperature (°C)	10.0
Conductivity (μmhos/cm)	50
pH	6.6
Color	Slightly humic-stained
Turbidity	Clear
Bottom Type	Mud/organic mat
Fish Block(s)	None in areas surveyed

SPRING SURVEY FORM

WATERBODY

Waterbody Unnamed Creek 1262.3

Main Drainage Tanana River Tributary to Chisana River

Figure 3 Northwest Alignment Sheet 124 & 125

Identification Nos: NPSI 6-216.01 NPMP 701.9

Alaska Highway Milepost AHMP 1262.3

USGS Map Reference Tanacross, Ak. T 14N R 19E Sec 11

Site Access On foot from Alaska Highway

Section Surveyed NAPLINE and Alaska Highway crossings

ASSESSMENT

Unnamed Creek 1262.3 is a small, slightly humic-stained tributary to the Chisana River. This creek crosses the NAPLINE corridor approximately 300 m upstream of the Alaska Highway. No visible water was found in this stream except at the outfall of the two highway culverts where two small pools had formed. Terrestrial vegetation including willow, birch and spruce border these two pools. Aquatic plants found included *Equisetum*, filamentous green algae and bryophytes. Where visible, the stream channel is less than 0.2 m wide with a mud substrate.

No fish were observed during the present investigation. Due to very limited or absence of discharge and the poorly defined channel which probably acts as a barrier to fish passage, this creek was considered to be poor fish habitat. In addition to these habitat limitations, the upstream end of one highway culvert was found to be clogged with highway fill.

FISH

Date 19 June 1979

Fish Present: None

Gear/Effort: Visual observation

Species Present:	Quantity		Size Range (mm)	
	Fry	Other	Fry	Other
None				

PHYSICAL CONDITION

Date	19 June 1979
Channel Width (m)	0.2
Floodplain Width (m)	NA
Water Depth (cm)	NA
Discharge (m^3/s)	Not measurable
D.O. (mg/ℓ)	10/9
Temperature (°C)	13.0/5.0
Conductivity (μmhos/cm)	50/50
pH	6.6/6.6
Color	Slightly humic-stained
Turbidity	Clear
Bottom Type	Mud
Fish Block(s)	Water quantity at either highway or NAPLINE crossing was insufficient for fish passage

SPRING SURVEY FORM

WATERBODY

Waterbody Unnamed Creek 1266.5

Main Drainage Tanana River Tributary to Chisana River

Figure 3 Northwest Alignment Sheet 124

Identification Nos: NPSI 6-216 NPMP 699.2

Alaska Highway Milepost AHMP 1266.5

USGS Map Reference Tanacross, Ak. T 15N R 19E Sec 33

Site Access On foot from Alaska Highway

Section Surveyed From 50 m upstream to the NAPLINE crossing; also at Alaska Highway

ASSESSMENT

Unnamed Creek 1266.5 is a small stream, 0.3 to 2 m wide lying within heavily vegetated banks up to 2 m high. Vegetation includes dead willow in or across the channel, birch and dwarf spruce. The slightly humic-stained water flows over a mud substrate with occasional patches of fine gravel. At the proposed NAPLINE crossing, the narrow channel opens into a series of shallow pools and riffles. Eight hundred meters downstream of the pipeline crossing, the Alaska Highway culvert has created an effective barrier to fish migration. The wooden culvert is perched, with a drop of about 3 m on the downstream side.

Previous studies have failed to produce fish either above or below the highway, although habitat was considered good (Ref. 2). Present investigations also failed to find fish. Due to the fish block at the Alaska Highway, upstream regions including the pipeline crossing are presumably non-fish areas. The fisheries status below the Alaska Highway is not known.

FISH

Date 19 June 1979

Fish Present: None

Gear/Effort: EF(20m)

Species Present:	Quantity		Size Range (mm)	
	Fry	Other	Fry	Other
None				

PHYSICAL CONDITION

Date	19 June 1979
Channel Width (m)	0.3-2 m
Floodplain Width (m)	NA
Water Depth (cm)	15-50
Discharge (m^3/s)	<0.03
D.O. (mg/ℓ)	8
Temperature (°C)	9
Conductivity (μmhos/cm)	77
pH	6.5
Color	Slightly humic-stained
Turbidity	Clear
Bottom Type	Mud and some spots of small gravel
Fish Block(s)	Alaska Highway culvert

SPRING SURVEY FORM

WATERBODY

Waterbody Beaver Creek

Main Drainage Yukon River Tributary to Tanana River

Figure 3 Northwest Alignment Sheet 124

Identification Nos: NPSI 6-215 NPMP 697.4

Alaska Highway Milepost AHMP 1268.0

USGS Map Reference Tanacross, Ak. T 15N R 19E Sec 29

Site Access On foot from Alaska Highway

Section Surveyed From 100 m above to 100 m below NAPLINE crossing

ASSESSMENT

Beaver Creek is a small stream which flows southwest across the Alaska Highway to its confluence with the Tanana River. This slow-flowing stream is a series of shallow riffles and pools up to 1.5 m deep with predominantly sand and small gravel substrates. It lies in a gorge with incised, mud banks which are 2-3 m high. The channel is bordered by stands of willow, birch and spruce and has accumulated a number of fallen logs and snags which provide considerable cover for fish.

During the open-water period this stream is used by a number of different species. Our spring sampling efforts indicate that the proposed NAPLINE crosses a rearing area for juvenile and adult grayling, juvenile round whitefish and longnose sucker. Other studies have verified the presence of these species (Ref. 5, 6, 9 & 26). The area may be used by grayling for spawning, although no fry were found. Northern pike may use Beaver Creek as a spawning and rearing area (Ref. 6).

FISH

Date 19 June 1979

Fish Present: Yes

Gear/Effort: EF(175m)
AN(1h)

Species Present:	Quantity Fry	Quantity Other	Size Range (mm) Fry	Size Range (mm) Other
Grayling		6		74-301
Longnose sucker		2		129-154
Round whitefish		1		84

PHYSICAL CONDITION

Date	19 June 1979
Channel Width (m)	3
Floodplain Width (m)	4.5-6.0
Water Depth (cm)	25-75
Discharge (m^3/s)	0.03
D.O. (mg/ℓ)	9
Temperature (°C)	10.0
Conductivity (μmhos/cm)	150
pH	6.8
Color	Slightly humic-stained
Turbidity	Clear
Bottom Type	Sand/small gravel; some cobble below Alaska Highway
Fish Block(s)	None, but many fallen logs and debris across channel

SPRING SURVEY FORM

WATERBODY

Waterbody Unnamed Creek 1270.4

Main Drainage Yukon River Tributary to Tanana River

Figure 3 Northwest Alignment Sheet 123

Identification Nos: NPSI 6-214.01 NPMP 695.2

Alaska Highway Milepost AHMP 1270.4

USGS Map Reference Tanacross, Ak. T 15N R 18E Sec 24

Site Access On foot from the Alaska Highway

Section Surveyed From NAPLINE to 10 m downstream from Alaska Highway (approximately 100 m)

ASSESSMENT

Unnamed Creek 1270.4 is a very small drainage which flows south across the Alaska Highway and into the Tanana River. This stream had no defined channel and negligible flow during present investigations. The only significant concentration of water observed in the vicinity of the NAPLINE was a small pool approximately 90 cm deep located below the Alaska Highway culvert. Dissolved oxygen was notably low in this pool.

Fish utilization during spring appears to be low to non-existent. Fish were not seen or captured during present investigations or in June 1978 (Ref. 2) when water levels were considerably higher than in 1979.

FISH

Date 20 June 1979

Fish Present: None

Gear/Effort: EF(10m), pond at culvert outfall

Species Present:	Quantity		Size Range (mm)	
	Fry	Other	Fry	Other
None				

PHYSICAL CONDITION

Date	20 June 1979
Channel Width (m)	Less than 0.3
Floodplain Width (m)	NA
Water Depth (cm)	0-2; maximum depth culvert outfall pool 90 cm
Discharge (m^3/s)	negligible
D.O. (mg/ℓ)	4.0
Temperature (°C)	9.0
Conductivity (μmhos/cm)	60
pH	6.7
Color	Humic-stained
Turbidity	Clear
Bottom Type	Moss and detritus; gravel/cobble in culvert outfall pool only
Fish Block(s)	No defined channel; water seeps through vegetated mat in low muskeg area; will not pass fish at this time

SPRING SURVEY FORM

WATERBODY

Waterbody Bitters Creek

Main Drainage Yukon River Tributary to Tanana River

Figure 3 Northwest Alignment Sheet 122

Identification Nos: NPSI 6-212 NPMP 686.5

Alaska Highway Milepost AHMP 1280.2

USGS Map Reference Tanacross, Ak. T 16N R 17E Sec 24

Site Access On foot from the Alaska Highway

Section Surveyed From NAPLINE to 300 m downstream from Alaska Highway (approximately 400 m)

ASSESSMENT

Bitters Creek is a small stream which flows through a steep gorge and into the Tanana River approximately 1.6 km downstream from the Alaska Highway. Its channel is 2.4-3.0 m wide with a sand and small gravel substrate. Large boulders, snags and debris litter the channel downstream from the Alaska Highway providing excellent cover for fish. The stream gradient is steep but pools are numerous.

Bitters Creek provides good to excellent habitat for fish during spring, although none have been found upstream from the Alaska Highway. The highway culvert appears to block fish migration because the culvert has low water levels (10 cm), fairly fast flow (>3 fps) and the outfall is perched 35-40 cm above the stream surface.

Below the highway, Bitters Creek is a rearing area for juvenile grayling, longnose sucker, round whitefish and adult and juvenile slimy sculpin. Grayling and sculpin were also captured in Bitters Creek below the Alaska Highway in July 1976 (Ref. 6). Little direct evidence of utilization by spring spawning fishes (i.e., presence of adults and/or young-of-the-year) was apparent; however, visual observations and aerial photographs indicate a high potential for use by spawning grayling and slimy sculpin in its lower reaches near the Tanana River.

FISH

Date 20 June 1979

Fish Present: Yes

Gear/Effort: EF(300m); from NAPLINE downstream to Alaska Highway and from Alaska Highway downstream 300 m

Species Present:	Quantity		Size Range (mm)	
	Fry	Other	Fry	Other
Grayling		9		76-125
Longnose sucker		1		119
Slimy sculpin		6		66-79
Round whitefish		1		100

PHYSICAL CONDITION

Date	20 June 1979
Channel Width (m)	2.4-3.0
Floodplain Width (m)	NA
Water Depth (cm)	30-90
Discharge (m^3/s)	0.03
D.O. (mg/ℓ)	8
Temperature (°C)	13.0
Conductivity (µmhos/cm)	100
pH	7.8
Color	Slightly humic-stained
Turbidity	Clear
Bottom Type	Sand, small gravel; large boulders downstream from Alaska Highway
Fish Block(s)	Alaska Highway is a fish block

SPRING SURVEY FORM

WATERBODY

Waterbody Tanana River

Main Drainage Yukon River Tributary to Yukon River

Figure 3 Northwest Alignment Sheet 118

Identification Nos: NPSI 6-207A,B,C 6-208 NPMP 664.3

Alaska Highway Milepost AHMP 1303.3

USGS Map Reference Tanacross, Ak. T 18N R 14E Sec 25

Site Access By boat from boat launch at Alaska Highway bridge

Section Surveyed From Alaska Highway downstream 900 m

ASSESSMENT

The Tanana River is a large braided glacial river formed by the junction of the Chisana and Nabesna Rivers near the Alaska/Canada border. The Tanana River crosses the Alaska Highway at AHMP 1303.3 and flows northwest into central Alaska where it joins the Yukon River. Fish species reported to be present include: grayling, round whitefish, humpback whitefish, lake whitefish, northern pike, burbot, slimy sculpin, longnose sucker, lake chub, least cisco, sheepfish, Dolly Varden, coho salmon, chum salmon and king salmon (Ref. 5, 11 & 26). Some of these species probably do not occur as far upstream as the Alaska Highway, however.

Relatively little is known about the fishery resource of this large braded glacial stream. It was previously thought that few fish were able to tolerate its highly turbid waters during summer months (Ref. 6); consequently, few attempts have been made to sample the Tanana River at this time. Based on recent findings presented herein, it appears that the Tanana River is an important fish stream year-round.

The Tanana River at Tok is a rearing area for adult and/or juvenile northern pike, burbot, longnose sucker, lake chub, slimy sculpin, round whitefish and humpback whitefish. It is also a nursery area for humpback whitefish fry. Until further investigations can be conducted, this area should be considered an adult humpback whitefish spawning area and an

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SPRING SURVEY FORM

WATERBODY

Waterbody_____

Main Drainage_____ Tributary to_____

Figure_____ Northwest Alignment Sheet_____

Identification Nos: NPSI_____ NPMP_____

Alaska Highway Milepost_____

USGS Map Reference_____ T_____ R_____ Sec_____

Site Access_____

Section Surveyed_____

_____

ASSESSMENT

Tanana River (continued)

overwintering area for their eggs. The Tanana River at Tok is also an important avenue for migration of fishes moving from overwintering locations in the river to clearwater tributaries during spring.

Humpback whitefish were the most numerous fish species encountered during spring investigations. Abundant mayfly nymphs found in seine hauls identified a probable important food source for many of the species present.

The Tanana River is an important waterbody for spawning and migrating anadromous fishes (Ref. 13). Utilization by anadromous fishes as far upstream as the Alaska Highway has not been confirmed.

FISH

Date 21 June 1979

Fish Present Yes

Gear/Effort: 9 SL (54h)
Two 15m GN (44h)
8m GN (1.5h)
4m Seine (15 hauls @ 30m/haul)

Species Present:	Quantity		Size Range (mm)	
	Fry	Other	Fry	Other
Burbot		2		312-520
Northern Pike		1		427
Longnose Sucker		5		44-329
Lake Chub		2		49-64
Slimy Sculpin		4		44-55
Round Whitefish		1		340
Humpback Whitefish	10	1	22-35	52
Unidentified Whitefish	1		15	

PHYSICAL CONDITIONS

Date	21 June 1979
Channel Width (m)	200-300
Flood Plain Width (m)	200-600
Water Depth (cm)	300-1000
Discharge (m^3/s)	291; mean for June 1978 (Ref. 67)
D.O. (mg/l)	10
Temperature (^oC)	13.0
Conductivity (µmhos/cm)	140
pH	7.6
Color	Brown
Turbidity	Highly turbid
Bottom Type	Mud/silt
Fish Block(s)	None

SPRING SURVEY FORM

WATERBODY

Waterbody Tok River

Main Drainage Yukon River Tributary to Tanana River

Figure 3 Northwest Alignment Sheet 117

Identification Nos: NPSI 6-205 NPMP 658.2

Alaska Highway Milepost AHMP 1309.4

USGS Map Reference Tanacross, Ak. T 18N R 13E Sec 24

Site Access On foot from Alaska Highway

Section Surveyed From 100 m upstream to 150 m downstream from Alaska Highway bridge; NAPLINE crossing

ASSESSMENT

The Tok River is a semi-glacial stream that crosses the Alaska Highway about five miles east of Tok and flows northeast into the Tanana River. This stream is 25-40 m wide, about 95 km long and originates in the Alaska Range. Its waters are clearer than most typical glacial streams due to contributions by springs and clear water tributaries. Due to recent precipitation however, the Tok River was relatively high, brown in color and highly turbid during present investigations.

Fish utilization of the Tok River during spring appears to be high. The Tok River is reported to be a rearing area during spring and summer for juvenile round whitefish, longnose sucker, grayling, burbot and slimy sculpin (Refs. 6 & 54). This stream is also a nursery area for whitefish fry and perhaps grayling. Little is known of grayling spawning in this region except that important grayling spawning grounds have been identified in a tributary of the Tok River called the Little Tok River (Ref. 39). However, the following evidence suggests grayling may utilize the lower reaches of the Tok River near the NAPLINE for spawning: 1) a grayling fry was captured at the Alaska Highway bridge during present investigations, 2) adequate spawning substrate is available in the vicinity of the NAPLINE and 3) the Tok River at the Alaska Highway bridge supports a small sport fishery by local residents in early spring, implying the presence of adult grayling at that time.

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SPRING SURVEY FORM

WATERBODY

Waterbody_____

Main Drainage_____ Tributary to_____

Figure_____ Northwest Alignment Sheet_____

Identification Nos: NPSI_____ NPMP_____

Alaska Highway Milepost_____

USGS Map Reference_____ T_____ R_____ Sec_____

Site Access_____

Section Surveyed_____

_____

ASSESSMENT

Tok River (continued)

Whitefish fry captured in the Tok River during present investigations probably migrated downstream from the more stable areas within the Tok River drainage. The lower reaches of the Tok River near the NAPLINE either dry up and/or freeze to the bottom during winter (Refs. 9 & 55) and cannot overwinter the eggs of fall spawning species.

The Tok River is a major migration pathway for many species during spring and fall since most of this stream probably freezes solid during winter months. It remains unknown, however, if the important major grayling populations found in the Tok overflow and Little Tok River (upstream tributaries of the Tok River) migrate downstream into the Tanana River or remain upstream to overwinter. Other fish species known to be present in the Tok River include northern pike and lake chub (Refs. 6 & 10).

The presence of a State campground at the Alaska Highway bridge has created a high public use area not far upstream from the NAPLINE. A well traveled path follows the stream bank downstream to the NAPLINE area, but most activity is concentrated in the immediate vicinity of the campground.

FISH

Date 22 June 1979

Fish Present: Yes

Gear/Effort: 5m Seine (4 hauls @ 50 m/haul); shoreline

Species Present:	Quantity		Size Range (mm)	
	Fry	Other	Fry	Other
Round whitefish		15		74-198
Longnose sucker		5		90-224
Grayling	1	8	25	71-93
Burbot		1		230
Slimy sculpin		13		41-63
Whitefish spp.	35		25-40	

PHYSICAL CONDITION

Date	22 June 1979
Channel Width (m)	24-45
Floodplain Width (m)	Same
Water Depth (cm)	50-120
Discharge (m^3/s)	19.6
D.O. (mg/ℓ)	9
Temperature (°C)	12
Conductivity (µmhos/cm)	190
pH	8.0
Color	Brown
Turbidity	Highly turbid
Bottom Type	Gravel/cobble in riffle areas; sand/silt in slower waters
Fish Block(s)	None

SPRING SURVEY FORM

WATERBODY

Waterbody Crystal Springs

Main Drainage Yukon River. Tributary to Tanana River

Figure 3 Northwest Alignment Sheet 114

Identification Nos: NPSI 6-203.03 NPMP 639.0

Alaska Highway Milepost AHMP 1328.0

USGS Map Reference Tanacross, Ak. T 18N R 10E Sec 11 & 2

Site Access On foot from Alaska Highway

Section Surveyed From NAPLINE 300 m downstream to the Alaska Highway and from the Alaska Highway downstream 700 m to a large slough

ASSESSMENT

Crystal Springs originates, in part, from an upwelling source which flows north across the Alaska Highway and joins additional springs near the Tanana River. Between the proposed NAPLINE crossing and the Alaska Highway, its 1-3 m wide channel flows through a large muskeg area vegetated with willow, dwarf birch and scattered spruce. Crystal Springs is relatively shallow (usually less than 0.5 m deep), clear, and in some areas remains open year-round. The stream channel is well-defined but often hidden from view by overhanging vegetation.

Crystal Springs is a rearing area during spring and summer for juvenile grayling, longnose sucker and slimy sculpin. Although fair numbers of adult grayling in spawning condition were reported to have been caught at the Alaska Highway in early June 1978 (Ref. 2), no adult or young-of-the-year grayling were seen or captured during present investigations.

Fish were less abundant upstream from the Alaska Highway than downstream during present investigations. Only four juvenile grayling were captured near the upstream end of the highway culverts and no fish were found in a 750 m stretch of stream from the highway upstream to the NAPLINE crossing. Fish habitat in this upstream area appeared to be less favorable than downstream where all three species were captured. Other species indigenous to the Tanana River, such as lake chub and northern pike, probably frequent Crystal Springs as well.

FISH

Date 22 June 1979

Fish Present: Yes

Gear/Effort: EF(150m)

Species Present:	Quantity		Size Range (mm)	
	Fry	Other	Fry	Other
Grayling		5		81-115
Slimy sculpin		19		21-115
Longnose sucker		8		49-133

PHYSICAL CONDITION

Date	22 June 1979
Channel Width (m)	0.3-1.0
Floodplain Width (m)	Same
Water Depth (cm)	10-30
Discharge (m^3/s)	0.06
D.O. (mg/ℓ)	9
Temperature (°C)	9.0
Conductivity (μmhos/cm)	40
pH	6.6
Color	Clear
Turbidity	Clear; some detritus in water
Bottom Type	Primarily sand; mud/silt in standing water
Fish Block(s)	None, highway culvert appears to be suitable for fish passage

SPRING SURVEY FORM

WATERBODY

Waterbody Unnamed Creek 1328.2

Main Drainage Tanana River Tributary to Crystal Springs

Figure 3 Northwest Alignment Sheet 114

Identification Nos: NPSI 6-203.02 NPMP 638.8

Alaska Highway Milepost AHMP 1328.2

USGS Map Reference Tanacross, Ak. T 18N R 10E Sec 11

Site Access On foot from Alaska Highway

Section Surveyed From 30 m upstream to 30 m downstream from Alaska Highway

ASSESSMENT

Unnamed Creek 1328.2 is a small, slightly humic-stained stream which crosses the Alaska Highway and then flows along the Haines Products Pipeline to its confluence with Crystal Springs. Its channel is poorly defined and variable in width from 0.3-1.0 m. Water from this stream was ponded up to 1.0 m deep on both sides of the Alaska Highway culvert and intermittently along the Haines Products Pipeline. This stream drains large areas of low-lying muskeg and tundra.

Fish use of Unnamed Creek 1328.2 during spring appears to be low to non-existent. No fish were seen or captured in this stream near the Alaska Highway. There is no defined channel south of the Alaska Highway and it is unlikely that fish could penetrate this low, wet muskeg as far upstream as the NAPLINE.

Three other Alaska Highway culverts are situated between milepost 1328.2 and 1328.6. Only standing water was present at these culverts.

FISH

Date 22 June 1979

Fish Present None

Gear/Effort: EF (20m)

Species Present:	Quantity		Size Range (mm)	
	Fry	Other	Fry	Other
None				

PHYSICAL CONDITIONS

Date	22 June 1979
Channel Width (m)	0.3-1.0
Flood Plain Width (m)	Same
Water Depth (cm)	15-50
Discharge (m^3/s)	<0.06 (Est)
D.O. (mg/l)	7
Temperature (^oC)	12.0
Conductivity (µmhos/cm)	40
pH	6.6
Color	Slightly humic-stained
Turbidity	Clear
Bottom Type	Mud/detritus
Fish Block(s)	The stream disappears south of the Alaska Highway.

SPRING SURVEY FORM

WATERBODY

Waterbody Unnamed Creek 1330.5

Main Drainage Yukon River Tributary to Tanana River

Figure 3 Northwest Alignment Sheet 113

Identification Nos: NPSI 6-203 NPMP 636.5

Alaska Highway Milepost AHMP 1330.5

USGS Map Reference Tanacross, Ak. T 18N R 10E Sec 4 & 9

Site Access On foot from Alaska Highway

Section Surveyed NAPLINE crossing downstream 170 m (50 m downstream of Alaska Highway)

ASSESSMENT

Unnamed Creek 1330.5 flows northerly about 2 km from its NAPLINE crossing to its confluence with the Tanana River. This is a small stream, 2-3 m wide, which is dry except during periods of high runoff. The gradient is very steep, providing high velocity water and few pools during periods of precipitation. The substrate is typical of steep, high runoff channels, consisting predominantly of large bounders (0.5-1.5 m) cobble and some gravel. Mud and humus banks up to 1 m high are well-vegetated with mosses, grasses, alder and wild roses and are bordered by a mixed stand of birch, aspen and spruce.

This stream provides no fish habitat in the proximity of the NAPLINE crossing. The intermittent nature of the water flow, steep gradient and accumulation of sticks and debris in the channel, prevent fish from reaching the NAPLINE crossing. On 23 June 1979 the stream was found to be dry with some evidence of flow during the recent spring breakup. The lower reaches of this stream may provide fish habitat nearer its confluence with the Tanana River (Ref. 2);

FISH

Date 23 June 1979

Fish Present None

Gear/Effort: None

Species Present:	Quantity		Size Range (mm)	
	Fry	Other	Fry	Other
None				

PHYSICAL CONDITIONS

Date	23 June 1979
Channel Width (m)	2-3
Flood Plain Width (m)	Same
Water Depth (cm)	None, streambed was dry
Discharge (m^3/s)	NA
D.O. (mg/l)	NA
Temperature (^oC)	NA
Conductivity (µmhos/cm)	NA
pH	NA
Color	NA
Turbidity	NA
Bottom Type	Boulder; cobble; gravel
Fish Block(s)	Presently lacking water, sticks and deadwood jams

SPRING SURVEY FORM

WATERBODY

Waterbody Yerrick Creek

Main Drainage Yukon River Tributary to Tanana River

Figure 3 Northwest Alignment Sheet 113

Identification Nos: NPSI 6-201 NPMP 633.0

Alaska Highway Milepost AHMP 1333.7

USGS Map Reference Tanacross, Ak. T 19N,18N R 9E,9E Sec 36 & 1

Site Access On foot from Alaska Highway

Section Surveyed From 1000 m downstream of Alaska Highway to 50 m upstream of NAPLINE crossing (approximately 1500 m)

ASSESSMENT

Yerrick Creek is a swift, clear water stream flowing northerly from the Alaska Range to its confluence with the Tanana River. The 10-15 m wide and sometimes braided channel follows steep gradient floodplain consisting of boulders, cobble and gravel. Gravel, sand and mud banks up to 2.5 m high are vegetated by alder, cottonwood and aspen. A larger volume of water has been reported approximately 1.5 km upstream of the NAPLINE crossing than at the Alaska Highway which indicates the presence of some subterranean flow (Ref. 6).

Yerrick Creek provides very good habitat for a number of different fish species. It offers potential grayling spawning habitat and serves as a rearing area for Dolly Varden, round whitefish and juvenile and adult grayling in the vicinity of the NAPLINE. Grayling are also reported to migrate upstream above the proposed NAPLINE crossing in spring (Ref. 6). Other species reported to be present include slimy sculpin and round whitefish (Refs. 5, 6 10 & 26). The lower reaches of Yerrick Creek near its confluence with the Tanana River are suspected to also contain northern pike, lake chub and longnose sucker (Refs. 6, 7 & 10).

FISH

Date 23 June 1979

Fish Present Yes

Gear/Effort: EF(400m)
1AN(4h)

Species Present:	Quantity Fry	Quantity Other	Size Range (mm) Fry	Size Range (mm) Other
Grayling		19		83-250
Dolly Varden		2		173-174

PHYSICAL CONDITIONS

Date	23 June 1979
Channel Width (m)	6-15
Flood Plain Width (m)	100
Water Depth (cm)	20-60
Discharge (m^3/s)	2.2
D.O. (mg/l)	11
Temperature (^oC)	10.0
Conductivity (µmhos/cm)	80
pH	7.8
Color	Clear
Turbidity	Clear
Bottom Type	Boulder, cobble, gravel and sand
Fish Block(s)	None

SPRING SURVEY FORM

WATERBODY

Waterbody Unnamed Creek 1336.9

Main Drainage Yukon River Tributary to Tanana River

Figure 3 Northwest Alignment Sheet 112

Identification Nos: NPSI 6-200 NPMP 630.7

Alaska Highway Milepost AHMP 1336.9

USGS Map Reference Tanacross, Ak. T 19N R 9E Sec 33

Site Access On foot from Alaska Highway

Section Surveyed From 150 m downstream of Alaska Highway to 100 m upstream of Alaska Highway (250 m)

ASSESSMENT

Unnamed Creek 1336.9 crosses the Alaska Highway approximately 800 m downstream of the NAPLINE and flows northwest along the edge of a material site before emptying into the Tanana River some 600 m downstream. Immediately upstream of the Alaska Highway the channel is narrow and poorly defined. In this area Unnamed Creek 1336.9 is lightly stained and flows through a series of small, 1.5 m deep pools bordered by willow, cottonwood, aspen and spruce. The stream bottom consists primarily of mud, with banks up to 1 m high. No fish were caught in the vicinity of the NAPLINE--low discharge and a poorly defined channel make fish use unlikely.

Downstream from the Alaska Highway flow is gentle and the stream becomes a deep channelized pool about 6 m wide and 120 m long. The steep banks surrounding this pool are up to 2 m high and have often slumped into the creek. The pond bottom is primarily boulder and cobble. *Carex* and *Equisetum* species are abundant around the waters edge, giving way to willow, aspen and spruce in the higher areas. At the outlet of this pool the creek flows through a weed choked channel that appears to impede stream flow and may restrict fish movement during low water levels.

Although no fish were encountered during present investigations, habitat in the vicinity of the highway appeared favorable. Previous investigations also failed to verify the presence of fish, but rated this same area as good fish habitat (Ref. 2).

FISH

Date 26 June 1979

Fish Present None

Gear/Effort: EF(70m)

Species Present:	Quantity		Size Range (mm)	
	Fry	Other	Fry	Other
None				

PHYSICAL CONDITIONS

Date	26 June 1979
Channel Width (m)	3-6
Flood Plain Width (m)	Same
Water Depth (cm)	15-45
Discharge (m^3/s)	0.006
D.O. (mg/l)	10
Temperature (^oC)	10.0
Conductivity (µmhos/cm)	20
pH	6.4
Color	Humic-stained
Turbidity	Slightly turbid
Bottom Type	From Alaska Highway 50m downstream, boulder/cobble Mud upstream & downstream of this section
Fish Block(s)	Shallow; poorly defined channel upstream and downstream of Alaska Highway may prevent fish passage

SPRING SURVEY FORM

WATERBODY

Waterbody Unnamed Creek 1339.8

Main Drainage Yukon River Tributary to Tanana River

Figure 3 Northwest Alignment Sheet 112

Identification Nos: NPSI 6-193.01 NPMP 627.5

Alaska Highway Milepost AHMP 1339.8

USGS Map Reference Tanacross, Ak. T 19N R 8E Sec 25

Site Access On foot from Alaska Highway

Section Surveyed From NAPLINE crossing downstream to 200 m below Alaska Highway

ASSESSMENT

Unnamed Creek 1339.8 forms a shallow pond approximately 150 m^2 at the NAPLINE crossing. This 25 cm deep pond was choked with *Carex* and *Equisetum* species and did not appear to have any inward or outward exchange of water during present investigations. From this pond downstream to the Alaska Highway the creek seeps southwesterly through a heavily vegetated, low-lying bog.

No flow was visible from the Alaska Highway culvert to 30 m downstream, where Unnamed Creek 1339.8 becomes a shallow slough 8-10 m wide. This slough is turbid, has a mud/silt bottom, and is inundated by backwaters of the Tanana River. *Carex* and *Equisetum* are abundant along the waters edge while its mud banks are heavily vegetated with willow, cottonwood and spruce.

Fish utilization of Unnamed Creek 1339.8 during spring is low to non-existent from the Alaska Highway upstream to the NAPLINE. There is no defined channel and flow or seepage is intermittent. No fish were caught in this section. Downstream from the highway however, this stream is transformed into a slough-like backwater of the Tanana River. Many species indigenous to the Tanana are likely to frequent this slough throughout the summer. Lake chub, round whitefish, northern pike, longnose sucker and

...continued

SPRING SURVEY FORM

WATERBODY

Waterbody_____

Main Drainage_____ Tributary to_____

Figure_____ Northwest Alignment Sheet_____

Identification Nos: NPSI_____ NPMP_____

Alaska Highway Milepost_____

USGS Map Reference_____ T_____ R_____ Sec_____

Site Access_____

Section Surveyed_____

_____

ASSESSMENT

Unnamed Creek 1339.8 (continued)

grayling utilize this waterbody as a rearing and summering area (Refs. 6 & 54). It is a nursery for round whitefish and probably other species as well. Although no northern pike fry were captured, this slough provides good spawning habitat for this species. Fish probably enter this slough immediately after breakup but is unlikely that they ever reach the NAPLINE area.

FISH

Date 23 June 1979

Fish Present Yes

Gear/Effort: EF(200m)

Species Present:	Quantity Fry	Quantity Other	Size Range (mm) Fry	Size Range (mm) Other
Northern Pike		1		352
Round Whitefish	3		33-39	
Lake Chub		1		86

PHYSICAL CONDITIONS

Date	23 June 1979
Channel Width (m)	3-6
Flood Plain Width (m)	4-20
Water Depth (cm)	30-100
Discharge (m^3/s)	0
D.O. (mg/l)	10
Temperature (^oC)	18.0
Conductivity (µmhos/cm)	150
pH	7.4
Color	Brown/gray
Turbidity	Moderately turbid
Bottom Type	Mud/silt
Fish Block(s)	The stream was dry at the NAPLINE crossing

SPRING SURVEY FORM

WATERBODY

Waterbody Unnamed Creek 1340.5

Main Drainage Yukon River Tributary to Tanana River

Figure 3 Northwest Alignment Sheet 111

Identification Nos: NPSI 6-192.01 NPMP 626.2

Alaska Highway Milepost AHMP 1340.5

USGS Map Reference Tanacross, Ak. T 19N R 8E Sec 25

Site Access On foot from the Alaska Highway

Section Surveyed From 75 m downstream of the Alaska Highway upstream to the NAPLINE crossing (approximately 150 m)

ASSESSMENT

Unnamed Creek 1340.5 was dry at the time of this investigation. From the Alaska Highway upstream to above the NAPLINE crossing the channel was poorly defined as it ran through a spruce and willow forest. Below the Alaska Highway, the channel was well-defined with a steep gradient.

Fish use of this stream at the NAPLINE crossing is unlikely at any time of year due to poor habitat. In addition, the culvert on the Alaska Highway would be a barrier to fish migration due to a 1 m drop at its outfall.

FISH

Date 24 June 1979

Fish Present: None

Gear/Effort: None

Species Present:	Quantity		Size Range (mm)	
	Fry	Other	Fry	Other
None				

PHYSICAL CONDITION

Date	24 June 1979
Channel Width (m)	0.3-1.1
Floodplain Width (m)	Same
Water Depth (cm)	0
Discharge (m^3/s)	0
D.O. (mg/ℓ)	NA
Temperature (°C)	NA
Conductivity (μmhos/cm)	NA
pH	NA
Color	NA
Turbidity	NA
Bottom Type	Cobble/gravel downstream of Alaska Highway; mud upstream of NAPLINE crossing
Fish Block(s)	Highway culvert is barrier to fish migration

SPRING SURVEY FORM

WATERBODY

Waterbody Sheep Creek

Main Drainage Yukon River Tributary to Tanana River

Figure 3 Northwest Alignment Sheet 111

Identification Nos: NPSI 6-191 NPMP 625.1

Alaska Highway Milepost AHMP 1342.2

USGS Map Reference Tanacross, Ak. T 19N R 8E Sec 14

Site Access On foot from the Alaska Highway

Section Surveyed 20 m upstream from NAPLINE to 100 m downstream from the Alaska Highway bridge (approximately 220 m)

ASSESSMENT

Sheep Creek is a small stream 1-2 m wide that drains the north face of the Alaska Range and flows northeast to its confluence with the Tanana River. The water of this intermittently flowing stream is slightly turbid (glacial). Substrate consists primarily of gravel with numerous sand and silt deposits. Downstream of the proposed NAPLINE crossing, 1-2 m high banks are heavily vegetated with willow and alder. Upstream of the NAPLINE crossing the floodplain widens out to approximately 175 m with the substrate changing to cobble and boulder.

Fish use in the area of the NAPLINE crossing was considered unlikely due to the intermittent flow characteristic of this stream. Upstream of the pipeline crossing fish habitat appeared good due to a favorable pool--riffle ratio, but no fish were captured or observed during the present investigation. Other investigators have failed to identify fish use of this stream as well (Refs. 6,7 & 8).

FISH

Date 24 June 1979

Fish Present None

Gear/Effort: EF(200m)

Species Present:	Quantity		Size Range (mm)	
	Fry	Other	Fry	Other
None				

PHYSICAL CONDITIONS

Date	24 June 1979
Channel Width (m)	1.5-2.0
Flood Plain Width (m)	Same
Water Depth (cm)	20-40
Discharge (m^3/s)	0.2
D.O. (mg/l)	10
Temperature (^oC)	14.0
Conductivity (µmhos/cm)	170
pH	7.6
Color	Slightly gray
Turbidity	Slightly glacial turbidity
Bottom Type	Primarily gravel; some sand/silt deposits
Fish Block(s)	None

SPRING SURVEY FORM

WATERBODY

Waterbody Unnamed Creek 1343.7

Main Drainage Yukon River Tributary to Tanana River

Figure 3 Northwest Alignment Sheet 111

Identification Nos: NPSI 5-190 NPMP 623.5

Alaska Highway Milepost AHMP 1343.7

USGS Map Reference Tanacross, Ak. T 19N R 8E Sec 11

Site Access On foot from the Alaska Highway

Section Surveyed From NAPLINE to 100 m downstream of the Alaska Highway (approximately 175 m)

ASSESSMENT

Unnamed Creek 1343.7 flows northeast to the Tanana River through a series of small ponds and areas of low-lying muskeg. The narrow channel, less than 1 m wide, is bordered by low banks vegetated with sedges, willow and spruce. Terrestrial vegetation, including grasses and willow, are abundant within the stream channel which suggests only occasional or intermittent flow. The stream bottom consists primarily of mud with some areas of cobble substrate.

Approximately 90 m upstream of the Alaska Highway the NAPLINE bisects a pond approximately 250 m^2. Sedges are dominant in and around this shallow 0.3 m deep standing water pond. A poorly defined outlet with only seepage flow, makes fish immigration into the pond from downstream unlikely. In addition, the Alaska Highway culvert is perched and has created a 0.3 m vertical drop from the bottom of the pipe to the water surface. This would block or impede upstream fish movements.

No fish were encountered during present investigations, and habitat was considered to be poor due to the fish block at the highway culvert and the apparently intermittent nature of this stream.

FISH

Date 24 June 1979

Fish Present: None

Gear/Effort: EF(150m)

Species Present:	Quantity		Size Range (mm)	
	Fry	Other	Fry	Other
None				

PHYSICAL CONDITION

Date	24 June 1979
Channel Width (m)	0.3
Floodplain Width (m)	NA
Water Depth (cm)	10-20
Discharge (m^3/s)	<0.03
D.O. (mg/ℓ)	8
Temperature (°C)	16.0
Conductivity (μmhos/cm)	30
pH	6.2
Color	Humic-stained
Turbidity	Clear
Bottom Type	Primarily mud; cobble in pool below Alaska Highway
Fish Block(s)	Alaska Highway culvert would block or impede fish migration (0.3 m drop at outlet)

SPRING SURVEY FORM

WATERBODY

Waterbody Robertson River

Main Drainage Yukon River Tributary to Tanana River

Figure 3 Northwest Alignment Sheet 110

Identification Nos: NPSI 5-187 NPMP 619.6

Alaska Highway Milepost AHMP 1347.6

USGS Map Reference Tanacross, Ak. T 20N R 8E Sec 23

Site Access On foot from Alaska Highway

Section Surveyed From NAPLINE crossing downstream 500 m

ASSESSMENT

The Robertson River is a large braided glacial stream which originates in the Alaska Range and flows northeast into the Tanana River. The waters of the Robertson River are highly turbid during spring and summer but are clear by late fall. Flow is sustained year-round. The Robertson River has two major clearwater tributaries which are known to contain fish. These feeder streams enter the Robertson approximately 10-13 km above the Alaska Highway and are reported to contain round whitefish, grayling and Dolly Varden (Ref. 6).

The Robertson River was sampled on two occasions during the present spring survey. Waters were low and only moderately turbid on 13 May. Aufeis up to 1.3 m thick was still abundant on the floodplain. On 24 June the Robertson was revisisted. By this time the floodplain was completely free of aufeis and the river was high and extremely turbid.

High turbidity from glacial silt during summer months has been reported to preclude residence by aquatic life in Robertson River (Ref. 6); however, present investigations have shown that this may not be the case. Juvenile grayling were caught by gill net in early may and whitefish fry were seined from a shallow backwater near the Alaska Highway bridge on 24 June. Sculpin are also reported to be present (Ref. 6). Spring spawning

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SPRING SURVEY FORM

WATERBODY

Waterbody_____

Main Drainage_____ Tributary to_____

Figure_____ Northwest Alignment Sheet_____

Identification Nos: NPSI_____ NPMP_____

Alaska Highway Milepost_____

USGS Map Reference_____ T_____ R_____ Sec_____

Site Access_____

Section Surveyed_____

_____

ASSESSMENT

Robertson River (continued)

fishes (grayling, slimy sculpin, northern pike, etc.) probably do not use the mainstem of the Robertson in the NAPLINE area for spawning but these fish may migrate through this area in spring enroute to spawning areas upstream.

FISH

Date 13 May and 24 June 1979

Fish Present: Yes

Gear/Effort: 15mGN(50h); 13 May
Seine (5 hauls @ 20 m/haul); 24 June

Species Present:	Quantity		Size Range (mm)	
	Fry	Other	Fry	Other
Grayling (13 May)		2		163-187
Whitefish spp. (24 June)	6		20-30	

PHYSICAL CONDITION

Date	13 May 1979
Channel Width (m)	30-55
Floodplain Width (m)	≈550
Water Depth (cm)	50-200
Discharge (m^3/s)	10.5
D.O. (mg/ℓ)	11.2
Temperature (°C)	4.0
Conductivity (μmhos/cm)	200
pH	8.0
Color	Blue/green
Turbidity	Moderately turbid
Bottom Type	Gravel stream bottom; sand/silt floodplain
Fish Block(s)	None

SPRING SURVEY FORM

WATERBODY

Waterbody Unnamed Creek 1350.1

Main Drainage Yukon River Tributary to Tanana River

Figure 3 Northwest Alignment Sheet 110

Identification Nos: NPSI 5-185.03 NPMP 617.2

Alaska Highway Milepost AHMP 1350.1

USGS Map Reference Tanacross, Ak. T 20N R 8E Sec 10

Site Access On foot from the Alaska Highway

Section Surveyed From Alaska Highway downstream to NAPLINE

(approximately 75 m)

ASSESSMENT

Unnamed Creek 1350.1 is a very small drainage with no defined channel. Its waters seep from a tundra/muskeg area north across the Alaska Highway to the NAPLINE about 80 m downstream. The only significant concentrations of water were found just above and below the Alaska Highway culvert and at the NAPLINE. Flow was intermittent between these locations.

It is unlikely that this drainage in the area of the NAPLINE supports fish at any time of year due to poor fish habitat. This drainage was seined in June 1978 without result (Ref. 2). In addition, a perched culvert (1 m drop at outfall) on the Alaska Highway would be a barrier to fish passage.

FISH

Date 24 June 1979

Fish Present: None

Gear/Effort: Visual observation

Species Present:	Quantity		Size Range (mm)	
	Fry	Other	Fry	Other
None				

PHYSICAL CONDITION

Date	24 June 1979
Channel Width (m)	<0.3
Floodplain Width (m)	NA
Water Depth (cm)	0-20
Discharge (m^3/s)	Negligible
D.O. (mg/ℓ)	6
Temperature (°C)	10.0
Conductivity (μmhos/cm)	40
pH	6.2
Color	Humic-stained
Turbidity	Clear
Bottom Type	Mud/detritus
Fish Block(s)	Alaska Highway culvert is a barrier to fish passage

SPRING SURVEY FORM

WATERBODY

Waterbody Unnamed Creek 1350.2

Main Drainage Yukon River Tributary to Tanana River

Figure 3 Northwest Alignment Sheet 110

Identification Nos: NPSI 5-185.02 NPMP 617.0

Alaska Highway Milepost AHMP 1350.2

USGS Map Reference Tanacross, Ak. T 20N R 8E Sec 10

Site Access On foot from Alaska Highway

Section Surveyed From the Alaska Highway downstream to the NAPLINE crossing (approximately 80 m)

ASSESSMENT

Unnamed Creek 1350.2 is a very small drainage which appears to seep from a tundra/muskeg area south of the Alaska Highway. The only body of water found was a small pool just upstream from the Alaska Highway culvert. This drainage had a poorly defined channel overgrown with spruce and willow and was dry at the NAPLINE crossing.

Unnamed Creek 1350.2 did not provide fish habitat during present investigations, and it is unlikely that fish utilize this drainage in the area of the NAPLINE at any time of the year. The stream also was considered marginal habitat at the NAPLINE crossing and electrofished without result in a previous survey, June 1978 (Ref. 2).

FISH

Date 24 June 1979

Fish Present: None

Gear/Effort: Visual Observation

Species Present:	Quantity		Size Range (mm)	
	Fry	Other	Fry	Other
None				

PHYSICAL CONDITION

Date	24 June 1979
Channel Width (m)	<0.3
Floodplain Width (m)	NA
Water Depth (cm)	0-20
Discharge (m^3/s)	Negligible
D.O. (mg/ℓ)	9
Temperature (°C)	8.0
Conductivity (μmhos/cm)	25
pH	6.2
Color	Humic-stained
Turbidity	Clear
Bottom Type	Mud/detritus
Fish Block(s)	None

SPRING SURVEY FORM

WATERBODY

Waterbody Unnamed Creek 1352.3

Main Drainage Yukon River Tributary to Tanana River

Figure 3 Northwest Alignment Sheet 109

Identification Nos: NPSI 5-185.01 NPMP 615.1

Alaska Highway Milepost AHMP 1352.3

USGS Map Reference Tanacross, Ak. T 21N R 8E Sec 33

Site Access On foot from Alaska Highway

Section Surveyed From 30 m upstream of the Alaska Highway crossing downstream to NAPLINE (approximately 130 m)

ASSESSMENT

Unnamed Creek 1352.3 is a small drainage which seeps from a large muskeg area south of the Alaska Highway. Its channel is poorly defined and disappears not far upstream and downstream from the Alaska Highway. No definable channel or water could be located at the NAPLINE. The only significant concentrations of water were small pools found on either end of the wooden highway culvert. Water was approximately 1 m deep in the downstream pool and dissolved oxygen measured only 5 mg/ℓ.

Unnamed Creek 1352.3 is not a fish stream in the area of the NAPLINE crossing. No fish were caught during the present survey or a previous one in June 1978 (Ref. 2).

FISH

Date 24 June 1979

Fish Present None

Gear/Effort: EF (15m); above and below Alaska Highway culvert

Species Present:	Quantity		Size Range (mm)	
	Fry	Other	Fry	Other
None				

PHYSICAL CONDITIONS

Date	24 June 1979
Channel Width (m)	NA
Flood Plain Width (m)	NA
Water Depth (cm)	0-50
Discharge (m^3/s)	Negligible
D.O. (mg/l)	5
Temperature (^oC)	8.0
Conductivity (µmhos/cm)	55
pH	6.3
Color	humic-stained
Turbidity	Clear
Bottom Type	Primarily mud; cobble in pond just off shoulder of highway
Fish Block(s)	None

SPRING SURVEY FORM

WATERBODY

Waterbody Bear Creek

Main Drainage Yukon River Tributary to Tanana River

Figure 3 Northwest Alignment Sheet 109

Identification Nos: NPSI 5-185 NPMP 609.9

Alaska Highway Milepost AHMP 1357.3

USGS Map Reference Tanacross, Ak. T 21N R 7E Sec 11 & 12

Site Access On foot from Alaska Highway

Section Surveyed From 300 m upstream to 200 m downstream from NAPLINE

ASSESSMENT

Bear Creek is a glacial stream 6-12 m in width which originates in the Alaska Range. Its main tributary flows from Fish Lake and contributes slightly humic-stained water to the main stream 18 km above the Alaska Highway. Bear Creek was highly turbid during present investigations. The stream bottom was composed primarily of gravel and cobble with some scattered boulders. Benthic periphyton was notably abundant on these substrates.

Bear Creek is a rearing area for juvenile grayling, longnose sucker, and slimy sculpin during spring and summer months. Adult grayling and Dolly Varden are also reported in this stream (Ref. 6 & 10). A single Dolly Varden was also seen during present investigations but was not captured. During spring, Bear Creek is probably an important migratory pathway for several fish species which move upstream from the Tanana River and distribute themselves throughout the stream during the open-water months.

FISH

Date 24 June 1979

Fish Present Yes

Gear/Effort: EF (200m)
Seine (8 hauls @ 25m/haul)

Species Present:	Quantity Fry	Quantity Other	Size Range (mm) Fry	Size Range (mm) Other
Grayling		23		63-184
Longnose Sucker		3		141-163
Slimy Sculpin		4		54-92

PHYSICAL CONDITIONS

Date	24 June 1979
Channel Width (m)	6-12
Flood Plain Width (m)	Same
Water Depth (cm)	30-90
Discharge (m^3/s)	2.8
D.O. (mg/l)	9
Temperature (^oC)	15.0
Conductivity (µmhos/cm)	50
pH	7.9
Color	Brown
Turbidity	Highly turbid
Bottom Type	Primarily gravel/cobble; scattered boulders; silt and sand in standing water
Fish Block(s)	None

SPRING SURVEY FORM

WATERBODY

Waterbody Chief Creek

Main Drainage Tanana River Tributary to Bear Creek

Figure 3 Northwest Alignment Sheet 108

Identification Nos: NPSI 5-184 NPMP 608.6

Alaska Highway Milepost AHMP 1358.6

USGS Map Reference Mt. Hayes, Ak. T21N R 7E Sec 2

Site Access On foot from Alaska Highway

Section Surveyed From Alaska Highway upstream 200 m

ASSESSMENT

Chief Creek is a small humic-stained stream which drains a portion of Knob Ridge and flows north across the Alaska Highway into Bear Creek. Chief Creek is reported to be fed by an occasional spring (Ref. 10) but depends primarily on runoff to sustain its flow. Flow is seasonal and intermittent; extreme fluctuations occur throughout the open-water months. Its channel is 3-6 m wide and the bottom is composed of gravel and silt.

No fish were seen or captured in Chief Creek on two occasions during present investigations. No fish or macroinvertebrates were found during stream surveys in July 1976 as well (Ref. 6). Reference 10, however, indicates that at least one grayling was captured in June 1963. It appears that fish utilization of Chief Creek during spring and summer is low to non-existent. The paucity of fish is probably due largely to intermittent flow, a stream characteristic highly unfavorable for spring spawning species.

FISH

Date 14 May 1979

Fish Present: None

Gear/Effort: 5mGN(22h) 14 May 1979
EF(150m) 14 May 1979
EF(75m) 24 June 1979

Species Present:	Quantity		Size Range (mm)	
	Fry	Other	Fry	Other
None				

PHYSICAL CONDITION

Date	14 May 1979
Channel Width (m)	3-6
Floodplain Width (m)	Same
Water Depth (cm)	15-45
Discharge (m^3/s)	0.2
D.O. (mg/ℓ)	11.4
Temperature (°C)	4.0
Conductivity (μmhos/cm)	25
pH	7.2
Color	Humic-stained
Turbidity	Slightly turbid
Bottom Type	Gravel/silt
Fish Block(s)	None

SPRING SURVEY FORM

WATERBODY

Waterbody Unnamed Creek 1361.7

Main Drainage Yukon River Tributary to Tanana River

Figure 3 Northwest Alignment Sheet 108

Identification Nos: NPSI 5-183 NPMP 605.4

Alaska Highway Milepost AHMP 1361.7

USGS Map Reference Mt. Hayes, Ak. T 22N R 7E Sec 20 & 29

Site Access On foot from Alaska Highway

Section Surveyed From NAPLINE crossing to 75 m downstream of Alaska Highway (approximately 350 m)

ASSESSMENT

Unnamed Creek 1361.7 is a small muskeg drainage which flows east from the NAPLINE crossing and is crossed by the Alaska Highway before emptying into Dot Lake. The slow-flowing humic-stained water was contained in a channel that rarely exceeded 1.0 m in width. The stream is bordered by tussocks of willow and dwarf birch, *Equisetum*, *Eriophorum* and small spruce. Along the NAPLINE corridor and at the Alaska Highway the channel forms a number of ponds up to 1.5 m deep.

This stream does not appear to support fish in the vicinity of the NAPLINE crossing. Electrofishing 200 m of pond and stream channel from the NAPLINE downstream to below the Alaska Highway yielded no fish during present investigations. Other studies have listed northern pike and grayling as present in Dot Lake but not in this inlet drainage (Ref. 5, 10 & 26). Perhaps fish access into the stream is blocked near the lake.

FISH

Date 25 June 1979

Fish Present None

Gear/Effort: EF(200m)

Species Present:	Quantity Fry	Quantity Other	Size Range (mm) Fry	Size Range (mm) Other
None				

PHYSICAL CONDITIONS

Date	24 June 1979
Channel Width (m)	0.5-1.0
Flood Plain Width (m)	NA
Water Depth (cm)	15-30
Discharge (m^3/s)	0.02 (floating chip method)
D.O. (mg/l)	7
Temperature (^oC)	11
Conductivity (µmhos/cm)	250
pH	7.3
Color	Slightly humic-stained
Turbidity	Clear
Bottom Type	Mud/organic mat
Fish Block(s)	Vegetation in muskeg area and lack of defined channels prevents fish access to NAPLINE

SPRING SURVEY FORM

WATERBODY

Waterbody Unnamed Creek 1362.0

Main Drainage Yukon River Tributary to Tanana River

Figure 3 Northwest Alignment Sheet 108

Identification Nos: NPSI 5-182 NPMP 605.2

Alaska Highway Milepost AHMP 1362

USGS Map Reference Mt. Hayes, Ak. T 22N R 7E Sec 29, 28 & 21

Site Access On foot from the Alaska Highway

Section Surveyed From 25 m downstream of Alaska Highway to the NAPLINE crossing

ASSESSMENT

Unnamed Creek 1362.0 is a small, low-lying muskeg drainage with little to no flow and a few isolated pools near the proposed NAPLINE corridor. A distinct channel was not visible between the NAPLINE and the highway. This stream drains the same muskeg area as 1361.7.

This stream does not support fish in the vicinity of the NAPLINE crossing. Fish access to infrequently ponded water is prevented by the absence of connecting channels between the Tanana and areas upstream near the NAPLINE. Previous investigations (Ref. 2) agreed with these findings.

FISH

Date 25 June 1979

Fish Present None

Gear/Effort: EF(100m)

Species Present:	Quantity		Size Range (mm)	
	Fry	Other	Fry	Other
None				

PHYSICAL CONDITIONS

Date	25 June 1979
Channel Width (m)	Undefined
Flood Plain Width (m)	Same
Water Depth (cm)	Not measurable
Discharge (m^3/s)	Negligible
D.O. (mg/l)	5.0
Temperature (^oC)	13 0
Conductivity (µmhos/cm)	220
pH	7.0
Color	Slightly humic-stained
Turbidity	Clear
Bottom Type	Mud
Fish Block(s)	Low lying muskeg area prevents fish passage to NAPLINE area

SPRING SURVEY FORM

WATERBODY

Waterbody Unnamed Creek 1364.4

Main Drainage Yukon River Tributary to Tanana River

Figure 3 Northwest Alignment Sheet 107

Identification Nos: NPSI 5-181 NPMP 603.1

Alaska Highway Milepost AHMP 1364.4

USGS Map Reference Mt. Hayes, Ak. T 22N R 6E Sec 24

Site Access On foot from Alaska Highway

Section Surveyed From 125 m upstream to 100 m downstream from NAPLINE (approximately 250 m)

ASSESSMENT

Unnamed Creek 1364.4 is a small (1-4 m wide) stream which forms two large ponds; one 20 m downstream from the NAPLINE crossing and the other just downstream from the Alaska Highway. These ponds are approximately 350 m^2 in surface area and 1.5 m deep. Aquatic vegetation is abundant in the ponds as well as the stream channel. Sunken logs and organic debris further contribute to potential fish cover. The presence of a 72-in corrugated metal pipe (cmp) and a 48" cmp at the highway may indicate periodically high flow.

Fish use of this stream during spring appears to be low to non-existent although habitat was considered good. Previous fisheries investigations gave similar results (Ref. 2). Fish access may be impeded by log jams and debris downstream from the highway and by culverts on the Alaska Highway which have a 0.1 m fall at the outlet.

FISH

Date 25 June 1979

Fish Present: None

Gear/Effort: EF(100m)

Species Present:	Quantity		Size Range (mm)	
	Fry	Other	Fry	Other
None				

PHYSICAL CONDITION

Date	25 June 1979
Channel Width (m)	1-4
Floodplain Width (m)	1-4
Water Depth (cm)	20-150
Discharge (m^3/s)	0.02
D.O. (mg/ℓ)	8
Temperature (°C)	10.0
Conductivity (μmhos/cm)	40
pH	6.8
Color	Slightly humic-stained
Turbidity	Clear
Bottom Type	Mud with some gravel & cobble
Fish Block(s)	Possible natural barrier (falls 0.4 m high) 75 m upstream of NAPLINE. Highway culvert (0.1 m spill distance) may also impede fish passage (0.1 m fall at outlet)

SPRING SURVEY FORM

WATERBODY

Waterbody Sam Creek

Main Drainage Yukon River Tributary to Tanana River

Figure 3 Northwest Alignment Sheet 107

Identification Nos: NPSI 5-180 NPMP 601.6

Alaska Highway Milepost AHMP 1365.9

USGS Map Reference Mt. Hayes, Ak. T 22N R 6E Sec 14

Site Access On foot from Alaska Highway

Section Surveyed From 100 m upstream from NAPLINE to 150 m downstream from Alaska Highway (approximately 400 m)

ASSESSMENT

Sam Creek is a small, spring-fed stream that originates from springs and ponds in a large marsh area north of the Alaska Highway. Sam Creek is reported to cross the Alaska Highway at milepost 1365.9 and then parallel the highway and the Haines Products Pipeline for several miles before emptying into the Tanana River. However, Sam Creek no longer has an active stream channel at the Alaska Highway. Only vague remnants of a previous drainage exist in the NAPLINE area and there are no drainage structures at the Alaska Highway. Sam Creek was also reported to have a dry stream bed at the Alaska Highway in July 1976 (Ref. 6).

Sam Creek at the NAPLINE crossing is not a fish stream, although grayling, northern pike, round whitefish and longnose sucker are reported further downstream (Ref. 10).

FISH

Date 25 June 1979

Fish Present None

Gear/Effort: Visual Observation

Species Present:

	Quantity		Size Range (mm)	
	Fry	Other	Fry	Other
None				

PHYSICAL CONDITIONS

:e	25 June 1979
nnel Width (m)	NA; no channel
od Plain Width (m)	20-40
:r Depth (cm)	0
harge (m^3/s)	0
(mg/l)	NA
:rature (^oC)	NA
ictivity (µmhos/cm)	NA
	NA
	NA
lity	NA
Type	NA
lock(s)	No drainage structure present at Alaska Highway

SPRING SURVEY FORM

WATERBODY

Waterbody Unnamed Creek 1369.1

Main Drainage Tanana River Tributary to Sam Creek

Figure 3 Northwest Alignment Sheet 106

Identification Nos: NPSI 5-179 NPMP 598.4

Alaska Highway Milepost AHMP 1369.1

USGS Map Reference Mt. Hayes, Ak. T 22N R 6E Sec 17

Site Access On foot from Alaska Highway

Section Surveyed From culvert outfall pool below Alaska Highway upstream to 50 m above the NAPLINE crossing (approximately 100 m)

ASSESSMENT

Unnamed Creek 1369.1 is a small, humic-stained stream which drains the north face of Knob Ridge and empties into Sam Creek north of the Alaska Highway. Its channel is 1-3 m wide and the bottom is composed primarily of mud and silt. Its banks are steep, 1.5-2.5 m high, and well vegetated. *Equisetum* is common near the waters edge while willow, birch and spruce line the banks. This stream crosses the Alaska Highway through a perched wooden culvert that probably serves as an effective fish block year-round. The spill distance from the bottom of the culvert to the stream surface during present investigations was 1.0 m.

Fish were not found in Unnamed Creek 1369.1 between the Alaska Highway and the NAPLINE. This area provides adequate fish habitat but is not used by fish due to the aforementioned fish block. Similarly, no fish were found in this area in July 1976 (Ref. 6).

Downstream from the Alaska Highway, the stream is a rearing area for grayling, round whitefish, longnose sucker and slimy sculpin (Ref. 6 & 54). Large numbers of fish were captured in the culvert outfall pool in July of 1976 but no information as to whether these fish were fry, juveniles, or adults was apparently recorded (Ref. 6). In general, little is known about this stream below the Alaska Highway culvert outfall pool because previous investigations have emphasized only this pool and upstream areas and present investigations were limited to the same area by access restrictions.

FISH

Date 25 June 1979

Fish Present: Yes

Gear/Effort: EF(150m)

Species Present:	Quantity		Size Range (mm)	
	Fry	Other	Fry	Other
Slimy sculpin		4		57-76
Grayling		1		200

PHYSICAL CONDITION

Date	25 June 1979
Channel Width (m)	1-3
Floodplain Width (m)	5
Water Depth (cm)	20-60
Discharge (m^3/s)	0.1
D.O. (mg/ℓ)	10
Temperature (°C)	7.0
Conductivity (μmhos/cm)	50
pH	7.0
Color	Slightly humic-stained
Turbidity	Clear
Bottom Type	Mud/Silt
Fish Block(s)	Alaska Highway culvert is a barrier to fish passage (1 m drop at outfall)

SPRING SURVEY FORM

WATERBODY

Waterbody Berry Creek

Main Drainage Tanana River Tributary to Johnson Slough

Figure 3 Northwest Alignment Sheet 106

Identification Nos: NPSI 5-178 NPMP 596.2

Alaska Highway Milepost AHMP 1371.4

USGS Map Reference Mt. Hayes, Ak. T 22N R 5E Sec 13

Site Access On foot from Alaska Highway

Section Surveyed From 300 m upstream to 1000 m downstream from Alaska Highway

ASSESSMENT

Berry Creek originates from glaciers behind the Macomb Plateau and flows northerly across the Alaska Highway into Johnson Slough. Fed primarily by springs and summer runoff, the flow of this olive green, slightly turbid stream is seasonal, with little winter flow (Ref. 10 & 55). Berry Creek flows over a cobble, gravel and pebble bottom through an 8-13 m wide channel. The channel is bordered by 1-2 m high banks. Primary vegetation includes willow, alder and spruce.

The benthic macroinvertebrate fauna of Berry Creek is extremely rich including heptageniid mayfly nymphs, chloroperlid stoneflies, baetid and ephemerellid mayflies, blackflies and midges (Ref. 6).

Numerous deep pools and shallow riffles provide excellent fish habitat. Berry Creek is a rearing area during spring and summer for juvenile and adult round whitefish, longnose sucker, burbot, Dolly Varden and slimy sculpin (Ref. 6 & 54). This stream is a nursery and rearing area for grayling fry and juveniles. Berry Creek is also a migration route during spring for species utilizing its upper reaches. In addition, this stream supports a light grayling fishery near the Alaska Highway during the open-water months (Refs. 6, 10 & 54).

FISH

Date 26 June 1979

Fish Present Yes

Gear/Effort: EF(400m)
1AN(1h)

Species Present:	Quantity Fry	Quantity Other	Size Range (mm) Fry	Size Range (mm) Other
Grayling	6	6	15-20	89-191
Round Whitefish		9		118-347
Longnose Sucker		3		298-334
Slimy Sculpin		18		25-88

PHYSICAL CONDITIONS

Date	26 June 1979
Channel Width (m)	7.5-12.0
Flood Plain Width (m)	12-16.5
Water Depth (cm)	20-80
Discharge (m^3/s)	2.7
D.O. (mg/l)	10
Temperature (^oC)	10.0
Conductivity (µmhos/cm)	40
pH	7.0
Color	Olive Green
Turbidity	Slightly turbid
Bottom Type	Cobble/gravel; scattered boulders; sand/silt in standing water
Fish Block(s)	None

SPRING SURVEY FORM

WATERBODY

Waterbody Sears Creek

Main Drainage Tanana River Tributary to Johnson Slough

Figure 3 Northwest Alignment Sheet 106

Identification Nos: NPSI 5-177 NPMP 593.1

Alaska Highway Milepost AHMP 1374.4

USGS Map Reference Mt. Hayes, Ak. T 22N R 5E Sec 16

Site Access On foot from Alaska Highway

Section Surveyed From 100 m upstream of NAPLINE to 100 m downstream of Alaska Highway bridge (approximately 225 m)

ASSESSMENT

Sears Creek is a small, slightly humic-stained stream which flows north from the foothills of the Macomb Plateau to its confluence with Johnson slough. Channel width varies from 2-3 m. It is a predominantly shallow, slow-flowing stream with gravel substrates in riffle areas and sand, mud and detritus in pools. The channel has numerous log jams that may impede fish movement within the stream. Banks are 0.5-1.5 m high and bordered by alder and willow.

Both juvenile grayling and longnose sucker were captured in the area of the NAPLINE crossing. Fish previously reported to use this stream include grayling and Dolly Varden (Ref. 6, 9 & 10).

FISH

Date 26 June 1979

Fish Present Yes

Gear/Effort: EF(200m)

Species Present:	Quantity		Size Range (mm)	
	Fry	Other	Fry	Other
Longnose Sucker		4		105-123
Grayling		2		111-115

PHYSICAL CONDITIONS

Date	26 June 1979
Channel Width (m)	2-3
Flood Plain Width (m)	Same
Water Depth (cm)	15-60
Discharge (m^3/s)	0.05
D.O. (mg/l)	11
Temperature (^oC)	6.0
Conductivity (µmhos/cm)	75
pH	7.1
Color	Very lightly humic-stained
Turbidity	Clear
Bottom Type	Gravel in riffles/ sand & mud in pools
Fish Block(s)	Numerous natural log jams may impede fish movement

SPRING SURVEY FORM

WATERBODY

Waterbody Unnamed Creek 1377.0

Main Drainage Tanana River Tributary to Johnson Slough

Figure 3 Northwest Alignment Sheet 105

Identification Nos: NPSI 5-176.01 NPMP 590.6

Alaska Highway Milepost AHMP 1377.0

USGS Map Reference Mt. Hayes, Ak. T 14S R 16E Sec 24

Site Access On foot from Alaska Highway

Section Surveyed Alaska Highway upstream to NAPLINE (approximately 50 m)

ASSESSMENT

Unnamed Creek 1377.0 flows north to Johnson Slough through a narrow (1 m wide) channel bordered by low banks heavily vegetated with overhanging willow. The bottom is mud and detritus with numerous riffle areas of gravel and sand.

Unnamed Creek 1377.0 was dry during present investigations and did not show signs of recent flow. Since it is unlikely that this stream contains water except during periods of high spring runoff, fish use during any time of the year is unlikely.

FISH

Date 26 June 1979

Fish Present None

Gear/Effort: Visual Observations

Species Present:	Quantity		Size Range (mm)	
	Fry	Other	Fry	Other
None				

PHYSICAL CONDITIONS

Date	26 June 1979
Channel Width (m)	0.3-1.0
Flood Plain Width (m)	Same
Water Depth (cm)	None; creek was dry
Discharge (m^3/s)	NA
D.O. (mg/l)	NA
Temperature (^oC)	NA
Conductivity (µmhos/cm)	NA
pH	NA
Color	NA
Turbidity	NA
Bottom Type	Gravel & riffle areas; mud & detritus in pools and holes
Fish Block(s)	None

SPRING SURVEY FORM

WATERBODY

Waterbody Dry Creek

Main Drainage Tanana River Tributary to Johnson Slough

Figure 3 Northwest Alignment Sheet 105

Identification Nos: NPSI 5-176 NPMP 589.5

Alaska Highway Milepost AHMP 1378.1

USGS Map Reference Mt. Hayes T 14S R 16E Sec 24

Site Access On foot from Alaska Highway

Section Surveyed Highway crossing to 300 m above NAPLINE (approximately 500 m)

ASSESSMENT

Dry Creek flows north into Johnson Slough through a 6-15 m wide channel bordered by steep, incised, well-vegetated banks 2-3 m high. The bottom consists primarily of gravel with occasional sand bar deposits. At the proposed NAPLINE crossing, flow in Dry Creek is intermittent, restricted to those periods of high spring runoff and heavy rain. Dry Creek is reported to flow year-round farther upstream (Ref. 9), and may support a resident population of fish (Ref. 6).

Dry Creek was investigated two times during May and June of 1979, and was found to be dry on both occasions. Due to the intermittent nature of the stream flow in the area of the NAPLINE, fish use in spring and summer is considered unlikely.

FISH

Date 14 May & 26 June 1979

Fish Present None

Gear/Effort: Visual Observation

Species Present:	Quantity		Size Range (mm)	
	Fry	Other	Fry	Other
None				

PHYSICAL CONDITIONS

Date	14 May & 26 June 1979
Channel Width (m)	6-14
Flood Plain Width (m)	Same
Water Depth (cm)	Dry on both sampling days
Discharge (m^3/s)	NA
D.O. (mg/l)	NA
Temperature (^oC)	NA
Conductivity (μmhos/cm)	NA
pH	NA
Color	NA
Turbidity	NA
Bottom Type	Gravel and sand
Fish Block(s)	None

SPRING SURVEY FORM

WATERBODY

Waterbody Johnson River

Main Drainage Yukon River Tributary to Tanana River

Figure 3 Northwest Alignment Sheet 105

Identification Nos: NPSI 5-175 NPMP 587

Alaska Highway Milepost AHMP 1380.5

USGS Map Reference Mt. Hayes, Ak. T 14S R 16E Sec 16

Site Access On foot from Alaska Highway

Section Surveyed From NAPLINE crossing downstream to 300 m below Alaska Highway bridge (approximately 450 m)

ASSESSMENT

The Johnson River is a large, braided, glacial stream originating from the Johnson Glacier in the Alaska Range and flowing northward into the Tanana River. Its waters are turbid during summer, moderately turbid during spring and fall, and clear under winter ice cover. The stream bottom is primarily gravel while the floodplain is composed of sand and silt. The Johnson River is bounded by steep banks 20-30 m high.

Fish utilization of the Johnson River during spring appears to be low. However, this stream is a probable migration route for fish moving to and from productive feeder streams. No fish were seen or captured during present investigations (12 May and 26 June 1979). Habitat appeared adequate for fish on 12 May but was considered less suitable on 26 June due to the high turbid flow. Although fish have never been captured in the mainstem, whitefish, Dolly Varden and grayling were captured from two small feeder streams 5-7 km upstream from the Alaska Highway (Refs. 6, 9, 54 & 55). Other species suspected to be present in the lower reaches of this river include lake chub, burbot and northern pike (Ref. 10).

FISH

Date 12 May and 26 June 1979

Fish Present: None

Gear/Effort: Seine (4 hauls @ 25 m/haul); 26 June 1979
EF(100m); 12 May 1979
15mGN(108.5h); 12 May 1979
Seine (100 m); 12 May 1979

Species Present:	Quantity		Size Range (mm)	
	Fry	Other	Fry	Other
None				

PHYSICAL CONDITION

Date	12 May 1979
Channel Width (m)	18-30
Floodplain Width (m)	≈250
Water Depth (cm)	30-150
Discharge (m^3/s)	10.2
D.O. (mg/ℓ)	10.2
Temperature (°C)	8.0
Conductivity (μmhos/cm)	200
pH	8.1
Color	Glacial green
Turbidity	Moderately turbid
Bottom Type	Gravel, sand, silt
Fish Block(s)	None

SPRING SURVEY FORM

WATERBODY

Waterbody Little Gerstle River

Main Drainage Yukon River Tributary to Tanana River

Figure 3 Northwest Alignment Sheet 103

Identification Nos: NPSI 5-174 NPMP 579.3

Alaska Highway Milepost AHMP 1388.4

USGS Map Reference Mt. Hayes, Ak. T 13S R 15E Sec 14

Site Access On foot from Alaska Highway

Section Surveyed From NAPLINE crossing downstream 300 m

ASSESSMENT

The Little Gerstle River is a fairly large (8-10 m wide) stream of moderate gradient flowing northeast into the Tanana River. The greenish, glacially-turbid water of this creek flows through an often braided channel bordered by 1 m high sand and gravel banks vegetated with alders and willow. The stream bottom is primarily cobble mixed with areas of sand and gravel. In the area of the NAPLINE the 100 m wide floodplain is bordered by cottonwoods and aspens.

Present investigations indicate that Little Gerstle River is an important fish stream offering fair fish habitat for rearing juvenile and adult grayling, round whitefish, longnose sucker and slimy sculpin as well as a spawning area for grayling.

FISH

Date 27 June 1979

Fish Present: Yes

Gear/Effort: EF(300m)

Species Present:	Quantity		Size Range (mm)	
	Fry	Other	Fry	Other
Grayling	1	5	25	91-98
Round whitefish		1		120
Slimy sculpin		2		58-63
Longnose sucker		19		64-126

PHYSICAL CONDITION

Date	27 June 1979
Channel Width (m)	8-10
Floodplain Width (m)	30
Water Depth (cm)	30-90
Discharge (m^3/s)	2.1
D.O. (mg/ℓ)	10.0
Temperature (°C)	10.0
Conductivity (μmhos/cm)	150
pH	7.8
Color	Greenish
Turbidity	Moderately turbid glacial silt
Bottom Type	Cobble; gravel; silt
Fish Block(s)	None

SPRING SURVEY FORM

WATERBODY

Waterbody Gerstle River

Main Drainage Yukon River Tributary to Tanana River

Figure 3 Northwest Alignment Sheet 102

Identification Nos: NPSI 5-172 NPMP 575.0

Alaska Highway Milepost AHMP 1393.0

USGS Map Reference Mt. Hayes, Ak. T 13S R 15E Sec 6

Site Access On foot from Alaska Highway

Section Surveyed From 150 m upstream to 50 m downstream of NAPLINE crossing

ASSESSMENT

The Gerstle River is a large, braided, glacial stream that originates at the Gerstle and Riley creek glaciers, high in the Alaska Range. Although the floodplain is approximately 600 m in width, the glacially-turbid water is confined to multiple small channels with cobble, gravel, sand and silt substrates. The absence of standing vegetation and presence of scattered deadwood within the floodplain is indicative of the magnitude of flooding and ice scouring characteristics of glacial floodplains. Outside the active floodplain, the primary vegetation consisted of poplar and alder intermixed with tundra and spruce forest.

No fish use was documented in the present or previous surveys (Ref. 6). However, local residents believe that this drainage may receive periodic use by grayling and Dolly Varden (Ref. 6).

FISH

Date 27 June 1979

Fish Present None

Gear/Effort: EF(300m)
Seine (5 hauls @ 20m/haul)

Species Present:	Quantity		Size Range (mm)	
	Fry	Other	Fry	Other
None				

PHYSICAL CONDITIONS

Date	27 June 1979
Channel Width (m)	50
Flood Plain Width (m)	600
Water Depth (cm)	60
Discharge (m^3/s)	22.5
D.O. (mg/l)	10
Temperature (^oC)	13.5
Conductivity (µmhos/cm)	160
pH	8.3
Color	Brown
Turbidity	Highly turbid
Bottom Type	Cobble/gravel in channel; sand/silt in floodplain
Fish Block(s)	None

SPRING SURVEY FORM

WATERBODY

Waterbody Sawmill Creek

Main Drainage Tanana River Tributary to Clearwater Creek

Figure 3 Northwest Alignment Sheet 100

Identification Nos: NPSI 5-171 NPMP 563.8

Alaska Highway Milepost AHMP 1403.9

USGS Map Reference Mt. Hayes, Ak. T 12S R 13E Sec 5

Site Access On foot from Alaska Highway; Helicopter, Alaska Highway to 11 miles upstream

Section Surveyed At Alaska Highway crossing

ASSESSMENT

Sawmill Creek is a small, intermittent stream that flows northeast across the Alaska Highway to its confluence with Clearwater Creek. It is reported to go subterranean some 4 km above the Alaska Highway crossing (Ref. 6). During aerial surveys in 1979, flowing water was found in an area extending from approximately 5 km upstream of the Alaska Highway to a point approximately 18 km farther upstream, near the foothills.

Sawmill Creek was dry at the NAPLINE crossing during surveys in June and July 1979, and appears to contain water only during high spring runoff and heavy rains. Due to intermittent flow and resulting unstable habitat at the NAPLINE crossing, fish habitat was considered to be poor or non-existent.

FISH

Date 14 May and 26 June 1979

Fish Present: None

Gear/Effort: No water present during either survey

Species Present:	Quantity		Size Range (mm)	
	Fry	Other	Fry	Other
None				

PHYSICAL CONDITION

Date	14 May and 26 June 1979
Channel Width (m)	10-15
Floodplain Width (m)	Same
Water Depth (cm)	NA
Discharge (m^3/s)	NA
D.O. (mg/ℓ)	NA
Temperature (°C)	NA
Conductivity (μmhos/cm)	NA
pH	NA
Color	NA
Turbidity	NA
Bottom Type	Sand/gravel
Fish Block(s)	NA

SPRING SURVEY FORM

WATERBODY

Waterbody Rhoads Creek

Main Drainage Tanana River Tributary to Sawmill Creek

Figure 3 Northwest Alignment Sheet 100

Identification Nos: NPSI 5-170 NPMP 560.1

Alaska Highway Milepost AHMP 1407.6

USGS Map Reference Mt. Hayes, Ak. T 11S R 12E Sec 26

Site Access On foot from Alaska Highway

Section Surveyed Alaska Highway crossing

ASSESSMENT

Rhoads Creek, at the NAPLINE, should not be considered a fish stream due to absence of habitat. The stream was visited on 12 May and 26 June 1979, but water was not present at the Alaska Highway on either survey. During aerial surveys, 26 June 1979, this stream was not visible except at the highway culvert.

FISH

Date 12 May and 26 June 1979

Fish Present None

Gear/Effort: Visual observation

Species Present:	Quantity Fry	Quantity Other	Size Range (mm) Fry	Size Range (mm) Other
None				

PHYSICAL CONDITIONS

Date	12 May and 26 June 1979
Channel Width (m)	Unknown
Flood Plain Width (m)	NA
Water Depth (cm)	0
Discharge (m^3/s)	0
D.O. (mg/l)	NA
Temperature (^oC)	NA
Conductivity (µmhos/cm)	NA
pH	NA
Color	NA
Turbidity	NA
Bottom Type	Sand
Fish Block(s)	Alaska Highway Culvert

SPRING SURVEY FORM

WATERBODY

Waterbody Granite Creek

Main Drainage Tanana River Tributary to Sawmill Creek

Figure 3 Northwest Alignment Sheet 99

Identification Nos: NPSI 5-169 NPMP 558.4

Alaska Highway Milepost AHMP 1409.2

USGS Map Reference Mt. Hayes, Ak. T 11S R 12E Sec 22

Site Access On foot from Alaska Highway

Section Surveyed From Alaska Highway crossing upstream 3 km

ASSESSMENT

Granite Creek drains an area north and west of the Granite Mountains and flows north across the Alaska Highway into Sawmill Creek. Far above the Alaska Highway (at least 5 km), stream discharge is reported to be considerable but the stream becomes subterranean before reaching the Alaska Highway. Discharge was 5.182 m^3/sec some 31 km upstream from the Alaska Highway in July 1976 (Ref. 6). No fish were encountered in the upper reaches of this stream but habitat appeared to be good and food abundant (Ref. 6). Granite Creek at the Alaska Highway, however, is a small intermittent stream thought to flow above ground only during spring runoff and heavy rains. This stream was dry during present investigations (14 May and 26 June 1979) and throughout July 1976 (Ref. 6). Furthermore, a definable stream channel was not visited at the highway during aerial surveys on 26 June 1979. Fish utilization of Granite Creek in the NAPLINE area during spring appears to be low to non-existent.

FISH

Date 14 May and 26 June 1979

Fish Present None

Gear/Effort: Visual observations

Species Present:	Quantity		Size Range (mm)	
	Fry	Other	Fry	Other
None				

PHYSICAL CONDITIONS

Date	14 May and 26 June 1979
Channel Width (m)	No channel apparent
Flood Plain Width (m)	NA
Water Depth (cm)	NA
Discharge (m^3/s)	0
D.O. (mg/l)	NA
Temperature (^oC)	NA
Conductivity (µmhos/cm)	NA
pH	NA
Color	NA
Turbidity	NA
Bottom Type	NA
Fish Block(s)	NA

SPRING SURVEY FORM

WATERBODY

Waterbody South Fork Minton Creek #4

Main Drainage Salcha River Tributary to McCoy Creek

Figure 2 Northwest Alignment Sheet 91

Identification Nos: NPSI 5-161 NPMP 516.3

Alaska Highway Milepost NA

USGS Map Reference Big Delta, Ak. T 6S R 7E Sec 13

Site Access Helicopter

Section Surveyed 50 m upstream and 50 m downstream from NAPLINE crossing

ASSESSMENT

South Fork of Minton Creek #4 at this location is a small stream 1-2.5 m in width with incised banks. Some algae was present on the gravel, rock and sand substrate. Within 50 m downstream of this sample site, the stream flows through a wide tundra bog area that may constitute a fish block particularly during periods of low water.

The upstream portions of Minton Creek do not appear to be used by fish, especially during low water years. Fish may, however, pass upstream of this site occasionally depending on water conditions. Fish were not seen or captured during present field surveys.

Minton Creek crosses the workpad twice in this vicinity which is not clearly evident on current alignment sheets. Both crossings are low water crossings and do not pose fish blocks. Fish passage was not required of Alyeska pipeline above this approximate location (Ref. 11).

FISH

Date 26 June 1979

Fish Present: None

Gear/Effort: EF(300m)

Species Present:	Quantity		Size Range (mm)	
	Fry	Other	Fry	Other
None				

PHYSICAL CONDITION

Date	26 June 1979
Channel Width (m)	2.4
Floodplain Width (m)	2.4
Water Depth (cm)	11-18
Discharge (m^3/s)	0.02
D.O. (mg/ℓ)	9.8
Temperature (°C)	5.5
Conductivity (μmhos/cm)	130
pH	7.5
Color	Clear
Turbidity	Colorless
Bottom Type	Gravel/sand
Fish Block(s)	This stream flows through tundra downstream of the sample site which may constitute a fish block especially during periods of low water

SPRING SURVEY FORM

WATERBODY

Waterbody South Fork Minton Creek #7

Main Drainage Salcha River Tributary to McCoy Creek

Figure 2 Northwest Alignment Sheet 92

Identification Nos: NPSI 5-161 NPMP 515.5

Alaska Highway Milepost NA

USGS Map Reference Big Delta, Ak. T 6S R 7E Sec 13

Site Access Helicopter

Section Surveyed NAPLINE crossing

ASSESSMENT

The South Fork of Minton Creek #7 is a small stream 0.5-1.5 m in width. The stream channel is heavily incised and overgrown with willow mixed with stunted black spruce.

The proposed NAPLINE crosses headwater regions of Minton Creek which may occasionally be used by fish. In the vicinity of the three downstream NAPLINE crossings the stream may be used for spawning and rearing by grayling. During 1979 spring surveys, a large grayling was caught near this crossing and previous surveys also indicate that this area is used by grayling (Ref. 11). Further upstream in the vicinity of the other NAPLINE crossings, the creek is probably used infrequently by fish due to limited flows.

FISH

Date 26 June 1979

Fish Present: Yes

Gear/Effort: EF(50m)

Species Present:	Quantity		Size Range (mm)	
	Fry	Other	Fry	Other
Grayling*		1		300

*No sexual products expressed by milking

PHYSICAL CONDITION

Date	26 June 1979
Channel Width (m)	2.3
Floodplain Width (m)	2.3
Water Depth (cm)	7-12
Discharge (m^3/s)	0.1
D.O. (mg/ℓ)	10.0
Temperature (°C)	10.0
Conductivity (μmhos/cm)	109
pH	7.5
Color	Colorless
Turbidity	Clear
Bottom Type	Mud
Fish Block(s)	None visible at this site

SPRING SURVEY FORM

WATERBODY

Waterbody North Fork Minton Creek #1

Main Drainage Salcha River Tributary to McCoy Creek

Figure 2 Northwest Alignment Sheet 91

Identification Nos: NPSI 5-161 NPMP 515.4

Alaska Highway Milepost NA

USGS Map Reference Big Delta, Ak. T 6S R 7E Sec 13

Site Access Helicopter

Section Surveyed From 100 m upstream of crossing to 100 m downstream

ASSESSMENT

The North Fork of Minton Creek #1 is a small shallow stream 0.3-1.0 m wide with water depths less than 15 cm. The stream channel is heavily overgrown with willow and stunted spruce and is often not visible due to extensive braiding. Where the channel is clearly visible, the substrate consists of mud and silt.

The mid- to upper stretches of this North Fork do not appear to be used by fish due to numerous waterfalls and brush piles that are barriers to fish movement. The lower 200-300 m above the confluence with the South Fork may be used by grayling or other species, especially during high water periods. Grayling were observed during previous surveys in the lowest section of the North Fork below the furthest downstream culvert (Ref. 11). Fish passage was also required of Alyeska just above #4 at 10395+00 (Ref. 11).

FISH

Date 26 June 1979

Fish Present: None

Gear/Effort: EF(120m) - 80 m below crossing to 40 m above crossing to the waterfall

Species Present:	Quantity		Size Range (mm)	
	Fry	Other	Fry	Other
None				

PHYSICAL CONDITION

Date	26 June 1979
Channel Width (m)	1-2 m
Floodplain Width (m)	1-2 m
Water Depth (cm)	5-12
Discharge (m^3/s)	0.03
D.O. (mg/ℓ)	11.2
Temperature (°C)	6.0
Conductivity (μmhos/cm)	75
pH	7.0
Color	Clear
Turbidity	Clear
Bottom Type	Gravel at the workpad; mud elsewhere
Fish Block(s)	45 cm high waterfall 40 m above crossing

SPRING SURVEY FORM

WATERBODY

Waterbody North Fork Minton Creek #2

Main Drainage Salcha River Tributary to McCoy Creek

Figure 2 Northwest Alignment Sheet 91

Identification Nos: NPSI 5-161 NPMP 514.8

Alaska Highway Milepost NA

USGS Map Reference Big Delta, Ak. T 6S R 7E Sec 14

Site Access Helicopter

Section Surveyed From 50 m downstream to 50 m upstream of NAPLINE crossing

ASSESSMENT

The North Fork of Minton Creek #2 is a small shallow stream 0.3-1.0 m wide with water depths less than 10 cm. The stream channel is heavily overgrown with willow and stunted spruce and is often not visible due to extensive braiding. Where the channel is clearly visible, the substrate consists of mud and silt.

The mid- to upper stretches of this stream do not appear to be used by fish due to numerous waterfalls and brush piles that are barriers to fish movements. The lower 200-300 m above the confluence with the South Fork may be used by grayling or other species, especially during high water periods. Grayling were observed during previous surveys in the lowest section of the North Fork below the furthest downstream culvert (Ref. 11).

FISH

Date 26 June 1979

Fish Present: None

Gear/Effort: EF(100m) - 50 m downstream to 50 m upstream of crossing

Species Present:	Quantity		Size Range (mm)	
	Fry	Other	Fry	Other
None				

PHYSICAL CONDITION

Date	26 June 1979
Channel Width (m)	~ 0.3-3 m at NAPLINE
Floodplain Width (m)	~ 0.3-3 m at NAPLINE
Water Depth (cm)	4-7
Discharge (m^3/s)	0.03
D.O. (mg/ℓ)	10.2
Temperature (°C)	6.5
Conductivity (μmhos/cm)	58
pH	7.5
Color	Clear
Turbidity	Clear
Bottom Type	Sand/gravel at workpad; mud/silt elsewhere
Fish Block(s)	Numerous 0.3-0.4 m high waterfalls; stream also occasionally braids out through the tundra

SPRING SURVEY FORM

WATERBODY

Waterbody Gold Run Creek

Main Drainage Salcha River Tributary to McCoy Creek

Figure 2 Northwest Alignment Sheet 91

Identification Nos: NPSI 5-160 NPMP 512.7

Alaska Highway Milepost NA

USGS Map Reference Big Delta, Ak. T 6S R 7E Sec 3

Site Access Helicopter

Section Surveyed From 40 m upstream to 60 m downstream of NAPLINE

ASSESSMENT

Gold Run Creek, at the proposed NAPLINE crossing, is a small tundra stream 0.5-1.1 m in width. Substrate consisted primarily of mud with submerged logs and debris. Many of these log jams extended 0.3-0.4 m out of the water, thus creating fish barriers.

Grayling were caught 80 m below the Alyeska crossing in September 1975 (Ref. 11), but at the NAPLINE crossing the stream was considered poor fish habitat due to numerous natural fish barriers and high velocity waters.

FISH

Date 26 June 1979

Fish Present None

Gear/Effort: EF(100m)

Species Present:	Quantity		Size Range (mm)	
	Fry	Other	Fry	Other
None				

PHYSICAL CONDITIONS

Date	26 June 1979
Channel Width (m)	1.3 (at flow measurement site)
Flood Plain Width (m)	Same
Water Depth (cm)	12-15
Discharge (m^3/s)	0.07
D.O. (mg/l)	10.0
Temperature (^oC)	4.0
Conductivity (μmhos/cm)	50
pH	8.0
Color	Clear
Turbidity	Clear
Bottom Type	Mud/sand; boulders near workpad
Fish Block(s)	Numerous 0.3-0.4m high waterfalls and log jams

SPRING SURVEY FORM

WATERBODY

Waterbody Small Creek

Main Drainage Salcha River Tributary to McCoy Creek

Figure 2 Northwest Alignment Sheet 91

Identification Nos: NPSI 5-159.02 NPMP 511.3

Alaska Highway Milepost NA

USGS Map Reference Big Delta, Ak. T 6S R 7E Sec 12 & 13

Site Access Helicopter

Section Surveyed From 50 m upstream of NAPLINE to 25 m below NAPLINE

ASSESSMENT

Small Creek is a narrow stream 0.4-0.6 m in width with a sand, cobble and gravel substrate. The NAPLINE crossing is located in a high elevation region of Small Creek where stream gradient is steep. Waterfalls 0.3-0.4 m high are common in this area. Water velocities varied from an estimated 1-1.5 m^3/sec between waterfalls. Incised banks were generally 1.5-2.5 m high and covered with willow and birch.

Small Creek does not provide good fish habitat due to the waterfalls, high velocity water and log jams common in the crossing area. Results of present investigation agree with earlier surveys (Ref. 11).

FISH

Date 26 June 1979

Fish Present None

Gear/Effort: EF(75m)

Species Present:	Quantity		Size Range (mm)	
	Fry	Other	Fry	Other
None				

PHYSICAL CONDITIONS

Date	26 June 1979
Channel Width (m)	0.8
Flood Plain Width (m)	0.8
Water Depth (cm)	6-9
Discharge (m^3/s)	0.01
D.O. (mg/l)	11.4
Temperature (^oC)	6.0
Conductivity (µmhos/cm)	75
pH	7.5
Color	Clear
Turbidity	None
Bottom Type	Sand/cobble
Fish Block(s)	Numerous 0.3-0.4m high waterfalls below workpad (NAPLINE)

SPRING SURVEY FORM

WATERBODY

Waterbody Tributary to Small Creek

Main Drainage Tanana River Tributary to Salcha River

Figure 2 Northwest Alignment Sheet 91

Identification Nos: NPSI 5-159.01 NPMP 510.7

Alaska Highway Milepost NA

USGS Map Reference Big Delta, Ak. T 6S R 7E Sec 5

Site Access Helicopter

Section Surveyed 0.4 km upstream to 0.8 km downstream of NAPLINE

ASSESSMENT

This unnamed creek was not visible from the air or ground at the NAPLINE crossing. This crossing is approximately 0.4 km downstream of the drainage origin at an elevation of 460 m. This stream does not offer fish habitat at the NAPLINE crossing.

FISH

Date 27 June 1979

Fish Present: None

Gear/Effort: Visual observation

Species Present:	Quantity		Size Range (mm)	
	Fry	Other	Fry	Other
None				

PHYSICAL CONDITION

Date	27 June 1979
Channel Width (m)	No definable channel
Floodplain Width (m)	
Water Depth (cm)	Stream dry
Discharge (m^3/s)	
D.O. (mg/ℓ)	
Temperature (°C)	
Conductivity (μmhos/cm)	
pH	
Color	
Turbidity	
Bottom Type	Tundra vegetation
Fish Block(s)	Absence of water

SPRING SURVEY FORM

WATERBODY

Waterbody Redmond Creek

Main Drainage Tanana River Tributary to Salcha River

Figure 2 Northwest Alignment Sheet 90

Identification Nos: NPSI 5-159 NPMP 505.7

Alaska Highway Milepost NA

USGS Map Reference Big Delta, Ak. T 5S R 6E Sec 22

Site Access Helicopter

Section Surveyed From 20 m downstream of NAPLINE to 150 m upstream

ASSESSMENT

Redmond Creek is a meandering stream which flows into the Salcha River. The channel width varies from 3-6 m and has a silt, mud and gravel substrate. During the spring survey, algae was present on gravel substrates. This stream offers good pool riffle combination for fish both in numbers and depth. Pools may exceed 2 m in depth.

Redmond Creek provides important habitat to several fish species. During spring surveys, juvenile and adult grayling (including a recently-spawned male) were found at the pipeline crossing. Other fish reported in Redmond Creek include king and chum salmon, burbot, slimy sculpin and round whitefish (Ref. 11).

FISH

Date 27 June 1979

Fish Present: Yes

Gear/Effort: EF(120m)

~~1AN(0.5h)~~

Species Present:	Quantity Fry	Quantity Other	Size Range (mm) Fry	Size Range (mm) Other
Grayling*		10		150-300

*One male (298) was spawned-out

PHYSICAL CONDITION

Date	27 June 1979
Channel Width (m)	6-8
Floodplain Width (m)	6-10
Water Depth (cm)	25-39
Discharge (m^3/s)	0.6
D.O. (mg/ℓ)	7.4
Temperature (°C)	9.5
Conductivity (μmhos/cm)	95
pH	7.5
Color	Moderately humic-stained
Turbidity	Slightly turbid
Bottom Type	Sand/gravel
Fish Block(s)	None visible at NAPLINE

SPRING SURVEY FORM

WATERBODY

Waterbody Unnamed Tributary to the Salcha River

Main Drainage Tanana River Tributary to Salcha River

Figure 2 Northwest Alignment Sheet 89

Identification Nos: NPSI 4-158.03 NPMP 502.8

Alaska Highway Milepost NA

USGS Map Reference Big Delta, Ak. T 5S R 6E Sec 18

Site Access Helicopter

Section Surveyed From NAPLINE downstream approximately 2 km to Salcha River

ASSESSMENT

Unnamed Tributary of the Salcha River is an old highwater channel which has been dry for many years. The Salcha River has migrated further to the west at this site which would reduce the possibility of this drainage being flooded. At the confluence with the Salcha River, a 1.5 m high cut bank would prevent fish from moving upstream. This area does not provide fish habitat.

FISH

Date 27 June 1979

Fish Present: None

Gear/Effort: Visual observation

Species Present:	Quantity		Size Range (mm)	
	Fry	Other	Fry	Other
None				

PHYSICAL CONDITION

Date	27 June 1979
Channel Width (m)	Not definable
Floodplain Width (m)	Stream dry
Water Depth (cm)	NA
Discharge (m^3/s)	NA
D.O. (mg/ℓ)	NA
Temperature (°C)	NA
Conductivity (μmhos/cm)	NA
pH	NA
Color	NA
Turbidity	NA
Bottom Type	Grass/willow tundra where visible
Fish Block(s)	1.5 m drop at the confluence with the Salcha River

SPRING SURVEY FORM

WATERBODY

Waterbody TAPS Slough

Main Drainage Tanana River Tributary to Salcha River

Figure 2 Northwest Alignment Sheet 89

Identification Nos: NPSI 4-158.02 NPMP 501.9

Alaska Highway Milepost NA

USGS Map Reference Big Delta, Ak. T 5S R 5E Sec 13

Site Access Helicopter

Section Surveyed NAPLINE downstream to Salcha River (approximately .6 km)

ASSESSMENT

TAPS Slough is an old highwater channel of the Salcha River. The channel varied from 0-10 m in width, and was overgrown with tall grass. A few depressions in the lower end of this slough had standing and stagnant water, otherwise it was dry. A 1-m high bank at the confluence of this slough and the Salcha River would be a barrier to fish passage. This drainage does not offer stable fish habitat.

FISH

Date 27 June 1979

Fish Present: None

Gear/Effort: Visual Observation

Species Present:	Quantity		Size Range (mm)	
	Fry	Other	Fry	Other
None				

PHYSICAL CONDITION

Date	27 June 1979
Channel Width (m)	0-10 m
Floodplain Width (m)	Same
Water Depth (cm)	0 (except for pockets of standing water)
Discharge (m^3/s)	0
D.O. (mg/ℓ)	5.0
Temperature (°C)	6.5
Conductivity (μmhos/cm)	80
pH	6.5
Color	
Turbidity	
Bottom Type	Grass
Fish Block(s)	1 m drop at confluence with Salcha River

SPRING SURVEY FORM

WATERBODY

Waterbody Oxbow Slough

Main Drainage Tanana River Tributary to Salcha River

Figure 2 Northwest Alignment Sheet 89

Identification Nos: NPSI 4-157.02 NPMP 501.3

Alaska Highway Milepost NA

USGS Map Reference Big Delta, Ak. T 5S R 5E Sec 12

Site Access Helicopter

Section Surveyed From NAPLINE crossing 0.6 km downstream to the Salcha River

ASSESSMENT

Oxbow Slough is an old highwater channel of the Salcha River that is overgrown with tall grass and willow. Near the pipeline crossing, this drainage has a channel width varying 0-5 m with grass covered banks. Abandoned beaver dams are visible downstream of the NAPLINE where Oxbow Slough was dry. This drainage would not have flowing water at the NAPLINE crossing except during periods of high floods and so it should not be considered fish habitat. Approximately 800 m downstream of the crossing at the confluence with the Salcha, Oxbow Slough forms a small pool 25 m in length and 0.1-0.3 m in depth. This pool offers the only visible fish habitat throughout the length of the Slough.

FISH

Date 27 June 1979

Fish Present: None

Gear/Effort: Visual observation

Species Present:	Quantity		Size Range (mm)	
	Fry	Other	Fry	Other
None				

PHYSICAL CONDITION

Date	27 June 1979
Channel Width (m)	0-5
Floodplain Width (m)	0-5
Water Depth (cm)	Stream dry
Discharge (m^3/s)	NA
D.O. (mg/ℓ)	NA
Temperature (°C)	NA
Conductivity (μmhos/cm)	NA
pH	NA
Color	NA
Turbidity	NA
Bottom Type	Grass
Fish Block(s)	Dry at NAPLINE

SPRING SURVEY FORM

WATERBODY

Waterbody Two-Nineteen Creek

Main Drainage Tanana River Tributary to Little Salcha River

Figure 2 Northwest Alignment Sheet 88

Identification Nos: NPSI 4-157.01 NPMP 497.6

Alaska Highway Milepost NA

USGS Map Reference Big Delta, Ak. T 5S R 5E Sec 4

Site Access Helicopter

Section Surveyed From NAPLINE approximately 1 km downstream to Little Salcha River

ASSESSMENT

Two-Nineteen Creek is a small beaded tundra stream 0.5-2 m in width and 0-15 cm in depth. Its highly stained water flows over unstable mud and sand substrates. The tundra banks varied from 0.5 to 1.5 m in height and were sometimes severely incised. Predominate vegetation included dwarf spruce, willow intermixed with some birch.

No fish were caught at the NAPLINE crossing but downstream areas may provide fish habitat. Grayling are reported to be present in this stream (Ref. 11).

FISH

Date 27 June 1979

Fish Present None

Gear/Effort: EF(75m)

Species Present:	Quantity		Size Range (mm)	
	Fry	Other	Fry	Other
None				

PHYSICAL CONDITIONS

Date	27 June 1979
Channel Width (m)	0.5-2.0
Flood Plain Width (m)	0.5-2.0
Water Depth (cm)	8-15
Discharge (m^3/s)	0.04
D.O. (mg/l)	8.8
Temperature (^oC)	7.0
Conductivity (µmhos/cm)	90
pH	7.5
Color	Brown humic-stained
Turbidity	Slightly turbid
Bottom Type	Mud/sand
Fish Block(s)	None visible

SPRING SURVEY FORM

WATERBODY

Waterbody Tributary to Little Salcha River

Main Drainage Tanana River Tributary to Little Salcha River

Figure 2 Northwest Alignment Sheet 88

Identification Nos: NPSI 4-156.05 NPMP 495.3

Alaska Highway Milepost NA

USGS Map Reference Big Delta, Ak. T 4S R 5E Sec 30

Site Access Helicopter

Section Surveyed From 400 m upstream of NAPLINE to 400 m downstream

ASSESSMENT

The Tributary to the Little Salcha River is a small poorly-defined stream with a width of 0.1-0.5 m at the proposed NAPLINE crossing. Flow was negligible during a period when the Tanana Valley had been receiving moderate precipitation for one week. In view of the small flow and recent precipitation, this drainage may dry up frequently. Where visible, substrate is mud, sand and some gravel (from the workpad) and a limited amount of emergent grasses. This tributary disappears into bogs and tundra which were considered to block fish passage. The stream is, therefore, considered to be poor fish habitat.

Reference 11 indicates that areas further downstream contain grayling but that these fish do not get as far upstream as the pipeline.

FISH

Date 27 June 1979

Fish Present: None

Gear/Effort: Visual observation

Species Present:	Quantity		Size Range (mm)	
	Fry	Other	Fry	Other
None				

PHYSICAL CONDITION

Date	27 June 1979
Channel Width (m)	0.1-0.5
Floodplain Width (m)	0.1-0.5
Water Depth (cm)	4-9
Discharge (m^3/s)	<0.0.1
D.O. (mg/ℓ)	9.1
Temperature (°C)	8.0
Conductivity (μmhos/cm)	50
pH	7.0
Color	Humic-stain brown
Turbidity	Slightly turbid
Bottom Type	Mud/sand
Fish Block(s)	Numerous areas where stream flow disappears into tundra

SPRING SURVEY FORM

WATERBODY

Waterbody Tributary to Million Dollar Creek

Main Drainage Tanana River Tributary to French Creek

Figure 2 Northwest Alignment Sheet 88

Identification Nos: NPSI 4-156.04 NPMP 493.9

Alaska Highway Milepost NA

USGS Map Reference Big Delta, Ak. T 4S R 5E Sec 19,24

Site Access Helicopter

Section Surveyed From 400 m upstream of NAPLINE to 1600 m downstream

ASSESSMENT

Tributary to Million Dollar Creek is a shallow, muddy stream with a poorly-defined stream channel at the proposed NAPLINE crossing. This drainage frequently disappears into bogs and willow thickets which would impede fish movements during dry years.

Tributary to Million Dollar Creek is poor fish habitat due to its limited flow, the absence of defined channels in many locations, and unstable substrate. No fish were caught or seen during the spring survey. Fish use, if any, of this stream would probably occur during high water and very infrequently. Department of Fish and Game personnel recommended removal of this creek from the fish stream list (8 June 1979, Ref. 31).

FISH

Date 27 June 1979

Fish Present: None

Gear/Effort: EF(90m)

Species Present:	Quantity		Size Range (mm)	
	Fry	Other	Fry	Other
None				

PHYSICAL CONDITION

Date	27 June 1979
Channel Width (m)	0-0.8
Floodplain Width (m)	0-0.8
Water Depth (cm)	4-18
Discharge (m^3/s)	0.01
D.O. (mg/ℓ)	Information not available
Temperature (°C)	11.0
Conductivity (μmhos/cm)	55
pH	7.2
Color	Brown; humic-stained
Turbidity	Slightly turbid
Bottom Type	Mud/silt
Fish Block(s)	Numerous shallow bogs may impede fish movements

SPRING SURVEY FORM

WATERBODY

Waterbody Bear Lake Outlet

Main Drainage Tanana River Tributary to Moose Creek

Figure 2 Northwest Alignment Sheet 85

Identification Nos: NPSI 4-148.01 NPMP 480.2

Alaska Highway Milepost NA

USGS Map Reference Fairbanks, Ak. T 2S R 3E Sec 27

Site Access Helicopter

Section Surveyed From 400 m upstream to 400 m downstream of NAPLINE

ASSESSMENT

Bear Lake Outlet at the NAPLINE crossing is a dry stream channel overgrown with grass and willow. The large quantity of vegetative matter indicates that water has not been flowing here for many years. The culvert presently installed in the Alyeska workpad is perched and constitutes a barrier to fish movement, should flowing water be present in Bear Lake Outlet. Alaska Department of Fish and Game approved of this fish block to keep fish from entering Bear Lake (Ref. 11).

FISH

Date 29 June 1979

Fish Present: None

Gear/Effort: Visual observation

Species Present:	Quantity		Size Range (mm)	
	Fry	Other	Fry	Other
None				

PHYSICAL CONDITION

Date	29 June 1979
Channel Width (m)	1-3
Floodplain Width (m)	1-3
Water Depth (cm)	Stream dry
Discharge (m^3/s)	NA
D.O. (mg/ℓ)	NA
Temperature (°C)	NA
Conductivity (μmhos/cm)	NA
pH	MA
Color	MA
Turbidity	MA
Bottom Type	Mud/grass
Fish Block(s)	Perched culvert on TAPSLINE workpad

SPRING SURVEY FORM

WATERBODY

Waterbody Moose Creek Crossing #1

Main Drainage Yukon River Tributary to Tanana River

Figure 2 Northwest Alignment Sheet 85

Identification Nos: NPSI 4-148 NPMP 479.3

Alaska Highway Milepost NA

USGS Map Reference Fairbanks, Ak. T 2S R 3E Sec 28

Site Access Helicopter

Section Surveyed Survey of entire lower (4.8 km) drainage

ASSESSMENT

Moose Creek Crossing #1 is a meandering, deep stream approximately 12 m in width with a mud substrate. Logs and other sunken debris were common at this site. Banks were gently sloping 1.5-2.0 m in height and covered with grass, willow, birch and a few spruce. Due to recent precipitation, flow was high and muddy during the spring survey.

Juvenile longnose sucker were caught at this crossing. In addition, 3 other species of juvenile fish (humpback whitefish, round whitefish and grayling) were caught at Moose Creek #2 and #3. The presence of four species of juvenile fish at the three crossings indicates that Moose Creek is an important rearing area. Other species reported in this stream include burbot and northern pike (Ref. 11).

FISH

Date 28 June 1979

Fish Present Yes

Gear/Effort: 15mGN (7.75h)

Species Present:	Quantity Fry	Quantity Other	Size Range (mm) Fry	Size Range (mm) Other
Longnose sucker		1		~200

PHYSICAL CONDITIONS

Date	28 June 1979
Channel Width (m)	~12
Flood Plain Width (m)	~12
Water Depth (cm)	Information not attainable due to high flow
Discharge (m^3/s)	Information not attainable
D.O. (mg/l)	7.2
Temperature (^oC)	10.0
Conductivity (µmhos/cm)	120
pH	7.5
Color	Muddy brown
Turbidity	Highly turbid
Bottom Type	Mud
Fish Block(s)	None visible

SPRING SURVEY FORM

WATERBODY

Waterbody Moose Creek Crossing #2

Main Drainage Yukon River Tributary to Tanana River

Figure 2 Northwest Alignment Sheet 85

Identification Nos: NPSI 4-147 NPMP 478.0

Alaska Highway Milepost NA

USGS Map Reference Fairbanks, Ak. T 2S R 3E Sec 20

Site Access Helicopter

Section Surveyed From Moose Creek Crossing #3 up to Moose Creek Crossing #2

ASSESSMENT

Moose Creek Crossing #2 is a medium size stream 12-17 m in width. This deep, meandering stream is contained by steep grassy banks 1.5-2 m high. Due to recent precipitation, flow was high and muddy during the spring survey.

Moose Creek has been shown to support fish in the past but the specific use by fish was largely unknown (Ref. 11). Juvenile round whitefish, humpback whitefish and grayling were caught by gillnet at this site. The site appears to be a rearing area for juvenile fish.

FISH

Date 27 June 1979

Fish Present Yes

Gear/Effort: 7mGN (16.75h)

Species Present:	Quantity Fry	Quantity Other	Size Range (mm) Fry	Size Range (mm) Other
Round Whitefish		2		180-200
Humpback Whitefish		2		160-190
Grayling		1		∿ 165

PHYSICAL CONDITIONS

Date	27 June 1979
Channel Width (m)	∿ 12
Flood Plain Width (m)	∿ 12
Water Depth (cm)	Information not attainable due to high flow
Discharge (m^3/s)	Information not attainable
D.O. (mg/l)	7.8
Temperature (^oC)	10.0
Conductivity (µmhos/cm)	145
pH	7.7
Color	Muddy brown
Turbidity	Highly turbid
Bottom Type	Mud
Fish Block(s)	None visible

SPRING SURVEY FORM

WATERBODY

Waterbody Moose Creek Crossing #3

Main Drainage Yukon River Tributary to Tanana River

Figure 2 Northwest Alignment Sheet 85

Identification Nos: NPSI 4-146 NPMP 477.3

Alaska Highway Milepost NA

USGS Map Reference Fairbanks, Ak. T 2S R 3E Sec 20

Site Access Helicopter

Section Surveyed From 400 m downstream to 400 m upstream of NAPLINE

ASSESSMENT

Moose Creek Crossing #3 is a medium size stream 10-15 m in width. Steep grassy banks were 0.5-1.5 m high and vegetated with willow and alder. The water appeared somewhat stagnant with green floatables of unknown composition.

Moose Creek has been known to support fish in the past but the specific use by fish was largely unknown (Ref. 11). Juvenile longnose sucker and grayling were caught at this site. The site appears to be a rearing area for juvenile fish.

FISH

Date 27 June 1979

Fish Present Yes

Gear/Effort: 15mGN(17h)

Species Present:	Quantity Fry	Quantity Other	Size Range (mm) Fry	Size Range (mm) Other
Longnose sucker		11		~175-190
Grayling		3		~150-180

PHYSICAL CONDITIONS

Date	27 June 1979
Channel Width (m)	~ 15
Flood Plain Width (m)	~ 15
Water Depth (cm)	100-300
Discharge (m^3/s)	Information not attainable
D.O. (mg/l)	8.4
Temperature (^oC)	13.0
Conductivity (µmhos/cm)	155
pH	7.5
Color	Muddy brown
Turbidity	Moderately turbid
Bottom Type	Mud
Fish Block(s)	None visible

SPRING SURVEY FORM

WATERBODY

Waterbody Unnamed Creek

Main Drainage Tanana River Tributary to Unknown

Figure 2 Northwest Alignment Sheet 84

Identification Nos: NPSI 4-145.04 NPMP 473.7

Alaska Highway Milepost NA

USGS Map Reference Fairbanks, Ak. T 2S R 2E Sec 12

Site Access Helicopter

Section Surveyed General vicinity of the reported stream location

ASSESSMENT

This site is apparently not a stream. Drainage structures were not installed on the TAPS workpad. A local resident stated that water had not been present at this location for 4-5 years.

FISH

Date 28 June 1979

Fish Present None

Gear/Effort: Visual observation

Species Present:	Quantity		Size Range (mm)	
	Fry	Other	Fry	Other
None				

PHYSICAL CONDITIONS

Date	28 June 1979
Channel Width (m)	This site is not a stream
Flood Plain Width (m)	NA
Water Depth (cm)	NA
Discharge (m^3/s)	NA
D.O. (mg/l)	NA
Temperature (^oC)	NA
Conductivity (µmhos/cm)	NA
pH	NA
Color	NA
Turbidity	NA
Bottom Type	NA
Fish Block(s)	NA

SPRING SURVEY FORM

WATERBODY

Waterbody Unnamed Creek

Main Drainage Tanana River Tributary to Unknown

Figure 2 Northwest Alignment Sheet 84

Identification Nos: NPSI 4-145.03 NPMP 473.5

Alaska Highway Milepost NA

USGS Map Reference Fairbanks, Ak. T 2S R 2E Sec 12

Site Access Helicopter

Section Surveyed General vicinity of the reported stream location

ASSESSMENT

This site is apparently not a stream. Drainage structures were not installed on the TAPS workpad. A local resident stated that water had not been present at this location for 4-5 years.

FISH

Date 28 June 1979

Fish Present None

Gear/Effort: Visual observation

Species Present:	Quantity		Size Range (mm)	
	Fry	Other	Fry	Other
None				

PHYSICAL CONDITIONS

Date	28 June 1979
Channel Width (m)	This site is not a stream
Flood Plain Width (m)	NA
Water Depth (cm)	NA
Discharge (m^3/s)	NA
D.O. (mg/l)	NA
Temperature (^oC)	NA
Conductivity (µmhos/cm)	NA
pH	NA
Color	NA
Turbidity	NA
Bottom Type	NA
Fish Block(s)	NA

SPRING SURVEY FORM

WATERBODY

Waterbody Seventeen-Twenty Slough

Main Drainage Chena River Tributary to Seventeen-Thirty Slough

Figure 2 Northwest Alignment Sheet 83

Identification Nos: NPSI 4-145.01 NPMP 468.2

Alaska Highway Milepost NA

USGS Map Reference Fairbanks, Ak. T 1S R 2E Sec 16

Site Access Helicopter

Section Surveyed From 30 m upstream of NAPLINE to 70 m downstream; Aerial survey of entire drainage

ASSESSMENT

Seventeen-Twenty Slough is a stagnant body of water 1.5-2.5 m in width with a soft mud bottom. The banks are usually less than 1 m high and covered with grass and dwarf willow. Dense moss and algae growths are common and result in a dark green water color.

Seventeen-Twenty Slough empties into Seventeen-Thirty Slough 800 m downstream of the proposed gasline crossing. At the time of survey this drainage did not provide fish habitat due to major barriers to fish passage. Since Seventeen-Twenty Slough is a tributary to Seventeen-Thirty Slough, the material site on Nordale Road serves as a complete barrier (see Seventeen-Thirty Slough assessment). In addition, the Alyeska culvert for Seventeen-Twenty Slough would be a stream block during low water.

FISH

Date 28 June 1979

Fish Present: None

Gear/Effort: EF(100m)

Species Present:	Quantity		Size Range (mm)	
	Fry	Other	Fry	Other
None				

PHYSICAL CONDITION

Date	28 June 1979
Channel Width (m)	1.5-2.5
Floodplain Width (m)	1.5-2.5
Water Depth (cm)	10-30
Discharge (m^3/s)	0
D.O. (mg/ℓ)	2.6
Temperature (°C)	9.0
Conductivity (μmhos/cm)	140
pH	7.5
Color	Greenish brown
Turbidity	Moderately turbid
Bottom Type	Mud
Fish Block(s)	Culvert at low flow is fish block; approximately 12.9 km downstream, the channel was obliterated by excavation of a storage yard

SPRING SURVEY FORM

WATERBODY

Waterbody Seventeen-Thirty Slough

Main Drainage Tanana River Tributary to Chena River

Figure 2 Northwest Alignment Sheet 83

Identification Nos: NPSI 4-145 NPMP 468.0

Alaska Highway Milepost NA

USGS Map Reference Fairbanks, Ak. T 1S R 2E Sec 16

Site Access Helicopter

Section Surveyed From 20 m upstream to 100 m downstream of NAPLINE;
Aerial survey of entire drainage

ASSESSMENT

Seventeen-Thirty Slough is a stagnant body of water 2-8 m wide with a mud substrate. The banks are stable and do not show visible signs of scouring from flooding. Surrounding vegetation includes grasses, willow and black spruce. The water color is a dark green/brown due to dense growths of algae and moss.

At the time of survey, Seventeen-Thirty Slough did not offer fish habitat due to major barriers to fish passage. At the point this stream crosses Nordale Road, the channel has been completely obliterated by the construction of a material site. There are no provisions for water passage in this material site, which indicates flow is usually not present. This stream should not be considered a fish stream, as it has been in the past (Ref. 11).

FISH

Date 28 June 1979

Fish Present: None

Gear/Effort: EF120m (20 m upstream of NAPLINE to 100 m downstream)

Species Present:	Quantity		Size Range (mm)	
	Fry	Other	Fry	Other
None				

PHYSICAL CONDITION

Date	28 June 1979
Channel Width (m)	2-8
Floodplain Width (m)	2-8
Water Depth (cm)	20-~100
Discharge (m^3/s)	0
D.O. (mg/ℓ)	7.0
Temperature (°C)	14.0
Conductivity (μmhos/cm)	185
pH	7.8
Color	Green/brown
Turbidity	Moderately turbid
Bottom Type	Mud
Fish Block(s)	Fish passage is completely blocked by a large material site or storage yard on Nordale Road

SPRING SURVEY FORM

WATERBODY

Waterbody Isolated Slough

Main Drainage Tanana River Tributary to Chena River

Figure 2 Northwest Alignment Sheet 83

Identification Nos: NPSI 4-144.01 NPMP 465.9

Alaska Highway Milepost NA

USGS Map Reference Fairbanks, Ak. T 1S R 2E Sec 7

Site Access Helicopter

Section Surveyed Aerial survey of entire drainage (300 m)

ASSESSMENT

Isolated Slough is an old highwater channel of the Chena River which would contain water only when the Chena River was 1.5 m above normal flow. Standing water was present only in depressions below the proposed pipeline crossing. In other areas and at the NAPLINE crossing, the 2-3 m wide stream channel was dry and overgrown with tall grass and willow. Where visible, the substrate was mud.

A 1.5 m high bank was present where Isolated Slough converges with the Chena River. This bank was above the highest Chena River high water mark visible, indicating that water had not been present in Isolated Slough for several years. Isolated Slough should not be considered a fish stream.

FISH

Date 28 June 1979

Fish Present None

Gear/Effort: Visual observation

Species Present:	Quantity		Size Range (mm)	
	Fry	Other	Fry	Other
None				

PHYSICAL CONDITIONS

Date	28 June 1979
Channel Width (m)	2-3
Flood Plain Width (m)	2-3
Water Depth (cm)	10-30
Discharge (m^3/s)	0
D.O. (mg/l)	10.6/11.2
Temperature (^oC)	18.0
Conductivity (µmhos/cm)	210
pH	8.3
Color	Brown
Turbidity	Slightly turbid
Bottom Type	Mud
Fish Block(s)	1.5m high stream block at outlet; numerous dry areas

SPRING SURVEY FORM

WATERBODY

Waterbody Steele Creek

Main Drainage Tanana River Tributary to Chena River

Figure 2 Northwest Alignment Sheet 82

Identification Nos: NPSI 4-143 NPMP 463.6

Alaska Highway Milepost NA

USGS Map Reference Fairbanks, Ak. T 1N R 1E Sec 35,36

Site Access Helicopter

Section Surveyed From 20 m downstream to 80 m upstream of NAPLINE on foot; Aerial survey from NAPLINE downstream 1200 m

ASSESSMENT

Steele Creek is a small stream averaging 1.5 m in width and 0-0.5 m in depth near the proposed pipeline crossing. It flows through dense alder and willow thickets common to tundra areas. Substrates consist primarily of mud and silt with an accumulation of sunken logs and debris. During periods of precipitation, the stream becomes highly turbid due to agitation of mud substrates and sloughing of banks.

Steele Creek, in the vicinity of the pipeline crossing, may provide fish habitat during high water years. During low water, 30-40 log jams are present downstream of the proposed crossing which may be fish blocks.

FISH

Date 28 June 1979

Fish Present None

Gear/Effort: EF100m

Species Present:	Quantity		Size Range (mm)	
	Fry	Other	Fry	Other
None				

PHYSICAL CONDITIONS

Date	28 June 1979
Channel Width (m)	1-1.5
Flood Plain Width (m)	1-1.5
Water Depth (cm)	5-15
Discharge (m^3/s)	0.05
D.O. (mg/l)	8.6
Temperature (^oC)	9.0
Conductivity (µmhos/cm)	130
pH	7.8
Color	Brown/muddy
Turbidity	Moderately turbid
Bottom Type	Gravel at TAPSline/ mud elsewhere
Fish Block(s)	Numerous log jams below the NAPLINE may constitute fish blocks during low water

SPRING SURVEY FORM

WATERBODY

Waterbody Engineer Creek

Main Drainage Chatanika River Tributary to Goldstream Creek

Figure 2 Northwest Alignment Sheet 81

Identification Nos: NPSI 4-142 NPMP 457.5

Alaska Highway Milepost NA

USGS Map Reference Fairbanks, Ak. T 1N R 1E Sec 8

Site Access Helicopter

Section Surveyed From NAPLINE downstream to Steese Highway (approximately 2 km)

ASSESSMENT

Engineer Creek, at the proposed pipeline crossing, has cut a large, deep V-channel, 4-5 m in depth, through ice-rich, unstable tundra. At this location, the stream is basically a combination of shallow dish-like depressions (0.2-1.0 m wide) where water collects and then spills over 0.2-1.0 m high waterfalls into the next depression. This morphology continues 3-4 km downstream of the proposed pipeline crossing. Substrate in these dish-like depressions is primarily silt and mud contributed by sloughing of ice-rich banks.

Engineer Creek offers poor fish habitat during summer months due to abundance of waterfalls and limited amount of flow. In addition, the Steese Highway culvert crossing, approximately 8 km downstream of the proposed NAPLINE crossing is a barrier to fish passage. The highway culvert is perched approximately 1 m above the natural level of stream flow and all flow was filtering through the highway road fill 1 m below the culvert.

FISH

Date 28 June 1979

Fish Present: No

Gear/Effort: Visual observation

Species Present:	Quantity		Size Range (mm)	
	Fry	Other	Fry	Other
None				

PHYSICAL CONDITION

Date	28 June 1979
Channel Width (m)	0.2-0.3
Floodplain Width (m)	0.2-0.3
Water Depth (cm)	1-15
Discharge (m^3/s)	approx. 0.01
D.O. (mg/ℓ)	9.4
Temperature (°C)	7.5
Conductivity (μmhos/cm)	200
pH	7.5
Color	Humic-stained brown
Turbidity	Clear
Bottom Type	Mud/organic debris
Fish Block(s)	Steese Highway culvert is perched 1 m above streambed which constitutes total fish block

SPRING SURVEY FORM

WATERBODY

Waterbody Goldstream Creek

Main Drainage Tanana River Tributary to Chatanika River

Figure 2 Northwest Alignment Sheet 81

Identification Nos: NPSI 4-141 NPMP 454.7

Alaska Highway Milepost NA

USGS Map Reference Fairbanks, Ak. T 1N R 1W Sec 1

Site Access Helicopter

Section Surveyed NAPLINE crossing 800 m downstream to TAPSline

ASSESSMENT

Goldstream Creek is a slightly stained, medium-sized stream 5-7 m in width and 0-0.5 m in depth at the NAPLINE crossing. This stream originates approximately 32 km to the north and flows southerly through the gold dredge tailings of the Fox Mining District before reaching the proposed crossing. As a result, substrate at the crossings consists of large gravel and some rocks with minimal accumulations of silt or mud. Stream channel configuration and banks are in their natural condition at this point of crossing. Banks are 0.2 to 1.0 m high, consisting of gravel, sand and some silt, and vegetated with mature birch, willow and spruce.

Previous investigators have reported grayling in Goldstream Creek (Ref. 11), but no fish were caught during the present spring survey. The habitat appears suitable for fish up- and downstream of the proposed NAPLINE crossing.

FISH

Date 29 June 1979

Fish Present None

Gear/Effort: EF200m upstream of TAPSline

Species Present:	Quantity		Size Range (mm)	
	Fry	Other	Fry	Other
None				

PHYSICAL CONDITIONS

Date	29 June 1979
Channel Width (m)	~ 6
Flood Plain Width (m)	~ 6
Water Depth (cm)	17-32
Discharge (m^3/s)	0.5
D.O. (mg/l)	10.2
Temperature (^oC)	6.5
Conductivity (µmhos/cm)	270
pH	7.8
Color	Slightly humic-stained brown
Turbidity	Moderately turbid from recent rain
Bottom Type	Gravel/sand with some mud
Fish Block(s)	None visible

SPRING SURVEY FORM

WATERBODY

Waterbody Treasure Creek

Main Drainage Chatanika River Tributary to Vault Creek

Figure 2 Northwest Alignment Sheet 80

Identification Nos: NPSI 4-140 NPMP 448.6

Alaska Highway Milepost NA

USGS Map Reference Livengood, Ak. T 2N R 1W Sec 3

Site Access Helicopter

Section Surveyed From 400 m upstream of NAPLINE to 800 m downstream

ASSESSMENT

Treasure Creek is a small tundra stream 1-m wide with 0.3-1.5 m high banks. The silt and mud banks are occasionally incised and vegetated with birch, dwarf spruce and dwarf willow. Substrates consist primarily of soft mud with many sunken logs and an abundance of detritus. Upstream placer mining may account partially for the extensive mud and silt deposits and abundance of sunken logs.

Treasure Creek appears to be suitable fish habitat and would probably be utilized if downstream fish blocks were removed. Three active beaver dams, 800-1200 m downstream of the proposed crossing, are complete stream blocks. The largest is 1.5 m in height. At the present time, these dams would provide good settling ponds for any upstream silt-causing activities. Fish are probably present downstream of these dams during open water seasons.

FISH

Date 30 June 1979

Fish Present: None

Gear/Effort: EF(75m NAPLINE upstream)

Species Present:	Quantity		Size Range (mm)	
	Fry	Other	Fry	Other
None				

PHYSICAL CONDITION

Date	30 June 1979
Channel Width (m)	1
Floodplain Width (m)	1
Water Depth (cm)	40-52
Discharge (m^3/s)	0.12
D.O. (mg/ℓ)	10
Temperature (°C)	5.5
Conductivity (μmhos/cm)	140
pH	7.5
Color	Muddy brown; highly humic-stained
Turbidity	Highly turbid
Bottom Type	Mud/grass
Fish Block(s)	1.5 m high beaver dam 800 m downstream of NAPLINE

SPRING SURVEY FORM

WATERBODY

Waterbody Shocker Creek

Main Drainage Tanana River Tributary to Chatanika River

Figure 2 Northwest Alignment Sheet 79

Identification Nos: NPSI 4-138 NPMP 443.7

Alaska Highway Milepost NA

USGS Map Reference Livengood, Ak. T 3N R 1W Sec 19

Site Access Helicopter

Section Surveyed NAPLINE downstream to Chatanika (approximately 1 km)

ASSESSMENT

Shocker Creek is a small tundra stream 0.6-2 m in width, with 1-1.5 m high banks. The banks are silt and tundra covered with willow, birch and berry bushes. This drainage is a braided tundra stream with highly stained water. Substrates consisted of gravel and mud with emergent grass abundant in shallow water.

During the spring survey, young-of-the-year and juvenile grayling were present at the proposed crossing. Although adult grayling were not caught or sighted, the presence of young-of-the-year fish indicates that grayling spawned near the NAPLINE. Previous surveys of this stream also recorded that grayling were present (Ref. 11).

FISH

Date 30 June 1979

Fish Present: Yes

Gear/Effort: EF(75m downstream)

Species Present:	Quantity		Size Range (mm)	
	Fry	Other	Fry	Other
Grayling	3	4	Est. 25	Est. 100-175

PHYSICAL CONDITION

Date	30 June 1979
Channel Width (m)	0.6-2.0
Floodplain Width (m)	0.6-2.0
Water Depth (cm)	0-21
Discharge (m^3/s)	0.2
D.O. (mg/ℓ)	9.2
Temperature (°C)	12
Conductivity (μmhos/cm)	80
pH	7.5
Color	Stained
Turbidity	Clear
Bottom Type	Gravel, mud, grass
Fish Block(s)	None seen from NAPLINE to Chatanika

SPRING SURVEY FORM

WATERBODY

Waterbody Unnamed Tributary to Shocker Creek #1

Main Drainage Tanana River Tributary to Chatanika River

Figure 2 Northwest Alignment Sheet 79

Identification Nos: NPSI 4-137.06 NPMP 443.5

Alaska Highway Milepost NA

USGS Map Reference Livengood, Ak. T 3N R 1W Sec 19

Site Access Helicopter

Section Surveyed From NAPLINE to 100 m upstream; Aerial survey of entire drainage

ASSESSMENT

Unnamed Tributary to Shocker Creek #1 is a small intermittent tundra stream with a channel width of 0-0.5 m. Where visible, the channel was completely choked with heavy grass. The limited amount of surface water was highly stained. This particular crossing appears as a sheet flow culvert and would generally not provide fish habitat near the pipe crossing.

Approximately 1000 m downstream of the proposed crossing, this drainage reaches its terminus at its confluence with Unnamed Tributary to Shocker Creek #2. Below this point, the drainage may offer limited habitat, particularly during high water years.

FISH

Date 30 June 1979

Fish Present: None

Gear/Effort: Visual observation

Species Present:	Quantity		Size Range (mm)	
	Fry	Other	Fry	Other
None				

PHYSICAL CONDITION

Date	30 June 1979
Channel Width (m)	0-0.5
Floodplain Width (m)	0-0.5
Water Depth (cm)	0-10
Discharge (m^3/s)	<0.01 (Est)
D.O. (mg/ℓ)	6.2
Temperature (°C)	14
Conductivity (μmhos/cm)	75
pH	5.7
Color	Stained
Turbidity	Clear
Bottom Type	Mud/grass
Fish Block(s)	

SPRING SURVEY FORM

WATERBODY

Waterbody Unnamed Tributary to Shocker Creek #2

Main Drainage Tanana River Tributary to Chatanika River

Figure 2 Northwest Alignment Sheet 79

Identification Nos: NPSI 4-137.05 NPMP 443.4

Alaska Highway Milepost NA

USGS Map Reference Livengood, Ak. T 3N R 1W Sec 19

Site Access Helicopter

Section Surveyed From NAPLINE to 400 meters downstream

ASSESSMENT

Unnamed Tributary to Shocker Creek #2 was similar to #1 in that the drainage was a sheet flow culvert. This is a shallow drainage which flows through heavy grass and tundra and was dry in many areas above and below the proposed crossing. Where present, water was highly stained but not measurably flowing. The drainage was small enough that a distinct channel was not present. Tributary #2 does not provide suitable habitat for fish near the proposed NAPLINE crossing. Suitable habitat may be present, however, approximately 1000 m downstream below the confluence of Tributary #1 and #2, particularly during high water years.

FISH

Date 30 June 1979

Fish Present: None

Gear/Effort: Visual observation

Species Present:	Quantity		Size Range (mm)	
	Fry	Other	Fry	Other
None				

PHYSICAL CONDITION

Date	30 June 1979
Channel Width (m)	Generally not visible
Floodplain Width (m)	
Water Depth (cm)	
Discharge (m^3/s)	0
D.O. (mg/ℓ)	5.6
Temperature (°C)	13
Conductivity (μmhos/cm)	65
pH	5.5
Color	Highly stained
Turbidity	Clear
Bottom Type	Mud/grass
Fish Block(s)	Dry in places

SPRING SURVEY FORM

WATERBODY

Waterbody Unnamed Tributary to Shocker Creek #3

Main Drainage Tanana River Tributary to Chatanika River

Figure 2 Northwest Alignment Sheet 79

Identification Nos: NPSI 4-137.04 NPMP 443.3

Alaska Highway Milepost NA

USGS Map Reference Livengood, Ak. T 3N R 2W Sec 14

Site Access Helicopter

Section Surveyed From NAPLINE to 400 m downstream

ASSESSMENT

Unnamed Tributary to Shocker Creek #3 is a small tundra drainage confined to a 0.2-1.0 m wide channel. The substrate consists of gravel and mud with an abundance of emergent grasses. The primary vegetation includes dwarf willow, birch and black spruce with an abundance of blueberry and highbush cranberry. At the time of sampling, this stream was cutting a new channel through the willows at the pipeline crossing.

This tributary appears as though it could go dry during years of low precipitation. Fish habitat may be present near the pipeline crossing during wet years.

FISH

Date 30 June 1979

Fish Present: None

Gear/Effort: DN(30m downstream of workpad)

Species Present:	Quantity		Size Range (mm)	
	Fry	Other	Fry	Other
None				

PHYSICAL CONDITION

Date	30 June 1979
Channel Width (m)	0.2-1.0
Floodplain Width (m)	0.2-1.0
Water Depth (cm)	0-18
Discharge (m^3/s)	0.01
D.O. (mg/ℓ)	9.8
Temperature (°C)	6.5
Conductivity (μmhos/cm)	80
pH	6.5
Color	Highly stained
Turbidity	
Bottom Type	Mud/grass
Fish Block(s)	Shallow water may provide fish blocks at low water

SPRING SURVEY FORM

WATERBODY

Waterbody Washington Creek

Main Drainage Tanana River Tributary to Tolovana River

Figure 2 Northwest Alignment Sheet 78

Identification Nos: NPSI 4-137 NPMP 438.2

Alaska Highway Milepost NA

USGS Map Reference Livengood, Ak. T 3N R 2W Sec 4

Site Access Helicopter

Section Surveyed From 800 m downstream to NAPLINE

ASSESSMENT

Washington Creek is a medium sized stream 15-20 m in width with well-defined banks 1.0-2.5 m in height. This stream meanders through mature stands of birch and spruce with intermixed muskeg areas. Although Washington Creek was highly turbid at the time of survey, it is normally stained brown in color. Substrates are composed primarily of gravel and sand with small amounts of silt.

Washington Creek has been known for its good grayling fishing. During the spring survey, this stream was at a high flood stage which prevented detailed sampling, but approximately 15 juvenile grayling were caught in a 24-h gillnet set. Near the NAPLINE, Washington Creek is a rearing area for grayling and may also provide nursery habitat and a migration route for spring and fall fish movement.

FISH

Date 30 June 1979

Fish Present: Yes

Gear/Effort: 15mGN(24h)

Species Present:	Quantity Fry	Quantity Other	Size Range (mm) Fry	Size Range (mm) Other
Juvenile grayling		Est. 15		Est. 120-200

PHYSICAL CONDITION

Date	30 June 1979
Channel Width (m)	15
Floodplain Width (m)	15
Water Depth (cm)	Not attainable due to high flow
Discharge (m^3/s)	Not attainable
D.O. (mg/ℓ)	10
Temperature (°C)	8.0
Conductivity (μmhos/cm)	100
pH	7.5
Color	Muddy brown
Turbidity	Highly turbid from recent precipitation
Bottom Type	Gravel, sand
Fish Block(s)	None

SPRING SURVEY FORM

WATERBODY

Waterbody South Fork of Aggie Creek

Main Drainage Tanana River · Tributary to Washington Creek

Figure 2 Northwest Alignment Sheet 76

Identification Nos: NPSI 4-136 NPMP 430.9

Alaska Highway Milepost NA

USGS Map Reference Livengood, Ak. T 4N R 3W Sec 10

Site Access Helicopter

Section Surveyed Headwaters 1.6 km downstream to NAPLINE

ASSESSMENT

The South Fork of Aggie Creek is a clear water stream which flows from the Elliot Highway west to the proposed NAPLINE crossing. The substrate consists of gravel and sand with little detritus or algae. This headwater portion of the South Fork is confined to a narrow channel 0.5-1.5 m in width. Predominate vegetation includes willow and dwarf birch scattered through surrounding tundra and muskeg.

The proposed NAPLINE crossing is in a high elevation and steep gradient area that would be generally unsuitable for fish use. Water velocities of 1-2 m/sec were common. In addition, a 1 m high waterfall has been created at the Alyeska workpad and this would block upstream fish movement if fish were present.

FISH

Date 30 June 1979

Fish Present: None

Gear/Effort: DN(100m)

Species Present	Quantity Fry	Quantity Other	Size Range (mm) Fry	Size Range (mm) Other
None				

PHYSICAL CONDITION

Date	30 June 1979
Channel Width (m)	0.5-1.5
Floodplain Width (m)	0.5-1.5
Water Depth (cm)	0-9
Discharge (m^3/s)	0.1
D.O. (mg/ℓ)	11.2
Temperature (°C)	5
Conductivity (μmhos/cm)	120
pH	7.6
Color	Clear
Turbidity	Clear
Bottom Type	Gravel
Fish Block(s)	Fish block at workpad low water crossing (1 m waterfall at downstream end)

SPRING SURVEY FORM

WATERBODY

Waterbody North Fork of Aggie Creek

Main Drainage Tanana River Tributary to Washington Creek

Figure 2 Northwest Alignment Sheet 76

Identification Nos: NPSI 4-135 NPMP 430.1

Alaska Highway Milepost NA

USGS Map Reference Livengood, Ak. T 4N R 3W Sec 3

Site Access Helicopter

Section Surveyed NAPLINE 1.6 km downstream

ASSESSMENT

The North Fork of Aggie Creek originates near the Elliot Highway and flows westerly 3-5 km through tundra and muskeg to the proposed NAPLINE crossing. The NAPLINE crosses Aggie Creek in its headwater regions where stream gradient varies from 700-1000 foot drop per mile. Despite the steep gradient and mud substrate, Aggie Creek water was clear during the spring survey. The stream channel varied from 0.2-1.5 m in width and was vegetated primarily by birch and willow.

The North Fork of Aggie Creek, in the vicinity of the proposed NAPLINE construction, does not provide suitable fish habitat due to the steep gradient, the presence of numerous natural waterfalls, and areas of extensive braiding. The Alyeska workpad also creates a 1.0 m high waterfall. However, areas 3-8 km downstream do not appear to have fish blocks and may provide suitable habitat for summer use.

FISH

Date 30 June 1979

Fish Present: None

Gear/Effort: DN(75m downstream to workpad)

Species Present:	Quantity		Size Range (mm)	
	Fry	Other	Fry	Other
None				

PHYSICAL CONDITION

Date	30 June 1979
Channel Width (m)	0.2-1.5
Floodplain Width (m)	0.2-1.5
Water Depth (cm)	0-12
Discharge (m^3/s)	0.06
D.O. (mg/ℓ)	10
Temperature (°C)	4.0
Conductivity (μmhos/cm)	95
pH	7.8
Color	Clear
Turbidity	Clear
Bottom Type	Cobble
Fish Block(s)	25 m below low water crossing North Fork braids into 10-15 small channels without adequate flow for fish passage. Also 1 m waterfall at downstream end of workpad low water crossing

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APPENDIX I

Calibration of Field Equipment

and

Accuracy of Measurements

ENVIRONMENTAL SERVICES Ltd.

May 8, 1979

LGL Limited U.S., Inc.
P.O. Box 80607
Fairbanks, Alaska 99708

Attention: Mr. Mike Chihuly

Gentlemen:

For the purpose of quality control, field equipment used by LGL was brought to Environmental Services, Limited's laboratory for calibration. Following is a report of results.

YSI S-C-T Meters Model 3300

Upon receipt, each of 2 meters and 2 probes were labeled and carried through calibration procedure as described in the 14th edition of Standard Methods for the Examination of Water and Wastewater. Temperature at 25°C was found to be accurate within the limits of the one degree increments provided on the meter when checked against an ASTM certified thermometer.

Conductivity in each meter, using a Potassium Chloride solution of known conductivity, deviated slightly from the known. However, calculated cell constants ranged between 1 and 2, which is acceptable accuracy.

Each probe was cleaned with a solution recommended by the manufacturer. At the same time the meters were calibrated and batteries tested.

The meters were again tested and found to have cell constants of 2 at 1000 level and .1 at 100 level, again acceptable according to Standard Methods. When compared to a laboratory meter of same make and model, the laboratory meter performed with equivalent accuracy.

The meters, finally, were tested for accuracy at low temperatures similar to those encountered during field surveys in winter months. The temperatures were found to vary 2-3 degrees celsius. It is suggested that hand thermometers be carried to verify accuracy of temperature rather than relying solely on the S-C-T meter.

Hach Dissolved Oxygen Test Kit Model OX-2P

Two field Hach Dissolved Oxygen kits were tested for precision against a YSI Model 57 Dissolved Oxygen Meter. The kits were found to deviate, using low level method, approximately 0.2 mg/l to 0.4 mg/l at 22-25°C as well as 3.2°. This deviation is close to the precision of the dissolved oxygen test of 0.1 mg/l as described in Standard Methods.

Hach pH Wide Range Test Kit Model 17-N

Both colorimetric pH kits were found to be accurate within the limits of the 0.5 pH unit increments when checked against an Orion 801A digital ionalyzer using pH buffers 4.00, 7.00, and 10.00. Temperatures included 0°C to 25°C. Distilled water as well as river water were also used to ensure that sample interferences were limited.

Should you have any further questions regarding this report, please do not hesitate to contact our laboratory at 479-3115.

Very truly yours,
Environmental Services, Ltd.

Theresa J. Olson,
Environmental Scientist

JO:taf

:: Mr. Brian Tomlinson

APPENDIX II

Provisional List of Waterbodies Crossed or Potentially Affected by the NAPLINE

APPENDIX II. Provisional list of 492 waterbodies crossed or potentially affected by the Northwest Alaskan Pipeline including an evaluation of existing spring fisheries data for each. Data sources (see Literature Reviewed) and spring criteria (see Table 1) are listed by number. Primary data sources are underlined. Abbreviations: NPSI (Northwest Alaskan Pipeline Stream Identification Number), NPAS (Northwest Pipeline Alignment Sheet), NPMP (Northwest Pipeline Milepost), AHMP (Alaska Highway Milepost), Alyeska AS (Alyeska Assignment Sheet), Sta. (Staion). Reference 42 identified the alignment sheet series used.

Waterbody	NPSI	NPAS	NPMP	AHMP	Alyeska AS	Alyeska Pipe Sta.	Haul Road Sta.	Spring Criteria	Data Source
Unnamed Creek	6-227.03	131	738.7	1222.2				2	2,54
Unnamed Creek	6-227.02	131	738.3	1222.6				1	54
Unnamed Pond	6-227.01	131	737.5	1223.4				1	2,54
Scottie Creek	6-227	131	737.5	1223.4				1	5,6,7,8,9,10, 17,22,26,29,54, 55
Desper Creek	6-226	130	735.6	1225.6				1	5,6,7,9,10,17, 26,29,54,55
Unnamed Creek	6-225.01	129	730.6	1232.1				2	2,54
Sweetwater Creek	6-225	129	728.4	1234.2				2	2,9,29,54
Unnamed Creek	6-224	129	728.0	1234.7				3	2,29,54
Unnamed Creek	6-223	129	726.8	1235.9				3	2,29,54
Unnamed Creek	6-223	129	726.8	1235.9				3	2,29,54
Unnamed Creek	6-222	129	726.5	1236.3				4B	2,29,54
Gardiner Creek	6-219	127	716.8	1246.7				1	5,6,7,8,9,10,17 22,26,29,54
Tenmile Creek	6-218	126	710.7	1252.8				2	2,5,6,9,10, 17,26,29,54
Silver Creek	6-217	125	704.8	1258.7				4A	2,5,6,9,10,26, 29,54
Unnamed Creek	6-216.01	124	701.9	1262.3				2	2,54
Unnamed Creek	6-216.01	124	701.9	1262.3				2	2,54
Unnamed Creek	6-216	124	699.2	1266.5				2	2,29,54
Beaver Creek	6-215	124	697.4	1268.0				1	5,6,7,8,9,10,17 22,26,29,54
Unnamed Creek	6-214.01	123	695.2	1270.4				2	2,54
Unnamed Creek	6-213.01	123	692.8	1273.0				3	2
Unnamed Creek	6-213	122	688.3	1278.3				3	2,9,29
Bitters Creek	6-212	122	686.5	1280.2				1	5,6,9,10,26, 29,54
Unnamed Creek	6-210.02	121	683.9	1283.2				2	2
Unnamed Creek	6-210.01	121	681.8	1285.4				2	2
Unnamed Creek	6-210	119	671.0	1296.7				3	2,29
Unnamed Creek	6-209	119	669.9	1297.9				3	2,29
Tanana River	6-207 A/B	118	664.3	1303.3				1	3,5,6,7,9,10,13, 17,22,26,29,54
Tanana River Alt #1	6-207C	118	664.3	1303.3				1	3,5,6,7,9,10,17, 22,26,29,54
Tanana River Alt #2	6-208	118	664.3	1303.3				1	3,5,6,7,9,10,17, 22,26,29,54
Tok River	6-205	117	658.2	1309.4				1	3,5,6,7,9,10,17, 22,26,29,54
Crystal Springs	6-203.03	114	639.0	1328.2				1	2,9,26,54
Unnamed Creek	6-203.02	114	638.8	1328.2				3	54
Unnamed Creek	6-203.01	113	637.6	1329.5				3	2
Unnamed Creek	6-203	113	636.5	1330.5				3	2,54
Moon Lake Tributary	6-202	113	635.2	1331.9				2	2,6,29

Appendix II. (cont'd)

Waterbody	NPSI	NPAS	NPMP	AHMP	Alyeska AS	Alyeska Pipe Sta.	Haul Road Sta.	Spring Criteria	Data Source
Moon Lake Tributary	6-202	113	635.2	1331.9				2	2,6,29
Yerrick Creek	6-201	113	633.0	1333.7				1	3,5,6,7,8,9,10,17,22,26,29,54
Unnamed Creek	6-200.01	112	630.8	1336.9				2	2,29,54
Unnamed Creek	6-200	112	630.7	1336.9				2	2,29,54
Cathedral Rapids Creek #1	6-199	112	629.2	1338.1				3	2,4,7,22,29
Cathedral Rapids Creek #2	6-198	112	628.6	1338.7				3	2,4,7,22,29
Cathedral Rapids Creek #3	6-197B	112	628.6	1338.7				3	2,4,7,22,29
Cathedral Rapids Creek #4	6-197A	112	628.5	1338.8				3	2,4,7,22,29
Cathedral Rapids Creek #5	6-197	112	628.4	1338.9				3	2,4,7,22,29
Cathedral Rapids Creek #6	6-196	112	628.2	1339.0				3	2,4,7,22,29
Cathedral Rapids Creek #7	6-195	112	628.0	1339.2				3	2,4,7,22,29
Unnamed Creek	6-193.01	112	627.5	1339.8				1	2,5,6,10,26,29,54
Unnamed Creek	6-192.01	111	626.2	1340.5				3	2,54
Sheep Creek	6-191	111	625.1	1342.2				3	3,5,6,7,8,10,22,29,54
Unnamed Creek	5-190	111	623.5	1343.7				2	2,29,54
Robertson River	5-187	110	619.6	1347.6				1	3,5,6,7,8,9,10,17,22,26,29,54
Unnamed Creek	5-185.03	110	617.2	1350.1				2	2,54
Unnamed Creek	5-185.02	110	617.0	1350.2				2	2,54
Unnamed Creek	5-185.01	109	615.1	1352.3				2	2,54
Bear Creek	5-185	109	609.9	1357.3				1	3,5,6,7,8,9,10,17,22,26,29,54
Chief Creek	5-184	108	608.6	1358.6				1,4B	3,5,6,7,8,9,10,17,22,26,29,54
Unnamed Creek	5-183	108	605.4	1361.7				3	2,5,10,26,29,54
Unnamed Creek	5-182	108	605.2	1362.0				3	2,5,54
Unnamed Creek	5-181	107	603.1	1364.4				3	2,29,54
Sam Creek	5-180	107	601.6	1365.9				2	3,5,6,7,8,9,10,26,29,54
Unnamed Creek	5-179	106	598.4	1369.1				1	3,5,6,9,10,26,29,54
Berry Creek	5-178	106	596.2	1371.4				1	3,5,6,7,8,9,10,22,29,54
Sears Creek	5-177	106	593.1	1374.4				1	3,5,6,7,8,9,10,17,22,29,54
Unnamed Creek	5-176.01	105	590.6	1377.0				2	2
Dry Creek	5-176	105	589.5	1378.1				1	3,5,6,7,8,9,10,22,29,54

Appendix II. (cont'd)

Waterbody	NPSI	NPAS	NPMP	AHMP	Alyeska AS	Alyeska Pipe Sta.	Haul Road Sta.	Spring Criteria	Data Source
Johnson River	5-175	104	587.0	1380.5				1	3,5,6,7,8,9, 10,17,22,26,29 54
Little Gerstle River	5-174	103	579.3	1388.4				1	3,5,6,7,8,9, 10,17,22,26,29 54
Gerstle River	5-172	102	575.0	1393.0				1	3,5,6,7,8,9, 10,17,22,26,29 54
Sawmill Creek	5-171	100	563.8	1403.9				3	3,5,6,7,8,9, 10,29,54
Rhoads Creek	5-170	100	560.1	1407.6				3	3,5,6,9,10, 29,54
Granite Creek	5-169	99	558.4	1409.2				3	3,5,6,7,9,10, 22,29,54
Tanana River	5-166	96	537.3		47	9215+00		1	3,5,11,13,15, 16,27,29,32
Side Channel of Tanana River	5-165.01	95	536.7					1	3,11,13,42,43
Shaw Creek	5-165	93	526.0		49	9789+15		1	3,5,11,29,30,57,65
Rosa Creek #1	5-164	93	525.8		49	9800+40		1	5,11,29,30
West Branch Keystone Creek	5-163	93	525.2		49	9830+70		1	5,11,29,30
Rosa Creek #2	5-162	92	519.8		50	10110+50		4A	5,11,29
Rosa Creek #3	5-162	92	519.2		50	10142+74		4A	5,11,29
Rosa Creek #4	5-162	92	518.9		50	10165+25		4A	5,11,29
South Fork Minton Creek #1	5-161	92	518.0		51	10214+80		3	5,11,29,32,54,60,66
South Fork Minton Creek #2	5-161	92	517.4		51	10244+06		3	5,11,29,32,54,66,
South Fork Minton Creek #3	5-161	92	517.0		51	10258+12		3	5,11,29,32,54,66
South Fork Minton Creek #4	5-161	92	516.3		51	10298+63		3	5,11,29,32,54,66
South Fork Minton Creek #5	5-161	92	516.0		51	10305+90		3	5,11,29,32,54,66
South Fork Tributary Minton Creek	5-161	92	515.8		51	10316+00		3	5,11,29,32,54,66
South Fork Minton Creek #6	5-161	92	515.8		51	10316+98		1	5,11,29,32,54,66
South Fork Minton Creek #7	5-161	91	515.5		51	10343+09		1	5,11,29,30,32 54,66
North Fork Minton Creek #1	5-161	91	515.4		51	10346+68		1	5,11,32,54
North Fork Minton Creek #2	5-161	91	514.8		51	10374+14		1	5,11,32,54
North Fork Minton Creek #3	5-161	91	514.5		51	10393+01		3	5,11,32,54
North Fork Minton Creek #4	5-161	91	514.4		51	10394+88		3	5,11,32,54
Gold Run Creek	5-160	91	512.7		51	10487+62		1	3,5,11,29,54
Small Creek	5-159.02	91	511.3		52	10561+41		2	11,54
Tributary to Small Creek	5-159.01	91	510.7		52	10589+47		3	11
Redmond Creek	5-159	90	505.7		53	10855+33		1	3,5,11,14,29, 30,32,35,38, 54
Unnamed Tributary to Salcha River	4-158.03	89	502.8		53	11037+79		2	11,54
TAPS Slough	4-158.02	89	501.9		53A	2+00		1	11,54,55
Unnamed Slough	4-158.01	89	501.8		53A	7+50		1	11,55
Salcha River	4-158	89	501.5		53A	19+00		1	3,5,11,13,14, 25,29,32,35, 38

Waterbody	NPSI	NPAS	NPMP	AHMP	Alyeska AS	Alyeska Pipe Sta.	Haul Road Sta.	Spring Criteria	Data Source
Oxbow Slough	4-157.02	89	501.3		53A	33+00		2	11,54
Two-Nineteen Creek	4-157.01	88	497.6		54	223+50		1	11,54
Little Salcha River	4-157	88	496.5		54	281+71		1	3,5,11,13, 29,31,38
Tributary to Little Salcha River	4-156.05	88	495.3		54	345+50		3	11,54
Tributary to Million Dollar Creek	4-156.04	88	493.9		54	417+00		2	11,29,31,54
Million Dollar Creek	4-156.03	87	491.5		55	545+00		1	5,11,29,31
Million Dollar Creek #2	4-156.02	87	491.2		55	558+60		1	5,11,29
Million Dollar Creek #3	4-156.01	87	491.0		55	568+00		1	5,11,29
Million Dollar Creek #4	4-156	87	490.6		55	592+00		1	5,11,29,31
French Creek #0	4-155	87	489.6		55	643+55		1	3,5,11,19, 29,31,38
Knokanpeover Creek	4-154	86	486.4		56	809+40		1	3,5,11,19, 29,31
French Creek #1	4-153	86	483.7		56	942+85		1	3,5,11,19, 29,38
French Creek #2	4-152	86	483.0		56	993+69		1	3,5,11,19, 29,38
French Creek #3	4-151	86	482.5		56	1018+95		1	3,5,11,19, 29,38
French Creek #4	4-150	85	482.2		56	1035+43		1	3,5,11,19, 29,38
French Creek #5	4-149	85	480.4		57	1125+18		1	3,5,11,19, 29,38
Bear Lake Outlet	4-148.01	85	480.2		57	1134+40		3	11,31,54
Moose Creek #1	4-148	85	479.3		57	1188+02		1	5,11,29,31, 38,54
Moose Creek #2	4-147	85	478.0		57	1250+70		1	5,11,29,31, 38,54
Moose Creek #3	4-146	85	477.3		57	NA		1	5,11,29,31, 38,54
Unnamed Creek	4-145.04	84	473.7		58	1495+15		2	11,54
Unnamed Creek	4-145.03	84	473.5		58	1505+00		2	11,54
Ess Shaped Slough	4-145.02	84	471.9		58	1570+00		2	11,31
Seventeen-twenty Slough	4-145.01	83	468.2		59	1720+20		3	11,31,54
Seventeen-thirty Slough	4-145	83	468.0		59	1730+50		3	11,29,31,54
Isolated Slough	4-144.01	83	465.9		59	1845+55		2	11,31,54
Chena River	4-144	83	465.8		59	1849+50		1	3,5,11,13, 17,27,29,31, 38,39
Steele Creek	4-143	82	463.6		60	1962+80		2	11,29,54
Engineer Creek	4-142	81	457.5		61	210+00		3	11,17,29,31, 54
Goldstream Creek	4-141	81	454.7		61	336+01		1	3,5,11,17, 29,54
Treasure Creek	4-140	80	448.6		62	659+43		1	3,5,11,17, 29,54
Chatanika River	4-139	79	444.5		63	873+63		1	3,5,11,17, 29,31,38
Shocker Creek	4-138	79	443.7		63	914+00		1	5,11,29,54
Unnamed Tributary to Shocker Creek #1	4-137.06	79	443.5		63			3	54
Unnamed Tributary to Shocker Creek #2	4-137.05	79	443.4		63			3	54
Unnamed Tributary to Shocker Creek #3	4-137.04	79	443.3		63				54
Unnamed Tributary to Chatanika River #1	4-137.03	78	441.7		63	1025+70		3	11,54
Unnamed Tributary to Chatanika River #2	4-137.02	78	441.7		63	1027+70		2	11,54

Appendix II. (cont'd)

Waterbody	NPSI	NPAS	NPMP	AHMP	Alyeska AS	Alyeska Pipe Sta.	Haul Road Sta.	Spring Criteria	Data Source
Unnamed Tributary to Chatanika River #3	4-137.01	78	441.7		63	1032+20		3	11,54
Washington Creek	4-137	78	438.2		64	1209+62		1	1,3,5,11,17 29,31,38,54
Unnamed Tributary to Washington Creek	4-136.01	78	438.0		64	1220+00		2	11
South Fork Aggie Creek	4-136	76	430.9		65	1595+00		3	1,3,5,11,17, 29,31,38,54
North Fork Aggie Creek	4-135	76	430.1		65	1635+00		3	1,3,5,11,17, 29,31,38,48, 54
Tributary to Little Globe Creek	4-134.01	76	428.3		66	1740+00		4B	11
Little Globe Creek	4-134	76	427.2		66	1759+00		4B	11,17,29
Unnamed Tributary to Little Globe Creek	4-133.01	76	427.0		66	1796+00		4B	11
Globe Creek	4-133	75	423.8		66	1966+75		1	1,3,5,11,17, 29,38,48
Unnamed Tributary to Globe Creek	4-132.02	75	423.4		67	1988+88		4B	11,66
Unnamed Tributary to Tatalina River	4-132.01	74	420.0		67	2167+00		1,4B	11,30,48
Tatalina River	4-132	74	419.0		67	2241+80		1	1,3,5,11,17, 29,48
Tributary of Slate Creek	4-131.01	73	415.0		68	2456+31		2	11
Slate Creek	4-131	73	414.9		68	2459+35		1	3,5,11,17,29, 30,38,48
Ski Jump Ramp Creek	4-130	73	413.1		68	2550+00		4B	11,29
Wilber Creek	4-129	73	412.1		68-69	2608+00		1	3,5,11,17,29, 48
Tributary of Wilber Creek	4-128.04	73	410.6		69	2666+35		4B	11
Shorty Creek	4-128.03	72	407.0		69	2855+73		4B	11
Tributary of Shorty Creek	4-128.02	72	406.8		69	2865+11		4B	11
Tributary to Tolovana River	4-128.01	72	405.7		70	2924+55		4B	11
Tolovana River	4-128	72	405.1		70	2957+90		1	1,3,5,11,13, 17,29,48
Unnamed Tributary to West Fork Tolovana River	4-127.01	71	402.0		70	3122+16		4B	11
Lost Creek	4-127	71	398.6		71	104+33		1	3,5,11,17,29, 30,31,48
Erickson Creek Tributary	4-126	70	394.3		72	337+66		4B	3,11,29
Erickson Creek #1	4-125	69	390.9		72	513+62		1	3,5,11,17,29, 30,31
Unnamed Lake Outlet	4-124.01	69	390.0		73	562+98		4B	11
Erickson Creek #2	4-124	69	389.1		73	611+95		1	3,5,11,17,29, 30,31,48
Hess Creek Tributary	4-123.05	68	385.5		73	800+02		4B	11,17
Hess Creek	4-123A.04	68	385.2		73,74W	820+00		1	1,3,5,11,17, 29,31,48
Fish Creek	4-123.03	68	385.0		73	829+65		1	11
Unnamed Creek	4-123.02	68	381.0		74	1040+40		4B	11
Unnamed Creek	4-123.01	68	380.4		74	1071+47		4B	11
Unnamed Creek	4-123	67	379.9		74	1096+85		4B	11,29
Unnamed Creek	3-122.05	67	378.8		75	1150+15		4B	11,17
Unnamed Creek	3-122.04	67	378.3		75	1181+44		4B	11
Hot Cat Creek	3-122.03	67	377.1		75	1242+94		1	5,11,17,31, 48

Appendix II. (cont'd)

Waterbody	NPSI	NPAS	NPMP	AHMP	Alyeska AS	Alyeska Pipe Sta.	Haul Road Sta.	Spring Criteria	Data Source
Unnamed Creek	3-122.02	67	374.7		75	1367+33		4B	11,17
Unnamed Creek	3-122.01	66	373.2		75	1447+20		4B	11,17
Isom Creek #1	3-122	66	369.5		76	1642+50		1	3,5,11,29,30,31, 48
Isom Creek #2	3-121.02	66	368.4		76	1549+50		1	3,5,11,17,29,30, 31,48
Isom Creek #3	3-121.01	66	369.4		76	1651+34		1	3,5,11,30,31,48
Tributary to Isom Creek	3-121	66	368.8		76	1682+08		4B	11
Yukon River	3-120	64	360.0		77-78	58+00		1	1,3,5,11,13,17, 20,21,29,38,48
Burbot Creek	3-119	64	358.3		78	158+21	1HR168+10	1	5,11,20,21,29, 48
Wood Chopper Creek	3-118	63	357.2		78	215+30	1HR215+20	1	5,11,20,21,29, 48
Phelps Creek	3-117	62	351.7		79	508+70	1HR501+00	1	5,11,20,21,29, 48
Unnamed Creek	3-112	61	344.3		80	899+15	1HR892+15	4B	11,17,20,21,29
Fort Hamlin Hills Creek	3-111	61	342.9		81	971+50	1HR1011+08	1	5,11,20,21,29, 30,48
Unnamed Creek	3-110.01	60	340.0		81	1123+25	1HR1158+45	1	11,20,21
North Fork Ray River	3-110	59	336.0		82	58+49	1HR1337+34	1	1,5,11,17,20, 21,29,48
Fed Creek	3-109	59	332.0		82	270+25	1HR1600+24	1	11,29,30,48
South Branch West Fork Dall River	3-108	57	324.3		84	673+00	1HR2001+50	1	1,5,11,20,21, 29,38,48
Middle Branch West Fork Dall River	3-107	57	321.9		84	798+00	1HR2125+39	1	1,5,11,20,21, 29,30,38,48
Smoky Creek	3-106.02	57	321.4		84	818+75	1HR2163+02	4B	11,20,21
Unnamed Creek	3-106.01	56	319.7		85	915+75	1HR2245+45	4B	11,20,21
Finger Mountain Creek	3-106	56	318.8		85	961+66	1HR2291+88	1	5,11,20,29,30, 48
Olson's Lake Creek	3-105	55	315.3		85	1149+38	1HR2469+77	1	5,11,29,30,48
Caribou Mountain Creek	3-104	55	312.9		86	56+03	1HR2609+50	1	5,11,29,30,31 48
Kanuti River	3-103	54	309.7		86	231+00	1HR2777+75	1	1,3,5,11,13,17, 20,21,29,30,37, 38,48
Netsch's Creek Tributary #1	3-102	54	307.7		87	331+60	1HR2875+90	4B	11,29
Netsch's Creek Tributary #2	3-101	54	307.4		87	349+00	1HR2894+96	4B	11,29
Netsch's Creek Tributary #3	3-100.01	54	307.0		87	370+80	1HR2944+05	4B	11
South Fork Fish Creek	3-100	53	304.1		87	520+50	1HR3255	1	1,3,5,11,20,21, 29,30,48
Middle Fork Fish Creek	3-99	53	303.1		87	577+90	1HR3255	1	1,3,5,11,20,21 29,30,48
Fish Creek	3-98	53	301.7		88W	653+50	1HR3255+12	1	1,3,5,11,17,20 21,29,30,34,37, 38,48
Alder Moutain Creek	3-97	53	300.0		88W	742+50	2HR115+00	1	5,11,20,21,29,30 48
Pung's Crossing Creek #1	3-96.01	52	296.5		89	932+40	2HR363+36	1	5,11,20,21
Pung's Crossing Creek #2	3-96	52	296.5		89	931+40	2HR363+36	1	5,11,20,21,29
South Fork Bonanza Creek	3-95	52	292.8		89	1123+60	2HR550+59	1	1,3,5,11,17,20,21 29,30,31,34,37,38 48
Unnamed Bonanza Creek Channel	3-94.02	52	292.8		89	1128+50	2HR547	1,4B	11,20,21

Waterbody	NPSI	NPAS	NPMP	AHMP	Alyeska AS	Alyeska Pipe Sta.	Haul Road Sta.	Spring Criteria	Data Source
Oxbow Lake System	3-94.01	51	292.3		89	1148+00	2HR561+64	1	11,20,48
North Fork Bonanza Creek	3-94	51	291.2		89	1208+32	2HR606+69	1	1,3,5,11,17,20, 21,29,30,31,34 38,48
South Fork of the Little Nasty	3-93	51	289.0		90	1327+15	2HR759+84	1	5,11,20,21,29 30,48
The Little Nasty	3-92	51	288.8		90	1340+25	2HR767+82	1	1,5,11,20,21,29, 30,48
Prospect Creek	3-91	50	284		91	1590+00	2HR1099+52	1	1,3,5,11,17,20, 21,29,30,31,34, 37,38,48
Little Piddler Creek	3-90.03	49	279		91	241+60	2HR1376+57	1	11,30
Jim River Side Channel #1	3-90.02	49	278.9		91	257+00	2HR1379+45	1	1,5,11,17,29,31, 34,48
Jim River Side Channel #2	3-90.01	49	278.0		92	272+49	2HR1425+40	1	1,5,11,17,29,31, 34,48
Douglas Creek	3-89	49	277.2		92	330+00	2HR1470+34	1	1,3,5,11,17,20, 21,29,34,48
Dee Creek	3-88	49	275.8		92	407+00	2HR1544+97	1	5,11,20,21,29,48
Beaver Springs #1	3-87.02	49	275.5		92	435+84	2HR1557+06	1	11,20,21,55
Beaver Springs #2	3-87.01	49	275.5		92	436+73	2HR1565+32	1	11,20,21,55
Jim River Side Channel #3	3-87	49	274.9		92	453+50	2HR1579+80	1	1,3,5,11,13,17, 20,21,29,34,38, 48
Inlet to Grayling Lake	3-86.04	47	268.3		93	798+30	2HR1926+00	1	11,20,48
Avoided Lake Inlet	3-86.03	47	267.7		93	832+75	2HR1960	2	11,20
Grayling Lake Creek	3-86.02	47	267.3		93	849+00	2HR1949+14	1	11,20,48
Unnamed Creek	3-86.01	47	266.7		94	884+80	2HR2017	1	11,20
Abba-dabba Creek	3-86	47	265.2		94	963+28	2HR2098+18	1	1,5,11,20,21,29 48
South Fork Koyukuk River	3-85	46	263.0		94-95	1073+00	2HR2206+88	1	1,3,5,11,13,17, 20,21,29,48
Cross Roads Creek #1	3-82.03	46	258.6		95	222+50	3HR129+23	4B	11,20,21,29
Cross Roads Creek #2	3-82.02	46	258.4		95	228+75	3HR129+58	4B	11,20,21,29
Cross Roads Creek #3	3-82.01	46	258.4		95	232+25	3HR129+58	4B	11,20,21,29
Cross Roads Creek #4	3-82	46	258.4		95	233+60	3HR129+58	4B	11,20,21,29
Chapman Creek	3-81	46	257.2		96	295+17	3HR205+23	1	1,5,11,20,21,29, 30,48
South Fork Windy Arm Creek	3-80	45	256.3		96	343+75	3HR255+64	1	1,11,20,21,29,30 48
North Fork Windy Arm Creek	3-79	45	254.9		96	417+25	3HR326+94	1	1,5,11,20,21,29 48
Unnamed Creek	3-78.01	45	254.1		96	458+70	3HR369+59	4B	11,20,21
Trent's Trickle	3-78	45	253.0		96	518+39	3HR413+47	1	5,11,20,21,29,30 48
Jackson Slough East Channel #1	3-77.02	45	252.2		97	555+85	3HR452+15	1	5,11,34,48
Jackson Slough Cross Channel	3-77.01	44	252.0		97	570+70	3HR464+00	1	5,11,29,34,48
Jackson Slough East Channel #2	3-77	44	251.9		97	593+00	3HR483+00	1	5,11,34,48
Rosie Creek	3-74	44	249.4		97		3HR599+00	1	3,5,11,17,20,21, 29,31,48
First Creek #1	3-72.06	44	247.3		97		3HR727+14	1	11,20,21
First Creek #2	3-72.05	44	247.1		97		3HR727+14	1	11,20,21
East Fork Spring Slough	3-72.04	44	245.8		97-98		3HR776+84	1	5,11
Spring Slough #1	3-72.03	44	245.5		98		3HR783+98	1	5,11
Spring Slough #2	3-72.02	44	245.4		98		3HR790+14	1	5,11
Spring Slough #3	3-72.01	43	245.3		98		3HR797+60	1	5,11,48
Slate Creek	2-72	43	243.7		98	976+83	3HR876+86	1	1,3,5,11,17,20, 21,29,31,38

Appendix II. (cont'd)

Waterbody	NPSI	NPAS	NPMP	AHMP	Alyeska AS	Alyeska Pipe Sta.	Haul Road Sta.	Spring Criteria	Data Source
Calf Creek	3-71	43	243.2		98	1004+75	3HR910+70	1	5,11,29,31,48
South Fork Clara Creek Overflow	3-70.01	43	243.0		98	1015+80	3HR925+49	1	5,11,29,31,48
Clara Creek Overflow	3-70	43	242.9		98	1019+50	3HR933+34	1	5,11,29,48
Clara Creek #1	3-69.01	43	242.6		98	1033+70	3HR941+85	1	5,11,17,29,31, 34,48
Clara Creek #2	3-69	43	242.6		98	1036+20	3HR941+85	1	5,11,17,29,31, 34,48
Equisetum Creek	3-68	43	242.3		98		3HR944	1	5,11,29,48
Organo Creek	3-67	43	242.2		98		3HR946	1	5,11,29,31,34, 48
Unnamed Creek	3-65.01	43	240.8		98		3HR1037+00	4B	11
South Fork Mary Angel Creek	3-65	43	240.4		98-99	4+30	3HR1052+04	1	5,11,29,31,48
Mary Angel Creek	3-63.04	43	240.3		99	8+40	3HR1055+57	1	3,11,34,48
South Fork Sharon Creek	3-63.03	43	239.8		99	38+70	3HR1076+29	1	5,11
Sharon Creek #1	3-63.02	43	239.7		99	45+00	3HR1097	3	5,11,31,48
Sharon Creek #2	3-63.01	42	239.4		99	55+00	3HR1097	3	3,11,31,48
Marion Creek	3-63	42	239.3		99	59+85	3HR1114+14	1	1,3,5,11,20,21, 29,31,34,38,48
North Marion Creek Overflow #1	3-62.04	42	239.2		99	68+80	3HR1115	4B	11
North Marion Creek Overflow #2	3-62.03	42	239.2		99	70+75	3HR1120+33	4B	11
North Marion Creek Overflow #3	3-62.02	42	239.0		99	78+00	3HR1122+90	4B	11
Pence's Pond Creek	3-62.01	42	238.9		99	85+50	3HR1143+81	1	5,11,20,21,31, 48
Confusion Creek	3-61.02	41	233.5		100	369+00	3HR1439+92	1	5,11,20,31,48
North Fork Confusion Creek	3-61.01	41	233.0		100	91+70	3HR1443	1	5,11,20,31,48
Minnie Creek	3-61	41	231.8		100	454+46	3HR1519+34	1	1,3,5,11,17,20, 21,29,34,38,48
North Fork Koyukuk River	2-60.19	41	231.0		100	495+50	3HR1588+80	1	1,3,5,11,13,17, 20,21
Union Gulch Creek #1	2-60.18	41	230.7		100	516+65	3HR1600	1	5,11,20,21,31
Union Gulch Creek #2	2-60.17	41	230.2		100	536+00	3HR1600	1	5,11,20,21,31,48
Confederate Gulch Creek	2-60.16	41	229.3		100	590+75	3HR1655+00	1	11
North Fork Confederate Gulch Creek	2-60.15	41	228.8		100	607+90	3HR1675	4B	11,48
Hammond River	2-55	40	228.1		101	635+60	3HR1711+42	1	1,3,5,11,17,20, 21,29,37,48
Middle Fork Koyukuk River Anabranch	2-60.14	40	227.5		101			4A	1
Middle Fork Koyukuk River	2-60.13	40	227.1		101			1	1,5,11,13,20,21 29,38,48
Richardson's Slough #1	2-60.12	40	225.2		101	778+30	3HR1861+03	1	5,11,48
Richardson's Slough #2	2-60.11	40	225.2		101	781+90	3HR1865+68	1	5,11,48
Over Creek #1	2-60.10	40	224.8		101	796+70		1	1,11,48
Over Creek #2	2-60.09	40	224.8		101	800+50		1	1,11,48
Over Creek #3	2-60.08	40	224.7		101	803+10	3HR1891+44	1	1,11,48
Over Creek #4	2-60.07	40	224.7		101	805+39	3HR1896+30	1	1,11,48

Waterbody	NPSI	NPAS	NPMP	AHMP	Alyeska AS	Alyeska Pipe Sta.	Haul Road Sta.	Spring Criteria	Data Source
Alignment Slough #1	2-60.06	40	222.1		101	836+40	3HR1945+13	1	5,11,48
Alignment Slough #2	2-60.05	40	222.0		101	841+20	3HR1945+13	1	5,11,48
Alignment Slough #3	2-60.04	40	221.9		101	845+28	3HR1945+13	1	5,11,48
Alignment Slough #4	2-60.03	40	221.8		101	849+30	3HR1945+13	1	5,11,48
Alignment Slough #5	2-60.02	40	221.7		101	855+70	3HR1945+13	1	5,11,48
Alignment Slough #6	2-60.01	40	221.6		101	860+00	3HR1945+13	1	5,11,48
Nugget Creek	2-60	40	221.1		101	886+60	3HR1969+70	1	5,11,20,21,34,48
Wolf Pup Creek	2-59	39	220.7		102	906+50	3HR1990+56	1	5,11,20,48
Sheep Creek	2-53	39	220.2		102	933+00	3HR2018+85	1	5,11,20,21,29,34,48
Cushing Creek	2-52.01	39	219.9		102	948+60	3HR2033+06	4B	5,11,20,48
Gold Creek	2-52	39	219.4		102	976+00	3HR2059+11	1	3,5,11,17,20,21,29,31,34,48
Linda Creek	2-51	39	218.8		102	1001+18	3HR2087+21	1	5,11,17,20,21,29,31,34,48
Valve Site Creek	2-49.07	39	216.6		102	1121+05	3HR2203+04	4B	11,20
Rocky Creek #1	2-49.06	38	214.1		103	1250+60	3HR2326	1	11
Rocky Creek #2	2-49.05	38	214.0		103	1258+30	3HR2326	1	11
Rocky Creek #3	2-49.04	38	213.8		103	1269+10	3HR2326	1	11
Sukakpak Creek	2-49.03	38	213.1		103	1305+00	3HR2373+80	1	5,11,20,21
North Fork Sukakpak Creek	2-49.02	38	212.7		103	1332+20	3HR2447+70	1	11,20,21
Unnamed Creek	2-49.01	38	212.3		103	1353+23	3HR2440	1	11
Middle Fork Koyukuk River	2-49	38	212.2		103	1361+45	3HR2460+47	1	1,3,5,11,13,17,20,21,29,31,38,48
Way Back Creek	2-48.04	38	211.3		103	1408+00	3HR2485	1	11,48
Millie's Meander	2-48.03	38	211.0		103	1418+76	3HR2489+68	1	11,31,48
Unnamed Creek	2-48.02	38	210.6		103	1444+19	3HR2528+00	1	11,20
Eva's Alv	2-48.01	38	209.4		103	1507+08	3HR2583+84	1	11,20,48
Dietrich River	2-48	38	209.0		104	1526+55	3HR2604+66	1	1,3,5,11,17,20,21,29,31,37,38,48
1415 Lake Inlet	2-46.01	37	208.4		104	1556+18	3HR2631+80	4B	11
Brockman Creek	2-46	37	207.7		104	1581+87	3HR2662+07	1	11,20,21,29,48
Steitz Lake Outlet	2-45.04	37	206.2		104	1607+52	3HR2703	1	11,20,21,48
South Branch Airport Creek	2-45.03	37	206.7		104	1637+70	3HR2728+26	1	11,20
Middle Tributary Airport Creek	2-45.02	37	206.5		104	1644+93	3HR27+36+41	1	11,20
Airport Creek	2-45.01	37	205.8		104	1681+92	3HR2775+58	1	11,20,48
Disaster Creek	2-45	37	205.1		104	1719+41	3HR2809+90	4B	3,5,11,20,29,48
Unnamed Creek	2-43.07	37	204.7		104	1736+51	3HR2826+88	4B	11
Trap Slough	2-43.06	37	204.6		104	1747+44	3HR2847+57	4B	11
Dietrich River	2-43.05	37	204.2		104	1756+00		1	1,3,5,11,17,20,21,29,31,37,38,48
Dietrich River	2-43.04	37	205.7		104			1	1,3,5,11,17,20,21,29,31,37,38,48
Sahr's Slough	2-43.03	37	205.6		104	1795+99	3HR2889+08	4B	5,11
Meadow Slough	2-43.02	37	205.4		104	1801+00	3HR2892+78	4B	11
Unnamed Creek	2-43.01	37	204.8		104	1831+09	3HR2925+28	4B	11
Snowden Creek	2-43	36	204.1		105	1870+20	3HR2959+42	1	3,5,11,17,20,21,29,34,48
Unnamed Creek	2-41.05	36	203.6		105	1897+49	3HR2978+20	1	11
Snowden Pond Outlet	2-41.04	36	203.4		105	1906+65	4HR1984	1	5,11
Numbers Lake Creek	2-41.03	36	202.7		105	1941+95	4HR3026+13	1	1,5,11,20,48
Dunder's Dribble	2-41.02	36	202.6		105	1947+73	4HR3036	1	5,11,21,48

Appendix II. (cont'd)

Waterbody	NPSI	NPAS	NPMP	AHMP	Alyeska AS	Alyeska Pipe Sta.	Haul Road Sta.	Spring Criteria	Data Source
Stanzla Creek	2-41.01	36	202.5		105	1952+70	4HR3060	1	11,20,31,48
Ugh Creek	2-41	36	201.6		105	2011+00	4HR3103+51	1	11,20,48
Unnamed Creek	2-39.01	36	199.2		106	2123+20	4HR2333+30	1	11
Steep Creek	2-39	35	197.2		106	2235+00	4HR3309+86	4B	11,29,30
Buff Creek	2-38	35	195.8		106	52+10	4HR3375+85	1	11,29,30
Burger's Bayou	2-36.02	35	195.5		106	72+50	4HR3414+01	1	1,5,11,20,30,48
Drainage Material Site #106	2-36.01	35	195.3		106		4HR3447	1	1,11,30,48
Unnamed Creek	2-36	35	193.0		107	212+40	4HR3543+02	4B	11
Dietrich River Floodplain	2-34.06	34	192.4-191.3		107	248+79 - 302+00	4HR3579 - 257+00.	1	1,3,5,11,30,31
Beaver Dam Brook #1	2-34.05	34	191.7		107	295+10	4HR255+58	1	11,20,21,30
Beaver Dam Brook #2	2-34.04	34	191.1		107	321+32	4HR280+97	4B	11,30
Beaver Dam Brook #3	2-34.03	34	190.9		107	329+88	4HR290+66	4B	11,30
Beaver Dam Brook #4	2-34.02	34	190.8		107	334+05	4HR293+50	4B	11,30
Beaver Dam Brook #5	2-34.01	34	190.7		107	336+75	4HR296+15	4B	11,30
Nutirwik Creek	2-34	34	189.8		107	375+54	4HR343+00	1	3,5,11,17,20, 21,30,38,48
Dietrich River Floodplain	2-32.06	34	189.8-188.1		107	379+39 - 457+37	4HR349+31 - 481+82	1	1,3,5,11,20,21 48
Unnamed Spring	2-32.05	34	187.4			496+00		1	41
Dietrich River	2-32.04	33	187.4-187.2		107	500+36 - 513+36		1	1,3,5,11,21,31
Dietrich River Floodplain	2-32.03	33	187.0-186.4		108	525+75 - 556+00	4HR503+72 - 547+00	1	1,3,5,11,21
Unnamed Spring	2-32.02	33	185.9		108		4HR553+73	1	30,40,41
Dietrich River Floodplain	2-32.01	33	186.0-184.9		108	578+00 - 621+69		1	1,3,5,11,21
Oskar's Eddy	2-31	33	184.3		108	662+80	4HR632+98	1	5,11
Unnamed Creek	2-30.02	33	184.1		108	675+00	4HR649+00	4B	11,20
Bear Track Creek	2-30.01	33	183.6		108	705+50	4HR678+00	4B	11,20
Dietrich River Floodplain	2-29.03	33	183.3-182.9		108			1	1,3,5,11,20,30
Dietrich River Floodplain	2-29.02	33	182.4-181.1		109			1	1,3,5,11,20,30
Andy's Creek	2-29.01	32	180.9		109	840+52	4HR817+50	1	11,20,21,30,48
West Fork of North Fork Chandalar River	2-29	32	179.0-178.7		109	945+23 - 957+00		1	1,3,5,11,20,21, 30,48
West Fork of North Fork Chandalar River Floodplain	2-28	32	177.3-176.1		109	1030+00 - 1093+00		1	1,3,5,11,20,21 30,42
West Fork of North Fork Chandalar River Floodplain	2-28	31	174.6-174.2		109	55+00 - 78+72		1	1,3,5,11,20,21 30,42
Atigun River Floodplain	2-27	30-31	171.0-165.1		110-112	247+32	4HR1360-5HR431+54	4B	1,3,5,11,30,31 48
Unnamed Creek	2-26	29	162-161		111		5HR520+00	1	11
Unnamed Creek	2-25.03	29	162-161		111-112		5HR541+66	1	11
Unnamed Creek	2-25.02	29	162-161		112		5HR550+80	1	11
Unnamed Creek	2-25.01	29	162-161		112		5HR552+37	1	11
Trevor Creek	2-25	29	159.8		112	837+00	5HR709+72	1	11,48,30
Tyler Creek #1	2-24.03	29	159.3		112	871+00	5HR717+90	1	11,48,30
Tyler Creek #2	2-24.02	29	159.0		112	878+65	5HR717+90	1	11,48,30
Tyler Creek #3	2-24.01	29	159.0		112	881+00	5HR717+90	1	11,48,30
Roche Montonee	2-24	28	153.3		113	1170+91	5HR1053+28	1	3,11,30,48
One-one-three Creek	2-23.03	28	153.2		113	1176+95		4B	11
Main Line Spring	2-23.02	27	152.2		113	1226+50	5HR1097	1	11,30,48
Holdon Creek	2-23.01	27	151.5		114	30+44	5HR1176+47	1	11,30,48
Vanish Creek	2-23	27	151.4		114	35+24	5HR1161	1	11,30,48
Unnamed Creek	2-22.05	27	151.3		114	38+70	5HR1164	1	11
Tad Creek	2-22.04	27	151.1		114	44+00	5HR1169	1	11
Tee Lake Outlet #1	2-22.03	27	148.9		114	153+63	5HR1280+85	1	1,5,11,30,31, 48
Tee Lake Outlet #2	2-22.02	27	148.9		114	155+29	5HR1280+85	1	1,5,11,30,31, 48

Appendix II. (cont'd)

Waterbody	NPSI	NPAS	NPMP	AHMP	Alyeska AS	Alyeska Pipe Sta.	Haul Road Sta.	Spring Criteria	Data Source
Mosquito Lake	2-22.01	27	148.9		114		5HR1334	1	11,30,48
Atigun River	2-22	27	147.6		114	20+94	5HR1364+44	1	1,3,5,11,31,48
Jill Creek	1-21.11	25	140.7		115	380+60	6HR229+00	4B	11,48
Jill Creek Tributary	1-21.10	25	140.4		115	395+24	6HR234+75	4B	11,48
Ed Creek	1-21.09	25	140.0		115	421+74	6HR436+25	1,4B	11,30,48
Mack Creek	1-21.08	25	139.6		115	438+29	6HR452+00	1	11,30,48
Terry Creek	1-21.07	25	139.1		115	466+12	6HR490+00	1	11,30,48
Moss Creek	1-21.06	25	138.6		115	494+00	6HR500+41	1,4B	11,30,48
Hallock Creek	1-21.05	25	138.4		115	504+27	6HR512+00	1,4B	11,30,48
Yan Creek	1-21.04	25	136.0			629+06	6HR641+00	1,4B	11,30,48
Becky Creek #1	1-21.03	24	134.2		116	721+63	6HR684	1	1,11,30,48
Becky Creek #2	1-21.02	24	132.8		116	797+80	6HR984	1	1,11,30,48
Holt Creek	1-21.01	24	132.6		116	804+36	6HR985	1	11,30,48
Kuparuk River	1-21	24	131.9		117	842+00	6HR986+50	1	1,3,5,11,29,30,36,48
East Fork Kuparuk River	1-20.01	23	130.4		117	921+55	6HR911+80	1	5,11,30,48
Toolik River	1-20	23	129.5		117	968+30	6HR948+50	1	3,5,11,29,30,48
East Fork Toolik River	1-19.01	23	129.4		117	973+30	6HR970+25	1,4B	11,48
Oksrukuyik Creek	1-19	22	122.7		118	1325+64	6HR1285+32	1	1,3,5,11,29,30,48
Shifish Creek #1	1-18.04	22	121.3		118	1395+51		1,4B	11,30,48
Shifish Creek #2	1-18.03	22	120.5		119	1441+26		1,4B	11,30,48
Thiele's Trickle	1-18.02	21	119.1		119	1512+60	6HR1518	1,4B	1,11,30,48
Lower Oksrukuyik Creek #1	1-18.01	20	109.5					1	1,11,30,48
Lower Oksrukuyik Creek #2	1-18	20	109.4					1	1,11,30,48
Unnamed Creek	1-17.02	20	109.2		120	911+80		1,4B	11
Unnamed Creek	1-17.01	20	108.9		120	924+50		1,4B	11
Rudy Creek	1-17	19	108.5		120	947+99	6HR2153	1	3,11,29,30,48
Bassett Creek	1-16.03	19	106.9		121	1029+20	6HR2228+14	1,4B	11,30,48
Dennis Creek	1-16.02	19	106.8		121	1033+60	6HR2234+80	1	11,30,48
Climb Creek	1-16.01	19	106.3		121	1060+34	6HR2262+60	1	11,30,48
Poison Pipe Creek	1-16	19	106.0		121	1077+10	6HR2318+92	1	11,29,30,48
Polygon Creek	1-15	19	105.1		121	1125+00	6HR2351+97	1	11,30,48
Gustafson Gulch	1-14	18	102.2		122	1280+00	6HR2517+85	1	11,30,48
Arthur Creek	1-13	18	101.8		122	1297+50	6HR2536+20	1	11,29,30,48
Sagavanirktok River Side Channel	1-12.05	18	99.4		122	1424+79	6HR2657+20	1	11,48
Sagavanirktok River Side Channel	1-12.04	18	99.0		122	1445+85	6HR2684+43	1	11,48
Clark's Lake	1-12.03	17	98.4-98.2		122	1481+00-1489+28	6HR2770+86	1	11,30,48
Stump Creek	1-12.02	17	98.0		122	1499+00	6HR2770+86	1	11,30,48
Lori Creek	1-12.01	17	93.0		123	1719+50	6HR2974+15	1	11,30,48
Charlotte Creek	1-12	16	91.0		123		6HR3083+19	1	11,29
Happy Valley Camp Creek	1-11	16	87.3		124		6HR3259+77	1	3,5,11,29,48
Milke Creek	1-10	16	86.6		124		6HR3296+20	1	3,11,29,48
Stout Creek	1-9	15	83.1		124		6HR3471+69	1	11,48
Sagavanirktok River Side Channel	1-8.03	15	81.9-81.5		125	469+75		1	11,30,48
Sagavanirktok River Side Channel	1-8.02	15	81.9-81.5		125	489+35		1	11,30,48
Sagavanirktok River Side Channel	1-8.01	15	81.9-81.5		125	492+70		1	11,30,48
Spoiled Mary Creek	1-8	15	81.5		125	493+95	6HR3535+62	1	11,30,29,48

Appendix II. (cont'd)

Waterbody	NPSI	NPAS	NPMP	AHMP	Alyeska AS	Alyeska Pipe Sta.	Haul Road Sta.	Spring Criteria	Data Source
Sagavanirktok River Side Channel	1-7.11	14	79.2		125	616+70		4B	11,48
Sagavanirktok River Side Channel	1-7.10	14	78.8		125	632+50		4B	11,48
Sagavanirktok River Side Channel	1-7.09	14	78.7		125	637+00		4B	11,48
Sagavanirktok River Side Channel	1-7.08	14	78.6		125	643+50		4B	11,48
Sagavanirktok River Side Channel	1-7.07	14	78.2		125	666+00		4B	11,48
Sagavanirktok River Side Channel	1-7.06	14	77.7		125	696+00		4B	11,48
Sagavanirktok River Side Channel	1-7.05	14	77.7		125	697+50		4B	11,48
Sagavanirktok River Side Channel	1-7.04	14	77.3		125	714+00		4B	11,48
Sagavanirktok River Side Channel	1-7.03	14	77.0		125	734+30		1	11,48
Sagavanirktok River Side Channel	1-7.02	14	76.7		125	747+12		1	11,48
Sagavanirktok River Side Channel	1-7.01	14	75.9		126	790+40		4B	11,48
Mark Creek	1-7	14	75.8		126	791+40	6HR3840+41	1	3,11,29,30,48
Unnamed Creek	1-5.49	13	69.2		126W		6HR4195+99	1	11,42,43
Unnamed Creek	1-5.48	12	63.9		126W		6HR4481+00	4B	11,42,43
Wood Creek #1	1-5.47	11	59.0		128	210+92	7HR486+16	1	11,30
Wood Creek #2	1-5.46	11	58.9		128	215+96		1	11,30,48
Wood Creek #3	1-5.45	11	58.5		129	233+50		1	11,30,48
Wood Creek #4	1-5.44	11	58.4		129	242+80		1	11,30
Wood Creek #5	1-5.43	11	58.3		129	246+20		1	11,30
Wood Creek #6	1.5.42	11	58.1		129	258+60		1	11,30
Wood Creek #7	1-5.41	11	58.0		129	265+76		1	11,30
Wood Creek #8	1-5.40	11	57.7		129	281+50		1	11,30,48
Wood Creek #9	1-5.39	11	57.1		129	322+66		1	11,30,48
Wood Creek #10	1-5.38	10	56.5		129	355+07		1	11,30
Wood Creek #11	1-5.37	10	56.4		129	360+60		1	11,30
Wood Creek #12	1-5.36	10	55.8		129	395+41		1	11,30,48
Extension Creek #1	1-5.35	10	55.4		129	410+52		4B	11,30,48
Extension Creek #2	1-5.34	10	55.4		129	412+57		1	11,30,48
Extension Creek #3	1-5.33	10	55.1		129	430+57		1	11,30
Extension Creek #4	1-5.32	10	55.1		129	432+00		4B	11,30,48
Extension Creek #5	1-5.31	10	53.9		129	492+35		1	11,30,48
Extension Creek #6	1-5.30	10	53.8		129	499+16		1	11,30,48
Extension Creek #7	1-5.29	10	53.2		129	531+00		4B	11,30,48
Extension Creek #8	1-5.28	10	53.0		129	539+10		1	11,30
Unnamed Pond	1-5.27	9	50.0		130	702+00		4B	11
Ghost Creek #1	1-5.26	9	49.5		130	728+68		1	11,30,48
Ghost Creek #2	1-5.25	9	49.3		130	736+81		4B	11,30,48
Ghost Creek #3	1-5.24	9	48.9		130	756+49		4B	11
Ghost Creek #4	1-5.23	9	48.7		130	768+86		4B	11
Ghost Creek #5	1-5.22	9	48.0		130	804+68		4B	11,30,48
Ghost Creek #6	1-5.21	9	47.6		130	826+22		1	11,30,48
Ghost Creek #7	1-5.20	9	47.5		130	831+23		1	11,30,48
Ghost Creek #8	1-5.19	9	47.3		130	843+08		4B	11
Ghost Creek #9	1-5.18	9	47.2		130	846+16		1	11
Ghost Creek #10	1-5.17	9	47.1		130	853+25		1	11

Appendix II. (cont'd)

Waterbody	NPSI	NPAS	NPMP	AHMP	Alyeska AS	Alyeska Pipe Sta.	Haul Road Sta.	Spring Criteria	Data Source
Ghost Creek #11	1-5.16	9	46.7		131	871+81		1	11,30,48
Ghost Creek #12	1-5.15	9	46.3		131	892+55		1	11,30,48
Ghost Creek #13	1-5.14	9	46.1		131	905+20		1	11,30,48
Ghost Creek #14	1-5.13	8	45.7		131	924+58		4B	11
Ghost Creek #15	1-5.12	8	45.6		131	937+85		1	11,30,48
Ghost Creek #16	1-5.11	8	45.3		131	957+04		1	11,30,48
Ghost Creek #17	1-5.10	8	45.1		131	958+00		1	11
Sagavanirktok River Side Channel	1-5.09	8	43.5		131	1042+70		1	11,43,48
Sagavanirktok River Side Channel	1-5.08	8	42.9		131	1076+42		1	11,43,48
Sagavanirktok River	1-5.07	8	42.6		131	1095+00		1	11,43,48
Sagavanirktok River	1-5.06	8	42.4		131	1106+70		1	11,43,48
Silvia Creek	1-5.05	7	38.4		132	1316+45	7HR1624+77	1	11,30,48
Unnamed Pond	1-5.04	7	38.1		132			4A	11,43
Sagavanirktok River Side Channel	1-5.03	7	37.9		132	4822+81	7HR1655+59	1	11,30,48
Sagavanirktok River Side Channel	1-5.02	7	37.9		132	4827+89		1	11,30,43,48
Unnamed Creek	1-5.01	7	35.4		132	4951+44		1	11,30,48
Sagavanirktok River Floodplain	1-5	6-7	35.4-32.7		132-133	4951+44-5103+20		1,4B	11,30,48
Sagavanirktok River Side Channel	1-4.05	6	30.6		133	5211+48		1	11,43,48
Sagavanirktok River Side Channel	1-4.04	6	30.5		133	5215+30		1	11,43,48
Sagavanirktok River Side Channel	1-4.03	6	30.1		133	5238+76		1	11,43,48
Sagavanirktok River Side Channel	1-4.02	6	30.0		133	5243+53		1	11,43,48
Sagavanirktok River Side Channel	1-4.01	6	29.9		133	5251+05		1	11,43,48
Sagavanirktok River Floodplain	1-4	5	27.3-25.5		134	5396+10-5459+93		1	11,43,48
Unnamed Creek	1-3.02	5	23.0		135	806	7HR2482+36	4B	11
Unnamed Lake	1-3.01	4	17.2		137			4B	11
Little Putuligayuk River	1-3	2	10.2			1478+52		4B	11,48
Pump Station #1 Drainage Ditch	1-2	1	4.8					4B	42,43,48
Putuligayuk River	1-1	1	3.2					4B	27,42,43,48