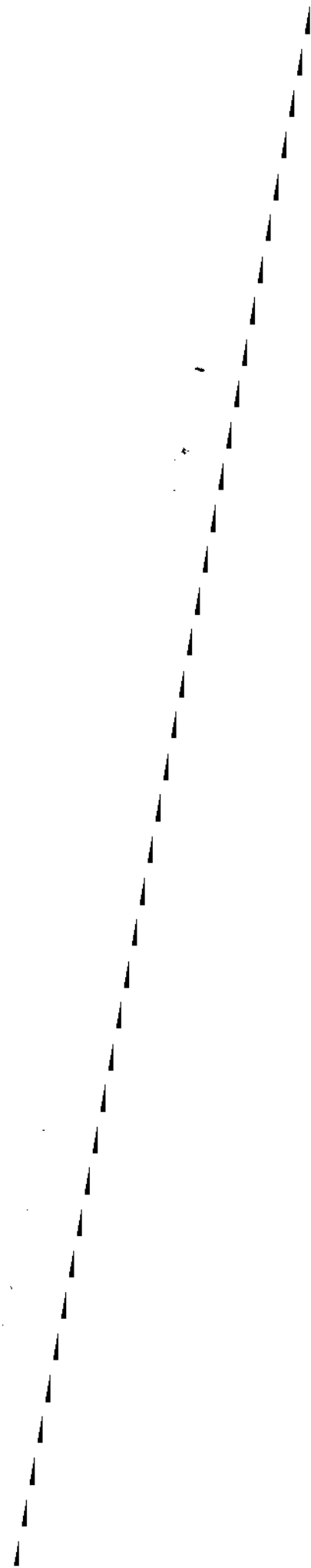


# **RUN LOGS/EXTRACTION SHEETS**



Analyst	Date and Time	Sample Name	Description/ Solution	Matrix/ Dil.	Raw Data File	Method File	Reported	ReAnalyzed
IAA	2/14/97 9:27	CH2CL2		1	8015\021497-D\02149701.d01	8015\021497-D.MET		
IAA	2/14/97 10:12	RT 0608.36.1		1	8015\021497-D\02149701.d02	8015\021497-D.MET	OK	
IAA	2/14/97 10:57	RT 0727.58.1		1	8015\021497-D\02149701.d03	8015\021497-D.MET	OK	
IAA	2/14/97 11:41	1D 0990.04.1		1	8015\021497-D\02149701.d04	8015\021497-D.MET	OK	
IAA	2/14/97 12:26	2D 0990.04.2		1	8015\021497-D\02149701.d06	8015\021497-D.MET	OK	
IAA	2/14/97 13:12	3D 0990.04.3		1	8015\021497-D\02149701.d08	8015\021497-D.MET	OK	
IAA	2/14/97 13:56	4D 0990.04.4		1	8015\021497-D\02149701.d07	8015\021497-D.MET	OK	
IAA	2/14/97 14:41	5D 0990.04.5		1	8015\021497-D\02149701.d08	8015\021497-D.MET	OK	
IAA	2/14/97 15:26	QCCS 0990.08.1		1	8015\021497-D\02149701.d09	8015\021497-D.MET	OK	
IAA	2/14/97 16:11	1G 0990.08.1		1	8015\021497-D\02149701.d10	8015\021497-D.MET	OK	
IAA	2/14/97 16:56	2G 0990.08.2		1	8015\021497-D\02149701.d11	8015\021497-D.MET	OK	
IAA	2/14/97 17:42	3G 0990.08.3		1	8015\021497-D\02149701.d12	8015\021497-D.MET	OK	
IAA	2/14/97 18:27	4G 0990.08.4		1	8015\021497-D\02149701.d13	8015\021497-D.MET	OK	
IAA	2/14/97 19:11	5G 0990.08.5		1	8015\021497-D\02149701.d14	8015\021497-D.MET	OK	
IAA	2/14/97 19:56	GCCS 0990.08.2		1	8015\021497-D\02149701.d15	8015\021497-D.MET	OK	
IAA	2/14/97 20:41	1K 0990.07.1		1	8015\021497-D\02149701.d16	8015\021497-D.MET	OK	
IAA	2/14/97 21:26	2K 0990.07.2		1	8015\021497-D\02149701.d17	8015\021497-D.MET	OK	
IAA	2/14/97 22:10	3K 0990.07.3		1	8015\021497-D\02149701.d18	8015\021497-D.MET	OK	
IAA	2/14/97 22:55	4K 0990.07.4		1	8015\021497-D\02149701.d19	8015\021497-D.MET	OK	
IAA	2/14/97 23:40	5K 0990.07.5		1	8015\021497-D\02149701.d20	8015\021497-D.MET	OK	
IAA	2/15/97 0:25	1MO 0860.94.1		1	8015\021497-D\02149701.d21	8015\021497-D.MET	OK	
IAA	2/15/97 1:09	2MO 0860.94.2		1	8015\021497-D\02149701.d22	8015\021497-D.MET	OK	
IAA	2/15/97 1:54	3MO 0860.94.3		1	8015\021497-D\02149701.d23	8015\021497-D.MET	OK	
IAA	2/15/97 2:39	4MO 0860.94.4		1	8015\021497-D\02149701.d24	8015\021497-D.MET	OK	
IAA	2/15/97 3:24	5MO 0860.94.5		1	8015\021497-D\02149701.d25	8015\021497-D.MET	OK	
IAA	2/15/97 4:08	3D 0990.04.3		1	8015\021497-D\02149701.d26	8015\021497-D.MET	OK	
IAA	2/15/97 4:53	3D 0990.04.3		1	8015\021497-D\02149701.d27	8015\021497-D.MET		
IAA	2/15/97 5:39	CH2CL2		1	8015\021497-D\02149701.d28	8015\021497-D.MET		
IAA	2/15/97 6:23	45642MB		0.1666	8015\021497-D\02149701.d28	8015\021497-D.MET		
IAA	2/15/97 7:08	45642LCS		0.166	8015\021497-D\02149701.d30	8015\021497-D.MET		
IAA	2/15/97 7:53	45642MS		0.2236	8015\021497-D\02149701.d31	8015\021497-D.MET		
IAA	2/15/97 8:38	45642MSD		0.2233	8015\021497-D\02149701.d32	8015\021497-D.MET		
IAA	2/15/97 9:23	L8794.39		0.2303	8015\021497-D\02149701.d33	8015\021497-D.MET		
IAA	2/15/97 10:07	L8794.40		0.2337	8015\021497-D\02149701.d34	8015\021497-D.MET		
IAA	2/15/97 10:52	L8794.41		0.2581	8015\021497-D\02149701.d35	8015\021497-D.MET		
IAA	2/15/97 11:38	L8794.42		0.2192	8015\021497-D\02149701.d36	8015\021497-D.MET		
IAA	2/15/97 12:22	L8794.43		0.2387	8015\021497-D\02149701.d37	8015\021497-D.MET		
IAA	2/15/97 13:07	L8794.44		0.2445	8015\021497-D\02149701.d38	8015\021497-D.MET		
IAA	2/15/97 13:52	3D 0990.04.3		1	8015\021497-D\02149701.d39	8015\021497-D.MET		
IAA	2/15/97 14:37	3D 0990.04.3		1	8015\021497-D\02149701.d40	8015\021497-D.MET		
IAA	2/15/97 15:21	L8794.45		0.2167	8015\021497-D\02149701.d41	8015\021497-D.MET		
IAA	2/15/97 16:06	L8794.46		0.2226	8015\021497-D\02149701.d42	8015\021497-D.MET		
IAA	2/15/97 16:51	L8794.47		0.2113	8015\021497-D\02149701.d43	8015\021497-D.MET		
IAA	2/15/97 17:36	L8794.48		0.2032	8015\021497-D\02149701.d44	8015\021497-D.MET		
IAA	2/15/97 18:21	L8794.49		0.2294	8015\021497-D\02149701.d45	8015\021497-D.MET		
IAA	2/15/97 19:05	L8794.50		0.2228	8015\021497-D\02149701.d46	8015\021497-D.MET		
IAA	2/15/97 19:50	L8794.51		0.211	8015\021497-D\02149701.d47	8015\021497-D.MET		
IAA	2/15/97 20:35	L8794.52		0.1989	8015\021497-D\02149701.d48	8015\021497-D.MET		
IAA	2/15/97 21:19	L8794.53		0.2269	8015\021497-D\02149701.d49	8015\021497-D.MET		

Analyst	Date and Time	Sample Name	Description/ Solution	Matrix/ Dil.	Raw Data File	Method File	Reported	ReAnalyzed
DA	2/18/97 20:08	30 0990-04-3		1	8015\021897-D\02189701.d01	8015\021497-D.MET		
DA	2/18/97 20:53	30 0990-04-3		1	8015\021897-D\02189701.d02	8015\021497-D.MET		
DA	2/18/97 21:37	3G 0990-06-3		1	8015\021897-D\02189701.d03	8015\021497-D.MET		
DA	2/18/97 22:22	3G 0990-06-3		1	8015\021897-D\02189701.d04	8015\021497-D.MET		
DA	2/18/97 23:08	CH2CL2		1	8015\021897-D\02189701.d05	8015\021497-D.MET		
DA	2/18/97 23:52	45490MB		1	8015\021897-D\02189701.d06	8015\021497-D.MET		
DA	2/19/97 0:37	45490LCS-1		1	8015\021897-D\02189701.d07	8015\021497-D.MET		
DA	2/19/97 1:22	45490LCS-2		1	8015\021897-D\02189701.d08	8015\021497-D.MET		
DA	2/19/97 2:07	45490MS-1		1	8015\021897-D\02189701.d09	8015\021497-D.MET		
DA	2/19/97 2:52	45490MSD-1		1	8015\021897-D\02189701.d10	8015\021497-D.MET		
DA	2/18/97 3:37	45490MS-2		1	8015\021897-D\02189701.d11	8015\021497-D.MET		
DA	2/18/97 4:22	45490MSD-2		1	8015\021897-D\02189701.d12	8015\021497-D.MET		
DA	2/19/97 5:07	L8786-27		1	8015\021897-D\02189701.d13	8015\021497-D.MET		
DA	2/19/97 5:51	L8786-28		1	8015\021897-D\02189701.d14	8015\021497-D.MET		
DA	2/19/97 6:36	L8786-29		1	8015\021897-D\02189701.d15	8015\021497-D.MET		
DA	2/19/97 7:21	CH2CL2		1	8015\021897-D\02189701.d16	8015\021497-D.MET		
DA	2/18/97 8:06	L8786-26		1	8015\021897-D\02189701.d17	8015\021497-D.MET		
DA	2/19/97 8:51	CH2CL2		1	8015\021897-D\02189701.d18	8015\021497-D.MET		
DA	2/18/97 9:36	L8786-25 1:10		1	8015\021897-D\02189701.d19	8015\021497-D.MET		
DA	2/19/97 10:20	30 0990-04-3		1	8015\021897-D\02189701.d20	8015\021497-D.MET		
DA	2/19/97 16:00	3G 0990-06-3		1	8015\021897-D\02189701.d21	8015\021497-D.MET		
DA	2/19/97 16:45	3D 0990-04-3		1	8015\021897-D\02189701.d22	8015\021497-D.MET		
DA	2/21/97 9:30	30 0990-04-3		1	8015\021897-D\02189701.d23	8015\021497-D.MET	OK	
DA	2/21/97 11:49	CH2CL2		1	8015\021897-D\02189701.d24	8015\021497A-D.MET		
DA	2/21/97 12:33	45797MB		0.1663	8015\021897-D\02189701.d25	8015\021497A-D.MET	OK	
DA	2/21/97 13:18	45797LCS		0.1663	8015\021897-D\02189701.d26	8015\021497A-D.MET	OK	
DA	2/21/97 14:03	45797MS		0.2063	8015\021897-D\02189701.d27	8015\021497A-D.MET	OK	
DA	2/21/97 14:49	45797MSD		0.2087	8015\021897-D\02189701.d28	8015\021497A-D.MET	OK	
DA	2/21/97 15:34	L8849-54		0.2002	8015\021897-D\02189701.d29	8015\021497A-D.MET	OK	
DA	2/21/97 16:18	L8849-57		0.2048	8015\021897-D\02189701.d30	8015\021497A-D.MET	OK	
DA	2/21/97 17:04	L8849-61		0.2814	8015\021897-D\02189701.d31	8015\021497A-D.MET	OK	
DA	2/21/97 17:48	L8849-77		0.2689	8015\021897-D\02189701.d32	8015\021497A-D.MET	OK	
DA	2/21/97 18:33	L8849-85		0.2332	8015\021897-D\02189701.d33	8015\021497A-D.MET	OK	
DA	2/21/97 19:19	L8849-50		0.2183	8015\021897-D\02189701.d34	8015\021497A-D.MET	OK	
DA	2/21/97 20:03	L8849-73		0.2271	8015\021897-D\02189701.d35	8015\021497A-D.MET	OK	
DA	2/21/97 20:48	L8849-69		0.2445	8015\021897-D\02189701.d36	8015\021497A-D.MET	OK	
DA	2/21/97 21:34	L8849-81		0.2573	8015\021897-D\02189701.d37	8015\021497A-D.MET	OK	
DA	2/21/97 22:18	30 0990-04-3		1	8015\021897-D\02189701.d38	8015\021497A-D.MET	OK	
DA	2/21/97 23:03	30 0990-04-3		1	8015\021897-D\02189701.d39	8015\021497A-D.MET	NO	
DA	2/21/97 23:48	L8849-85		0.3004	8015\021897-D\02189701.d40	8015\021497A-D.MET	OK	
DA	2/22/97 0:33	L8849-95		0.2326	8015\021897-D\02189701.d41	8015\021497A-D.MET	OK	
DA	2/22/97 1:19	L8849-99		0.2327	8015\021897-D\02189701.d42	8015\021497A-D.MET	OK	
DA	2/22/97 2:03	L8849-103		0.2067	8015\021897-D\02189701.d43	8015\021497A-D.MET	OK	
DA	2/22/97 2:47	CH2CL2		1	8015\021897-D\02189701.d44	8015\021497A-D.MET	NO	
DA	2/22/97 3:32	45796MB		0.1666	8015\021897-D\02189701.d45	8015\021497A-D.MET	OK	
DA	2/22/97 4:17	45796LCS		0.1665	8015\021897-D\02189701.d46	8015\021497A-D.MET	OK	
DA	2/22/97 5:02	45796MS		0.2051	8015\021897-D\02189701.d47	8015\021497A-D.MET	OK	
DA	2/22/97 5:47	45796MSD		0.2053	8015\021897-D\02189701.d48	8015\021497A-D.MET	OK	
DA	2/22/97 6:32	L8849-18		0.2077	8015\021897-D\02189701.d49	8015\021497A-D.MET	OK	

Analyst	Date and Time	Sample Name	Description/ Solution	Matrix/ Dil.	Raw Data File	Method File	Reported	ReAnalyzed
DA	2/22/97 7:18	L8849-34		0.2113	8015\021897-D\02189701.d50	8015\21497A-D.MET	OK	
DA	2/22/97 8:06	L8849-42		0.2059	8015\021897-D\02189701.d51	8015\21497A-D.MET	OK	
DA	2/22/97 8:52	3D 0990-04-3		1	8015\021897-D\02189701.d52	8015\21497A-D.MET	NO	
DA	2/22/97 9:40	3D 0990-04-3		1	8015\021897-D\02189701.d53	8015\21497A-D.MET	OK	
DA	2/22/97 10:28	L8849-38		1	8015\021897-D\02189701.d54	8015\21497A-D.MET	NO	
DA	2/22/97 11:16	L8849-22		1	8015\021897-D\02189701.d55	8015\21497A-D.MET	NO	
DA	2/22/97 12:05	L8849-2		1	8015\021897-D\02189701.d56	8015\21497A-D.MET	NO	
DA	2/22/97 12:56	L8849-46		1	8015\021897-D\02189701.d57	8015\21497A-D.MET	NO	
DA	2/22/97 13:46	L8849-26		1	8015\021897-D\02189701.d58	8015\21497A-D.MET	NO	
DA	2/22/97 14:38	L8849-6		1	8015\021897-D\02189701.d59	8015\21497A-D.MET	NO	
DA	2/22/97 15:29	L8849-30		1	8015\021897-D\02189701.d60	8015\21497A-D.MET	NO	
DA	2/22/97 16:20	L8849-10		1	8015\021897-D\02189701.d61	8015\21497A-D.MET	NO	
DA	2/22/97 17:10	L8849-14		1	8015\021897-D\02189701.d62	8015\21497A-D.MET	NO	
DA	2/22/97 18:00	3D 0990-04-3		1	8015\021897-D\02189701.d63	8015\21497A-D.MET	NO	
DA	2/22/97 18:49	3D 0990-04-3		1	8015\021897-D\02189701.d64	8015\21497A-D.MET	NO	
DA	2/24/97 9:10	CH2CL2		1	8015\021897-D\02189701.d65	8015\21497A-D.MET	NO	
DA	2/24/97 9:56	3D 0990-04-3		1	8015\021897-D\02189701.d66	8015\21497A-D.MET	NO	
DA	2/24/97 11:31	3D 0990-04-3		1	8015\021897-D\02189701.d67	8015\21497A-D.MET	NO	
DA	2/24/97 13:52	CH2CL2		1	8015\021897-D\02189701.d68	8015\21497A-D.MET	NO	
DA	2/24/97 14:38	3D 0990-04-3		1	8015\021897-D\02189701.d69	8015\21497A-D.MET	OK	
DA	2/24/97 15:35	L8849-38		0.2259	8015\021897-D\02189701.d70	8015\21497A-D.MET	OK	
DA	2/24/97 16:20	L8849-22		0.2288	8015\021897-D\02189701.d71	8015\21497A-D.MET	OK	
DA	2/24/97 17:06	L8849-2		0.2258	8015\021897-D\02189701.d72	8015\21497A-D.MET	OK	
DA	2/24/97 17:51	L8849-46		0.2062	8015\021897-D\02189701.d73	8015\21497A-D.MET	OK	
DA	2/24/97 18:36	L8849-26		0.2258	8015\021897-D\02189701.d74	8015\21497A-D.MET	OK	
DA	2/24/97 19:21	L8849-6		0.205	8015\021897-D\02189701.d75	8015\21497A-D.MET	OK	
DA	2/24/97 20:08	L8849-30		0.217	8015\021897-D\02189701.d76	8015\21497A-D.MET	OK	
DA	2/24/97 20:51	L8849-10		0.2457	8015\021897-D\02189701.d77	8015\21497A-D.MET	OK	
DA	2/24/97 21:36	L8849-14		0.2127	8015\021897-D\02189701.d78	8015\21497A-D.MET	OK	
DA	2/24/97 22:21	3D 0990-04-3		1	8015\021897-D\02189701.d79	8015\21497A-D.MET	NO	
DA	2/24/97 23:06	3D 0990-04-3		1	8015\021897-D\02189701.d80	8015\21497A-D.MET	NO	
DA	2/24/97 23:51	3D 0990-04-3		1	8015\021897-D\02189701.d81	8015\21497A-D.MET	OK	
DA	2/25/97 13:19	3D 0990-04-3		1	8015\021897-D\02189701.d82	8015\21497A-D.MET		

LOCKHEED ANALYTICAL SERVICES  
 TRACKING SHEET DATA REPORT (ba09)  
 EXTRACTION SHEET FOR: AK 102.0 DRO Extraction  
 WORKSHEET NUMBER: AK 102.0 DRO\_45796

7 DAY TAT!

L #	QC TYPE	CLIENT ID	DATE COLLECTED	DATE RECEIVED/ CREATED	VOL (L) EXTR CS	WATER SAMPLE PH	SURR ML	MS ML	BROUGHT TO FINAL VOLUME OF	AMT GIVEN TO ANALYST
1849-18		97BPXL1810SD01(01)	15-FEB-97	19-FEB-97	30.12	N/A	2.0		5.0al	~4al
1849-34		97BPXL111SD02(08)	15-FEB-97	19-FEB-97	30.08					
1849-42		97BPXL1C2SD02(08)	15-FEB-97	19-FEB-97	30.26					
1849-38		97BPXL1C2SD01(01)	15-FEB-97	19-FEB-97	30.21					
1849-22		97BPXL1810SD02(08)	15-FEB-97	19-FEB-97	30.01					
1849-2		97BPXL183SD01(01)	14-FEB-97	19-FEB-97	30.06					
1849-46		97BPXL1C2SD61(08)	15-FEB-97	19-FEB-97	30.02					
1849-26		97BPXL1810SD62(08)	15-FEB-97	19-FEB-97	30.12					
1849-6		97BPXL183SD02(08)	14-FEB-97	19-FEB-97	30.05					
1849-30		97BPXL111SD01(01)	15-FEB-97	19-FEB-97	30.00					
1849-10		97BPXL186SD01(01)	15-FEB-97	19-FEB-97	30.02					
1849-14		97BPXL186SD02(08)	15-FEB-97	19-FEB-97	30.15					
1796MB	MB	Method Blank		19-FEB-97	30.02	✓	✓			✓

Diesel  
Matrix Spike

EXTRACTION METHOD: Alaska DRO

DATE STARTED: 2-20-97

DATE COMPLETED: 2-20-97

SIGNED: [Signature]

BATCH# : AK 102.0 DRO\_45796

LOT #'S

SPIKE WITNESS: [Signature]

SR ID # : 0859-82-1

CONC: 200.0 mg/hyd MECL2 : 36240

NA2SO4: 1639635

ID # : 0859-80-3

CONC: 15.107 mg/l ACETONE: N/A

REVIEWED BY: [Signature]

NARRATIVE

EXTRACT COC: RECEIVED BY: [Signature] DATE: 2-20-97

LOCKHEED ANALYTICAL SERVICES

TRACKING SHEET DATA REPORT (b09)

EXTRACTION SHEET FOR: AK 102.0 DRO Extraction

WORKSHEET NUMBER: AK 102.0 DRO\_45796

LAB #	QC TYPE	CLIENT ID	DATE COLLECTED	DATE RECEIVED/CREATED	VOL/WT EXTR	WATER SAMPLE pH	SURR ML	MS ML	BROUGHT TO FINAL VOLUME OF	AMT GIVEN TO ANALYST
1796LCS	LCS	Lab Ctrl Sample		19-FEB-97	30.03	N/A	2.0	1.0	5.0 ml	~ 4 ml
5796MS L8849-6	MS	Matrix Spike	14-FEB-97	19-FEB-97	30.03	↓	↓	↓	↓	↓
5796MSD L8849-6	MSD	Matrix Spike Dup	14-FEB-97	19-FEB-97	30.01	↓	↓	↓	↓	↓
31KEL0745796	SPKEL07	Spike Lot Sample		19-FEB-97						

JCB 02-19-97

EXTRACTION METHOD: \_\_\_\_\_

DATE STARTED: \_\_\_\_\_

DATE COMPLETED: \_\_\_\_\_

SIGNED: \_\_\_\_\_

BATCH# : AK 102.0 DRO\_45796

LOT #'S

SPIKE WITNESS: \_\_\_\_\_

RR ID # : \_\_\_\_\_ CONC: \_\_\_\_\_ MECL2 : \_\_\_\_\_ NA2SO4: \_\_\_\_\_

ID # : \_\_\_\_\_ CONC: \_\_\_\_\_ ACETONE: \_\_\_\_\_

REVIEWED BY: \_\_\_\_\_

NARRATIVE \_\_\_\_\_ EXTRACT COC: RECEIVED BY: \_\_\_\_\_ DATE: \_\_\_\_\_

\_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

LOCKHEED ANALYTICAL SERVICES

TRACKING SHEET DATA REPORT (ba09)

EXTRACTION SHEET FOR: AK 102.0 DRO Extraction

WORKSHEET NUMBER: AK 102.0 DRO\_45797

7 Day TAT!

AL #	QC TYPE	CLIENT ID	DATE COLLECTED	DATE RECEIVED/CREATED	VOL (RT) EXTR CS	WATER SAMPLE pH	SURR ML	MS ML	BROUGHT TO FINAL VOLUME OF	AMT GIVEN TO ANALYST
8849-54		97BPXLI A4SD01(01)	16-FEB-97	19-FEB-97	2.20-97					
8849-57		97BPXLI A4SD02(08)	16-FEB-97	19-FEB-97	30.04	N/A	20		5.0ml	~4ml
8849-61		97BPXLI A6SD01(01)	16-FEB-97	19-FEB-97	30.04					
8849-77		97BPXLI A8SD01(01)	16-FEB-97	19-FEB-97	30.18					
8849-65		97BPXLI A6SD02(08)	16-FEB-97	19-FEB-97	30.04					
8849-50		97BPXLI C4SD02(08)	15-FEB-97	19-FEB-97	30.04					
8849-73		97BPXLI A8SD02(08)	16-FEB-97	19-FEB-97	30.03					
8849-69		97BPXLI A6SD02(08)	16-FEB-97	19-FEB-97	30.11					
8849-81		97BPXLI A10SD01(01)	16-FEB-97	19-FEB-97	30.01					
8849-85		97BPXLI A10SD02(08)	16-FEB-97	19-FEB-97	30.04					
8849-95		97BPXLI B8SD02(08)	15-FEB-97	19-FEB-97	30.18					
8849-99		97BPXLI B8SD01(01)	15-FEB-97	19-FEB-97	30.02					
8849-103		97BPXLI C4SD01(01)	15-FEB-97	19-FEB-97	30.02	↓	↓		↓	↓

Diesel matrix spike

EXTRACTION METHOD: Alaska DRO

DATE STARTED: 2.20.97

DATE COMPLETED: 2.20.97

SIGNED: [Signature]

QC BATCH# : AK 102.0 DRO\_45797

LOT #'S

SPIKE WITNESS: [Signature]

SURR ID # : 0859-82-1

CONC: 200.0mg/L MECL2 : 36240

HAZSO4: K39635

MS ID # : 0859-80-3

CONC: 15.10mg/L ACETONE: N/A

REVIEWED BY: [Signature]

NARRATIVE

EXTRACT COC: RECEIVED BY: [Signature] DATE: 2-20-



LOCKHEED ANALYTICAL SERVICES

TRACKING SHEET DATA REPORT (ba09)

EXTRACTION SHEET FOR: AK 102.0 DRO Extraction

WORKSHEET NUMBER: AK 102.0 DRO\_45797

LAL #	QC TYPE	CLIENT ID	DATE COLLECTED	DATE RECEIVED/CREATED	VOL/WT EXTR	WATER SAMPLE PH	SURR ML	MS ML	BROUGHT TO FINAL VOLUME OF	AMT GIVEN TO ANALYST
45797MB	MB	Method Blank		19-FEB-97	30.07	NA	2.0		5.0ml	~4ml
45797LCS	LCS	Lab Ctrl Sample		19-FEB-97	30.06	↓	↓	1.0	↓	↓
45797MS L 8844-03	MS	Matrix Spike	15-FEB-97	19-FEB-97	30.08	↓	↓	↓	↓	↓
45797MSD L 8844-103	MSD	Matrix Spike Dup	15-FEB-97	19-FEB-97	30.02	↓	↓	↓	↓	↓
SPK6LOT45797	SPK6LOT	Spike Lot Sample		10-FEB-97						

ULB 02-17-97

EXTRACTION METHOD: \_\_\_\_\_

DATE STARTED: \_\_\_\_\_

DATE COMPLETED: \_\_\_\_\_

SIGNED: \_\_\_\_\_

C BATCH# : AK 102.0 DRO\_45797

LOT #'S

SPIKE WITNESS: \_\_\_\_\_

URR ID # : \_\_\_\_\_ CONC: \_\_\_\_\_ MECL2 : \_\_\_\_\_ NA2SO4: \_\_\_\_\_

S ID # : \_\_\_\_\_ CONC: \_\_\_\_\_ ACETONE: \_\_\_\_\_

REVIEWED BY: \_\_\_\_\_

NARRATIVE \_\_\_\_\_ EXTRACT COC: RECEIVED BY: \_\_\_\_\_ DATE: \_\_\_\_\_

## 8015 Soils Conversion Values Ug/MI Concentration To Mg/kg

### 1. Surrogate Concentration in Ug/MI:

200

Sample Name	Mass In Grams	Percent Solid	Of Surr. (ug/kg) Found	Volume Of Surr. Used ml	Final Volume Of Extract ml	Extract Con. ug/MI If 100% Rec.	Sample Mg/Kg If 100% Rec.	Factor Ug/MI EC Mg/Kg St
L8849-18	30.12	79.94		2	5	80	16.6136001	0.20767
L8849-34	30.08	78.66		2	5	80	16.90499189	0.21131
L8849-42	30.26	80.26		2	5	80	16.46993603	0.20587
L8849-38	30.21	73.28		2	5	80	18.06857095	0.22586
L8849-22	30.01	72.81		2	5	80	18.30715504	0.22884
L8849-2	30.06	73.67		2	5	80	18.06309374	0.22579
L8849-46	30.02	80.77		2	5	80	16.49698568	0.20621
L8849-26	30.12	73.51		2	5	80	18.06588294	0.22582
L8849-6	30.05	81.17		2	5	80	16.39893667	0.20499
L8849-30	30	76.81		2	5	80	17.35885084	0.21699
L8849-10	30.02	67.80		2	5	80	19.65287153	0.24566
L8849-14	30.15	77.97		2	5	80	17.01460014	0.2126
45796MB	30.02	100.00		2	5	80	13.32445037	0.16656
45796LCS	30.03	100.00		2	5	80	13.32001332	0.16650
45796MS	30.03	81.17		2	5	80	16.41002011	0.20513
45796MSD	30.01	81.17		2	5	80	16.42095647	0.20526

## 8015 Soils Conversion Values Ug/MI Concentration To Mg/kg

1. Surrogate Concentration In Ug/MI:

200

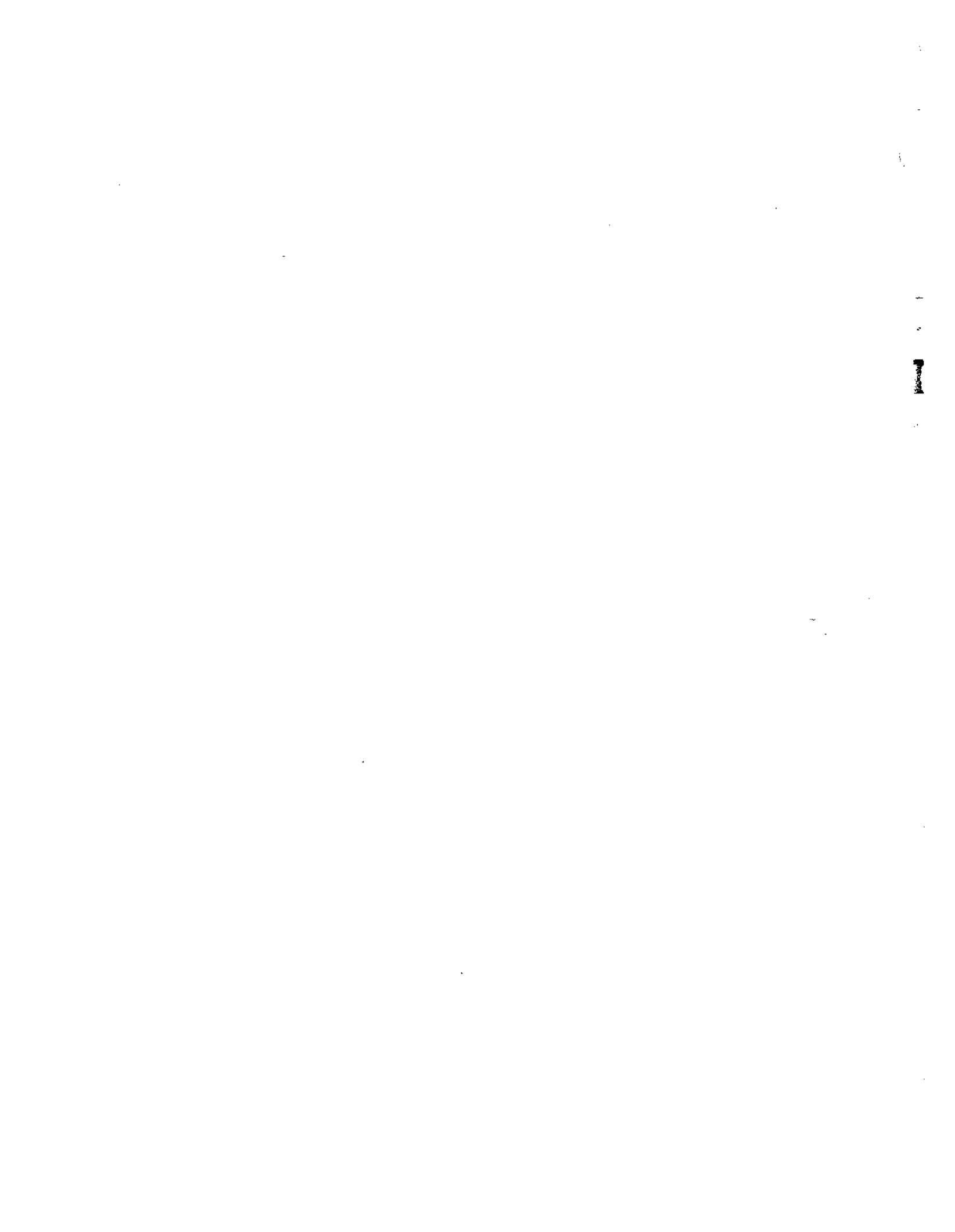
Sample Name	Mass In Grams	Percent Solid	Of Surr. (ug/kg) Found	Volume Of Surr. Used ml	Final Volume Of Extract ml	Extract Con. ug/MI If 100% Rec.	Sample Mg/Kg If 100% Rec.	Factor Ug/MI EC To Mg/Kg SC
L8849-54	30.14	82.87		2	5	80	16.01557623	0.20019
L8849-57	30.04	81.34		2	5	80	16.37027198	0.20463
L8849-61	30.04	57.12		2	5	80	23.31082513	0.29139
L8849-77	30.18	61.62		2	5	80	21.50929173	0.26887
L8849-65	30.04	71.38		2	5	80	18.65397331	0.23317
L8849-50	30.08	76.15		2	5	80	17.46213831	0.21828
L8849-73	30.03	73.31		2	5	80	18.16909692	0.22711
L8849-69	30.11	67.93		2	5	80	19.55703285	0.24446
L8849-81	30.01	64.75		2	5	80	20.58427192	0.25730
L8849-85	30.04	55.40		2	5	80	24.03389259	0.30042
L8849-95	30.18	71.24		2	5	80	18.60397251	0.23255
L8849-99	30.02	71.56		2	5	80	18.61931929	0.23274
L8849-103	30.02	80.59		2	5	80	16.53424295	0.20668
45797MB	30.07	100.00		2	5	80	13.30229465	0.16628
45797LCS	30.06	100.00		2	5	80	13.30671989	0.16633
45797MS	30.08	80.59		2	5	80	16.50064815	0.20626
45797MSD	30.02	80.59		2	5	80	16.53362746	0.20667

Percent Solids for L8849

LAL Sample #	Client ID	Value
L8849-83	97BPXLIA10SD01(01)	64.7527910685805
L8849-87	97BPXLIA10SD02(08)	55.4033485540335
L8849-55	97BPXLIA4SD01(01)	82.8655834564254
L8849-59	97BPXLIA4SD02(08)	81.3411078717201
L8849-63	97BPXLIA6SD01(01)	57.1218795888399
L8849-67	97BPXLIA6SD02(08)	71.3821138211382
L8849-71	97BPXLIA6SD62(08)	67.9276315789474
L8849-79	97BPXLIA8SD01(01)	61.6191904047976
L8849-75	97BPXLIA8SD02(08)	73.3113673805601
L8849-20 --- 8	97BPXLIB10SD01(01)	79.9357945425361
L8849-24 --- 22	97BPXLIB10SD02(08)	72.8070175438596
L8849-28 --- 26	97BPXLIB10SD62(08)	73.5099337748344
L8849-4 --- 2	97BPXLIB3SD01(01)	73.6681887366819
L8849-8 --- 6	97BPXLIB3SD02(08)	81.1708860759494
L8849-12 --- 10	97BPXLIB6SD01(01)	67.7993527508091
L8849-16 --- 14	97BPXLIB6SD02(08)	77.9742765273312
L8849-101	97BPXLIB8SD01(01)	71.5625
L8849-97	97BPXLIB8SD02(08)	71.2418300653595
L8849-40 --- 38	97BPXLIC2SD01(01)	73.28125
L8849-44 --- 42	97BPXLIC2SD02(08)	80.2610114192496
L8849-48 --- 46	97BPXLIC2SD61(08)	80.7692307692308
L8849-105	97BPXLIC4SD01(01)	80.5872756933116
L8849-52	97BPXLIC4SD02(08)	76.1526232114468
L8849-32 --- 30	97BPXLII1SD01(01)	76.8115942028985
L8849-36 --- 34	97BPXLII1SD02(08)	78.6624203821656
L8849-105SD	Duplicate	79.6116504854369

## Percent Solids for L8849

LAL Sample #	Client ID	Value
8849-83 — 81 —	97BPXLIA10SD01 (01)	64.7527910685805
L8849-87 — 85 —	97BPXLIA10SD02 (08)	55.4033485540335
L8849-55 — 54 —	97BPXLIA4SD01 (01)	82.8655834564254
L8849-59 — 57 —	97BPXLIA4SD02 (08)	81.3411078717201
L8849-63 — 61 —	97BPXLIA6SD01 (01)	57.1218795888399
L8849-67 — 65 —	97BPXLIA6SD02 (08)	71.3821138211382
L8849-71 — 69 —	97BPXLIA6SD62 (08)	67.9276315789474
L8849-79 — 77 —	97BPXLIA8SD01 (01)	61.6191904047976
L8849-75 — 73 —	97BPXLIA8SD02 (08)	73.3113673805601
L8849-20	97BPXLIB10SD01 (01)	79.9357945425361
L8849-24	97BPXLIB10SD02 (08)	72.8070175438596
L8849-28	97BPXLIB10SD62 (08)	73.5099337748344
L8849-4	97BPXLIB3SD01 (01)	73.6681887366819
L8849-8	97BPXLIB3SD02 (08)	81.1708860759494
L8849-12	97BPXLIB6SD01 (01)	67.7993527508091
L8849-16	97BPXLIB6SD02 (08)	77.9742765273312
L8849-101 — 99 —	97BPXLIB8SD01 (01)	71.5625
L8849-97 — 95 —	97BPXLIB8SD02 (08)	71.2418300653595
L8849-40	97BPXLIC2SD01 (01)	73.28125
L8849-44	97BPXLIC2SD02 (08)	80.2610114192496
L8849-48	97BPXLIC2SD61 (08)	80.7692307692308
L8849-105 — 103 —	97BPXLIC4SD01 (01)	80.5872756933116
L8849-52 — 50 —	97BPXLIC4SD02 (08)	76.1526232114468
L8849-32	97BPXLII1SD01 (01)	76.8115942028985
L8849-36	97BPXLII1SD02 (08)	78.6624203821656
L8849-105SD	Duplicate	79.6116504854369

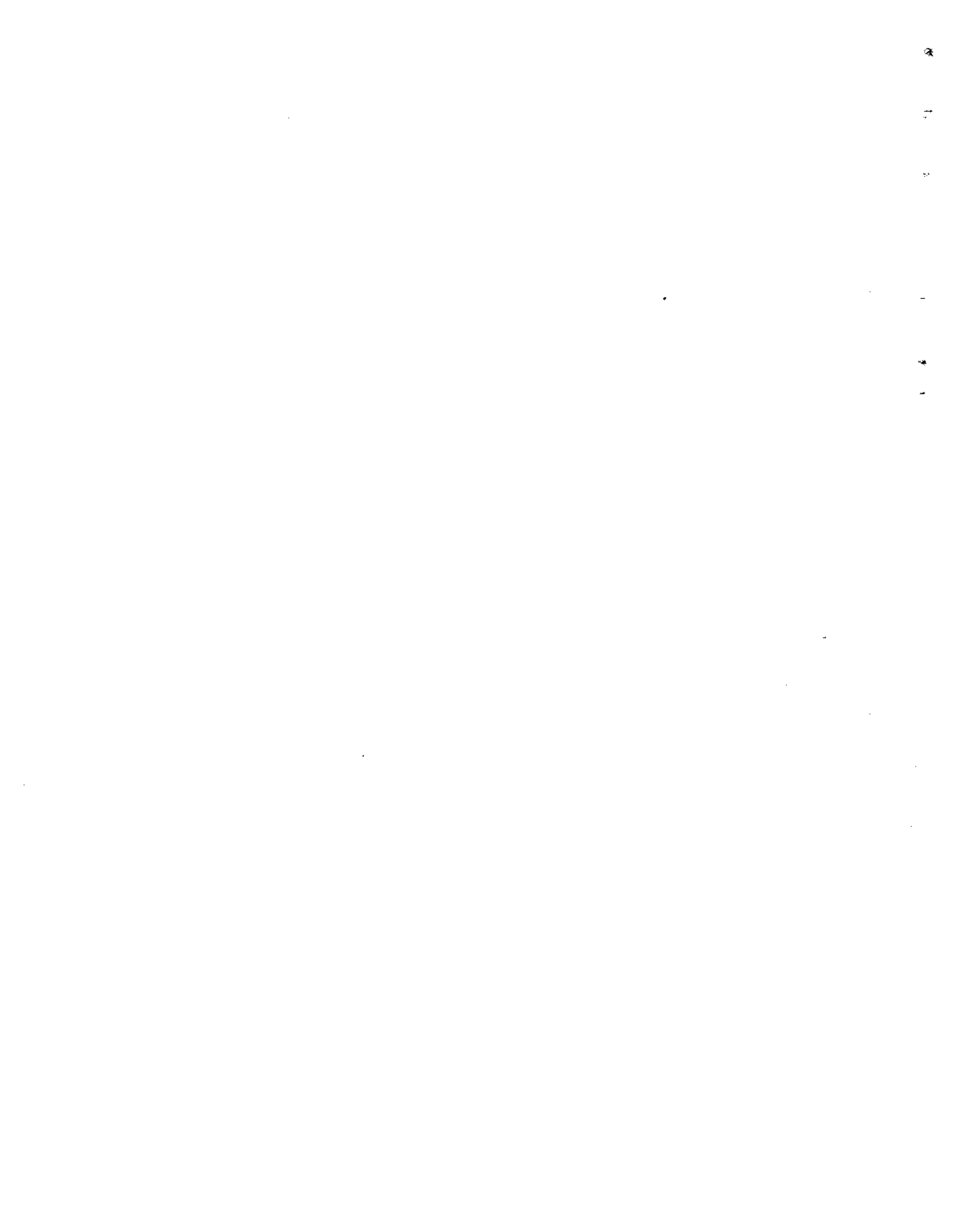




**CT&E Laboratory**



**MONTGOMERY WATSON**





**COPY**

*Reviewed  
JFW*



**CT&E Environmental Services Inc.**

Laboratory Division **////////////////////**

FEDERAL I.D. 22-3334380

200 W. Potter Drive  
Anchorage, AK 99518-1605  
Tel: (907) 562-2343  
Fax: (907) 561-5301

Client PO: **INVOICE NO. 52228023** Workorder Date: **02/17/97**  
 Project Name: **1109002.280101 Liberty Island** DATE: **02/25/97** CT&E Ref.#: **970760**  
 Account #: **JMMENGN**

**PLEASE REMIT TO: P.O. Box 10001-1019, Pasadena, CA 91110-1019**

DIRECT PAYMENT INQUIRIES TO: 1919 S. Highland Ave., Suite 210-B, Lombard, IL 60148-4991 Tel. (630) 953-9300 Fax (630) 953-9306

TERMS: Net 30 Days. A Service Charge of One and a Half Percent (1½%) Per Month Will Be Charged on Overdue Accounts.

Bill To  
Montgomery Watson Americas Inc  
4100 Spenard Rd  
Anchorage, AK 99517-2901

**FEB 28 1997**  
MONTGOMERY WATSON

Contact: Accounts Payable  
Phone: (907) 561-5829  
Ordered By:

Special Instructions

Client Sample ID/CT&E Sample ID	Parameter	Charge
97 BPX LI A4 WA 01(05)[970760001]	Total Suspended Solids	18.00
97 BPX LI A4 WA 01(05)[970760001]	Turbidity	18.00
97 BPX LI A6 WA 01(06)[970760002]	Total Suspended Solids	18.00
97 BPX LI A6 WA 01(06)[970760002]	Turbidity	18.00
97 BPX LI A8 WA 01(2-5)[970760003]	Total Suspended Solids	18.00
97 BPX LI A8 WA 01(2-5)[970760003]	Turbidity	18.00
97 BPX LI A8 WA 02(9-5)[970760004]	Total Suspended Solids	18.00
97 BPX LI A8 WA 02(9-5)[970760004]	Turbidity	18.00
97 BPX LI A10 WA 01(4.5)[970760005]	Total Suspended Solids	18.00
97 BPX LI A10 WA 01(4.5)[970760005]	Turbidity	18.00
97 BPX LI A10 WA 02(11)[970760006]	Total Suspended Solids	18.00
97 BPX LI A10 WA 02(11)[970760006]	Turbidity	18.00
97 BPX LI B3 WA 01(3.2)[970760007]	Total Suspended Solids	18.00
97 BPX LI B3 WA 01(3.2)[970760007]	Turbidity	18.00
97 BPX LI B6 WA 01(2.0)[970760008]	Total Suspended Solids	18.00
97 BPX LI B6 WA 01(2.0)[970760008]	Turbidity	18.00
97 BPX LI B8 WA 02(3.5)[970760009]	Total Suspended Solids	18.00
97 BPX LI B8 WA 02(3.5)[970760009]	Turbidity	18.00
97 BPX LI B8 WA 01(1.5)[970760010]	Total Suspended Solids	18.00

CONTROL NO.  
**R- 58515**



INVOICE (Original)

**COPY**

**CT&E Environmental Services Inc.**

Laboratory Division

200 W. Potter Drive  
Anchorage, AK 99518-160  
Tel: (907) 562-2343  
Fax: (907) 561-5301

FEDERAL I.D.: 22-3334380

INVOICE NO. 52228023

Workorder Date: 02/17/97

Client PO:

DATE 02/25/97

CT&E Ref.# 970760

Project Name: 1189002.280101 Liberty Island

Account # JMMENGN

**PLEASE REMIT TO: P.O. Box 10001-1019, Pasadena, CA 91110-1019**

DIRECT PAYMENT INQUIRIES TO: 1919 S. Highland Ave., Suite 210-B, Lombard, IL 60148-4991 Tel. (630) 953-9300 Fax (630) 953-9306

TERMS: Net 30 Days. A Service Charge of One and a Half Percent (1½%) Per Month Will Be Charged on Overdue Accounts.

Client Sample ID/CT&E Sample ID	Parameter	Charge
97 BPX LI B8 WA 01(1.5)[970760010]	Turbidity	18.00
97 BPX LI B10 WA 01(8.0)[970760011]	Total Suspended Solids	18.00
97 BPX LI B10 WA 01(8.0)[970760011]	Turbidity	18.00
97 BPX LI C2 WA 01(3.0)[970760012]	Total Suspended Solids	18.00
97 BPX LI C2 WA 01(3.0)[970760012]	Turbidity	18.00
97 BPX LI C2 WA 02(8.0)[970760013]	Total Suspended Solids	18.00
97 BPX LI C2 WA 02(8.0)[970760013]	Turbidity	18.00
97 BPX LI C4 WA 01(7.0)[970760014]	Total Suspended Solids	18.00
97 BPX LI C4 WA 01(7.0)[970760014]	Turbidity	18.00
97 BPX LI I1 WA 01(11)[970760015]	Total Suspended Solids	18.00
97 BPX LI I1 WA 01(11)[970760015]	Turbidity	18.00
97 BPX LI B8 WA 03(6.5)[970760016]	Total Suspended Solids	18.00
97 BPX LI B8 WA 03(6.5)[970760016]	Turbidity	18.00
<b>TOTAL DUE</b>		<b>\$576.00</b>

CONTROL NO.  
**R- 58516**



**CT&E Environmental Services Inc.**

Laboratory Division

---

## Laboratory Analysis Report

February 20, 1997

Bonnie McLear  
Montgomery Watson Americas Inc  
4100 Spenard Rd  
Anchorage, AK 99517-2901

---

<b>Client Name</b>	Montgomery Watson Americas Inc
<b>Project ID</b>	1189002.280101 Liberty Island [970760]
<b>Printed</b>	February 20, 1997

---

Enclosed are the analytical results associated with the above project.

As required by the state of Alaska and the USEPA, a formal Quality Assurance/Quality Control Program is maintained by CT&E. A copy of our Quality Control Manual that outlines this program is available at your request.

Except as specifically noted, all statements and data in this report are in conformance to the provisions set forth in our Quality Assurance Program Plan.

If you have any questions regarding this report or if we can be of any other assistance, please call your CT&E Project Manager at (907) 562-2343.

The following descriptors may be found on your report which will serve to further qualify the data.

- U - Indicates the compound was analyzed for but not detected.
- J - Indicates an estimated value that falls below PQL, but is greater than the MDL.
- B - Indicates the analyte is found in the blank associated with the sample.
- \* - The analyte has exceeded allowable limits.
- GT - Greater Than
- D - Secondary Dilution
- LT - Less Than



CT&E Ref.# 970760001  
 Client Name Montgomery Watson Americas Inc  
 Project Name/# 1189002.280101 Liberty Island  
 Client Sample ID 97 BPX LI A4 WA 01(05)  
 Matrix Water (Surface, Eff., Ground)  
 Ordered By  
 PWSID

Client PO#  
 Printed Date/Time 02/20/97 16:45  
 Collected Date/Time 02/16/97 11:00  
 Received Date/Time 02/17/97 14:25  
 Technical Director: Stephen C. Ede

Released By *Stephen C Ede*

Sample Remarks:

---

Parameter	Results	PQL	Units	Method	Allowable Limits	Prep Date	Analysis Date	Init
Turbidity	10.0	0.100	NTU	EPA 180.1			02/18/97	ENB
Total Suspended Solids	48.0	0.200	mg/L	EPA 160.2			02/18/97	RAM



CT&E Ref.# 970760002  
Client Name Montgomery Watson Americas Inc  
Project Name/# 1189002.280101 Liberty Island  
Client Sample ID 97 BPX LI A6 WA 01(06)  
Matrix Water (Surface, Eff., Ground)  
Ordered By  
PWSID

Client PO#  
Printed Date/Time 02/20/97 16:45  
Collected Date/Time 02/16/97 09:00  
Received Date/Time 02/17/97 14:25  
Technical Director: Stephen C. Ede

Released By *Stephen C Ede*

Sample Remarks:

Parameter	Results	PQL	Units	Method	Allowable Limits	Prep Date	Analysis Date	Init
Turbidity	24.0	0.100	NTU	EPA 180.1			02/18/97	EMB
	Sample analyzed past 48 hour hold time.							
Total Suspended Solids	18.4	0.200	mg/L	EPA 160.2			02/18/97	RAM



**CT&E Ref.#** 970760003  
**Client Name** Montgomery Watson Americas Inc  
**Project Name/#** 1189002.280101 Liberty Island  
**Client Sample ID** 97 BPX LI A8 WA 01(2-5)  
**Matrix** Water (Surface, Eff., Ground)  
**Ordered By**  
**PWSID**

**Client PO#**  
**Printed Date/Time** 02/24/97 10:16  
**Collected Date/Time** 02/15/97 03:50  
**Received Date/Time** 02/17/97 14:25  
**Technical Director:** Stephen C. Ede

Released By

Sample Remarks:

Parameter	Results	PQL	Units	Method	Allowable Limits	Prep Date	Analysis Date	Init
Turbidity	2.1	0.100	NTU	EPA 180.1			02/18/97	EMB
	Sample analyzed past 48 hour hold time.							
Total Suspended Solids	63.5	0.200	mg/L	EPA 160.2			02/18/97	RAM



**CT&E Ref.#** 970760004  
**Client Name** Montgomery Watson Americas Inc  
**Project Name/#** 1189002.280101 Liberty Island  
**Client Sample ID** 97 BPX LI A8 WA 02(9-5)  
**Matrix** Water (Surface, Eff., Ground)  
**Ordered By**  
**PWSID**

**Client PO#**  
**Printed Date/Time** 02/20/97 16:45  
**Collected Date/Time** 02/15/97 04:00  
**Received Date/Time** 02/17/97 14:25  
**Technical Director: Stephen C. Ede**

Released By *Stephen C Ede*

Sample Remarks:

Parameter	Results	PQL	Units	Method	Allowable Limits	Prep Date	Analysis Date	Init
Turbidity	5.5	0.100	NTU	EPA 180.1			02/18/97	EMB
	Sample analyzed past 48 hour hold time.							
Total Suspended Solids	24.5	0.200	mg/L	EPA 160.2			02/18/97	RAM



CT&E Ref.# 970760005  
 Client Name Montgomery Watson Americas Inc  
 Project Name/# 1189002.280101 Liberty Island  
 Client Sample ID 97 BPX LI A10 WA 01(4.5)  
 Matrix Water (Surface, Eff., Ground)  
 Ordered By  
 PWSID

Client PO#  
 Printed Date/Time 02/20/97 16:45  
 Collected Date/Time 02/16/97 01:10  
 Received Date/Time 02/17/97 14:25  
 Technical Director: Stephen C. Ede

Released By

Sample Remarks:

Parameter	Results	PQL	Units	Method	Allowable Limits	Prep Date	Analysis Date	Init
Turbidity	3.1	0.100	NTU	EPA 180.1			02/18/97	EMB
	Sample analyzed past 48 hour hold time.							
Total Suspended Solids	44.4	0.200	mg/L	EPA 160.2			02/18/97	RAM





**CT&E Ref.#** 970760006  
**Client Name** Montgomery Watson Americas Inc  
**Project Name/#** 1189002.280101 Liberty Island  
**Client Sample ID** 97 BPX LI A10 WA 02(11)  
**Matrix** Water (Surface, Eff., Ground)  
**Ordered By**  
**PWSID**

**Client PO#**  
**Printed Date/Time** 02/20/97 16:45  
**Collected Date/Time** 02/16/97 01:20  
**Received Date/Time** 02/17/97 14:25  
**Technical Director:** Stephen C. Ede

Released By *Stephen C Ede*

**Sample Remarks:**

---

Parameter	Results	PQL	Units	Method	Allowable Limits	Prep Date	Analysis Date	Init
Turbidity	21.0	0.100	NTU	EPA 180.1			02/18/97	EMB
	Sample analyzed past 48 hour hold time.							
Total Suspended Solids	76.5	0.200	mg/L	EPA 160.2			02/18/97	RAM



CT&E Environmental Services Inc.

CT&E Ref.# 970760007  
Client Name Montgomery Watson Americas Inc  
Project Name/# 1189002.280101 Liberty Island  
Client Sample ID 97 BPX LI B3 WA 01(3.2)  
Matrix Water (Surface, Eff., Ground)  
Ordered By  
PWSID

Client PO#  
Printed Date/Time 02/20/97 16:45  
Collected Date/Time 02/14/97 22:00  
Received Date/Time 02/17/97 14:25  
Technical Director: Stephen C. Ede

Released By

Sample Remarks:

Parameter	Results	PQL	Units	Method	Allowable Limits	Prep Date	Analysis Date	Init
Turbidity	7.5	0.100	NTU	EPA 180.1			02/18/97	EMB
	Sample analyzed past 48 hour hold time.							
Total Suspended Solids	26.0	0.200	mg/L	EPA 160.2			02/18/97	RAM



CT&E Ref.# 970760008  
 Client Name Montgomery Watson Americas Inc  
 Project Name/# 1189002.280101 Liberty Island  
 Client Sample ID 97 BPX LJ B6 WA 01(2.0)  
 Matrix Water (Surface, Eff., Ground)  
 Ordered By  
 PWSID

Client PO#  
 Printed Date/Time 02/20/97 16:45  
 Collected Date/Time 02/15/97 01:00  
 Received Date/Time 02/17/97 14:25  
 Technical Director: Stephen C. Ede

Released By *Stephen C Ede*

Sample Remarks:

Parameter	Results	PQL	Units	Method	Allowable Limits	Prep Date	Analysis Date	Init
Turbidity	0.89	0.100	NTU	EPA 180.1			02/18/97	EMB
	Sample analyzed past 48 hour hold time.							
Total Suspended Solids	2.5	0.200	mg/L	EPA 160.2			02/18/97	RAM



**CT&E Ref.#** 970760009  
**Client Name** Montgomery Watson Americas Inc  
**Project Name/#** 1189002.280101 Liberty Island  
**Client Sample ID** 97 BPX LI B8 WA 02(3.5)  
**Matrix** Water (Surface, Eff., Ground)  
**Ordered By**  
**PWSID**

**Client PO#**  
**Printed Date/Time** 02/20/97 16:45  
**Collected Date/Time** 02/15/97 04:10  
**Received Date/Time** 02/17/97 14:25  
**Technical Director:** Stephen C. Ede

Released By *Stephen C Ede*

Sample Remarks:

---

Parameter	Results	PQL	Units	Method	Allowable Limits	Prep Date	Analysis Date	Init
Turbidity	6.4	0.100	NTU	EPA 180.1			02/18/97	EMB
	Sample analyzed past 48 hour hold time.							
Total Suspended Solids	64.5	0.200	mg/L	EPA 160.2			02/18/97	RAM



CT&E Ref.# 970760010  
 Client Name Montgomery Watson Americas Inc  
 Project Name/# 1189002.280101 Liberty Island  
 Client Sample ID 97 BPX LI B8 WA 01(1.5)  
 Matrix Water (Surface, Eff., Ground)  
 Ordered By  
 PWSID

Client PO#  
 Printed Date/Time 02/20/97 16:45  
 Collected Date/Time 02/15/97 04:00  
 Received Date/Time 02/17/97 14:25  
 Technical Director: Stephen C. Ede

Released By *Stephen C Ede*

Sample Remarks:

---

Parameter	Results	PQL	Units	Method	Allowable Limits	Prep Date	Analysis Date	Init
Turbidity	6.1	0.100	NTU	EPA 180.1			02/18/97	EMB
	Sample analyzed past 48 hour hold time.							
Total Suspended Solids	46.5	0.200	mg/L	EPA 160.2			02/18/97	RAM



CT&E Ref.# 970760011  
 Client Name Montgomery Watson Americas Inc  
 Project Name/# 1189002.280101 Liberty Island  
 Client Sample ID 97 BPX LI B10 WA 01(8.0)  
 Matrix Water (Surface, Eff., Ground)  
 Ordered By  
 PWSID

Client PO#  
 Printed Date/Time 02/20/97 16:45  
 Collected Date/Time 02/15/97 08:30  
 Received Date/Time 02/17/97 14:25  
 Technical Director: Stephen C. Ede

Released By

Sample Remarks:

Parameter	Results	PQL	Units	Method	Allowable Limits	Prep Date	Analysis Date	Init
Turbidity	5.4	0.100	NTU	EPA 180.1			02/18/97	EMB
	Sample analyzed past 48 hour hold time.							
Total Suspended Solids	39.5	0.200	mg/L	EPA 160.2			02/18/97	RAM



CT&E Ref.# 970760012  
 Client Name Montgomery Watson Americas Inc  
 Project Name/# 1189002.280101 Liberty Island  
 Client Sample ID 97 BPX LI C2 WA 01(3.0)  
 Matrix Water (Surface, Eff., Ground)  
 Ordered By  
 PWSID

Client PO#  
 Printed Date/Time 02/20/97 16:45  
 Collected Date/Time 02/15/97 21:00  
 Received Date/Time 02/17/97 14:25  
 Technical Director: Stephen C. Ede

Released By *Stephen C Ede*

Sample Remarks:

---

Parameter	Results	PQL	Units	Method	Allowable Limits	Prep Date	Analysis Date	Init
Turbidity	3.4	0.100	NTU	EPA 180.1			02/18/97	EMB
	Sample analyzed past 48 hour hold time.							
Total Suspended Solids	13.0	0.200	mg/L	EPA 160.2			02/18/97	RAM



**CT&E Ref.#** 970760013  
**Client Name** Montgomery Watson Americas Inc  
**Project Name/#** 1189002.280101 Liberty Island  
**Client Sample ID** 97 BPX LI C2 WA 02(8.0)  
**Matrix** Water (Surface, Eff., Ground)  
**Ordered By**  
**PWSID**

**Client PO#**  
**Printed Date/Time** 02/20/97 16:45  
**Collected Date/Time** 02/15/97 21:10  
**Received Date/Time** 02/17/97 14:25  
**Technical Director: Stephen C. Ede**

Released By *Stephen C Ede*

Sample Remarks:

---

Parameter	Results	PQL	Units	Method	Allowable Limits	Prep Date	Analysis Date	Init
Turbidity	2.8	0.100	NTU	EPA 180.1			02/18/97	EMB
	Sample analyzed past 48 hour hold time.							
Total Suspended Solids	11.5	0.200	mg/L	EPA 160.2			02/18/97	RAM





CT&E Ref.# 970760014  
Client Name Montgomery Watson Americas Inc  
Project Name/# 1189002.280101 Liberty Island  
Client Sample ID 97 BPX LI C4 WA 01(7.0)  
Matrix Water (Surface, Eff., Ground)  
Ordered By  
PWSID

Client PO#  
Printed Date/Time 02/20/97 16:45  
Collected Date/Time 02/15/97 17:00  
Received Date/Time 02/17/97 14:25  
Technical Director: Stephen C. Ede

Released By *Stephen C Ede*

Sample Remarks:

Parameter	Results	PQL	Units	Method	Allowable Limits	Prep Date	Analysis Date	Init
Turbidity	7.4	0.100	NTU	EPA 180.1			02/18/97	EMB
	Sample analyzed past 48 hour hold time.							
Total Suspended Solids	15.5	0.200	mg/L	EPA 160.2			02/18/97	RAM



**CT&E Ref.#** 970760015  
**Client Name** Montgomery Watson Americas Inc  
**Project Name/#** 1189002.280101 Liberty Island  
**Client Sample ID** 97 BPX LJ II WA 01(11)  
**Matrix** Water (Surface, Eff., Ground)  
**Ordered By**  
**PWSID**

**Client PO#**  
**Printed Date/Time** 02/20/97 16:45  
**Collected Date/Time** 02/15/97 13:45  
**Received Date/Time** 02/17/97 14:25  
**Technical Director:** Stephen C. Ede

Released By *Stephen C Ede*

Sample Remarks:

---

Parameter	Results	PQL	Units	Method	Allowable Limits	Prep Date	Analysis Date	Init
Turbidity	0.54	0.100	NTU	EPA 180.1			02/18/97	EMB
	sample analyzed past 48 hour hold time.							
Total Suspended Solids	8.3	0.200	mg/L	EPA 160.2			02/18/97	RAM



CT&E Ref.# 970760016  
Client Name Montgomery Watson Americas Inc  
Project Name/# 1189002.280101 Liberty Island  
Client Sample ID 97 BPX LI B8 WA 03(6.5)  
Matrix Water (Surface, Eff., Ground)  
Ordered By  
PWSID

Client PO#  
Printed Date/Time 02/20/97 16:45  
Collected Date/Time 02/15/97 04:20  
Received Date/Time 02/17/97 14:25  
Technical Director: Stephen C. Ede

Released By

Sample Remarks:

Parameter	Results	PQL	Units	Method	Allowable Limits	Prep Date	Analysis Date	Init
Turbidity	1.7	0.100	NTU	EPA 180.1			02/18/97	EMB
	Sample analyzed past 48 hour hold time.							
Total Suspended Solids	12.3	0.200	mg/L	EPA 160.2			02/18/97	RAM



MONTGOMERY WATSON

C of C # 97-C # LI |  
Page 1 of 1

BP EXPLORATION (ALASKA) INC.  
LIBERTY ISLAND SEDIMENT AND WATER  
SAMPLING

RETURN COOLERS TO:  
MONTGOMERY WATSON  
4100 Spenard Road  
Anchorage, Alaska  
(907) 248-8883

97.0760

REPORT DUE IN 7 CALANDER DAYS

CHAIN OF CUSTODY FORM

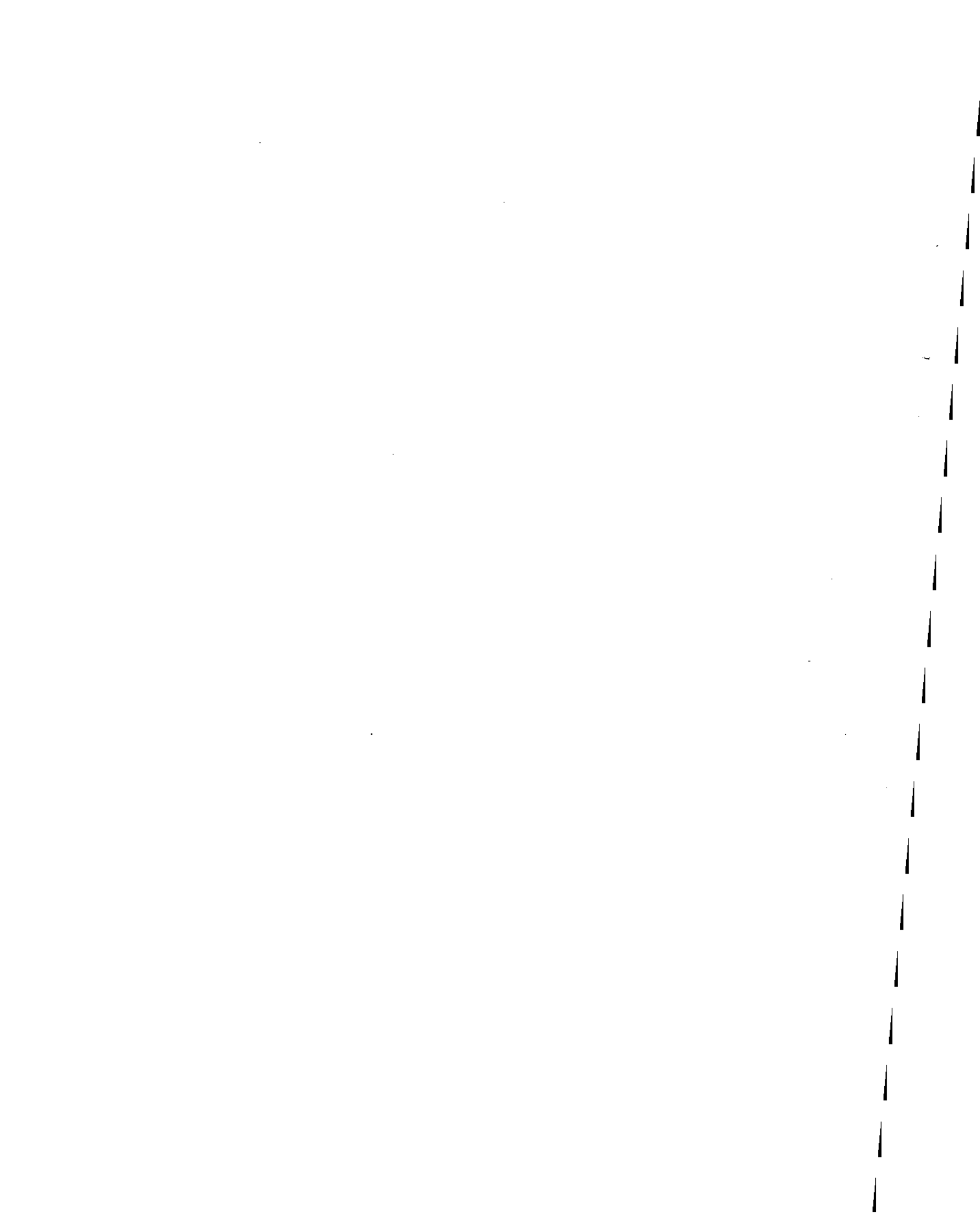
PROJ. NO. 1189002.280101		To: C T & E GAS, ANCHORAGE		TOTAL NO. OF CON- TAINERS	160.2 TSS AND TURB.				REMARKS
SAMPLERS: (Signature) 1997		Signature							
DATE	TIME	S/W	Sample ID						
①	2/16 1100	W	97 BPX LI A4 WA01(05)	2	✓				
②	2/16 0900	W	97 BPX LI A6 WA01(06)	2	✓				
③	2/15 0358	W	97 BPX LI A8 WA01(2.5)	2	✓				
④	2/15 0400	W	97 BPX LI A8 WA02(9.5)	2	✓				Turb TA
⑤	2/16 0110	W	97 BPX LI A10 WA01(4.5)	2	✓				Turb TA
⑥	2/16 0120	W	97 BPX LI A10 WA02(11)	2	✓				
⑦	2/14 2200	W	97 BPX LI 33 WA01(3.2)	1	✓				Turb. TA
⑧	2/15 100	W	97 BPX LI B6 WA01(2.0)	1	✓				Turb TA
⑨	2/15 0410	W	97 BPX LI B8 WA02(3.5)	1	✓				Turb. TA
⑩	2/15 0400	W	97 BPX LI B8 WA01(1.5)	1	✓				Turb. TA
⑪	2/15 0830	W	97 BPX LI B10 WA01(48.0)	2	✓				Turb. TA
⑫	2/15 2100	W	97 BPX LI B10 WA01(3.0)	2	✓				
			C2 WA01(3.0)						NO ENTRY
⑬	2/15 2110	W	97 BPX LI C2 WA02(8.0)	2	✓				
⑭	2/15 1700	W	97 BPX LI C4 WA01(7.0)	2	✓				
⑮	2/15 1345	W	97 BPX LI E1 WA01(11)	2	✓				
Relinquished by: 97 BPX		Date/Time		Shipped via:		Notified:		Date/Time	
Burchman		2/17/96		Delivered					
Received for Laboratory by: Jana Acosta				Date: 2/17/97		Time: 1425			



# Columbia Analytical Services



**MONTGOMERY WATSON**



Review  
JF



**RECEIVED**  
MAR 6 1997  
ANCH

**MONTGOMERY WATSON**

March 3, 1997

Doug Quist  
Montgomery Watson  
4100 Spenard Road  
Anchorage, AK 99517

Service Request No: A9700086

Re: **BP Exploration Alaska, Inc./.(1189002.280101)**

Dear Doug:

Attached are the results of the rush samples submitted to our lab on February 21, 1997. For your reference, our service request number for this work is A9700086.

All analyses were performed consistent with generally accepted analytical laboratory principles and practices. All results are intended to be considered in their entirety, and CAS is not responsible for use of less than the complete report. Results apply only to the samples analyzed.

Please call if you have any questions.

Respectfully submitted,

**Columbia Analytical Services, Inc.**

Mike Shelton  
Laboratory Director

COLUMBIA ANALYTICAL SERVICES, INC.

Client: Montgomery Watson  
Project: BP Exploration Alaska, Inc.  
Sample Matrix: Soil

Date Received: 2/21/97  
Work Order No: A9700086

CASE NARRATIVE

All analyses were performed consistent with generally accepted analytical principles and practices.

All particle size determination samples were sent to our Kelso laboratory. The service request number for these samples is K971202.

-Acronyms-

MRL Method Reporting Limit  
ND None Detected at or above the method reporting limit  
DRO Diesel Range Organics  
GRO Gasoline Range Organics  
RRO Residual Range Organics

Approved by        March 3, 1997

000002



**COLUMBIA ANALYTICAL SERVICES, INC.**

Analytical Report

**Client:** Montgomery Watson Americas, Inc.  
**Project:** Liberty Island/1189002.280101  
**Sample Matrix:** Sediment

**Service Request:** K9701202  
**Date Collected:** 2/14/97  
**Date Received:** 2/24/97  
**Date Analyzed:** 2/28/97

Particle Size Determination  
 ASTM Method D422 Modified

**Sample Name:** 97BPXLIB3SD01(01)  
**Lab Code:** K9701202-001

Sand Fraction: Weight (Grams) 18.8024  
 Sand Fraction: Weight Recovered (Grams) 18.7183  
 Sand Fraction: Percent Recovery 100

Weight as received (Grams)	53.9082
Percent Solids	72.1
Weight Oven-Dried (Grams)	38.8678

Description	Sieve Size	Sieve Number	Dry Weight (Grams)	Percent of Total Weight Recovered
Medium Gravel	4.75 mm	4	0.0000	0.00
Fine Gravel	2.00 mm	10	0.0000	0.00
Very Coarse Sand	0.850 mm	20	0.0320	0.08
Coarse Sand	0.425 mm	40	0.2379	0.61
Medium Sand	0.250 mm	60	1.4789	3.80
Fine Sand	0.106 mm	140	8.7652	22.6
Very Fine Sand	0.075 mm	200	3.8259	9.84
Clay			3.0950	7.96
Silt			23.0950	59.4
Total			40.5299	104

Approved By: Mike Sullivan Date: 3/3/97

000003

**COLUMBIA ANALYTICAL SERVICES, INC.**

Analytical Report

**Client:** Montgomery Watson Americas, Inc.  
**Project:** Liberty Island/1189002.280101  
**Sample Matrix** Sediment

**Service Request:** K9701202  
**Date Collected:** 2/14/97  
**Date Received:** 2/24/97  
**Date Analyzed:** 2/28/97

Particle Size Determination  
 ASTM Method D422 Modified

**Sample Name:** 97BPXLIB3SD02(08)  
**Lab Code:** K9701202-002

**Sand Fraction: Weight (Grams)** 82.8151  
**Sand Fraction: Weight Recovered (Grams)** 82.7387  
**Sand Fraction: Percent Recovery** 100

Weight as received (Grams)	105.248
Percent Solids	83.5
Weight Oven-Dried (Grams)	87.8821

Description	Sieve Size	Sieve Number	Dry Weight (Grams)	Percent of Total Weight Recovered
Medium Gravel	4.75 mm	4	0.0000	0.00
Fine Gravel	2.00 mm	10	0.0452	0.05
Very Coarse Sand	0.850 mm	20	0.0320	0.04
Coarse Sand	0.425 mm	40	0.5295	0.60
Medium Sand	0.250 mm	60	25.8069	29.4
Fine Sand	0.106 mm	140	51.2720	58.3
Very Fine Sand	0.075 mm	200	3.1086	3.54
Clay			1.5800	1.80
Silt			5.6200	6.39
Total			87.9942	100

Approved By: \_\_\_\_\_ Date: 3/3/97

**COLUMBIA ANALYTICAL SERVICES, INC.**

Analytical Report

**Client:** Montgomery Watson Americas, Inc.  
**Project:** Liberty Island/1189002.280101  
**Sample Matrix Sediment**

**Service Request:** K9701202  
**Date Collected:** 2/15/97  
**Date Received:** 2/24/97  
**Date Analyzed:** 2/28/97

Particle Size Determination  
 ASTM Method D422 Modified

**Sample Name:** 97BPXLIB6SD01(01)  
**Lab Code:** K9701202-003

Sand Fraction: Weight (Grams) 2.0336  
 Sand Fraction: Weight Recovered (Grams) 1.9723  
 Sand Fraction: Percent Recovery 97.0

Weight as received (Grams)	38.5563
Percent Solids	70.1
Weight Oven-Dried (Grams)	27.0280

Description	Sieve Size	Sieve Number	Dry Weight (Grams)	Percent of Total Weight Recovered
Medium Gravel	4.75 mm	4	0.0000	0.00
Fine Gravel	2.00 mm	10	0.0034	0.01
Very Coarse Sand	0.850 mm	20	0.0248	0.09
Coarse Sand	0.425 mm	40	0.0393	0.15
Medium Sand	0.250 mm	60	0.0770	0.28
Fine Sand	0.106 mm	140	0.3171	1.17
Very Fine Sand	0.075 mm	200	0.5936	2.20
Clay			1.9450	7.20
Silt			23.8800	88.4
Total			26.8802	99.5

Approved By: \_\_\_\_\_

11715

Date: 2/23/97

**COLUMBIA ANALYTICAL SERVICES, INC.**

**Analytical Report**

**Client:** Montgomery Watson Americas, Inc.  
**Project:** Liberty Island/1189002.280101  
**Sample Matrix:** Sediment

**Service Request:** K9701202  
**Date Collected:** 2/15/97  
**Date Received:** 2/24/97  
**Date Analyzed:** 2/28/97

Particle Size Determination  
 ASTM Method D422 Modified

**Sample Name:** 97BPXLIB6SD02(08)  
**Lab Code:** K9701202-004

Sand Fraction: Weight (Grams) 3.0506  
 Sand Fraction: Weight Recovered (Grams) 3.024  
 Sand Fraction: Percent Recovery 99.1

Weight as received (Grams)	34.8972
Percent Solids	76.7
Weight Oven-Dried (Grams)	26.7662

Description	Sieve Size	Sieve Number	Dry Weight (Grams)	Percent of Total Weight Recovered
Medium Gravel	4.75 mm	4	0.0000	0.00
Fine Gravel	2.00 mm	10	0.0080	0.03
Very Coarse Sand	0.850 mm	20	0.0088	0.03
Coarse Sand	0.425 mm	40	0.0338	0.13
Medium Sand	0.250 mm	60	0.0556	0.21
Fine Sand	0.106 mm	140	0.2879	1.08
Very Fine Sand	0.075 mm	200	0.4201	1.57
Clay			2.3250	8.69
Silt			23.2500	86.9
Total			26.3892	98.6

Approved By: 17715 Date: 3/3/97



**COLUMBIA ANALYTICAL SERVICES, INC.**

**Analytical Report**

**Client:** Montgomery Watson Americas, Inc.  
**Project:** Liberty Island/1189002.280101  
**Sample Matrix:** Sediment

**Service Request:** K9701202  
**Date Collected:** 2/15/97  
**Date Received:** 2/24/97  
**Date Analyzed:** 2/28/97

Particle Size Determination  
 ASTM Method D422 Modified

**Sample Name:** 97BPXLIB8SD02(08)  
**Lab Code:** K9701202-006

Sand Fraction: Weight (Grams) 14.4281  
 Sand Fraction: Weight Recovered (Grams) 14.3143  
 Sand Fraction: Percent Recovery 99.2

Weight as received (Grams)	61.6584
Percent Solids	67.5
Weight Oven-Dried (Grams)	41.6194

Description	Sieve Size	Sieve Number	Dry Weight (Grams)	Percent of Total Weight Recovered
Medium Gravel	4.75 mm	4	0.0000	0.00
Fine Gravel	2.00 mm	10	0.0269	0.06
Very Coarse Sand	0.850 mm	20	0.1035	0.25
Coarse Sand	0.425 mm	40	0.4336	1.04
Medium Sand	0.250 mm	60	2.5856	6.21
Fine Sand	0.106 mm	140	5.3886	12.9
Very Fine Sand	0.075 mm	200	2.6863	6.45
Clay			5.7450	13.8
Silt			27.2950	65.6
Total			44.2645	106

Approved By: \_\_\_\_\_

17715

Date: 3/3/97

**COLUMBIA ANALYTICAL SERVICES, INC.**

Analytical Report

**Client:** Montgomery Watson Americas, Inc.  
**Project:** Liberty Island/1189002.280101  
**Sample Matrix:** Sediment

**Service Request:** K9701202  
**Date Collected:** 2/15/97  
**Date Received:** 2/24/97  
**Date Analyzed:** 2/28/97

Particle Size Determination  
 ASTM Method D422 Modified

**Sample Name:** 97BPXLIB8SD02(08)  
**Lab Code:** K9701202-006d

Sand Fraction: Weight (Grams) 10.8452  
 Sand Fraction: Weight Recovered (Grams) 10.6645  
 Sand Fraction: Percent Recovery 98.3

Weight as received (Grams)	57.3659
Percent Solids	72.5
Weight Oven-Dried (Grams)	41.5903

Description	Sieve Size	Sieve Number	Dry Weight (Grams)	Percent of Total Weight Recovered
Medium Gravel	4.75 mm	4	0.0000	0.00
Fine Gravel	2.00 mm	10	0.0114	0.03
Very Coarse Sand	0.850 mm	20	0.1450	0.35
Coarse Sand	0.425 mm	40	0.3947	0.95
Medium Sand	0.250 mm	60	1.0133	2.44
Fine Sand	0.106 mm	140	3.1458	7.56
Very Fine Sand	0.075 mm	200	1.8541	4.46
Clay			5.1100	12.3
Silt			27.2100	65.4
Total			38.8843	93.5

Approved By: MMIS Date: 3/3/97

**COLUMBIA ANALYTICAL SERVICES, INC.**

Analytical Report

**Client:** Montgomery Watson Americas, Inc.  
**Project:** Liberty Island/1189002.280101  
**Sample Matrix:** Sediment

**Service Request:** K9701202  
**Date Collected:** 2/15/97  
**Date Received:** 2/24/97  
**Date Analyzed:** 2/28/97

Particle Size Determination  
 ASTM Method D422 Modified

**Sample Name:** 97BPXLIB8SD02(08)  
**Lab Code:** K9701202-006t

Sand Fraction: Weight (Grams) 11.8146  
 Sand Fraction: Weight Recovered (Grams) 11.6371  
 Sand Fraction: Percent Recovery 98.5

Weight as received (Grams)	54.5878
Percent Solids	70.0
Weight Oven-Dried (Grams)	38.2115

Description	Sieve Size	Sieve Number	Dry Weight (Grams)	Percent of Total Weight Recovered
Medium Gravel	4.75 mm	4	0.0000	0.00
Fine Gravel	2.00 mm	10	0.0031	0.01
Very Coarse Sand	0.850 mm	20	0.1653	0.43
Coarse Sand	0.425 mm	40	0.2877	0.75
Medium Sand	0.250 mm	60	1.0398	2.72
Fine Sand	0.106 mm	140	2.9078	7.61
Very Fine Sand	0.075 mm	200	1.7589	4.60
Clay			4.7300	12.4
Silt			26.1700	68.5
Total			37.0626	97.0

Approved By: 11715 Date: 3/3/97





**COLUMBIA ANALYTICAL SERVICES, INC.**

**Analytical Report**

**Client:** Montgomery Watson Americas, Inc.  
**Project:** Liberty Island/1189002.280101  
**Sample Matrix:** Sediment

**Service Request:** K9701202  
**Date Collected:** 2/15/97  
**Date Received:** 2/24/97  
**Date Analyzed:** 2/28/97

Particle Size Determination  
 ASTM Method D422 Modified

**Sample Name:** 97BPXLIB10SD02(08)  
**Lab Code:** K9701202-008

*B-10 E17*

Sand Fraction: Weight (Grams) 2.0051  
 Sand Fraction: Weight Recovered (Grams) 1.975  
 Sand Fraction: Percent Recovery 98.5

Weight as received (Grams)	32.4177
Percent Solids	72.5
Weight Oven-Dried (Grams)	23.5028

Description	Sieve Size	Sieve Number	Dry Weight (Grams)	Percent of Total Weight Recovered
Medium Gravel	4.75 mm	4	0.0000	0.00
Fine Gravel	2.00 mm	10	0.0000	0.00
Very Coarse Sand	0.850 mm	20	0.0060	0.03
Coarse Sand	0.425 mm	40	0.0321	0.14
Medium Sand	0.250 mm	60	0.3971	1.69
Fine Sand	0.106 mm	140	1.0078	4.29
Very Fine Sand	0.075 mm	200	0.2198	0.94
Clay			6.8450	29.1
Silt			14.9900	63.8
Total			23.4978	100

Approved By: \_\_\_\_\_ *1/115* Date: *3/3/97*

**COLUMBIA ANALYTICAL SERVICES, INC.**

Analytical Report

**Client:** Montgomery Watson Americas, Inc.  
**Project:** Liberty Island/1189002.280101  
**Sample Matrix:** Sediment

**Service Request:** K9701202  
**Date Collected:** 2/15/97  
**Date Received:** 2/24/97  
**Date Analyzed:** 2/28/97

Particle Size Determination  
 ASTM Method D422 Modified

**Sample Name:** 97BPXLIII1SD01(01)  
**Lab Code:** K9701202-009

Sand Fraction: Weight (Grams) 35.3751  
 Sand Fraction: Weight Recovered (Grams) 35.1601  
 Sand Fraction: Percent Recovery 99.4

Weight as received (Grams)	67.4098
Percent Solids	81.5
Weight Oven-Dried (Grams)	54.9390

Description	Sieve Size	Sieve Number	Dry Weight (Grams)	Percent of Total Weight Recovered
Medium Gravel	4.75 mm	4	0.0000	0.00
Fine Gravel	2.00 mm	10	0.0201	0.04
Very Coarse Sand	0.850 mm	20	0.1352	0.25
Coarse Sand	0.425 mm	40	0.1349	0.25
Medium Sand	0.250 mm	60	0.7251	1.32
Fine Sand	0.106 mm	140	16.9634	30.9
Very Fine Sand	0.075 mm	200	10.2088	18.6
Clay			3.6700	6.68
Silt			20.1850	36.7
Total			52.0425	94.7

Approved By: Mike Stelton Date: 3/3/97



**COLUMBIA ANALYTICAL SERVICES, INC.**

**Analytical Report**

**Client:** Montgomery Watson Americas, Inc.  
**Project:** Liberty Island/1189002.280101  
**Sample Matrix** Sediment

**Service Request:** K9701202  
**Date Collected:** 2/15/97  
**Date Received:** 2/24/97  
**Date Analyzed:** 2/28/97

Particle Size Determination  
 ASTM Method D422 Modified

**Sample Name:** 97BPXLIC2SD01(01)  
**Lab Code:** K9701202-011

Sand Fraction: Weight (Grams) 1.4428  
 Sand Fraction: Weight Recovered (Grams) 1.3263  
 Sand Fraction: Percent Recovery 91.9

Weight as received (Grams)	59.9115
Percent Solids	70.9
Weight Oven-Dried (Grams)	42.4773

Description	Sieve Size	Sieve Number	Dry Weight (Grams)	Percent of Total Weight Recovered
Medium Gravel	4.75 mm	4	0.0000	0.00
Fine Gravel	2.00 mm	10	0.0000	0.00
Very Coarse Sand	0.850 mm	20	0.0014	0.00
Coarse Sand	0.425 mm	40	0.0138	0.03
Medium Sand	0.250 mm	60	0.0328	0.08
Fine Sand	0.106 mm	140	0.2163	0.51
Very Fine Sand	0.075 mm	200	0.2545	0.60
Clay			3.5400	8.33
Silt			38.5150	90.7
Total			42.5738	100

Approved By: \_\_\_\_\_

1778

Date: 3/3/97

**COLUMBIA ANALYTICAL SERVICES, INC.**

**Analytical Report**

**Client:** Montgomery Watson Americas, Inc.  
**Project:** Liberty Island/1189002.280101  
**Sample Matrix** Sediment

**Service Request:** K9701202  
**Date Collected:** 2/15/97  
**Date Received:** 2/24/97  
**Date Analyzed:** 2/28/97

**Particle Size Determination  
 ASTM Method D422 Modified**

**Sample Name:** 97BPXLIC2SD02(08)  
**Lab Code:** K9701202-012

Sand Fraction: Weight (Grams) 2.6933  
 Sand Fraction: Weight Recovered (Grams) 2.673  
 Sand Fraction: Percent Recovery 99.2

Weight as received (Grams)	25.012
Percent Solids	83.5
Weight Oven-Dried (Grams)	20.8850

Description	Sieve Size	Sieve Number	Dry Weight (Grams)	Percent of Total Weight Recovered
Medium Gravel	4.75 mm	4	0.0000	0.00
Fine Gravel	2.00 mm	10	0.0000	0.00
Very Coarse Sand	0.850 mm	20	0.0099	0.05
Coarse Sand	0.425 mm	40	0.0283	0.14
Medium Sand	0.250 mm	60	0.2962	1.42
Fine Sand	0.106 mm	140	1.5188	7.27
Very Fine Sand	0.075 mm	200	0.5037	2.41
Clay			9.4800	45.4
Silt			8.3950	40.2
Total			20.2319	96.9

Approved By: 1778 Date: 3/3/97

**COLUMBIA ANALYTICAL SERVICES, INC.**

Analytical Report

**Client:** Montgomery Watson Americas, Inc.  
**Project:** Liberty Island/1189002.280101  
**Sample Matrix:** Sediment

**Service Request:** K9701202  
**Date Collected:** 2/15/97  
**Date Received:** 2/24/97  
**Date Analyzed:** 2/28/97

Particle Size Determination  
 ASTM Method D422 Modified

**Sample Name:** 97BPXLIC4SD02(08)  
**Lab Code:** K9701202-013

Sand Fraction: Weight (Grams) 66.3786  
 Sand Fraction: Weight Recovered (Grams) 66.2127  
 Sand Fraction: Percent Recovery 100

Weight as received (Grams)	92.254
Percent Solids	79.7
Weight Oven-Dried (Grams)	73.5264

Description	Sieve Size	Sieve Number	Dry Weight (Grams)	Percent of Total Weight Recovered
Medium Gravel	4.75 mm	4	0.0000	0.00
Fine Gravel	2.00 mm	10	0.0013	0.00
Very Coarse Sand	0.850 mm	20	0.0147	0.02
Coarse Sand	0.425 mm	40	0.0545	0.07
Medium Sand	0.250 mm	60	1.4404	1.96
Fine Sand	0.106 mm	140	48.7899	66.4
Very Fine Sand	0.075 mm	200	11.6167	15.8
Clay			1.7050	2.32
Silt			7.7850	10.6
Total			71.4075	97.1

Approved By: \_\_\_\_\_

*11715*

Date: 3/3/97

**COLUMBIA ANALYTICAL SERVICES, INC.**

**Analytical Report**

**Client:** Montgomery Watson Americas, Inc.  
**Project:** Liberty Island/1189002.280101  
**Sample Matrix:** Sediment

**Service Request:** K9701202  
**Date Collected:** 2/15/97  
**Date Received:** 2/24/97  
**Date Analyzed:** 2/28/97

Particle Size Determination  
 ASTM Method D422 Modified

**Sample Name:** 97BPXLIC4SD01(01)  
**Lab Code:** K9701202-014

Sand Fraction: Weight (Grams) 10.0257  
 Sand Fraction: Weight Recovered (Grams) 9.8972  
 Sand Fraction: Percent Recovery 98.7

Weight as received (Grams)	58.1901
Percent Solids	72.2
Weight Oven-Dried (Grams)	42.0133

Description	Sieve Size	Sieve Number	Dry Weight (Grams)	Percent of Total Weight Recovered
Medium Gravel	4.75 mm	4	0.0000	0.00
Fine Gravel	2.00 mm	10	0.0000	0.00
Very Coarse Sand	0.850 mm	20	0.0210	0.05
Coarse Sand	0.425 mm	40	0.0389	0.09
Medium Sand	0.250 mm	60	0.5383	1.28
Fine Sand	0.106 mm	140	5.5294	13.2
Very Fine Sand	0.075 mm	200	1.7010	4.05
Clay			3.9050	9.29
Silt			31.8850	75.9
Total			43.6186	104

Approved By: 17715 Date: 3/3/97



**COLUMBIA ANALYTICAL SERVICES, INC.**

Analytical Report

**Client:** Montgomery Watson Americas, Inc.  
**Project:** Liberty Island/1189002.280101  
**Sample Matrix:** Sediment

**Service Request:** K9701202  
**Date Collected:** 2/16/97  
**Date Received:** 2/24/97  
**Date Analyzed:** 2/28/97

Particle Size Determination  
 ASTM Method D422 Modified

**Sample Name:** 97BPXLIA4SD01(01)  
**Lab Code:** K9701202-015

Sand Fraction: Weight (Grams) 67.0099  
 Sand Fraction: Weight Recovered (Grams) 66.8148  
 Sand Fraction: Percent Recovery 100

Weight as received (Grams)	87.2264
Percent Solids	88.9
Weight Oven-Dried (Grams)	77.5443

Description	Sieve Size	Sieve Number	Dry Weight (Grams)	Percent of Total Weight Recovered
Medium Gravel	4.75 mm	4	2.4660	3.18
Fine Gravel	2.00 mm	10	1.2550	1.62
Very Coarse Sand	0.850 mm	20	0.6571	0.85
Coarse Sand	0.425 mm	40	3.8091	4.91
Medium Sand	0.250 mm	60	22.7192	29.3
Fine Sand	0.106 mm	140	32.3866	41.8
Very Fine Sand	0.075 mm	200	1.7992	2.32
Clay			3.7250	4.80
Silt			6.9400	8.95
Total			75.7572	97.7

Approved By: \_\_\_\_\_

*1770* Date: *3/3/97*

**COLUMBIA ANALYTICAL SERVICES, INC.**

Analytical Report

**Client:** Montgomery Watson Americas, Inc.  
**Project:** Liberty Island/1189002.280101  
**Sample Matrix** Sediment

**Service Request:** K9701202  
**Date Collected:** 2/16/97  
**Date Received:** 2/24/97  
**Date Analyzed:** 2/28/97

Particle Size Determination  
 ASTM Method D422 Modified

**Sample Name:** 97BPXLIA4SD02(08)  
**Lab Code:** K9701202-016

Sand Fraction: Weight (Grams) 90.4426  
 Sand Fraction: Weight Recovered (Grams) 90.363  
 Sand Fraction: Percent Recovery 100

Weight as received (Grams)	108.145
Percent Solids	85.1
Weight Oven-Dried (Grams)	92.0310

Description	Sieve Size	Sieve Number	Dry Weight (Grams)	Percent of Total Weight Recovered
Medium Gravel	4.75 mm	4	9.5634	10.4
Fine Gravel	2.00 mm	10	2.3032	2.50
Very Coarse Sand	0.850 mm	20	1.4641	1.59
Coarse Sand	0.425 mm	40	4.3069	4.68
Medium Sand	0.250 mm	60	43.0847	46.8
Fine Sand	0.106 mm	140	28.1088	30.5
Very Fine Sand	0.075 mm	200	1.0047	1.09
Clay			1.5150	1.65
Silt			2.0000	2.17
Total			93.3508	101

Approved By: 17715 Date: 3/3/97

**COLUMBIA ANALYTICAL SERVICES, INC.**

Analytical Report

**Client:** Montgomery Watson Americas, Inc.  
**Project:** Liberty Island/1189002.280101  
**Sample Matrix:** Sediment

**Service Request:** K9701202  
**Date Collected:** 2/16/97  
**Date Received:** 2/24/97  
**Date Analyzed:** 2/28/97

Particle Size Determination  
 ASTM Method D422 Modified

**Sample Name:** 97BPXLIA4SD02(08)  
**Lab Code:** K9701202-016d

Sand Fraction: Weight (Grams) 91.2509  
 Sand Fraction: Weight Recovered (Grams) 91.0646  
 Sand Fraction: Percent Recovery 100

Weight as received (Grams)	107.984
Percent Solids	84.8
Weight Oven-Dried (Grams)	91.5706

Description	Sieve Size	Sieve Number	Dry Weight (Grams)	Percent of Total Weight Recovered
Medium Gravel	4.75 mm	4	16.8718	18.4
Fine Gravel	2.00 mm	10	1.9209	2.10
Very Coarse Sand	0.850 mm	20	1.1428	1.25
Coarse Sand	0.425 mm	40	5.3384	5.83
Medium Sand	0.250 mm	60	35.1659	38.4
Fine Sand	0.106 mm	140	29.2320	31.9
Very Fine Sand	0.075 mm	200	0.7958	0.87
Clay			1.6000	1.75
Silt			2.0700	2.26
Total			94.1376	103

Approved By: \_\_\_\_\_

17715

Date: \_\_\_\_\_

3/3/97

**COLUMBIA ANALYTICAL SERVICES, INC.**

**Analytical Report**

**Client:** Montgomery Watson Americas, Inc.  
**Project:** Liberty Island/1189002.280101  
**Sample Matrix:** Sediment

**Service Request:** K9701202  
**Date Collected:** 2/16/97  
**Date Received:** 2/24/97  
**Date Analyzed:** 2/28/97

**Particle Size Determination  
 ASTM Method D422 Modified**

**Sample Name:** 97BPXLIA4SD02(08)  
**Lab Code:** K9701202-0161

**Sand Fraction: Weight (Grams)** 90.1459  
**Sand Fraction: Weight Recovered (Grams)** 90.0547  
**Sand Fraction: Percent Recovery** 100

Weight as received (Grams)	107.053
Percent Solids	85.0
Weight Oven-Dried (Grams)	90.9414

Description	Sieve Size	Sieve Number	Dry Weight (Grams)	Percent of Total Weight Recovered
Medium Gravel	4.75 mm	4	11.4577	12.6
Fine Gravel	2.00 mm	10	0.7290	0.80
Very Coarse Sand	0.850 mm	20	0.7757	0.85
Coarse Sand	0.425 mm	40	3.3704	3.71
Medium Sand	0.250 mm	60	40.0474	44.0
Fine Sand	0.106 mm	140	32.0653	35.3
Very Fine Sand	0.075 mm	200	0.8089	0.89
Clay			1.4050	1.54
Silt			2.1900	2.41
Total			92.8494	102

Approved By: 1778 Date: 3/3/97

**COLUMBIA ANALYTICAL SERVICES, INC.**

**Analytical Report**

**Client:** Montgomery Watson Americas, Inc.  
**Project:** Liberty Island/1189002.280101  
**Sample Matrix:** Sediment

**Service Request:** K9701202  
**Date Collected:** 2/16/97  
**Date Received:** 2/24/97  
**Date Analyzed:** 2/28/97

Particle Size Determination  
 ASTM Method D422 Modified

**Sample Name:** 97BPXLIA6SD01(01)  
**Lab Code:** K9701202-017

Sand Fraction: Weight (Grams) 59.7172  
 Sand Fraction: Weight Recovered (Grams) 59.5882  
 Sand Fraction: Percent Recovery 100

Weight as received (Grams)	96.8374
Percent Solids	80.5
Weight Oven-Dried (Grams)	77.9541

Description	Sieve Size	Sieve Number	Dry Weight (Grams)	Percent of Total Weight Recovered
Medium Gravel	4.75 mm	4	1.0714	1.37
Fine Gravel	2.00 mm	10	0.2535	0.33
Very Coarse Sand	0.850 mm	20	0.1769	0.23
Coarse Sand	0.425 mm	40	0.4364	0.56
Medium Sand	0.250 mm	60	11.1410	14.3
Fine Sand	0.106 mm	140	39.1413	50.2
Very Fine Sand	0.075 mm	200	4.4337	5.69
Clay			3.1250	4.01
Silt			15.1700	19.5
Total			74.9492	96.1

Approved By: 1278 Date: 3/3/97



**COLUMBIA ANALYTICAL SERVICES, INC.**

Analytical Report

**Client:** Montgomery Watson Americas, Inc.  
**Project:** Liberty Island/1189002.280101  
**Sample Matrix:** Sediment

**Service Request:** K9701202  
**Date Collected:** 2/16/97  
**Date Received:** 2/24/97  
**Date Analyzed:** 2/28/97

Particle Size Determination  
 ASTM Method D422 Modified

**Sample Name:** 97BPXLIA8SD02(08)  
**Lab Code:** K9701202-019

*A 8 847*

**Sand Fraction: Weight (Grams)** 17.723  
**Sand Fraction: Weight Recovered (Grams)** 17.5632  
**Sand Fraction: Percent Recovery** 99.1

Weight as received (Grams)	63.8683
Percent Solids	73.7
Weight Oven-Dried (Grams)	47.0709

Description	Sieve Size	Sieve Number	Dry Weight (Grams)	Percent of Total Weight Recovered
Medium Gravel	4.75 mm	4	0.0000	0.00
Fine Gravel	2.00 mm	10	0.0000	0.00
Very Coarse Sand	0.850 mm	20	0.1316	0.28
Coarse Sand	0.425 mm	40	0.1711	0.36
Medium Sand	0.250 mm	60	0.3260	0.69
Fine Sand	0.106 mm	140	4.6817	9.95
Very Fine Sand	0.075 mm	200	5.1741	11.0
Clay			4.9800	10.6
Silt			30.4200	64.6
Total			45.8845	97.5

Approved By: \_\_\_\_\_ *17715* Date: *3/3/97*





**COLUMBIA ANALYTICAL SERVICES, INC.**

Analytical Report

**Client:** Montgomery Watson Americas, Inc.  
**Project:** Liberty Island/1189002.280101  
**Sample Matrix** Sediment

**Service Request:** K9701202  
**Date Collected:** 2/16/97  
**Date Received:** 2/24/97  
**Date Analyzed:** 2/28/97

Particle Size Determination  
 ASTM Method D422 Modified

**Sample Name:** 97BPXLIA10SD01(01)  
**Lab Code:** K9701202-021

*A 110 1F7*

Sand Fraction: Weight (Grams) 32.1191  
 Sand Fraction: Weight Recovered (Grams) 32.0103  
 Sand Fraction: Percent Recovery 100

Weight as received (Grams)	61.4534
Percent Solids	81.0
Weight Oven-Dried (Grams)	49.7773

Description	Sieve Size	Sieve Number	Dry Weight (Grams)	Percent of Total Weight Recovered
Medium Gravel	4.75 mm	4	0.0000	0.00
Fine Gravel	2.00 mm	10	0.0394	0.08
Very Coarse Sand	0.850 mm	20	0.0863	0.17
Coarse Sand	0.425 mm	40	0.2890	0.58
Medium Sand	0.250 mm	60	3.4337	6.90
Fine Sand	0.106 mm	140	20.7419	41.7
Very Fine Sand	0.075 mm	200	2.8292	5.68
Clay			1.7400	3.50
Silt			18.6400	37.4
Total			47.7995	96.0

Approved By: \_\_\_\_\_ *11715* Date: *3/3/97*

**COLUMBIA ANALYTICAL SERVICES, INC.**

**Analytical Report**

**Client:** Montgomery Watson Americas, Inc.  
**Project:** Liberty Island/1189002.280101  
**Sample Matrix:** Sediment

**Service Request:** K9701202  
**Date Collected:** 2/16/97  
**Date Received:** 2/24/97  
**Date Analyzed:** 2/28/97

**Particle Size Determination  
 ASTM Method D422 Modified**

**Sample Name:** 97BPXLIA10SD02(08)  
**Lab Code:** K9701202-022

*A-10 8 fr*

**Sand Fraction: Weight (Grams)** 17.5188  
**Sand Fraction: Weight Recovered (Grams)** 17.1901  
**Sand Fraction: Percent Recovery** 98.1

Weight as received (Grams)	61.0743
Percent Solids	56.0
Weight Oven-Dried (Grams)	34.2016

Description	Sieve Size	Sieve Number	Dry Weight (Grams)	Percent of Total Weight Recovered
Medium Gravel	4.75 mm	4	0.0000	0.00
Fine Gravel	2.00 mm	10	0.0838	0.25
Very Coarse Sand	0.850 mm	20	0.6112	1.79
Coarse Sand	0.425 mm	40	0.8858	2.59
Medium Sand	0.250 mm	60	0.6678	1.95
Fine Sand	0.106 mm	140	5.2105	15.2
Very Fine Sand	0.075 mm	200	3.1105	9.09
Clay			5.7050	16.7
Silt			19.7300	57.7
<b>Total</b>			<b>36.0046</b>	<b>105</b>

Approved By: \_\_\_\_\_ Date: \_\_\_\_\_

**APPENDIX A**

**CHAIN OF CUSTODY INFORMATION  
COOLER RECEIPT FORM**

000029







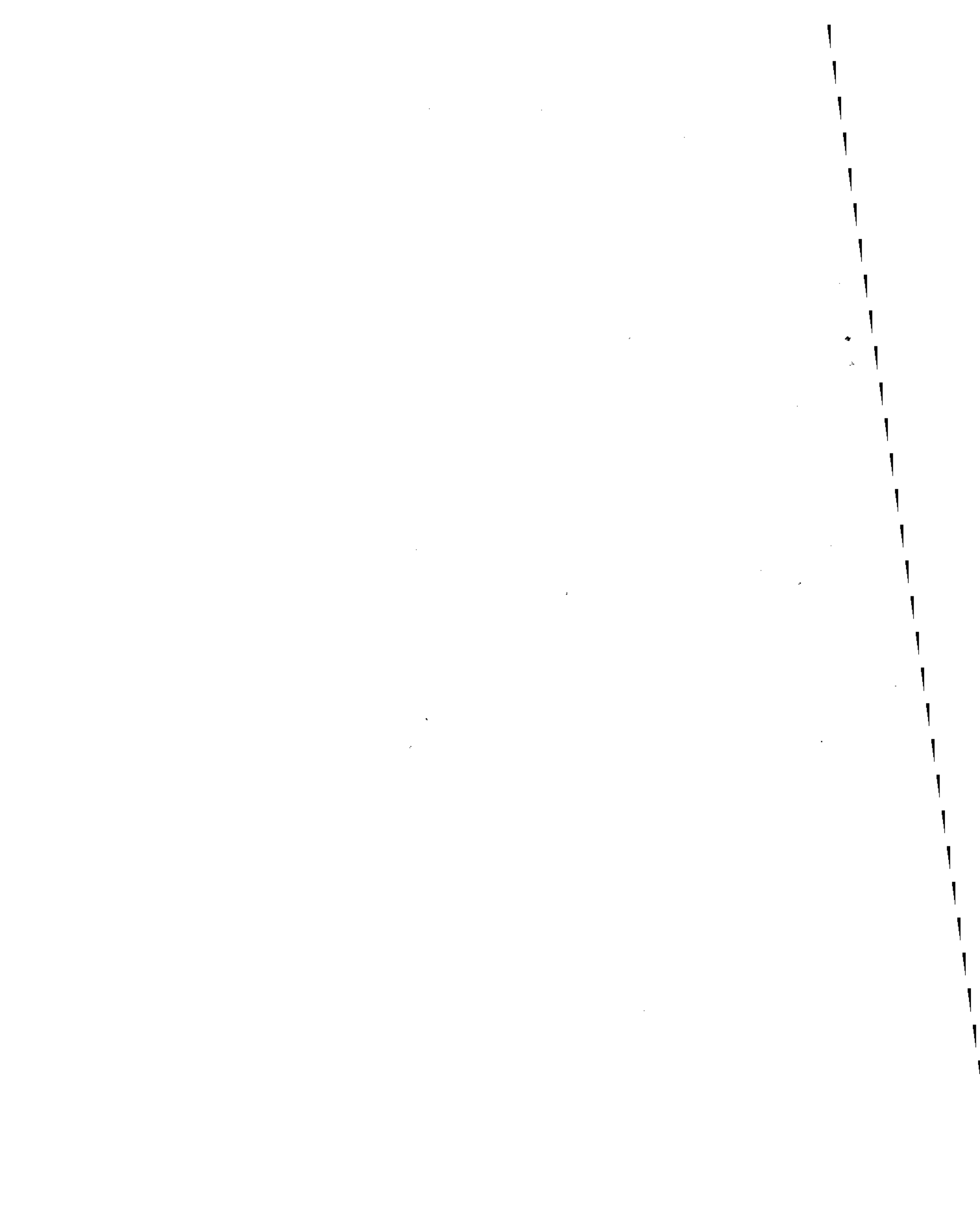
---

**Appendix D**  
**Chain-of-Custody-Records**

---



**MONTGOMERY WATSON**







MONTGOMERY WATSON

Michael Turner

BP EXPLORATION (ALASKA) INC.  
LIBERTY ISLAND SEDIMENT AND WATER  
SAMPLING

C of C # 97-C # LI |  
Page 1 of 1

RETURN COOLERS TO:  
MONTGOMERY WATSON  
4100 Spenard Road  
Anchorage, Alaska  
(907) 248-8883

97.0760

REPORT DUE IN 7 CALANDER DAYS

CHAIN OF CUSTODY FORM

PROJ. NO. 1189002.280101		To: CT & E - GAS, ANCHORAGE		TOTAL NO. OF CON- TAINERS	160.2 TSS AND TURB.				REMARKS
SAMPLERS: (Signature) 1997		Signature							
DATE	TIME	S/W	Sample ID						
2/16	1100	W	97 BPX LI A4 WA01 (05)	2	✓				
2/16	0900	W	97 BPX LI A6 WA01 (06)	2	✓				
2/16	0350	W	97 BPX LI A8 WA01 (2.5)	2	✓				
2/15	0400	W	97 BPX LI A8 WA02 (9.5)	2	✓				Turb TA
2/16	0110	W	97 BPX LI A10 WA01 (4.5)	2	✓				Turb TA
2/16	0120	W	97 BPX LI A10 WA02 (11)	2	✓				
2/14	2200	W	97 BPX LI 33 WA01 (3.2)	1	✓				Turb. TA
2/15	100	W	97 BPX LI B6 WA01 (2.0)	1	✓				Turb TA
2/15	0410	W	97 BPX LI B8 WA02 (3.5)	1	✓				Turb. TA
2/15	0400	W	97 BPX LI B8 WA01 (1.5)	1	✓				Turb. TA
2/15	830	W	97 BPX LI B10 WA01 (48.0)	2	✓				Turb. TA
2/15	2100	W	97 BPX LI B10 WA01 (3.0)	2	✓				
			C2 WA01 (3.0)			NO entries			
2/15	2110	W	97 BPX LI C2 WA02 (8.0)	2	✓				
2/15	1700	W	97 BPX LI C4 WA01 (7.0)	2	✓				
2/15	1345	W	97 BPX LI E1 WA01 (11)	2	✓				
2/15	420	W	97 BPX LI B8 WA03 (6.9)	1	✓				Assesd: Burdick
Relinquished by: 97 BPX		Date/Time		Shipped via:		Notified:		Date/Time	
Burdick		2/17/97		Delivered					
Received for Laboratory by: Dana Beckett				Date: 2/17/97			Time: 1425		



CT&E Environmental Services Inc.

February 19, 1997

Bonnie McLearn  
Montgomery Watson Americas Inc  
4100 Spenard Rd  
Anchorage, AK 99517-2901

REGISTERED  
FEB 24 1997  
MONTGOMERY WATSON

Dear Bonnie McLearn:

Thank you for your recent request for analytical services. The sample(s) below will be analyzed per your request.

These samples will be disposed 30 days after completion of analysis. Your samples are assigned to the indicated project

Client: Montgomery Watson Americas Inc - JMMENGN  
Project: 1189002.280101 Liberty Island - [970760]

Sample: 970760001 Client/CT&E ID: 97 BPX LI A4 WA 01(05)

Matrix: 1 - Water (Surface, Eff., Ground)

Collected: 02/16/97 11:00

Received: 02/17/97 14:25

02/26/97 17:00

Receiving Codes:

OK - Sample arrived in good condition

Total Suspended Solids

Turbidity

Sample: 970760002 Client/CT&E ID: 97 BPX LI A6 WA 01(06)

Matrix: 1 - Water (Surface, Eff., Ground)

Collected: 02/16/97 09:00

Received: 02/17/97 14:25

02/26/97 17:00

Receiving Codes:

OK - Sample arrived in good condition

Total Suspended Solids

Turbidity

Sample: 970760003 Client/CT&E ID: 97 BPX LI A8 WA 01(2-5)

Matrix: 1 - Water (Surface, Eff., Ground)

Collected: 02/16/97 03:50

Received: 02/17/97 14:25

02/26/97 17:00

Receiving Codes:

OK - Sample arrived in good condition

Total Suspended Solids

Turbidity



Sample: 970760004 Client/CT&E ID: 97 BPX LI A8 WA 02(9-5)  
Matrix: 1 - Water (Surface, Eff., Ground)  
Collected: 02/15/97 04:00 Received: 02/17/97 14:25 02/26/97 17:00  
Receiving Codes:  
OK - Sample arrived in good condition

Total Suspended Solids  
Turbidity

Sample: 970760005 Client/CT&E ID: 97 BPX LI A10 WA 01(4.5)  
Matrix: 1 - Water (Surface, Eff., Ground)  
Collected: 02/16/97 01:10 Received: 02/17/97 14:25 02/26/97 17:00  
Receiving Codes:  
OK - Sample arrived in good condition

Total Suspended Solids  
Turbidity

Sample: 970760006 Client/CT&E ID: 97 BPX LI A10 WA 02(11)  
Matrix: 1 - Water (Surface, Eff., Ground)  
Collected: 02/16/97 01:20 Received: 02/17/97 14:25 02/26/97 17:00  
Receiving Codes:  
OK - Sample arrived in good condition

Total Suspended Solids  
Turbidity

Sample: 970760007 Client/CT&E ID: 97 BPX LI B3 WA 01(3.2)  
Matrix: 1 - Water (Surface, Eff., Ground)  
Collected: 02/14/97 22:00 Received: 02/17/97 14:25 02/26/97 17:00  
Receiving Codes:  
OK - Sample arrived in good condition

Total Suspended Solids  
Turbidity

Sample: 970760008 Client/CT&E ID: 97 BPX LI B6 WA 01(2.0)  
Matrix: 1 - Water (Surface, Eff., Ground)  
Collected: 02/15/97 01:00 Received: 02/17/97 14:25 02/26/97 17:00  
Receiving Codes:  
OK - Sample arrived in good condition

Total Suspended Solids  
Turbidity



Sample: 970760009 Client/CT&E ID: 97 BPX LI B8 WA 02(3.5)  
Matrix: 1 - Water (Surface, Eff., Ground)  
Collected: 02/15/97 04:10 Received: 02/17/97 14:25 02/26/97 17:00  
Receiving Codes:  
OK - Sample arrived in good condition

Total Suspended Solids  
Turbidity

Sample: 970760010 Client/CT&E ID: 97 BPX LI B8 WA 01(1.5)  
Matrix: 1 - Water (Surface, Eff., Ground)  
Collected: 02/15/97 04:00 Received: 02/17/97 14:25 02/26/97 17:00  
Receiving Codes:  
OK - Sample arrived in good condition

Total Suspended Solids  
Turbidity

Sample: 970760011 Client/CT&E ID: 97 BPX LI B10 WA 01(8.0)  
Matrix: 1 - Water (Surface, Eff., Ground)  
Collected: 02/15/97 08:30 Received: 02/17/97 14:25 02/26/97 17:00  
Receiving Codes:  
OK - Sample arrived in good condition

Total Suspended Solids  
Turbidity

Sample: 970760012 Client/CT&E ID: 97 BPX LI C2 WA 01(3.0)  
Matrix: 1 - Water (Surface, Eff., Ground)  
Collected: 02/15/97 21:00 Received: 02/17/97 14:25 02/26/97 17:00  
Receiving Codes:  
OK - Sample arrived in good condition

Total Suspended Solids  
Turbidity

Sample: 970760013 Client/CT&E ID: 97 BPX LI C2 WA 02(8.0)  
Matrix: 1 - Water (Surface, Eff., Ground)  
Collected: 02/15/97 21:10 Received: 02/17/97 14:25 02/26/97 17:00  
Receiving Codes:  
OK - Sample arrived in good condition

Total Suspended Solids  
Turbidity



CT&E Environmental Services Inc.

Sample: 970760014 Client/CT&E ID: 97 BPX LI C4 WA 01(7.0)  
Matrix: 1 - Water (Surface, Eff., Ground)  
Collected: 02/15/97 17:00 Received: 02/17/97 14:25 02/26/97 17:00  
Receiving Codes:  
OK - Sample arrived in good condition

Total Suspended Solids  
Turbidity

Sample: 970760015 Client/CT&E ID: 97 BPX LI II WA 01(11)  
Matrix: 1 - Water (Surface, Eff., Ground)  
Collected: 02/15/97 13:45 Received: 02/17/97 14:25 02/26/97 17:00  
Receiving Codes:  
OK - Sample arrived in good condition

Total Suspended Solids  
Turbidity

Sample: 970760016 Client/CT&E ID: 97 BPX LI B8 WA 03(6.5)  
Matrix: 1 - Water (Surface, Eff., Ground)  
Collected: 02/15/97 04:20 Received: 02/17/97 14:25 02/26/97 17:00  
Receiving Codes:  
OK - Sample arrived in good condition

Total Suspended Solids  
Turbidity

For further information or assistance concerning samples, please contact:  
Joyce Windebank at (907)562-2343



MONTGOMERY WATSON

C of C, #97-LI2

Page 1 of 2

BP EXPLORATION (ALASKA) INC.  
LIBERTY ISLAND PIPELINE SEDIMENT AND WATER  
SAMPLING

RETURN COOLERS TO:  
MONTGOMERY WATSON  
4100 Spenard Road  
Anchorage, Alaska 99517  
(907) 248-8883

REPORT DUE IN 7 CALANDER DAYS

CHAIN OF CUSTODY FORM

PROJ. NO. 1189002.280101		To: LOCKHEED, Attn: MARY WOLFE		TOTAL NO. OF CON- TAINERS	WATER				REMARKS
SAMPLERS: (Signature) 1997 WJ [Signature]		[Signature]			TSS, EPA 160.2	VOC, 8260A 2.2 OZ	SVOC (8270B), DRO (8100M), TOC (415.1), 8 OZ.	As, Cd, Cr, Ba, Hg, Cr+6, BaSO4, 4 OZ.	
DATE	TIME	S/W	Sample ID						
2/14	2300	SED	97BPXLIB3SD01(01)	4	X	X	X		
2/14	2330	SED	97BPXLIB3SD01(08)	4					
2/15	0120	SED	97BPXLIB6SD01(01)	4					
2/15	0145	SED	97BPXLIB6SD02(08)	4					
2/15	0900	SED	97BPXLIB10SD01(07)	4					
2/15	0930	SED	97BPXLIB10SD02(08)	4					
2/15	1000	SED	97BPXLIB10SD62(08)	4					
2/15	1400	SED	97BPXLIT1SD01(01)	4					
2/15	1445	SED	97BPXLIT1SD02(08)	4					
2/15	2220	SED	97BPXLIC2SD01(01)	4					
2/15	2230	SED	97BPXLIC2SD02(08)	4					
2/15	2300	SED	97BPXLIC2SD61(08)	4				← 50 62 (08)	
2/15	1800	SED	97BPXLIC4SD02(08)	4				← Completed 2/20 (08) should be	
2/15	1730	SED	97BPXLIC4SD01(08)	4				(01) Bgm	
2/16	1130	SED	97BPXLIA4SD01(01)	3					
2/16	1200	SED	97BPXLIA4SD02(08)	4					
2/16	0930	SED	97BPXLIA6SD01(01)	4	X	X	X		
Relinquished by: [Signature]		Date/Time 2/10/97 1200		Shipped via: FedEx 3842059662		Notified: [Signature]		Date/Time	
Received for Laboratory by:				Date:		Time:			

WJW

correct (01) (08)

← 50 62 (08)  
Completed 2/20  
(08) should be  
(01) Bgm



MONTGOMERY WATSON

C of C, #97-LI2

Page 2 of 2.

BP EXPLORATION (ALAS..A) INC.  
LIBERY ISLAND PILELINE SEDIMENT AND WATER  
SAMPLING

RETURN COOLERS TO:  
MONTGOMERY WATSON  
4100 Spenard Road  
Anchorage, Alaska 99517  
(907) 248-8883

REPORT DUE IN 7 CALANDER DAYS

CHAIN OF CUSTODY FORM

PROJ. NO. 1189002.280101		To: LOCKHEED, Attn: MARY WOLFE		TOTAL NO. OF CON- TAINERS	WATER			REMARKS
SAMPLERS: ( Signature ) 1997 <i>W. [Signature]</i>		<i>Zunchea</i>			TSS, EPA 160.2 VOC, 8260A 2.2 OZ	SVOC (8270B), DRO (8100M), TOC (415.1), 8 OZ.	As, Cd, Cr, Ba, Hg, Cr+6, BaSO4, 4 OZ.	
DATE	TIME	S/W	Sample ID					
2/16	1000	SED	97BPX LIA6SD02(OE)	4	X	X	X	
2/16	1010	SED	97BPX LIA6SD62(OE)	4				
2/16	0440	SED	97BPX LIA8SD02(OE)	4				
2/16	0430	SED	97BPX LIA8SD01(O1)	4				
2/16	0130	SED	97BPX LIA10SD01(O1)	4				
2/16	0150	SED	97BPX LIA10SD02(OE)	4	X	X	X	
2/16	1900	W	97 BPX LI TB 21697	3	X			
2/14	1900	W	97 BPX LI 021497	3	X			
2/15	0430	SD	97 BPX LIA8SD01(O1)	4	X	X	X	JARS Rec'd
2/15	0500	SD	97BPX LIA8SD02(OE)	4	X	X	X	by LAB - Added to C of C 2/20 <i>[Signature]</i>
Relinquished by: <i>[Signature]</i>					Date/Time: 2/18/97 (2:00)	Shipped via: FedEx 3842	Notified:	Date/Time:
Received for Laboratory by:					Date:	Time:		

✓  
✓  
2/20  
7:20  
1/20/97

2009662



MONTGOMERY WATSON

C of C, #97-LI2

Page 1 of 2

BP EXPLORATION (ALASKA) INC.  
LIBERTY ISLAND PIPELINE SEDIMENT AND WATER  
SAMPLING

RETURN COOLERS TO:  
MONTGOMERY WATSON  
4100 Spanard Road  
Anchorage, Alaska 99517  
(907) 248-8883

REPORT DUE IN 7 CALANDER DAYS

CHAIN OF CUSTODY FORM

PROJ. NO. 1189002.280101		To: LOCKHEED, Attn: MARY WOLFE		TOTAL NO. OF CON- TAINERS	WATER				REMARKS
SAMPLERS: (Signature) 1997 WL [Signature]		[Signature]			TSS, EPA 160.2 VOC, 8260A 2-2 OZ	SVOC (8270B), DRO (8100M), TOC (415.1), 8 OZ	As, Cd, Cr, Ba, Hg, Cr+6, BaSO4, 4 OZ		
DATE	TIME	S/W	Sample ID						
2/14	2300	SED	97BPXLIB3SD01(01)	4	X	X	X		
2/14	2330	SED	97BPXLIB3SD01(08)	4					
2/15	0120	SED	97BPXLIB6SD01(01)	4					
2/15	0145	SED	97BPXLIB6SD02(08)	4					
2/15	0900	SED	97BPXLIB10SD01(01)	4					
2/15	0930	SED	97BPXLIB10SD02(08)	4					
2/15	1000	SED	97BPXLIB10SD62(08)	4					
2/15	1400	SED	97BPXLI11SD01(01)	4					
2/15	1445	SED	97BPXLI11SD02(08)	4					
2/15	2220	SED	97BPXLIC2SD01(01)	4					
2/15	2240	SED	97BPXLIC2SD02(08)	4					
2/15	2300	SED	97BPXLIC2SD61(08)	4					
2/15	1800	SED	97BPXLIC4SD02(08)	4					
2/15	1730	SED	97BPXLIC4SD01(08)	4				One replicate 02/20 (08) should be (01) Bgmx	
2/16	1130	SED	97BPXLIA4SD01(01)	3					
2/16	1200	SED	97BPXLIA4SD02(08)	4					
2/16	0930	SED	97BPXLIA6SD01(01)	4	X	X	X		
Retinquished by: [Signature]		Date/Time 2/10/97 1700		Shipped via: FedEx 38420		Notified: 9662		Date/Time	
Received for Laboratory by:				Date:	Time:				

3  
6  
58  
WCA  
4  
16





MONTGOMERY WATSON

C of C, #97-LI2

Page 2 of 2

BP EXPLORATION (ALAS..A) INC.  
LIBERTY ISLAND PIPELINE SEDIMENT AND WATER  
SAMPLING

RETURN COOLERS TO:  
MONTGOMERY WATSON  
4100 Spenard Road  
Anchorage, Alaska 99517  
(907) 248-8883

REPORT DUE IN 7 CALANDER DAYS

CHAIN OF CUSTODY FORM

PROJ. NO. 1189002.280101		To: LOCKHEED, Attn: MARY WOLFE		TOTAL NO. OF CON- TAINERS	WATER			REMARKS
SAMPLERS: ( Signature ) 1997 WC <i>[Signature]</i>		<i>[Signature]</i>			TSS, EPA 160.2 VOC, 8260A 2.2 OZ	SVOC (8270B), DRO (8100M), TOC (415.1), 8 OZ.	As, Cd, Cr, Ba, Hg, Cr+6, BaSO4, 4 OZ.	
DATE	TIME	S/W	Sample ID					
2/16	1000	SED	97BPX LIA6SD02(08)	4	X	X	X	
2/16	1010	SED	97BPX LIA6SD62(08)	4				
2/16	0440	SED	97BPX LIA8SD01(08)	4				
2/16	0430	SED	97BPX LIA8SD01(01)	4				
2/16	0130	SED	97BPX LIA10SD01(01)	4				
2/16	0150	SED	97BPX LIA10SD02(08)	4	X	X	X	
<del>2/16</del>	<del>1900</del>	<del>W</del>	<del>97 BPX LI TB 21697</del>	<del>3</del>	<del>X</del>			
<del>2/14</del>	<del>1900</del>	<del>W</del>	<del>97 BPX LI 021497</del>	<del>3</del>	<del>X</del>			
2/15	0430	SD	97 BPX LI B8SD01(01)	4	X	X	X	JARS Rec'd
2/15	0500	SD	97BPX LI B8SD02(08)	4	X	X	X	by LAB - Added to C of C 2/20 <i>[Signature]</i>
2009652								
Relinquished by: <i>[Signature]</i>		Date/Time 2/15/97 (200)		Shipped via FedEx 384		Notified:		Date/Time
Received for Laboratory by:					Date:		Time:	

3/20/97  
2:20  
3:00pm

# FedEx. USA Airbill

Tracking Number **3842009662**

**Sender's Copy**  
863140 00006/00200

**1** From (please print) \_\_\_\_\_  
Date 2/18/97 Sender's FedEx Account Number 1387-3266-5

Sender Name omnie McLean Phone (907) 248-8883  
Dept./Floor/Suite/Room \_\_\_\_\_

Company MONTGOMERY WATSON

Address 4100 SPENARD RD

City ANCHORAGE State AK Zip 99517

**2** Your Internal Billing Reference Information (Optional) (First 30 characters will appear on invoice) 1189002.270101

**3** To (please print) \_\_\_\_\_  
Recipient's Name Mary Wolfe Phone (800) 582-7605  
Dept./Floor/Suite/Room \_\_\_\_\_

Company IAS Lab

Address 975 Kelly Johnson Dr.  
(We Cannot Deliver to P.O. Boxes or P.O. Zip Codes)

City Las Vegas State NV Zip 89119

**For HOLD at FedEx Location check here**  
 Hold Weekday (Not available with FedEx First Overnight)  
 Hold Saturday (Not available at all locations) (Not available with FedEx First Overnight or FedEx Standard Overnight)  
**For Saturday Delivery check here**  
 Home Change (Not available at all locations) (Not available with FedEx First Overnight or FedEx Standard Overnight)

**Special Conditions, Insured Values, and Limit of Liability**—By using this Airbill, you agree to the service conditions in our current Service Guide or U.S. Government Service Guide. Both are available on request. **SEE BACK OF SENDER'S COPY OF THIS AIRBILL FOR INFORMATION AND ADDITIONAL TERMS.** We will not be responsible for any claim in excess of \$100 per package whether the result of loss, damage, or delay, non-delivery, re-delivery, or misrouting, unless you declare a higher value, pay an additional charge, and document your

actual loss in a timely manner. Your right to recover from us for any loss includes intrinsic value of the package, loss of sales, interest, profit, attorney's fees, costs, and other forms of damage, whether direct, incidental, consequential, or special, and is limited to the greater of \$100 or the declared value but cannot exceed actual documented loss. The maximum declared value for any FedEx Letter and FedEx Pak is \$500. Federal Express may, upon your request, and with some limitations, refund all transportation charges paid. See the FedEx Service Guide for further details.

Questions?  
Call 1-800-Go-FedEx (1-800-463-3339)

## The World On Time.

**4a Express Package Service** Packages under 150 lbs. Delivery commitment may be later in some areas.  
 FedEx Priority Overnight (Next business morning)  
 FedEx Standard Overnight (Next business afternoon)  
 FedEx 2Day® (Second business day)

NEW FedEx First Overnight (Earliest next business morning; delivery to select locations) (Higher rates apply)  
 \* FedEx Letter may not exceed additional charge. Only ground FedEx 2Day rate.

**4b Express Freight Service** Packages over 150 lbs. Delivery commitment may be later in some areas.  
 FedEx Overnight Freight (Next business day service for any distance)  
 FedEx 2Day Freight (Second business day service for any distance)  
 FedEx Express Saver Freight (Up to 3 business day service based upon distance)  
 Call for delivery schedule. See back for detailed descriptions of freight products.

**5 Packaging**  FedEx Letter  FedEx Pak  FedEx Box  FedEx Tube  Other Pkg.  
 (Declared value limit \$500)

**6 Special Handling**  
 Does this shipment contain dangerous goods?  Yes (Hazardous material, flammable, etc.)  No  
 Dry Ice (Dry Ice, U. N. 1845 or Dangerous Goods Shipper's Declaration not required) CA  Cargo Aircraft Only

**7 Payment**  
 Bill to:  Sender (Account no. in Section 10 to be filled)  Recipient  Third Party  Credit Card  Cash/Check  
 (Enter FedEx, Visa, or Credit Card no. below)

FedEx Account No. \_\_\_\_\_ Exp. Date \_\_\_\_\_  
 Credit Card No. \_\_\_\_\_

Total Packages	Total Weight	Total Declared Value*
		\$ .00

\*When declaring a value higher than \$500 per shipment, you pay an additional charge. See SERVICE CONDITIONS, DECLARED VALUE AND LIMIT OF LIABILITY sections for further information.

**8 Release Signature** Sign to authorize delivery without obtaining signature.

Your signature authorizes Federal Express to deliver this shipment without obtaining a signature and agree to indemnify and hold harmless Federal Express from any resulting claims.

272

WCSL 1284 Rev. Date 8/95 PART #14755 ©1994-95 FedEx PRINTED IN U.S.A.

F A X



MONTGOMERY WATSON

4100 Spenard Road  
Anchorage, Alaska 99517

Tel: (907) 248-8883  
Fax: (907) 248-8884

Date:

2/20/97

To:

Mary White

Fax No:

702 361-3137

From:

Bonnie McLean

Reference:

Subject:

Co C 97 LI 2

No. of Pages:

3

Corrected

(including cover)

If you do not receive all pages, or if there are any problems with this transmission, please call Jenny Farr at (907) 248-8883.

2/16/97

Time

ADD: 97 BPK LI B8 SD 01 (01) @ 0430

P92. 97 BPK LI B8 SD 02 (08) @ 0500

Correct

Pg 1. 2/15/97 @ 1730

97 BPK LI C4 SD 01 (08)

Should be

97 BPK LI C4 SD 0 2 (01)



MON. GOMERY WATSON

C of C # 97-C # L23

Page 1 of 2

# BP EXPLORATION (ALAS) INC. LIBERTY ISLAND SEDIMENT AND WATER SAMPLING

RETURN COOLERS TO:  
MONTGOMERY WATSON  
4100 Spenard Road  
Anchorage, Alaska 99517  
(907) 248-8883

REPORT DUE IN 7 CALANDER DAYS

## CHAIN OF CUSTODY FORM

PROJ. NO. 1189002.280101		To: CAS, ANCHORAGE		TOTAL NO. OF CON- TAINERS	GRAIN SIZE, ASTM D442					REMARKS
SAMPLERS: ( Signature ) 1997 <i>[Signature]</i>										
DATE	TIME	S/W	Sample ID							
2/14	2300	S	97 BPX LI B3 SD 01 (01)	1	✓					
2/14	2330	S	97 BPX LI B3 SD 02 (08)	1	✓					
2/15	0120	S	97 BPX LI B6 SD 01 (01)	1	✓					
2/15	0145	S	97 BPX LI B6 SD 02 (08)	1	✓					
2/15	900	S	97 BPX LI B10 SD 01 (01)	1	✓					
2/15	0900	S	97 BPX LI B8 SD 02 (08)	1	✓					
2/15	0930	S	97 BPX LI B8 SD 01 (01)	1	✓					
2/15	1000	S	97 BPX LI B10 SD (02) (08)	1	✓					02 (08)
2/15	1400	S	97 BPX LI I1 SD 01 (01)	1	✓					
2/15	1445	S	97 BPX LI I1 SD (02) (08)	1	✓					02 (08)
2/15	2220	S	97 BPX LI C2 SD 01 (01)	1	✓					
2/15	2240	S	97 BPX LI C2 SD 02 (08)	1	✓					
2/15	1800	S	97 BPX LI C4 SD 02 (08)	1	✓					
2/15	1730	S	97 BPX LI C4 SD 01 (01)	1	✓					
2/16	1130	S	97 BPX LI A4 SD 01 (01)	1	✓					
2/16	1200	S	97 BPX LI A4 SD 02 (08)	1	✓					
2/16	0930	S	97 BPX LI A6 SD 01 (01)	1	✓					

Relinquished by: <i>[Signature]</i>	Date/Time: 2/21/97 1455	Shipped via: <i>Delivered</i>	Notified: <i>N/A</i>	Date/Time: _____
Received for Laboratory by: <i>[Signature]</i>		Date: 2-21-97	Time: 2:50 PM	





---

## **Appendix E**

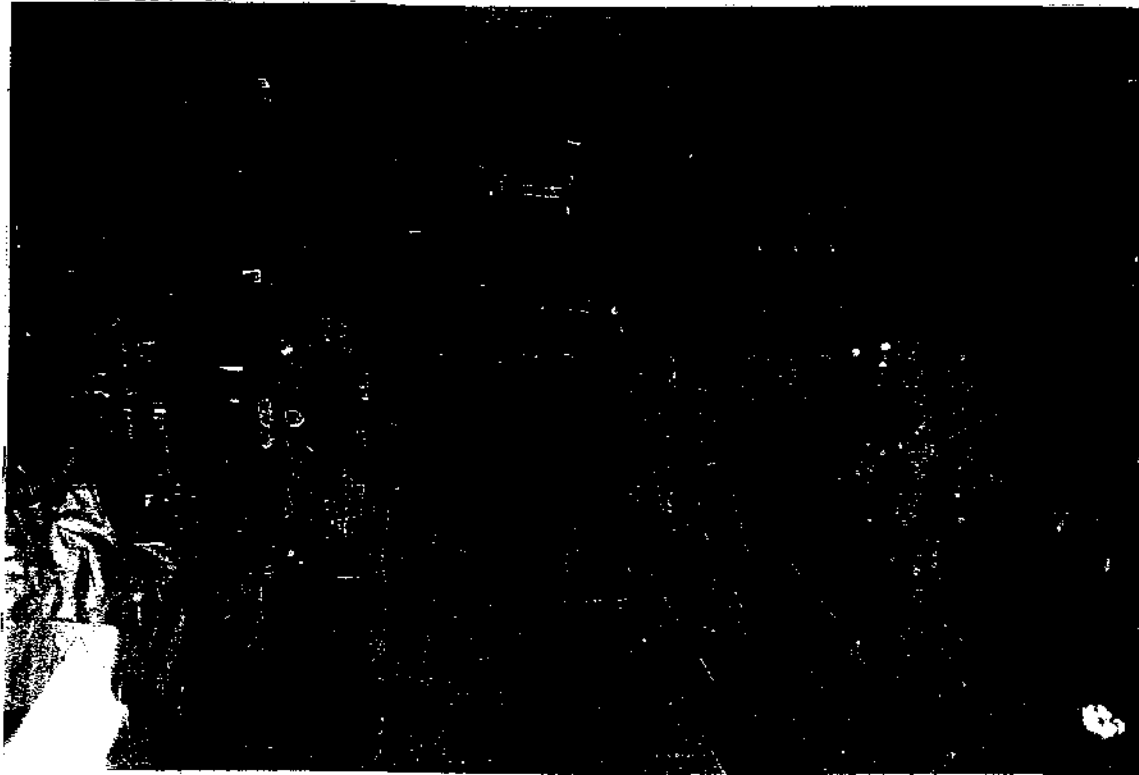
### **Photographs**

---



**MONTGOMERY WATSON**

BP Exploration (Alaska), Inc  
Liberty Island  
Water and Sediment Sampling



Five Foot Split Spoon, Extracted From Hole, Preparing To Open



Collecting Soil Sample From Split Spoon By Bill Nettleton, MW



---

**Appendix F**  
**Health and Safety Plan**  
**(Duane Miller & Associates)**

---



**MONTGOMERY WATSON**

SOP FILE NO: 4119.22

DATE: Feb. 11, 1997

## SIMULTANEOUS OPERATING PLAN BPX: Liberty Geotechnical Exploration

**WORK PACKAGE:** Drill and sample geotechnical borings

**JOB TITLE:** Liberty Geotechnical

**LOCATION:** Offshore in Foggy Island Bay between Endicott and Liberty #1 Ice Island

**START DATE:** Feb. 14, 1997

**COMPLETION DATE:** March 1, 1997

**SPOC FOR THIS JOB:** W. Phillips / E. Bashaw

**Acknowledgment** \_\_\_\_\_

**OPERATOR:** Duane Miller & Associates

**Acknowledgment** \_\_\_\_\_

**1. List the areas and the individuals that will be impacted by this job.**

**AREA:** offshore in Foggy Island Bay  
east of Endicott

**INDIVIDUAL:** W. Phillips and E. Bashaw

**2. Indicate any special worksite considerations that may impact this work:**

Ice safety  
Polar Bears

**3. Provide a brief scope of work:**

Drill and sample soil and permafrost conditions at about 30 different locations to depths of 30 to 100 feet below mudline. The drilling will be performed with a CME-75 soils drill mounted in an enclosed sled. A second sled with generator and survival shed will be towed in tandem with the drill sled. The sleds will be moved using a Catco RD-85 which will also carry a 3500 gallon fuel tank.

**4. Have the following items been considered in the final work plan?**

EMERGENCY ACTION PLAN  
WORK PERMITS  
LIFT PLANS  
SPECIAL PROCEDURES  
JOB HAZARD ANALYSIS

X
X
X
X
X

**NOTE:**

All information referred to in this SOP must be reviewed and approved by the individuals listed in section #1.

**DM&A Originator:** Duane Miller

DUANE MILLER & ASSOCIATES  
**HAZARD ANALYSIS**

ACTIVITY: Geotechnical Exploration - Moving from site to site

ANALYZED BY/DATE: D L Miller 2/11/97

PRINCIPLE STEPS	POTENTIAL HAZARDS	RECOMMENDED CONTROLS
Movement of drill and support sleds between boring locations using CATCO RD-85	Weak ice Getting lost	Check ice conditions before start of work and after any significant storms Reflector set at each location by survey team Use GPS Have redundant GPS systems Check ice thickness at drilling location
EQUIPMENT TO BE USED	INSPECTION REQUIREMENTS	TRAINING REQUIREMENTS
RD-85 Hand Held GPS List of boring coordinates Ice auger	Inspect ice conditions prior to start of work Inspect ice conditions after storms Inspect interior of sled before moving	Ice safety Use of GPS
REQUIRED PERMITS	ENVIRONMENTAL REQUIREMENTS	EMERGENCY CONTACTS
DNR Misc land Use Permit NSB Development Permit MMS approval	Housekeeping Backfill boring with any remaining cuttings	Radio CATCO Cellular phone to BP Endicott EMERGENCY 659-2222 or SECURITY 659-6800

DUANE MILLER & ASSOCIATES  
**HAZARD ANALYSIS**

ACTIVITY: Geotechnical Exploration - Drilling and sampling

ANALYZED BY/DATE: D L Miller 2/11/97

PRINCIPLE STEPS	POTENTIAL HAZARDS	RECOMMENDED CONTROLS
Drill sea ice and subsea soil Stop at depths and sample soil Recover samples, log and label Backfill boring	Equipment / personnel accident Fire in enclosure Polar bears Methane pocket Ice movement while drilling	Inspect equipment & rigging each day Practice safe operation of equipment Placement of fire extinguishers at both ends of enclosure Check operation of methane detector Proper exterior lighting for bear detection Awareness of auger binding as indicator of ice movement Plan for retreat from ice if severe movement
EQUIPMENT TO BE USED	INSPECTION REQUIREMENTS	TRAINING REQUIREMENTS
Drill rig Sample extruder Fire extinguishers Methane detector Emergency survival gear on second sled	Inspect equipment & rigging eachday Qualified driller CATCO RD-85 watches for bears	Drilling safety Operation of fire extinguishers Fire drill w/ plan of evacuation Methane alarm and evacuation plan
REQUIRED PERMITS	ENVIRONMENTAL REQUIREMENTS	EMERGENCY CONTACTS
DNR Misc land Use Permit NSB Development Permit MMS approval	Housekeeping Liners in place for fueling & idling vehicles Good management refueling	Radio CATCO Cellular phone to BP Endicott EMERGENCY 659-2222 or SECURITY 659-6800

DUANE MILLER & ASSOCIATES

## HAZARD ANALYSIS

ACTIVITY: Geotechnical Exploration - Personnel transport and temperature monitoring

ANALYZED BY/DATE: D L Miller 2/11/97

PRINCIPLE STEPS	POTENTIAL HAZARDS	RECOMMENDED CONTROLS
Transport on ice w/ CATCO RD-85 and on Ice-Road w/ 4-wheel drive crew cabs	Weak ice Getting lost	Check ice conditions after any significant storms Use GPS Have redundant GPS systems Convoy 4WD's when visibility is bad
EQUIPMENT TO BE USED	INSPECTION REQUIREMENTS	TRAINING REQUIREMENTS
RD-85 Hand Held GPS List of boring coordinates	Inspect ice conditions after storms CATCO RD-85 operator watches for bears	Ice safety Use of GPS
REQUIRED PERMITS	ENVIRONMENTAL REQUIREMENTS	EMERGENCY CONTACTS
DNR Misc land Use Permit NSB Development Permit MMS approval	Housekeeping Liners in place for fueling & idling vehicles Good management refueling	Radio CATCO Cellular phone to BP Endicott EMERGENCY 659-2222 or SECURITY 659-6800

## MEMORANDUM

Duane Miller & Associates  
(907) 346-1021 FAX 346-1636

---

**To:** Participating Parties (see distribution at end)  
**From:** Duane Miller  
**Date:** February 11, 1997 DM&A Job No. 4119.22  
**Subject:** Liberty Geotechnical Program - Contingency Plan

---

### Contingency Plan

This winter's geotechnical work for the Liberty Development project will be performed using a soils drill mounted on an enclosed sled and moved by a Catco RD-85 rolligon. The work will be performed on a 24-hour per day basis. Field supervisor and the geologist for one shift will be Walt Phillips of DM&A, the second geo-engineer will be Erin Bashaw, and Mike Hendee will assist during the day shift as expediter and engineering technician. Discovery Drilling will have a driller and helper on each shift. Our contingency planning relies heavily on Catco and BP support for communications and transport.

Environmental sampling will be performed by Bonnie McLean and Bill Nettleton of Montgomery Watson when the drill is cleanest and will be completed before the geotechnical work. Walt and Erin will assist. The work is expected to start Friday's day shift (2/14) and be completed in 2 or 3 shifts. The environmental work should start with Boring B-3 (it can be driven to on the ice road and a snow ramp is present where the drill-sled can be off-loaded).

The geotechnical drilling should start with the near shore borings (B-1, B-2, B-3, B-4 and B-5 and A-1, A-2, A-3 and A-4). These holes are all in shallow water and we might add additional holes depending on what permafrost we find. The work will then continue on to the holes in deeper water. A list of the borings (with coordinates) and a map (showing the ice road) are attached.

### Communications Systems

Two systems will be available. The primary system is the Catco Network with radios in the RD-85, in the drill enclosure and at the Catco Base. This allows for communication with Catco Base which is operated on a 24-hour basis and between the drill and the Catco unit.

The second system is cellular phone. The three DM&A cell phones have the following numbers through Arctic Slope Telephone:

Erin Bashaw 448-1358

Walt Phillips 448-1357

Mike Hendee 448-1328

### Emergency Notification

During the work for Liberty, if an incident/emergency occurs such as injury, fire or spill, the field party will contact Catco and BP Endicott. Catco will notify the other parties on this list as needed:

Catco Dispatch  
Deborah Hamilton-Johnson (days)  
Carmenlita Cothron (nights)  
radio is expected to be the initial contact  
659-2548 or 659-2526

Bill Kuper, Catco General Manager  
659-2205 Room Number  
659-3711 Pickup

BP Emergency @ Endicott 659-2222 (the "Red" phone)  
BP Security @ Endicott 659-6800

Duane Miller, DM&A Anchorage  
(907) 346-1021 office 24 hours  
(907) 346-2563 home

Kyle Brown, owner/manager, Discovery Drilling  
(907) 344-6431 office  
(907) 346-2006 home  
Mark Terry, operations manager, 346-4098 home  
Dave Roes, chief mechanic, 562-6652 home

### Fire Response

The drill operation will be equipped with Ansul style fire extinguishers near each exit door. If a fire destroys the drill, the crew will retreat to the RD-85 for weather protection and evacuation or to the secondary survival sled that is moved with the drill.

### Injury Response

First aid equipment will be at the drill rig. The drillers and helpers have current first aid and CPR training. If an injury occurs that requires evacuation, BP Emergency should be notified and they will call for help to transport the injured to the emergency aid station at BP Base Camp.

### Ice Safety

Robert Lewellen, PhD, has been monitoring the ice in this area for the Liberty Ice Island and ice road. Check with Bob @ Prudhoe Bay Hotel for current

conditions before start of work. If any ice movement is detected, he will provide further inspection to verify that we can still safely travel on the ice.

The holes drilled through the ice should be used to verify the thickness of the ice at each drill site, the initial freeboard and to monitor the change in freeboard as work progresses.

#### Oil Spill Response

Pickups parked on the ice road will be left running in most weather and a drip pan should be under the engine area of the pickup while it is parked.

Fueling of the operation will be from a 3,500 gallon fuel tank carried by the Rolligon. The fueling operations will be in accordance with best management practices; drip pans will be used and absorbent pads, shovels and collection bags will be available to contain and immediately respond to any small spills.

Catco and BP Emergency will be notified of any fuel spills.

#### Bear Awareness/Confrontation

All personnel will receive North Slope environmental and Cultural Awareness training in the form of BPX's "Achieving Environmental Excellence" program. All personnel will participate in a specific training program for Polar Bear awareness and safety.

A site layout that minimizes the possibility of polar bear interaction is planned. During drilling operations, the Catco RD-85 operator will watch for bears. A 12-gauge shotgun with buckshot and slugs will be kept at the drill rig for the extreme emergency.

#### Rolligon Breakdown

If the Rolligon breaks down at a remote location away from camp, the personnel will rely on the emergency equipment in the survival drum on the Rolligon. The Catco radio system will be used to call for help from Catco Prudhoe Operations.



**Attachments:**

Summary of Planned Borings  
Map showing Planned Borings and Existing Ice Road

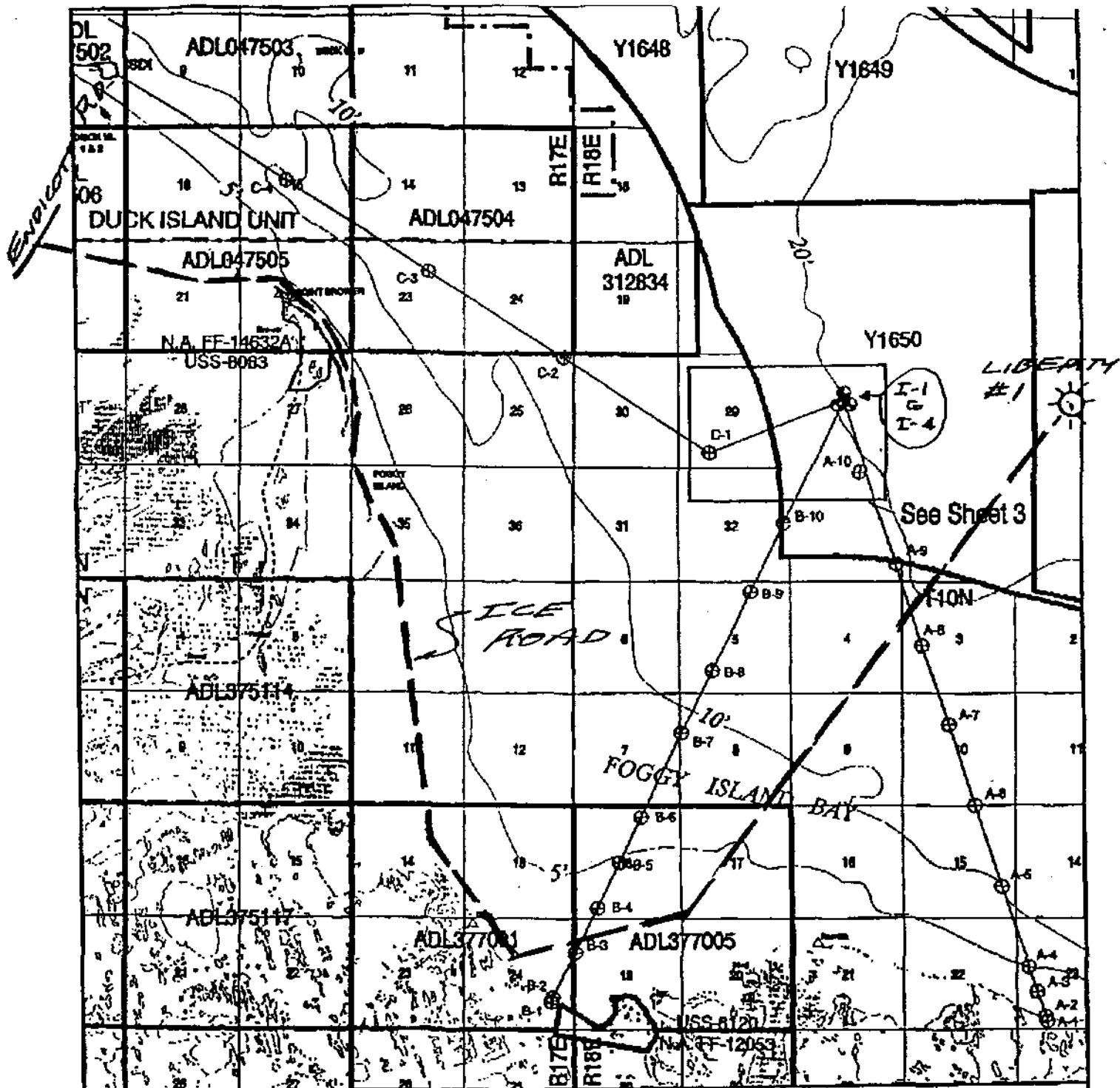
**Distribution :**

Walt Phillips and Erin Bashaw @ DM&A, Liberty Field  
Bonnie McLean @ Montgomery Watson  
Bill Kuper @ Catco, Prudhoe Bay  
BP Endicott Security  
Kyle Brown @ Discovery Drilling Anchorage  
Jim Lewis @ BP Exploration (Alaska), Anchorage  
José González Jáuregui @ INTEC Engineering c/o BP Anchorage  
Rory Mayra @ BP Exploration (Alaska), Anchorage

LIBERTY GEOTECHNICAL EXPLORATION PLAN

Boring	Facility location	EASTING ASP zone 3, NAD 27	NORTHING ASP zone 3, NAD 27	Latitude	Longitude	Enviro. Sampling	Expected Water	Geotech Hole Depth
A1	SSE Badami route	313,271 ft.	5,925,151 ft.	70° 12.026'	147° 30.308'		on shore	30 ft.
A2	SSE Badami route	313,203 ft.	5,925,378 ft.	70° 12.063'	147° 30.343'		beach	30 ft.
A3	SSE Badami route	312,849 ft.	5,926,563 ft.	70° 12.255'	147° 30.528'		3 ft.	30 ft.
A4	SSE Badami route	312,496 ft.	5,927,747 ft.	70° 12.448'	147° 30.714'	yes	5 ft.	30 ft.
A5	SSE Badami route	311,356 ft.	5,931,567 ft.	70° 13.069'	147° 31.311'		9 ft.	30 ft.
A6	SSE Badami route	310,216 ft.	5,935,387 ft.	70° 13.690'	147° 31.909'	yes	16 ft.	30 ft.
A7	SSE Badami route	309,075 ft.	5,939,206 ft.	70° 14.312'	147° 32.508'		18 ft.	30 ft.
A8	SSE Badami route	307,935 ft.	5,943,026 ft.	70° 14.933'	147° 33.107'	yes	20 ft.	30 ft.
A9	SSE Badami route	306,795 ft.	5,946,845 ft.	70° 15.554'	147° 33.707'		19 ft.	30 ft.
A10	SSE Badami route	305,657 ft.	5,950,657 ft.	70° 16.174'	147° 34.307'	yes	18 ft.	30 ft.
B1	SSW Badami route	289,870 ft.	5,926,732 ft.	70° 12.184'	147° 41.641'		on shore	30 ft.
B2	SSW Badami route	289,963 ft.	5,926,908 ft.	70° 12.213'	147° 41.598'		beach	30 ft.
B3	SSW Badami route	291,067 ft.	5,929,001 ft.	70° 12.561'	147° 41.092'	yes	3 ft.	30 ft.
B4	SSW Badami route	292,171 ft.	5,931,093 ft.	70° 12.909'	147° 40.586'		3 ft.	30 ft.
B5	SSW Badami route	293,275 ft.	5,933,186 ft.	70° 13.257'	147° 40.080'		4 ft.	30 ft.
B6	SSW Badami route	294,380 ft.	5,935,278 ft.	70° 13.605'	147° 39.573'	yes	6 ft.	30 ft.
B7	SSW Badami route	296,427 ft.	5,939,158 ft.	70° 14.250'	147° 38.633'		7 ft.	30 ft.
B8	SSW Badami route	297,975 ft.	5,942,092 ft.	70° 14.737'	147° 37.921'	yes	14 ft.	30 ft.
B9	SSW Badami route	299,910 ft.	5,945,758 ft.	70° 15.346'	147° 37.031'		17 ft.	30 ft.
B10	SSW Badami route	301,581 ft.	5,948,926 ft.	70° 15.873'	147° 36.261'	yes	12 ft.	30 ft.
C1	Endicott route	298,096 ft.	5,952,260 ft.	70° 16.404'	147° 37.995'		15 ft.	30 ft.
C2	Endicott route	291,288 ft.	5,956,828 ft.	70° 17.122'	147° 41.359'	yes	15 ft.	30 ft.
C3	Endicott route	284,967 ft.	5,961,071 ft.	70° 17.788'	147° 44.486'		10 ft.	30 ft.
C4	Endicott route	278,336 ft.	5,965,522 ft.	70° 18.486'	147° 47.770'	yes	11 ft.	30 ft.
I1	center of island	304,514 ft.	5,954,484 ft.	70° 16.796'	147° 34.909'		20 ft.	100 ft.
I2	350' SE of island cen	304,815 ft.	5,954,311 ft.	70° 16.769'	147° 34.761'		20 ft.	50 ft.
I3	350' N of island cent	304,515 ft.	5,954,831 ft.	70° 16.853'	147° 34.913'	yes	20 ft.	50 ft.
I4	350' SW of island cer	304,215 ft.	5,954,311 ft.	70° 16.766'	147° 35.052'		20 ft.	50 ft.

Geotechnical hole depths are from mudline. All holes should end in gravel or gravelly sand and not in frozen silt, clay or sand.



This map is based on U.S.G.S. quad Beechy Point (B-2,B-1, A-2,A-1) and on the Unit Operator's Facility Maps.

NORTH

⊕ Boring less than 50' deep  
 ⊙ Boring greater than 50' deep

Within T11NR17E Sec. 8, 8, 14, 15, 16, 23, 24, 25  
 T11NR18E Sec. 29, 30, 32, 33  
 T10NR17E Sec. 24  
 T10NR18E Sec. 3, 4, 5, 7, 8, 10, 16, 18, 19, 22, 23

**BP EXPLORATION (ALASKA) INC.**

**LIBERTY  
 GEOTECHNICAL  
 BORE HOLE LOCATIONS  
 PERMIT APPLICATION**

DATE:  
1/28/87

SCALE:  
1" = 1.25 Mile

SHEET:  
2 OF 3