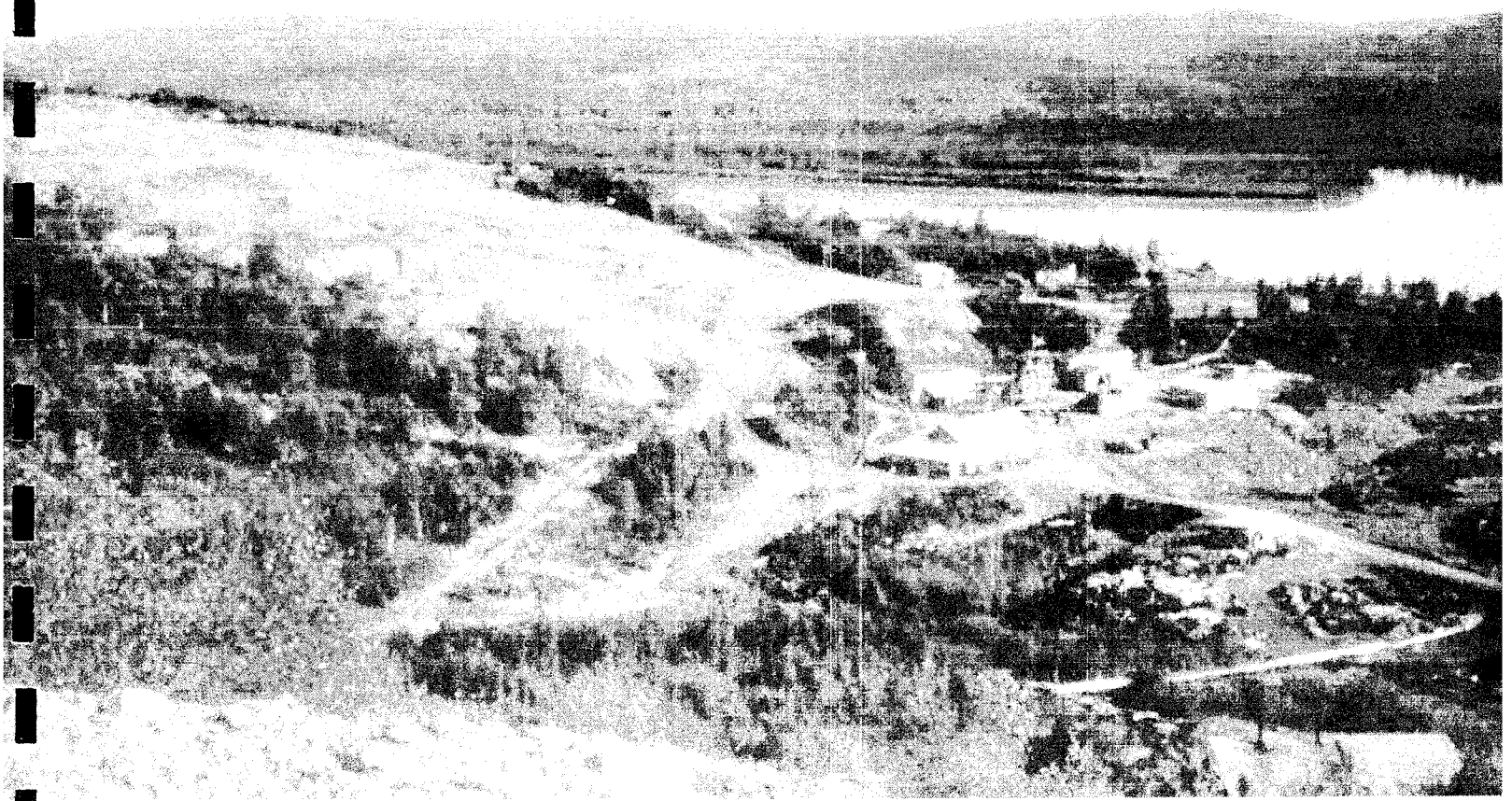
Red Devil Mine
Source Area Removal and Investigation



Prepared for

Bureau of Land Management

Volume 2

Prepared by

Harding Lawson Associates/
Wilder Construction Company
Joint Venture

March 2001

Retort Building Demolition and Site Investigation Red Devil Mine Red Devil, Alaska

Volume 2: Appendixes J-L

Prepared for

Department of Interior
Bureau of Land Management
Denver Federal Center, Building 50
Post Office Box 25047
Denver, Colorado 80225-0047

HLA Project 51192

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Associate Engineer

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March 30, 2001

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APPENDIXES

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J Data Quality Assessments and Analytical Data Packages
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L Survey Report

APPENDIX J

APPENDIX J

DATA QUALITY ASSESSMENTS AND ANALYTICAL DATA PACKAGES

CT&E Environmental Services

- 1004238
- 1004299
- 1004464
- 1004695
- 1004781
- 1004859
- 1004860
- 1004861
- 1004862
- 1004863
- 1004864
- 3003749

Environmental Hazards Services LLC

- 07-00-2351
- 07-00-3046
- 08-00-0607

WEC

- 00-469

DATA QUALITY ASSESSMENT

CHEMICAL DATA QUALITY ASSESSMENT

HLA/Wilder performed a chemical data quality assessment for all project and quality control (QC) data submitted for laboratory analysis during the 2000 Red Devil Mine field sampling event. Analytical data was reviewed according to *Chemical Quality Assurance for Hazardous, Toxic, and Radioactive Waste (HTRW) Projects*, USACE EM-200-1-6, October 10, 1997. The data quality review included examination and review of sample holding times, temperatures, custody records, extraction QC samples, and reported results for project and QC samples.

Various samples and matrixes were analyzed for diesel-range organics (DRO), gasoline-range organics (GRO), benzene, toluene, ethylbenzene, and xylenes (BTEX), polynuclear aromatic hydrocarbons (PAHs), total aqueous hydrocarbons (TaqH), total metals, and TCLP metals. QC samples were collected at a rate of 10%. When appropriate, data qualifiers have been added to the result tables. Specific data quality details are are presented on the data quality assessment checklists.

This data quality assessment did not include a review of the field screening data. Field screening data was reviewed and qualified by the Bureau of Land Management.

Laboratories

CT&E Environmental Services Inc. was the primary laboratory used for this project. Environmental Hazards Services, L.L.C. performed TCLP analyses for some metals samples.

Sample Receipt

For CT&E Work Order 1004238, sample 00RDV01SL was not included as listed on the chain of custody, so the trip blank was substituted for that number by the lab. For CT&E Work Order 1004859, sample RT63/1.5-3.0 was not included as listed on the chain of custody. For CT&E Work Order 1004861, sample RT47/3.0-4.5 was not included as listed on the chain of custody. For CT&E Work Order 1004863 a sample was included as "unnamed".

Holding Times

Holding times for mercury were exceeded by 1 day on samples 00RDV041SL, 00RDV047SL, and 00RDV048SL. The holding time for mercury is 28 days. Results should not be affected, however the mercury results for these samples have been qualified as estimated.

GRO/DRO/RRO/PAHs/BTEX

GRO, DRO, RRO, and naphthalene were detected in the method blank for samples 00RDV01SL, 00RDV02SL, 00RDV03SL, 00RDV04SL, 00RDV05SL, 00RDV06SL, 00RDV07SL, 00RDV08SL, 00RDV09SL, 00RDV10SL, 00RDV11SL, 00RDV12SL, 00RDV13SL, 00RDV14SL, 00RDV15SL, 00RDV16SL, 00RDV17SL, 00RDV18SL, 00RDV19SL, 00RDV20SL, 00RDV21SL, 00RDV22SL, 00RDV23SL. The relative percent difference for phenanthrene was outside acceptance criteria. Surrogate recoveries were outside acceptance limits for several samples. Results should be considered estimated for DRO/RRO for samples 00RDV02SL, 00RDV03SL, 00RDV04SL, 00RDV05SL, 00RDV06SL, 00RDV07SL, 00RDV10SL, 00RDV11SL, 00RDV12SL, 00RDV13SL, 00RDV18SL, 00RDV19SL, and 00RDV20SL. Results should be considered estimated for GRO/BTEX for samples 00RDV02SL, 00RDV03SL, 00RDV04SL, 00RDV05SL, 00RDV06SL, 00RDV07SL, 00RDV10SL, 00RDV11SL, 00RDV12SL, 00RDV13SL, 00RDV18SL, 00RDV19SL, and 00RDV20SL.

Metals

Several metals were detected in various method blanks at low concentrations (generally below the PQL). Instrument QC and LCS/LCSDs were generally within acceptance criteria for all samples and therefore results are acceptable. Samples 00RDV41SL, 00RDV47SL, and 00RDV48SL were extracted one day past the accepted holding time. Instrument QC and LCS/LCSDs were within acceptance criteria for these samples therefore results are acceptable, but have been qualified as estimated.

Field Duplicates

Field duplicates agree for all analytes with the following exceptions:

- Field duplicates 00RDV01WA and 00RDV02WA have a relative percent difference of 138% for mercury.
- Field duplicates 00RDV32WA and 00RDV33WA have a relative percent difference of 85.93% for mercury.

High RPD between field duplicates may be due to non-homogeneity of the samples.

Summary of Chemical Data Quality

Problems that affect the acceptability of analytical data include failure to meet holding times, poor internal standard recoveries, and poor surrogate recoveries. All data that are affected are noted above and flagged in the sample results tables. Except where noted above, the quality of analytical data is good and may be accepted without qualification.

List of Data Qualifiers (added by HLA)

Sample Number	Analyte	Flag
00RDV11SL	Phenanthrene	J
00RDV041SL, 00RDV047SL, and 00RDV048SL	Mercury	J
00RDV02SL, 00RDV03SL, 00RDV04SL, 00RDV05SL, 00RDV06SL, 00RDV07SL, 00RDV10SL, 00RDV11SL, 00RDV12SL, 00RDV13SL, 00RDV18SL, 00RDV19SL, 00RDV20SL	DRO, RRO	J
00RDV03SL, 00RDV04SL, 00RDV05SL, 00RDV06SL, 00RDV07SL, 00RDV10SL, 00RDV11SL, 00RDV12SL, 00RDV13SL, 00RDV18SL, 00RDV19SL, 00RDV20SL	GRO, BTEX	J

DATA QUALITY ASSESSMENT

Laboratory: CTE Environmental Services
Batch No.: 1004238
Sampled: 00RDV01SL, 00RDV02SL, 00RDV03SL, 00RDV04SL, 00RDV05SL, 00RDV06SL, 00RDV07SL, 00RDV08SL, 00RDV09SL, 00RDV10SL, 00RDV11SL, 00RDV12SL, 00RDV13SL, 00RDV14SL, 00RDV15SL, 00RDV16SL, 00RDV17SL, 00RDV18SL, 00RDV19SL, 00RDV20SL, 00RDV21SL, 00RDV22SL, 00RDV23SL

	Yes	No	Not Required/Applicable
1. Were samples analyzed for requested parameters?	X		
2. Is the USACE Data Deliverables package complete?			X
3. Were samples extracted within holding time acceptance criteria?	X		
4. Were samples analyzed within holding time acceptance criteria?	X		
5. For soils, were sample results reported on a "dry weight" basis?	X		
6. Were method blanks analytes all reported as ND?		X	
7. For water, were trip blank analytes all reported as ND?			X
8. Are the surrogate percent recoveries within acceptance criteria?		X	
9. Are the matrix spike percent recoveries within acceptance criteria?	X		
10. Are the matrix spike relative percent differences within acceptance criteria?		X	
11. Are the field duplicate relative percent differences less than 50 percent?			X

Comments:

6) GRO estimated at 0.191 mg/kg (below the PQL) (CTE ref. # 321597); GRO estimated at 0.338 mg/kg (below the PQL) (CTE ref. # 321964); DRO estimated at 4.91 mg/kg (below the PQL) (CTE ref. # 320391); DRO estimated at 1.56 mg/kg (below the PQL) (CTE ref. # 320847); Naphthalene estimated at 1.15 µg/L (CTE ref. # 320658); RRO estimated at 6.42 mg/kg (below the PQL) (CTE ref. # 320847). Sample results are not significantly affected. Data is acceptable.

8) 5a Androstane biased high for samples: 00RDV02SL, 00RDV03SL, 00RDV04SL, 00RDV05SL, 00RDV06SL, 00RDV07SL, 00RDV10SL, 00RDV11SL, 00RDV12SL, 00RDV13SL, 00RDV18SL, 00RDV19SL, 00RDV20SL. Results are not affected.

4-Bromofluorobenzene biased high for samples: 00RDV03SL, 00RDV04SL, 00RDV05SL, 00RDV06SL, 00RDV07SL, 00RDV08SL, 00RDV09SL, 00RDV10SL, 00RDV11SL, 00RDV12SL, 00RDV14SL, 00RDV15SL, 00RDV16SL, 00RDV18SL, 00RDV19SL, 00RDV20SL. Results are not affected.

d-Triacontane biased high for samples: 00RDV03SL, 00RDV04SL, 00RDV05SL, 00RDV06SL, 00RDV07SL, 00RDV08SL, 00RDV09SL, 00RDV10SL, 00RDV12SL, 00RDV13SL, 00RDV18SL, 00RDV19SL, 00RDV20SL. Results are not affected.

10) Phenanthrene RPD=43% (acceptance criteria is <30%) Result for phenanthrene on sample number 00RDV11SL should be considered estimated.

11) All relative percent differences for DRO, GRO, RRO, and BTEX analyses for field duplicates (00RDV05SL and 00RDV06SL) were within 50 percent. A duplicate sample was not collected for comparison to sample 00RDV05SL for the PAH analysis. Results for sample 00RDV05SL are acceptable based on internal laboratory QC information.

Date: 3-30-01
Reviewer: JEW.

RECEIVED
SEP 0 8 2000
HARDING LAWSON
ASSOCIATES

CTE Environmental Services
Alaska Division
Laboratory Data Report

Project: Red Devil Mine 47411

Client: Harding Lawson & Assoc

CTE Work Order: 1004238

Contents:

Chain of Custody
Quality Control Summary Forms

Note:

Unless otherwise noted, all quality assurance/quality control criteria is in compliance with the proper regulatory authority and/or CTE's Quality Assurance Program Plan.

Case Narrative

Customer: HARLAWP **Harding Lawson & Assoc**

Project: 1004238 **Red Devil Mine 47411**

1004238002 PS

DRO/RRO - Pattern consistent with weathered middle distillate.
DRO - Surrogate recovery is outside controls due to matrix interference.

1004238003 PS

DRO/RRO - Pattern consistent with weathered middle distillate.
DRO/RRO - Surrogate recoveries outside controls due to matrix interference.
GRO/BTEX - Surrogate recovery is biased high due to matrix interference. Results not affected.

1004238004 PS

DRO/RRO - Surrogate recoveries outside controls due to matrix interference and/or sample dilution.
DRO/RRO - Pattern consistent with weathered middle distillate.
GRO/BTEX - Surrogate recovery is biased high due to matrix interference. Results not affected.

1004238005 PS

DRO/RRO - Pattern consistent with weathered middle distillate.
DRO/RRO - Surrogate recoveries outside controls due to matrix interference.
GRO/BTEX - Surrogate recovery is biased high due to matrix interference. Results not affected.

1004238006 PS

GRO/BTEX - Surrogate recovery is biased high due to matrix interference. Results not affected.
DRO/RRO - Pattern consistent with weathered middle distillate.
DRO/RRO - Surrogate recoveries outside controls due to matrix interference.

1004238007 PS

GRO/BTEX - Surrogate recovery is biased high due to matrix interference. Results not affected.
DRO/RRO - Surrogate recoveries outside controls due to matrix interference.
DRO/RRO - Pattern consistent with weathered middle distillate.

1004238008 PS

GRO/BTEX - Surrogate recovery is biased high due to matrix interference. Results not affected.
DRO/RRO - Pattern consistent with weathered middle distillate.
RRO - Surrogate recovery is outside controls due to matrix interference.

Case Narrative

Customer: HARLAWP **Harding Lawson & Assoc**

Project: 1004238 **Red Devil Mine 47411**

1004238009 PS

GRO/BTEX - Surrogate recovery is biased high due to matrix interference. Results not affected.

DRO/RRO - Pattern consistent with weathered middle distillate.

RRO - Surrogate recovery is outside controls due to matrix interference.

PAHSIM - Recovery for surrogate #2 is outside QC goals due to interference from non-target hydrocarbons. See dilution for this surrogate recovery.

1004238010 PS

GRO/BTEX - Surrogate recovery is biased high due to matrix interference. Results not affected.

DRO/RRO - Pattern consistent with weathered middle distillate.

DRO/RRO - Surrogate recoveries outside controls due to matrix interference.

1004238011 PS

GRO/BTEX - Surrogate recovery is biased high due to matrix interference. Results not affected.

DRO/RRO - Pattern consistent with weathered middle distillate.

DRO - Surrogate recovery is outside controls due to matrix interference.

PAHSIM - LCS/LCSD RPD for Phenanthrene is outside qc goals. The positive results for Phenanthrene are estimated.

1004238012 PS

GRO/BTEX - Surrogate recovery is biased high due to matrix interference. Results not affected.

DRO/RRO - Surrogate recoveries outside controls due to matrix interference.

DRO/RRO - Pattern consistent with weathered middle distillate.

1004238013 PS

DRO/RRO - Pattern consistent with weathered middle distillate.

DRO/RRO - Surrogate recoveries outside controls due to matrix interference.

1004238014 PS

GRO/BTEX - Surrogate recovery is biased high due to matrix interference. Results not affected.

DRO/RRO - Pattern consistent with weathered middle distillate.

1004238015 PS

GRO/BTEX - Surrogate recovery is biased high due to matrix interference. Results not affected.

DRO/RRO - Pattern consistent with weathered middle distillate.

Case Narrative

Customer: HARLAWP **Harding Lawson & Assoc**

Project: 1004238 **Red Devil Mine 47411**

1004238016 PS

GRO/BTEX - Surrogate recovery is biased high due to matrix interference. Results not affected.
DRO/RRO - Pattern consistent with weathered middle distillate.

1004238018 PS

GRO/BTEX - Surrogate recovery is biased high due to matrix interference. Results not affected.
DRO/RRO - Pattern consistent with weathered middle distillate.
DRO/RRO - Surrogate recoveries outside controls due to matrix interference.

1004238019 PS

GRO/BTEX - Surrogate recovery is biased high due to matrix interference. Results not affected.
DRO/RRO - Pattern consistent with weathered middle distillate.
DRO/RRO - Surrogate recoveries outside controls due to matrix interference.

1004238020 PS

DRO/RRO - Pattern consistent with weathered middle distillate.
DRO/RRO - Surrogate recoveries outside controls due to matrix interference.
GRO/BTEX - Surrogate recovery is biased high due to matrix interference. Results not affected.

1004238021 PS

DRO/RRO - Pattern consistent with weathered middle distillate.

1004238022 PS

DRO - Pattern consistent with weathered middle distillate.

1004238023 PS

DRO - Unknown hydrocarbon with several peaks.

320392 LCS

DRO/RRO LCS/LCSD - Surrogate/s are biased high due to interference by method required petroleum spike.

320848 LCS

DRO/RRO LCS/LCSD - Surrogate/s are biased high due to interference by method required petroleum spike.

320393 LCSD

DRO/RRO LCS/LCSD - Surrogate/s are biased high due to interference by method required petroleum spike.

320660 LCSD

PAHSIM - RPD for Phenanthrene is outside qc goals. The positive results for Phenanthrene are estimated.

Case Narrative

Customer: HARLAWP **Harding Lawson & Assoc**

Project: 1004238 **Red Devil Mine 47411**

320849 LCSD

DRO/RRO LCS/LCSD - Surrogate/s are biased high due to interference by method required petroleum spike.

Harding Lawson Associates
601 East 57th Place
Anchorage, AK 99518
907 / 563-8102
907 / 561-4574 FAX

CHAIN OF CUSTODY FORM

Lab: CT

Samplers: C. Marshall

Project Number: 47411

Name/Location: RED DEVIL Mine

Project Manager: Brian Lunch

Recorder: Charles Mille (Signature Required)

	SOURCE CODE	MATRIX: Water	Sediment	Soil	Oil	#CONTAINERS & PRESERV.: Unpres.	H_2SO_4	HNO_3	Methanol	8oz	SAMPLE NUMBER OR LAB NUMBER: Yr	Wk	Seq	DATE: Yr	Mo	Dy	Time	STATION DESCRIPTION/ NOTES	EPA 601/8010	EPA 602/8020	EPA 624/8240	EPA 625/8270	ICP METALS	EPA 8015M/TPH	DRO/RUO-AK102/103	GRO/BTEX-AK101/8021B	cPAHs/8270 Simac
1	SO			X					X					00	07	26	1600	00RDV01SL								X	
2	SO			X					X	X				00	07	26	1630	00RDV02SL							X	X	
3	SO			X					X	X				00	07	26	1700	00RDV03SL							X	X	
4	SO			X					X	X				00	07	27	0745	00RDV04SL							X	X	
5	SO			X					X	X				00	07	27	0830	00RDV05SL							X	X	X
6	SO			X					X	X				00	07	27	0835	00RDV06SL							X	X	
7	SO			X					X	X				00	07	27	0920	00RDV07SL							X	X	
8	SO			X					X	X				00	07	27	0930	00RDV08SL							X	X	
9	SO			X					X	X				00	27	27	0020	00RDV09SL							X	X	X
10	SO			X					X	X				00	27	27	1030	00RDV10SL							X	X	

LAB NUMBER: Yr	Wk	Seq	DEPTH IN FEET	COL MTD CD	QA CODE	MISCELLANEOUS

CHAIN OF CUSTODY RECORD

RELINQUISHED BY: (Signature)	RECEIVED BY: (Signature)	DATE/TIME
Charles R. Mille 7/28/00 1200	[illegible]	8/1/00 9:22am
[illegible] 8/1/00 2:00	E. Nieman	8/1/00 14:00

DISPATCHED BY: (Signature) DATE/TIME

RECEIVED FOR LAB BY: (Signature) DATE/TIME

METHOD OF SHIPMENT: Hazelwood Air / Frontier # 658265

Laboratory Copy White — Project Office Copy Yellow — Field or Office Copy Pink

6533

1004238

Harding Lawson Associates
601 East 57th Place
Anchorage, AK 99518
907 / 563-8102
907 / 561-4574 FAX

CHAIN OF CUSTODY FORM

Lab: C

Samplers: C. Marshall

Project Number: 47411

Name/Location: Red Devil Mine

Project Manager: Brian Lund

Recorder: Charles A. Mitchell (Signature Required)

	SOURCE CODE	MATRIX: Water	Sediment	Soil	Oil	#CONTAINERS & PRESERV.: Unpres.	H_2SO_4	HNO_3	Meth 4oz	8oz	SAMPLE NUMBER OR LAB NUMBER: Yr	Wk	Seq	DATE: Yr	Mo	Dy	Time	STATION DESCRIPTION/ NOTES	EPA 601/8010	EPA 602/8020	EPA 624/8240	EPA 625/8270	ICP METALS	EPA 8015M/TPH	DRO/RRO Alt 102/103	GRO/BTEX Alt 101/8021B
21	SO			X					X	X				00	07	27	1625	00RDV21SL							X	X
22	SO			X					X	X				00	07	27	1635	00RDV22SL							X	X
23	SO			X					X	X				000	72	8	0800	00RDV23SL							X	X

LAB NUMBER: Yr	Wk	Seq	DEPTH IN FEET	COL MTD CD	QA CODE	MISCELLANEOUS

CHAIN OF CUSTODY RECORD

RELINQUISHED BY: (Signature)	RECEIVED BY: (Signature)	DATE/TIME
Charles Mitchell 1200 7/28/00	[illegible]	8/1/00 900am
RELINQUISHED BY: (Signature) 8/1/00 2:00	RECEIVED BY: (Signature) [illegible]	8/1/00 14:0
RELINQUISHED BY: (Signature)	RECEIVED BY: (Signature)	DATE/TIME
RELINQUISHED BY: (Signature)	RECEIVED BY: (Signature)	DATE/TIME

DISPATCHED BY: (Signature) DATE/TIME

RECEIVED FOR LAB BY: (Signature) DATE/TIME

METHOD OF SHIPMENT Hayland Air / Frontier # 658265

Laboratory Copy — Project Office Copy (Yellow) — Field or Office Copy

6533

Harding Lawson Associates
601 East 57th Place
Anchorage, AK 99518
907 / 563-8102
907 / 561-4574 FAX

CHAIN OF CUSTODY FORM

Lab: C

Samplers: C. Marshall

Project Number: 47411

Name/Location: RED Devil Mine

Project Manager: Brian Lund

Recorder: Charles R. Mahl (Signature Required)

	SOURCE CODE	MATRIX: Water	Sediment	Soil	Oil	#CONTAINERS & PRESERV.: Unpres.	H_2SO_4	HNO_3	Meth 4oz	8oz	SAMPLE NUMBER OR LAB NUMBER: Yr	Wk	Seq	DATE: Yr	Mo	Dy	Time	STATION DESCRIPTION/ NOTES	EPA 601/8010	EPA 602/8020	EPA 624/8240	EPA 625/8270	ICP METALS	EPA 8015M/TPH	DRO/RRO-AK102/103	GRO/BTEX-AK101/8021B	cPAHs/8270 Simms
1	S0			X					X	X				00	07	27	1050	00RDV11SL							X	X	X
2	S0			X					X	X				00	07	27	1120	00RDV12SL							X	X	
3	S0			X					X	X				00	07	27	1140	00RDV13SL							X	X	
4	S0			X					X	X				00	07	27	1340	00RDV14SL							X	X	
5	S0			X					X	X				00	07	27	1405	00RDV15SL							X	X	
6	S0			X					X	X				00	07	27	1430	00RDV16SL							X	X	
7	S0			X					X	X				00	07	27	1445	00RDV17SL							X	X	
8	S0			X					X	X				00	07	27	1510	00RDV18SL							X	X	
9	S0			X					X	X				00	07	27	1540	00RDV19SL							X	X	
10	S0			X					X	X				00	07	27	1615	00RDV20SL							X	X	

LAB NUMBER: Yr	Wk	Seq	DEPTH IN FEET	COL MTD CD	QA CODE	MISCELLANEOUS

CHAIN OF CUSTODY RECORD

RELINQUISHED BY: (Signature)	RECEIVED BY: (Signature)	DATE/TIME
Charles R. Mahl 7/28/00 1200	[illegible]	8/1/00 9:00am
[illegible] 8/1/00 7:00	[illegible]	8/1/00 14:0[illegible]
DISPATCHED BY: (Signature) DATE/TIME	RECEIVED FOR LAB BY: (Signature)	DATE/TIME

METHOD OF SHIPMENT: Agelnst Air / Frontier #658265

Laboratory Copy White | Project Office Copy Yellow | Field or Office Copy Pink

6533

1004238

01

1004238

CT&E Environmental Services Inc.

SAMPLE RECEIPT FORM

CT&E WO#:

Yes	No	
	✓	Are samples **RUSH**, priority, or *within 72 hrs* of **hold time**?
		If yes, have you done *e-mail notification*?
	✓	Are samples *within 24 hrs* of **hold time** or **due date**?
		If yes, have you *spoken with* Supervisor?
✓		Are there any **problems** (e.g., ids, analyses)?
✓		Were samples preserved correctly and pH verified?
		#1 is missing
✓		Has Project Manager been notified of problems?
		Is this an ACOE/AFCEE/ADEC project?
		Will a **data package** be required?
		If this is for PWS, provide **PWSID**.
		Is there a **quote** for this project?
	✓	Will **courier** charges apply?

Completed by (sign): E Thurman (print): Eva Thurman

Due Date: 8/10/00
Received Date/Time: 8/1 - 14:00
Cooler Temperature: 3.8 °C
Sample Condition: Good / Poor

Matrix of each Sample:

2	" "	2-23
	" "	
	" "	
	" "	
2	Trip Blank	24
	MS/MSD	

Additional Sample Remarks:

- AK101s/_____ 8260s field pres'd?
- Field-filtered for dissolved_____?
- Lab-filter for dissolved_____?
- Ref Lab required?

Notes:

*** The following *must* be completed for *all* ACOE & AFCEE projects: ***

Yes	No		Notes:
✓		Is cooler temperature 4 ± C?	3.8 °C
		thermometer used:	ODC-2
	n/c	Was there an airbill, etc? note #:	
	✓	Was cooler sealed with custody seals?	
		#/where?	
	n/a	Were seals intact upon arrival?	
✓		Was there a COC with cooler?	
✓		Was the COC filled out properly?	
	✓	Did the COC indicate ACOE/AFCEE project?	
		Did the COC and samples correspond?	
✓		Were samples screened with Geiger counter?	
✓		Were all samples packed to prevent breakage?	
		packing material:	bubble wrap
✓		Were all samples unbroken and clearly labelled?	
✓		Were all samples sealed in separate plastic bags?	
	n/a	Were all bottles for volatiles free of headspace?	
✓		Were correct container/sample sizes submitted?	
		Was client notified of problems? (specify below)	

Individual contacted: _____

Date & Time: _____ Phone/Fax #: _____

# of each Container Received:

	950 ml amber	unpres'd
	950 ml amber	w/ HCl
	500 ml amber	w/ H2SO4
	1L cubies	unpres'd
	1L cubies	w/ HNO3
	1L cubies	w/ H2SO4
	1L cubies	w/ NaOH + ZnAc
	120 ml coli	bottles
	60 ml	Nalg
25	8 oz amber	unpres'd
	4 oz amber	unpres'd
24	4 oz w/ septa	w/ MeOH
	40 ml vials	w/ HCl
2	Other (specify)	4oz w/septa unpr
	Other (specify)	

#/Log In Proofed by: _____

Form Number: F004r2
Printed: 7/1/99

CT&E Environmental Services Inc.
Laboratory Division

Laboratory Analysis Report

200 W. Potter Drive
Anchorage, AK 99518-1605
Tel: (907) 562-2343
Fax: (907) 561-5301
Web: http://www.cteesi.com

Brian Lund
Harding Lawson & Assoc
601 East 57th Place
Anchorage, AK 99518

Work Order:	1004238
	Red Devil Mine 47411
Client:	Harding Lawson & Assoc
Report Date:	August 22, 2000

Enclosed are the analytical results associated with the above workorder.

As required by the state of Alaska and the USEPA, a formal Quality Assurance/Quality Control Program is maintaned 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 analyte 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
!	Surrogate out of range

SGS Member of the SGS Group (Societe Generale de Surveillance)
200 W. Potter Drive, **Anchorage, AK 99518-1605** — Tel: (907) 562-2343 Fax: (907) 561-5301
3180 Peger Road, **Fairbanks, AK 99709-5471** — Tel: (907) 474-8656 Fax: (907) 474-9685

CT&E Environmental Services Inc.

CT&E Ref.#	1004238002	**Client PO#**	Auth 48 Job #39551
Client Name	Harding Lawson & Assoc	**Printed Date/Time**	08/22/2000 10:08
Project Name/#	Red Devil Mine 47411	**Collected Date/Time**	07/26/2000 16:30
Client Sample ID	00RDV02SL	**Received Date/Time**	08/01/2000 14:00
Matrix	Soil/Solid	**Technical Director**	**Stephen C. Ede**
Ordered By		**Released By**	J Windebank

Sample Remarks:

DRO/RRO - Pattern consistent with weathered middle distillate.
DRO/RRO - Surrogate recoveries outside controls due to matrix interference.

Parameter	Results	PQL	Units	Method	Allowable Limits	Prep Date	Analysis Date	Init
Solids								
Total Solids	85.2		%	SM20 2540G			08/02/00	AKL
Volatile Fuels Department								
Gasoline Range Organics	10.6	3.93	mg/Kg	AK101/8021B		07/26/00	08/08/00	MAH
Benzene	0.0197 U	0.0197	mg/Kg	AK101/8021B		07/26/00	08/08/00	MAH
Toluene	0.0787 U	0.0787	mg/Kg	AK101/8021B		07/26/00	08/08/00	MAH
Ethylbenzene	0.0787 U	0.0787	mg/Kg	AK101/8021B		07/26/00	08/08/00	MAH
P & M -Xylene	0.0787 U	0.0787	mg/Kg	AK101/8021B		07/26/00	08/08/00	MAH
o-Xylene	0.0787 U	0.0787	mg/Kg	AK101/8021B		07/26/00	08/08/00	MAH
Surrogates								
1,4-Difluorobenzene <Surr>	87.9		%	AK101/8021B	60-120	07/26/00	08/08/00	MAH
4-Bromofluorobenzene <Surr>	119		%	AK101/8021B	50-150	07/26/00	08/08/00	MAH
Semivolatile Organic Fuels Department								
Diesel Range Organics	3760	109	mg/Kg	AK102/103		08/04/00	08/08/00	MCM
Residual Range Organics GC	179 U	179	mg/Kg	AK102/103		08/04/00	08/08/00	MCM
Surrogates								
5a Androstane <surr>	383 !		%	AK102/103	60-120	08/04/00	08/08/00	MCM
d-Triacontane <Surr>	112		%	AK102/103	60-120	08/04/00	08/08/00	MCM

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CT&E Environmental Services Inc.

CT&E Ref.#	1004238003	**Client PO#**	Auth 48 Job #39551
Client Name	Harding Lawson & Assoc	**Printed Date/Time**	08/22/2000 10:08
Project Name/#	Red Devil Mine 47411	**Collected Date/Time**	07/26/2000 17:00
Client Sample ID	00RDV03SL	**Received Date/Time**	08/01/2000 14:00
Matrix	Soil/Solid	**Technical Director**	**Stephen C. Ede**
Ordered By		**Released By**	J Windebank

Sample Remarks:

DRO/RRO - Pattern consistent with weathered middle distillate.
DRO/RRO - Surrogate recoveries outside controls due to matrix interference.
GRO/BTEX - Surrogate recovery is biased high due to matrix interference. Results not affected.

Parameter	Results		PQL	Units	Method	Allowable Limits	Prep Date	Analysis Date	Init
Solids									
Total Solids	84.4			%	SM20 2540G			08/02/00	AKL
Volatile Fuels Department									
Gasoline Range Organics	214		6.95	mg/Kg	AK101/8021B		07/26/00	08/08/00	MAH
Benzene	0.0348 U		0.0348	mg/Kg	AK101/8021B		07/26/00	08/08/00	MAH
Toluene	0.139 U		0.139	mg/Kg	AK101/8021B		07/26/00	08/08/00	MAH
Ethylbenzene	0.400		0.139	mg/Kg	AK101/8021B		07/26/00	08/08/00	MAH
P & M -Xylene	1.70		0.139	mg/Kg	AK101/8021B		07/26/00	08/08/00	MAH
o-Xylene	0.789		0.139	mg/Kg	AK101/8021B		07/26/00	08/08/00	MAH
Surrogates									
1,4-Difluorobenzene <Surr>	91.6			%	AK101/8021B	60-120	07/26/00	08/08/00	MAH
4-Bromofluorobenzene <Surr>	754	!		%	AK101/8021B	50-150	07/26/00	08/08/00	MAH
Semivolatile Organic Fuels Department									
Diesel Range Organics	8670		206	mg/Kg	AK102/103		08/04/00	08/08/00	MCM
Residual Range Organics GC	340 U		340	mg/Kg	AK102/103		08/04/00	08/08/00	MCM
Surrogates									
5a Androstane <surr>	265	!		%	AK102/103	60-120	08/04/00	08/08/00	MCM
d-Triacontane <Surr>	145	!		%	AK102/103	60-120	08/04/00	08/08/00	MCM

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CT&E Environmental Services Inc.

CT&E Ref.#	1004238004	**Client PO#**	Auth 48 Job #39551
Client Name	Harding Lawson & Assoc	**Printed Date/Time**	08/22/2000 10:08
Project Name/#	Red Devil Mine 47411	**Collected Date/Time**	07/27/2000 7:45
Client Sample ID	00RDV04SL	**Received Date/Time**	08/01/2000 14:00
Matrix	Soil/Solid	**Technical Director**	**Stephen C. Ede**
Ordered By		**Released By**	JWindebank

Sample Remarks:

DRO/RRO - Surrogate recoveries outside controls due to matrix interference and/or sample dilution.
DRO/RRO - Pattern consistent with weathered middle distillate.
GRO/BTEX - Surrogate recovery is biased high due to matrix interference. Results not affected.

Parameter	Results		PQL	Units	Method	Allowable Limits	Prep Date	Analysis Date	Init
Solids									
Total Solids	86.0			%	SM20 2540G			08/02/00	AKL
Volatile Fuels Department									
Gasoline Range Organics	38.7		2.99	mg/Kg	AK101/8021B		07/27/00	08/08/00	MAH
Benzene	0.0150 U		0.0150	mg/Kg	AK101/8021B		07/27/00	08/08/00	MAH
Toluene	0.0598 U		0.0598	mg/Kg	AK101/8021B		07/27/00	08/08/00	MAH
Ethylbenzene	0.0598 U		0.0598	mg/Kg	AK101/8021B		07/27/00	08/08/00	MAH
P & M -Xylene	0.425		0.0598	mg/Kg	AK101/8021B		07/27/00	08/08/00	MAH
o-Xylene	0.127		0.0598	mg/Kg	AK101/8021B		07/27/00	08/08/00	MAH
Surrogates									
1,4-Difluorobenzene <Surr>	87			%	AK101/8021B	60-120	07/27/00	08/08/00	MAH
4-Bromofluorobenzene <Surr>	220	!		%	AK101/8021B	50-150	07/27/00	08/08/00	MAH
Semivolatile Organic Fuels Department									
Diesel Range Organics	4010		227	mg/Kg	AK102/103		08/04/00	08/08/00	MCM
Residual Range Organics GC	375 U		375	mg/Kg	AK102/103		08/04/00	08/08/00	MCM
Surrogates									
5a Androstane <surr>	178	!		%	AK102/103	60-120	08/04/00	08/08/00	MCM
d-Triacontane <Surr>	145	!		%	AK102/103	60-120	08/04/00	08/08/00	MCM

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CT&E Environmental Services Inc.

CT&E Ref.#	1004238005	**Client PO#**	Auth 48 Job #39551
Client Name	Harding Lawson & Assoc	**Printed Date/Time**	08/22/2000 10:08
Project Name/#	Red Devil Mine 47411	**Collected Date/Time**	07/27/2000 8:30
Client Sample ID	00RDV05SL	**Received Date/Time**	08/01/2000 14:00
Matrix	Soil/Solid	**Technical Director**	**Stephen C. Ede**
Ordered By		**Released By**	J Windebank

Sample Remarks:

DRO/RRO - Pattern consistent with weathered middle distillate.
DRO/RRO - Surrogate recoveries outside controls due to matrix interference.
GRO/BTEX - Surrogate recovery is biased high due to matrix interference. Results not affected.

Parameter	Results		PQL	Units	Method	Allowable Limits	Prep Date	Analysis Date	Init
Solids									
Total Solids	82.2			%	SM20 2540G			08/02/00	AKL
Volatile Fuels Department									
Gasoline Range Organics	23.2		2.84	mg/Kg	AK101/8021B		07/27/00	08/08/00	MAH
Benzene	0.0142 U		0.0142	mg/Kg	AK101/8021B		07/27/00	08/08/00	MAH
Toluene	0.0567 U		0.0567	mg/Kg	AK101/8021B		07/27/00	08/08/00	MAH
Ethylbenzene	0.0567 U		0.0567	mg/Kg	AK101/8021B		07/27/00	08/08/00	MAH
P & M -Xylene	0.235		0.0567	mg/Kg	AK101/8021B		07/27/00	08/08/00	MAH
o-Xylene	0.105		0.0567	mg/Kg	AK101/8021B		07/27/00	08/08/00	MAH
Surrogates									
1,4-Difluorobenzene <Surr>	88.6			%	AK101/8021B	60-120	07/27/00	08/08/00	MAH
4-Bromofluorobenzene <Surr>	157	!		%	AK101/8021B	50-150	07/27/00	08/08/00	MAH
Semivolatile Organic Fuels Department									
Diesel Range Organics	6620		288	mg/Kg	AK102/103		08/04/00	08/08/00	MCM
Residual Range Organics GC	475 U		475	mg/Kg	AK102/103		08/04/00	08/08/00	MCM
Surrogates									
5a Androstane <surr>	266	!		%	AK102/103	60-120	08/04/00	08/08/00	MCM
d-Triacontane <Surr>	173	!		%	AK102/103	60-120	08/04/00	08/08/00	MCM
Semivolatile Organic GC/MS									

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CT&E Environmental Services Inc.

CT&E Ref.#	1004238005	**Client PO#**	Auth 48 Job #39551
Client Name	Harding Lawson & Assoc	**Printed Date/Time**	08/22/2000 10:08
Project Name/#	Red Devil Mine 47411	**Collected Date/Time**	07/27/2000 8:30
Client Sample ID	00RDV05SL	**Received Date/Time**	08/01/2000 14:00
Matrix	Soil/Solid	**Technical Director**	**Stephen C. Ede**
Ordered By			

Parameter	Results	PQL	Units	Method	Allowable Limits	Prep Date	Analysis Date	Init
Semivolatile Organic GC/MS								
Naphthalene	5.58 U	5.58	ug/Kg	PAH SIM		08/03/00	08/08/00	KWM
Acenaphthylene	5.58 U	5.58	ug/Kg	PAH SIM		08/03/00	08/08/00	KWM
Acenaphthene	5.58 U	5.58	ug/Kg	PAH SIM		08/03/00	08/08/00	KWM
Fluorene	5.58 U	5.58	ug/Kg	PAH SIM		08/03/00	08/08/00	KWM
Phenanthrene	5.58 U	5.58	ug/Kg	PAH SIM		08/03/00	08/08/00	KWM
Anthracene	5.58 U	5.58	ug/Kg	PAH SIM		08/03/00	08/08/00	KWM
Fluoranthene	5.58 U	5.58	ug/Kg	PAH SIM		08/03/00	08/08/00	KWM
Pyrene	20.1	5.58	ug/Kg	PAH SIM		08/03/00	08/08/00	KWM
Benzo(a)Anthracene	5.58 U	5.58	ug/Kg	PAH SIM		08/03/00	08/08/00	KWM
Chrysene	15.7	5.58	ug/Kg	PAH SIM		08/03/00	08/08/00	KWM
Benzo[b]Fluoranthene	6.36	5.58	ug/Kg	PAH SIM		08/03/00	08/08/00	KWM
Benzo[k]fluoranthene	5.58 U	5.58	ug/Kg	PAH SIM		08/03/00	08/08/00	KWM
Benzo[a]pyrene	5.58 U	5.58	ug/Kg	PAH SIM		08/03/00	08/08/00	KWM
Indeno[1,2,3-c,d] pyrene	5.58 U	5.58	ug/Kg	PAH SIM		08/03/00	08/08/00	KWM
Dibenzo[a,h]anthracene	5.58 U	5.58	ug/Kg	PAH SIM		08/03/00	08/08/00	KWM
Benzo[g,h,i]perylene	5.58 U	5.58	ug/Kg	PAH SIM		08/03/00	08/08/00	KWM
Surrogates								
Naphthalene-d8 <surr/IS>	92.5		%	PAH SIM	10-148	08/03/00	08/08/00	KWM
Acenaphthene-d10 <surr/IS>	83.1		%	PAH SIM	10-163	08/03/00	08/08/00	KWM
Chrysene-d12 <surr/IS>	76.2		%	PAH SIM	10-140	08/03/00	08/08/00	KWM

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CT&E Environmental Services Inc.

CT&E Ref.#	1004238006	**Client PO#**	Auth 48 Job #39551
Client Name	Harding Lawson & Assoc	**Printed Date/Time**	08/22/2000 10:08
Project Name/#	Red Devil Mine 47411	**Collected Date/Time**	07/27/2000 8:35
Client Sample ID	00RDV06SL	**Received Date/Time**	08/01/2000 14:00
Matrix	Soil/Solid	**Technical Director**	**Stephen C. Ede**
Ordered By		**Released By**	J Windebank

Sample Remarks:

GRO/BTEX - Surrogate recovery is biased high due to matrix interference. Results not affected.
DRO/RRO - Pattern consistent with weathered middle distillate.
DRO/RRO - Surrogate recoveries outside controls due to matrix interference.

Parameter	Results		PQL	Units	Method	Allowable Limits	Prep Date	Analysis Date	Init
Solids									
Total Solids	82.4			%	SM20 2540G			08/02/00	AKL
Volatile Fuels Department									
Gasoline Range Organics	21.8		2.63	mg/Kg	AK101/8021B		07/27/00	08/07/00	MAH
Benzene	0.0132 U		0.0132	mg/Kg	AK101/8021B		07/27/00	08/07/00	MAH
Toluene	0.0527 U		0.0527	mg/Kg	AK101/8021B		07/27/00	08/07/00	MAH
Ethylbenzene	0.0527 U		0.0527	mg/Kg	AK101/8021B		07/27/00	08/07/00	MAH
P & M -Xylene	0.234		0.0527	mg/Kg	AK101/8021B		07/27/00	08/07/00	MAH
o-Xylene	0.0797		0.0527	mg/Kg	AK101/8021B		07/27/00	08/07/00	MAH
Surrogates									
1,4-Difluorobenzene <Surr>	89.6			%	AK101/8021B	60-120	07/27/00	08/07/00	MAH
4-Bromofluorobenzene <Surr>	158	!		%	AK101/8021B	50-150	07/27/00	08/07/00	MAH
Semivolatile Organic Fuels Department									
Diesel Range Organics	6900		238	mg/Kg	AK102/103		08/04/00	08/08/00	MCM
Residual Range Organics GC	392 U		392	mg/Kg	AK102/103		08/04/00	08/08/00	MCM
Surrogates									
5a Androstane <surr>	282	!		%	AK102/103	60-120	08/04/00	08/08/00	MCM
d-Triacontane <Surr>	217	!		%	AK102/103	60-120	08/04/00	08/08/00	MCM

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CT&E Environmental Services Inc.

CT&E Ref.#	1004238007	**Client PO#**	Auth 48 Job #39551
Client Name	Harding Lawson & Assoc	**Printed Date/Time**	08/22/2000 10:08
Project Name/#	Red Devil Mine 47411	**Collected Date/Time**	07/27/2000 9:20
Client Sample ID	00RDV07SL	**Received Date/Time**	08/01/2000 14:00
Matrix	Soil/Solid	**Technical Director**	**Stephen C. Ede**
Ordered By		**Released By**	J C Wandebank

Sample Remarks:

GRO/BTEX - Surrogate recovery is biased high due to matrix interference. Results not affected.
DRO/RRO - Surrogate recoveries outside controls due to matrix interference.
DRO/RRO - Pattern consistent with weathered middle distillate.

Parameter	Results		PQL	Units	Method	Allowable Limits	Prep Date	Analysis Date	Init
Solids									
Total Solids	85.4			%	SM20 2540G			08/02/00	A[illegible]
Volatile Fuels Department									
Gasoline Range Organics	195		9.64	mg/Kg	AK101/8021B		07/27/00	08/07/00	MAH
Benzene	0.0482 U		0.0482	mg/Kg	AK101/8021B		07/27/00	08/07/00	M[illegible]
Toluene	0.193 U		0.193	mg/Kg	AK101/8021B		07/27/00	08/07/00	MAH
Ethylbenzene	0.215		0.193	mg/Kg	AK101/8021B		07/27/00	08/07/00	MAH
P & M -Xylene	2.84		0.193	mg/Kg	AK101/8021B		07/27/00	08/07/00	M[illegible]
o-Xylene	0.551		0.193	mg/Kg	AK101/8021B		07/27/00	08/07/00	MAH
Surrogates									
1,4-Difluorobenzene <Surr>	89.8			%	AK101/8021B	60-120	07/27/00	08/07/00	MAH
4-Bromofluorobenzene <Surr>	613	!		%	AK101/8021B	50-150	07/27/00	08/07/00	MAH
Semivolatile Organic Fuels Department									
Diesel Range Organics	6640		108	mg/Kg	AK102/103		08/04/00	08/08/00	M[illegible]
Residual Range Organics GC	178 U		178	mg/Kg	AK102/103		08/04/00	08/08/00	MCM
Surrogates									
5a Androstane <surr>	181	!		%	AK102/103	60-120	08/04/00	08/08/00	MCM
d-Triacontane <Surr>	153	!		%	AK102/103	60-120	08/04/00	08/08/00	M[illegible]

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CT&E Environmental Services Inc.

CT&E Ref.#	1004238008	**Client PO#**	Auth 48 Job #39551
Client Name	Harding Lawson & Assoc	**Printed Date/Time**	08/22/2000 10:08
Project Name/#	Red Devil Mine 47411	**Collected Date/Time**	07/27/2000 9:30
Client Sample ID	00RDV08SL	**Received Date/Time**	08/01/2000 14:00
Matrix	Soil/Solid	**Technical Director**	**Stephen C. Ede**
Ordered By		**Released By**	J W Underbank

Sample Remarks:

GRO/BTEX - Surrogate recovery is biased high due to matrix interference. Results not affected.
DRO/RRO - Pattern consistent with weathered middle distillate.
DRO/RRO - Surrogate recoveries outside controls due to matrix interference.

Parameter	Results	PQL	Units	Method	Allowable Limits	Prep Date	Analysis Date	Init
Solids								
Total Solids	86.8		%	SM20 2540G			08/02/00	AKL
Volatile Fuels Department								
Gasoline Range Organics	128	4.25	mg/Kg	AK101/8021B		07/27/00	08/07/00	MAH
Benzene	0.0213 U	0.0213	mg/Kg	AK101/8021B		07/27/00	08/07/00	MAH
Toluene	0.158	0.0851	mg/Kg	AK101/8021B		07/27/00	08/07/00	MAH
Ethylbenzene	0.436	0.0851	mg/Kg	AK101/8021B		07/27/00	08/07/00	MAH
P & M -Xylene	2.69	0.0851	mg/Kg	AK101/8021B		07/27/00	08/07/00	MAH
o-Xylene	0.838	0.0851	mg/Kg	AK101/8021B		07/27/00	08/07/00	MAH
Surrogates								
1,4-Difluorobenzene <Surr>	91.8		%	AK101/8021B	60-120	07/27/00	08/07/00	MAH
4-Bromofluorobenzene <Surr>	515 !		%	AK101/8021B	50-150	07/27/00	08/07/00	MAH
Semivolatile Organic Fuels Department								
Diesel Range Organics	3270	109	mg/Kg	AK102/103		08/04/00	08/08/00	MCM
Residual Range Organics GC	180 U	180	mg/Kg	AK102/103		08/04/00	08/08/00	MCM
Surrogates								
5a Androstane <surr>	114		%	AK102/103	60-120	08/04/00	08/08/00	MCM
d-Triacontane <Surr>	1330 !		%	AK102/103	60-120	08/04/00	08/08/00	MCM

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CT&E Environmental Services Inc.

CT&E Ref.#	1004238009	**Client PO#**	Auth 48 Job #39551
Client Name	Harding Lawson & Assoc	**Printed Date/Time**	08/22/2000 10:08
Project Name/#	Red Devil Mine 47411	**Collected Date/Time**	07/27/2000 10:20
Client Sample ID	00RDV09SL	**Received Date/Time**	08/01/2000 14:00
Matrix	Soil/Solid	**Technical Director**	**Stephen C. Ede**
Ordered By		**Released By**	JW Indebiank

Sample Remarks:

GRO/BTEX - Surrogate recovery is biased high due to matrix interference. Results not affected.
DRO/RRO - Pattern consistent with weathered middle distillate.
DRO/RRO - Surrogate recoveries outside controls due to matrix interference.
PAHSIM - Recovery for surrogate #2 is outside QC goals due to interference from non-target hydrocarbons. See dilution for this surrogate recovery.

Parameter	Results		PQL	Units	Method	Allowable Limits	Prep Date	Analysis Date	Init
Solids									
Total Solids	86.1			%	SM20 2540G			08/02/00	AK
Volatile Fuels Department									
Gasoline Range Organics	41.7		3.33	mg/Kg	AK101/8021B		07/27/00	08/07/00	MA
Benzene	0.0166 U		0.0166	mg/Kg	AK101/8021B		07/27/00	08/07/00	MAH
Toluene	0.0666 U		0.0666	mg/Kg	AK101/8021B		07/27/00	08/07/00	MA
Ethylbenzene	0.0666 U		0.0666	mg/Kg	AK101/8021B		07/27/00	08/07/00	MA
P & M -Xylene	0.488		0.0666	mg/Kg	AK101/8021B		07/27/00	08/07/00	MAH
o-Xylene	0.247		0.0666	mg/Kg	AK101/8021B		07/27/00	08/07/00	MA
Surrogates									
1,4-Difluorobenzene <Surr>	90.7			%	AK101/8021B	60-120	07/27/00	08/07/00	M
4-Bromofluorobenzene <Surr>	214	!		%	AK101/8021B	50-150	07/27/00	08/07/00	M
Semivolatile Organic Fuels Department									
Diesel Range Organics	4660		156	mg/Kg	AK102/103		08/04/00	08/08/00	MCM
Residual Range Organics GC	257 U		257	mg/Kg	AK102/103		08/04/00	08/08/00	M
Surrogates									
5a Androstane <surr>	114			%	AK102/103	60-120	08/04/00	08/08/00	M
d-Triacontane <Surr>	137	!		%	AK102/103	60-120	08/04/00	08/08/00	MCM

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CT&E Environmental Services Inc.

CT&E Ref.#	1004238009	**Client PO#**	Auth 48 Job #39551
Client Name	Harding Lawson & Assoc	**Printed Date/Time**	08/22/2000 10:08
Project Name/#	Red Devil Mine 47411	**Collected Date/Time**	07/27/2000 10:20
Client Sample ID	00RDV09SL	**Received Date/Time**	08/01/2000 14:00
Matrix	Soil/Solid	**Technical Director**	**Stephen C. Ede**
Ordered By			

Parameter	Results	PQL	Units	Method	Allowable Limits	Prep Date	Analysis Date	Init
Semivolatile Organic GC/MS								
Naphthalene	511 U	511	ug/Kg	PAH SIM		08/03/00	08/08/00	KWM
Acenaphthylene	511 U	511	ug/Kg	PAH SIM		08/03/00	08/08/00	KWM
Acenaphthene	511 U	511	ug/Kg	PAH SIM		08/03/00	08/08/00	KWM
Fluorene	511 U	511	ug/Kg	PAH SIM		08/03/00	08/08/00	KWM
Phenanthrene	5.11 U	5.11	ug/Kg	PAH SIM		08/03/00	08/08/00	KWM
Anthracene	5.11 U	5.11	ug/Kg	PAH SIM		08/03/00	08/08/00	KWM
Fluoranthene	5.11 U	5.11	ug/Kg	PAH SIM		08/03/00	08/08/00	KWM
Pyrene	9.08	5.11	ug/Kg	PAH SIM		08/03/00	08/08/00	KWM
Benzo(a)Anthracene	5.11 U	5.11	ug/Kg	PAH SIM		08/03/00	08/08/00	KWM
Chrysene	7.20	5.11	ug/Kg	PAH SIM		08/03/00	08/08/00	KWM
Benzo[b]Fluoranthene	5.25	5.11	ug/Kg	PAH SIM		08/03/00	08/08/00	KWM
Benzo[k]fluoranthene	5.11 U	5.11	ug/Kg	PAH SIM		08/03/00	08/08/00	KWM
Benzo[a]pyrene	5.11 U	5.11	ug/Kg	PAH SIM		08/03/00	08/08/00	KWM
Indeno[1,2,3-c,d] pyrene	5.11 U	5.11	ug/Kg	PAH SIM		08/03/00	08/08/00	KWM
Dibenzo[a,h]anthracene	5.11 U	5.11	ug/Kg	PAH SIM		08/03/00	08/08/00	KWM
Benzo[g,h,i]perylene	5.11 U	5.11	ug/Kg	PAH SIM		08/03/00	08/08/00	KWM
Surrogates								
Naphthalene-d8 <surr/IS>	91.7		%	PAH SIM	10-148	08/03/00	08/08/00	KWM
Acenaphthene-d10 <surr/IS>	103		%	PAH SIM	10-163	08/03/00	08/08/00	KWM
Chrysene-d12 <surr/IS>	72.7		%	PAH SIM	10-140	08/03/00	08/08/00	KWM

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CT&E Environmental Services Inc.

CT&E Ref.#	1004238010	**Client PO#**	Auth 48 Job #39551
Client Name	Harding Lawson & Assoc	**Printed Date/Time**	08/22/2000 10:08
Project Name/#	Red Devil Mine 47411	**Collected Date/Time**	07/27/2000 10:30
Client Sample ID	00RDV10SL	**Received Date/Time**	08/01/2000 14:00
Matrix	Soil/Solid	**Technical Director**	**Stephen C. Ede**
Ordered By		**Released By**	J Windebank

Sample Remarks:

GRO/BTEX - Surrogate recovery is biased high due to matrix interference. Results not affected.
DRO/RRO - Pattern consistent with weathered middle distillate.
DRO/RRO - Surrogate recoveries outside controls due to matrix interference.

Parameter	Results		PQL	Units	Method	Allowable Limits	Prep Date	Analysis Date	Init
Solids									
Total Solids	92.4			%	SM20 2540G			08/02/00	AKL
Volatile Fuels Department									
Gasoline Range Organics	79.9		2.82	mg/Kg	AK101/8021B		07/27/00	08/07/00	MAH
Benzene	0.0141 U		0.0141	mg/Kg	AK101/8021B		07/27/00	08/07/00	MAH
Toluene	0.0564 U		0.0564	mg/Kg	AK101/8021B		07/27/00	08/07/00	MAH
Ethylbenzene	0.142		0.0564	mg/Kg	AK101/8021B		07/27/00	08/07/00	MAH
P & M -Xylene	0.807		0.0564	mg/Kg	AK101/8021B		07/27/00	08/07/00	MAH
o-Xylene	0.260		0.0564	mg/Kg	AK101/8021B		07/27/00	08/07/00	MAH
Surrogates									
1,4-Difluorobenzene <Surr>	92.4			%	AK101/8021B	60-120	07/27/00	08/07/00	MAH
4-Bromofluorobenzene <Surr>	648	!		%	AK101/8021B	50-150	07/27/00	08/07/00	MAH
Semivolatile Organic Fuels Department									
Diesel Range Organics	2660		99.3	mg/Kg	AK102/103		08/04/00	08/08/00	MCM
Residual Range Organics GC	164 U		164	mg/Kg	AK102/103		08/04/00	08/08/00	MCM
Surrogates									
5a Androstane <surr>	255	!		%	AK102/103	60-120	08/04/00	08/08/00	MCM
d-Triacontane <Surr>	221	!		%	AK102/103	60-120	08/04/00	08/08/00	MCM

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CT&E Environmental Services Inc.

CT&E Ref.#	1004238011	**Client PO#**	Auth 48 Job #39551
Client Name	Harding Lawson & Assoc	**Printed Date/Time**	08/22/2000 10:08
Project Name/#	Red Devil Mine 47411	**Collected Date/Time**	07/27/2000 10:50
Client Sample ID	00RDV11SL	**Received Date/Time**	08/01/2000 14:00
Matrix	Soil/Solid	**Technical Director**	**Stephen C. Ede**
Ordered By		**Released By**	J Windebank

Sample Remarks:

GRO/BTEX - Surrogate recovery is biased high due to matrix interference. Results not affected.
DRO/RRO - Pattern consistent with weathered middle distillate.
DRO - Surrogate recoveries outside controls due to matrix interference.
PAHSIM - LCS/LCSD RPD for Phenanthrene is outside qc goals. The positive results for Phenanthrene are estimated.

Parameter	Results		PQL	Units	Method	Allowable Limits	Prep Date	Analysis Date	Init
Solids									
Total Solids	85.5			%	SM20 2540G			08/02/00	AKL
Volatile Fuels Department									
Gasoline Range Organics	79.9		2.68	mg/Kg	AK101/8021B		07/27/00	08/07/00	MAH
Benzene	0.0950		0.0134	mg/Kg	AK101/8021B		07/27/00	08/07/00	MAH
Toluene	0.643		0.0536	mg/Kg	AK101/8021B		07/27/00	08/07/00	MAH
Ethylbenzene	0.811		0.0536	mg/Kg	AK101/8021B		07/27/00	08/07/00	MAH
P & M -Xylene	2.86		0.0536	mg/Kg	AK101/8021B		07/27/00	08/07/00	MAH
o-Xylene	1.37		0.0536	mg/Kg	AK101/8021B		07/27/00	08/07/00	MAH
Surrogates									
1,4-Difluorobenzene <Surr>	98.2			%	AK101/8021B	60-120	07/27/00	08/07/00	MAH
4-Bromofluorobenzene <Surr>	512	!		%	AK101/8021B	50-150	07/27/00	08/07/00	MAH
Semivolatile Organic Fuels Department									
Diesel Range Organics	1910		30.7	mg/Kg	AK102/103		08/04/00	08/07/00	MCM
Residual Range Organics GC	91.1		50.6	mg/Kg	AK102/103		08/04/00	08/07/00	MCM
Surrogates									
5a Androstane <surr>	184	!		%	AK102/103	60-120	08/04/00	08/07/00	MCM
d-Triacontane <Surr>	117			%	AK102/103	60-120	08/04/00	08/07/00	MCM
Semivolatile Organic GC/MS									

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CT&E Environmental Services Inc.

CT&E Ref.#	1004238011	**Client PO#**	Auth 48 Job #39551
Client Name	Harding Lawson & Assoc	**Printed Date/Time**	08/22/2000 10:08
Project Name/#	Red Devil Mine 47411	**Collected Date/Time**	07/27/2000 10:50
Client Sample ID	00RDV11SL	**Received Date/Time**	08/01/2000 14:00
Matrix	Soil/Solid	**Technical Director**	**Stephen C. Ede**
Ordered By			

Parameter	Results	PQL	Units	Method	Allowable Limits	Prep Date	Analysis Date	Init
Semivolatile Organic GC/MS								
Naphthalene	230	45.3	ug/Kg	PAH SIM		08/03/00	08/08/00	KWM
Acenaphthylene	45.3 U	45.3	ug/Kg	PAH SIM		08/03/00	08/08/00	KWM
Acenaphthene	87.7	45.3	ug/Kg	PAH SIM		08/03/00	08/08/00	KWM
Fluorene	126	45.3	ug/Kg	PAH SIM		08/03/00	08/08/00	KWM
Phenanthrene	133	4.53	ug/Kg	PAH SIM		08/03/00	08/08/00	KWM
Anthracene	4.53 U	4.53	ug/Kg	PAH SIM		08/03/00	08/08/00	KWM
Fluoranthene	4.53 U	4.53	ug/Kg	PAH SIM		08/03/00	08/08/00	KWM
Pyrene	4.53 U	4.53	ug/Kg	PAH SIM		08/03/00	08/08/00	KWM
Benzo(a)Anthracene	4.53 U	4.53	ug/Kg	PAH SIM		08/03/00	08/08/00	KWM
Chrysene	7.01	4.53	ug/Kg	PAH SIM		08/03/00	08/08/00	KWM
Benzo[b]Fluoranthene	4.53 U	4.53	ug/Kg	PAH SIM		08/03/00	08/08/00	KWM
Benzo[k]fluoranthene	4.53 U	4.53	ug/Kg	PAH SIM		08/03/00	08/08/00	KWM
Benzo[a]pyrene	4.53 U	4.53	ug/Kg	PAH SIM		08/03/00	08/08/00	KWM
Indeno[1,2,3-c,d] pyrene	4.53 U	4.53	ug/Kg	PAH SIM		08/03/00	08/08/00	KWM
Dibenzo[a,h]anthracene	4.53 U	4.53	ug/Kg	PAH SIM		08/03/00	08/08/00	KWM
Benzo[g,h,i]perylene	4.53 U	4.53	ug/Kg	PAH SIM		08/03/00	08/08/00	KWM
Surrogates								
Naphthalene-d8 <surr/IS>	80.9		%	PAH SIM	10-148	08/03/00	08/08/00	KWM
Acenaphthene-d10 <surr/IS>	103		%	PAH SIM	10-163	08/03/00	08/08/00	KWM
Chrysene-d12 <surr/IS>	79.5		%	PAH SIM	10-140	08/03/00	08/08/00	KWM

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CT&E Environmental Services Inc.

CT&E Ref.#	1004238012	**Client PO#**	Auth 48 Job #39551
Client Name	Harding Lawson & Assoc	**Printed Date/Time**	08/22/2000 10:08
Project Name/#	Red Devil Mine 47411	**Collected Date/Time**	07/27/2000 11:20
Client Sample ID	00RDV12SL	**Received Date/Time**	08/01/2000 14:00
Matrix	Soil/Solid	**Technical Director**	**Stephen C. Ede**
Ordered By		**Released By**	Windebank

Sample Remarks:

GRO/BTEX - Surrogate recovery is biased high due to matrix interference. Results not affected.
DRO/RRO - Surrogate recoveries outside controls due to matrix interference.
DRO/RRO - Pattern consistent with weathered middle distillate.

Parameter	Results		PQL	Units	Method	Allowable Limits	Prep Date	Analysis Date	Init
Solids									
Total Solids	89.4			%	SM20 2540G			08/02/00	AKL
Volatile Fuels Department									
Gasoline Range Organics	41.1		3.00	mg/Kg	AK101/8021B		07/27/00	08/07/00	MAH
Benzene	0.0486		0.0150	mg/Kg	AK101/8021B		07/27/00	08/07/00	MAH
Toluene	0.252		0.0599	mg/Kg	AK101/8021B		07/27/00	08/07/00	MAH
Ethylbenzene	0.310		0.0599	mg/Kg	AK101/8021B		07/27/00	08/07/00	MAH
P & M -Xylene	1.14		0.0599	mg/Kg	AK101/8021B		07/27/00	08/07/00	MAH
o-Xylene	0.531		0.0599	mg/Kg	AK101/8021B		07/27/00	08/07/00	MAH
Surrogates									
1,4-Difluorobenzene <Surr>	96.2			%	AK101/8021B	60-120	07/27/00	08/07/00	MAH
4-Bromofluorobenzene <Surr>	306	!		%	AK101/8021B	50-150	07/27/00	08/07/00	MAH
Semivolatile Organic Fuels Department									
Diesel Range Organics	1250		10.2	mg/Kg	AK102/103		08/04/00	08/07/00	MCM
Residual Range Organics GC	81.8		16.8	mg/Kg	AK102/103		08/04/00	08/07/00	MCM
Surrogates									
5a Androstane <surr>	211	!		%	AK102/103	60-120	08/04/00	08/07/00	MCM
d-Triacontane <Surr>	125	!		%	AK102/103	60-120	08/04/00	08/07/00	MCM

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CT&E Environmental Services Inc.

CT&E Ref.#	1004238013	**Client PO#**	Auth 48 Job #39551
Client Name	Harding Lawson & Assoc	**Printed Date/Time**	08/22/2000 10:08
Project Name/#	Red Devil Mine 47411	**Collected Date/Time**	07/27/2000 11:40
Client Sample ID	00RDV13SL	**Received Date/Time**	08/01/2000 14:00
Matrix	Soil/Solid	**Technical Director**	**Stephen C. Ede**
Ordered By		**Released By**	J Windebank

Sample Remarks:

DRO/RRO - Pattern consistent with weathered middle distillate.
DRO/RRO - Surrogate recoveries outside controls due to matrix interference.

Parameter	Results		PQL	Units	Method	Allowable Limits	Prep Date	Analysis Date	Init
Solids									
Total Solids	82.6			%	SM20 2540G			08/02/00	AKL
Volatile Fuels Department									
Gasoline Range Organics	7.07		3.12	mg/Kg	AK101/8021B		07/27/00	08/07/00	MA
Benzene	0.0156 U		0.0156	mg/Kg	AK101/8021B		07/27/00	08/07/00	MAH
Toluene	0.0625 U		0.0625	mg/Kg	AK101/8021B		07/27/00	08/07/00	MAH
Ethylbenzene	0.0625 U		0.0625	mg/Kg	AK101/8021B		07/27/00	08/07/00	MA
P & M -Xylene	0.139		0.0625	mg/Kg	AK101/8021B		07/27/00	08/07/00	MAH
o-Xylene	0.0781		0.0625	mg/Kg	AK101/8021B		07/27/00	08/07/00	MAH
Surrogates									
1,4-Difluorobenzene <Surr>	90.6			%	AK101/8021B	60-120	07/27/00	08/07/00	MAH
4-Bromofluorobenzene <Surr>	73.6			%	AK101/8021B	50-150	07/27/00	08/07/00	M
Semivolatile Organic Fuels Department									
Diesel Range Organics	3060		49.5	mg/Kg	AK102/103		08/04/00	08/07/00	MCM
Residual Range Organics GC	194		81.7	mg/Kg	AK102/103		08/04/00	08/07/00	M
Surrogates									
5a Androstane <surr>	214	!		%	AK102/103	60-120	08/04/00	08/07/00	M
d-Triacontane <Surr>	136	!		%	AK102/103	60-120	08/04/00	08/07/00	M

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CT&E Environmental Services Inc.

CT&E Ref.#	1004238014	**Client PO#**	Auth 48 Job #39551
Client Name	Harding Lawson & Assoc	**Printed Date/Time**	08/22/2000 10:08
Project Name/#	Red Devil Mine 47411	**Collected Date/Time**	07/27/2000 13:40
Client Sample ID	00RDV14SL	**Received Date/Time**	08/01/2000 14:00
Matrix	Soil/Solid	**Technical Director**	**Stephen C. Ede**
Ordered By		**Released By**	J Wundebank

Sample Remarks:

GRO/BTEX - Surrogate recovery is biased high due to matrix interference. Results not affected.
DRO/RRO - Pattern consistent with weathered middle distillate.

Parameter	Results	PQL	Units	Method	Allowable Limits	Prep Date	Analysis Date	Init
Solids								
Total Solids	91.9		%	SM20 2540G			08/02/00	AKL
Volatile Fuels Department								
Gasoline Range Organics	110	2.78	mg/Kg	AK101/8021B		07/27/00	08/07/00	MAH
Benzene	0.0658	0.0139	mg/Kg	AK101/8021B		07/27/00	08/07/00	MAH
Toluene	0.724	0.0556	mg/Kg	AK101/8021B		07/27/00	08/07/00	MAH
Ethylbenzene	1.03	0.0556	mg/Kg	AK101/8021B		07/27/00	08/07/00	MAH
P & M -Xylene	3.84	0.0556	mg/Kg	AK101/8021B		07/27/00	08/07/00	MAH
o-Xylene	1.78	0.0556	mg/Kg	AK101/8021B		07/27/00	08/07/00	MAH
Surrogates								
1,4-Difluorobenzene <Surr>	97.3		%	AK101/8021B	60-120	07/27/00	08/07/00	MAH
4-Bromofluorobenzene <Surr>	675 !		%	AK101/8021B	50-150	07/27/00	08/07/00	MAH
Semivolatile Organic Fuels Department								
Diesel Range Organics	530	10.6	mg/Kg	AK102/103		08/04/00	08/07/00	MCM
Residual Range Organics GC	18.2	17.6	mg/Kg	AK102/103		08/04/00	08/07/00	MCM
Surrogates								
5a Androstane <surr>	92.2		%	AK102/103	60-120	08/04/00	08/07/00	MCM
d-Triacontane <Surr>	90.5		%	AK102/103	60-120	08/04/00	08/07/00	MCM

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CT&E Environmental Services Inc.

CT&E Ref.#	1004238015	**Client PO#**	Auth 48 Job #39551
Client Name	Harding Lawson & Assoc	**Printed Date/Time**	08/22/2000 11:14
Project Name/#	Red Devil Mine 47411	**Collected Date/Time**	07/27/2000 14:05
Client Sample ID	00RDV15SL	**Received Date/Time**	08/01/2000 14:00
Matrix	Soil/Solid	**Technical Director**	**Stephen C. Ede**
Ordered By		**Released By**	J Windebank

Sample Remarks:

GRO/BTEX - Surrogate recovery is biased high due to matrix interference. Results not affected.
DRO/RRO - Pattern consistent with weathered middle distillate.

Parameter	Results	PQL	Units	Method	Allowable Limits	Prep Date	Analysis Date	Init
Solids								
Total Solids	92.1		%	SM20 2540G			08/02/00	AKL
Volatile Fuels Department								
Gasoline Range Organics	53.8	3.05	mg/Kg	AK101/8021B		07/27/00	08/07/00	MA
Benzene	0.0319	0.0153	mg/Kg	AK101/8021B		07/27/00	08/07/00	MAH
Toluene	0.308	0.0611	mg/Kg	AK101/8021B		07/27/00	08/07/00	MA
Ethylbenzene	0.403	0.0611	mg/Kg	AK101/8021B		07/27/00	08/07/00	MA
P & M -Xylene	1.64	0.0611	mg/Kg	AK101/8021B		07/27/00	08/07/00	MAH
o-Xylene	0.763	0.0611	mg/Kg	AK101/8021B		07/27/00	08/07/00	MA
Surrogates								
1,4-Difluorobenzene <Surr>	94.8		%	AK101/8021B	60-120	07/27/00	08/07/00	MA
4-Bromofluorobenzene <Surr>	368 !		%	AK101/8021B	50-150	07/27/00	08/07/00	MA
Semivolatile Organic Fuels Department								
Diesel Range Organics	559	10.5	mg/Kg	AK102/103		08/04/00	08/07/00	MCM
Residual Range Organics GC	27.7	17.3	mg/Kg	AK102/103		08/04/00	08/07/00	MC
Surrogates								
5a Androstane <surr>	101		%	AK102/103	60-120	08/04/00	08/07/00	MC
d-Triacontane <Surr>	120		%	AK102/103	60-120	08/04/00	08/07/00	MCM

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CT&E Environmental Services Inc.

CT&E Ref.#	1004238016	**Client PO#**	Auth 48 Job #39551
Client Name	Harding Lawson & Assoc	**Printed Date/Time**	08/22/2000 10:08
Project Name/#	Red Devil Mine 47411	**Collected Date/Time**	07/27/2000 14:30
Client Sample ID	00RDV16SL	**Received Date/Time**	08/01/2000 14:00
Matrix	Soil/Solid	**Technical Director**	**Stephen C. Ede**
Ordered By		**Released By**	J Windebank

Sample Remarks:

GRO/BTEX - Surrogate recovery is biased high due to matrix interference. Results not affected.
DRO/RRO - Pattern consistent with weathered middle distillate.

Parameter	Results	PQL	Units	Method	Allowable Limits	Prep Date	Analysis Date	Init
Solids								
Total Solids	91.3		%	SM20 2540G			08/02/00	AKL
Volatile Fuels Department								
Gasoline Range Organics	52.9	3.60	mg/Kg	AK101/8021B		07/27/00	08/07/00	MAH
Benzene	0.0180 U	0.0180	mg/Kg	AK101/8021B		07/27/00	08/07/00	MAH
Toluene	0.167	0.0720	mg/Kg	AK101/8021B		07/27/00	08/07/00	MAH
Ethylbenzene	0.118	0.0720	mg/Kg	AK101/8021B		07/27/00	08/07/00	MAH
P & M -Xylene	0.956	0.0720	mg/Kg	AK101/8021B		07/27/00	08/07/00	MAH
o-Xylene	0.424	0.0720	mg/Kg	AK101/8021B		07/27/00	08/07/00	MAH
Surrogates								
1,4-Difluorobenzene <Surr>	89.8		%	AK101/8021B	60-120	07/27/00	08/07/00	MAH
4-Bromofluorobenzene <Surr>	256 !		%	AK101/8021B	50-150	07/27/00	08/07/00	MAH
Semivolatile Organic Fuels Department								
Diesel Range Organics	515	10.8	mg/Kg	AK102/103		08/04/00	08/07/00	MCM
Residual Range Organics GC	17.8 U	17.8	mg/Kg	AK102/103		08/04/00	08/07/00	MCM
Surrogates								
5a Androstane <surr>	105		%	AK102/103	60-120	08/04/00	08/07/00	MCM
d-Triacontane <Surr>	93.8		%	AK102/103	60-120	08/04/00	08/07/00	MCM

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CT&E Environmental Services Inc.

CT&E Ref.#	1004238017	**Client PO#**	Auth 48 Job #39551
Client Name	Harding Lawson & Assoc	**Printed Date/Time**	08/22/2000 10:08
Project Name/#	Red Devil Mine 47411	**Collected Date/Time**	07/27/2000 14:45
Client Sample ID	00RDV17SL	**Received Date/Time**	08/01/2000 14:00
Matrix	Soil/Solid	**Technical Director**	**Stephen C. Ede**
Ordered By		**Released By**	J Windebank

Sample Remarks:

Parameter	Results	PQL	Units	Method	Allowable Limits	Prep Date	Analysis Date	Init
Solids								
Total Solids	93.2		%	SM20 2540G			08/02/00	AKL
Volatile Fuels Department								
Gasoline Range Organics	3.55 U	3.55	mg/Kg	AK101/8021B		07/27/00	08/07/00	MAH
Benzene	0.0178 U	0.0178	mg/Kg	AK101/8021B		07/27/00	08/07/00	MAH
Toluene	0.0710 U	0.0710	mg/Kg	AK101/8021B		07/27/00	08/07/00	MAH
Ethylbenzene	0.0710 U	0.0710	mg/Kg	AK101/8021B		07/27/00	08/07/00	MAH
P & M -Xylene	0.0710 U	0.0710	mg/Kg	AK101/8021B		07/27/00	08/07/00	MAH
o-Xylene	0.0710 U	0.0710	mg/Kg	AK101/8021B		07/27/00	08/07/00	MAH
Surrogates								
1,4-Difluorobenzene <Surr>	90		%	AK101/8021B	60-120	07/27/00	08/07/00	MAH
4-Bromofluorobenzene <Surr>	57.2		%	AK101/8021B	50-150	07/27/00	08/07/00	MAH
Semivolatile Organic Fuels Department								
Diesel Range Organics	9.99 U	9.99	mg/Kg	AK102/103		08/04/00	08/07/00	MCM
Residual Range Organics GC	16.5 U	16.5	mg/Kg	AK102/103		08/04/00	08/07/00	MCM
Surrogates								
5a Androstane <surr>	83.7		%	AK102/103	60-120	08/04/00	08/07/00	MCM
d-Triacontane <Surr>	104		%	AK102/103	60-120	08/04/00	08/07/00	MCM

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CT&E Environmental Services Inc.

CT&E Ref.#	1004238018	**Client PO#**	Auth 48 Job #39551
Client Name	Harding Lawson & Assoc	**Printed Date/Time**	08/22/2000 10:08
Project Name/#	Red Devil Mine 47411	**Collected Date/Time**	07/27/2000 15:10
Client Sample ID	00RDV18SL	**Received Date/Time**	08/01/2000 14:00
Matrix	Soil/Solid	**Technical Director**	**Stephen C. Ede**
Ordered By		**Released By**	J Windebank

Sample Remarks:

GRO/BTEX - Surrogate recovery is biased high due to matrix interference. Results not affected.
DRO/RRO - Pattern consistent with weathered middle distillate.
DRO/RRO - Surrogate recoveries outside controls due to matrix interference.

Parameter	Results		PQL	Units	Method	Allowable Limits	Prep Date	Analysis Date	Init
Solids									
Total Solids	87.5			%	SM20 2540G			08/02/00	AKL
Volatile Fuels Department									
Gasoline Range Organics	22.6		3.28	mg/Kg	AK101/8021B		07/27/00	08/07/00	MAH
Benzene	0.0164 U		0.0164	mg/Kg	AK101/8021B		07/27/00	08/07/00	MAH
Toluene	0.0657 U		0.0657	mg/Kg	AK101/8021B		07/27/00	08/07/00	MAH
Ethylbenzene	0.0657 U		0.0657	mg/Kg	AK101/8021B		07/27/00	08/07/00	MAH
P & M -Xylene	0.263		0.0657	mg/Kg	AK101/8021B		07/27/00	08/07/00	MAH
o-Xylene	0.168		0.0657	mg/Kg	AK101/8021B		07/27/00	08/07/00	MAH
Surrogates									
1,4-Difluorobenzene <Surr>	89.6			%	AK101/8021B	60-120	07/27/00	08/07/00	MAH
4-Bromofluorobenzene <Surr>	158	!		%	AK101/8021B	50-150	07/27/00	08/07/00	MAH
Semivolatile Organic Fuels Department									
Diesel Range Organics	2350		28.9	mg/Kg	AK102/103		08/04/00	08/07/00	MCM
Residual Range Organics GC	72.5		47.6	mg/Kg	AK102/103		08/04/00	08/07/00	MCM
Surrogates									
5a Androstane <surr>	152	!		%	AK102/103	60-120	08/04/00	08/07/00	MCM
d-Triacontane <Surr>	134	!		%	AK102/103	60-120	08/04/00	08/07/00	MCM

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CT&E Environmental Services Inc.

CT&E Ref.#	1004238019	**Client PO#**	Auth 48 Job #39551
Client Name	Harding Lawson & Assoc	**Printed Date/Time**	08/22/2000 10:08
Project Name/#	Red Devil Mine 47411	**Collected Date/Time**	07/27/2000 15:40
Client Sample ID	00RDV19SL	**Received Date/Time**	08/01/2000 14:00
Matrix	Soil/Solid	**Technical Director**	**Stephen C. Ede**
Ordered By		**Released By**	J Windebank

Sample Remarks:

GRO/BTEX - Surrogate recovery is biased high due to matrix interference. Results not affected.
DRO/RRO - Pattern consistent with weathered middle distillate.
DRO/RRO - Surrogate recoveries outside controls due to matrix interference.

Parameter	Results		PQL	Units	Method	Allowable Limits	Prep Date	Analysis Date	Init
Solids									
Total Solids	88.1			%	SM20 2540G			08/02/00	AK
Volatile Fuels Department									
Gasoline Range Organics	69.8		3.09	mg/Kg	AK101/8021B		07/27/00	08/07/00	MAH
Benzene	0.0154 U		0.0154	mg/Kg	AK101/8021B		07/27/00	08/07/00	MA
Toluene	0.0617 U		0.0617	mg/Kg	AK101/8021B		07/27/00	08/07/00	MA
Ethylbenzene	0.209		0.0617	mg/Kg	AK101/8021B		07/27/00	08/07/00	MAH
P & M -Xylene	0.734		0.0617	mg/Kg	AK101/8021B		07/27/00	08/07/00	MA
o-Xylene	0.160		0.0617	mg/Kg	AK101/8021B		07/27/00	08/07/00	MA
Surrogates									
1,4-Difluorobenzene <Surr>	87.4			%	AK101/8021B	60-120	07/27/00	08/07/00	MAH
4-Bromofluorobenzene <Surr>	550	!		%	AK101/8021B	50-150	07/27/00	08/07/00	MAH
Semivolatile Organic Fuels Department									
Diesel Range Organics	13600		216	mg/Kg	AK102/103		08/04/00	08/08/00	MC
Residual Range Organics GC	356 U		356	mg/Kg	AK102/103		08/04/00	08/08/00	MCM
Surrogates									
5a Androstane <surr>	172	!		%	AK102/103	60-120	08/04/00	08/08/00	MCM
d-Triacontane <Surr>	411	!		%	AK102/103	60-120	08/04/00	08/08/00	MC

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CT&E Environmental Services Inc.

CT&E Ref.#	1004238020	**Client PO#**	Auth 48 Job #39551
Client Name	Harding Lawson & Assoc	**Printed Date/Time**	08/22/2000 10:08
Project Name/#	Red Devil Mine 47411	**Collected Date/Time**	07/27/2000 16:15
Client Sample ID	00RDV20SL	**Received Date/Time**	08/01/2000 14:00
Matrix	Soil/Solid	**Technical Director**	**Stephen C. Ede**
Ordered By		**Released By**	J Windebank

Sample Remarks:

DRO/RRO - Pattern consistent with weathered middle distillate.
DRO/RRO - Surrogate recoveries outside controls due to matrix interference.
GRO/BTEX - Surrogate recovery is biased high due to matrix interference. Results not affected.

Parameter	Results		PQL	Units	Method	Allowable Limits	Prep Date	Analysis Date	Init
Solids									
Total Solids	87.6			%	SM20 2540G			08/02/00	AKL
Volatile Fuels Department									
Gasoline Range Organics	79.7		6.54	mg/Kg	AK101/8021B		07/27/00	08/08/00	MAH
Benzene	0.0327 U		0.0327	mg/Kg	AK101/8021B		07/27/00	08/08/00	MAH
Toluene	0.131 U		0.131	mg/Kg	AK101/8021B		07/27/00	08/08/00	MAH
Ethylbenzene	0.197		0.131	mg/Kg	AK101/8021B		07/27/00	08/08/00	MAH
P & M -Xylene	1.06		0.131	mg/Kg	AK101/8021B		07/27/00	08/08/00	MAH
o-Xylene	0.226		0.131	mg/Kg	AK101/8021B		07/27/00	08/08/00	MAH
Surrogates									
1,4-Difluorobenzene <Surr>	88.5			%	AK101/8021B	60-120	07/27/00	08/08/00	MAH
4-Bromofluorobenzene <Surr>	536	!		%	AK101/8021B	50-150	07/27/00	08/08/00	MAH
Semivolatile Organic Fuels Department									
Diesel Range Organics	22900		211	mg/Kg	AK102/103		08/04/00	08/08/00	MCM
Residual Range Organics GC	348 U		348	mg/Kg	AK102/103		08/04/00	08/08/00	MCM
Surrogates									
5a Androstane <surr>	241	!		%	AK102/103	60-120	08/04/00	08/08/00	MCM
d-Triacontane <Surr>	160	!		%	AK102/103	60-120	08/04/00	08/08/00	MCM

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CT&E Environmental Services Inc.

CT&E Ref.#	1004238021	**Client PO#**	Auth 48 Job #39551
Client Name	Harding Lawson & Assoc	**Printed Date/Time**	08/22/2000 10:08
Project Name/#	Red Devil Mine 47411	**Collected Date/Time**	07/27/2000 16:25
Client Sample ID	00RDV21SL	**Received Date/Time**	08/01/2000 14:00
Matrix	Soil/Solid	**Technical Director**	**Stephen C. Ede**
Ordered By		**Released By**	J Windebank

Sample Remarks:

DRO/RRO - Pattern consistent with weathered middle distillate.

Parameter	Results	PQL	Units	Method	Allowable Limits	Prep Date	Analysis Date	Init
Solids								
Total Solids	90.6		%	SM20 2540G			08/02/00	AK
Volatile Fuels Department								
Gasoline Range Organics	14.4	3.43	mg/Kg	AK101/8021B		07/27/00	08/07/00	MAH
Benzene	0.0172 U	0.0172	mg/Kg	AK101/8021B		07/27/00	08/07/00	MAH
Toluene	0.0686 U	0.0686	mg/Kg	AK101/8021B		07/27/00	08/07/00	MAH
Ethylbenzene	0.0686 U	0.0686	mg/Kg	AK101/8021B		07/27/00	08/07/00	MAH
P & M -Xylene	0.0759	0.0686	mg/Kg	AK101/8021B		07/27/00	08/07/00	MAH
o-Xylene	0.337	0.0686	mg/Kg	AK101/8021B		07/27/00	08/07/00	MAH
Surrogates								
1,4-Difluorobenzene <Surr>	86.8		%	AK101/8021B	60-120	07/27/00	08/07/00	MAH
4-Bromofluorobenzene <Surr>	128		%	AK101/8021B	50-150	07/27/00	08/07/00	MAH
Semivolatile Organic Fuels Department								
Diesel Range Organics	1400	19.4	mg/Kg	AK102/103		08/04/00	08/07/00	MCM
Residual Range Organics GC	32.0 U	32.0	mg/Kg	AK102/103		08/04/00	08/07/00	MCM
Surrogates								
5a Androstane <surr>	106		%	AK102/103	60-120	08/04/00	08/07/00	MCM
d-Triacontane <Surr>	113		%	AK102/103	60-120	08/04/00	08/07/00	MCM

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CT&E Environmental Services Inc.

CT&E Ref.#	1004238022	**Client PO#**	Auth 48 Job #39551
Client Name	Harding Lawson & Assoc	**Printed Date/Time**	08/22/2000 10:08
Project Name/#	Red Devil Mine 47411	**Collected Date/Time**	07/27/2000 16:35
Client Sample ID	00RDV22SL	**Received Date/Time**	08/01/2000 14:00
Matrix	Soil/Solid	**Technical Director**	**Stephen C. Ede**
Ordered By		**Released By**	J Windebank

Sample Remarks:

DRO - Pattern consistent with weathered middle distillate.

Parameter	Results	PQL	Units	Method	Allowable Limits	Prep Date	Analysis Date	Init
Solids								
Total Solids	91.9		%	SM20 2540G			08/02/00	AKL
Volatile Fuels Department								
Gasoline Range Organics	12.9	3.09	mg/Kg	AK101/8021B		07/27/00	08/07/00	MAH
Benzene	0.0154 U	0.0154	mg/Kg	AK101/8021B		07/27/00	08/07/00	MAH
Toluene	0.0618 U	0.0618	mg/Kg	AK101/8021B		07/27/00	08/07/00	MAH
Ethylbenzene	0.0623	0.0618	mg/Kg	AK101/8021B		07/27/00	08/07/00	MAH
P & M -Xylene	0.0729	0.0618	mg/Kg	AK101/8021B		07/27/00	08/07/00	MAH
o-Xylene	0.286	0.0618	mg/Kg	AK101/8021B		07/27/00	08/07/00	MAH
Surrogates								
1,4-Difluorobenzene <Surr>	84.5		%	AK101/8021B	60-120	07/27/00	08/07/00	MAH
4-Bromofluorobenzene <Surr>	124		%	AK101/8021B	50-150	07/27/00	08/07/00	MAH
Semivolatile Organic Fuels Department								
Diesel Range Organics	636	20.1	mg/Kg	AK102/103		08/02/00	08/03/00	MCM
Residual Range Organics GC	33.2 U	33.2	mg/Kg	AK102/103		08/02/00	08/03/00	MCM
Surrogates								
5a Androstane <surr>	94.9		%	AK102/103	60-120	08/02/00	08/03/00	MCM
d-Triacontane <Surr>	91.8		%	AK102/103	60-120	08/02/00	08/03/00	MCM

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CT&E Environmental Services Inc.

CT&E Ref.#	1004238023	**Client PO#**	Auth 48 Job #39551
Client Name	Harding Lawson & Assoc	**Printed Date/Time**	08/22/2000 10:08
Project Name/#	Red Devil Mine 47411	**Collected Date/Time**	07/28/2000 8:00
Client Sample ID	00RDV23SL	**Received Date/Time**	08/01/2000 14:00
Matrix	Soil/Solid	**Technical Director**	**Stephen C. Ede**
Ordered By		**Released By**	J Wundebank

Sample Remarks:

DRO - Unknown hydrocarbon with several peaks.

Parameter	Results	PQL	Units	Method	Allowable Limits	Prep Date	Analysis Date	Init
Solids								
Total Solids	88.7		%	SM20 2540G			08/02/00	AK
Volatile Fuels Department								
Gasoline Range Organics	4.36 U	4.36	mg/Kg	AK101/8021B		07/28/00	08/07/00	MA
Benzene	0.0218 U	0.0218	mg/Kg	AK101/8021B		07/28/00	08/07/00	MAH
Toluene	0.0873 U	0.0873	mg/Kg	AK101/8021B		07/28/00	08/07/00	MA
Ethylbenzene	0.0873 U	0.0873	mg/Kg	AK101/8021B		07/28/00	08/07/00	MA
P & M -Xylene	0.0873 U	0.0873	mg/Kg	AK101/8021B		07/28/00	08/07/00	MAH
o-Xylene	0.0873 U	0.0873	mg/Kg	AK101/8021B		07/28/00	08/07/00	MA
Surrogates								
1,4-Difluorobenzene <Surr>	87.3		%	AK101/8021B	60-120	07/28/00	08/07/00	MA
4-Bromofluorobenzene <Surr>	71.6		%	AK101/8021B	50-150	07/28/00	08/07/00	MA
Semivolatile Organic Fuels Department								
Diesel Range Organics	10.9 U	10.9	mg/Kg	AK102/103		08/02/00	08/03/00	MCM
Residual Range Organics GC	17.9 U	17.9	mg/Kg	AK102/103		08/02/00	08/03/00	MC
Surrogates								
5a Androstane <surr>	60.9		%	AK102/103	60-120	08/02/00	08/03/00	MC
d-Triacontane <Surr>	67.4		%	AK102/103	60-120	08/02/00	08/03/00	MCM

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CT&E Environmental Services Inc.

CT&E Ref.#	1004238024	**Client PO#**	Auth 48 Job #39551
Client Name	Harding Lawson & Assoc	**Printed Date/Time**	08/22/2000 10:08
Project Name/#	Red Devil Mine 47411	**Collected Date/Time**	07/28/2000 0:00
Client Sample ID	OORDV01SL Trip Blank	**Received Date/Time**	08/01/2000 14:00
Matrix	Soil/Solid	**Technical Director**	**Stephen C. Ede**
Ordered By		**Released By**	J W Windebank

Sample Remarks:

Parameter	Results	PQL	Units	Method	Allowable Limits	Prep Date	Analysis Date	Init
Solids								
Total Solids	100		%	SM20 2540G			08/02/00	AKL
Volatile Fuels Department								
Gasoline Range Organics	2.59 U	2.59	mg/Kg	AK101/8021B		07/28/00	08/07/00	MAH
Benzene	0.0129 U	0.0129	mg/Kg	AK101/8021B		07/28/00	08/07/00	MAH
Toluene	0.0517 U	0.0517	mg/Kg	AK101/8021B		07/28/00	08/07/00	MAH
Ethylbenzene	0.0517 U	0.0517	mg/Kg	AK101/8021B		07/28/00	08/07/00	MAH
P & M -Xylene	0.0517 U	0.0517	mg/Kg	AK101/8021B		07/28/00	08/07/00	MAH
o-Xylene	0.0517 U	0.0517	mg/Kg	AK101/8021B		07/28/00	08/07/00	MAH
Surrogates								
1,4-Difluorobenzene <Surr>	87.4		%	AK101/8021B	60-120	07/28/00	08/07/00	MAH
4-Bromofluorobenzene <Surr>	80.5		%	AK101/8021B	50-150	07/28/00	08/07/00	MAH

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CT&E Environmental Services Inc.

CT&E Ref.#	320190	Method Blank	**Printed Date/Time**	08/22/2000 10:09
Client Name	Harding Lawson & Assoc		**Prep**	**Batch**
Project Name/#	Red Devil Mine 47411			**Method**
Matrix	Soil/Solid			**Date**

QC results affect the following production samples:

1004238002, 1004238003, 1004238004, 1004238005, 1004238006, 1004238007, 1004238008, 1004238009, 1004238010, 1004238011, 1004238012, 1004238013, 1004238014, 1004238015, 1004238016, 1004238017, 1004238018, 1004238019, 1004238020, 1004238021

Parameter	Results	PQL	Units	Analysis Date	Init
Solids					
Total Solids		100	%	08/02/00	AK

Batch SPT 3419
Method SM20 2540G
Instrument

CT&E Environmental Services Inc.

CT&E Ref.#	320191	Duplicate	**Printed Date/Time**	08/22/2000 10:10
Client Name	Harding Lawson & Assoc		**Prep**	**Batch**
Project Name/#	Red Devil Mine 47411			**Method**
Original	1004238002			**Date**
Matrix	Soil/Solid			

QC results affect the following production samples:

1004238002, 1004238003, 1004238004, 1004238005, 1004238006, 1004238007, 1004238008, 1004238009, 1004238010, 1004238011, 1004238012, 1004238013, 1004238014, 1004238015, 1004238016, 1004238017, 1004238018, 1004238019, 1004238020, 1004238021

Parameter	Original Result	QC Result	RPD	RPD Limits	Analysis Date	Init
Solids						
Total Solids	85.2	86.7	1.80		08/02/00	AKL

Batch SPT 3419
Method SM20 2540G
Instrument

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CT&E Environmental Services Inc.

CT&E Ref.#	320192	Method Blank	**Printed Date/Time**	08/22/2000 10:09
Client Name	Harding Lawson & Assoc		**Prep** **Batch**	
Project Name/#	Red Devil Mine 47411		**Method**	
Matrix	Soil/Solid		**Date**	

QC results affect the following production samples:

1004238022, 1004238023, 1004238024

Parameter	Results	PQL	Units	Analysis Date	Init
Solids					
Total Solids		100	%	08/02/00	AKL

Batch SPT 3420
Method SM20 2540G
Instrument

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CT&E Environmental Services Inc.

CT&E Ref.#	320193	Duplicate	**Printed Date/Time**	08/22/2000 10:10
Client Name	Harding Lawson & Assoc		**Prep**	**Batch**
Project Name/#	Red Devil Mine 47411			**Method**
Original	1004238022			**Date**
Matrix	Soil/Solid			

QC results affect the following production samples:
1004238022, 1004238023, 1004238024

Parameter	Original Result	QC Result	RPD	RPD Limits	Analysis Date	Init
Solids						
Total Solids	91.9	92.1	0.18		08/02/00	AKL
Batch SPT 3420						
Method SM20 2540G						
Instrument						

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CT&E Environmental Services Inc.

CT&E Ref.#	321597	Method Blank	**Printed Date/Time**	08/22/2000 10:09	
Client Name	Harding Lawson & Assoc		**Prep Batch**	VXX	6700
Project Name/#	Red Devil Mine 47411		**Method**		
Matrix	Soil/Solid		**Date**		

QC results affect the following production samples:

1004238002, 1004238003, 1004238004, 1004238005, 1004238006, 1004238007, 1004238008, 1004238009, 1004238010, 1004238011, 1004238012, 1004238013, 1004238014, 1004238015, 1004238016, 1004238017, 1004238018, 1004238019, 1004238020

Parameter	Results	PQL	Units	Analysis Date	Init
Volatile Fuels Department					
Gasoline Range Organics	0.191 J	2.50	mg/Kg	08/07/00	MAH
Benzene	0.0125 U	0.0125	mg/Kg	08/07/00	MAH
Toluene	0.0500 U	0.0500	mg/Kg	08/07/00	MAH
Ethylbenzene	0.0500 U	0.0500	mg/Kg	08/07/00	MAH
P & M -Xylene	0.0500 U	0.0500	mg/Kg	08/07/00	MAH
o-Xylene	0.0500 U	0.0500	mg/Kg	08/07/00	MAH

Batch VFC 4263
Method AK101/8021B
Instrument HP 5890 Series II PID+FID VDA

CT&E Environmental Services Inc.

CT&E Ref.#	321598 Lab Control Sample 321599 Lab Control Sample Duplicate	**Printed Date/Time**	08/22/2000 10:10
		Prep Batch	VXX 6700
Client Name	Harding Lawson & Assoc	**Method**	
Project Name/#	Red Devil Mine 47411	**Date**	
Matrix	Soil/Solid		

QC results affect the following production samples:

1004238002, 1004238003, 1004238004, 1004238005, 1004238006, 1004238007, 1004238008, 1004238009, 1004238010, 1004238011, 1004238012, 1004238013, 1004238014, 1004238015, 1004238016, 1004238017, 1004238018, 1004238019, 1004238020

Parameter		QC Results	Pct Recov	LCS/LCSD Limits	RPD	RPD Limits	Spiked Amount	Analysis Date	Init
Volatile Fuels Department									
Gasoline Range Organics	LCS	19.8	88	(60-120)			22.5 mg/Kg	08/07/00	MAH
	LCSD	19.4	86		2	(< 20)	22.5 mg/Kg	08/07/00	MAH
Benzene	LCS	0.738	95	(80-120)			0.78 mg/Kg	08/07/00	MAH
	LCSD	0.716	92		3	(< 25)	0.78 mg/Kg	08/07/00	MAH
Toluene	LCS	2.81	87	(80-120)			3.24 mg/Kg	08/07/00	MAH
	LCSD	2.73	84		3	(< 25)	3.24 mg/Kg	08/07/00	MAH
Ethylbenzene	LCS	0.474	94	(80-120)			0.504 mg/Kg	08/07/00	MAH
	LCSD	0.464	92		2	(< 25)	0.504 mg/Kg	08/07/00	MAH
P & M -Xylene	LCS	1.75	95	(80-120)			1.84 mg/Kg	08/07/00	MAH
	LCSD	1.72	93		2	(< 25)	1.84 mg/Kg	08/07/00	MAH
o-Xylene	LCS	0.661	101	(80-120)			0.652 mg/Kg	08/07/00	MAH
	LCSD	0.650	100		1	(< 25)	0.652 mg/Kg	08/07/00	MAH

Batch VFC 4263
Method AK101/8021B
Instrument HP 5890 Series II PID+FID VDA

CT&E Environmental Services Inc.

CT&E Ref.#	321964	Method Blank	**Printed Date/Time**	08/22/2000 10:09	
Client Name	Harding Lawson & Assoc		**Prep Batch**	VXX	6706
Project Name/#	Red Devil Mine 47411		**Method**		
Matrix	Soil/Solid		**Date**		

QC results affect the following production samples:

1004238021, 1004238022, 1004238023, 1004238024

Parameter	Results	PQL	Units	Analysis Date	Init
Volatile Fuels Department					
Gasoline Range Organics	0.338 J	2.50	mg/Kg	08/07/00	MAH
Benzene	0.0125 U	0.0125	mg/Kg	08/07/00	MAH
Toluene	0.0500 U	0.0500	mg/Kg	08/07/00	MAH
Ethylbenzene	0.0500 U	0.0500	mg/Kg	08/07/00	MAH
P & M -Xylene	0.0500 U	0.0500	mg/Kg	08/07/00	MAH
o-Xylene	0.0500 U	0.0500	mg/Kg	08/07/00	MAH

Batch VFC 4268
Method AK101/8021B
Instrument HP 5890 Series II PID+FID VCA

F-701

CT&E Environmental Services Inc.

CT&E Ref.#	321965 Lab Control Sample 321966 Lab Control Sample Duplicate	**Printed Date/Time**	08/22/2000 10:10
		Prep Batch	VXX 6706
Client Name	Harding Lawson & Assoc	**Method**	
Project Name/#	Red Devil Mine 47411	**Date**	
Matrix	Soil/Solid		

QC results affect the following production samples:
1004238021, 1004238022, 1004238023, 1004238024

Parameter		QC Results	Pct Recov	LCS/LCSD Limits	RPD	RPD Limits	Spiked Amount	Analysis Date	Init
Volatile Fuels Department									
Gasoline Range Organics	LCS	18.1	80	(60-120)			22.5 mg/Kg	08/06/00	MAH
	LCSD	18.3	81		1	(< 20)	22.5 mg/Kg	08/08/00	MAH
Benzene	LCS	0.704	90	(80-120)			0.78 mg/Kg	08/06/00	MAH
	LCSD	0.739	95		5	(< 25)	0.78 mg/Kg	08/08/00	MAH
Toluene	LCS	2.91	90	(80-120)			3.24 mg/Kg	08/06/00	MAH
	LCSD	3.02	93		4	(< 25)	3.24 mg/Kg	08/08/00	MAH
Ethylbenzene	LCS	0.497	99	(80-120)			0.504 mg/Kg	08/06/00	MAH
	LCSD	0.517	103		5	(< 25)	0.504 mg/Kg	08/08/00	MAH
P & M -Xylene	LCS	1.78	97	(80-120)			1.84 mg/Kg	08/06/00	MAH
	LCSD	1.84	100		3	(< 25)	1.84 mg/Kg	08/08/00	MAH
o-Xylene	LCS	0.646	99	(80-120)			0.652 mg/Kg	08/06/00	MAH
	LCSD	0.664	102		3	(< 25)	0.652 mg/Kg	08/08/00	MAH

Batch VFC 4268
Method AK101/8021B
Instrument HP 5890 Series II PID+FID VCA

CT&E Environmental Services Inc.

CT&E Ref.#	320391	Method Blank	**Printed Date/Time**	08/22/2000 10:09	
Client Name	Harding Lawson & Assoc		**Prep Batch**	XXX	7284
Project Name/#	Red Devil Mine 47411		**Method**		
Matrix	Soil/Solid		**Date**	08/02/2000	

QC results affect the following production samples:

1004238022, 1004238023

Parameter	Results	PQL	Units	Analysis Date	Init
Semivolatile Organic Fuels Department					
Diesel Range Organics	4.91 J	9.98	mg/Kg	08/03/00	MCM
Residual Range Organics GC	16.5 U	16.5	mg/Kg	08/03/00	MCM

Batch XFC 4755
Method AK102/103
Instrument HP 5890 Series II FID SV C F

F-701

CT&E Environmental Services Inc.

CT&E Ref.#	320392 Lab Control Sample	**Printed Date/Time**	08/22/2000 10:10	
	320393 Lab Control Sample Duplicate	**Prep Batch**	XXX 7284	
Client Name	Harding Lawson & Assoc	**Method**		
Project Name/#	Red Devil Mine 47411	**Date**	08/02/2000	
Matrix	Soil/Solid			

QC results affect the following production samples:

1004238022, 1004238023

Parameter		QC Results	Pct Recov	LCS/LCSD Limits	RPD	RPD Limits	Spiked Amount	Analysis Date	Init
Semivolatile Organic Fuels Department									
Diesel Range Organics	LCS	291	87	(75-125)			336 mg/Kg	08/03/00	MCM
	LCSD	290	88		2	(< 20)	329 mg/Kg	08/03/00	MCM
Residual Range Organics GC	LCS	241	72	(60-120)			336 mg/Kg	08/03/00	MCM
	LCSD	242	74		2	(< 20)	329 mg/Kg	08/03/00	MCM

Batch XFC 4755
Method AK102/103
Instrument HP 5890 Series II FID SV C F

F-701

CT&E Environmental Services Inc.

CT&E Ref.#	320658 Method Blank	**Printed Date/Time**	08/22/2000 10:09	
Client Name	Harding Lawson & Assoc	**Prep Batch**	XXX	7291
Project Name/#	Red Devil Mine 47411	**Method**		
Matrix	Soil/Solid	**Date**	08/03/2000	

QC results affect the following production samples:

1004238005, 1004238009, 1004238011

Parameter	Results	PQL	Units	Analysis Date	Init
Semivolatile Organic GC/MS					
Naphthalene	1.15 J	2.24	ug/Kg	08/08/00	KWM
Acenaphthylene	2.24 U	2.24	ug/Kg	08/08/00	KWM
Acenaphthene	2.24 U	2.24	ug/Kg	08/08/00	KWM
Fluorene	2.24 U	2.24	ug/Kg	08/08/00	KWM
Phenanthrene	2.24 U	2.24	ug/Kg	08/08/00	KWM
Anthracene	2.24 U	2.24	ug/Kg	08/08/00	KWM
Fluoranthene	2.24 U	2.24	ug/Kg	08/08/00	KWM
Pyrene	2.24 U	2.24	ug/Kg	08/08/00	KWM
Benzo(a)Anthracene	2.24 U	2.24	ug/Kg	08/08/00	KWM
Chrysene	2.24 U	2.24	ug/Kg	08/08/00	KWM
Benzo[b]Fluoranthene	2.24 U	2.24	ug/Kg	08/08/00	KWM
Benzo[k]fluoranthene	2.24 U	2.24	ug/Kg	08/08/00	KWM
Benzo[a]pyrene	2.24 U	2.24	ug/Kg	08/08/00	KWM
Indeno[1,2,3-c,d] pyrene	2.24 U	2.24	ug/Kg	08/08/00	KWM
Dibenzo[a,h]anthracene	2.24 U	2.24	ug/Kg	08/08/00	KWM
Benzo[g,h,i]perylene	2.24 U	2.24	ug/Kg	08/08/00	KWM

Batch XMS 1856
Method PAH SIM
Instrument HP 5890 Series II MS2 SVOA

F-701

CT&E Environmental Services Inc.

CT&E Ref.#	320659 Lab Control Sample	**Printed Date/Time**	08/22/2000 10:10
	320660 Lab Control Sample Duplicate	**Prep Batch**	XXX 7291
Client Name	Harding Lawson & Assoc	**Method**	
Project Name/#	Red Devil Mine 47411	**Date**	08/03/2000
Matrix	Soil/Solid		

QC results affect the following production samples:
1004238005, 1004238009, 1004238011

Parameter		QC Results	Pct Recov	LCS/LCSD Limits	RPD	RPD Limits	Spiked Amount	Analysis Date	Init
Semivolatile Organic GC/MS									
Naphthalene	LCS	22.4	99	(78-152)			22.6 ug/Kg	08/07/00	KWM
	LCSD	22.7	101		2	(< 30)	22.6 ug/Kg	08/08/00	KW
Acenaphthylene	LCS	19.1	85	(64-145)			22.6 ug/Kg	08/07/00	KWM
	LCSD	20.4	90		7	(< 30)	22.6 ug/Kg	08/08/00	KW
Acenaphthene	LCS	22.5	99	(74-139)			22.6 ug/Kg	08/07/00	KWM
	LCSD	23.4	104		5	(< 30)	22.6 ug/Kg	08/08/00	KW
Fluorene	LCS	24.0	106	(76-137)			22.6 ug/Kg	08/07/00	KWM
	LCSD	24.1	107		1	(< 30)	22.6 ug/Kg	08/08/00	KW
Phenanthrene	LCS	11.6	51	(30-155)			22.6 ug/Kg	08/07/00	KWM
	LCSD	17.8	79 *		43	(< 30)	22.6 ug/Kg	08/08/00	KW
Anthracene	LCS	15.6	69	(26-126)			22.6 ug/Kg	08/07/00	KWM
	LCSD	19.0	84		20	(< 30)	22.6 ug/Kg	08/08/00	KW
Fluoranthene	LCS	17.3	77	(45-146)			22.6 ug/Kg	08/07/00	KWM
	LCSD	21.2	94		20	(< 30)	22.6 ug/Kg	08/08/00	KW
Pyrene	LCS	18.9	84	(48-144)			22.6 ug/Kg	08/07/00	KWM
	LCSD	22.0	98		15	(< 30)	22.6 ug/Kg	08/08/00	KW
Benzo(a)Anthracene	LCS	21.9	97	(69-143)			22.6 ug/Kg	08/07/00	KWM
	LCSD	21.1	94		4	(< 30)	22.6 ug/Kg	08/08/00	KW
Chrysene	LCS	26.3	117	(64-145)			22.6 ug/Kg	08/07/00	KWM
	LCSD	26.3	117		0	(< 30)	22.6 ug/Kg	08/08/00	KW
Benzo[b]Fluoranthene	LCS	23.7	105	(67-155)			22.6 ug/Kg	08/07/00	KWM
	LCSD	23.1	102		3	(< 30)	22.6 ug/Kg	08/08/00	KW
Benzo[k]fluoranthene	LCS	24.2	107	(60-150)			22.6 ug/Kg	08/07/00	KWM
	LCSD	24.2	107		0	(< 30)	22.6 ug/Kg	08/08/00	KW
Benzo[a]pyrene	LCS	16.0	71	(43-113)			22.6 ug/Kg	08/07/00	KWM
	LCSD	14.4	64		10	(< 30)	22.6 ug/Kg	08/08/00	KW
Indeno[1,2,3-c,d] pyrene	LCS	21.6	96	(80-144)			22.6 ug/Kg	08/07/00	KWM
	LCSD	20.9	93		3	(< 30)	22.6 ug/Kg	08/08/00	KW
Dibenzo[a,h]anthracene	LCS	19.7	87	(60-146)			22.6 ug/Kg	08/07/00	KWM
	LCSD	18.9	84		4	(< 30)	22.6 ug/Kg	08/08/00	KW
Benzo[g,h,i]perylene	LCS	21.8	96	(83-142)			22.6 ug/Kg	08/07/00	KWM
	LCSD	21.5	95		1	(< 30)	22.6 ug/Kg	08/08/00	KW

Batch XMS 1856
Method PAH SIM
Instrument HP 5890 Series II MS2 SVOA

F-701

CT&E Environmental Services Inc.

CT&E Ref.#	320847 Method Blank		**Printed Date/Time**	08/22/2000 10:09	
Client Name	Harding Lawson & Assoc		**Prep Batch**	XXX	7300
Project Name/#	Red Devil Mine 47411		**Method**		
Matrix	Soil/Solid		**Date**	08/04/2000	

QC results affect the following production samples:

1004238002, 1004238003, 1004238004, 1004238005, 1004238006, 1004238007, 1004238008, 1004238009, 1004238010, 1004238011, 1004238012, 1004238013, 1004238014, 1004238015, 1004238016, 1004238017, 1004238018, 1004238019, 1004238020, 1004238021

Parameter	Results	PQL	Units	Analysis Date	Init
Semivolatile Organic Fuels Department					
Diesel Range Organics	1.56 J	9.97	mg/Kg	08/07/00	MCM
Residual Range Organics GC	6.42 J	16.4	mg/Kg	08/07/00	MCM

Batch XFC 4764
Method AK102/103
Instrument HP 5890 Series II FID SV C F

CT&E Environmental Services Inc.

CT&E Ref.#	320848 Lab Control Sample	**Printed Date/Time**	08/22/2000 10:10	
	320849 Lab Control Sample Duplicate	**Prep**	**Batch**	XXX 7300
Client Name	Harding Lawson & Assoc		**Method**	
Project Name/#	Red Devil Mine 47411		**Date**	08/04/2000
Matrix	Soil/Solid			

QC results affect the following production samples:

1004238002, 1004238003, 1004238004, 1004238005, 1004238006, 1004238007, 1004238008, 1004238009, 1004238010, 1004238011, 1004238012, 1004238013, 1004238014, 1004238015, 1004238016, 1004238017, 1004238018, 1004238019, 1004238020, 1004238021

Parameter		QC Results	Pct Recov	LCS/LCSD Limits	RPD	RPD Limits	Spiked Amount	Analysis Date	Init
Semivolatile Organic Fuels Department									
Diesel Range Organics	LCS	324	97	(75-125)			333 mg/Kg	08/07/00	MCM
	LCSD	332	98		1	(< 20)	338 mg/Kg	08/07/00	MCM
Residual Range Organics GC	LCS	292	88	(60-120)			333 mg/Kg	08/07/00	MCM
	LCSD	277	82		7	(< 20)	338 mg/Kg	08/07/00	MCM

Batch XFC 4764
Method AK102/103
Instrument HP 5890 Series II FID SV C F

DATA QUALITY ASSESSMENT

Laboratory: CTE Environmental Services
Batch No.: 1004299
Sampled: 00RDV09MI, 00RDV10MI

	Yes	No	Not Required/Applicable
1. Were samples analyzed for requested parameters?	X		
2. Is the USACE Data Deliverables package complete?			X
3. Were samples extracted within holding time acceptance criteria?	X		
4. Were samples analyzed within holding time acceptance criteria?	X		
5. For soils, were sample results reported on a "dry weight" basis?			X
6. Were method blanks analytes all reported as ND?		X	
7. For water, were trip blank analytes all reported as ND?	X		
8. Are the surrogate percent recoveries within acceptance criteria?	X		
9. Are the matrix spike percent recoveries within acceptance criteria?		X	
10. Are the matrix spike relative percent differences within acceptance criteria?	X		
11. Are the field duplicate relative percent differences less than 50 percent?	X		

Comments:

6) Strontium was detected at 0.102 µg/L, cobalt was detected at 0.533 µg/L, calcium was estimated at 35.9 µg/L (below PQL), selenium estimated at 0.437 µg/L (below PQL), zinc estimated at 2.01 µg/L (below PQL), magnesium estimated at 3.74 µg/L (below PQL), molybdenum estimated at 0.516 µg/L (below PQL) (CTE ref. # 321120). Results are not significantly affected.

9) RPD for silver was 43%, results were not affected.

Date: 3-30-01
Reviewer: JEW.

RECEIVED
AUG 1 6 2000
HARDING LAWSON
ASSOCIATES

CTE Environmental Services
Alaska Division
Laboratory Data Report

Project: 51192 Red Devil
Client: Harding Lawson & Assoc
CTE Work Order: 1004299

Contents:

Chain of Custody
Quality Control Summary Forms

Note:

Unless otherwise noted, all quality assurance/quality control criteria is in compliance with the proper regulatory authority and/or CTE's Quality Assurance Program Plan.

Case Narrative

Customer: HARLAWP **Harding Lawson & Assoc**

Project: 1004299 **51192 Red Devil**

There were no analytical anomalies associated with your data.

1004299

Harding Lawson Associates
601 East 57th Place
Anchorage, AK 99518
907 / 563-8102
907 / 561-4574 FAX

CHAIN OF CUSTODY FORM

Lab: CT

Samplers: BD LUND

Project Number: 51192

Name/Location: RED DEVIL

Project Manager: BRYAN LUND

Recorder: BDL (Signature Required)

SOURCE CODE	MATRIX: Water	Sediment	Soil	Oil	#CONTAINERS & PRESERV.: Unpres.	H_2SO_4	HNO_3	HCL	SAMPLE NUMBER OR LAB NUMBER: Yr	Wk	Seq	DATE: Yr	Mo	Dy	Time	STATION DESCRIPTION/ NOTES	EPA 601/8010	EPA 602/8020	EPA 624/8240	EPA 625/8270	ICP METALS	EPA 8015M/TPH	Metals - As, Pb, Hg Sb (soil/water)	BTEX/TPH (602/8015)	BTEX
	X						1	3				000802	09	00		00RDV09MI							X	X	X
	X							2				000802	09	05		00 RDV 10 MI									X

RUSH

LAB NUMBER: Yr	Wk	Seq	DEPTH IN FEET	COL MTD CD	QA CODE	MISCELLANEOUS
						24 HR
						TAT
						FAX RESULTS

CHAIN OF CUSTODY RECORD

RELINQUISHED BY: (Signature) BDL	RECEIVED BY: (Signature)	DATE/TIME
RELINQUISHED BY: (Signature)	RECEIVED BY: (Signature)	DATE/TIME
RELINQUISHED BY: (Signature)	RECEIVED BY: (Signature)	DATE/TIME
RELINQUISHED BY: (Signature)	RECEIVED BY: (Signature)	DATE/TIME
DISPATCHED BY: (Signature) DATE/TIME	RECEIVED FOR LAB BY: (Signature) [illegible]	DATE/TIME 8/3/00 10:30

METHOD OF SHIPMENT: HAND DELIVER - HLA PERSONNEL

6533

Laboratory Copy — Project Office Copy Yellow — Field or Office Copy Pink

1004299

01

1004299

CT&E Environmental Services Inc.

SAMPLE RECEIPT FORM

CT&E WO#:

Yes	No	
✓		Are samples **RUSH**, priority, or *within 72 hrs* of **hold time**?
✓		If yes, have you done *e-mail notification*?
	✓	Are samples *within 24 hrs* of **hold time** or **due date**?
		If yes, have you *spoken with* Supervisor?
	✓	Are there any **problems** (e.g., ids, analyses)?
✓		Were samples preserved correctly and pH verified?
	✓	Has Project Manager been notified of problems?
		Is this an ACOE/AFCEE/ADEC project?
	✓	Will a **data package** be required?
		If this is for PWS, provide **PWSID**.
		Is there a **quote** for this project?
	✓	Will **courier** charges apply?

Due Date: 8/8/00

Received Date/Time: 8/3 - 10:30

Cooler Temperature: 4.2°C

Sample Condition: Good / Poor

Matrix of each Sample:

1	" "
	" "
	" "
	" "
1	Trip Blank
	MS/MSD

1	
2	

Additional Sample Remarks:

	AK101s/_____ 8260s field pres'd?
	Field-filtered for dissolved_____?
	Lab-filter for dissolved_____?
	Ref Lab required?

Completed by (sign): [signature] (print): [signature]

Notes:

*** The following *must* be completed for *all* ACOE & AFCEE projects: ***

Yes	No		Notes:
		Is cooler temperature 4 ± C?	
		thermometer used:	
		Was there an airbill, etc? note #:	
		Was cooler sealed with custody seals?	
		#/where?	
		Were seals intact upon arrival?	
		Was there a COC with cooler?	
		Was the COC filled out properly?	
		Did the COC indicate ACOE/AFCEE project?	
		Did the COC and samples correspond?	
		Were samples screened with Geiger counter?	
		Were all samples packed to prevent breakage?	
		packing material:	
		Were all samples unbroken and clearly labelled?	
		Were all samples sealed in separate plastic bags?	
		Were all bottles for volatiles free of headspace?	
		Were correct container/sample sizes submitted?	
		Was client notified of problems? (specify below)	

RUSH

# of each Container Received:

	950 ml amber	unpres'd
	950 ml amber	w/ HCl
	500 ml amber	w/ H2SO4
	1L cubies	unpres'd
1	1L cubies	w/ HNO3
	1L cubies	w/ H2SO4
	1L cubies	w/ NaOH + ZnAc
	120 ml coli	bottles
	60 ml	Nalg
	8 oz amber	unpres'd
	4 oz amber	unpres'd
	4 oz w/ septa	w/ MeOH
5	40 ml vials	w/ HCl
	Other (specify)	
	Other (specify)	

Individual contacted:

Date & Time:

Phone/Fax #:

#/Log In Proofed by:

Form Number: F004r2
Printed: 7/12/99

CT&E Environmental Services Inc.

200 W. Potter Drive
Anchorage, AK 99518-1605
Tel: (907) 562-2343
Fax: (907) 561-5301
Web: http://www.cteesi.com

Brian Lund
Harding Lawson & Assoc
601 East 57th Place
Anchorage, AK 99518

Work Order:	1004299
	51192 Red Devil
Client:	Harding Lawson & Assoc
Report Date:	August 08, 2000

Enclosed are the analytical results associated with the above workorder.

As required by the state of Alaska and the USEPA, a formal Quality Assurance/Quality Control Program is maintaned 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 analyte 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
!	Surrogate out of range

CT&E Environmental Services Inc.

CT&E Ref.#	1004299001	Client PO#	Auth 48 Job #39551
Client Name	Harding Lawson & Assoc	Printed Date/Time	08/08/2000 14:17
Project Name/#	51192 Red Devil	Collected Date/Time	08/02/2000 9:00
Client Sample ID	00RDV09MI	Received Date/Time	08/03/2000 10:30
Matrix	Water (Surface, Eff., Ground)	Technical Director	Stephen C. Ede
Ordered By		Released By	J Wunderbink

Sample Remarks:

Parameter	Results	PQL	Units	Method	Allowable Limits	Prep Date	Analysis Date	Init
Metals Department								
Mercury by Cold Vapor	0.0298	0.00200	mg/L	SW7470/E245.1		08/07/00	08/08/00	JDT
Metals by ICP/MS								
Antimony	14500	227	ug/L	SW846 6020		08/04/00	08/08/00	KGF
Arsenic	25800	114	ug/L	SW846 6020		08/04/00	08/08/00	KGF
Lead	68.2 U	68.2	ug/L	SW846 6020		08/04/00	08/08/00	KGF
Volatile Fuels Department								
Benzene	0.000500 U	0.000500	mg/L	BTEX EPA 602		08/05/00	08/05/00	MAH
Toluene	0.00200 U	0.00200	mg/L	BTEX EPA 602		08/05/00	08/05/00	MAH
Ethylbenzene	0.00200 U	0.00200	mg/L	BTEX EPA 602		08/05/00	08/05/00	MAH
P & M -Xylene	0.00200 U	0.00200	mg/L	BTEX EPA 602		08/05/00	08/05/00	MAH
o-Xylene	0.00200 U	0.00200	mg/L	BTEX EPA 602		08/05/00	08/05/00	MAH
Surrogates								
1,4-Difluorobenzene <Surr>	89.8		%	BTEX EPA 602	60-120	08/05/00	08/05/00	MAH
4-Bromofluorobenzene <Surr>	67.8		%	BTEX EPA 602	50-150	08/05/00	08/05/00	MAH

CT&E Environmental Services Inc.

CT&E Ref.#	1004299002	Client PO#	Auth 48 Job #39551
Client Name	Harding Lawson & Assoc	Printed Date/Time	08/08/2000 14:17
Project Name/#	51192 Red Devil	Collected Date/Time	08/02/2000 9:05
Client Sample ID	00RDV10MI	Received Date/Time	08/03/2000 10:30
Matrix	Water (Surface, Eff., Ground)	Technical Director	Stephen C. Ede
Ordered By		Released By	J Windebank

Sample Remarks:

Parameter	Results	PQL	Units	Method	Allowable Limits	Prep Date	Analysis Date	Init
Volatile Fuels Department								
Benzene	0.000500 U	0.000500	mg/L	BTEX EPA 602		08/05/00	08/05/00	MAH
Toluene	0.00200 U	0.00200	mg/L	BTEX EPA 602		08/05/00	08/05/00	MAH
Ethylbenzene	0.00200 U	0.00200	mg/L	BTEX EPA 602		08/05/00	08/05/00	MAH
P & M -Xylene	0.00200 U	0.00200	mg/L	BTEX EPA 602		08/05/00	08/05/00	MAH
o-Xylene	0.00200 U	0.00200	mg/L	BTEX EPA 602		08/05/00	08/05/00	MAH
Surrogates								
1,4-Difluorobenzene <Surr>	88.6		%	BTEX EPA 602	60-120	08/05/00	08/05/00	MAH
4-Bromofluorobenzene <Surr>	56.1		%	BTEX EPA 602	50-150	08/05/00	08/05/00	MAH

CT&E Environmental Services Inc.

CT&E Ref.#	321262 Method Blank	**Printed Date/Time**	08/08/2000 18:23	
Client Name	Harding Lawson & Assoc	**Prep Batch**	VXX	6691
Project Name/#	51192 Red Devil	**Method**		
Matrix	Water (Surface, Eff., Ground)	**Date**	08/05/2000	

QC results affect the following production samples:

1004299001, 1004299002

Parameter	Results	PQL	Units	Analysis Date	Init
Volatile Fuels Department					
Gasoline Range Organics	0.0900 U	0.0900	mg/L	08/05/00	MAH
Benzene	0.000500 U	0.00050	mg/L	08/05/00	MAH
Ethylbenzene	0.00200 U	0.00200	mg/L	08/05/00	MAH
P & M -Xylene	0.00200 U	0.00200	mg/L	08/05/00	MAH
o-Xylene	0.00200 U	0.00200	mg/L	08/05/00	MAH
Toluene	0.00200 U	0.00200	mg/L	08/05/00	MAH

Batch VFC 4261
Method AK101/8021B
Instrument HP 5890 Series II PID+FID VDA

F-701

CT&E Environmental Services Inc.

CT&E Ref.#	321263 Lab Control Sample	**Printed Date/Time**	08/08/2000 18:23
	321264 Lab Control Sample Duplicate	**Prep Batch**	VXX 6691
Client Name	Harding Lawson & Assoc	**Method**	
Project Name/#	51192 Red Devil	**Date**	08/05/2000
Matrix	Water (Surface, Eff., Ground)		

QC results affect the following production samples:

1004299001, 1004299002

Parameter		QC Results	Pct Recov	LCS/LCSD Limits	RPD	RPD Limits	Spiked Amount	Analysis Date	Init
Gasoline Range Organics	LCS	0.838	93	(60-120)			0.9 mg/L	08/05/00	MAH
	LCSD	0.836	93		0	(< 20)	0.9 mg/L	08/05/00	MAH
o-Xylene	LCS	0.0262	101	(80-120)			0.0261 mg/L	08/05/00	MAH
	LCSD	0.0260	100		1	(< 25)	0.0261 mg/L	08/05/00	MAH
P & M -Xylene	LCS	0.0702	95	(80-120)			0.0738 mg/L	08/05/00	MAH
	LCSD	0.0697	95		1	(< 25)	0.0738 mg/L	08/05/00	MAH
Ethylbenzene	LCS	0.0190	94	(80-120)			0.0202 mg/L	08/05/00	MAH
	LCSD	0.0188	93		1	(< 25)	0.0202 mg/L	08/05/00	MAH
Benzene	LCS	0.0307	98	(80-120)			0.0312 mg/L	08/05/00	MAH
	LCSD	0.0304	98		1	(< 25)	0.0312 mg/L	08/05/00	MAH
Toluene	LCS	0.114	88	(80-120)			0.13 mg/L	08/05/00	MAH
	LCSD	0.113	87		1	(< 25)	0.13 mg/L	08/05/00	MAH

Batch VFC 4261
Method AK101/8021B
Instrument HP 5890 Series II PID+FID VDA

F-701

CT&E Environmental Services Inc.

CT&E Ref.#	321120 Method Blank	**Printed Date/Time**	08/08/2000 18:23	
Client Name	Harding Lawson & Assoc	**Prep Batch**	MXX	7631
Project Name/#	51192 Red Devil	**Method**		
Matrix	Water (Surface, Eff., Ground)	**Date**	08/04/2000	

QC results affect the following production samples:

1004299001

Parameter	Results	PQL	Units	Analysis Date	Init
Thallium	0.0222 U	0.0222	ug/L	08/08/00	KGF

Batch MMS 1171
Method SW846 6020
Instrument Perkin Elmer Sciex ICP-MS P3

Metals by ICP/MS

Aluminum	55.6 U	55.6	ug/L	08/08/00	KGF
Antimony	2.22 U	2.22	ug/L	08/08/00	KGF
Arsenic	1.11 U	1.11	ug/L	08/08/00	KGF
Barium	2.22 U	2.22	ug/L	08/08/00	KGF
Beryllium	0.0778 U	0.0778	ug/L	08/08/00	KGF
Cadmium	0.111 U	0.111	ug/L	08/08/00	KGF
Calcium	35.9 J	83.3	ug/L	08/08/00	KGF
Chromium	2.22 U	2.22	ug/L	08/08/00	KGF
Copper	6.67 U	6.67	ug/L	08/08/00	KGF
Iron	55.6 U	55.6	ug/L	08/08/00	KGF
Lead	6.67 U	6.67	ug/L	08/08/00	KGF
Potassium	111 U	111	ug/L	08/08/00	KGF
Selenium	0.437 J	1.11	ug/L	08/08/00	KGF
Silver	0.444 U	0.444	ug/L	08/08/00	KGF
Sodium	111 U	111	ug/L	08/08/00	KGF
Strontium	0.102		ug/L	08/08/00	KGF
Vanadium	0.222 U	0.222	ug/L	08/08/00	KGF
Zinc	2.01 J	5.56	ug/L	08/08/00	KGF
Cobalt	0.533	0.333	ug/L	08/08/00	KGF
Magnesium	3.74 J	11.1	ug/L	08/08/00	KGF
Manganese	11.1 U	11.1	ug/L	08/08/00	KGF
Molybdenum	0.516 J	0.556	ug/L	08/08/00	KGF
Nickel	6.67 U	6.67	ug/L	08/08/00	KGF

Batch MMS 1171
Method SW846 6020
Instrument Perkin Elmer Sciex ICP-MS P3

F-701

CT&E Environmental Services Inc.

CT&E Ref.#	321121 Lab Control Sample	**Printed Date/Time**	08/08/2000 18:23
		Prep Batch	MXX 7631
Client Name	Harding Lawson & Assoc	**Method**	
Project Name/#	51192 Red Devil	**Date**	08/04/2000
Matrix	Water (Surface, Eff., Ground)		

QC results affect the following production samples:

1004299001

Parameter		QC Results	Pct Recov	LCS/LCSD Limits	RPD	RPD Limits	Spiked Amount	Analysis Date	Init
Cobalt	LCS	1140	100	(85-115)			1140 ug/L	08/08/00	KGF
Potassium	LCS	12000	106	(85-115)			11400 ug/L	08/08/00	KGF
Nickel	LCS	1190	105	(85-115)			1140 ug/L	08/08/00	KGF
Manganese	LCS	1120	99	(85-115)			1140 ug/L	08/08/00	KGF
Magnesium	LCS	12100	106	(85-115)			11400 ug/L	08/08/00	KGF
Lead	LCS	1150	101	(85-115)			1140 ug/L	08/08/00	KGF
Aluminum	LCS	1140	100	(85-115)			1140 ug/L	08/08/00	KGF
Copper	LCS	1210	106	(85-115)			1140 ug/L	08/08/00	KGF
Sodium	LCS	12000	106	(85-115)			11400 ug/L	08/08/00	KGF
Chromium	LCS	1170	103	(85-115)			1140 ug/L	08/08/00	KGF
Calcium	LCS	11700	103	(85-115)			11400 ug/L	08/08/00	KGF
Cadmium	LCS	590	104	(85-115)			568 ug/L	08/08/00	KGF
Beryllium	LCS	461	101	(85-115)			457 ug/L	08/08/00	KGF
Barium	LCS	1160	102	(85-115)			1140 ug/L	08/08/00	KGF
Arsenic	LCS	1160	102	(85-115)			1140 ug/L	08/08/00	KGF
Antimony	LCS	1160	102	(85-115)			1140 ug/L	08/08/00	KGF
Iron	LCS	1100	97	(85-115)			1140 ug/L	08/08/00	KGF
Thallium	LCS	1130	99	(85-115)			1150 ug/L	08/08/00	KGF
Vanadium	LCS	1160	102	(85-115)			1140 ug/L	08/08/00	KGF
Zinc	LCS	1170	103	(85-115)			1140 ug/L	08/08/00	KGF
Selenium	LCS	1150	101	(85-115)			1140 ug/L	08/08/00	KGF
Silver	LCS	98.2	43 *	(85-115)			227 ug/L	08/08/00	KGF

Batch MMS 1171
Method SW846 6020
Instrument Perkin Elmer Sciex ICP-MS P3

F-701

CT&E Environmental Services Inc.

CT&E Ref.#	321571	Method Blank	**Printed Date/Time**	08/08/2000 18:23	
Client Name	Harding Lawson & Assoc		**Prep Batch**	MXX	7647
Project Name/#	51192 Red Devil		**Method**		
Matrix	Water (Surface, Eff., Ground)		**Date**	08/07/2000	

QC results affect the following production samples:

1004299001

Parameter	Results	PQL	Units	Analysis Date	Init
Metals Department					
Mercury by Cold Vapor	0.000200 U	0.00020	mg/L	08/08/00	JDT

Batch MCV 2157
Method SW7470/E245.1
Instrument HgAA Leeman AutoAnalyzer PS200

F-701

CT&E Environmental Services Inc.

CT&E Ref.#	321572 Lab Control Sample	Printed Date/Time	08/08/2000 18:23
		Prep Batch	MXX 7647
Client Name	Harding Lawson & Assoc	Method	
Project Name/#	51192 Red Devil	Date	08/07/2000
Matrix	Water (Surface, Eff., Ground)		

QC results affect the following production samples:

1004299001

Parameter		QC Results	Pct Recov	LCS/LCSD Limits	RPD	RPD Limits	Spiked Amount	Analysis Date	Init
TOTAL METALS ANALYSIS									
Mercury by Cold Vapor	LCS	0.00197	99	(85-115)			0.002 mg/L	08/08/00	JDT

Batch MCV 2157
Method SW7470/E245.1
Instrument HgAA Leeman AutoAnalyzer PS200

F-701

DATA QUALITY ASSESSMENT

Laboratory: CTE Environmental Services
Batch No.: 1004464
Sampled: RDV-P1SL, RDV-P2SL

	Yes	No	Not Required/Applicable
1. Were samples analyzed for requested parameters?	X		
2. Is the USACE Data Deliverables package complete?			X
3. Were samples extracted within holding time acceptance criteria?	X		
4. Were samples analyzed within holding time acceptance criteria?	X		
5. For soils, were sample results reported on a "dry weight" basis?	X		
6. Were method blank analytes all reported as ND?		X	
7. For water, were trip blank analytes all reported as ND?			X
8. Are the surrogate percent recoveries within acceptance criteria?			X
9. Are the matrix spike percent recoveries within acceptance criteria?			X
10. Are the matrix spike relative percent differences within acceptance criteria?			X
11. Are the field duplicate relative percent differences less than 50 percent?	X		

Comments:

6.) Arsenic detected in the method blank at 0.0029 mg/L (estimated). Results are not affected.

Date: 3-30-01
Reviewer: JEW.

RECEIVED
SEP 05 2000
HARDING LAWSON
ASSOCIATES

CTE Environmental Services
Alaska Division
Laboratory Data Report

Project: 47411 Red Devil Mine
Client: Harding Lawson & Assoc
CTE Work Order: 1004464

Contents:

Chain of Custody
Quality Control Summary Forms

Note:

Unless otherwise noted, all quality assurance/quality control criteria is in compliance with the proper regulatory authority and/or CTE's Quality Assurance Program Plan.

Case Narrative

Customer: HARLAWP **Harding Lawson & Assoc**

Project: 1004464 **47411 Red Devil Mine**

There were no analytical anomalies associated with your data.

CHAIN OF CUSTODY RECORD

1004464

ryland
w Jersey

CT&E Environmental Services Inc.
Laboratory Division

.com

(1)

CLIENT: WILDER/HLA

CONTACT: Brian Lund PHONE NO: (907)

PROJECT: 47411 SITE: Red Devil Mine

REPORTS TO: Tom Johnston
Philip Services FAX NO: (907) 272-6805

INVOICE TO: WILDER/HLA

P.O. NUMBER:

CT&E Reference:

PAGE 1 OF 1

(2)

LAB NO.	SAMPLE IDENTIFICATION	DATE	TIME	MATRIX	No. CONTAINERS	SAMPLE TYPE C=COMP G=GRAB	Preservatives Used: none	Analysis Required (3): RCRA METALS + TCLP	Total Mercury	REMARKS
1	RDV-P1SL	8/5/00	1000	SOLID	1	G		✓	✓	
2	RDV-P2SL	8/5/00	1530	SOLID	1	G		✓	✓	

(5)

Collected/Relinquished By: (1)	Date	Time	Received By:
Tom Johnston	8/10/00	1330	
Relinquished By: (2)	Date	Time	Received By:
Relinquished By: (3)	Date	Time	Received By:
Relinquished By: (4)	Date	Time	Received For Laboratory By:
	8/10	1330	

(4)

Shipping Carrier:

Shipping Ticket No:

Samples Received Cold? (Circle) YES NO

Temperature °C:

Data Deliverables Required

Level I Level II Level III

Chain of Custody Seal: (Circle)

INTACT BROKEN ABSENT

Requested Turnaround Time and Special Instructions:

normal

Please call Tom Johnston at 272-9007 with any questions regarding samples/analyses

200 W. Potter Drive Anchorage, AK 99518 Tel: (907) 562-2343 Fax: (907) 561-5301
3180 Peger Road Fairbanks, AK 99701 Tel: (907) 474-8656 Fax: (907) 474-9685

White - Retained by Lab (Project File) Yellow - Returned with Report Pink - Retained by Sampler

0-720

1004464

CT&E Environmental Services Inc.

SAMPLE RECEIPT FORM

CT&E WO#: _____

Yes	No		
	X	Are samples **RUSH**, priority, or *within 72 hrs* of **hold time**?	
		If yes, have you done *e-mail notification*?	
	X	Are samples *within 24 hrs* of **hold time** or **due date**?	
		If yes, have you *spoken with* Supervisor?	
	X	Are there any **problems** (e.g., ids, analyses)?	
		Were samples preserved correctly and pH verified?	
		Has Project Manager been notified of problems?	
		Is this an ACOE/AFCEE/ADEC project?	
		Will a **data package** be required?	
		If this is for PWS, provide **PWSID**.	
		Is there a **quote** for this project?	
		Will **courier** charges apply?	

Due Date: 8/24
Received Date/Time: 8/10 1430
Cooler Temperature: 4c
Sample Condition: Good / Poor

Matrix of each Sample:
2 " " 1-2
" "
" "
" "
Trip Blank
MS/MSD

Additional Sample Remarks:
_____ AK101s/_____ 8260s field pres'd?
_____ Field-filtered for dissolved_____?
_____ Lab-filter for dissolved_____?
_____ Ref Lab required?

Notes:

Completed by (sign): Sarita Phillips (print): Sarita Phillips

*** The following *must* be completed for *all* ACOE & AFCEE projects: ***

Yes	No		Notes:
		Is cooler temperature 4 ± C?	
		thermometer used:	
		Was there an airbill, etc? note #:	
		Was cooler sealed with custody seals?	
		#/where?	
		Were seals intact upon arrival?	
		Was there a COC with cooler?	
		Was the COC filled out properly?	
		Did the COC indicate ACOE/AFCEE project?	
		Did the COC and samples correspond?	
		Were samples screened with Geiger counter?	
		Were all samples packed to prevent breakage?	
		packing material:	
		Were all samples unbroken and clearly labelled?	
		Were all samples sealed in separate plastic bags?	
		Were all bottles for volatiles free of headspace?	
		Were correct container/sample sizes submitted?	
		Was client notified of problems? (specify below)	

Individual contacted: _____
Date & Time: _____ Phone/Fax #: _____

# of each Container Received:

	950 ml amber	unpres'd
	950 ml amber	w/ HCl
	500 ml amber	w/ H2SO4
	1L cubies	unpres'd
	1L cubies	w/ HNO3
	1L cubies	w/ H2SO4
	1L cubies	w/ NaOH + ZnAc
	120 ml coli	bottles
	60 ml	Nalg
2	8 oz amber	unpres'd
	4 oz amber	unpres'd
	4 oz w/ septa	w/ MeOH
	40 ml vials	w/ HCl
	Other (specify)	
	Other (specify)	

#/Log In Proofed by: _____

Form Number: F004r2
Printed: 7/12/99

CT&E Environmental Services Inc.
Laboratory Division

Laboratory Analysis Report

200 W. Potter Drive
Anchorage, AK 99518-1605
Tel: (907) 562-2343
Fax: (907) 561-5301
Web: http://www.cteesi.com

Brian Lund
Harding Lawson & Assoc
601 East 57th Place
Anchorage, AK 99518

Work Order:	1004464
	47411 Red Devil Mine
Client:	Harding Lawson & Assoc
Report Date:	August 24, 2000

Enclosed are the analytical results associated with the above workorder.

As required by the state of Alaska and the USEPA, a formal Quality Assurance/Quality Control Program is maintaned 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 analyte 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
!	Surrogate out of range

SGS Member of the SGS Group (Societe Generale de Surveillance)
200 W. Potter Drive, **Anchorage, AK 99518-1605** — Tel: (907) 562-2343 Fax: (907) 561-5301
3180 Peger Road, **Fairbanks, AK 99709-5471** — Tel: (907) 474-8656 Fax: (907) 474-9685

CT&E Environmental Services Inc.

CT&E Ref.#	1004464001	**Client PO#**	Auth 48 Job #39551
Client Name	Harding Lawson & Assoc	**Printed Date/Time**	08/24/2000 16:00
Project Name/#	47411 Red Devil Mine	**Collected Date/Time**	08/05/2000 10:00
Client Sample ID	RDV-P1SL	**Received Date/Time**	08/10/2000 13:30
Matrix	Other Solids (Wet Weight)	**Technical Director**	**Stephen C. Ede**
Ordered By		**Released By**	J Windebank

Sample Remarks:

Parameter	Results		PQL	Units	Method	Allowable Limits	Prep Date	Analysis Date	Init
Characterization									
Aqueous Phase, Total	0.00			%	SW846-1311 TCLP			08/14/00	WA
Oil Phase, Total	0.00			%	SW846-1311 TCLP			08/14/00	WA
Solid Phase, Total	100			%	SW846-1311 TCLP			08/14/00	WAW
TCLP Metals									
Arsenic	70.4	*	50.0	mg/L	SW846-7060A TCLP	5 max	08/17/00	08/18/00	JM
Barium	0.234		0.100	mg/L	SW846-6010B TCLP	100 max	08/17/00	08/18/00	CMO
Cadmium	0.200 U		0.200	mg/L	SW846-6010B TCLP	1 max	08/17/00	08/18/00	CMO
Chromium	0.100 U		0.100	mg/L	SW846-6010B TCLP	5 max	08/17/00	08/18/00	CM
Lead	1.00 U		1.00	mg/L	SW846-6010B TCLP	5 max	08/17/00	08/18/00	CMO
Selenium	0.0500 U		0.0500	mg/L	SW846 7740A TCLP	1 max	08/17/00	08/18/00	JMO
Silver	0.200 U		0.200	mg/L	SW846-7760A TCLP	5 max	08/17/00	08/18/00	WA
Mercury by Cold Vapor	0.361	*	0.0200	mg/L	SW846-7470A TCLP	.2 max	08/17/00	08/18/00	JD

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CT&E Environmental Services Inc.

CT&E Ref.#	1004464002	**Client PO#**	Auth 48 Job #39551
Client Name	Harding Lawson & Assoc	**Printed Date/Time**	08/24/2000 16:00
Project Name/#	47411 Red Devil Mine	**Collected Date/Time**	08/05/2000 15:30
Client Sample ID	RDV-P2SL	**Received Date/Time**	08/10/2000 13:30
Matrix	Other Solids (Wet Weight)	**Technical Director**	**Stephen C. Ede**
Ordered By		**Released By**	J Windebank

Sample Remarks:

Parameter	Results		PQL	Units	Method	Allowable Limits	Prep Date	Analysis Date	Init
Characterization									
Aqueous Phase, Total	0.00			%	SW846-1311 TCLP			08/14/00	WAW
Oil Phase, Total	0.00			%	SW846-1311 TCLP			08/14/00	WAW
Solid Phase, Total	100			%	SW846-1311 TCLP			08/14/00	WAW
TCLP Metals									
Arsenic	280	*	50.0	mg/L	SW846-7060A TCLP	5 max	08/17/00	08/18/00	JMO
Barium	0.121		0.100	mg/L	SW846-6010B TCLP	100 max	08/17/00	08/18/00	CMO
Cadmium	0.386		0.200	mg/L	SW846-6010B TCLP	1 max	08/17/00	08/18/00	CMO
Chromium	0.100 U		0.100	mg/L	SW846-6010B TCLP	5 max	08/17/00	08/18/00	CMO
Lead	1.00 U		1.00	mg/L	SW846-6010B TCLP	5 max	08/17/00	08/18/00	CMO
Selenium	0.0500 U		0.0500	mg/L	SW846 7740A TCLP	1 max	08/17/00	08/18/00	JMO
Silver	0.200 U		0.200	mg/L	SW846-7760A TCLP	5 max	08/17/00	08/18/00	WAW
Mercury by Cold Vapor	0.00444		0.00200	mg/L	SW846-7470A TCLP	.2 max	08/17/00	08/18/00	JDT

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CT&E Environmental Services Inc.

CT&E Ref.#	1004464003	**Client PO#**	Auth 48 Job #39551
Client Name	Harding Lawson & Assoc	**Printed Date/Time**	08/24/2000 12:09
Project Name/#	47411 Red Devil Mine	**Collected Date/Time**	08/05/2000 10:00
Client Sample ID	RDV-P1SL	**Received Date/Time**	08/10/2000 13:30
Matrix	Soil/Solid	**Technical Director**	**Stephen C. Ede**
Ordered By		**Released By**	J Windlebank

Sample Remarks:

Parameter	Results	PQL	Units	Method	Allowable Limits	Prep Date	Analysis Date	Init
Solids								
Total Solids	76.4		%	SM20 2540G			08/16/00	JCO
Metals Department								
Mercury by Cold Vapor	29100	2550	mg/Kg	SW846-7471A		08/17/00	08/18/00	JD

F-701

CT&E Environmental Services Inc.

CT&E Ref.#	1004464004	**Client PO#**	Auth 48 Job #39551
Client Name	Harding Lawson & Assoc	**Printed Date/Time**	08/24/2000 12:09
Project Name/#	47411 Red Devil Mine	**Collected Date/Time**	08/05/2000 15:30
Client Sample ID	RDV-P2SL	**Received Date/Time**	08/10/2000 13:30
Matrix	Soil/Solid	**Technical Director**	**Stephen C. Ede**
Ordered By		**Released By**	J Windebank

Sample Remarks:

Parameter	Results	PQL	Units	Method	Allowable Limits	Prep Date	Analysis Date	Init
Solids								
Total Solids	85.6		%	SM20 2540G			08/16/00	JCO
Metals Department								
Mercury by Cold Vapor	104000	2170	mg/Kg	SW846-7471A		08/17/00	08/18/00	JDT

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CT&E Environmental Services Inc.

CT&E Ref.#	323693	Method Blank	**Printed Date/Time**	08/24/2000 12:09
Client Name	Harding Lawson & Assoc		**Prep Batch**	
Project Name/#	47411 Red Devil Mine		**Method**	
Matrix	Soil/Solid		**Date**	

QC results affect the following production samples:

1004464003, 1004464004

Parameter	Results	PQL	Units	Analysis Date	Init
Solids					
Total Solids		100	%	08/16/00	JCO

Batch SPT 3457
Method SM20 2540G
Instrument

F-701

CT&E Environmental Services Inc.

CT&E Ref.#	323694	Duplicate	**Printed Date/Time**	08/24/2000 12:10
Client Name	Harding Lawson & Assoc		**Prep Batch**	
Project Name/#	47411 Red Devil Mine		**Method**	
Original	1004659003		**Date**	
Matrix	Soil/Solid			

QC results affect the following production samples:
1004464003, 1004464004

Parameter	Original Result	QC Result	RPD	RPD Limits	Analysis Date	Init
Solids						
Total Solids	93.6	93.7	0.19		08/16/00	JCO

Batch SPT 3457
Method SM20 2540G
Instrument

F-701

CT&E Environmental Services Inc.

CT&E Ref.#	323957	Method Blank	**Printed Date/Time**	08/24/2000 12:09	
Client Name	Harding Lawson & Assoc		**Prep**	**Batch**	MXT 2819
Project Name/#	47411 Red Devil Mine			**Method**	
Matrix	Water (Surface, Eff., Ground)			**Date**	08/17/2000

QC results affect the following production samples:

1004464001, 1004464002

Parameter	Results	PQL	Units	Analysis Date	Init
TCLP Metals					
Selenium	0.00500 U	0.00500	mg/L	08/18/00	JMO
Batch MGF 9028					
Method SW846 7740A TCLP					
Instrument GFAA Perkin Elmer 5000					
Arsenic	0.00290 J	0.00500	mg/L	08/18/00	JMO
Batch MGF 9025					
Method SW846-7060A TCLP					
Instrument GFAA Perkin Elmer 5000					

CT&E Environmental Services Inc.

CT&E Ref.#	323958 Lab Control Sample	**Printed Date/Time**	08/24/2000 12:10
		Prep Batch	MXT 2819
Client Name	Harding Lawson & Assoc	**Method**	
Project Name/#	47411 Red Devil Mine	**Date**	08/17/2000
Matrix	Water (Surface, Eff., Ground)		

QC results affect the following production samples:
1004464001, 1004464002

Parameter		QC Results	Pct Recov	LCS/LCSD Limits	RPD	RPD Limits	Spiked Amount	Analysis Date	Init
TCLP Metals									
Selenium	LCS	0.205	102	(85-115)			0.2 mg/L	08/18/00	JMO
Batch	MGF 9028								
Method	SW846 7740A TCLP								
Instrument	GFAA Perkin Elmer 5000								
Arsenic	LCS	0.198	99	(85-115)			0.2 mg/L	08/18/00	JMO
Batch	MGF 9025								
Method	SW846-7060A TCLP								
Instrument	GFAA Perkin Elmer 5000								

CT&E Environmental Services Inc.

CT&E Ref.#	323962 Method Blank		**Printed Date/Time**	08/24/2000 12:09	
Client Name	Harding Lawson & Assoc		**Prep Batch**	MXT	2820
Project Name/#	47411 Red Devil Mine		**Method**		
Matrix	Water (Surface, Eff., Ground)		**Date**	08/17/2000	

QC results affect the following production samples:

1004464001, 1004464002

Parameter	Results	PQL	Units	Analysis Date	Init
TCLP Metals					
Silver	0.200 U	0.200	mg/L	08/18/00	WAW

Batch MFL 1495
Method SW846-7760A TCLP
Instrument AA Perkin Elmer 3100

F-791

CT&E Environmental Services Inc.

CT&E Ref.#	323963 Lab Control Sample	**Printed Date/Time**	08/24/2000 12:10
		Prep Batch	MXT 2820
Client Name	Harding Lawson & Assoc	**Method**	
Project Name/#	47411 Red Devil Mine	**Date**	08/17/2000
Matrix	Water (Surface, Eff., Ground)		

QC results affect the following production samples:
1004464001, 1004464002

Parameter		QC Results	Pct Recov	LCS/LCSD Limits	RPD	RPD Limits	Spiked Amount	Analysis Date	Init
TCLP Metals									
Silver	LCS	1.03	103	(85-115)			1 mg/L	08/18/00	WAW

Batch MFL 1495
Method SW846-7760A TCLP
Instrument AA Perkin Elmer 3100

F-701

CT&E Environmental Services Inc.

CT&E Ref.#	323967	Method Blank	**Printed Date/Time**	08/24/2000 12:09	
Client Name	Harding Lawson & Assoc		**Prep Batch**	MXT	2821
Project Name/#	47411 Red Devil Mine		**Method**		
Matrix	Water (Surface, Eff., Ground)		**Date**	08/17/2000	

QC results affect the following production samples:

1004464001, 1004464002

Parameter	Results	PQL	Units	Analysis Date	Init
TCLP Metals					
Barium	0.0100 U	0.0100	mg/L	08/18/00	CMO
Cadmium	0.0200 U	0.0200	mg/L	08/18/00	CMO
Chromium	0.0100 U	0.0100	mg/L	08/18/00	CMO
Lead	0.100 U	0.100	mg/L	08/18/00	CMO

Batch MIP 3258
Method SW846-6010B TCLP
Instrument TJA Enviro II ICP P2

F-701

CT&E Environmental Services Inc.

CT&E Ref.#	323968 Lab Control Sample	**Printed Date/Time**	08/24/2000 12:10
		Prep Batch	MXT 2821
Client Name	Harding Lawson & Assoc	**Method**	
Project Name/#	47411 Red Devil Mine	**Date**	08/17/2000
Matrix	Water (Surface, Eff., Ground)		

QC results affect the following production samples:
1004464001, 1004464002

Parameter		QC Results	Pct Recov	LCS/LCSD Limits	RPD	RPD Limits	Spiked Amount	Analysis Date	Init
TCLP Metals									
Barium	LCS	2.08	104	(85-115)			2 mg/L	08/18/00	CMO
Cadmium	LCS	1.96	98	(85-115)			2 mg/L	08/18/00	CMO
Chromium	LCS	2.14	107	(85-115)			2 mg/L	08/18/00	CMO
Lead	LCS	2.12	106	(85-115)			2 mg/L	08/18/00	CMO

Batch MIP 3258
Method SW846-6010B TCLP
Instrument TJA Enviro II ICP P2

F-701

CT&E Environmental Services Inc.

CT&E Ref.#	324091	Undigested Duplicate	**Printed Date/Time**	08/24/2000 12:10
Client Name	Harding Lawson & Assoc		**Prep Batch**	
Project Name/#	47411 Red Devil Mine		**Method**	
Original	1004711001		**Date**	
Matrix	Water (Surface, Eff., Ground)			

QC results affect the following production samples:
1004464001, 1004464002

Parameter	Original Result	QC Result	RPD	RPD Limits	Analysis Date	Init
Metals Department						
Iron		0.0500 U		(< 20)	08/18/00	CMC

Batch MIP 3258
Method SW846 6010B
Instrument TJA Enviro II ICP P2

F-701

CT&E Environmental Services Inc.

CT&E Ref.#	324126	Method Blank	**Printed Date/Time**	08/24/2000 12:09	
Client Name	Harding Lawson & Assoc		**Prep Batch**	MXX	7723
Project Name/#	47411 Red Devil Mine		**Method**		
Matrix	Water (Surface, Eff., Ground)		**Date**	08/17/2000	

QC results affect the following production samples:

1004464001, 1004464002

Parameter	Results	PQL	Units	Analysis Date	Init
Metals Department					
Mercury by Cold Vapor	0.000200 U	0.00020	mg/L	08/18/00	JDT

Batch MCV 2166
Method SW7470/E245.1
Instrument HgAA Leeman AutoAnalyzer PS200

F-701

CT&E Environmental Services Inc.

CT&E Ref.#	324127 Lab Control Sample	**Printed Date/Time**	08/24/2000 12:10
		Prep Batch	MXX 7723
Client Name	Harding Lawson & Assoc	**Method**	
Project Name/#	47411 Red Devil Mine	**Date**	08/17/2000
Matrix	Water (Surface, Eff., Ground)		

QC results affect the following production samples:
1004464001, 1004464002

Parameter		QC Results	Pct Recov	LCS/LCSD Limits	RPD	RPD Limits	Spiked Amount	Analysis Date	Init
Metals Department									
Mercury by Cold Vapor	LCS	0.00203	102	(85-115)			0.002 mg/L	08/18/00	JDT

Batch MCV 2166
Method SW7470/E245.1
Instrument HgAA Leeman AutoAnalyzer PS200

F-701

CT&E Environmental Services Inc.

CT&E Ref.#	324146	Method Blank	**Printed Date/Time**	08/24/2000 12:09	
Client Name	Harding Lawson & Assoc		**Prep**	**Batch**	MXX 7724
Project Name/#	47411 Red Devil Mine			**Method**	
Matrix	Water (Surface, Eff., Ground)			**Date**	08/17/2000

QC results affect the following production samples:

1004464003, 1004464004

Parameter	Results	PQL	Units	Analysis Date	Init
Metals Department					
Mercury by Cold Vapor	0.000200 U	0.00020	mg/L	08/18/00	JDT

Batch MCV 2167
Method SW846-7471A
Instrument HgAA Leeman AutoAnalyzer PS200

F-701

CT&E Environmental Services Inc.

CT&E Ref.#	324147 Lab Control Sample	**Printed Date/Time**	08/24/2000 12:10
		Prep Batch	MXX 7724
Client Name	Harding Lawson & Assoc	**Method**	
Project Name/#	47411 Red Devil Mine	**Date**	08/17/2000
Matrix	Water (Surface, Eff., Ground)		

QC results affect the following production samples:
1004464003, 1004464004

Parameter		QC Results	Pct Recov	LCS/LCSD Limits	RPD	RPD Limits	Spiked Amount	Analysis Date	Init
Metals Department									
Mercury by Cold Vapor	LCS	0.00216	108	(85-115)			0.002 mg/L	08/18/00	JDT

Batch MCV 2167
Method SW846-7471A
Instrument HgAA Leeman AutoAnalyzer PS200

F-701

DATA QUALITY ASSESSMENT

Laboratory: CTE Environmental Services
Batch No.: 1004695
Sampled: 00RDV01WA, 00RDV02WA, 00RDV03WA, 00RDV04WA, 00RDV05WA, 00RDV06WA, 00RDV07WA, 00RDV24SL, 00RDV25SL, 00RDV26SL, 00RDV27SL, 00RDV28SL, 00RDV29SL, 00RDV30SL

	Yes	No	Not Required/Applicable
1. Were samples analyzed for requested parameters?	X		
2. Is the USACE Data Deliverables package complete?			X
3. Were samples extracted within holding time acceptance criteria?	X		
4. Were samples analyzed within holding time acceptance criteria?	X		
5. For soils, were sample results reported on a "dry weight" basis?	X		
6. Were method blanks analytes all reported as ND?		X	
7. For water, were trip blank analytes all reported as ND?			X
8. Are the surrogate percent recoveries within acceptance criteria?			X
9. Are the matrix spike percent recoveries within acceptance criteria?		X	
10. Are the matrix spike relative percent differences within acceptance criteria?			X
11. Are the field duplicate relative percent differences less than 50 percent?	X		

Comments:

6) Thallium was reported at 0.0656 µg/L, strontium was reported at 0.00111 µg/L (CTE reference # 323704); cadmium was reported at 0.0172 mg/kg, zinc was reported at 0.554 mg/kg, chromium was estimated at 0.0296 mg/kg (below the PQL) (CTE ref. #323716). Results are not affected.

9) Zinc recovered at 120% (CTE ref. # 323717). Results are not affected.

11) RPD for mercury in samples 00RDV01WA and 00RDV02WA was 138%. Results should not be affected.

Date: 3-30-01
Reviewer: EN.

RECEIVED
OCT 3 0 2000
HARDING LAWSON
ASSOCIATES

CTE Environmental Services
Alaska Division
Laboratory Data Report

Project: 47411 Red Devil Mine

Client: Harding Lawson & Assoc

CTE Work Order: 1004695

Contents:

Chain of Custody
Quality Control Summary Forms

Note:

Unless otherwise noted, all quality assurance/quality control criteria is in compliance with the proper regulatory authority and/or CTE's Quality Assurance Program Plan.

Case Narrative

Customer: HARLAWP **Harding Lawson & Assoc**

Project: 1004695 **47411 Red Devil Mine**

There were no analytical anomalies associated with your data.

Harding Lawson Associates
601 East 57th Place
Anchorage, AK 99518
907 / 563-8102
907 / 561-4574 FAX

H_2O

CHAIN OF CUSTODY FORM

Lab: 1004695

Samplers: C. Marshall & K. Vincent

Project Number: 47411

Name/Location: RED DEVIL MINE

Project Manager: Brian Lund

Recorder: Charles A. Marshall (Signature Required)

	SOURCE CODE	MATRIX: Water	Sediment	Soil	Oil	#CONTAINERS & PRESERV.: Unpres.	H_2SO_4	HNO_3	1L poly	100 mL	SAMPLE NUMBER OR LAB NUMBER: Yr	Wk	Seq	DATE: Yr	Mo	Dy	Time	STATION DESCRIPTION/ NOTES	EPA 601/8010	EPA 602/8020	EPA 624/8240	EPA 625/8270	ICP METALS	EPA 8015M/TPH	Mercury, Arsenic	Antimony, Lead *	TAL Metals	Total Fecal
1	23	X						X	X					0008	14	14	50	RDV01WA							X	X		
2	23	X						X	X					0008	14	15	00	RDV02WA							X	X		
3	23	X						X	X					0008	14	15	30	RDV03WA							X	X		
4	23	X						X	X					0008	14	16	00	RDV04WA							X	X		
5	23	X						X	X					0008	14	16	45	RDV05WA							X	X		
6	23	X						X	X					0008	14	17	05	RDV06WA							X	X		
7	20	X						X	X					0008	15			RDV07WA									X	X

LAB NUMBER: Yr	Wk	Seq	DEPTH IN FEET	COL MTD CD	QA CODE	MISCELLANEOUS
						*: Hg, Pb, As, Sb 6010/7000

CHAIN OF CUSTODY RECORD

RELINQUISHED BY: (Signature)	RECEIVED BY: (Signature)	DATE/TIME
Charles A. Marshall	E. Shannon	8/15/90 15:52
RELINQUISHED BY: (Signature)	RECEIVED BY: (Signature)	DATE/TIME
RELINQUISHED BY: (Signature)	RECEIVED BY: (Signature)	DATE/TIME
RELINQUISHED BY: (Signature)	RECEIVED BY: (Signature)	DATE/TIME
DISPATCHED BY: (Signature) DATE/TIME	RECEIVED FOR LAB BY: (Signature)	DATE/TIME
METHOD OF SHIPMENT		

6533

Laboratory Copy White | Project Office Copy Yellow | Field or Office Copy Pink

Harding Lawson Associates
601 East 57th Place
Anchorage, AK 99518
907 / 563-8102
907 / 561-4574 FAX

soil

CHAIN OF CUSTODY FORM

1004695

Samplers: C. Marshall & K. Vincent

Project Number: 47411
Name/Location: REA Devil Mine
Project Manager: Brian Lund

Recorder: [signature] (Signature Required)

	SOURCE CODE	MATRIX: Water	Sediment	Soil	Oil	#CONTAINERS & PRESERV.: Unpres.	H_2SO_4	HNO_3	8 oz Jar	SAMPLE NUMBER OR LAB NUMBER: Yr	Wk	Seq	DATE: Yr	Mo	Dy	Time	STATION DESCRIPTION/ NOTES	EPA 601/8010	EPA 602/8020	EPA 624/8240	EPA 625/8270	ICP METALS	EPA 8015M/TPH	** TOC	Mercury, Arsenic, Antimony, Lead *
(8)	48			X					X				0008	12	10	45	RDV24SL								X
(9)	48												0008	12	10	55	RDV25SL								X
(10)	48												0008	12	11	00	RDV26SL								X
(11)	48												0008	12	11	10	RDV27SL								X
(12)	48												0008	12	11	20	RDV28SL								X
(3)	48			X					X				0008	13	09	45	RDV29SL							X	
(4)	48			X					X				0008	13	10	00	RDV30SL							X	

LAB NUMBER: Yr	Wk	Seq	DEPTH IN FEET	COL MTD CD	QA CODE	MISCELLANEOUS
						** Total Organic Carbon
						* Mercury, Arsenic, Antimony, Lead 6010 / 7000

CHAIN OF CUSTODY RECORD

RELINQUISHED BY: (Signature) [signature]	RECEIVED BY: (Signature) [signature]	DATE/TIME 8/15/00 15:50
RELINQUISHED BY: (Signature)	RECEIVED BY: (Signature)	DATE/TIME
RELINQUISHED BY: (Signature)	RECEIVED BY: (Signature)	DATE/TIME
RELINQUISHED BY: (Signature)	RECEIVED BY: (Signature)	DATE/TIME
DISPATCHED BY: (Signature) DATE/TIME	RECEIVED FOR LAB BY: (Signature)	DATE/TIME
METHOD OF SHIPMENT		

6533

Laboratory Copy — Project Office Copy — Field Office Copy

CT&E Environmental Services Inc.

SAMPLE RECEIPT FORM

01 **CT&E WO#:** 1004695

Yes	No	
	✓	Are samples **RUSH**, priority, or *within 72 hrs* of **hold time**?
		If yes, have you done *e-mail notification*?
	✓	Are samples *within 24 hrs* of **hold time** or **due date**?
		If yes, have you *spoken with* Supervisor?
	✓	Are there any **problems** (e.g., ids, analyses)?
✓		Were samples preserved correctly and pH verified?
		Has Project Manager been notified of problems?
	✓	Is this an ACOE/AFCEE/ADEC project?
	✓	Will a **data package** be required?
		If this is for PWS, provide **PWSID**.
		Is there a **quote** for this project?
	✓	Will **courier** charges apply?

Completed by (sign): EMem (print): EVA Thiemann

Due Date: 8/24/00
Received Date/Time: 8/15 – 15:50
Cooler Temperature: 4.1°C
Sample Condition: Good / Poor

Matrix of each Sample:
1 " "
2 " "
" "
" "
Trip Blank
MS/MSD

1 – 7
8 – 14

Additional Sample Remarks:
AK101s/_____ 8260s field pres'd?
Field-filtered for dissolved_____?
Lab-filter for dissolved_____?
Ref Lab required?

Notes:

*** The following *must* be completed for *all* ACOE & AFCEE projects: ***

Yes	No		Notes:
		Is cooler temperature 4 ± C?	
		thermometer used:	
		Was there an airbill, etc? note #:	
		Was cooler sealed with custody seals?	
		#/where?	
		Were seals intact upon arrival?	
		Was there a COC with cooler?	
		Was the COC filled out properly?	
		Did the COC indicate ACOE/AFCEE project?	
		Did the COC and samples correspond?	
		Were samples screened with Geiger counter?	
		Were all samples packed to prevent breakage?	
		packing material:	
		Were all samples unbroken and clearly labelled?	
		Were all samples sealed in separate plastic bags?	
		Were all bottles for volatiles free of headspace?	
		Were correct container/sample sizes submitted?	
		Was client notified of problems? (specify below)	

Individual contacted:
Date & Time: Phone/Fax #:

# of each Container Received:

	950 ml amber	unpres'd
	950 ml amber	w/ HCl
	500 ml amber	w/ H2SO4
	1L cubies	unpres'd
6	1L cubies	w/ HNO3
	1L cubies	w/ H2SO4
	1L cubies	w/ NaOH + ZnAc
1	120 ml coli	bottles
	60 ml	Nalg
7	8 oz amber	unpres'd
	4 oz amber	unpres'd
	4 oz w/ septa	w/ MeOH
	40 ml vials	w/ HCl
	Other (specify)	
	Other (specify)	

#/Log In Proofed by:

Form Number: F004r2
Printed: 7/12/99

CT&E Environmental Services Inc.
Laboratory Division

Laboratory Analysis Report

200 W. Potter Drive
Anchorage, AK 99518-1605
Tel: (907) 562-2343
Fax: (907) 561-5301
Web: http://www.cteesi.com

Brian Lund
Harding Lawson & Assoc
601 East 57th Place
Anchorage, AK 99518

Work Order:	1004695
	47411 Red Devil Mine
Client:	Harding Lawson & Assoc
Report Date:	October 24, 2000

Enclosed are the analytical results associated with the above workorder.

As required by the state of Alaska and the USEPA, a formal Quality Assurance/Quality Control Program is maintaned 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 analyte 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
!	Surrogate out of range

CT&E Environmental Services Inc.

CT&E Ref.#	1004695001	**Client PO#**	Auth 48 Job #39551
Client Name	Harding Lawson & Assoc	**Printed Date/Time**	10/24/2000 15:29
Project Name/#	47411 Red Devil Mine	**Collected Date/Time**	08/14/2000 14:50
Client Sample ID	RDV01WA	**Received Date/Time**	08/15/2000 15:00
Matrix	Water (Surface, Eff., Ground)	**Technical Director**	**Stephen C. Ede**
Ordered By		**Released By**	J Windebank

Sample Remarks:

Parameter	Results	PQL	Units	Method	Allowable Limits	Prep Date	Analysis Date	Init
Metals Department								
Mercury by Cold Vapor	0.0286	0.00200	mg/L	SW7470/E245.1		08/19/00	08/20/00	JI
UST Metals								
Antimony	52.8	22.2	ug/L	SW846 6020		08/17/00	08/25/00	KG
Arsenic	58.2	11.1	ug/L	SW846 6020		08/17/00	08/25/00	KG
Lead	13.3 U	13.3	ug/L	SW846 6020		08/17/00	09/11/00	K
Lead	66.7 U	66.7	ug/L	SW846 6020		08/17/00	08/25/00	KGF

F-701

CT&E Environmental Services Inc.

CT&E Ref.#	1004695002	**Client PO#**	Auth 48 Job #39551
Client Name	Harding Lawson & Assoc	**Printed Date/Time**	10/24/2000 15:29
Project Name/#	47411 Red Devil Mine	**Collected Date/Time**	08/14/2000 15:00
Client Sample ID	RDV02WA	**Received Date/Time**	08/15/2000 15:00
Matrix	Water (Surface, Eff., Ground)	**Technical Director**	**Stephen C. Ede**
Ordered By		**Released By**	J Windebank

Sample Remarks:

Parameter	Results	PQL	Units	Method	Allowable Limits	Prep Date	Analysis Date	Init
Metals Department								
Mercury by Cold Vapor	0.0112	0.00200	mg/L	SW7470/E245.1		08/19/00	08/20/00	JDT
UST Metals								
Antimony	39.8	22.2	ug/L	SW846 6020		08/17/00	08/25/00	KGF
Arsenic	36.9	11.1	ug/L	SW846 6020		08/17/00	08/25/00	KGF
Lead	13.3 U	13.3	ug/L	SW846 6020		08/17/00	09/11/00	KGF
Lead	66.7 U	66.7	ug/L	SW846 6020		08/17/00	08/25/00	KGF

F-701

CT&E Environmental Services Inc.

CT&E Ref.#	1004695003	**Client PO#**	Auth 48 Job #39551
Client Name	Harding Lawson & Assoc	**Printed Date/Time**	10/24/2000 15:29
Project Name/#	47411 Red Devil Mine	**Collected Date/Time**	08/14/2000 15:30
Client Sample ID	RDV03WA	**Received Date/Time**	08/15/2000 15:00
Matrix	Water (Surface, Eff., Ground)	**Technical Director**	**Stephen C. Ede**
Ordered By		**Released By**	J Windebank

Sample Remarks:

Parameter	Results	PQL	Units	Method	Allowable Limits	Prep Date	Analysis Date	Init
Metals Department								
Mercury by Cold Vapor	0.00531	0.00200	mg/L	SW7470/E245.1		08/19/00	08/20/00	JD
UST Metals								
Antimony	1010	22.2	ug/L	SW846 6020		08/17/00	08/25/00	KGF
Arsenic	129	11.1	ug/L	SW846 6020		08/17/00	08/25/00	KGF
Lead	66.7 U	66.7	ug/L	SW846 6020		08/17/00	08/25/00	KGF
Lead	13.3 U	13.3	ug/L	SW846 6020		08/17/00	09/11/00	KGF

F-701

CT&E Environmental Services Inc.

CT&E Ref.#	1004695004	**Client PO#**	Auth 48 Job #39551
Client Name	Harding Lawson & Assoc	**Printed Date/Time**	10/24/2000 15:29
Project Name/#	47411 Red Devil Mine	**Collected Date/Time**	08/14/2000 16:00
Client Sample ID	RDV04WA	**Received Date/Time**	08/15/2000 15:00
Matrix	Water (Surface, Eff., Ground)	**Technical Director**	**Stephen C. Ede**
Ordered By		**Released By**	J Windebank

Sample Remarks:

Parameter	Results	PQL	Units	Method	Allowable Limits	Prep Date	Analysis Date	Init
Metals Department								
Mercury by Cold Vapor	0.000829	0.000200	mg/L	SW7470/E245.1		08/19/00	08/20/00	JDT
UST Metals								
Antimony	90.3	22.2	ug/L	SW846 6020		08/17/00	08/25/00	KGF
Arsenic	52.3	11.1	ug/L	SW846 6020		08/17/00	08/25/00	KGF
Lead	13.3 U	13.3	ug/L	SW846 6020		08/17/00	09/11/00	KGF
Lead	66.7 U	66.7	ug/L	SW846 6020		08/17/00	08/25/00	KGF

F-701

CT&E Environmental Services Inc.

CT&E Ref.#	1004695005	**Client PO#**	Auth 48 Job #39551
Client Name	Harding Lawson & Assoc	**Printed Date/Time**	10/24/2000 15:29
Project Name/#	47411 Red Devil Mine	**Collected Date/Time**	08/14/2000 16:45
Client Sample ID	RDV05WA	**Received Date/Time**	08/15/2000 15:00
Matrix	Water (Surface, Eff., Ground)	**Technical Director**	**Stephen C. Ede**
Ordered By		**Released By**	J Windebank

Sample Remarks:

SW6020 Metals by ICP-MS : MS/MSD recoveries were outside limits, a PDS was performed and was within limits

Parameter	Results	PQL	Units	Method	Allowable Limits	Prep Date	Analysis Date	Init
Metals Department								
Mercury by Cold Vapor	0.000200 U	0.000200	mg/L	SW7470/E245.1		08/19/00	08/20/00	JDT
UST Metals								
Antimony	103	22.7	ug/L	SW846 6020		08/17/00	08/25/00	KGF
Arsenic	25.4	11.4	ug/L	SW846 6020		08/17/00	08/25/00	KGF
Lead	13.6 U	13.6	ug/L	SW846 6020		08/17/00	09/11/00	KGF
Lead	68.2 U	68.2	ug/L	SW846 6020		08/17/00	08/25/00	KGF

F-701

CT&E Environmental Services Inc.

CT&E Ref.#	1004695006	**Client PO#**	Auth 48 Job #39551
Client Name	Harding Lawson & Assoc	**Printed Date/Time**	08/31/2000 11:44
Project Name/#	47411 Red Devil Mine	**Collected Date/Time**	08/14/2000 17:05
Client Sample ID	RDV06WA	**Received Date/Time**	08/15/2000 15:00
Matrix	Water (Surface, Eff., Ground)	**Technical Director**	**Stephen C. Ede**
Ordered By		**Released By**	J C Windebank

Sample Remarks:

Parameter	Results	PQL	Units	Method	Allowable Limits	Prep Date	Analysis Date	Init
Metals Department								
Mercury by Cold Vapor	0.00548	0.00200	mg/L	SW7470/E245.1		08/19/00	08/20/00	JDT
Metals by ICP/MS								
Antimony	22.2 U	22.2	ug/L	SW846 6020		08/17/00	08/25/00	KGF
Arsenic	114	11.1	ug/L	SW846 6020		08/17/00	08/25/00	KGF
Lead	205	66.7	ug/L	SW846 6020		08/17/00	08/25/00	KGF

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CT&E Environmental Services Inc.

CT&E Ref.#	1004695007	**Client PO#**	Auth 48 Job #39551
Client Name	Harding Lawson & Assoc	**Printed Date/Time**	08/31/2000 11:44
Project Name/#	47411 Red Devil Mine	**Collected Date/Time**	08/15/2000 0:00
Client Sample ID	RDV07WA	**Received Date/Time**	08/15/2000 15:00
Matrix	Water (Surface, Eff., Ground)	**Technical Director**	**Stephen C. Ede**
Ordered By		**Released By**	J Windebank

Sample Remarks:

Parameter	Results	PQL	Units	Method	Allowable Limits	Prep Date	Analysis Date	Init
Barium	124	2.00	ug/L	EPA 200.8			08/30/00	K[redacted]
Lead	2.00 U	2.00	ug/L	EPA 200.8			08/30/00	KGF
Iron	250 U	250	ug/L	EPA 200.8			08/30/00	K[redacted]
Copper	84.5	7.50	ug/L	EPA 200.8			08/30/00	K[redacted]
Cobalt	25.0 U	25.0	ug/L	EPA 200.8			08/30/00	KGF
Chromium	12.5 U	12.5	ug/L	EPA 200.8			08/30/00	K[redacted]
Calcium	18600	2500	ug/L	EPA 200.8			08/30/00	K[redacted]
Beryllium	0.500 U	0.500	ug/L	EPA 200.8			08/30/00	KGF
Nickel	50.0 U	50.0	ug/L	EPA 200.8			08/30/00	K[redacted]
Arsenic	10.0 U	10.0	ug/L	EPA 200.8			08/30/00	K[redacted]
Antimony	4.00 U	4.00	ug/L	EPA 200.8			08/30/00	KGF
Aluminum	75.0 U	75.0	ug/L	EPA 200.8			08/30/00	K[redacted]
Manganese	13.1	10.0	ug/L	EPA 200.8			08/30/00	K[redacted]
Cadmium	1.00 U	1.00	ug/L	EPA 200.8			08/30/00	KGF
Zinc	100 U	100	ug/L	EPA 200.8			08/30/00	K[redacted]
Magnesium	7200	250	ug/L	EPA 200.8			08/30/00	K[redacted]
Mercury by Cold Vapor	0.000200 U	0.000200	mg/L	SW7470/E245.1		08/19/00	08/20/00	JDT
Vanadium	12.5 U	12.5	ug/L	EPA 200.8			08/30/00	K[redacted]
Thallium	0.150 U	0.150	ug/L	EPA 200.8			08/30/00	K[redacted]
Sodium	2990	2000	ug/L	EPA 200.8			08/30/00	KGF
Silver	2.00 U	2.00	ug/L	EPA 200.8			08/30/00	K[redacted]
Selenium	3.00 U	3.00	ug/L	EPA 200.8			08/30/00	K[redacted]
Potassium	2500 U	2500	ug/L	EPA 200.8			08/30/00	KGF

Microbiology Laboratory

Fecal Coliform	0		col/100mL	SM18 9222D			08/15/00	K[redacted]

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CT&E Environmental Services Inc.

CT&E Ref.#	1004695008	**Client PO#**	Auth 48 Job #39551
Client Name	Harding Lawson & Assoc	**Printed Date/Time**	08/31/2000 11:44
Project Name/#	47411 Red Devil Mine	**Collected Date/Time**	08/12/2000 10:45
Client Sample ID	RDV24SL	**Received Date/Time**	08/15/2000 15:00
Matrix	Soil/Solid	**Technical Director**	**Stephen C. Ede**
Ordered By		**Released By**	J W Indlebank

Sample Remarks:

Parameter	Results	PQL	Units	Method	Allowable Limits	Prep Date	Analysis Date	Init
Solids								
Total Solids	93.0		%	SM20 2540G			08/17/00	JCO
Metals Department								
Mercury by Cold Vapor	396	188	mg/Kg	SW846-7471A		08/17/00	08/22/00	JDT
Metals by ICP/MS								
Antimony	37.5	8.76	mg/Kg	SW846 6020		08/17/00	08/25/00	KGF
Arsenic	380	4.38	mg/Kg	SW846 6020		08/17/00	08/25/00	KGF
Lead	26.3 U	26.3	mg/Kg	SW846 6020		08/17/00	08/25/00	KGF

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CT&E Environmental Services Inc.

CT&E Ref.#	1004695009	**Client PO#**	Auth 48 Job #39551
Client Name	Harding Lawson & Assoc	**Printed Date/Time**	08/31/2000 11:44
Project Name/#	47411 Red Devil Mine	**Collected Date/Time**	08/12/2000 10:55
Client Sample ID	RDV25SL	**Received Date/Time**	08/15/2000 15:00
Matrix	Soil/Solid	**Technical Director**	**Stephen C. Ede**
Ordered By		**Released By**	J Windebank

Sample Remarks:

Parameter	Results	PQL	Units	Method	Allowable Limits	Prep Date	Analysis Date	Init
Solids								
Total Solids	91.1		%	SM20 2540G			08/17/00	JC
Metals Department								
Mercury by Cold Vapor	1110	192	mg/Kg	SW846-7471A		08/17/00	08/22/00	JDT
Metals by ICP/MS								
Antimony	2560	10.7	mg/Kg	SW846 6020		08/17/00	08/25/00	KG
Arsenic	2540	5.37	mg/Kg	SW846 6020		08/17/00	08/25/00	KG
Lead	32.2 U	32.2	mg/Kg	SW846 6020		08/17/00	08/25/00	KGF

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CT&E Environmental Services Inc.

CT&E Ref.#	1004695010	**Client PO#**	Auth 48 Job #39551
Client Name	Harding Lawson & Assoc	**Printed Date/Time**	08/31/2000 11:44
Project Name/#	47411 Red Devil Mine	**Collected Date/Time**	08/12/2000 11:00
Client Sample ID	RDV26SL	**Received Date/Time**	08/15/2000 15:00
Matrix	Soil/Solid	**Technical Director**	**Stephen C. Ede**
Ordered By		**Released By**	J Windlebank

Sample Remarks:

Parameter	Results	PQL	Units	Method	Allowable Limits	Prep Date	Analysis Date	Init
Solids								
Total Solids	90.1		%	SM20 2540G			08/17/00	JCO
Metals Department								
Mercury by Cold Vapor	212	195	mg/Kg	SW846-7471A		08/17/00	08/22/00	JDT
Metals by ICP/MS								
Antimony	3490	9.26	mg/Kg	SW846 6020		08/17/00	08/25/00	KGF
Arsenic	2010	4.63	mg/Kg	SW846 6020		08/17/00	08/25/00	KGF
Lead	27.8 U	27.8	mg/Kg	SW846 6020		08/17/00	08/25/00	KGF

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CT&E Environmental Services Inc.

CT&E Ref.#	1004695011	**Client PO#**	Auth 48 Job #39551
Client Name	Harding Lawson & Assoc	**Printed Date/Time**	08/31/2000 11:44
Project Name/#	47411 Red Devil Mine	**Collected Date/Time**	08/12/2000 11:10
Client Sample ID	RDV27SL	**Received Date/Time**	08/15/2000 15:00
Matrix	Soil/Solid	**Technical Director**	**Stephen C. Ede**
Ordered By		**Released By**	J Windebank

Sample Remarks:

Parameter	Results	PQL	Units	Method	Allowable Limits	Prep Date	Analysis Date	Init
Solids								
Total Solids	85.9		%	SM20 2540G			08/17/00	JC
Metals Department								
Mercury by Cold Vapor	472	214	mg/Kg	SW846-7471A		08/17/00	08/22/00	JDT
Metals by ICP/MS								
Antimony	677	8.93	mg/Kg	SW846 6020		08/17/00	08/25/00	KG
Arsenic	1030	4.46	mg/Kg	SW846 6020		08/17/00	08/25/00	KG
Lead	26.8 U	26.8	mg/Kg	SW846 6020		08/17/00	08/25/00	KGF

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CT&E Environmental Services Inc.

CT&E Ref.#	1004695012	**Client PO#**	Auth 48 Job #39551
Client Name	Harding Lawson & Assoc	**Printed Date/Time**	08/31/2000 11:44
Project Name/#	47411 Red Devil Mine	**Collected Date/Time**	08/12/2000 11:20
Client Sample ID	RV28SL	**Received Date/Time**	08/15/2000 15:00
Matrix	Soil/Solid	**Technical Director**	**Stephen C. Ede**
Ordered By		**Released By**	J Windebank

Sample Remarks:

Parameter	Results	PQL	Units	Method	Allowable Limits	Prep Date	Analysis Date	Init
Solids								
Total Solids	87.4		%	SM20 2540G			08/17/00	JCO
Metals Department								
Mercury by Cold Vapor	533	215	mg/Kg	SW846-7471A		08/17/00	08/22/00	JDT
Metals by ICP/MS								
Antimony	966	11.1	mg/Kg	SW846 6020		08/17/00	08/25/00	KGF
Arsenic	1160	5.54	mg/Kg	SW846 6020		08/17/00	08/25/00	KGF
Lead	33.2 U	33.2	mg/Kg	SW846 6020		08/17/00	08/25/00	KGF

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CT&E Environmental Services Inc.

CT&E Ref.#	1004695013	**Client PO#**	Auth 48 Job #39551
Client Name	Harding Lawson & Assoc	**Printed Date/Time**	08/31/2000 11:44
Project Name/#	47411 Red Devil Mine	**Collected Date/Time**	08/13/2000 9:45
Client Sample ID	RDV29SL	**Received Date/Time**	08/15/2000 15:00
Matrix	Soil/Solid	**Technical Director**	**Stephen C. Ede**
Ordered By		**Released By**	J Windebank

Sample Remarks:

Parameter	Results	PQL	Units	Method	Allowable Limits	Prep Date	Analysis Date	Init
Solids								
Total Solids	84.3		%	SM20 2540G			08/17/00	JC
Waters Department								
Total Organic Carbon	22470	2230	mg/Kg	TOC CTE SOP		08/25/00	08/25/00	SCL

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CT&E Environmental Services Inc.

CT&E Ref.#	1004695014	**Client PO#**	Auth 48 Job #39551
Client Name	Harding Lawson & Assoc	**Printed Date/Time**	08/31/2000 11:44
Project Name/#	47411 Red Devil Mine	**Collected Date/Time**	08/13/2000 10:00
Client Sample ID	RDV30SL	**Received Date/Time**	08/15/2000 15:00
Matrix	Soil/Solid	**Technical Director**	**Stephen C. Ede**
Ordered By		**Released By**	J Windlebank

Sample Remarks:

Parameter	Results	PQL	Units	Method	Allowable Limits	Prep Date	Analysis Date	Init
Solids								
Total Solids	72.2		%	SM20 2540G			08/17/00	JCO
Waters Department								
Total Organic Carbon	8197	2160	mg/Kg	TOC CTE SOP		08/25/00	08/25/00	SCL

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CT&E Environmental Services Inc.

CT&E Ref.#	327363	Undigested Duplicate	**Printed Date/Time**	08/31/2000 11:45
Client Name	Harding Lawson & Assoc		**Prep Batch**	
Project Name/#	47411 Red Devil Mine		**Method**	
Original	1004695007		**Date**	
Matrix	Water (Surface, Eff., Ground)			

QC results affect the following production samples:

1004695007

Parameter	Original Result	QC Result	RPD	RPD Limits	Analysis Date	Init
Lead	2.00 U	2.00 U		(< 20)	08/30/00	KGF
Zinc	100 U	100 U		(< 20)	08/30/00	KGF
Vanadium	12.5 U	12.5 U		(< 20)	08/30/00	KGF
Thallium	0.150 U	0.150 U			08/30/00	KGF
Sodium	2990	3130	4.50	(< 20)	08/30/00	KGF
Silver	2.00 U	2.00 U		(< 20)	08/30/00	KGF
Selenium	3.00 U	3.00 U		(< 20)	08/30/00	KGF
Potassium	2500 U	1030 J *	200.00	(< 20)	08/30/00	KGF
Nickel	50.0 U	2.70 J *	200.00	(< 20)	08/30/00	KGF
Molybdenum		2.50 U			08/30/00	KGF
Magnesium	7200	8000	10.50	(< 20)	08/30/00	KGF
Iron	250 U	250 U		(< 20)	08/30/00	KGF
Copper	84.5	82.2	2.70	(< 20)	08/30/00	KGF
Cobalt	25.0 U	25.0 U		(< 20)	08/30/00	KGF
Chromium	12.5 U	12.5 U		(< 20)	08/30/00	KGF
Calcium	18600	18500	0.16	(< 20)	08/30/00	KGF
Cadmium	1.00 U	1.00 U		(< 20)	08/30/00	KGF
Beryllium	0.500 U	0.500 U		(< 20)	08/30/00	KGF
Barium	124	129	4.20	(< 20)	08/30/00	KGF
Arsenic	10.0 U	10.0 U		(< 20)	08/30/00	KGF
Antimony	4.00 U	4.00 U		(< 20)	08/30/00	KGF
Aluminum	75.0 U	75.0 U		(< 20)	08/30/00	KGF
Manganese	13.1	13.6	3.60	(< 20)	08/30/00	KGF

Batch MMS 1214
Method EPA 200.8
Instrument Perkin Elmer Sciex ICP-MS P3

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CT&E Environmental Services Inc.

CT&E Ref.#	324386	Method Blank	**Printed Date/Time**	08/31/2000 11:45	
Client Name	Harding Lawson & Assoc		**Prep**	**Batch**	MXX 7725
Project Name/#	47411 Red Devil Mine			**Method**	
Matrix	Water (Surface, Eff., Ground)			**Date**	08/19/2000

QC results affect the following production samples:

1004695001, 1004695002, 1004695003, 1004695004, 1004695005, 1004695006, 1004695007

Parameter	Results	PQL	Units	Analysis Date	Init
Metals Department					
Mercury by Cold Vapor	0.000200 U	0.00020	mg/L	08/20/00	JDT

Batch MCV 2168
Method SW7470/E245.1
Instrument HgAA Leeman AutoAnalyzer PS200

F-701

CT&E Environmental Services Inc.

CT&E Ref.#	324387 Lab Control Sample	**Printed Date/Time**	08/31/2000 11:45
		Prep Batch	MXX 7725
Client Name	Harding Lawson & Assoc	**Method**	
Project Name/#	47411 Red Devil Mine	**Date**	08/19/2000
Matrix	Water (Surface, Eff., Ground)		

QC results affect the following production samples:

1004695001, 1004695002, 1004695003, 1004695004, 1004695005, 1004695006, 1004695007

Parameter		QC Results	Pct Recov	LCS/LCSD Limits	RPD	RPD Limits	Spiked Amount	Analysis Date	Init
Metals Department									
Mercury by Cold Vapor	LCS	0.00193	97	(85-115)			0.002 mg/L	08/20/00	JDT

Batch MCV 2168
Method SW7470/E245.1
Instrument HgAA Leeman AutoAnalyzer PS200

F-701

CT&E Environmental Services Inc.

CT&E Ref.#	324896	Method Blank	**Printed Date/Time**		08/31/2000 11:45
Client Name	Harding Lawson & Assoc		**Prep**	**Batch**	MXX 7730
Project Name/#	47411 Red Devil Mine			**Method**	
Matrix	Water (Surface, Eff., Ground)			**Date**	08/17/2000

QC results affect the following production samples:

1004695008, 1004695009, 1004695010, 1004695011, 1004695012

Parameter	Results	PQL	Units	Analysis Date	Init
Metals Department					
Mercury by Cold Vapor	0.000200 U	0.00020	mg/L	08/22/00	JDT

Batch MCV 2170
Method SW846-7471A
Instrument HgAA Leeman AutoAnalyzer PS200

F-701

CT&E Environmental Services Inc.

CT&E Ref.#	324897 Lab Control Sample	**Printed Date/Time**	08/31/2000 11:45
		Prep Batch	MXX 7730
Client Name	Harding Lawson & Assoc	**Method**	
Project Name/#	47411 Red Devil Mine	**Date**	08/17/2000
Matrix	Water (Surface, Eff., Ground)		

QC results affect the following production samples:

1004695008, 1004695009, 1004695010, 1004695011, 1004695012

Parameter		QC Results	Pct Recov	LCS/LCSD Limits	RPD	RPD Limits	Spiked Amount	Analysis Date	Init
Metals Department									
Mercury by Cold Vapor	LCS	0.00207	104	(85-115)			0.002 mg/L	08/22/00	JDT

Batch MCV 2170
Method SW846-7471A
Instrument HgAA Leeman AutoAnalyzer PS200

F-701

CT&E Environmental Services Inc.

CT&E Ref.#	324072	Method Blank	**Printed Date/Time**	08/31/2000 11:45
Client Name	Harding Lawson & Assoc		**Prep**	**Batch**
Project Name/#	47411 Red Devil Mine			**Method**
Matrix	Soil/Solid			**Date**

QC results affect the following production samples:

1004695008, 1004695009, 1004695010, 1004695011, 1004695012, 1004695013, 1004695014

Parameter	Results	PQL	Units	Analysis Date	Init
Solids					
Total Solids	99.9		%	08/17/00	JCO

Batch SPT 3462
Method SM20 2540G
Instrument

F-701

CT&E Environmental Services Inc.

CT&E Ref.#	324073	Duplicate	**Printed Date/Time**	08/31/2000 11:45
Client Name	Harding Lawson & Assoc		**Prep**	**Batch**
Project Name/#	47411 Red Devil Mine			**Method**
Original	1004657001			**Date**
Matrix	Soil/Solid			

QC results affect the following production samples:
1004695008, 1004695009, 1004695010, 1004695011, 1004695012, 1004695013, 1004695014

Parameter	Original Result	QC Result	RPD	RPD Limits	Analysis Date	Init
Solids						
Total Solids	95.3	94.8	0.47		08/17/00	JCC

Batch SPT 3462
Method SM20 2540G
Instrument

F-701

CT&E Environmental Services Inc.

CT&E Ref.#	323647	Method Blank	**Printed Date/Time**	08/31/2000 11:45
Client Name	Harding Lawson & Assoc		**Prep**	**Batch**
Project Name/#	47411 Red Devil Mine			**Method**
Matrix	Water (Surface, Eff., Ground)			**Date**

QC results affect the following production samples:

1004695007

Parameter	Results	PQL	Units	Analysis Date	Init
Microbiology Laboratory					
Fecal Coliform		0	col/100mL	08/15/00	KAP

Batch BTF 3777
Method SM18 9222D
Instrument

F-701

CT&E Environmental Services Inc.

CT&E Ref.#	326440	Method Blank	**Printed Date/Time**	08/31/2000 11:45	
Client Name	Harding Lawson & Assoc		**Prep**	**Batch**	WXX 2580
Project Name/#	47411 Red Devil Mine			**Method**	
Matrix	Soil/Solid			**Date**	08/25/2000

QC results affect the following production samples:

1004695013, 1004695014

Parameter	Results	PQL	Units	Analysis Date	Init
Waters Department					
Total Organic Carbon	1000 U	1000	mg/Kg	08/25/00	SCL

Batch WTC 1290
Method TOC CTE SOP
Instrument TOC Analyzer

F-7031

CT&E Environmental Services Inc.

CT&E Ref.#	326441 Lab Control Sample	**Printed Date/Time**	08/31/2000 11:45
		Prep Batch	WXX 2580
Client Name	Harding Lawson & Assoc	**Method**	
Project Name/#	47411 Red Devil Mine	**Date**	08/25/2000
Matrix	Soil/Solid		

QC results affect the following production samples:

1004695013, 1004695014

Parameter		QC Results	Pct Recov	LCS/LCSD Limits	RPD	RPD Limits	Spiked Amount	Analysis Date	Init
Waters Department									
Total Organic Carbon	LCS	8207 J	93	(75-125)			8800 mg/Kg	08/25/00	SCL

Batch WTC 1290
Method TOC CTE SOP
Instrument TOC Analyzer

F-701

CT&E Environmental Services Inc.

CT&E Ref.#	323704 Method Blank		**Printed Date/Time**	08/31/2000 11:45	
Client Name	Harding Lawson & Assoc		**Prep**	**Batch**	MXX 7710
Project Name/#	47411 Red Devil Mine			**Method**	
Matrix	Water (Surface, Eff., Ground)			**Date**	08/17/2000

QC results affect the following production samples:

1004695001, 1004695002, 1004695003, 1004695004, 1004695005, 1004695006

Parameter	Results	PQL	Units	Analysis Date	Init
Thallium	0.0656	0.0222	ug/L	08/25/00	KGF

Batch MMS 1205
Method SW846 6020
Instrument Perkin Elmer Sciex ICP-MS P3

Metals by ICP/MS

Aluminum	55.6 U	55.6	ug/L	08/25/00	KGF
Antimony	2.22 U	2.22	ug/L	08/25/00	KGF
Arsenic	1.11 U	1.11	ug/L	08/25/00	KGF
Barium	2.22 U	2.22	ug/L	08/25/00	KGF
Beryllium	0.0778 U	0.0778	ug/L	08/25/00	KGF
Cadmium	0.111 U	0.111	ug/L	08/25/00	KGF
Calcium	83.3 U	83.3	ug/L	08/25/00	KGF
Chromium	2.22 U	2.22	ug/L	08/25/00	KGF
Cobalt	0.333 U	0.333	ug/L	08/25/00	KGF
Iron	55.6 U	55.6	ug/L	08/25/00	KGF
Copper	6.67 U	6.67	ug/L	08/25/00	KGF
Lead	6.67 U	6.67	ug/L	08/25/00	KGF
Potassium	111 U	111	ug/L	08/25/00	KGF
Selenium	1.11 U	1.11	ug/L	08/25/00	KGF
Silver	0.444 U	0.444	ug/L	08/25/00	KGF
Sodium	111 U	111	ug/L	08/25/00	KGF
Strontium	0.00111		ug/L	08/25/00	KGF
Vanadium	0.222 U	0.222	ug/L	08/25/00	KGF
Zinc	5.56 U	5.56	ug/L	08/25/00	KGF
Magnesium	11.1 U	11.1	ug/L	08/25/00	KGF
Manganese	11.1 U	11.1	ug/L	08/25/00	KGF
Molybdenum	0.556 U	0.556	ug/L	08/25/00	KGF
Nickel	6.67 U	6.67	ug/L	08/25/00	KGF

Batch MMS 1205
Method SW846 6020
Instrument Perkin Elmer Sciex ICP-MS P3

CT&E Environmental Services Inc.

CT&E Ref.#	323705 Lab Control Sample	**Printed Date/Time**	08/31/2000 11:45
		Prep Batch	MXX 7710
Client Name	Harding Lawson & Assoc	**Method**	
Project Name/#	47411 Red Devil Mine	**Date**	08/17/2000
Matrix	Water (Surface, Eff., Ground)		

QC results affect the following production samples:

1004695001, 1004695002, 1004695003, 1004695004, 1004695005, 1004695006

Parameter		QC Results	Pct Recov	LCS/LCSD Limits	RPD	RPD Limits	Spiked Amount	Analysis Date	Init
Thallium	LCS	1190	103	(85-115)			1150 ug/L	08/25/00	KGF

Batch MMS 1205
Method SW846 6020
Instrument Perkin Elmer Sciex ICP-MS P3

Metals by ICP/MS

Aluminum	LCS	1210	106	(85-115)			1140 ug/L	08/25/00	KGF
Antimony	LCS	1190	104	(85-115)			1140 ug/L	08/25/00	KGF
Arsenic	LCS	1200	106	(85-115)			1140 ug/L	08/25/00	KGF
Barium	LCS	1220	108	(85-115)			1140 ug/L	08/25/00	KGF
Beryllium	LCS	516	113	(85-115)			457 ug/L	08/25/00	KGF
Cadmium	LCS	598	105	(85-115)			568 ug/L	08/25/00	KGF
Calcium	LCS	12300	108	(85-115)			11400 ug/L	08/25/00	KGF
Chromium	LCS	1190	105	(85-115)			1140 ug/L	08/25/00	KGF
Cobalt	LCS	1100	97	(85-115)			1140 ug/L	08/25/00	KGF
Iron	LCS	1130	100	(85-115)			1140 ug/L	08/25/00	KGF
Copper	LCS	1160	102	(85-115)			1140 ug/L	08/25/00	KGF
Lead	LCS	1210	106	(85-115)			1140 ug/L	08/25/00	KGF
Potassium	LCS	11400	100	(85-115)			11400 ug/L	08/25/00	KGF
Selenium	LCS	1140	101	(85-115)			1140 ug/L	08/25/00	KGF
Silver	LCS	214	94	(85-115)			227 ug/L	08/25/00	KGF
Sodium	LCS	12700	112	(85-115)			11400 ug/L	08/25/00	KGF
Vanadium	LCS	1200	106	(85-115)			1140 ug/L	08/25/00	KGF
Zinc	LCS	1260	111	(85-115)			1140 ug/L	08/25/00	KGF
Magnesium	LCS	12600	111	(85-115)			11400 ug/L	08/25/00	KGF
Manganese	LCS	1180	104	(85-115)			1140 ug/L	08/25/00	KGF
Nickel	LCS	1160	102	(85-115)			1140 ug/L	08/25/00	KGF

Batch MMS 1205
Method SW846 6020
Instrument Perkin Elmer Sciex ICP-MS P3

CT&E Environmental Services Inc.

CT&E Ref.#	323716	Method Blank	**Printed Date/Time**	08/31/2000 11:45	
Client Name	Harding Lawson & Assoc		**Prep Batch**	MXX	7711
Project Name/#	47411 Red Devil Mine		**Method**		
Matrix	Soil/Solid		**Date**	08/17/2000	

QC results affect the following production samples:

1004695008, 1004695009, 1004695010, 1004695011, 1004695012

Parameter	Results	PQL	Units	Analysis Date	Init
Thallium	0.0110	0.00100	mg/Kg	08/25/00	KGF

Batch MMS 1205
Method SW846 6020
Instrument Perkin Elmer Sciex ICP-MS P3

Metals by ICP/MS

Aluminum	2.50 U	2.50	mg/Kg	08/25/00	KGF
Antimony	0.100 U	0.100	mg/Kg	08/25/00	KGF
Arsenic	0.0500 U	0.0500	mg/Kg	08/25/00	KGF
Barium	0.100 U	0.100	mg/Kg	08/25/00	KGF
Beryllium	0.00400 U	0.00400	mg/Kg	08/25/00	KGF
Cadmium	0.0172	0.00500	mg/Kg	08/25/00	KGF
Calcium	3.75 U	3.75	mg/Kg	08/25/00	KGF
Chromium	0.0296 J	0.100	mg/Kg	08/25/00	KGF
Cobalt	0.0150 U	0.0150	mg/Kg	08/25/00	KGF
Iron	2.50 U	2.50	mg/Kg	08/25/00	KGF
Copper	0.300 U	0.300	mg/Kg	08/25/00	KGF
Lead	0.300 U	0.300	mg/Kg	08/25/00	KGF
Potassium	5.00 U	5.00	mg/Kg	08/25/00	KGF
Selenium	0.0500 U	0.0500	mg/Kg	08/25/00	KGF
Silver	0.0200 U	0.0200	mg/Kg	08/25/00	KGF
Sodium	5.00 U	5.00	mg/Kg	08/25/00	KGF
Vanadium	0.0100 U	0.0100	mg/Kg	08/25/00	KGF
Zinc	0.554	0.250	mg/Kg	08/25/00	KGF
Magnesium	0.500 U	0.500	mg/Kg	08/25/00	KGF
Manganese	0.500 U	0.500	mg/Kg	08/25/00	KGF
Molybdenum	0.0250 U	0.0250	mg/Kg	08/25/00	KGF
Nickel	0.300 U	0.300	mg/Kg	08/25/00	KGF

Batch MMS 1205
Method SW846 6020
Instrument Perkin Elmer Sciex ICP-MS P3

CT&E Environmental Services Inc.

CT&E Ref.#	323717 Lab Control Sample	**Printed Date/Time**	08/31/2000 11:45
		Prep Batch	MXX 7711
Client Name	Harding Lawson & Assoc	**Method**	
Project Name/#	47411 Red Devil Mine	**Date**	08/17/2000
Matrix	Soil/Solid		

QC results affect the following production samples:

1004695008, 1004695009, 1004695010, 1004695011, 1004695012

Parameter		QC Results	Pct Recov	LCS/LCSD Limits	RPD	RPD Limits	Spiked Amount	Analysis Date	Init
Thallium	LCS	51.5	102	(85-115)			50.5 mg/Kg	08/25/00	KGF

Batch MMS 1205
Method SW846 6020
Instrument Perkin Elmer Sciex ICP-MS P3

Metals by ICP/MS

Aluminum	LCS	52.4	105	(85-115)			50 mg/Kg	08/25/00	KGF
Antimony	LCS	51.0	102	(85-115)			50 mg/Kg	08/25/00	KGF
Arsenic	LCS	49.4	99	(85-115)			50 mg/Kg	08/25/00	KGF
Barium	LCS	52.8	106	(85-115)			50 mg/Kg	08/25/00	KGF
Beryllium	LCS	22.0	109	(85-115)			20.1 mg/Kg	08/25/00	KGF
Cadmium	LCS	26.5	106	(85-115)			25 mg/Kg	08/25/00	KGF
Calcium	LCS	505	101	(85-115)			500 mg/Kg	08/25/00	KGF
Chromium	LCS	50.2	100	(85-115)			50 mg/Kg	08/25/00	KGF
Cobalt	LCS	45.9	92	(85-115)			50 mg/Kg	08/25/00	KGF
Iron	LCS	45.9	92	(85-115)			50.1 mg/Kg	08/25/00	KGF
Copper	LCS	49.4	99	(85-115)			50 mg/Kg	08/25/00	KGF
Lead	LCS	52.7	105	(85-115)			50 mg/Kg	08/25/00	KGF
Potassium	LCS	466	93	(85-115)			500 mg/Kg	08/25/00	KGF
Selenium	LCS	47.2	94	(85-115)			50 mg/Kg	08/25/00	KGF
Silver	LCS	10.9	109	(85-115)			10 mg/Kg	08/25/00	KGF
Sodium	LCS	538	108	(85-115)			500 mg/Kg	08/25/00	KGF
Vanadium	LCS	49.9	100	(85-115)			50 mg/Kg	08/25/00	KGF
Zinc	LCS	59.8	120 *	(85-115)			50 mg/Kg	08/25/00	KGF
Magnesium	LCS	543	109	(85-115)			500 mg/Kg	08/25/00	KGF
Manganese	LCS	48.9	98	(85-115)			50 mg/Kg	08/25/00	KGF
Nickel	LCS	49.5	99	(85-115)			50 mg/Kg	08/25/00	KGF

Batch MMS 1205
Method SW846 6020
Instrument Perkin Elmer Sciex ICP-MS P3

F-701

DATA QUALITY ASSESSMENT

Laboratory: CTE Environmental Services
Batch No.: 1004781
Sampled: 00RDV31SL, 00RDV32SL, 00RDV33SL, 00RDV34SL, 00RDV35SL, 00RDV36SL, 00RDV37SL, 00RDV38SL, 00RDV39SL, 00RDV40SL

	Yes	No	Not Required
1. Were samples analyzed for requested parameters?	X		
2. Is the USACE Data Deliverables package complete?			X
3. Were samples extracted within holding time acceptance criteria?	X		
4. Were samples analyzed within holding time acceptance criteria?	X		
5. For soils, were sample results reported on a "dry weight" basis?		X	
6. Were method blanks analytes all reported as ND?		X	
7. For water, were trip blank analytes all reported as ND?			X
8. Are the surrogate percent recoveries within acceptance criteria?			X
9. Are the matrix spike percent recoveries within acceptance criteria?	X		
10. Are the matrix spike relative percent differences within acceptance criteria?	X		
11. Are the field duplicate relative percent differences less than 50 percent?		X	

Comments:

5) TCLP results for soils reported on a wet weight basis, which is standard of practice. Results are not affected.

6) Lead estimated at 0.0213 mg/L (below PQL) (CTE ref. #324879). Results should not be affected.

11) RPD for mercury for samples 00RDV39SL and 00RDV40SL was 85.93%. Results should not be affected.

Date: 3-30-01
Reviewer: JEQ

RECEIVED
SEP 2 6 2000
HARDING LAWSON
ASSOCIATES

CTE Environmental Services
Alaska Division
Laboratory Data Report

Project: 51192 Red Devil
Client: Harding Lawson & Assoc
CTE Work Order: 1004781

Contents:

Chain of Custody
Quality Control Summary Forms

Note:

Unless otherwise noted, all quality assurance/quality control criteria is in compliance with the proper regulatory authority and/or CTE's Quality Assurance Program Plan.

Case Narrative

Customer: HARLAWP **Harding Lawson & Assoc**

Project: 1004781 **51192 Red Devil**

There were no analytical anomalies associated with your data.

1004781

Harding Lawson Associates
601 East 57th Place
Anchorage, AK 99518
907 / 563-8102
907 / 561-4574 FAX

CHAIN OF CUSTODY FORM

Lab: 6

Samplers: K. Vincent + B. Miller

Project Number: 51192

Name/Location: Red Devil

Project Manager: Bryan Lund

Recorder: B. Miller (Signature Required)

	SOURCE CODE	MATRIX: Water	Sediment	Soil	Oil	#CONTAINERS & PRESERV.: Unpres.	H_2SO_4	HNO_3	SAMPLE NUMBER OR LAB NUMBER: Yr	Wk	Seq	DATE: Yr	Mo	Dy	Time	STATION DESCRIPTION/ NOTES	EPA 601/8010	EPA 602/8020	EPA 624/8240	EPA 625/8270	ICP METALS	EPA 8015M/TPH	TCLP/Ag 1311/7401	TCLP/As 1311/7060	TCLP/Sb 1311/7471	TCLP/Pb 1311/6010
1	50			X		1			00			000	8	03	1120	00RDV31SL							X	X	X	X
2	50			X		1						000	8	03	1545	00RDV32SL							X	X	X	X
3	50			X		1						000	8	03	1555	00RDV33SL							X	X	X	X
4	50			X		1						000	8	02	1640	00RDV34SL							X	X	X	X
5	50			X		1						000	8	04	0830	00RDV35SL							X	X	X	X
6	50			X		1						000	8	04	1055	00RDV36SL							X	X	X	X
7	50			X		1						000	8	04	1630	00RDV37SL							X	X	X	X
8	50			X		1						000	8	04	1530	00RDV38SL							X	X	X	X
9	50			X		1						000	8	04	0800	00RDV39SL							X	X	X	X
10	50			X		1						000	8	04	0815	00RDV40SL							X	X	X	X

LAB NUMBER: Yr	Wk	Seq	DEPTH IN FEET	COL MTD CD	QA CODE	MISCELLANEOUS

CHAIN OF CUSTODY RECORD

RELINQUISHED BY: (Signature)	RECEIVED BY: (Signature)	DATE/TIME
Beth M		
RELINQUISHED BY: (Signature)	RECEIVED BY: (Signature)	DATE/TIME
RELINQUISHED BY: (Signature)	RECEIVED BY: (Signature)	DATE/TIME
RELINQUISHED BY: (Signature)	RECEIVED BY: (Signature)	DATE/TIME
DISPATCHED BY: (Signature) DATE/TIME	RECEIVED FOR LAB BY: (Signature) E. Miller	DATE/TIME 8/18/ 14:15

METHOD OF SHIPMENT

Laboratory Copy White | Project Office Copy Yellow | Field or Office Copy Pink

6533

CT&E Environmental Services Inc.

SAMPLE RECEIPT FORM

1004781

01 :

1004781

Yes	No	
	✓	Are samples **RUSH**, priority, or *within 72 hrs* of **hold time**?
		If yes, have you done *e-mail notification*?
	✓	Are samples *within 24 hrs* of **hold time** or **due date**?
		If yes, have you *spoken with* Supervisor?
	✓	Are there any **problems** (e.g., ids, analyses)?
		Were samples preserved correctly and pH verified?

		Has Project Manager been notified of problems?
	✓	Is this an ACOE/AFCEE/ADEC project?
	✓	Will a **data package** be required?
		If this is for PWS, provide **PWSID**.
		Is there a **quote** for this project?
	✓	Will **courier** charges apply?

Completed by (sign): [signature] (print): Eva Freeman

Due Date: 9/1/00
Received Date/Time: 8/18 - 14:15
Cooler Temperature: 4 °C
Sample Condition: Good / Poor

Matrix of each Sample:

2	" "	1-10
	" "	
	" "	
	" "	
	Trip Blank	
	MS/MSD	

Additional Sample Remarks:

	AK101s/_____ 8260s field pres'd?
	Field-filtered for dissolved_____?
	Lab-filter for dissolved_____?
	Ref Lab required?

Notes:

*** The following *must* be completed for *all* ACOE & AFCEE projects: ***

Yes	No		Notes:
		Is cooler temperature 4 ± C?	
		thermometer used:	
		Was there an airbill, etc? note #:	
		Was cooler sealed with custody seals?	
		#/where?	
		Were seals intact upon arrival?	
		Was there a COC with cooler?	
		Was the COC filled out properly?	
		Did the COC indicate ACOE/AFCEE project?	
		Did the COC and samples correspond?	
		Were samples screened with Geiger counter?	
		Were all samples packed to prevent breakage?	
		packing material:	
		Were all samples unbroken and clearly labelled?	
		Were all samples sealed in separate plastic bags?	
		Were all bottles for volatiles free of headspace?	
		Were correct container/sample sizes submitted?	
		Was client notified of problems? (specify below)	

Individual contacted:

Date & Time: _____ Phone/Fax #: _____

# of each Container Received:

	950 ml amber	unpres'd
	950 ml amber	w/ HCl
	500 ml amber	w/ H2SO4
	1L cubies	unpres'd
	1L cubies	w/ HNO3
	1L cubies	w/ H2SO4
	1L cubies	w/ NaOH + ZnAc
	120 ml coli	bottles
	60 ml	Nalg
10	8 oz amber	unpres'd
	4 oz amber	unpres'd
	4 oz w/ septa	w/ MeOH
	40 ml vials	w/ HCl
	Other (specify)	
	Other (specify)	

#/Log In Proofed by: _____

Form Number: F004r2
Printed: 7/12/99

CT&E Environmental Services Inc.
Laboratory Division

Laboratory Analysis Report

200 W. Potter Drive
Anchorage, AK 99518-1605
Tel: (907) 562-2343
Fax: (907) 561-5301
Web: http://www.cteesi.com

Brian Lund
Harding Lawson & Assoc
601 East 57th Place
Anchorage, AK 99518

Work Order:	1004781
	51192 Red Devil
Client:	Harding Lawson & Assoc
Report Date:	September 07, 2000

Enclosed are the analytical results associated with the above workorder.

As required by the state of Alaska and the USEPA, a formal Quality Assurance/Quality Control Program is maintaned 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 analyte 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
!	Surrogate out of range

CT&E Environmental Services Inc.

CT&E Ref.#	1004781001	**Client PO#**	Auth 48 Job #39551
Client Name	Harding Lawson & Assoc	**Printed Date/Time**	09/08/2000 11:06
Project Name/#	51192 Red Devil	**Collected Date/Time**	08/03/2000 11:20
Client Sample ID	00RDV31SL	**Received Date/Time**	08/18/2000 14:15
Matrix	Other Solids (Wet Weight)	**Technical Director**	**Stephen C. Ede**
Ordered By		**Released By**	J. Windebank

Sample Remarks:

Parameter	Results		PQL	Units	Method	Allowable Limits	Prep Date	Analysis Date	Init
Characterization									
Aqueous Phase, Total	0.00			%	SW846-1311 TCLP			08/18/00	WA
Oil Phase, Total	0.00			%	SW846-1311 TCLP			08/18/00	WA
Solid Phase, Total	100			%	SW846-1311 TCLP			08/18/00	WA
TCLP Metals									
Antimony	46.1		2.00	mg/L	SW846-6010B TCLP		08/21/00	08/22/00	CM
Arsenic	22.8	*	5.00	mg/L	SW846-7060A TCLP	5 max	08/21/00	08/31/00	JM
Lead	1.00 U		1.00	mg/L	SW846-6010B TCLP	5 max	08/21/00	08/22/00	CMO
Mercury by Cold Vapor	0.0329		0.00200	mg/L	SW846-7470A TCLP	.2 max	08/22/00	08/23/00	JI

F-701

CT&E Environmental Services Inc.

CT&E Ref.#	1004781002	**Client PO#**	Auth 48 Job #39551
Client Name	Harding Lawson & Assoc	**Printed Date/Time**	09/08/2000 11:06
Project Name/#	51192 Red Devil	**Collected Date/Time**	08/03/2000 15:45
Client Sample ID	00RDV32SL	**Received Date/Time**	08/18/2000 14:15
Matrix	Other Solids (Wet Weight)	**Technical Director**	**Stephen C. Ede**
Ordered By		**Released By**	J Windebank

Sample Remarks:

Parameter	Results	PQL	Units	Method	Allowable Limits	Prep Date	Analysis Date	Init
Characterization								
Aqueous Phase, Total	0.00		%	SW846-1311 TCLP			08/18/00	WA
Oil Phase, Total	0.00		%	SW846-1311 TCLP			08/18/00	WA
Solid Phase, Total	100		%	SW846-1311 TCLP			08/18/00	WA
TCLP Metals								
Antimony	11.2	2.00	mg/L	SW846-6010B TCLP		08/21/00	08/22/00	CMO
Arsenic	1.97	0.500	mg/L	SW846-7060A TCLP	5 max	08/21/00	08/31/00	JMO
Lead	1.00 U	1.00	mg/L	SW846-6010B TCLP	5 max	08/21/00	08/22/00	CMO
Mercury by Cold Vapor	0.0452	0.00200	mg/L	SW846-7470A TCLP	.2 max	08/22/00	08/23/00	JDT

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CT&E Environmental Services Inc.

CT&E Ref.#	1004781005	**Client PO#**	Auth 48 Job #39551
Client Name	Harding Lawson & Assoc	**Printed Date/Time**	09/08/2000 11:06
Project Name/#	51192 Red Devil	**Collected Date/Time**	08/04/2000 8:30
Client Sample ID	00RDV35SL	**Received Date/Time**	08/18/2000 14:15
Matrix	Other Solids (Wet Weight)	**Technical Director**	**Stephen C. Ede**
Ordered By		**Released By**	J Windebank

Sample Remarks:
SW7060 GF Metal - MS/MSD recoveries for As were outside acceptance criteria; post digestion spike was successful.

Parameter	Results		PQL	Units	Method	Allowable Limits	Prep Date	Analysis Date	Init
Characterization									
Aqueous Phase, Total	0.00			%	SW846-1311 TCLP			08/18/00	WA
Oil Phase, Total	0.00			%	SW846-1311 TCLP			08/18/00	WA
Solid Phase, Total	100			%	SW846-1311 TCLP			08/18/00	WA
TCLP Metals									
Antimony	30.1		2.00	mg/L	SW846-6010B TCLP		08/21/00	08/22/00	CM
Arsenic	5.31	*	1.00	mg/L	SW846-7060A TCLP	5 max	08/21/00	09/06/00	JMC
Lead	1.00 U		1.00	mg/L	SW846-6010B TCLP	5 max	08/21/00	08/22/00	CMO
Mercury by Cold Vapor	0.0699		0.00200	mg/L	SW846-7470A TCLP	.2 max	08/22/00	08/23/00	JD

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CT&E Environmental Services Inc.

CT&E Ref.#	1004781006	**Client PO#**	Auth 48 Job #39551
Client Name	Harding Lawson & Assoc	**Printed Date/Time**	09/08/2000 11:06
Project Name/#	51192 Red Devil	**Collected Date/Time**	08/04/2000 10:55
Client Sample ID	00RDV36SL	**Received Date/Time**	08/18/2000 14:15
Matrix	Other Solids (Wet Weight)	**Technical Director**	**Stephen C. Ede**
Ordered By		**Released By**	J Windebank

Sample Remarks:

Parameter	Results		PQL	Units	Method	Allowable Limits	Prep Date	Analysis Date	Init
Characterization									
Aqueous Phase, Total	0.00			%	SW846-1311 TCLP			08/18/00	WA
Oil Phase, Total	0.00			%	SW846-1311 TCLP			08/18/00	WA
Solid Phase, Total	100			%	SW846-1311 TCLP			08/18/00	WA
TCLP Metals									
Antimony	19.0		2.00	mg/L	SW846-6010B TCLP		08/21/00	08/22/00	CMO
Arsenic	19.9	*	5.00	mg/L	SW846-7060A TCLP	5 max	08/21/00	08/31/00	JMO
Lead	1.00 U		1.00	mg/L	SW846-6010B TCLP	5 max	08/21/00	08/22/00	CMO
Mercury by Cold Vapor	0.0107		0.00200	mg/L	SW846-7470A TCLP	.2 max	08/22/00	08/23/00	JDT

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CT&E Environmental Services Inc.

CT&E Ref.#	1004781007	**Client PO#**	Auth 48 Job #39551
Client Name	Harding Lawson & Assoc	**Printed Date/Time**	09/08/2000 11:06
Project Name/#	51192 Red Devil	**Collected Date/Time**	08/04/2000 16:30
Client Sample ID	00RDV37SL	**Received Date/Time**	08/18/2000 14:15
Matrix	Other Solids (Wet Weight)	**Technical Director**	**Stephen C. Ede**
Ordered By		**Released By**	J Windebank

Sample Remarks:

Parameter	Results		PQL	Units	Method	Allowable Limits	Prep Date	Analysis Date	Init
Characterization									
Aqueous Phase, Total	0.00			%	SW846-1311 TCLP			08/18/00	WA
Oil Phase, Total	0.00			%	SW846-1311 TCLP			08/18/00	WA
Solid Phase, Total	100			%	SW846-1311 TCLP			08/18/00	WA
TCLP Metals									
Antimony	16.1		2.00	mg/L	SW846-6010B TCLP		08/21/00	08/22/00	CM
Arsenic	22.2	*	5.00	mg/L	SW846-7060A TCLP	5 max	08/21/00	08/31/00	JM
Lead	1.00 U		1.00	mg/L	SW846-6010B TCLP	5 max	08/21/00	08/22/00	CMO
Mercury by Cold Vapor	0.0296		0.00200	mg/L	SW846-7470A TCLP	.2 max	08/22/00	08/23/00	JD

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CT&E Environmental Services Inc.

CT&E Ref.#	1004781008	**Client PO#**	Auth 48 Job #39551
Client Name	Harding Lawson & Assoc	**Printed Date/Time**	09/08/2000 11:06
Project Name/#	51192 Red Devil	**Collected Date/Time**	08/04/2000 15:30
Client Sample ID	00RDV38SL	**Received Date/Time**	08/18/2000 14:15
Matrix	Other Solids (Wet Weight)	**Technical Director**	**Stephen C. Ede**
Ordered By		**Released By**	J Windlebank

Sample Remarks:

Parameter	Results	PQL	Units	Method	Allowable Limits	Prep Date	Analysis Date	Init
Characterization								
Aqueous Phase, Total	0.00		%	SW846-1311 TCLP			08/18/00	WA
Oil Phase, Total	0.00		%	SW846-1311 TCLP			08/18/00	WA
Solid Phase, Total	100		%	SW846-1311 TCLP			08/18/00	WA
TCLP Metals								
Antimony	16.7	2.00	mg/L	SW846-6010B TCLP		08/21/00	08/22/00	CMO
Arsenic	4.07	0.500	mg/L	SW846-7060A TCLP	5 max	08/21/00	08/31/00	JMO
Lead	1.00 U	1.00	mg/L	SW846-6010B TCLP	5 max	08/21/00	08/22/00	CMO
Mercury by Cold Vapor	0.0121	0.00200	mg/L	SW846-7470A TCLP	.2 max	08/22/00	08/23/00	JDT

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CT&E Environmental Services Inc.

CT&E Ref.#	1004781009	**Client PO#**	Auth 48 Job #39551
Client Name	Harding Lawson & Assoc	**Printed Date/Time**	09/08/2000 11:06
Project Name/#	51192 Red Devil	**Collected Date/Time**	08/04/2000 8:00
Client Sample ID	00RDV39SL	**Received Date/Time**	08/18/2000 14:15
Matrix	Other Solids (Wet Weight)	**Technical Director**	**Stephen C. Ede**
Ordered By		**Released By**	J Windebank

Sample Remarks:

Parameter	Results		PQL	Units	Method	Allowable Limits	Prep Date	Analysis Date	Init
Characterization									
Aqueous Phase, Total	0.00			%	SW846-1311 TCLP			08/18/00	WA
Oil Phase, Total	0.00			%	SW846-1311 TCLP			08/18/00	WA
Solid Phase, Total	100			%	SW846-1311 TCLP			08/18/00	WA
TCLP Metals									
Antimony	32.9		2.00	mg/L	SW846-6010B TCLP		08/21/00	08/22/00	CMO
Arsenic	9.98	*	1.00	mg/L	SW846-7060A TCLP	5 max	08/21/00	08/31/00	JM
Lead	1.00 U		1.00	mg/L	SW846-6010B TCLP	5 max	08/21/00	08/22/00	CMO
Mercury by Cold Vapor	0.00750		0.00200	mg/L	SW846-7470A TCLP	.2 max	08/22/00	08/23/00	JD

F-701

CT&E Environmental Services Inc.

CT&E Ref.#	1004781010	**Client PO#**	Auth 48 Job #39551
Client Name	Harding Lawson & Assoc	**Printed Date/Time**	09/08/2000 11:06
Project Name/#	51192 Red Devil	**Collected Date/Time**	08/04/2000 8:15
Client Sample ID	00RDV40SL	**Received Date/Time**	08/18/2000 14:15
Matrix	Other Solids (Wet Weight)	**Technical Director**	**Stephen C. Ede**
Ordered By		**Released By**	J Windlebank

Sample Remarks:

Parameter	Results		PQL	Units	Method	Allowable Limits	Prep Date	Analysis Date	Init
Characterization									
Aqueous Phase, Total	0.00			%	SW846-1311 TCLP			08/18/00	WA
Oil Phase, Total	0.00			%	SW846-1311 TCLP			08/18/00	WA
Solid Phase, Total	100			%	SW846-1311 TCLP			08/18/00	WA
TCLP Metals									
Antimony	31.8		2.00	mg/L	SW846-6010B TCLP		08/21/00	08/22/00	CMO
Arsenic	9.86	*	1.00	mg/L	SW846-7060A TCLP	5 max	08/21/00	08/31/00	JMO
Lead	1.00 U		1.00	mg/L	SW846-6010B TCLP	5 max	08/21/00	08/22/00	CMO
Mercury by Cold Vapor	0.0188		0.00200	mg/L	SW846-7470A TCLP	.2 max	08/22/00	08/23/00	JDT

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CT&E Environmental Services Inc.

CT&E Ref.#	324879	Method Blank	**Printed Date/Time**	09/07/2000 17:48	
Client Name	Harding Lawson & Assoc		**Prep Batch**	MXT	2825
Project Name/#	51192 Red Devil		**Method**		
Matrix	Water (Surface, Eff., Ground)		**Date**	08/21/2000	

QC results affect the following production samples:

1004781001, 1004781002, 1004781003, 1004781004, 1004781005, 1004781006, 1004781007, 1004781008, 1004781009, 1004781010

Parameter	Results	PQL	Units	Analysis Date	Init
TCLP Metals					
Antimony	0.200 U	0.200	mg/L	08/22/00	CMC
Lead	0.0213 J	0.100	mg/L	08/22/00	CMC

Batch MIP 3264
Method SW846-6010B TCLP
Instrument TJA Enviro II ICP P2

F-701

CT&E Environmental Services Inc.

CT&E Ref.#	324880 Lab Control Sample	**Printed Date/Time**	09/07/2000 17:48	
		Prep **Batch**	MXT 2825	
Client Name	Harding Lawson & Assoc	**Method**		
Project Name/#	51192 Red Devil	**Date**	08/21/2000	
Matrix	Water (Surface, Eff., Ground)			

QC results affect the following production samples:

1004781001, 1004781002, 1004781003, 1004781004, 1004781005, 1004781006, 1004781007, 1004781008, 1004781009, 1004781010

Parameter		QC Results	Pct Recov	LCS/LCSD Limits	RPD	RPD Limits	Spiked Amount	Analysis Date	Init
TCLP Metals									
Antimony	LCS	2.05	102	(85-115)			2 mg/L	08/22/00	CMO
Lead	LCS	2.09	104	(85-115)			2 mg/L	08/22/00	CMO

Batch MIP 3264
Method SW846-6010B TCLP
Instrument TJA Enviro II ICP P2

F-701

CT&E Environmental Services Inc.

CT&E Ref.#	324886	Method Blank	**Printed Date/Time**	09/07/2000 17:48	
Client Name	Harding Lawson & Assoc		**Prep**	**Batch**	MXT 2826
Project Name/#	51192 Red Devil			**Method**	
Matrix	Water (Surface, Eff., Ground)			**Date**	08/21/2000

QC results affect the following production samples:

1004781001, 1004781002, 1004781003, 1004781004, 1004781005, 1004781006, 1004781007, 1004781008, 1004781009, 1004781010

Parameter	Results	PQL	Units	Analysis Date	Init
TCLP Metals					
Arsenic			mg/L	08/31/00	JMO

Batch MGF 9065
Method SW846-7060A TCLP
Instrument GFAA Perkin Elmer 5000

F-701

CT&E Environmental Services Inc.

CT&E Ref.#	324887 Lab Control Sample	**Printed Date/Time**	09/07/2000 17:48
		Prep Batch	MXT 2826
Client Name	Harding Lawson & Assoc	**Method**	
Project Name/#	51192 Red Devil	**Date**	08/21/2000
Matrix	Water (Surface, Eff., Ground)		

QC results affect the following production samples:

1004781001, 1004781002, 1004781003, 1004781004, 1004781005, 1004781006, 1004781007, 1004781008, 1004781009, 1004781010

Parameter	QC Results	Pct Recov	LCS/LCSD Limits	RPD	RPD Limits	Spiked Amount	Analysis Date	Init
TCLP Metals								
Arsenic	LCS	96	(85-115)			0.2 mg/L	08/31/00	JMO

Batch MGF 9065
Method SW846-7060A TCLP
Instrument GFAA Perkin Elmer 5000

F-701

CT&E Environmental Services Inc.

CT&E Ref.#	328588	Duplicate	**Printed Date/Time**	09/07/2000 17:48
Client Name	Harding Lawson & Assoc		**Prep Batch**	
Project Name/#	51192 Red Devil		**Method**	
Original	1004740001		**Date**	
Matrix	Water (Surface, Eff., Ground)			

QC results affect the following production samples:

1004781001, 1004781002, 1004781003, 1004781004, 1004781005, 1004781006, 1004781007, 1004781008, 1004781009, 1004781010

Parameter	Original Result	QC Result	RPD	RPD Limits	Analysis Date	Init
Metals Department						
Arsenic	2.02	1.84	9.32	(< 20)	08/31/00	JMO

Batch MGF 9065
Method SW846-7060A
Instrument GFAA Perkin Elmer 5000

F-701

CT&E Environmental Services Inc.

CT&E Ref.#	325363	Method Blank	**Printed Date/Time**	09/07/2000 17:48	
Client Name	Harding Lawson & Assoc		**Prep** **Batch**	MXX	7746
Project Name/#	51192 Red Devil		**Method**		
Matrix	Water (Surface, Eff., Ground)		**Date**	08/22/2000	

QC results affect the following production samples:

1004781001, 1004781002, 1004781003, 1004781004, 1004781005, 1004781006, 1004781007, 1004781008, 1004781009, 1004781010

Parameter	Results	PQL	Units	Analysis Date	Init
Metals Department					
Mercury by Cold Vapor	0.000200 U	0.00020	mg/L	08/23/00	JDT

Batch MCV 2171
Method SW7470/E245.1
Instrument HgAA Leeman AutoAnalyzer PS200

F-701

CT&E Environmental Services Inc.

CT&E Ref.#	325364 Lab Control Sample	**Printed Date/Time**	09/07/2000 17:48
		Prep Batch	MXX 7746
Client Name	Harding Lawson & Assoc	**Method**	
Project Name/#	51192 Red Devil	**Date**	08/22/2000
Matrix	Water (Surface, Eff., Ground)		

QC results affect the following production samples:

1004781001, 1004781002, 1004781003, 1004781004, 1004781005, 1004781006, 1004781007, 1004781008, 1004781009, 1004781010

Parameter		QC Results	Pct Recov	LCS/LCSD Limits	RPD	RPD Limits	Spiked Amount	Analysis Date	Init
Metals Department									
Mercury by Cold Vapor	LCS	0.00207	104	(85-115)			0.002 mg/L	08/23/00	JDT

Batch MCV 2171
Method SW7470/E245.1
Instrument HgAA Leeman AutoAnalyzer PS200

F-701

DATA QUALITY ASSESSMENT

Laboratory: CTE Environmental Services
Batch No.: 1004859
Sampled: RT63/1.5-3.0, RT70/3.0-4.5, RT36/1.5-3.0, RT42/3.0-4.5, B6/14.0-15.5, RT70/1.5-3.0, B5/0.5-2.0, RT62/3.0-4.5, FS072, B6/0.5-2.0, B3/0.5-2.0, RT37/1.5-3.0, B5/5.0-6.5, B4/5.0-6.5, RT41/ 1.5-3.0, RT43/3.0-4.5

	Yes	No	Not Required
1. Were samples analyzed for requested parameters?	X		
2. Is the USACE Data Deliverables package complete?			X
3. Were samples extracted within holding time acceptance criteria?	X		
4. Were samples analyzed within holding time acceptance criteria?	X		
5. For soils, were sample results reported on a "dry weight" basis?	X		
6. Were method blanks analytes all reported as ND?	X		
7. For water, were trip blank analytes all reported as ND?			X
8. Are the surrogate percent recoveries within acceptance criteria?			X
9. Are the matrix spike percent recoveries within acceptance criteria?		X	
10. Are the matrix spike relative percent differences within acceptance criteria?			X
11. Are the field duplicate relative percent differences less than 50 percent?	X		

Comments:

9) Percent recoveries for aluminum reported at 84%, beryllium reported at 83%, sodium reported at 82%, magnesium reported at 81%, manganese reported at 116% (CTE ref. #325731). Results should not be affected.

Date: 3-30-01
Reviewer: JEW.

RECEIVED
SEP 26 2000
HARDING LAWSON
ASSOCIATES

CTE Environmental Services
Alaska Division
Laboratory Data Report

Project: BLM-Red Devil

Client: Harding Lawson & Assoc

CTE Work Order: 1004859

Contents:

Chain of Custody
Quality Control Summary Forms

Note:

Unless otherwise noted, all quality assurance/quality control criteria is in compliance with the proper regulatory authority and/or CTE's Quality Assurance Program Plan.

Case Narrative

Customer: HARLAWP **Harding Lawson & Assoc**

Project: 1004859 **BLM-Red Devil**

There were no analytical anomalies associated with your data.

1004859

1004859

CT&E Environmental Services Inc.

SAMPLE RECEIPT FORM 01

CT&E WO#:

Yes	No	
	✓	Are samples **RUSH**, priority, or *within 72 hrs* of **hold time**?
	✓	If yes, have you done *e-mail notification*?
		Are samples *within 24 hrs* of **hold time** or **due date**?
✓		If yes, have you *spoken with* Supervisor?
		Are there any **problems** (e.g., ids, analyses)?
		Were samples preserved correctly and pH verified?

#1 is missing

✓		Has Project Manager been notified of problems?
	✓	Is this an ACOE/AFCEE/ADEC project?
	✓	Will a **data package** be required?
		If this is for PWS, provide **PWSID**.
		Is there a **quote** for this project?
	✓	Will **courier** charges apply?

Completed by (sign): [signature] (print): [illegible]

Due Date: 8/30/00
Received Date/Time: 8/22/00 - 13:
Cooler Temperature: amb
Sample Condition: Good / Poor

Matrix of each Sample:
2 " "
" "
" "
" "
Trip Blank
MS/MSD

2-16

Additional Sample Remarks:
AK101s/_____ 8260s field pres'd?
Field-filtered for dissolved_____?
Lab-filter for dissolved_____?
Ref Lab required?

Notes: AB SB PB ML, HG. 2

*** The following *must* be completed for *all* ACOE & AFCEE projects: ***

Yes	No		Notes:
		Is cooler temperature 4 ± C?	
		thermometer used:	
		Was there an airbill, etc? note #:	
		Was cooler sealed with custody seals?	
		#/where?	
		Were seals intact upon arrival?	
		Was there a COC with cooler?	
		Was the COC filled out properly?	
		Did the COC indicate ACOE/AFCEE project?	
		Did the COC and samples correspond?	
		Were samples screened with Geiger counter?	
		Were all samples packed to prevent breakage?	
		packing material:	
		Were all samples unbroken and clearly labelled?	
		Were all samples sealed in separate plastic bags?	
		Were all bottles for volatiles free of headspace?	
		Were correct container/sample sizes submitted?	
		Was client notified of problems? (specify below)	

Individual contacted:
Date & Time: Phone/Fax #:

# of each Container Received:

	950 ml amber	unpres'd
	950 ml amber	w/ HCl
	500 ml amber	w/ H2SO4
	1L cubies	unpres'd
	1L cubies	w/ HNO3
	1L cubies	w/ H2SO4
	1L cubies	w/ NaOH + ZnAc
	120 ml coli	bottles
	60 ml	Nalg
	8 oz amber	unpres'd
	4 oz amber	unpres'd
	4 oz w/ septa	w/ MeOH
	40 ml vials	w/ HCl
15	Other (specify)	ziplock bag
	Other (specify)	

#/Log In Proofed by:

Form Number: F004r2
Printed: 7/12/99

[illegible] 8/22 1400

CT&E Environmental Services Inc.
Laboratory Division

Laboratory Analysis Report

200 W. Potter Drive
Anchorage, AK 99518-1605
Tel: (907) 562-2343
Fax: (907) 561-5301
Web: http://www.cteesi.com

Brian Lund
Harding Lawson & Assoc
601 East 57th Place
Anchorage, AK 99518

Work Order:	1004859
	BLM-Red Devil
Client:	Harding Lawson & Assoc
Report Date:	September 14, 2000

Enclosed are the analytical results associated with the above workorder.

As required by the state of Alaska and the USEPA, a formal Quality Assurance/Quality Control Program is maintaned 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 analyte 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
!	Surrogate out of range

CT&E Environmental Services Inc.

CT&E Ref.#	1004859002	**Client PO#**	Auth 48 Job #39551
Client Name	Harding Lawson & Assoc	**Printed Date/Time**	09/14/2000 9:38
Project Name/#	BLM-Red Devil	**Collected Date/Time**	08/07/2000 0:00
Client Sample ID	RT70/3-4.5	**Received Date/Time**	08/22/2000 13:30
Matrix	Soil/Solid	**Technical Director**	**Stephen C. Ede**
Ordered By		**Released By**	J Winslebank

Sample Remarks:

Parameter	Results	PQL	Units	Method	Allowable Limits	Prep Date	Analysis Date	Init
Solids								
Total Solids	95.6		%	SM20 2540G			08/24/00	MA
Metals Department								
Mercury by Cold Vapor	30.7	20.2	mg/Kg	SW846-7471A		08/24/00	08/28/00	JDT
Metals by ICP/MS								
Antimony	28.0	1.02	mg/Kg	SW846 6020		08/24/00	09/06/00	KG
Arsenic	1370	0.512	mg/Kg	SW846 6020		08/24/00	09/06/00	KG
Lead	22.7	3.07	mg/Kg	SW846 6020		08/24/00	09/06/00	KGF

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CT&E Environmental Services Inc.

CT&E Ref.#	1004859003	**Client PO#**	Auth 48 Job #39551
Client Name	Harding Lawson & Assoc	**Printed Date/Time**	09/14/2000 9:38
Project Name/#	BLM-Red Devil	**Collected Date/Time**	08/05/2000 0:00
Client Sample ID	RT36/1.5-3	**Received Date/Time**	08/22/2000 13:30
Matrix	Soil/Solid	**Technical Director**	**Stephen C. Ede**
Ordered By		**Released By**	J Windebank

Sample Remarks:

Parameter	Results	PQL	Units	Method	Allowable Limits	Prep Date	Analysis Date	Init
Solids								
Total Solids	97.3		%	SM20 2540G			08/24/00	MAH
Metals Department								
Mercury by Cold Vapor	25.7	18.2	mg/Kg	SW846-7471A		08/24/00	08/28/00	JDT
Metals by ICP/MS								
Antimony	1.87	0.958	mg/Kg	SW846 6020		08/24/00	09/06/00	KGF
Arsenic	43.0	0.479	mg/Kg	SW846 6020		08/24/00	09/06/00	KGF
Lead	15.3	2.87	mg/Kg	SW846 6020		08/24/00	09/06/00	KGF

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CT&E Environmental Services Inc.

CT&E Ref.#	1004859004	**Client PO#**	Auth 48 Job #39551
Client Name	Harding Lawson & Assoc	**Printed Date/Time**	09/14/2000 9:38
Project Name/#	BLM-Red Devil	**Collected Date/Time**	08/06/2000 0:00
Client Sample ID	RT42/3-4.5	**Received Date/Time**	08/22/2000 13:30
Matrix	Soil/Solid	**Technical Director**	**Stephen C. Ede**
Ordered By		**Released By**	J Windebank

Sample Remarks:

Parameter	Results	PQL	Units	Method	Allowable Limits	Prep Date	Analysis Date	Init
Solids								
Total Solids	94.1		%	SM20 2540G			08/24/00	MAF
Metals Department								
Mercury by Cold Vapor	62.2	2.12	mg/Kg	SW846-7471A		08/24/00	08/28/00	JDT
Metals by ICP/MS								
Antimony	15.7	0.965	mg/Kg	SW846 6020		08/24/00	09/06/00	KGF
Arsenic	58.0	0.483	mg/Kg	SW846 6020		08/24/00	09/06/00	KGF
Lead	12.5	2.90	mg/Kg	SW846 6020		08/24/00	09/06/00	KGF

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CT&E Environmental Services Inc.

CT&E Ref.#	1004859005	**Client PO#**	Auth 48 Job #39551
Client Name	Harding Lawson & Assoc	**Printed Date/Time**	09/14/2000 9:38
Project Name/#	BLM-Red Devil	**Collected Date/Time**	08/10/2000 0:00
Client Sample ID	B6/14-15.5	**Received Date/Time**	08/22/2000 13:30
Matrix	Soil/Solid	**Technical Director**	**Stephen C. Ede**
Ordered By		**Released By**	J Windebank

Sample Remarks:

Parameter	Results	PQL	Units	Method	Allowable Limits	Prep Date	Analysis Date	Init
Solids								
Total Solids	94.3		%	SM20 2540G			08/24/00	MAH
Metals Department								
Mercury by Cold Vapor	30.9	1.98	mg/Kg	SW846-7471A		08/24/00	08/28/00	JDT
Metals by ICP/MS								
Antimony	3.79	0.955	mg/Kg	SW846 6020		08/24/00	09/06/00	KGF
Arsenic	61.1	0.478	mg/Kg	SW846 6020		08/24/00	09/06/00	KGF
Lead	10.1	2.87	mg/Kg	SW846 6020		08/24/00	09/06/00	KGF

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CT&E Environmental Services Inc.

CT&E Ref.#	1004859006	**Client PO#**	Auth 48 Job #39551
Client Name	Harding Lawson & Assoc	**Printed Date/Time**	09/14/2000 9:38
Project Name/#	BLM-Red Devil	**Collected Date/Time**	08/07/2000 0:00
Client Sample ID	RT70/1.5-3	**Received Date/Time**	08/22/2000 13:30
Matrix	Soil/Solid	**Technical Director**	**Stephen C. Ede**
Ordered By		**Released By**	J Windebank

Sample Remarks:

Parameter	Results	PQL	Units	Method	Allowable Limits	Prep Date	Analysis Date	Init
Solids								
Total Solids	94.2		%	SM20 2540G			08/24/00	MA
Metals Department								
Mercury by Cold Vapor	18800	1970	mg/Kg	SW846-7471A		08/24/00	08/28/00	JDT
Metals by ICP/MS								
Antimony	13500	9.67	mg/Kg	SW846 6020		08/24/00	09/06/00	K
Arsenic	10700	0.483	mg/Kg	SW846 6020		08/24/00	09/06/00	K
Lead	2.90 U	2.90	mg/Kg	SW846 6020		08/24/00	09/06/00	KGF

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CT&E Environmental Services Inc.

CT&E Ref.#	1004859007	**Client PO#**	Auth 48 Job #39551
Client Name	Harding Lawson & Assoc	**Printed Date/Time**	09/14/2000 9:38
Project Name/#	BLM-Red Devil	**Collected Date/Time**	08/09/2000 0:00
Client Sample ID	B5/0.5-2	**Received Date/Time**	08/22/2000 13:30
Matrix	Soil/Solid	**Technical Director**	**Stephen C. Ede**
Ordered By		**Released By**	J Windebank

Sample Remarks:

Parameter	Results	PQL	Units	Method	Allowable Limits	Prep Date	Analysis Date	Init
Solids								
Total Solids	96.5		%	SM20 2540G			08/24/00	MAH
Metals Department								
Mercury by Cold Vapor	467	192	mg/Kg	SW846-7471A		08/24/00	08/28/00	JDT
Metals by ICP/MS								
Antimony	4340	0.960	mg/Kg	SW846 6020		08/24/00	09/06/00	KGF
Arsenic	3200	0.480	mg/Kg	SW846 6020		08/24/00	09/06/00	KGF
Lead	5.27	2.88	mg/Kg	SW846 6020		08/24/00	09/06/00	KGF

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CT&E Environmental Services Inc.

CT&E Ref.#	1004859008	**Client PO#**	Auth 48 Job #39551
Client Name	Harding Lawson & Assoc	**Printed Date/Time**	09/14/2000 9:38
Project Name/#	BLM-Red Devil	**Collected Date/Time**	08/07/2000 0:00
Client Sample ID	RT62/3-4.5	**Received Date/Time**	08/22/2000 13:30
Matrix	Soil/Solid	**Technical Director**	**Stephen C. Ede**
Ordered By		**Released By**	J Windlebank

Sample Remarks:

Parameter	Results	PQL	Units	Method	Allowable Limits	Prep Date	Analysis Date	Init
Solids								
Total Solids	97.5		%	SM20 2540G			08/24/00	MA
Metals Department								
Mercury by Cold Vapor	102	18.5	mg/Kg	SW846-7471A		08/24/00	08/28/00	JDT
Metals by ICP/MS								
Antimony	13.5	0.957	mg/Kg	SW846 6020		08/24/00	09/06/00	KG
Arsenic	61.9	0.478	mg/Kg	SW846 6020		08/24/00	09/06/00	KG
Lead	19.8	2.87	mg/Kg	SW846 6020		08/24/00	09/06/00	KGF

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CT&E Environmental Services Inc.

CT&E Ref.#	1004859009	**Client PO#**	Auth 48 Job #39551
Client Name	Harding Lawson & Assoc	**Printed Date/Time**	09/14/2000 9:38
Project Name/#	BLM-Red Devil	**Collected Date/Time**	08/06/2000 0:00
Client Sample ID	FS072	**Received Date/Time**	08/22/2000 13:30
Matrix	Soil/Solid	**Technical Director**	**Stephen C. Ede**
Ordered By		**Released By**	J Windebank

Sample Remarks:

Parameter	Results	PQL	Units	Method	Allowable Limits	Prep Date	Analysis Date	Init
Solids								
Total Solids	97.0		%	SM20 2540G			08/24/00	MAH
Metals Department								
Mercury by Cold Vapor	7360	197	mg/Kg	SW846-7471A		08/24/00	08/28/00	JDT
Metals by ICP/MS								
Antimony	4630	0.955	mg/Kg	SW846 6020		08/24/00	09/06/00	KGF
Arsenic	5480	0.478	mg/Kg	SW846 6020		08/24/00	09/06/00	KGF
Lead	15.3	2.87	mg/Kg	SW846 6020		08/24/00	09/06/00	KGF

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CT&E Environmental Services Inc.

CT&E Ref.#	1004859010	**Client PO#**	Auth 48 Job #39551
Client Name	Harding Lawson & Assoc	**Printed Date/Time**	09/14/2000 9:38
Project Name/#	BLM-Red Devil	**Collected Date/Time**	08/10/2000 0:00
Client Sample ID	B6/0.5-2	**Received Date/Time**	08/22/2000 13:30
Matrix	Soil/Solid	**Technical Director**	**Stephen C. Ede**
Ordered By		**Released By**	J Windebank

Sample Remarks:

Parameter	Results	PQL	Units	Method	Allowable Limits	Prep Date	Analysis Date	Init
Solids								
Total Solids	96.3		%	SM20 2540G			08/24/00	MA
Metals Department								
Mercury by Cold Vapor	183	19.5	mg/Kg	SW846-7471A		08/24/00	08/28/00	JDT
Metals by ICP/MS								
Antimony	1700	1.03	mg/Kg	SW846 6020		08/24/00	09/06/00	K
Arsenic	1870	0.516	mg/Kg	SW846 6020		08/24/00	09/06/00	K
Lead	5.77	3.09	mg/Kg	SW846 6020		08/24/00	09/06/00	KGF

F-701

CT&E Environmental Services Inc.

CT&E Ref.#	1004859011	**Client PO#**	Auth 48 Job #39551
Client Name	Harding Lawson & Assoc	**Printed Date/Time**	09/14/2000 9:38
Project Name/#	BLM-Red Devil	**Collected Date/Time**	08/08/2000 0:00
Client Sample ID	B3/0.5-2	**Received Date/Time**	08/22/2000 13:30
Matrix	Soil/Solid	**Technical Director**	**Stephen C. Ede**
Ordered By		**Released By**	J Windebank

Sample Remarks:

Parameter	Results	PQL	Units	Method	Allowable Limits	Prep Date	Analysis Date	Init
Solids								
Total Solids	96.4		%	SM20 2540G			08/24/00	MAH
Metals Department								
Mercury by Cold Vapor	671	192	mg/Kg	SW846-7471A		08/24/00	08/28/00	JDT
Metals by ICP/MS								
Antimony	1630	1.02	mg/Kg	SW846 6020		08/24/00	09/06/00	KGF
Arsenic	2980	0.512	mg/Kg	SW846 6020		08/24/00	09/06/00	KGF
Lead	29.9	3.07	mg/Kg	SW846 6020		08/24/00	09/06/00	KGF

F-701

CT&E Environmental Services Inc.

CT&E Ref.#	1004859012	**Client PO#**	Auth 48 Job #39551
Client Name	Harding Lawson & Assoc	**Printed Date/Time**	09/14/2000 9:38
Project Name/#	BLM-Red Devil	**Collected Date/Time**	08/05/2000 0:00
Client Sample ID	RT37/1.5-3	**Received Date/Time**	08/22/2000 13:30
Matrix	Soil/Solid	**Technical Director**	**Stephen C. Ede**
Ordered By		**Released By**	J Windebank

Sample Remarks:

Parameter	Results	PQL	Units	Method	Allowable Limits	Prep Date	Analysis Date	Init
Solids								
Total Solids	95.0		%	SM20 2540G			08/24/00	M
Metals Department								
Mercury by Cold Vapor	31.6	1.92	mg/Kg	SW846-7471A		08/24/00	08/28/00	JDT
Metals by ICP/MS								
Antimony	7.41	0.915	mg/Kg	SW846 6020		08/24/00	09/06/00	K
Arsenic	33.8	0.458	mg/Kg	SW846 6020		08/24/00	09/06/00	K
Lead	18.3	2.75	mg/Kg	SW846 6020		08/24/00	09/06/00	KGF

F-701

CT&E Environmental Services Inc.

CT&E Ref.#	1004859013	**Client PO#**	Auth 48 Job #39551
Client Name	Harding Lawson & Assoc	**Printed Date/Time**	09/14/2000 9:38
Project Name/#	BLM-Red Devil	**Collected Date/Time**	08/09/2000 0:00
Client Sample ID	B5/5-6.5	**Received Date/Time**	08/22/2000 13:30
Matrix	Soil/Solid	**Technical Director**	**Stephen C. Ede**
Ordered By		**Released By**	J. Windebank

Sample Remarks:

Parameter	Results	PQL	Units	Method	Allowable Limits	Prep Date	Analysis Date	Init
Solids								
Total Solids	95.7		%	SM20 2540G			08/24/00	MAH
Metals Department								
Mercury by Cold Vapor	214	198	mg/Kg	SW846-7471A		08/24/00	08/28/00	JDT
Metals by ICP/MS								
Antimony	1390	0.948	mg/Kg	SW846 6020		08/24/00	09/06/00	KGF
Arsenic	2040	0.474	mg/Kg	SW846 6020		08/24/00	09/06/00	KGF
Lead	8.76	2.84	mg/Kg	SW846 6020		08/24/00	09/06/00	KGF

F-701

CT&E Environmental Services Inc.

CT&E Ref.#	1004859014	**Client PO#**	Auth 48 Job #39551
Client Name	Harding Lawson & Assoc	**Printed Date/Time**	09/14/2000 9:38
Project Name/#	BLM-Red Devil	**Collected Date/Time**	08/09/2000 0:00
Client Sample ID	B4/5-6.5	**Received Date/Time**	08/22/2000 13:30
Matrix	Soil/Solid	**Technical Director**	**Stephen C. Ede**
Ordered By		**Released By**	Windebank

Sample Remarks:

Parameter	Results	PQL	Units	Method	Allowable Limits	Prep Date	Analysis Date	Init
Solids								
Total Solids	97.6		%	SM20 2540G			08/24/00	MA
Metals Department								
Mercury by Cold Vapor	2280	178	mg/Kg	SW846-7471A		08/24/00	08/28/00	JDT
Metals by ICP/MS								
Antimony	1890	1.02	mg/Kg	SW846 6020		08/24/00	09/06/00	KG
Arsenic	2790	0.509	mg/Kg	SW846 6020		08/24/00	09/06/00	KG
Lead	10.4	3.06	mg/Kg	SW846 6020		08/24/00	09/06/00	KGF

F-701

CT&E Environmental Services Inc.

CT&E Ref.#	1004859015	**Client PO#**	Auth 48 Job #39551
Client Name	Harding Lawson & Assoc	**Printed Date/Time**	09/14/2000 9:38
Project Name/#	BLM-Red Devil	**Collected Date/Time**	08/05/2000 0:00
Client Sample ID	RT41/1.5-3	**Received Date/Time**	08/22/2000 13:30
Matrix	Soil/Solid	**Technical Director**	**Stephen C. Ede**
Ordered By		**Released By**	Windebank

Sample Remarks:

Parameter	Results	PQL	Units	Method	Allowable Limits	Prep Date	Analysis Date	Init
Solids								
Total Solids	93.3		%	SM20 2540G			08/24/00	JCO
Metals Department								
Mercury by Cold Vapor	69.9	2.01	mg/Kg	SW846-7471A		08/24/00	08/28/00	JDT
Metals by ICP/MS								
Antimony	101	1.05	mg/Kg	SW846 6020		08/24/00	09/06/00	KGF
Arsenic	156	0.523	mg/Kg	SW846 6020		08/24/00	09/06/00	KGF
Lead	14.0	3.14	mg/Kg	SW846 6020		08/24/00	09/06/00	KGF

F-701

CT&E Environmental Services Inc.

CT&E Ref.#	1004859016	**Client PO#**	Auth 48 Job #39551
Client Name	Harding Lawson & Assoc	**Printed Date/Time**	09/14/2000 9:38
Project Name/#	BLM-Red Devil	**Collected Date/Time**	08/06/2000 0:00
Client Sample ID	RT43/3-4.5	**Received Date/Time**	08/22/2000 13:30
Matrix	Soil/Solid	**Technical Director**	**Stephen C. Ede**
Ordered By		**Released By**	J Windlebank

Sample Remarks:

Parameter	Results	PQL	Units	Method	Allowable Limits	Prep Date	Analysis Date	Init
Solids								
Total Solids	95.5		%	SM20 2540G			08/24/00	JC
Metals Department								
Mercury by Cold Vapor	69.6	2.00	mg/Kg	SW846-7471A		08/24/00	08/28/00	JDT
Metals by ICP/MS								
Antimony	10.2	0.919	mg/Kg	SW846 6020		08/24/00	09/06/00	KG
Arsenic	43.2	0.459	mg/Kg	SW846 6020		08/24/00	09/06/00	KG
Lead	15.3	2.76	mg/Kg	SW846 6020		08/24/00	09/06/00	KGF

F-701

CT&E Environmental Services Inc.

CT&E Ref.#	326130	Method Blank	**Printed Date/Time**	09/14/2000 9:39
Client Name	Harding Lawson & Assoc		**Prep**	**Batch**
Project Name/#	BLM-Red Devil			**Method**
Matrix	Soil/Solid			**Date**

QC results affect the following production samples:

1004859002, 1004859003, 1004859004, 1004859005, 1004859006, 1004859007, 1004859008, 1004859009, 1004859010, 1004859011, 1004859012, 1004859013, 1004859014

Parameter	Results	PQL	Units	Analysis Date	Init
Solids					
Total Solids		100	%	08/24/00	MAH

Batch SPT 3483
Method SM20 2540G
Instrument

F-701

CT&E Environmental Services Inc.

CT&E Ref.#	326131	Duplicate	**Printed Date/Time**	09/14/2000 9:39
Client Name	Harding Lawson & Assoc		**Prep**	**Batch**
Project Name/#	BLM-Red Devil			**Method**
Original	1004846004			**Date**
Matrix	Soil/Solid			

QC results affect the following production samples:

1004859002, 1004859003, 1004859004, 1004859005, 1004859006, 1004859007, 1004859008, 1004859009, 1004859010, 1004859011, 1004859012, 1004859013, 1004859014

Parameter	Original Result	QC Result	RPD	RPD Limits	Analysis Date	Init
Solids						
Total Solids	68.0	70.6	3.80		08/24/00	MAH

Batch SPT 3483
Method SM20 2540G
Instrument

F-701

CT&E Environmental Services Inc.

CT&E Ref.#	326039	Method Blank	**Printed Date/Time**	09/14/2000 9:39
Client Name	Harding Lawson & Assoc		**Prep**	**Batch**
Project Name/#	BLM-Red Devil			**Method**
Matrix	Soil/Solid			**Date**

QC results affect the following production samples:

1004859015, 1004859016

Parameter	Results	PQL	Units	Analysis Date	Init
Solids					
Total Solids	99.8		%	08/24/00	JCO

Batch SPT 3479
Method SM20 2540G
Instrument

F-781

CT&E Environmental Services Inc.

CT&E Ref.#	326040	Duplicate	**Printed Date/Time**	09/14/2000 9:39
Client Name	Harding Lawson & Assoc		**Prep**	**Batch**
Project Name/#	BLM-Red Devil			**Method**
Original	1004860001			**Date**
Matrix	Soil/Solid			

QC results affect the following production samples:
1004859015, 1004859016

Parameter	Original Result	QC Result	RPD	RPD Limits	Analysis Date	Init
Solids						
Total Solids	95.7	95.6	0.15		08/24/00	JCO

Batch SPT 3479
Method SM20 2540G
Instrument

F-701

CT&E Environmental Services Inc.

CT&E Ref.#	325730 Method Blank		**Printed Date/Time**	09/14/2000 9:39	
Client Name	Harding Lawson & Assoc		**Prep Batch**	MXX	7753
Project Name/#	BLM-Red Devil		**Method**		
Matrix	Soil/Solid		**Date**	08/24/2000	

QC results affect the following production samples:

1004859002, 1004859003, 1004859004, 1004859005, 1004859006, 1004859007, 1004859008, 1004859009, 1004859010, 1004859011, 1004859012, 1004859013, 1004859014, 1004859015, 1004859016

Parameter	Results	PQL	Units	Analysis Date	Init
Thallium	0.00100 U	0.00100	mg/Kg	09/06/00	KGF

Batch MMS 1225
Method SW846 6020
Instrument Perkin Elmer Sciex ICP-MS P3

UST Metals

Aluminum	2.50 U	2.50	mg/Kg	09/06/00	KGF
Antimony	0.100 U	0.100	mg/Kg	09/06/00	KGF
Arsenic	0.0500 U	0.0500	mg/Kg	09/06/00	KGF
Barium	0.100 U	0.100	mg/Kg	09/06/00	KGF
Beryllium	0.00400 U	0.00400	mg/Kg	09/06/00	KGF
Cadmium	0.00500 U	0.00500	mg/Kg	09/06/00	KGF
Calcium	3.75 U	3.75	mg/Kg	09/06/00	KGF
Chromium	0.100 U	0.100	mg/Kg	09/06/00	KGF
Copper	0.300 U	0.300	mg/Kg	09/06/00	KGF
Iron	2.50 U	2.50	mg/Kg	09/06/00	KGF
Lead	0.300 U	0.300	mg/Kg	09/06/00	KGF
Potassium	5.00 U	5.00	mg/Kg	09/06/00	KGF
Selenium	0.0500 U	0.0500	mg/Kg	09/06/00	KGF
Silver	0.0200 U	0.0200	mg/Kg	09/06/00	KGF
Sodium	5.00 U	5.00	mg/Kg	09/06/00	KGF
Vanadium	0.0100 U	0.0100	mg/Kg	09/06/00	KGF
Zinc	0.250 U	0.250	mg/Kg	09/06/00	KGF
Cobalt	0.0150 U	0.0150	mg/Kg	09/06/00	KGF
Magnesium	0.500 U	0.500	mg/Kg	09/06/00	KGF
Manganese	0.500 U	0.500	mg/Kg	09/06/00	KGF
Molybdenum	0.0250 U	0.0250	mg/Kg	09/06/00	KGF
Nickel	0.300 U	0.300	mg/Kg	09/06/00	KGF

Batch MMS 1225
Method SW846 6020
Instrument Perkin Elmer Sciex ICP-MS P3

CT&E Environmental Services Inc.

CT&E Ref.#	325731 Lab Control Sample	**Printed Date/Time**	09/14/2000 9:40
		Prep Batch	MXX 7753
Client Name	Harding Lawson & Assoc	**Method**	
Project Name/#	BLM-Red Devil	**Date**	08/24/2000
Matrix	Soil/Solid		

QC results affect the following production samples:

1004859002, 1004859003, 1004859004, 1004859005, 1004859006, 1004859007, 1004859008, 1004859009, 1004859010, 1004859011, 1004859012, 1004859013, 1004859014, 1004859015, 1004859016

Parameter		QC Results	Pct Recov		LCS/LCSD Limits	RPD	RPD Limits	Spiked Amount	Analysis Date	Init
Thallium	LCS	47.9	95		(85-115)			50.5 mg/Kg	09/06/00	KGF

Batch MMS 1225
Method SW846 6020
Instrument Perkin Elmer Sciex ICP-MS P3

UST Metals

Aluminum	LCS	42.1	84	*	(85-115)			50 mg/Kg	09/06/00	KGF
Antimony	LCS	50.1	100		(85-115)			50 mg/Kg	09/06/00	KGF
Arsenic	LCS	46.1	92		(85-115)			50 mg/Kg	09/06/00	KGF
Barium	LCS	45.7	91		(85-115)			50 mg/Kg	09/06/00	KGF
Beryllium	LCS	16.6	83	*	(85-115)			20.1 mg/Kg	09/06/00	KGF
Cadmium	LCS	25.5	102		(85-115)			25 mg/Kg	09/06/00	KGF
Calcium	LCS	564	113		(85-115)			500 mg/Kg	09/06/00	KGF
Chromium	LCS	51.5	103		(85-115)			50 mg/Kg	09/06/00	KGF
Copper	LCS	50.7	101		(85-115)			50 mg/Kg	09/06/00	KGF
Iron	LCS	53.5	107		(85-115)			50.1 mg/Kg	09/06/00	KGF
Lead	LCS	48.9	98		(85-115)			50 mg/Kg	09/06/00	KGF
Potassium	LCS	472	94		(85-115)			500 mg/Kg	09/06/00	KGF
Selenium	LCS	47.2	94		(85-115)			50 mg/Kg	09/06/00	KGF
Silver	LCS	10.2	102		(85-115)			10 mg/Kg	09/06/00	KGF
Sodium	LCS	411	82	*	(85-115)			500 mg/Kg	09/06/00	KGF
Vanadium	LCS	50.6	101		(85-115)			50 mg/Kg	09/06/00	KGF
Zinc	LCS	48.6	97		(85-115)			50 mg/Kg	09/06/00	KGF
Cobalt	LCS	48.5	97		(85-115)			50 mg/Kg	09/06/00	KGF
Magnesium	LCS	404	81	*	(85-115)			500 mg/Kg	09/06/00	KGF
Manganese	LCS	58.2	116	*	(85-115)			50 mg/Kg	09/06/00	KGF
Molybdenum	LCS	49.1	98		(85-115)			50 mg/Kg	09/06/00	KGF
Nickel	LCS	51.1	102		(85-115)			50 mg/Kg	09/06/00	KGF

Batch MMS 1225
Method SW846 6020
Instrument Perkin Elmer Sciex ICP-MS P3

F-701

CT&E Environmental Services Inc.

CT&E Ref.#	326521	Method Blank	**Printed Date/Time**	09/14/2000 9:39	
Client Name	Harding Lawson & Assoc		**Prep** **Batch**	MXX	7773
Project Name/#	BLM-Red Devil		**Method**		
Matrix	Water (Surface, Eff., Ground)		**Date**	08/24/2000	

QC results affect the following production samples:

1004859002, 1004859003, 1004859004, 1004859005, 1004859006, 1004859007, 1004859008, 1004859009, 1004859010, 1004859011, 1004859012, 1004859013, 1004859014, 1004859015, 1004859016

Parameter	Results	PQL	Units	Analysis Date	Init
Metals Department					
Mercury by Cold Vapor	0.000200 U	0.00020	mg/L	08/28/00	JDT

Batch MCV 2179
Method SW846-7471A
Instrument HgAA Leeman AutoAnalyzer PS200

F-701

CT&E Environmental Services Inc.

CT&E Ref.#	326522 Lab Control Sample	**Printed Date/Time**	09/14/2000 9:40
		Prep Batch	MXX 7773
Client Name	Harding Lawson & Assoc	**Method**	
Project Name/#	BLM-Red Devil	**Date**	08/24/2000
Matrix	Water (Surface, Eff., Ground)		

QC results affect the following production samples:

1004859002, 1004859003, 1004859004, 1004859005, 1004859006, 1004859007, 1004859008, 1004859009, 1004859010, 1004859011, 1004859012, 1004859013, 1004859014, 1004859015, 1004859016

Parameter		QC Results	Pct Recov	LCS/LCSD Limits	RPD	RPD Limits	Spiked Amount	Analysis Date	Init
Metals Department									
Mercury by Cold Vapor	LCS	0.00213	107	(85-115)			0.002 mg/L	08/28/00	JDT

Batch MCV 2179
Method SW846-7471A
Instrument HgAA Leeman AutoAnalyzer PS200

F-701

DATA QUALITY ASSESSMENT

Laboratory: CTE Environmental Services
Batch No.: 1004860
Sampled: RT54/5.0-6.5, RT47/5.0-6.5, RT49/3.0-4.5, RT45/3.0-4.5, RT52/3.0-4.5, RT50/1.5-3.0, RT68/3.0-4.5, RT51/3.0-4.5, RT63/3.0-4.5, RT53/5.0-6.5, B5/30.0-31.5, RT57/1.5-3.0, RT50/3.0-4.5, RT72/ 3.0-4.5, RT66/3.0-4.5, RT67/3.0-4.5

	Yes	No	Not Required
1. Were samples analyzed for requested parameters?	X		
2. Is the USACE Data Deliverables package complete?			X
3. Were samples extracted within holding time acceptance criteria?	X		
4. Were samples analyzed within holding time acceptance criteria?	X		
5. For soils, were sample results reported on a "dry weight" basis?	X		
6. Were method blanks analytes all reported as ND?		X	
7. For water, were trip blank analytes all reported as ND?			X
8. Are the surrogate percent recoveries within acceptance criteria?			X
9. Are the matrix spike percent recoveries within acceptance criteria?		X	
10. Are the matrix spike relative percent differences within acceptance criteria?			X
11. Are the field duplicate relative percent differences less than 50 percent?	X		

Comments:

7) **Antimony detected at 0.104 mg/kg, cadmium detected at 0.00630 mg/kg, chromium detected at 0.415 mg/kg (CTE ref. #325735); selenium estimated at 0.0375 mg/kg (below PQL), sodium estimated at 4.08 mg/kg (below PQL), zinc estimated at 0.150 mg/kg (below PQL), and magnesium estimated at 0.160 mg/kg (below PQL) (CTE ref. # 325735). Results should not be affected.**

9) Percent recover for silver was 118% (CTE ref. # 325736). Results are not affected.

Date: 3-30-01
Reviewer: J.E.D.

RECEIVED
SEP 26 2000
HARDING LAWSON
ASSOCIATES

CTE Environmental Services
Alaska Division
Laboratory Data Report

Project: BLM-Red Devil

Client: Harding Lawson & Assoc

CTE Work Order: 1004860

Contents:

Chain of Custody
Quality Control Summary Forms

Note:

Unless otherwise noted, all quality assurance/quality control criteria is in compliance with the proper regulatory authority and/or CTE's Quality Assurance Program Plan.

Case Narrative

Customer: HARLAWP **Harding Lawson & Assoc**

Project: 1004860 **BLM-Red Devil**

There were no analytical anomalies associated with your data.

Form 1703-1
(December 1997)

1004860

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

CHAIN-OF-CUSTODY RECORD

Ship to:	Project Name:	Field Contact:
CTE	Red Devil	BLM
	Sampler Name(s): HLA	Office: Telephone:
		Address:

	Sample Identification (5 - 6.6)	Date	Time	Matrix	Preservative	Conc. (HML)	No. Bottles	Lab QC	VOA	SVOC	Pest/PCB	Metals	Other	Remarks/Comments
1	RT 54/5-6.5?	8/6		SO								✓		
2	RT 47/5-6.5	8/6		↓								✓		
3	RT 49/3-4.5	8/6										✓		
4	RT 45/3-4.5	8/6										✓		
5	RT 52/3-4.5	8/6										✓		
6	RT 50/1.5-3	8/3										✓		
7	RT 68/3-4.5	8/7										✓		
8	RT 51/3-4.5	8/6										✓		
9	RT 63/3-4.5	8/7										✓		
10	RT 53/5-6.5	8/6										✓		
11	B5/30-31.5	8/9										✓		
12	RT 51/1.5-3	8/6										✓		
13	RT 50/3-4.5	8/6										✓		
14	RT 72/3-4.5	8/7										✓		
15	RT 66/3-4.5	8/7										✓		
16	RT 67/3-4.5	8/7		↓								✓		

Relinquished by:	Date:	Relinquished by:	Date:	Notes:
Karl Fold	8/21/00			
Received by:	**Date:**	**Received by:**	**Date:**	
		E Meece	8/22/00 13:30	

Original

☆ U.S. GOVERNMENT PRINTING OFFICE: 1998-674-580

Form 1703-1
(December 1997)

1004860

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

CHAIN-OF-CUSTODY RECORD

Ship to:	Project Name:	Field Contact:
CTE	Red Devil	BLM
	Sampler Name(s):	Office: / Telephone:
	HLA	Address:

	Sample Identification	Date	Time	Matrix	Preservative	Conc. (HML)	No. Bottles	Lab QC	VOA	SVOC	Pest/PCB	Metals	Other	Remarks/Comments
1	RT 54/5-6.5			SO								✓		
2	RT 47/5-6.5											✓		
3	RT 49/3-4.5											✓		
4	RT 45/3-4.5											✓		
5	RT 52/3-4.5											✓		
6	RT 50/1.5-3											✓		
7	RT 68/3-4.5											✓		
8	RT 51/3-4.5											✓		
9	RT 63/3-4.5											✓		
10	RT 53/5-6.5											✓		
11	B5/30-31.5											✓		
12	RT 51/1.5-3											✓		
13	RT 50/3-4.5											✓		
14	RT 72/3-4.5											✓		
15	RT 66/3-4.5											✓		
16	RT 67/3-4.5											✓		

Relinquished by:	Date:	Relinquished by:	Date:	Notes:
Kam Ford	8/21/00			
Received by:	**Date:**	**Received by:**	**Date:**	
		B Meece	8/22/00	13:30

U.S. GOVERNMENT PRINTING OFFICE: 1999-674-580

CT&E Environmental Services Inc.

SAMPLE RECEIPT FORM

1004860 **1004860**

01 O#:

Yes	No	
	✓	Are samples **RUSH**, priority, or *within 72 hrs* of **hold time**?
		If yes, have you done *e-mail notification*?
	✓	Are samples *within 24 hrs* of **hold time** or **due date**?
		If yes, have you *spoken with* Supervisor?
	✓	Are there any **problems** (e.g., ids, analyses)?
		Were samples preserved correctly and pH verified?

Has Project Manager been notified of problems?

	✓	Is this an ACOE/AFCEE/ADEC project?
	✓	Will a **data package** be required?
		If this is for PWS, provide **PWSID**.
		Is there a **quote** for this project?
	✓	Will **courier** charges apply?

Completed by (sign): [signature] (print): EVA Thomson

Due Date: 8/30/00
Received Date/Time: 8/22 - 13:30
Cooler Temperature: amb
Sample Condition: Good / Poor

Matrix of each Sample:

2	" "	1 - 16
	" "	
	" "	
	" "	
	Trip Blank	
	MS/MSD	

Additional Sample Remarks:

- AK101s/_____ 8260s field pres'd?
- Field-filtered for dissolved_____?
- Lab-filter for dissolved_____?
- Ref Lab required?

Notes: received to container of #3

*** The following *must* be completed for *all* ACOE & AFCEE projects: ***

Yes	No		Notes:
		Is cooler temperature 4 ± C?	
		thermometer used:	
		Was there an airbill, etc? note #:	
		Was cooler sealed with custody seals?	
		#/where?	
		Were seals intact upon arrival?	
		Was there a COC with cooler?	
		Was the COC filled out properly?	
		Did the COC indicate ACOE/AFCEE project?	
		Did the COC and samples correspond?	
		Were samples screened with Geiger counter?	
		Were all samples packed to prevent breakage?	
		packing material:	
		Were all samples unbroken and clearly labelled?	
		Were all samples sealed in separate plastic bags?	
		Were all bottles for volatiles free of headspace?	
		Were correct container/sample sizes submitted?	
		Was client notified of problems? (specify below)	

# of each Container Received:

	950 ml amber	unpres'd
	950 ml amber	w/ HCl
	500 ml amber	w/ H2SO4
	1L cubies	unpres'd
	1L cubies	w/ HNO3
	1L cubies	w/ H2SO4
	1L cubies	w/ NaOH + ZnAc
	120 ml coli	bottles
	60 ml	Nalg
	8 oz amber	unpres'd
	4 oz amber	unpres'd
	4 oz w/ septa	w/ MeOH
	40 ml vials	w/ HCl
16	Other (specify)	ziplock bags
	Other (specify)	

Individual contacted: _____
Date & Time: _____ Phone/Fax #: _____

#/Log In Proofed by: _____

Form Number: F004r2
Printed: 7/12/99

8/22/00 1410 hrs

CT&E Environmental Services Inc.
Laboratory Division

Laboratory Analysis Report

200 W. Potter Drive
Anchorage, AK 99518-1605
Tel: (907) 562-2343
Fax: (907) 561-5301
Web: http://www.cteesi.com

Brian Lund
Harding Lawson & Assoc
601 East 57th Place
Anchorage, AK 99518

Work Order:	1004860
	BLM-Red Devil
Client:	Harding Lawson & Assoc
Report Date:	September 14, 2000

Enclosed are the analytical results associated with the above workorder.

As required by the state of Alaska and the USEPA, a formal Quality Assurance/Quality Control Program is maintaned 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 analyte 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
!	Surrogate out of range

CT&E Environmental Services Inc.

CT&E Ref.#	1004860001	**Client PO#**	Auth 48 Job #39551
Client Name	Harding Lawson & Assoc	**Printed Date/Time**	09/14/2000 9:41
Project Name/#	BLM-Red Devil	**Collected Date/Time**	08/06/2000 0:00
Client Sample ID	RT54/5-6.5	**Received Date/Time**	08/22/2000 13:30
Matrix	Soil/Solid	**Technical Director**	**Stephen C. Ede**
Ordered By		**Released By**	J Windebank

Sample Remarks:

Parameter	Results	PQL	Units	Method	Allowable Limits	Prep Date	Analysis Date	Init
Solids								
Total Solids	95.7		%	SM20 2540G			08/24/00	JC
Metals Department								
Mercury by Cold Vapor	5.52	1.99	mg/Kg	SW846-7471A		08/24/00	08/25/00	JDT
Metals by ICP/MS								
Antimony	1.42	0.990	mg/Kg	SW846 6020		08/24/00	09/13/00	KG
Arsenic	61.5	0.495	mg/Kg	SW846 6020		08/24/00	09/13/00	KG
Lead	14.0	2.97	mg/Kg	SW846 6020		08/24/00	09/13/00	KGF

F-721

CT&E Environmental Services Inc.

CT&E Ref.#	1004860002	**Client PO#**	Auth 48 Job #39551
Client Name	Harding Lawson & Assoc	**Printed Date/Time**	09/14/2000 9:41
Project Name/#	BLM-Red Devil	**Collected Date/Time**	08/06/2000 0:00
Client Sample ID	RT47/5-6.5	**Received Date/Time**	08/22/2000 13:30
Matrix	Soil/Solid	**Technical Director**	**Stephen C. Ede**
Ordered By		**Released By**	J W Lindebank

Sample Remarks:

Parameter	Results	PQL	Units	Method	Allowable Limits	Prep Date	Analysis Date	Init
Solids								
Total Solids	96.4		%	SM20 2540G			08/24/00	JCO
Metals Department								
Mercury by Cold Vapor	2.15	0.189	mg/Kg	SW846-7471A		08/24/00	08/25/00	JDT
Metals by ICP/MS								
Antimony	0.908 U	0.908	mg/Kg	SW846 6020		08/24/00	09/13/00	KGF
Arsenic	21.5	0.454	mg/Kg	SW846 6020		08/24/00	09/13/00	KGF
Lead	11.4	2.73	mg/Kg	SW846 6020		08/24/00	09/13/00	KGF

F-701

CT&E Environmental Services Inc.

CT&E Ref.#	1004860003	**Client PO#**	Auth 48 Job #39551
Client Name	Harding Lawson & Assoc	**Printed Date/Time**	09/14/2000 9:41
Project Name/#	BLM-Red Devil	**Collected Date/Time**	08/06/2000 0:00
Client Sample ID	RT49/3-4.5	**Received Date/Time**	08/22/2000 13:30
Matrix	Soil/Solid	**Technical Director**	**Stephen C. Ede**
Ordered By		**Released By**	J Wendebank

Sample Remarks:

Parameter	Results	PQL	Units	Method	Allowable Limits	Prep Date	Analysis Date	Init
Solids								
Total Solids	97.8		%	SM20 2540G			08/24/00	JC
Metals Department								
Mercury by Cold Vapor	6.90	1.97	mg/Kg	SW846-7471A		08/24/00	08/25/00	JDT
Metals by ICP/MS								
Antimony	0.932 U	0.932	mg/Kg	SW846 6020		08/24/00	09/13/00	KG
Arsenic	29.1	0.466	mg/Kg	SW846 6020		08/24/00	09/13/00	KG
Lead	20.7	2.80	mg/Kg	SW846 6020		08/24/00	09/13/00	KGF

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CT&E Environmental Services Inc.

CT&E Ref.#	1004860004	**Client PO#**	Auth 48 Job #39551
Client Name	Harding Lawson & Assoc	**Printed Date/Time**	09/14/2000 9:41
Project Name/#	BLM-Red Devil	**Collected Date/Time**	08/06/2000 0:00
Client Sample ID	RT45/3-4.5	**Received Date/Time**	08/22/2000 13:30
Matrix	Soil/Solid	**Technical Director**	**Stephen C. Ede**
Ordered By		**Released By**	J Windebank

Sample Remarks:

Parameter	Results	PQL	Units	Method	Allowable Limits	Prep Date	Analysis Date	Init
Solids								
Total Solids	98.3		%	SM20 2540G			08/24/00	JCO
Metals Department								
Mercury by Cold Vapor	3.41	2.02	mg/Kg	SW846-7471A		08/24/00	08/25/00	JDT
Metals by ICP/MS								
Antimony	1.01 U	1.01	mg/Kg	SW846 6020		08/24/00	09/13/00	KGF
Arsenic	33.4	0.505	mg/Kg	SW846 6020		08/24/00	09/13/00	KGF
Lead	8.65	3.03	mg/Kg	SW846 6020		08/24/00	09/13/00	KGF

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CT&E Environmental Services Inc.

CT&E Ref.#	1004860005	**Client PO#**	Auth 48 Job #39551
Client Name	Harding Lawson & Assoc	**Printed Date/Time**	09/14/2000 9:41
Project Name/#	BLM-Red Devil	**Collected Date/Time**	08/06/2000 0:00
Client Sample ID	RT52/3-4.5	**Received Date/Time**	08/22/2000 13:30
Matrix	Soil/Solid	**Technical Director**	**Stephen C. Ede**
Ordered By		**Released By**	

Sample Remarks:

Parameter	Results	PQL	Units	Method	Allowable Limits	Prep Date	Analysis Date	Init
Solids								
Total Solids	97.7		%	SM20 2540G			08/24/00	JC
Metals Department								
Mercury by Cold Vapor	96.3	2.04	mg/Kg	SW846-7471A		08/24/00	08/25/00	JDT
Metals by ICP/MS								
Antimony	5.47	0.956	mg/Kg	SW846 6020		08/24/00	09/13/00	KG
Arsenic	70.6	0.478	mg/Kg	SW846 6020		08/24/00	09/13/00	KG
Lead	14.0	2.87	mg/Kg	SW846 6020		08/24/00	09/13/00	KGF

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CT&E Environmental Services Inc.

CT&E Ref.#	1004860006	**Client PO#**	Auth 48 Job #39551
Client Name	Harding Lawson & Assoc	**Printed Date/Time**	09/14/2000 9:41
Project Name/#	BLM-Red Devil	**Collected Date/Time**	08/03/2000 0:00
Client Sample ID	RT50/1.5-3	**Received Date/Time**	08/22/2000 13:30
Matrix	Soil/Solid	**Technical Director**	**Stephen C. Ede**
Ordered By		**Released By**	J Windebank

Sample Remarks:

Parameter	Results	PQL	Units	Method	Allowable Limits	Prep Date	Analysis Date	Init
Solids								
Total Solids	98.4		%	SM20 2540G			08/24/00	JCO
Metals Department								
Mercury by Cold Vapor	56.6	1.93	mg/Kg	SW846-7471A		08/24/00	08/25/00	JDT
Metals by ICP/MS								
Antimony	12.2	0.962	mg/Kg	SW846 6020		08/24/00	09/13/00	KGF
Arsenic	53.5	0.481	mg/Kg	SW846 6020		08/24/00	09/13/00	KGF
Lead	11.3	2.89	mg/Kg	SW846 6020		08/24/00	09/13/00	KGF

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CT&E Environmental Services Inc.

CT&E Ref.#	1004860007	**Client PO#**	Auth 48 Job #39551
Client Name	Harding Lawson & Assoc	**Printed Date/Time**	09/14/2000 9:41
Project Name/#	BLM-Red Devil	**Collected Date/Time**	08/07/2000 0:00
Client Sample ID	RT68/3-4.5	**Received Date/Time**	08/22/2000 13:30
Matrix	Soil/Solid	**Technical Director**	**Stephen C. Ede**
Ordered By		**Released By**	J.C. Wendelbank

Sample Remarks:

Parameter	Results	PQL	Units	Method	Allowable Limits	Prep Date	Analysis Date	Init
Solids								
Total Solids	97.4		%	SM20 2540G			08/24/00	JC
Metals Department								
Mercury by Cold Vapor	78.4	1.84	mg/Kg	SW846-7471A		08/24/00	08/25/00	JDT
Metals by ICP/MS								
Antimony	14.9	0.872	mg/Kg	SW846 6020		08/24/00	09/13/00	KG
Arsenic	209	0.436	mg/Kg	SW846 6020		08/24/00	09/13/00	KG
Lead	14.5	2.61	mg/Kg	SW846 6020		08/24/00	09/13/00	KGF

CT&E Environmental Services Inc.

CT&E Ref.#	1004860008	**Client PO#**	Auth 48 Job #39551
Client Name	Harding Lawson & Assoc	**Printed Date/Time**	09/14/2000 9:41
Project Name/#	BLM-Red Devil	**Collected Date/Time**	08/06/2000 0:00
Client Sample ID	RT51/3-4.5	**Received Date/Time**	08/22/2000 13:30
Matrix	Soil/Solid	**Technical Director**	**Stephen C. Ede**
Ordered By		**Released By**	

Sample Remarks:

Parameter	Results	PQL	Units	Method	Allowable Limits	Prep Date	Analysis Date	Init
Solids								
Total Solids	99.1		%	SM20 2540G			08/24/00	JCO
Metals Department								
Mercury by Cold Vapor	13.5	1.94	mg/Kg	SW846-7471A		08/24/00	08/25/00	JDT
Metals by ICP/MS								
Antimony	3.20	0.999	mg/Kg	SW846 6020		08/24/00	09/13/00	KGF
Arsenic	83.0	0.500	mg/Kg	SW846 6020		08/24/00	09/13/00	KGF
Lead	6.65	3.00	mg/Kg	SW846 6020		08/24/00	09/13/00	KGF

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CT&E Environmental Services Inc.

CT&E Ref.#	1004860009	**Client PO#**	Auth 48 Job #39551
Client Name	Harding Lawson & Assoc	**Printed Date/Time**	09/14/2000 9:41
Project Name/#	BLM-Red Devil	**Collected Date/Time**	08/07/2000 0:00
Client Sample ID	RT63/3-4.5	**Received Date/Time**	08/22/2000 13:30
Matrix	Soil/Solid	**Technical Director**	**Stephen C. Ede**
Ordered By		**Released By**	J Wendebank

Sample Remarks:

Parameter	Results	PQL	Units	Method	Allowable Limits	Prep Date	Analysis Date	Init
Solids								
Total Solids	98.3		%	SM20 2540G			08/24/00	JC
Metals Department								
Mercury by Cold Vapor	20.8	1.85	mg/Kg	SW846-7471A		08/24/00	08/25/00	JDT
Metals by ICP/MS								
Antimony	6.86	0.932	mg/Kg	SW846 6020		08/24/00	09/13/00	KG
Arsenic	63.2	0.466	mg/Kg	SW846 6020		08/24/00	09/13/00	KG
Lead	6.72	2.80	mg/Kg	SW846 6020		08/24/00	09/13/00	KGF

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CT&E Environmental Services Inc.

CT&E Ref.#	1004860010	**Client PO#**	Auth 48 Job #39551
Client Name	Harding Lawson & Assoc	**Printed Date/Time**	09/14/2000 9:41
Project Name/#	BLM-Red Devil	**Collected Date/Time**	08/06/2000 0:00
Client Sample ID	RT53/5-6.5	**Received Date/Time**	08/22/2000 13:30
Matrix	Soil/Solid	**Technical Director**	**Stephen C. Ede**
Ordered By		**Released By**	J. Wendelbank

Sample Remarks:

Parameter	Results	PQL	Units	Method	Allowable Limits	Prep Date	Analysis Date	Init
Solids								
Total Solids	98.0		%	SM20 2540G			08/24/00	JCO
Metals Department								
Mercury by Cold Vapor	4.36	1.99	mg/Kg	SW846-7471A		08/24/00	08/25/00	JDT
Metals by ICP/MS								
Antimony	0.946 U	0.946	mg/Kg	SW846 6020		08/24/00	09/13/00	KGF
Arsenic	21.3	0.473	mg/Kg	SW846 6020		08/24/00	09/13/00	KGF
Lead	18.4	2.84	mg/Kg	SW846 6020		08/24/00	09/13/00	KGF

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CT&E Environmental Services Inc.

CT&E Ref.#	1004860011	**Client PO#**	Auth 48 Job #39551
Client Name	Harding Lawson & Assoc	**Printed Date/Time**	09/14/2000 9:41
Project Name/#	BLM-Red Devil	**Collected Date/Time**	08/09/2000 0:00
Client Sample ID	B5/30-31.5	**Received Date/Time**	08/22/2000 13:30
Matrix	Soil/Solid	**Technical Director**	**Stephen C. Ede**
Ordered By		**Released By**	J Wendebank

Sample Remarks:

Parameter	Results	PQL	Units	Method	Allowable Limits	Prep Date	Analysis Date	Init
Solids								
Total Solids	98.9		%	SM20 2540G			08/24/00	JC
Metals Department								
Mercury by Cold Vapor	4.41	1.94	mg/Kg	SW846-7471A		08/24/00	08/25/00	JDT
Metals by ICP/MS								
Antimony	0.955 U	0.955	mg/Kg	SW846 6020		08/24/00	09/13/00	KG
Arsenic	113	0.477	mg/Kg	SW846 6020		08/24/00	09/13/00	KG
Lead	6.82	2.86	mg/Kg	SW846 6020		08/24/00	09/13/00	KGF

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CT&E Environmental Services Inc.

CT&E Ref.#	1004860012	**Client PO#**	Auth 48 Job #39551
Client Name	Harding Lawson & Assoc	**Printed Date/Time**	09/14/2000 9:41
Project Name/#	BLM-Red Devil	**Collected Date/Time**	08/06/2000 0:00
Client Sample ID	RT51/1.5-3	**Received Date/Time**	08/22/2000 13:30
Matrix	Soil/Solid	**Technical Director**	**Stephen C. Ede**
Ordered By		**Released By**	J Wunderlank

Sample Remarks:

Parameter	Results	PQL	Units	Method	Allowable Limits	Prep Date	Analysis Date	Init
Solids								
Total Solids	98.3		%	SM20 2540G			08/24/00	JCO
Metals Department								
Mercury by Cold Vapor	10.6	1.98	mg/Kg	SW846-7471A		08/24/00	08/25/00	JDT
Metals by ICP/MS								
Antimony	10.3	0.962	mg/Kg	SW846 6020		08/24/00	09/13/00	KGF
Arsenic	207	0.481	mg/Kg	SW846 6020		08/24/00	09/13/00	KGF
Lead	9.12	2.88	mg/Kg	SW846 6020		08/24/00	09/13/00	KGF

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CT&E Environmental Services Inc.

CT&E Ref.#	1004860013	**Client PO#**	Auth 48 Job #39551
Client Name	Harding Lawson & Assoc	**Printed Date/Time**	09/14/2000 9:41
Project Name/#	BLM-Red Devil	**Collected Date/Time**	08/06/2000 0:00
Client Sample ID	RT50/3-4.5	**Received Date/Time**	08/22/2000 13:30
Matrix	Soil/Solid	**Technical Director**	**Stephen C. Ede**
Ordered By		**Released By**	J Windebank

Sample Remarks:

Parameter	Results	PQL	Units	Method	Allowable Limits	Prep Date	Analysis Date	Init
Solids								
Total Solids	96.5		%	SM20 2540G			08/24/00	JC
Metals Department								
Mercury by Cold Vapor	12.0	2.04	mg/Kg	SW846-7471A		08/24/00	08/25/00	JDT
Metals by ICP/MS								
Antimony	7.35	1.03	mg/Kg	SW846 6020		08/24/00	09/13/00	KG
Arsenic	43.8	0.516	mg/Kg	SW846 6020		08/24/00	09/13/00	KG
Lead	18.7	3.10	mg/Kg	SW846 6020		08/24/00	09/13/00	KGF

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CT&E Environmental Services Inc.

CT&E Ref.#	1004860014	**Client PO#**	Auth 48 Job #39551
Client Name	Harding Lawson & Assoc	**Printed Date/Time**	09/14/2000 9:41
Project Name/#	BLM-Red Devil	**Collected Date/Time**	08/07/2000 0:00
Client Sample ID	RT72/3-4.5	**Received Date/Time**	08/22/2000 13:30
Matrix	Soil/Solid	**Technical Director**	**Stephen C. Ede**
Ordered By		**Released By**	J Windebank

Sample Remarks:

Parameter	Results	PQL	Units	Method	Allowable Limits	Prep Date	Analysis Date	Init
Solids								
Total Solids	97.5		%	SM20 2540G			08/24/00	JCO
Metals Department								
Mercury by Cold Vapor	13.7	1.80	mg/Kg	SW846-7471A		08/24/00	08/25/00	JDT
Metals by ICP/MS								
Antimony	55.3	1.02	mg/Kg	SW846 6020		08/24/00	09/13/00	KGF
Arsenic	1080	0.508	mg/Kg	SW846 6020		08/24/00	09/13/00	KGF
Lead	18.8	3.05	mg/Kg	SW846 6020		08/24/00	09/13/00	KGF

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CT&E Environmental Services Inc.

CT&E Ref.#	1004860015	**Client PO#**	Auth 48 Job #39551
Client Name	Harding Lawson & Assoc	**Printed Date/Time**	09/14/2000 9:41
Project Name/#	BLM-Red Devil	**Collected Date/Time**	08/07/2000 0:00
Client Sample ID	RT66/3-4.5	**Received Date/Time**	08/22/2000 13:30
Matrix	Soil/Solid	**Technical Director**	**Stephen C. Ede**
Ordered By		**Released By**	J Windebank

Sample Remarks:

Parameter	Results	PQL	Units	Method	Allowable Limits	Prep Date	Analysis Date	Init
Solids								
Total Solids	97.6		%	SM20 2540G			08/24/00	JC
Metals Department								
Mercury by Cold Vapor	29.3	1.94	mg/Kg	SW846-7471A		08/24/00	08/25/00	JDT
Metals by ICP/MS								
Antimony	36.3	0.948	mg/Kg	SW846 6020		08/24/00	09/13/00	KG
Arsenic	148	0.474	mg/Kg	SW846 6020		08/24/00	09/13/00	KG
Lead	11.9	2.84	mg/Kg	SW846 6020		08/24/00	09/13/00	KGF

F-701

CT&E Environmental Services Inc.

CT&E Ref.#	1004860016	**Client PO#**	Auth 48 Job #39551
Client Name	Harding Lawson & Assoc	**Printed Date/Time**	09/14/2000 9:41
Project Name/#	BLM-Red Devil	**Collected Date/Time**	08/07/2000 0:00
Client Sample ID	RT67/3-4.5	**Received Date/Time**	08/22/2000 13:30
Matrix	Soil/Solid	**Technical Director**	**Stephen C. Ede**
Ordered By		**Released By**	JW Lindebank

Sample Remarks:

Parameter	Results	PQL	Units	Method	Allowable Limits	Prep Date	Analysis Date	Init
Solids								
Total Solids	96.1		%	SM20 2540G			08/24/00	JCO
Metals Department								
Mercury by Cold Vapor	39.5	1.99	mg/Kg	SW846-7471A		08/24/00	08/25/00	JDT
Metals by ICP/MS								
Antimony	4.46	0.869	mg/Kg	SW846 6020		08/24/00	09/13/00	KGF
Arsenic	57.0	0.435	mg/Kg	SW846 6020		08/24/00	09/13/00	KGF
Lead	15.1	2.61	mg/Kg	SW846 6020		08/24/00	09/13/00	KGF

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CT&E Environmental Services Inc.

CT&E Ref.#	326039	Method Blank	**Printed Date/Time**	09/14/2000 9:42
Client Name	Harding Lawson & Assoc		**Prep**	**Batch**
Project Name/#	BLM-Red Devil			**Method**
Matrix	Soil/Solid			**Date**

QC results affect the following production samples:

1004860001, 1004860002, 1004860003, 1004860004, 1004860005, 1004860006, 1004860007, 1004860008, 1004860009, 1004860010, 1004860011, 1004860012, 1004860013, 1004860014, 1004860015, 1004860016

Parameter	Results	PQL	Units	Analysis Date	Init
Solids					
Total Solids	99.8		%	08/24/00	JCO

Batch SPT 3479
Method SM20 2540G
Instrument

F-701

CT&E Environmental Services Inc.

CT&E Ref.#	326040	Duplicate	**Printed Date/Time**	09/14/2000 9:42	
Client Name	Harding Lawson & Assoc		**Prep**	**Batch**	
Project Name/#	BLM-Red Devil			**Method**	
Original	1004860001			**Date**	
Matrix	Soil/Solid				

QC results affect the following production samples:

1004860001, 1004860002, 1004860003, 1004860004, 1004860005, 1004860006, 1004860007, 1004860008, 1004860009, 1004860010, 1004860011, 1004860012, 1004860013, 1004860014, 1004860015, 1004860016

Parameter	Original Result	QC Result	RPD	RPD Limits	Analysis Date	Init
Solids						
Total Solids	95.7	95.6	0.15		08/24/00	JCO

Batch SPT 3479
Method SM20 2540G
Instrument

F-701

CT&E Environmental Services Inc.

CT&E Ref.#	325735	Method Blank	**Printed Date/Time**	09/14/2000 9:42	
Client Name	Harding Lawson & Assoc		**Prep Batch**	MXX	7754
Project Name/#	BLM-Red Devil		**Method**		
Matrix	Soil/Solid		**Date**	08/24/2000	

QC results affect the following production samples:

1004860001, 1004860002, 1004860003, 1004860004, 1004860005, 1004860006, 1004860007, 1004860008, 1004860009, 1004860010, 1004860011, 1004860012, 1004860013, 1004860014, 1004860015, 1004860016

Parameter	Results	PQL	Units	Analysis Date	Init
Thallium	0.00320	0.00100	mg/Kg	09/13/00	KGF

Batch MMS 1242
Method SW846 6020
Instrument Perkin Elmer Sciex ICP-MS P3

UST Metals

Aluminum	2.50 U	2.50	mg/Kg	09/13/00	KGF
Antimony	0.104	0.100	mg/Kg	09/13/00	KGF
Arsenic	0.0500 U	0.0500	mg/Kg	09/13/00	KGF
Barium	0.100 U	0.100	mg/Kg	09/13/00	KGF
Beryllium	0.00400 U	0.00400	mg/Kg	09/13/00	KGF
Cadmium	0.00630	0.00500	mg/Kg	09/13/00	KGF
Calcium	3.75 U	3.75	mg/Kg	09/13/00	KGF
Chromium	0.415	0.100	mg/Kg	09/13/00	KGF
Copper	0.300 U	0.300	mg/Kg	09/13/00	KGF
Iron	2.50 U	2.50	mg/Kg	09/13/00	KGF
Lead	0.300 U	0.300	mg/Kg	09/13/00	KGF
Potassium	5.00 U	5.00	mg/Kg	09/13/00	KGF
Selenium	0.0375 J	0.0500	mg/Kg	09/13/00	KGF
Silver	0.0200 U	0.0200	mg/Kg	09/13/00	KGF
Sodium	4.08 J	5.00	mg/Kg	09/13/00	KGF
Vanadium	0.0100 U	0.0100	mg/Kg	09/13/00	KGF
Zinc	0.150 J	0.250	mg/Kg	09/13/00	KGF
Cobalt	0.0150 U	0.0150	mg/Kg	09/13/00	KGF
Magnesium	0.160 J	0.500	mg/Kg	09/13/00	KGF
Manganese	0.500 U	0.500	mg/Kg	09/13/00	KGF
Molybdenum	0.0250 U	0.0250	mg/Kg	09/13/00	KGF
Nickel	0.300 U	0.300	mg/Kg	09/13/00	KGF

Batch MMS 1242
Method SW846 6020
Instrument Perkin Elmer Sciex ICP-MS P3

CT&E Environmental Services Inc.

CT&E Ref.#	325736 Lab Control Sample	**Printed Date/Time**	09/14/2000 9:42
		Prep Batch	MXX 7754
Client Name	Harding Lawson & Assoc	**Method**	
Project Name/#	BLM-Red Devil	**Date**	08/24/2000
Matrix	Soil/Solid		

QC results affect the following production samples:

1004860001, 1004860002, 1004860003, 1004860004, 1004860005, 1004860006, 1004860007, 1004860008, 1004860009, 1004860010, 1004860011, 1004860012, 1004860013, 1004860014, 1004860015, 1004860016

Parameter		QC Results	Pct Recov	LCS/LCSD Limits	RPD	RPD Limits	Spiked Amount	Analysis Date	Init
Thallium	LCS	55.3	110	(85-115)			50.5 mg/Kg	09/13/00	KGF

Batch MMS 1242
Method SW846 6020
Instrument Perkin Elmer Sciex ICP-MS P3

UST Metals

Aluminum	LCS	56.0	112	(85-115)			50 mg/Kg	09/13/00	KGF
Antimony	LCS	56.4	113	(85-115)			50 mg/Kg	09/13/00	KGF
Arsenic	LCS	55.4	111	(85-115)			50 mg/Kg	09/13/00	KGF
Barium	LCS	56.6	113	(85-115)			50 mg/Kg	09/13/00	KGF
Beryllium	LCS	22.8	113	(85-115)			20.1 mg/Kg	09/13/00	KGF
Cadmium	LCS	28.2	113	(85-115)			25 mg/Kg	09/13/00	KGF
Calcium	LCS	571	114	(85-115)			500 mg/Kg	09/13/00	KGF
Chromium	LCS	55.0	110	(85-115)			50 mg/Kg	09/13/00	KGF
Copper	LCS	56.1	112	(85-115)			50 mg/Kg	09/13/00	KGF
Iron	LCS	55.7	111	(85-115)			50.1 mg/Kg	09/13/00	KGF
Lead	LCS	53.9	108	(85-115)			50 mg/Kg	09/13/00	KGF
Potassium	LCS	512	102	(85-115)			500 mg/Kg	09/13/00	KGF
Selenium	LCS	54.2	108	(85-115)			50 mg/Kg	09/13/00	KGF
Silver	LCS	11.8	118 *	(85-115)			10 mg/Kg	09/13/00	KGF
Sodium	LCS	562	112	(85-115)			500 mg/Kg	09/13/00	KGF
Vanadium	LCS	54.4	109	(85-115)			50 mg/Kg	09/13/00	KGF
Zinc	LCS	55.3	111	(85-115)			50 mg/Kg	09/13/00	KGF
Cobalt	LCS	52.1	104	(85-115)			50 mg/Kg	09/13/00	KGF
Magnesium	LCS	558	112	(85-115)			500 mg/Kg	09/13/00	KGF
Manganese	LCS	53.5	107	(85-115)			50 mg/Kg	09/13/00	KGF
Molybdenum	LCS	54.1	108	(85-115)			50 mg/Kg	09/13/00	KGF
Nickel	LCS	54.9	110	(85-115)			50 mg/Kg	09/13/00	KGF

Batch MMS 1242
Method SW846 6020
Instrument Perkin Elmer Sciex ICP-MS P3

CT&E Environmental Services Inc.

CT&E Ref.#	326081	Method Blank	**Printed Date/Time**	09/14/2000 9:42	
Client Name	Harding Lawson & Assoc		**Prep Batch**	MXX	7766
Project Name/#	BLM-Red Devil		**Method**		
Matrix	Water (Surface, Eff., Ground)		**Date**	08/24/2000	

QC results affect the following production samples:

1004860001, 1004860002, 1004860003, 1004860004, 1004860005, 1004860006, 1004860007, 1004860008, 1004860009, 1004860010, 1004860011, 1004860012, 1004860013, 1004860014, 1004860015, 1004860016

Parameter	Results	PQL	Units	Analysis Date	Init
Metals Department					
Mercury by Cold Vapor	0.000200 U	0.00020	mg/L	08/25/00	JDT

Batch MCV 2175
Method SW846-7471A
Instrument HgAA Leeman AutoAnalyzer PS200

F-701

CT&E Environmental Services Inc.

CT&E Ref.#	326082 Lab Control Sample	**Printed Date/Time**	09/14/2000 9:42
		Prep Batch	MXX 7766
Client Name	Harding Lawson & Assoc	**Method**	
Project Name/#	BLM-Red Devil	**Date**	08/24/2000
Matrix	Water (Surface, Eff., Ground)		

QC results affect the following production samples:

1004860001, 1004860002, 1004860003, 1004860004, 1004860005, 1004860006, 1004860007, 1004860008, 1004860009, 1004860010, 1004860011, 1004860012, 1004860013, 1004860014, 1004860015, 1004860016

Parameter		QC Results	Pct Recov	LCS/LCSD Limits	RPD	RPD Limits	Spiked Amount	Analysis Date	Init
Metals Department									
Mercury by Cold Vapor	LCS	0.00200	100	(85-115)			0.002 mg/L	08/25/00	JDT

Batch MCV 2175
Method SW846-7471A
Instrument HgAA Leeman AutoAnalyzer PS200

F-701

DATA QUALITY ASSESSMENT

Laboratory: CTE Environmental Services
Batch No.: 1004861
Sampled: RT70/5.0-6.5, RT51/5.0-6.5, RT48/1.5-3.0, RT67/1.5-3.0, RT47/3.0-4.5, RT64/1.5-3.0, RT71/3.0-4.5, RT34/1.5-3.0, RT50/5.0-6.5, FS076, RT66/1.5-3.0, RT55/5.0-6.5, B5/10.0-11.5, RT45/3.0-4.5, RT45/1.5-3.0, RT63/1.5-3.0

	Yes	No	Not Required
1. Were samples analyzed for requested parameters?	X		
2. Is the USACE Data Deliverables package complete?			X
3. Were samples extracted within holding time acceptance criteria?	X		
4. Were samples analyzed within holding time acceptance criteria?	X		
5. For soils, were sample results reported on a "dry weight" basis?	X		
6. Were method blanks analytes all reported as ND?		X	
7. For water, were trip blank analytes all reported as ND?			X
8. Are the surrogate percent recoveries within acceptance criteria?			X
9. Are the matrix spike percent recoveries within acceptance criteria?		X	
10. Are the matrix spike relative percent differences within acceptance criteria?			X
11. Are the field duplicate relative percent differences less than 50 percent?	X		

Comments:

6) Chromium estimated at 0.0540 mg/kg, zinc estimated at 0.0803 mg/kg, magnesium estimated at 0.140 mg/kg (all below PQL) (CTE ref. # 325740). Results are not affected.

Date: 3-30-01
Reviewer: JEH

RECEIVED
SEP 26 2000
HARDING LAWSON
ASSOCIATES

CTE Environmental Services
Alaska Division
Laboratory Data Report

Project: BLM-Red Devil

Client: Harding Lawson & Assoc

CTE Work Order: 1004861

Contents:

Chain of Custody
Quality Control Summary Forms

Note:

Unless otherwise noted, all quality assurance/quality control criteria is in compliance with the proper regulatory authority and/or CTE's Quality Assurance Program Plan.

Case Narrative

Customer: HARLAWP **Harding Lawson & Assoc**

Project: 1004861 **BLM-Red Devil**

There were no analytical anomalies associated with your data.

Form 1703-1
(December 1997)

1004861

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

CHAIN-OF-CUSTODY RECORD

Ship to: CTC

Project Name: Red Devil

Field Contact: BLM

Sampler Name(s): HLA

Office:

Telephone:

Address:

	Sample Identification	Date	Time	Matrix	Preservative	Conc. (HML)	No. Bottles	Lab QC	VOA	SVOC	Pest/PCB	Metals	Other	Remarks/Comments
1	RT70/5-6.5			SO								✓		
2	RT51/5-6.5			↓								✓		
3	RT48/1.5-3											✓		
4	RT67/1.5-3											✓		
5	~~RT47/3-4.5~~											✓		BM 8-23-00
6	RT64/1.5-3											✓		
7	RT71/3-4.5											✓		
8	RT34/1.5-3											✓		
9	RT50/5-6.5											✓		
10	FS076											✓		
11	RT66/1.5-3											✓		
12	RT55/5-6.5											✓		
13	BS/10-11.5											✓		
14	RT45/3-4.5											✓		
15	RT45/1.5-3											✓		
16	RT63/1.5-3											✓		

Relinquished by: Karl Ford	Date: 8/21/00	Relinquished by:	Date:
Received by:	Date:	Received by:	Date:

Notes:

Original

☆ U.S. GOVERNMENT PRINTING OFFICE: 1998-674-580

CT&E Environmental Services Inc.

SAMPLE RECEIPT FORM

1004861

CT&E WO#: 01 04861

Yes	No	
	✓	Are samples **RUSH**, priority, or *within 72 hrs* of **hold time**?
		If yes, have you done *e-mail notification*?
	✓	Are samples *within 24 hrs* of **hold time** or **due date**?
		If yes, have you *spoken with* Supervisor?
✓		Are there any **problems** (e.g., ids, analyses)?
		Were samples preserved correctly and pH verified?

#5 is missing

		Has Project Manager been notified of problems?
	✓	Is this an ACOE/AFCEE/ADEC project?
	✓	Will a **data package** be required?
		If this is for PWS, provide **PWSID**.
		Is there a **quote** for this project?
	✓	Will **courier** charges apply?

Completed by (sign): [signature] (print): EA Thomas

Due Date: 8/30/00
Received Date/Time: 8/22 - 13:30
Cooler Temperature: amb
Sample Condition: (Good) / Poor

Matrix of each Sample:

2	" "	1-4, 6-16
	" "	
	" "	
	" "	
	Trip Blank	
	MS/MSD	

Additional Sample Remarks:

	AK101s/_____ 8260s field pres'd?
	Field-filtered for dissolved_____?
	Lab-filter for dissolved_____?
	Ref Lab required?

Notes:

*** The following *must* be completed for *all* ACOE & AFCEE projects: ***

Yes	No		Notes:
		Is cooler temperature 4 ± C?	
		thermometer used:	
		Was there an airbill, etc? note #:	
		Was cooler sealed with custody seals?	
		#/where?	
		Were seals intact upon arrival?	
		Was there a COC with cooler?	
		Was the COC filled out properly?	
		Did the COC indicate ACOE/AFCEE project?	
		Did the COC and samples correspond?	
		Were samples screened with Geiger counter?	
		Were all samples packed to prevent breakage?	
		packing material:	
		Were all samples unbroken and clearly labelled?	
		Were all samples sealed in separate plastic bags?	
		Were all bottles for volatiles free of headspace?	
		Were correct container/sample sizes submitted?	
		Was client notified of problems? (specify below)	

Individual contacted:
Date & Time: Phone/Fax #:

# of each Container Received:

	950 ml amber	unpres'd
	950 ml amber	w/ HCl
	500 ml amber	w/ H2SO4
	1L cubies	unpres'd
	1L cubies	w/ HNO3
	1L cubies	w/ H2SO4
	1L cubies	w/ NaOH + ZnAc
	120 ml coli	bottles
	60 ml	Nalg
	8 oz amber	unpres'd
	4 oz amber	unpres'd
	4 oz w/ septa	w/ MeOH
	40 ml vials	w/ HCl
15	Other (specify)	Ziplock Bags
	Other (specify)	

#/Log In Proofed by:

Form Number: F004r2
Printed: 7/12/99

CT&E Environmental Services Inc.
Laboratory Division

Laboratory Analysis Report

200 W. Potter Drive
Anchorage, AK 99518-1605
Tel: (907) 562-2343
Fax: (907) 561-5301
Web: http://www.cteesi.com

Brian Lund
Harding Lawson & Assoc
601 East 57th Place
Anchorage, AK 99518

Work Order:	1004861
	BLM-Red Devil
Client:	Harding Lawson & Assoc
Report Date:	September 14, 2000

Enclosed are the analytical results associated with the above workorder.

As required by the state of Alaska and the USEPA, a formal Quality Assurance/Quality Control Program is maintaned 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 analyte 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
!	Surrogate out of range

CT&E Environmental Services Inc.

CT&E Ref.#	1004861001	**Client PO#**	Auth 48 Job #39551
Client Name	Harding Lawson & Assoc	**Printed Date/Time**	09/14/2000 12:56
Project Name/#	BLM-Red Devil	**Collected Date/Time**	08/07/2000 0:00
Client Sample ID	RT70/5-6.5	**Received Date/Time**	08/22/2000 13:30
Matrix	Soil/Solid	**Technical Director**	**Stephen C. Ede**
Ordered By		**Released By**	J. Wendlebank

Sample Remarks:

Parameter	Results	PQL	Units	Method	Allowable Limits	Prep Date	Analysis Date	Init
Solids								
Total Solids	97.6		%	SM20 2540G			08/24/00	JC
Metals Department								
Mercury by Cold Vapor	42.9	2.01	mg/Kg	SW846-7471A		08/24/00	08/29/00	JDT
Metals by ICP/MS								
Antimony	18.5	9.87	mg/Kg	SW846 6020		08/24/00	09/13/00	KG
Arsenic	997	4.94	mg/Kg	SW846 6020		08/24/00	09/13/00	KG
Lead	18.6	2.96	mg/Kg	SW846 6020		08/24/00	09/13/00	KGF

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CT&E Environmental Services Inc.

CT&E Ref.#	1004861002	**Client PO#**	Auth 48 Job #39551
Client Name	Harding Lawson & Assoc	**Printed Date/Time**	09/14/2000 12:56
Project Name/#	BLM-Red Devil	**Collected Date/Time**	08/06/2000 0:00
Client Sample ID	RT51/5-6.5	**Received Date/Time**	08/22/2000 13:30
Matrix	Soil/Solid	**Technical Director**	**Stephen C. Ede**
Ordered By		**Released By**	J Windebank

Sample Remarks:

Parameter	Results	PQL	Units	Method	Allowable Limits	Prep Date	Analysis Date	Init
Solids								
Total Solids	98.0		%	SM20 2540G			08/24/00	JCO
Metals Department								
Mercury by Cold Vapor	12.4	1.93	mg/Kg	SW846-7471A		08/24/00	08/29/00	JDT
Metals by ICP/MS								
Antimony	4.84	0.975	mg/Kg	SW846 6020		08/24/00	09/13/00	KGF
Arsenic	142	0.487	mg/Kg	SW846 6020		08/24/00	09/13/00	KGF
Lead	18.5	2.92	mg/Kg	SW846 6020		08/24/00	09/13/00	KGF

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CT&E Environmental Services Inc.

CT&E Ref.#	1004861003	**Client PO#**	Auth 48 Job #39551
Client Name	Harding Lawson & Assoc	**Printed Date/Time**	09/14/2000 12:56
Project Name/#	BLM-Red Devil	**Collected Date/Time**	08/06/2000 0:00
Client Sample ID	RT48/1.5-3	**Received Date/Time**	08/22/2000 13:30
Matrix	Soil/Solid	**Technical Director**	**Stephen C. Ede**
Ordered By		**Released By**	J Windebank

Sample Remarks:

Parameter	Results	PQL	Units	Method	Allowable Limits	Prep Date	Analysis Date	Init
Solids								
Total Solids	97.0		%	SM20 2540G			08/24/00	JC
Metals Department								
Mercury by Cold Vapor	12.9	2.01	mg/Kg	SW846-7471A		08/24/00	08/29/00	JDT
Metals by ICP/MS								
Antimony	1.63	0.925	mg/Kg	SW846 6020		08/24/00	09/13/00	KG
Arsenic	19.7	0.462	mg/Kg	SW846 6020		08/24/00	09/13/00	KG
Lead	18.9	2.77	mg/Kg	SW846 6020		08/24/00	09/13/00	KGF

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CT&E Environmental Services Inc.

CT&E Ref.#	1004861004	**Client PO#**	Auth 48 Job #39551
Client Name	Harding Lawson & Assoc	**Printed Date/Time**	09/14/2000 12:56
Project Name/#	BLM-Red Devil	**Collected Date/Time**	08/07/2000 0:00
Client Sample ID	RT67/1.5-3	**Received Date/Time**	08/22/2000 13:30
Matrix	Soil/Solid	**Technical Director**	**Stephen C. Ede**
Ordered By		**Released By**	J Windebank

Sample Remarks:

Parameter	Results	PQL	Units	Method	Allowable Limits	Prep Date	Analysis Date	Init
Solids								
Total Solids	97.9		%	SM20 2540G			08/24/00	JCO
Metals Department								
Mercury by Cold Vapor	19.4	1.90	mg/Kg	SW846-7471A		08/24/00	08/29/00	JDT
Metals by ICP/MS								
Antimony	5.34	0.966	mg/Kg	SW846 6020		08/24/00	09/13/00	KGF
Arsenic	106	0.483	mg/Kg	SW846 6020		08/24/00	09/13/00	KGF
Lead	9.21	2.90	mg/Kg	SW846 6020		08/24/00	09/13/00	KGF

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CT&E Environmental Services Inc.

CT&E Ref.#	1004861006	**Client PO#**	Auth 48 Job #39551
Client Name	Harding Lawson & Assoc	**Printed Date/Time**	09/14/2000 12:56
Project Name/#	BLM-Red Devil	**Collected Date/Time**	08/07/2000 0:00
Client Sample ID	RT64/1.5-3	**Received Date/Time**	08/22/2000 13:30
Matrix	Soil/Solid	**Technical Director**	**Stephen C. Ede**
Ordered By		**Released By**	J Windebank

Sample Remarks:

Parameter	Results	PQL	Units	Method	Allowable Limits	Prep Date	Analysis Date	Init
Solids								
Total Solids	95.5		%	SM20 2540G			08/24/00	JC
Metals Department								
Mercury by Cold Vapor	10.3	2.03	mg/Kg	SW846-7471A		08/24/00	08/29/00	JDT
Metals by ICP/MS								
Antimony	3.53	1.01	mg/Kg	SW846 6020		08/24/00	09/13/00	KG
Arsenic	33.2	0.504	mg/Kg	SW846 6020		08/24/00	09/13/00	KGF
Lead	15.4	3.02	mg/Kg	SW846 6020		08/24/00	09/13/00	KGF

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CT&E Environmental Services Inc.

CT&E Ref.#	1004861007	**Client PO#**	Auth 48 Job #39551
Client Name	Harding Lawson & Assoc	**Printed Date/Time**	09/14/2000 12:56
Project Name/#	BLM-Red Devil	**Collected Date/Time**	08/07/2000 0:00
Client Sample ID	RT71/3-4.5	**Received Date/Time**	08/22/2000 13:30
Matrix	Soil/Solid	**Technical Director**	**Stephen C. Ede**
Ordered By		**Released By**	J Windebank

Sample Remarks:

Parameter	Results	PQL	Units	Method	Allowable Limits	Prep Date	Analysis Date	Init
Solids								
Total Solids	97.6		%	SM20 2540G			08/24/00	JCO
Metals Department								
Mercury by Cold Vapor	34.4	2.01	mg/Kg	SW846-7471A		08/24/00	08/29/00	JDT
Metals by ICP/MS								
Antimony	68.2	0.954	mg/Kg	SW846 6020		08/24/00	09/13/00	KGF
Arsenic	727	0.477	mg/Kg	SW846 6020		08/24/00	09/13/00	KGF
Lead	24.0	2.86	mg/Kg	SW846 6020		08/24/00	09/13/00	KGF

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CT&E Environmental Services Inc.

CT&E Ref.#	1004861008	**Client PO#**	Auth 48 Job #39551
Client Name	Harding Lawson & Assoc	**Printed Date/Time**	09/14/2000 12:56
Project Name/#	BLM-Red Devil	**Collected Date/Time**	08/05/2000 0:00
Client Sample ID	RT34/1.5-3	**Received Date/Time**	08/22/2000 13:30
Matrix	Soil/Solid	**Technical Director**	**Stephen C. Ede**
Ordered By		**Released By**	J Windebank

Sample Remarks:

Parameter	Results	PQL	Units	Method	Allowable Limits	Prep Date	Analysis Date	Init
Solids								
Total Solids	96.2		%	SM20 2540G			08/24/00	JC
Metals Department								
Mercury by Cold Vapor	16.8	1.87	mg/Kg	SW846-7471A		08/24/00	08/29/00	JDT
Metals by ICP/MS								
Antimony	2.82	0.963	mg/Kg	SW846 6020		08/24/00	09/13/00	KG
Arsenic	138	0.482	mg/Kg	SW846 6020		08/24/00	09/13/00	KG
Lead	17.5	2.89	mg/Kg	SW846 6020		08/24/00	09/13/00	KGF

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CT&E Environmental Services Inc.

CT&E Ref.#	1004861009	**Client PO#**	Auth 48 Job #39551
Client Name	Harding Lawson & Assoc	**Printed Date/Time**	09/14/2000 12:56
Project Name/#	BLM-Red Devil	**Collected Date/Time**	08/06/2000 0:00
Client Sample ID	RT50/5-6.5	**Received Date/Time**	08/22/2000 13:30
Matrix	Soil/Solid	**Technical Director**	**Stephen C. Ede**
Ordered By		**Released By**	J Windebank

Sample Remarks:

Parameter	Results	PQL	Units	Method	Allowable Limits	Prep Date	Analysis Date	Init
Solids								
Total Solids	96.8		%	SM20 2540G			08/24/00	JCO
Metals Department								
Mercury by Cold Vapor	42.8	1.95	mg/Kg	SW846-7471A		08/24/00	08/29/00	JDT
Metals by ICP/MS								
Antimony	8.48	0.974	mg/Kg	SW846 6020		08/24/00	09/13/00	KGF
Arsenic	49.6	0.487	mg/Kg	SW846 6020		08/24/00	09/13/00	KGF
Lead	12.3	2.92	mg/Kg	SW846 6020		08/24/00	09/13/00	KGF

F-701

CT&E Environmental Services Inc.

CT&E Ref.#	1004861010	**Client PO#**	Auth 48 Job #39551
Client Name	Harding Lawson & Assoc	**Printed Date/Time**	09/14/2000 12:56
Project Name/#	BLM-Red Devil	**Collected Date/Time**	08/07/2000 0:00
Client Sample ID	FS076	**Received Date/Time**	08/22/2000 13:30
Matrix	Soil/Solid	**Technical Director**	**Stephen C. Ede**
Ordered By		**Released By**	J Windeler

Sample Remarks:

Parameter	Results	PQL	Units	Method	Allowable Limits	Prep Date	Analysis Date	Init
Solids								
Total Solids	95.7		%	SM20 2540G			08/24/00	JC
Metals Department								
Mercury by Cold Vapor	1250	191	mg/Kg	SW846-7471A		08/24/00	08/29/00	JDT
Metals by ICP/MS								
Antimony	9290	0.820	mg/Kg	SW846 6020		08/24/00	09/13/00	KG
Arsenic	8350	0.410	mg/Kg	SW846 6020		08/24/00	09/13/00	KG
Lead	2.46 U	2.46	mg/Kg	SW846 6020		08/24/00	09/13/00	KGF

F-701

CT&E Environmental Services Inc.

CT&E Ref.#	1004861011	**Client PO#**	Auth 48 Job #39551
Client Name	Harding Lawson & Assoc	**Printed Date/Time**	09/14/2000 12:56
Project Name/#	BLM-Red Devil	**Collected Date/Time**	08/07/2000 0:00
Client Sample ID	RT66/1.5-3	**Received Date/Time**	08/22/2000 13:30
Matrix	Soil/Solid	**Technical Director**	**Stephen C. Ede**
Ordered By		**Released By**	J W Indebank

Sample Remarks:

Parameter	Results	PQL	Units	Method	Allowable Limits	Prep Date	Analysis Date	Init
Solids								
Total Solids	98.3		%	SM20 2540G			08/24/00	JCO
Metals Department								
Mercury by Cold Vapor	38.4	1.95	mg/Kg	SW846-7471A		08/24/00	08/29/00	JDT
Metals by ICP/MS								
Antimony	86.8	0.968	mg/Kg	SW846 6020		08/24/00	09/13/00	KGF
Arsenic	232	0.484	mg/Kg	SW846 6020		08/24/00	09/13/00	KGF
Lead	9.94	2.90	mg/Kg	SW846 6020		08/24/00	09/13/00	KGF

F-701

CT&E Environmental Services Inc.

CT&E Ref.#	1004861012	**Client PO#**	Auth 48 Job #39551
Client Name	Harding Lawson & Assoc	**Printed Date/Time**	09/14/2000 12:56
Project Name/#	BLM-Red Devil	**Collected Date/Time**	08/06/2000 0:00
Client Sample ID	RT55/5-6.5	**Received Date/Time**	08/22/2000 13:30
Matrix	Soil/Solid	**Technical Director**	**Stephen C. Ede**
Ordered By		**Released By**	J Windebank

Sample Remarks:

Parameter	Results	PQL	Units	Method	Allowable Limits	Prep Date	Analysis Date	Init
Solids								
Total Solids	97.5		%	SM20 2540G			08/24/00	JCC
Metals Department								
Mercury by Cold Vapor	9.01	1.96	mg/Kg	SW846-7471A		08/24/00	08/29/00	JDT
Metals by ICP/MS								
Antimony	7.86	0.935	mg/Kg	SW846 6020		08/24/00	09/13/00	KGF
Arsenic	59.7	0.467	mg/Kg	SW846 6020		08/24/00	09/13/00	KGF
Lead	18.5	2.80	mg/Kg	SW846 6020		08/24/00	09/13/00	KGF

F-701

CT&E Environmental Services Inc.

CT&E Ref.#	1004861013	**Client PO#**	Auth 48 Job #39551
Client Name	Harding Lawson & Assoc	**Printed Date/Time**	09/14/2000 12:56
Project Name/#	BLM-Red Devil	**Collected Date/Time**	08/09/2000 0:00
Client Sample ID	B5/10-11.5	**Received Date/Time**	08/22/2000 13:30
Matrix	Soil/Solid	**Technical Director**	**Stephen C. Ede**
Ordered By		**Released By**	J Windebank

Sample Remarks:

Parameter	Results	PQL	Units	Method	Allowable Limits	Prep Date	Analysis Date	Init
Solids								
Total Solids	94.0		%	SM20 2540G			08/24/00	JCO
Metals Department								
Mercury by Cold Vapor	119	3.72	mg/Kg	SW846-7471A		08/24/00	08/29/00	JDT
Metals by ICP/MS								
Antimony	267	0.808	mg/Kg	SW846 6020		08/24/00	09/13/00	KGF
Arsenic	747	0.404	mg/Kg	SW846 6020		08/24/00	09/13/00	KGF
Lead	15.9	2.43	mg/Kg	SW846 6020		08/24/00	09/13/00	KGF

F-701

CT&E Environmental Services Inc.

CT&E Ref.#	1004861014	**Client PO#**	Auth 48 Job #39551
Client Name	Harding Lawson & Assoc	**Printed Date/Time**	09/14/2000 12:56
Project Name/#	BLM-Red Devil	**Collected Date/Time**	08/06/2000 0:00
Client Sample ID	RT45/3-4.5	**Received Date/Time**	08/22/2000 13:30
Matrix	Soil/Solid	**Technical Director**	**Stephen C. Ede**
Ordered By		**Released By**	J Windebank

Sample Remarks:

Parameter	Results	PQL	Units	Method	Allowable Limits	Prep Date	Analysis Date	Init
Solids								
Total Solids	96.0		%	SM20 2540G			08/24/00	JC
Metals Department								
Mercury by Cold Vapor	16.3	2.01	mg/Kg	SW846-7471A		08/24/00	08/29/00	JDT
Metals by ICP/MS								
Antimony	6.91	0.946	mg/Kg	SW846 6020		08/24/00	09/13/00	KG
Arsenic	94.5	0.473	mg/Kg	SW846 6020		08/24/00	09/13/00	KG
Lead	22.9	2.84	mg/Kg	SW846 6020		08/24/00	09/13/00	KGF

F-721

CT&E Environmental Services Inc.

CT&E Ref.#	1004861015	**Client PO#**	Auth 48 Job #39551
Client Name	Harding Lawson & Assoc	**Printed Date/Time**	09/14/2000 12:56
Project Name/#	BLM-Red Devil	**Collected Date/Time**	08/06/2000 0:00
Client Sample ID	RT45/1.5-3	**Received Date/Time**	08/22/2000 13:30
Matrix	Soil/Solid	**Technical Director**	**Stephen C. Ede**
Ordered By		**Released By**	J Wadebank

Sample Remarks:

Parameter	Results	PQL	Units	Method	Allowable Limits	Prep Date	Analysis Date	Init
Solids								
Total Solids	94.4		%	SM20 2540G			08/24/00	JCO
Metals Department								
Mercury by Cold Vapor	6.97	2.06	mg/Kg	SW846-7471A		08/24/00	08/29/00	JDT
Metals by ICP/MS								
Antimony	6.55	0.877	mg/Kg	SW846 6020		08/24/00	09/13/00	KGF
Arsenic	453	0.438	mg/Kg	SW846 6020		08/24/00	09/13/00	KGF
Lead	19.7	2.63	mg/Kg	SW846 6020		08/24/00	09/13/00	KGF

F-701

CT&E Environmental Services Inc.

CT&E Ref.#	1004861016	**Client PO#**	Auth 48 Job #39551
Client Name	Harding Lawson & Assoc	**Printed Date/Time**	09/14/2000 12:56
Project Name/#	BLM-Red Devil	**Collected Date/Time**	08/07/2000 0:00
Client Sample ID	RT63/1.5-3	**Received Date/Time**	08/22/2000 13:30
Matrix	Soil/Solid	**Technical Director**	**Stephen C. Ede**
Ordered By		**Released By**	J Windebank

Sample Remarks:

Parameter	Results	PQL	Units	Method	Allowable Limits	Prep Date	Analysis Date	Init
Solids								
Total Solids	97.6		%	SM20 2540G			08/24/00	JC
Metals Department								
Mercury by Cold Vapor	237	8.15	mg/Kg	SW846-7471A		08/24/00	08/29/00	JDT
Metals by ICP/MS								
Antimony	466	0.958	mg/Kg	SW846 6020		08/24/00	09/13/00	KG
Arsenic	663	0.479	mg/Kg	SW846 6020		08/24/00	09/13/00	KG
Lead	12.7	2.87	mg/Kg	SW846 6020		08/24/00	09/13/00	KGF

F-701

CT&E Environmental Services Inc.

CT&E Ref.#	326045	Method Blank	**Printed Date/Time**	09/14/2000 12:57
Client Name	Harding Lawson & Assoc		**Prep**	**Batch**
Project Name/#	BLM-Red Devil			**Method**
Matrix	Soil/Solid			**Date**

QC results affect the following production samples:

1004861001, 1004861002, 1004861003, 1004861004, 1004861006, 1004861007, 1004861008, 1004861009, 1004861010, 1004861011, 1004861012, 1004861013, 1004861014, 1004861015, 1004861016

Parameter	Results	PQL	Units	Analysis Date	Init
Solids					
Total Solids	99.9		%	08/24/00	JCO

Batch SPT 3480
Method SM20 2540G
Instrument

F-701

CT&E Environmental Services Inc.

CT&E Ref.#	326046	Duplicate	**Printed Date/Time**	09/14/2000 12:57
Client Name	Harding Lawson & Assoc		**Prep**	**Batch**
Project Name/#	BLM-Red Devil			**Method**
Original	1004861009			**Date**
Matrix	Soil/Solid			

QC results affect the following production samples:

1004861001, 1004861002, 1004861003, 1004861004, 1004861006, 1004861007, 1004861008, 1004861009, 1004861010, 1004861011, 1004861012, 1004861013, 1004861014, 1004861015, 1004861016

Parameter	Original Result	QC Result	RPD	RPD Limits	Analysis Date	Init
Solids						
Total Solids	96.8	96.6	0.21		08/24/00	JCO

Batch SPT 3480
Method SM20 2540G
Instrument

F-701

CT&E Environmental Services Inc.

CT&E Ref.#	325740	Method Blank	**Printed Date/Time**	09/14/2000 12:57	
Client Name	Harding Lawson & Assoc		**Prep**	**Batch**	MXX 7755
Project Name/#	BLM-Red Devil			**Method**	
Matrix	Soil/Solid			**Date**	08/24/2000

QC results affect the following production samples:

1004861001, 1004861002, 1004861003, 1004861004, 1004861006, 1004861007, 1004861008, 1004861009, 1004861010, 1004861011, 1004861012, 1004861013, 1004861014, 1004861015, 1004861016

Parameter	Results	PQL	Units	Analysis Date	Init
Thallium	0.00100 U	0.00100	mg/Kg	09/13/00	KGF

Batch MMS 1243
Method SW846 6020
Instrument Perkin Elmer Sciex ICP-MS P3

UST Metals

Aluminum	2.50 U	2.50	mg/Kg	09/13/00	KGF
Antimony	0.100 U	0.100	mg/Kg	09/13/00	KGF
Arsenic	0.0500 U	0.0500	mg/Kg	09/13/00	KGF
Barium	0.100 U	0.100	mg/Kg	09/13/00	KGF
Beryllium	0.00400 U	0.00400	mg/Kg	09/13/00	KGF
Cadmium	0.00500 U	0.00500	mg/Kg	09/13/00	KGF
Calcium	3.75 U	3.75	mg/Kg	09/13/00	KGF
Chromium	0.0540 J	0.100	mg/Kg	09/13/00	KGF
Copper	0.300 U	0.300	mg/Kg	09/13/00	KGF
Iron	2.50 U	2.50	mg/Kg	09/13/00	KGF
Lead	0.300 U	0.300	mg/Kg	09/13/00	KGF
Potassium	5.00 U	5.00	mg/Kg	09/13/00	KGF
Selenium	0.0500 U	0.0500	mg/Kg	09/13/00	KGF
Silver	0.0200 U	0.0200	mg/Kg	09/13/00	KGF
Sodium	5.00 U	5.00	mg/Kg	09/13/00	KGF
Vanadium	0.0100 U	0.0100	mg/Kg	09/13/00	KGF
Zinc	0.0803 J	0.250	mg/Kg	09/13/00	KGF
Cobalt	0.0150 U	0.0150	mg/Kg	09/13/00	KGF
Magnesium	0.140 J	0.500	mg/Kg	09/13/00	KGF
Manganese	0.500 U	0.500	mg/Kg	09/13/00	KGF
Molybdenum	0.0250 U	0.0250	mg/Kg	09/13/00	KGF
Nickel	0.300 U	0.300	mg/Kg	09/13/00	KGF

Batch MMS 1243
Method SW846 6020
Instrument Perkin Elmer Sciex ICP-MS P3

CT&E Environmental Services Inc.

CT&E Ref.#	325741 Lab Control Sample	**Printed Date/Time**	09/14/2000 12:58
		Prep Batch	MXX 7755
Client Name	Harding Lawson & Assoc	**Method**	
Project Name/#	BLM-Red Devil	**Date**	08/24/2000
Matrix	Soil/Solid		

QC results affect the following production samples:

1004861001, 1004861002, 1004861003, 1004861004, 1004861006, 1004861007, 1004861008, 1004861009, 1004861010, 1004861011, 1004861012, 1004861013, 1004861014, 1004861015, 1004861016

Parameter		QC Results	Pct Recov	LCS/LCSD Limits	RPD	RPD Limits	Spiked Amount	Analysis Date	Init
Thallium	LCS	52.0	103	(85-115)			50.5 mg/Kg	09/13/00	KGF

Batch MMS 1243
Method SW846 6020
Instrument Perkin Elmer Sciex ICP-MS P3

UST Metals

Aluminum	LCS	53.9	108	(85-115)			50 mg/Kg	09/13/00	KGF
Antimony	LCS	53.9	108	(85-115)			50 mg/Kg	09/13/00	KGF
Arsenic	LCS	54.7	109	(85-115)			50 mg/Kg	09/13/00	KGF
Barium	LCS	54.0	108	(85-115)			50 mg/Kg	09/13/00	KGF
Beryllium	LCS	21.0	105	(85-115)			20.1 mg/Kg	09/13/00	KGF
Cadmium	LCS	26.8	107	(85-115)			25 mg/Kg	09/13/00	KGF
Calcium	LCS	560	112	(85-115)			500 mg/Kg	09/13/00	KGF
Chromium	LCS	53.7	107	(85-115)			50 mg/Kg	09/13/00	KGF
Copper	LCS	54.3	109	(85-115)			50 mg/Kg	09/13/00	KGF
Iron	LCS	55.4	111	(85-115)			50.1 mg/Kg	09/13/00	KGF
Lead	LCS	52.9	106	(85-115)			50 mg/Kg	09/13/00	KGF
Potassium	LCS	512	102	(85-115)			500 mg/Kg	09/13/00	KGF
Selenium	LCS	52.3	105	(85-115)			50 mg/Kg	09/13/00	KGF
Silver	LCS	11.2	112	(85-115)			10 mg/Kg	09/13/00	KGF
Sodium	LCS	520	104	(85-115)			500 mg/Kg	09/13/00	KGF
Vanadium	LCS	52.9	106	(85-115)			50 mg/Kg	09/13/00	KGF
Zinc	LCS	51.7	103	(85-115)			50 mg/Kg	09/13/00	KGF
Cobalt	LCS	50.0	100	(85-115)			50 mg/Kg	09/13/00	KGF
Magnesium	LCS	515	103	(85-115)			500 mg/Kg	09/13/00	KGF
Manganese	LCS	52.6	105	(85-115)			50 mg/Kg	09/13/00	KGF
Molybdenum	LCS	52.9	106	(85-115)			50 mg/Kg	09/13/00	KGF
Nickel	LCS	53.4	107	(85-115)			50 mg/Kg	09/13/00	KGF

Batch MMS 1243
Method SW846 6020
Instrument Perkin Elmer Sciex ICP-MS P3

CT&E Environmental Services Inc.

CT&E Ref.#	326946	Method Blank	**Printed Date/Time**	09/14/2000 12:57	
Client Name	Harding Lawson & Assoc		**Prep**	**Batch**	MXX 7776
Project Name/#	BLM-Red Devil			**Method**	
Matrix	Water (Surface, Eff., Ground)			**Date**	08/24/2000

QC results affect the following production samples:

1004861001, 1004861002, 1004861003, 1004861004, 1004861006, 1004861007, 1004861008, 1004861009, 1004861010, 1004861011, 1004861012, 1004861013, 1004861014, 1004861015, 1004861016

Parameter	Results	PQL	Units	Analysis Date	Init
Metals Department					
Mercury by Cold Vapor	0.000200 U	0.00020	mg/L	08/29/00	JDT

Batch MCV 2181
Method SW846-7471A
Instrument HgAA Leeman AutoAnalyzer PS200

F-701

CT&E Environmental Services Inc.

CT&E Ref.#	326947 Lab Control Sample	**Printed Date/Time**	09/14/2000 12:58
		Prep Batch	MXX 7776
Client Name	Harding Lawson & Assoc	**Method**	
Project Name/#	BLM-Red Devil	**Date**	08/24/2000
Matrix	Water (Surface, Eff., Ground)		

QC results affect the following production samples:

1004861001, 1004861002, 1004861003, 1004861004, 1004861006, 1004861007, 1004861008, 1004861009, 1004861010, 1004861011, 1004861012, 1004861013, 1004861014, 1004861015, 1004861016

Parameter		QC Results	Pct Recov	LCS/LCSD Limits	RPD	RPD Limits	Spiked Amount	Analysis Date	Init
Metals Department									
Mercury by Cold Vapor	LCS	0.00204	102	(85-115)			0.002 mg/L	08/29/00	JDT

Batch MCV 2181
Method SW846-7471A
Instrument HgAA Leeman AutoAnalyzer PS200

F-701

DATA QUALITY ASSESSMENT

Laboratory: CTE Environmental Services
Batch No.: 1004862
Sampled: RT42/1.5-3.0, RT60/3.0-4.5, RT54/1.5-3.0, RT73/3.0-4.5, FS032, FS081, RT46/3.0-4.5, FS073, B4/0.5-2.0, RT75/1.5-3.0, RT58/5.0-6.5, RT60/1.5-3.0, RT64/3.0-4.5, RT48/5.0-6.5, RT53/1.5-3.0, RT45/5.0-6.5

	Yes	No	Not Required
1. Were samples analyzed for requested parameters?	X		
2. Is the USACE Data Deliverables package complete?			X
3. Were samples extracted within holding time acceptance criteria?	X		
4. Were samples analyzed within holding time acceptance criteria?	X		
5. For soils, were sample results reported on a "dry weight" basis?	X		
6. Were method blanks analytes all reported as ND?		X	
7. For water, were trip blank analytes all reported as ND?			X
8. Are the surrogate percent recoveries within acceptance criteria?			X
9. Are the matrix spike percent recoveries within acceptance criteria?		X	
10. Are the matrix spike relative percent differences within acceptance criteria?			X
11. Are the field duplicate relative percent differences less than 50 percent?	X		

Comments:

6) Antimony detected at 0.234 mg/kg, chromium detected at 0.366 mg/kg, zinc detected at 0.460 mg/kg (CTE ref. #325745); cadmium estimated at 0.00400 mg/kg (below PQL), calcium estimated at 1.51 mg/kg (below PQL), iron estimated at 0.918 mg/kg (below PQL), selenium estimated at 0.0261 mg/kg (below PQL), sodium estimated at 4.40 mg/kg (below PQL), magnesium estimated at 0.207 mg/kg (below PQL), molybdenum estimated at 0.0101 mg/kg (below PQL) (CTE ref. # 325745)

9) Percent recovery for aluminum was 116%. Percent recovery for calcium was 118% (CTE ref. # 325746). Results are not affected.

Date: 3-30-01
Reviewer: JEH

RECEIVED
SEP 26 2000
HARDING LAWSON
ASSOCIATES

CTE Environmental Services
Alaska Division
Laboratory Data Report

Project: BLM-Red Devil

Client: Harding Lawson & Assoc

CTE Work Order: 1004862

Contents:

Chain of Custody
Quality Control Summary Forms

Note:

Unless otherwise noted, all quality assurance/quality control criteria is in compliance with the proper regulatory authority and/or CTE's Quality Assurance Program Plan.

Case Narrative

Customer: HARLAWP **Harding Lawson & Assoc**

Project: 1004862 **BLM-Red Devil**

There were no analytical anomalies associated with your data.

Form 1703-1
(December 1997)

P 1004862

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

CHAIN-OF-CUSTODY RECORD

Ship to: CTE

Project Name: Red Devil

Field Contact: BLM

Sampler Name(s): HLA

Office:

Telephone:

Address:

	Sample Identification	Date	Time	Matrix	Preservative	Conc. (HM/L)	No. Bottles	Lab QC	VOA	SVOC	Pest/PCB	Metals	Other	Remarks/Comments
1	RT 42/1.5-3	8/6		SO								✓		
2	RT 60/3-4.5	8/7										✓		
3	RT 54/1.5-3	8/6										✓		
4	RT 73/3-4.5	8/7										✓		
5	FS 032	[illegible]										✓		
6	FS 081	8/8										✓		
7	RT 46/3-4.5	8/6										✓		
8	FS 073	8/6										✓		
9	B4/0.5-2	8/9										✓		
10	RT 75/1.5-3	8/7										✓		
11	RT 58/5-6.5	8/7										✓		
12	RT 60/1.5-3	8/7										✓		
13	RT 64/3-4.5	8/7										✓		
14	RT 48/5-6.5	8/6										✓		
15	RT 53/1.5-3	8/6										✓		
16	RT 45/5-6.5	8/6												

Relinquished by:	Date:	Relinquished by:	Date:	Notes:
KARL FORD	8/21/00			
Received by:	Date:	Received by:	Date:	
		[illegible]	8/22/00	13:30

Original

☆ U.S. GOVERNMENT PRINTING OFFICE: 1998-674-580

Form 1703-1
(December 1997)

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

p 1004862

CHAIN-OF-CUSTODY RECORD

Ship to:	Project Name:	Field Contact:
CTE	Red Devil	BLM
	Sampler Name(s):	Office: Telephone:
	HLA	Address:

	Sample Identification	Date	Time	Matrix	Preservative	Conc. (HML)	No. Bottles	Lab QC	VOA	SVOC	Pest/PCB	Metals	Other	Remarks/Comments
1	RT 42/1.5-3			SO								✓		
2	RT 60/3-4.5											✓		
3	RT 54/1.5-3											✓		
4	RT 73/3-4.5											✓		
5	FS 032											✓		
6	FS 081											✓		
7	RT 46/3-4.5											✓		
8	FS 073											✓		
9	B4/0.5-2											✓		
10	RT 75/1.5-3											✓		
11	RT 58/5-6.5											✓		
12	RT 60/1.5-3											✓		
13	RT 64/3-4.5											✓		
14	RT 48/5-6.5											✓		
15	RT 53/1.5-3											✓		
16	RT 45/5-6.5											✓		

Relinquished by:	Date:	Relinquished by:	Date:	Notes:
CLARK FORD	8/21/00			
Received by:	Date:	Received by:	Date:	
		[illegible]	8/22/00	13:30

Original

☆ U.S. GOVERNMENT PRINTING OFFICE: 1998-674-580

1004862 1004862

01 :

CT&E Environmental Services Inc.

SAMPLE RECEIPT FORM

Yes	No	
		Are samples **RUSH**, priority, or *within 72 hrs* of **hold time**?
		If yes, have you done *e-mail notification?*
	✓	Are samples *within 24 hrs* of **hold time** or **due date**?
		If yes, have you *spoken with* Supervisor?
	✓	Are there any **problems** (e.g., ids, analyses)?
		Were samples preserved correctly and pH verified?

	✓	Has Project Manager been notified of problems?
	✓	Is this an ACOE/AFCEE/ADEC project?
		Will a **data package** be required?
		If this is for PWS, provide **PWSID**.
		Is there a **quote** for this project?
	✓	Will **courier** charges apply?

Completed by (sign): [signature] (print): EA Thielen

Due Date: 8/30/00
Received Date/Time: 8/22 - 1530
Cooler Temperature: amb
Sample Condition: (Good) / Poor

Matrix of each Sample:

2	" "	1-16
	" "	
	" "	
	" "	
	Trip Blank	
	MS/MSD	

Additional Sample Remarks:

	AK101s/_____ 8260s field pres'd?
	Field-filtered for dissolved_____?
	Lab-filter for dissolved_____?
	Ref Lab required?

Notes:

*** The following *must* be completed for *all* ACOE & AFCEE projects: ***

Yes	No		Notes:
		Is cooler temperature 4 ± C?	
		thermometer used:	
		Was there an airbill, etc? note #:	
		Was cooler sealed with custody seals?	
		#/where?	
		Were seals intact upon arrival?	
		Was there a COC with cooler?	
		Was the COC filled out properly?	
		Did the COC indicate ACOE/AFCEE project?	
		Did the COC and samples correspond?	
		Were samples screened with Geiger counter?	
		Were all samples packed to prevent breakage?	
		packing material:	
		Were all samples unbroken and clearly labelled?	
		Were all samples sealed in separate plastic bags?	
		Were all bottles for volatiles free of headspace?	
		Were correct container/sample sizes submitted?	
		Was client notified of problems? (specify below)	

# of each Container Received:

	950 ml amber	unpres'd
	950 ml amber	w/ HCl
	500 ml amber	w/ H2SO4
	1L cubies	unpres'd
	1L cubies	w/ HNO3
	1L cubies	w/ H2SO4
	1L cubies	w/ NaOH + ZnAc
	120 ml coli	bottles
	60 ml	Nalg
	8 oz amber	unpres'd
	4 oz amber	unpres'd
	4 oz w/ septa	w/ MeOH
	40 ml vials	w/ HCl
16	Other (specify)	ziplock bags
	Other (specify)	

Individual contacted: _____
Date & Time: _____ Phone/Fax #: _____

#/Log In Proofed by: _____

Form Number: F004r2
Printed: 7/12/99

gmw 8/22/00 1410

CT&E Environmental Services Inc.
Laboratory Division

Laboratory Analysis Report

200 W. Potter Drive
Anchorage, AK 99518-1605
Tel: (907) 562-2343
Fax: (907) 561-5301
Web: http://www.cteesi.com

Brian Lund
Harding Lawson & Assoc
601 East 57th Place
Anchorage, AK 99518

Work Order:	1004862
	BLM-Red Devil
Client:	Harding Lawson & Assoc
Report Date:	September 14, 2000

Enclosed are the analytical results associated with the above workorder.

As required by the state of Alaska and the USEPA, a formal Quality Assurance/Quality Control Program is maintaned 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 analyte 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
!	Surrogate out of range

CT&E Environmental Services Inc.

CT&E Ref.#	1004862003	**Client PO#**	Auth 48 Job #39551
Client Name	Harding Lawson & Assoc	**Printed Date/Time**	09/14/2000 9:44
Project Name/#	BLM-Red Devil	**Collected Date/Time**	08/06/2000 0:00
Client Sample ID	RT54/1.5-3	**Received Date/Time**	08/22/2000 13:30
Matrix	Soil/Solid	**Technical Director**	**Stephen C. Ede**
Ordered By		**Released By**	J W Undebank

Sample Remarks:

Parameter	Results	PQL	Units	Method	Allowable Limits	Prep Date	Analysis Date	Init
Solids								
Total Solids	98.6		%	SM20 2540G			08/24/00	JC
Metals Department								
Mercury by Cold Vapor	20.4	1.94	mg/Kg	SW846-7471A		08/24/00	08/29/00	JDT
Metals by ICP/MS								
Antimony	5.38	0.930	mg/Kg	SW846 6020		08/24/00	09/07/00	KG
Arsenic	40.8	0.465	mg/Kg	SW846 6020		08/24/00	09/07/00	KG
Lead	18.2	2.79	mg/Kg	SW846 6020		08/24/00	09/07/00	KGF

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CT&E Environmental Services Inc.

CT&E Ref.#	1004862004	**Client PO#**	Auth 48 Job #39551
Client Name	Harding Lawson & Assoc	**Printed Date/Time**	09/14/2000 9:44
Project Name/#	BLM-Red Devil	**Collected Date/Time**	08/07/2000 0:00
Client Sample ID	RT73/3-4.5	**Received Date/Time**	08/22/2000 13:30
Matrix	Soil/Solid	**Technical Director**	**Stephen C. Ede**
Ordered By		**Released By**	J Wendlebank

Sample Remarks:

Parameter	Results	PQL	Units	Method	Allowable Limits	Prep Date	Analysis Date	Init
Solids								
Total Solids	99.3		%	SM20 2540G			08/24/00	JCO
Metals Department								
Mercury by Cold Vapor	89.0	1.88	mg/Kg	SW846-7471A		08/24/00	08/29/00	JDT
Metals by ICP/MS								
Antimony	85.9	0.868	mg/Kg	SW846 6020		08/24/00	09/07/00	KGF
Arsenic	328	4.34	mg/Kg	SW846 6020		08/24/00	09/07/00	KGF
Lead	4.53	2.60	mg/Kg	SW846 6020		08/24/00	09/07/00	KGF

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CT&E Environmental Services Inc.

CT&E Ref.#	1004862009	**Client PO#**	Auth 48 Job #39551
Client Name	Harding Lawson & Assoc	**Printed Date/Time**	09/14/2000 9:44
Project Name/#	BLM-Red Devil	**Collected Date/Time**	08/09/2000 0:00
Client Sample ID	B4/0.5-2	**Received Date/Time**	08/22/2000 13:30
Matrix	Soil/Solid	**Technical Director**	**Stephen C. Ede**
Ordered By		**Released By**	

Sample Remarks:

Parameter	Results	PQL	Units	Method	Allowable Limits	Prep Date	Analysis Date	Init
Solids								
Total Solids	98.4		%	SM20 2540G			08/24/00	JC
Metals Department								
Mercury by Cold Vapor	376	188	mg/Kg	SW846-7471A		08/24/00	08/29/00	JDT
Metals by ICP/MS								
Antimony	2600	0.826	mg/Kg	SW846 6020		08/24/00	09/07/00	KGF
Arsenic	2210	0.413	mg/Kg	SW846 6020		08/24/00	09/07/00	KGF
Lead	10.5	2.48	mg/Kg	SW846 6020		08/24/00	09/07/00	KGF

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CT&E Environmental Services Inc.

CT&E Ref.#	1004862010	**Client PO#**	Auth 48 Job #39551
Client Name	Harding Lawson & Assoc	**Printed Date/Time**	09/14/2000 9:44
Project Name/#	BLM-Red Devil	**Collected Date/Time**	08/07/2000 0:00
Client Sample ID	RT75/1.5-3	**Received Date/Time**	08/22/2000 13:30
Matrix	Soil/Solid	**Technical Director**	**Stephen C. Ede**
Ordered By		**Released By**	J Wendebank

Sample Remarks:

Parameter	Results	PQL	Units	Method	Allowable Limits	Prep Date	Analysis Date	Init
Solids								
Total Solids	98.4		%	SM20 2540G			08/24/00	JCO
Metals Department								
Mercury by Cold Vapor	15.1	1.74	mg/Kg	SW846-7471A		08/24/00	08/29/00	JDT
Metals by ICP/MS								
Antimony	19.4	0.875	mg/Kg	SW846 6020		08/24/00	09/07/00	KGF
Arsenic	444	0.438	mg/Kg	SW846 6020		08/24/00	09/07/00	KGF
Lead	13.5	2.63	mg/Kg	SW846 6020		08/24/00	09/07/00	KGF

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CT&E Environmental Services Inc.

CT&E Ref.#	1004862011	**Client PO#**	Auth 48 Job #39551
Client Name	Harding Lawson & Assoc	**Printed Date/Time**	09/14/2000 9:44
Project Name/#	BLM-Red Devil	**Collected Date/Time**	08/07/2000 0:00
Client Sample ID	RT58/5-6.5	**Received Date/Time**	08/22/2000 13:30
Matrix	Soil/Solid	**Technical Director**	**Stephen C. Ede**
Ordered By		**Released By**	J Wendebank

Sample Remarks:

Parameter	Results	PQL	Units	Method	Allowable Limits	Prep Date	Analysis Date	Init
Solids								
Total Solids	98.2		%	SM20 2540G			08/24/00	JC
Metals Department								
Mercury by Cold Vapor	7.16	1.80	mg/Kg	SW846-7471A		08/24/00	08/29/00	JDT
Metals by ICP/MS								
Antimony	1.66	0.959	mg/Kg	SW846 6020		08/24/00	09/07/00	KG
Arsenic	3.27	0.479	mg/Kg	SW846 6020		08/24/00	09/07/00	KG
Lead	18.3	2.88	mg/Kg	SW846 6020		08/24/00	09/07/00	KGF

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CT&E Environmental Services Inc.

CT&E Ref.#	1004862012	**Client PO#**	Auth 48 Job #39551
Client Name	Harding Lawson & Assoc	**Printed Date/Time**	09/14/2000 9:44
Project Name/#	BLM-Red Devil	**Collected Date/Time**	08/07/2000 0:00
Client Sample ID	RT60/1.5-3	**Received Date/Time**	08/22/2000 13:30
Matrix	Soil/Solid	**Technical Director**	**Stephen C. Ede**
Ordered By		**Released By**	J Windebank

Sample Remarks:

Parameter	Results	PQL	Units	Method	Allowable Limits	Prep Date	Analysis Date	Init
Solids								
Total Solids	98.7		%	SM20 2540G			08/24/00	JCO
Metals Department								
Mercury by Cold Vapor	25.9	2.02	mg/Kg	SW846-7471A		08/24/00	08/29/00	JDT
Metals by ICP/MS								
Antimony	6.02	0.942	mg/Kg	SW846 6020		08/24/00	09/07/00	KGF
Arsenic	94.9	0.471	mg/Kg	SW846 6020		08/24/00	09/07/00	KGF
Lead	6.54	2.83	mg/Kg	SW846 6020		08/24/00	09/07/00	KGF

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CT&E Environmental Services Inc.

CT&E Ref.#	1004862013	**Client PO#**	Auth 48 Job #39551
Client Name	Harding Lawson & Assoc	**Printed Date/Time**	09/14/2000 9:44
Project Name/#	BLM-Red Devil	**Collected Date/Time**	08/07/2000 0:00
Client Sample ID	RT64/3-4.5	**Received Date/Time**	08/22/2000 13:30
Matrix	Soil/Solid	**Technical Director**	**Stephen C. Ede**
Ordered By		**Released By**	J Windebank

Sample Remarks:

Parameter	Results	PQL	Units	Method	Allowable Limits	Prep Date	Analysis Date	Init
Solids								
Total Solids	98.3		%	SM20 2540G			08/24/00	JC
Metals Department								
Mercury by Cold Vapor	9.54	1.92	mg/Kg	SW846-7471A		08/24/00	08/29/00	JDT
Metals by ICP/MS								
Antimony	1.64	0.979	mg/Kg	SW846 6020		08/24/00	09/07/00	KG
Arsenic	19.2	0.490	mg/Kg	SW846 6020		08/24/00	09/07/00	KG
Lead	8.19	2.94	mg/Kg	SW846 6020		08/24/00	09/07/00	KGF

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CT&E Environmental Services Inc.

CT&E Ref.#	1004862014	**Client PO#**	Auth 48 Job #39551
Client Name	Harding Lawson & Assoc	**Printed Date/Time**	09/14/2000 9:44
Project Name/#	BLM-Red Devil	**Collected Date/Time**	08/06/2000 0:00
Client Sample ID	RT48/5-6.5	**Received Date/Time**	08/22/2000 13:30
Matrix	Soil/Solid	**Technical Director**	**Stephen C. Ede**
Ordered By		**Released By**	J Windebank

Sample Remarks:

Parameter	Results	PQL	Units	Method	Allowable Limits	Prep Date	Analysis Date	Init
Solids								
Total Solids	95.9		%	SM20 2540G			08/24/00	JCO
Metals Department								
Mercury by Cold Vapor	5.23	2.07	mg/Kg	SW846-7471A		08/24/00	08/29/00	JDT
Metals by ICP/MS								
Antimony	0.862 U	0.862	mg/Kg	SW846 6020		08/24/00	09/07/00	KGF
Arsenic	22.2	0.431	mg/Kg	SW846 6020		08/24/00	09/07/00	KGF
Lead	12.8	2.59	mg/Kg	SW846 6020		08/24/00	09/07/00	KGF

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CT&E Environmental Services Inc.

CT&E Ref.#	1004862015	**Client PO#**	Auth 48 Job #39551
Client Name	Harding Lawson & Assoc	**Printed Date/Time**	09/14/2000 9:44
Project Name/#	BLM-Red Devil	**Collected Date/Time**	08/06/2000 0:00
Client Sample ID	RT53/1.5-3	**Received Date/Time**	08/22/2000 13:30
Matrix	Soil/Solid	**Technical Director**	**Stephen C. Ede**
Ordered By		**Released By**	J Windlebank

Sample Remarks:

Parameter	Results	PQL	Units	Method	Allowable Limits	Prep Date	Analysis Date	Init
Solids								
Total Solids	96.8		%	SM20 2540G			08/24/00	JC
Metals Department								
Mercury by Cold Vapor	10.0	1.95	mg/Kg	SW846-7471A		08/24/00	08/29/00	JDT
Metals by ICP/MS								
Antimony	6.23	0.795	mg/Kg	SW846 6020		08/24/00	09/07/00	KG
Arsenic	50.9	0.397	mg/Kg	SW846 6020		08/24/00	09/07/00	KG
Lead	18.2	2.38	mg/Kg	SW846 6020		08/24/00	09/07/00	KGF

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CT&E Environmental Services Inc.

CT&E Ref.#	1004862016	**Client PO#**	Auth 48 Job #39551
Client Name	Harding Lawson & Assoc	**Printed Date/Time**	09/14/2000 9:44
Project Name/#	BLM-Red Devil	**Collected Date/Time**	08/06/2000 0:00
Client Sample ID	RT45/5-6.5	**Received Date/Time**	08/22/2000 13:30
Matrix	Soil/Solid	**Technical Director**	**Stephen C. Ede**
Ordered By		**Released By**	J W Indebank

Sample Remarks:

Parameter	Results	PQL	Units	Method	Allowable Limits	Prep Date	Analysis Date	Init
Solids								
Total Solids	97.0		%	SM20 2540G			08/24/00	JCO
Metals Department								
Mercury by Cold Vapor	57.8	2.02	mg/Kg	SW846-7471A		08/24/00	08/29/00	JDT
Metals by ICP/MS								
Antimony	7.74	0.864	mg/Kg	SW846 6020		08/24/00	09/07/00	KGF
Arsenic	80.1	0.432	mg/Kg	SW846 6020		08/24/00	09/07/00	KGF
Lead	24.1	2.59	mg/Kg	SW846 6020		08/24/00	09/07/00	KGF

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CT&E Environmental Services Inc.

CT&E Ref.#	326047	Method Blank	**Printed Date/Time**	09/14/2000 9:45
Client Name	Harding Lawson & Assoc		**Prep**	**Batch**
Project Name/#	BLM-Red Devil			**Method**
Matrix	Soil/Solid			**Date**

QC results affect the following production samples:

1004862001, 1004862002, 1004862003, 1004862004, 1004862005, 1004862006, 1004862007, 1004862008, 1004862009, 1004862010, 1004862011, 1004862012, 1004862013, 1004862014, 1004862015, 1004862016

Parameter	Results	PQL	Units	Analysis Date	Init
Solids					
Total Solids		100	%	08/24/00	JCO

Batch SPT 3481
Method SM20 2540G
Instrument

F-701

CT&E Environmental Services Inc.

CT&E Ref.#	326048	Duplicate	**Printed Date/Time**	09/14/2000 9:45	
Client Name	Harding Lawson & Assoc		**Prep**	**Batch**	
Project Name/#	BLM-Red Devil			**Method**	
Original	1004876007			**Date**	
Matrix	Soil/Solid				

QC results affect the following production samples:

1004862001, 1004862002, 1004862003, 1004862004, 1004862005, 1004862006, 1004862007, 1004862008, 1004862009, 1004862010, 1004862011, 1004862012, 1004862013, 1004862014, 1004862015, 1004862016

Parameter	Original Result	QC Result	RPD	RPD Limits	Analysis Date	Init
Solids						
Total Solids	62.6	64.0	2.30		08/24/00	JCO

Batch SPT 3481
Method SM20 2540G
Instrument

F-701

CT&E Environmental Services Inc.

CT&E Ref.#	325745	Method Blank	**Printed Date/Time**	09/14/2000 9:45	
Client Name	Harding Lawson & Assoc		**Prep**	**Batch**	MXX 7756
Project Name/#	BLM-Red Devil			**Method**	
Matrix	Soil/Solid			**Date**	08/24/2000

QC results affect the following production samples:

1004862001, 1004862002, 1004862003, 1004862004, 1004862005, 1004862006, 1004862007, 1004862008, 1004862009, 1004862010, 1004862011, 1004862012, 1004862013, 1004862014, 1004862015, 1004862016

Parameter	Results	PQL	Units	Analysis Date	Init
Thallium	0.00100 U	0.00100	mg/Kg	09/07/00	KGF

Batch MMS 1228
Method SW846 6020
Instrument Perkin Elmer Sciex ICP-MS P3

UST Metals

Aluminum	2.50 U	2.50	mg/Kg	09/07/00	KGF
Antimony	0.234	0.100	mg/Kg	09/07/00	KGF
Arsenic	0.0500 U	0.0500	mg/Kg	09/07/00	KGF
Barium	0.100 U	0.100	mg/Kg	09/07/00	KGF
Beryllium	0.00400 U	0.00400	mg/Kg	09/07/00	KGF
Cadmium	0.00400 J	0.00500	mg/Kg	09/07/00	KGF
Calcium	1.51 J	3.75	mg/Kg	09/07/00	KGF
Chromium	0.366	0.100	mg/Kg	09/07/00	KGF
Copper	0.300 U	0.300	mg/Kg	09/07/00	KGF
Iron	0.918 J	2.50	mg/Kg	09/07/00	KGF
Lead	0.300 U	0.300	mg/Kg	09/07/00	KGF
Potassium	5.00 U	5.00	mg/Kg	09/07/00	KGF
Selenium	0.0261 J	0.0500	mg/Kg	09/07/00	KGF
Silver	0.0200 U	0.0200	mg/Kg	09/07/00	KGF
Sodium	4.40 J	5.00	mg/Kg	09/07/00	KGF
Vanadium	0.0100 U	0.0100	mg/Kg	09/07/00	KGF
Zinc	0.460	0.250	mg/Kg	09/07/00	KGF
Cobalt	0.0150 U	0.0150	mg/Kg	09/07/00	KGF
Magnesium	0.207 J	0.500	mg/Kg	09/07/00	KGF
Manganese	0.500 U	0.500	mg/Kg	09/07/00	KGF
Molybdenum	0.0101 J	0.0250	mg/Kg	09/07/00	KGF
Nickel	0.300 U	0.300	mg/Kg	09/07/00	KGF

Batch MMS 1228
Method SW846 6020
Instrument Perkin Elmer Sciex ICP-MS P3

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CT&E Environmental Services Inc.

CT&E Ref.#	325746 Lab Control Sample	**Printed Date/Time**	09/14/2000 9:45
		Prep Batch	MXX 7756
Client Name	Harding Lawson & Assoc	**Method**	
Project Name/#	BLM-Red Devil	**Date**	08/24/2000
Matrix	Soil/Solid		

QC results affect the following production samples:

1004862001, 1004862002, 1004862003, 1004862004, 1004862005, 1004862006, 1004862007, 1004862008, 1004862009, 1004862010, 1004862011, 1004862012, 1004862013, 1004862014, 1004862015, 1004862016

Parameter		QC Results	Pct Recov	LCS/LCSD Limits	RPD	RPD Limits	Spiked Amount	Analysis Date	Init
Thallium	LCS	51.0	101	(85-115)			50.5 mg/Kg	09/07/00	KGF

Batch MMS 1228
Method SW846 6020
Instrument Perkin Elmer Sciex ICP-MS P3

UST Metals

Aluminum	LCS	58.0	116 *	(85-115)			50 mg/Kg	09/07/00	KGF
Antimony	LCS	52.2	104	(85-115)			50 mg/Kg	09/07/00	KGF
Arsenic	LCS	53.1	106	(85-115)			50 mg/Kg	09/07/00	KGF
Barium	LCS	53.3	107	(85-115)			50 mg/Kg	09/07/00	KGF
Beryllium	LCS	20.6	103	(85-115)			20.1 mg/Kg	09/07/00	KGF
Cadmium	LCS	25.7	103	(85-115)			25 mg/Kg	09/07/00	KGF
Calcium	LCS	589	118 *	(85-115)			500 mg/Kg	09/07/00	KGF
Chromium	LCS	56.3	113	(85-115)			50 mg/Kg	09/07/00	KGF
Copper	LCS	55.2	110	(85-115)			50 mg/Kg	09/07/00	KGF
Iron	LCS	56.7	113	(85-115)			50.1 mg/Kg	09/07/00	KGF
Lead	LCS	51.5	103	(85-115)			50 mg/Kg	09/07/00	KGF
Potassium	LCS	517	103	(85-115)			500 mg/Kg	09/07/00	KGF
Selenium	LCS	50.0	100	(85-115)			50 mg/Kg	09/07/00	KGF
Silver	LCS	10.7	107	(85-115)			10 mg/Kg	09/07/00	KGF
Sodium	LCS	557	111	(85-115)			500 mg/Kg	09/07/00	KGF
Vanadium	LCS	54.6	109	(85-115)			50 mg/Kg	09/07/00	KGF
Zinc	LCS	53.3	107	(85-115)			50 mg/Kg	09/07/00	KGF
Cobalt	LCS	50.9	102	(85-115)			50 mg/Kg	09/07/00	KGF
Magnesium	LCS	556	111	(85-115)			500 mg/Kg	09/07/00	KGF
Manganese	LCS	52.2	104	(85-115)			50 mg/Kg	09/07/00	KGF
Molybdenum	LCS	52.5	105	(85-115)			50 mg/Kg	09/07/00	KGF
Nickel	LCS	53.5	107	(85-115)			50 mg/Kg	09/07/00	KGF

Batch MMS 1228
Method SW846 6020
Instrument Perkin Elmer Sciex ICP-MS P3

F-701

CT&E Environmental Services Inc.

CT&E Ref.#	326926	Method Blank	**Printed Date/Time**	09/14/2000 9:45	
Client Name	Harding Lawson & Assoc		**Prep** **Batch**	MXX	7775
Project Name/#	BLM-Red Devil		**Method**		
Matrix	Water (Surface, Eff., Ground)		**Date**	08/24/2000	

QC results affect the following production samples:

1004862001, 1004862002, 1004862003, 1004862004, 1004862005, 1004862006, 1004862007, 1004862008, 1004862009, 1004862010, 1004862011, 1004862012, 1004862013, 1004862014, 1004862015, 1004862016

Parameter	Results	PQL	Units	Analysis Date	Init
Metals Department					
Mercury by Cold Vapor	0.000200 U	0.00020	mg/L	08/29/00	JDT

Batch MCV 2180
Method SW846-7471A
Instrument HgAA Leeman AutoAnalyzer PS200

F-701

CT&E Environmental Services Inc.

CT&E Ref.#	326927 Lab Control Sample	**Printed Date/Time**	09/14/2000 9:45	
		Prep **Batch**	MXX 7775	
Client Name	Harding Lawson & Assoc	**Method**		
Project Name/#	BLM-Red Devil	**Date**	08/24/2000	
Matrix	Water (Surface, Eff., Ground)			

QC results affect the following production samples:

1004862001, 1004862002, 1004862003, 1004862004, 1004862005, 1004862006, 1004862007, 1004862008, 1004862009, 1004862010, 1004862011, 1004862012, 1004862013, 1004862014, 1004862015, 1004862016

Parameter		QC Results	Pct Recov	LCS/LCSD Limits	RPD	RPD Limits	Spiked Amount	Analysis Date	Init
Metals Department									
Mercury by Cold Vapor	LCS	0.00218	109	(85-115)			0.002 mg/L	08/29/00	JDT

Batch MCV 2180
Method SW846-7471A
Instrument HgAA Leeman AutoAnalyzer PS200

F-701

DATA QUALITY ASSESSMENT

Laboratory: CTE Environmental Services
Batch No.: 1004863
Sampled: unnamed, FS015, FS020, FS022, FS012, FS014, FS018, FS021, FS010, FS011, FS013, FS012, FS019, FS016, RT49/5.0-6.5, FS079

	Yes	No	Not Required
1. Were samples analyzed for requested parameters?	X		
2. Is the USACE Data Deliverables package complete?			X
3. Were samples extracted within holding time acceptance criteria?	X		
4. Were samples analyzed within holding time acceptance criteria?	X		
5. For soils, were sample results reported on a "dry weight" basis?	X		
6. Were method blanks analytes all reported as ND?		X	
7. For water, were trip blank analytes all reported as ND?			X
8. Are the surrogate percent recoveries within acceptance criteria?			X
9. Are the matrix spike percent recoveries within acceptance criteria?	X		
10. Are the matrix spike relative percent differences within acceptance criteria?			X
11. Are the field duplicate relative percent differences less than 50 percent?	X		

Comments:

A sample was turned in to the lab without an identification number and is noted as "unnamed"

6) Molybdenum detected at 0.0294 mg/kg (CTE ref. # 325751); antimony estimated at 0.0385 mg/kg (below PQL), cadmium estimated at 0.00330 mg/kg (below PQL), chromium estimated at 0.0709 mg/kg (below PQL), selenium estimated at 0.0159 mg/kg (below PQL), silver estimated at 0.00935 mg/kg (below PQL), sodium estimated at 1.75 mg/kg (below PQL), magnesium estimated at 0.221 mg/kg (below PQL), zinc estimated at 0.120 mg/kg (below PQL) (CTE ref. # 325751)

Date: 3-30-01
Reviewer: JEW.

1004863

Form 1703-1
(December 1997)

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

CHAIN-OF-CUSTODY RECORD

Ship to:
LTE
200 W. Potter Dr.
Anchorage, AK 99518

Project Name: Red Devil

Field Contact: BLM

Sampler Name(s): HLA Anchorage, AC

Office:

Telephone:

Address:

	Sample Identification	Date	Time	Matrix	Preservative	Conc. (HML)	No. Bottles	Lab QC	VOA	SVOC	Pest/PCB	Metals	Other	Remarks/Comments
1	Unnamed			SO								✓		
2	FS015	8/1										✓		
3	FS020	7/30										✓		
4	FS022	8/1										✓		
5	FS012	8/1										✓		
6	FS014	8/1										✓		
7	FS018	8/1										✓		
8	FS021	8/1										✓		
9	FS010	8/1										✓		
10	FS011	8/1										✓		
11	FS013	8/1										✓		
12	FS012	8/1										✓		
13	FS019	8/1										✓		
14	FS016	8/1										✓		
15	RT49/5-6.5	8/6										✓		
16	FS019	8/8										✓		

Relinquished by: KARL FORD
Date: 8/21/00
Received by:
Date:

Relinquished by:
Date:
Received by: [signature]
Date: 8/22/00

Notes:

Original

☆ U.S. GOVERNMENT PRINTING OFFICE: 1998-674-580

Form 1703-1
(December 1997)

1004863

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

CHAIN-OF-CUSTODY RECORD

Ship to:
CTE
200 W. Potter Dr.
Anchorage, AK 99518

Project Name: Red Devil

Field Contact: BLM

Sampler Name(s): HLA Anchorage, AC

Office:

Telephone:

Address:

	Sample Identification	Date	Time	Matrix	Preservative	Conc. (HML)	No. Bottles	Lab QC	VOA	SVOC	Pest/PCB	Metals	Other	Remarks/Comments
1	Unnamed			SO								✓		
2	FS015											✓		
3	FS020											✓		
4	FS022											✓		
5	FS012											✓		
6	FS014											✓		
7	FS018											✓		
8	FS021											✓		
9	FS010											✓		
10	FS011											✓		
11	FS013											✓		
12	FS012											✓		
13	FS019											✓		
14	FS016											✓		
15	RT49/5-6.5											✓		
16	FS079											✓		

Relinquished by: Kam Ford	Date: 8/21/00	Relinquished by:	Date:
Received by:	Date:	Received by: [signature]	Date: 8/22/00

Notes:

Original ✓ BM 2-23-00

☆ U.S. GOVERNMENT PRINTING OFFICE: 1998-674-580

CT&E Environmental Services Inc.

SAMPLE RECEIPT FORM

1004863

1004863

WO#: 01

Yes	No	
	✓	Are samples **RUSH**, priority, or *within 72 hrs* of **hold time**?
		If yes, have you done *e-mail notification*?
	✓	Are samples *within 24 hrs* of **hold time** or **due date**?
		If yes, have you *spoken with* Supervisor?
	✓	Are there any **problems** (e.g., ids, analyses)?
		Were samples preserved correctly and pH verified?

Has Project Manager been notified of problems?

Yes	No		
	✓	Is this an ACOE/AFCEE/ADEC project?	
	✓	Will a **data package** be required?	
		If this is for PWS, provide **PWSID**.	
		Is there a **quote** for this project?	
	✓	Will **courier** charges apply?	

Completed by (sign): [signature] (print): [illegible]

Due Date: 8/30

Received Date/Time: 8/22 - 13:30

Cooler Temperature: amb

Sample Condition: Good / Poor

Matrix of each Sample:

2	" "	1-16
	" "	
	" "	
	" "	
	Trip Blank	
	MS/MSD	

Additional Sample Remarks:

- ____ AK101s/____ 8260s field pres'd?
- ____ Field-filtered for dissolved____?
- ____ Lab-filter for dissolved____?
- ____ Ref Lab required?

Notes:

*** The following *must* be completed for *all* ACOE & AFCEE projects: ***

Yes	No		Notes:
		Is cooler temperature 4 ± C?	
		thermometer used:	
		Was there an airbill, etc? note #:	
		Was cooler sealed with custody seals?	
		#/where?	
		Were seals intact upon arrival?	
		Was there a COC with cooler?	
		Was the COC filled out properly?	
		Did the COC indicate ACOE/AFCEE project?	
		Did the COC and samples correspond?	
		Were samples screened with Geiger counter?	
		Were all samples packed to prevent breakage?	
		packing material:	
		Were all samples unbroken and clearly labelled?	
		Were all samples sealed in separate plastic bags?	
		Were all bottles for volatiles free of headspace?	
		Were correct container/sample sizes submitted?	
		Was client notified of problems? (specify below)	

Individual contacted: ____

Date & Time: ____ Phone/Fax #: ____

# of each Container Received:

	950 ml amber	unpres'd
	950 ml amber	w/ HCl
	500 ml amber	w/ H2SO4
	1L cubies	unpres'd
	1L cubies	w/ HNO3
	1L cubies	w/ H2SO4
	1L cubies	w/ NaOH + ZnAc
	120 ml coli	bottles
	60 ml	Nalg
	8 oz amber	unpres'd
	4 oz amber	unpres'd
	4 oz w/ septa	w/ MeOH
	40 ml vials	w/ HCl
16	Other (specify)	Ziplock bags
	Other (specify)	

#/Log In Proofed by: ____

Form Number: F004r2
Printed: 7/12/99

Bon 8/22/00 1410

CT&E Environmental Services Inc.
Laboratory Division

Laboratory Analysis Report

200 W. Potter Drive
Anchorage, AK 99518-1605
Tel: (907) 562-2343
Fax: (907) 561-5301
Web: http://www.cteesi.com

Brian Lund
Harding Lawson & Assoc
601 East 57th Place
Anchorage, AK 99518

Work Order:	1004863
	BLM-Red Devil
Client:	Harding Lawson & Assoc
Report Date:	September 14, 2000

Enclosed are the analytical results associated with the above workorder.

As required by the state of Alaska and the USEPA, a formal Quality Assurance/Quality Control Program is maintaned 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 analyte 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
!	Surrogate out of range

CT&E Environmental Services Inc.

CT&E Ref.#	1004863001	**Client PO#**	Auth 48 Job #39551
Client Name	Harding Lawson & Assoc	**Printed Date/Time**	09/14/2000 9:47
Project Name/#	BLM-Red Devil	**Collected Date/Time**	
Client Sample ID	N/A	**Received Date/Time**	08/22/2000 13:30
Matrix	Soil/Solid	**Technical Director**	**Stephen C. Ede**
Ordered By		**Released By**	J Windebank

Sample Remarks:

Parameter	Results	PQL	Units	Method	Allowable Limits	Prep Date	Analysis Date	Init
Solids								
Total Solids	99.3		%	SM20 2540G			08/24/00	JC
Metals Department								
Mercury by Cold Vapor	44.6	1.81	mg/Kg	SW846-7471A		08/24/00	08/26/00	JDT
Metals by ICP/MS								
Antimony	13.2	0.975	mg/Kg	SW846 6020		08/24/00	09/11/00	KG
Arsenic	75.7	0.487	mg/Kg	SW846 6020		08/24/00	09/11/00	KG
Lead	8.71	2.92	mg/Kg	SW846 6020		08/24/00	09/11/00	KGF

F-701

CT&E Environmental Services Inc.

CT&E Ref.#	1004863002	**Client PO#**	Auth 48 Job #39551
Client Name	Harding Lawson & Assoc	**Printed Date/Time**	09/14/2000 9:47
Project Name/#	BLM-Red Devil	**Collected Date/Time**	08/01/2000 0:00
Client Sample ID	FS015	**Received Date/Time**	08/22/2000 13:30
Matrix	Soil/Solid	**Technical Director**	**Stephen C. Ede**
Ordered By		**Released By**	J Windebank

Sample Remarks:

Parameter	Results	PQL	Units	Method	Allowable Limits	Prep Date	Analysis Date	Init
Solids								
Total Solids	99.0		%	SM20 2540G			08/24/00	JCO
Metals Department								
Mercury by Cold Vapor	594	19.3	mg/Kg	SW846-7471A		08/24/00	08/26/00	JDT
Metals by ICP/MS								
Antimony	1010	0.922	mg/Kg	SW846 6020		08/24/00	09/11/00	KGF
Arsenic	3240	0.461	mg/Kg	SW846 6020		08/24/00	09/11/00	KGF
Lead	64.9	2.76	mg/Kg	SW846 6020		08/24/00	09/11/00	KGF

F-701

CT&E Environmental Services Inc.

CT&E Ref.#	1004863003	**Client PO#**	Auth 48 Job #39551
Client Name	Harding Lawson & Assoc	**Printed Date/Time**	09/14/2000 9:47
Project Name/#	BLM-Red Devil	**Collected Date/Time**	07/30/2000 0:00
Client Sample ID	FS020	**Received Date/Time**	08/22/2000 13:30
Matrix	Soil/Solid	**Technical Director**	**Stephen C. Ede**
Ordered By		**Released By**	J Windebank

Sample Remarks:

Parameter	Results	PQL	Units	Method	Allowable Limits	Prep Date	Analysis Date	Init
Solids								
Total Solids	98.1		%	SM20 2540G			08/24/00	JC
Metals Department								
Mercury by Cold Vapor	111	18.8	mg/Kg	SW846-7471A		08/24/00	08/26/00	JDT
Metals by ICP/MS								
Antimony	190	1.01	mg/Kg	SW846 6020		08/24/00	09/11/00	KG
Arsenic	555	0.505	mg/Kg	SW846 6020		08/24/00	09/11/00	KG
Lead	14.4	3.03	mg/Kg	SW846 6020		08/24/00	09/11/00	KGF

F-701

CT&E Environmental Services Inc.

CT&E Ref.#	1004863004	**Client PO#**	Auth 48 Job #39551
Client Name	Harding Lawson & Assoc	**Printed Date/Time**	09/14/2000 9:47
Project Name/#	BLM-Red Devil	**Collected Date/Time**	08/01/2000 0:00
Client Sample ID	FS022	**Received Date/Time**	08/22/2000 13:30
Matrix	Soil/Solid	**Technical Director**	**Stephen C. Ede**
Ordered By		**Released By**	J Windebank

Sample Remarks:

Parameter	Results	PQL	Units	Method	Allowable Limits	Prep Date	Analysis Date	Init
Solids								
Total Solids	98.2		%	SM20 2540G			08/24/00	JCO
Metals Department								
Mercury by Cold Vapor	494	172	mg/Kg	SW846-7471A		08/24/00	08/26/00	JDT
Metals by ICP/MS								
Antimony	1320	1.01	mg/Kg	SW846 6020		08/24/00	09/11/00	KGF
Arsenic	2290	0.504	mg/Kg	SW846 6020		08/24/00	09/11/00	KGF
Lead	369	3.02	mg/Kg	SW846 6020		08/24/00	09/11/00	KGF

F-701

CT&E Environmental Services Inc.

CT&E Ref.#	1004863005	**Client PO#**	Auth 48 Job #39551
Client Name	Harding Lawson & Assoc	**Printed Date/Time**	09/14/2000 9:47
Project Name/#	BLM-Red Devil	**Collected Date/Time**	08/01/2000 0:00
Client Sample ID	FS012	**Received Date/Time**	08/22/2000 13:30
Matrix	Soil/Solid	**Technical Director**	**Stephen C. Ede**
Ordered By		**Released By**	J Windebank

Sample Remarks:

Parameter	Results	PQL	Units	Method	Allowable Limits	Prep Date	Analysis Date	Init
Solids								
Total Solids	98.4		%	SM20 2540G			08/24/00	JC
Metals Department								
Mercury by Cold Vapor	424	17.7	mg/Kg	SW846-7471A		08/24/00	08/26/00	JDT
Metals by ICP/MS								
Antimony	138	0.930	mg/Kg	SW846 6020		08/24/00	09/11/00	KG
Arsenic	679	0.465	mg/Kg	SW846 6020		08/24/00	09/11/00	KG
Lead	31.6	2.79	mg/Kg	SW846 6020		08/24/00	09/11/00	KGF

F-7001

CT&E Environmental Services Inc.

CT&E Ref.#	1004863006	**Client PO#**	Auth 48 Job #39551
Client Name	Harding Lawson & Assoc	**Printed Date/Time**	09/14/2000 9:47
Project Name/#	BLM-Red Devil	**Collected Date/Time**	08/01/2000 0:00
Client Sample ID	FS014	**Received Date/Time**	08/22/2000 13:30
Matrix	Soil/Solid	**Technical Director**	**Stephen C. Ede**
Ordered By		**Released By**	J Windebank

Sample Remarks:

Parameter	Results	PQL	Units	Method	Allowable Limits	Prep Date	Analysis Date	Init
Solids								
Total Solids	98.8		%	SM20 2540G			08/24/00	JCO
Metals Department								
Mercury by Cold Vapor	1910	183	mg/Kg	SW846-7471A		08/24/00	08/26/00	JDT
Metals by ICP/MS								
Antimony	422	0.920	mg/Kg	SW846 6020		08/24/00	09/11/00	KGF
Arsenic	1330	0.460	mg/Kg	SW846 6020		08/24/00	09/11/00	KGF
Lead	22.9	2.76	mg/Kg	SW846 6020		08/24/00	09/11/00	KGF

F-701

CT&E Environmental Services Inc.

CT&E Ref.#	1004863007	**Client PO#**	Auth 48 Job #39551
Client Name	Harding Lawson & Assoc	**Printed Date/Time**	09/14/2000 9:47
Project Name/#	BLM-Red Devil	**Collected Date/Time**	08/01/2000 0:00
Client Sample ID	FS018	**Received Date/Time**	08/22/2000 13:30
Matrix	Soil/Solid	**Technical Director**	**Stephen C. Ede**
Ordered By		**Released By**	J Windlebank

Sample Remarks:

Parameter	Results	PQL	Units	Method	Allowable Limits	Prep Date	Analysis Date	Init
Solids								
Total Solids	99.6		%	SM20 2540G			08/24/00	JC
Metals Department								
Mercury by Cold Vapor	160	17.5	mg/Kg	SW846-7471A		08/24/00	08/26/00	JDT
Metals by ICP/MS								
Antimony	129	0.931	mg/Kg	SW846 6020		08/24/00	09/11/00	KG
Arsenic	313	0.466	mg/Kg	SW846 6020		08/24/00	09/11/00	KG
Lead	7.69	2.79	mg/Kg	SW846 6020		08/24/00	09/11/00	KGF

F-701

CT&E Environmental Services Inc.

CT&E Ref.#	1004863008	**Client PO#**	Auth 48 Job #39551
Client Name	Harding Lawson & Assoc	**Printed Date/Time**	09/14/2000 9:47
Project Name/#	BLM-Red Devil	**Collected Date/Time**	08/01/2000 0:00
Client Sample ID	FS021	**Received Date/Time**	08/22/2000 13:30
Matrix	Soil/Solid	**Technical Director**	**Stephen C. Ede**
Ordered By		**Released By**	J Wundebank

Sample Remarks:

Parameter	Results	PQL	Units	Method	Allowable Limits	Prep Date	Analysis Date	Init
Solids								
Total Solids	97.5		%	SM20 2540G			08/24/00	JCO
Metals Department								
Mercury by Cold Vapor	73300	1990	mg/Kg	SW846-7471A		08/24/00	08/26/00	JDT
Metals by ICP/MS								
Antimony	6100	0.901	mg/Kg	SW846 6020		08/24/00	09/11/00	KGF
Arsenic	7190	0.451	mg/Kg	SW846 6020		08/24/00	09/11/00	KGF
Lead	93.6	2.70	mg/Kg	SW846 6020		08/24/00	09/11/00	KGF

F-701

CT&E Environmental Services Inc.

CT&E Ref.#	1004863009	**Client PO#**	Auth 48 Job #39551
Client Name	Harding Lawson & Assoc	**Printed Date/Time**	09/14/2000 9:47
Project Name/#	BLM-Red Devil	**Collected Date/Time**	08/01/2000 0:00
Client Sample ID	FS010	**Received Date/Time**	08/22/2000 13:30
Matrix	Soil/Solid	**Technical Director**	**Stephen C. Ede**
Ordered By		**Released By**	J Windebank

Sample Remarks:

Parameter	Results	PQL	Units	Method	Allowable Limits	Prep Date	Analysis Date	Init
Solids								
Total Solids	96.7		%	SM20 2540G			08/24/00	JC
Metals Department								
Mercury by Cold Vapor	443	200	mg/Kg	SW846-7471A		08/24/00	08/26/00	JDT
Metals by ICP/MS								
Antimony	209	0.843	mg/Kg	SW846 6020		08/24/00	09/11/00	KG
Arsenic	744	0.422	mg/Kg	SW846 6020		08/24/00	09/11/00	KG
Lead	37.8	2.53	mg/Kg	SW846 6020		08/24/00	09/11/00	KGF

F-201

CT&E Environmental Services Inc.

CT&E Ref.#	1004863010	**Client PO#**	Auth 48 Job #39551
Client Name	Harding Lawson & Assoc	**Printed Date/Time**	09/14/2000 9:47
Project Name/#	BLM-Red Devil	**Collected Date/Time**	08/01/2000 0:00
Client Sample ID	FS011	**Received Date/Time**	08/22/2000 13:30
Matrix	Soil/Solid	**Technical Director**	**Stephen C. Ede**
Ordered By		**Released By**	J Windebank

Sample Remarks:

Parameter	Results	PQL	Units	Method	Allowable Limits	Prep Date	Analysis Date	Init
Solids								
Total Solids	95.8		%	SM20 2540G			08/24/00	JCO
Metals Department								
Mercury by Cold Vapor	1300	203	mg/Kg	SW846-7471A		08/24/00	08/26/00	JDT
Metals by ICP/MS								
Antimony	371	1.01	mg/Kg	SW846 6020		08/24/00	09/11/00	KGF
Arsenic	1750	0.505	mg/Kg	SW846 6020		08/24/00	09/11/00	KGF
Lead	93.8	3.03	mg/Kg	SW846 6020		08/24/00	09/11/00	KGF

F-701

CT&E Environmental Services Inc.

CT&E Ref.#	1004863011	**Client PO#**	Auth 48 Job #39551
Client Name	Harding Lawson & Assoc	**Printed Date/Time**	09/14/2000 9:47
Project Name/#	BLM-Red Devil	**Collected Date/Time**	08/01/2000 0:00
Client Sample ID	FS013	**Received Date/Time**	08/22/2000 13:30
Matrix	Soil/Solid	**Technical Director**	**Stephen C. Ede**
Ordered By		**Released By**	J Wendlebank

Sample Remarks:

Parameter	Results	PQL	Units	Method	Allowable Limits	Prep Date	Analysis Date	Init
Solids								
Total Solids	99.0		%	SM20 2540G			08/24/00	JC
Metals Department								
Mercury by Cold Vapor	1300	176	mg/Kg	SW846-7471A		08/24/00	08/26/00	JDT
Metals by ICP/MS								
Antimony	534	0.875	mg/Kg	SW846 6020		08/24/00	09/11/00	KG
Arsenic	2630	0.438	mg/Kg	SW846 6020		08/24/00	09/11/00	KG
Lead	43.0	2.63	mg/Kg	SW846 6020		08/24/00	09/11/00	KGF

F-701

CT&E Environmental Services Inc.

CT&E Ref.#	1004863012	**Client PO#**	Auth 48 Job #39551
Client Name	Harding Lawson & Assoc	**Printed Date/Time**	09/14/2000 9:47
Project Name/#	BLM-Red Devil	**Collected Date/Time**	08/01/2000 0:00
Client Sample ID	FS012	**Received Date/Time**	08/22/2000 13:30
Matrix	Soil/Solid	**Technical Director**	**Stephen C. Ede**
Ordered By		**Released By**	J. Windebank

Sample Remarks:

Parameter	Results	PQL	Units	Method	Allowable Limits	Prep Date	Analysis Date	Init
Solids								
Total Solids	99.4		%	SM20 2540G			08/24/00	JCO
Metals Department								
Mercury by Cold Vapor	2930	192	mg/Kg	SW846-7471A		08/24/00	08/26/00	JDT
Metals by ICP/MS								
Antimony	992	0.968	mg/Kg	SW846 6020		08/24/00	09/11/00	KGF
Arsenic	949	0.484	mg/Kg	SW846 6020		08/24/00	09/11/00	KGF
Lead	255	2.90	mg/Kg	SW846 6020		08/24/00	09/11/00	KGF

F-701

CT&E Environmental Services Inc.

CT&E Ref.#	1004863013	**Client PO#**	Auth 48 Job #39551
Client Name	Harding Lawson & Assoc	**Printed Date/Time**	09/14/2000 9:47
Project Name/#	BLM-Red Devil	**Collected Date/Time**	08/01/2000 0:00
Client Sample ID	FS019	**Received Date/Time**	08/22/2000 13:30
Matrix	Soil/Solid	**Technical Director**	**Stephen C. Ede**
Ordered By		**Released By**	J Windebank

Sample Remarks:

Parameter	Results	PQL	Units	Method	Allowable Limits	Prep Date	Analysis Date	Init
Solids								
Total Solids	99.6		%	SM20 2540G			08/24/00	JC
Metals Department								
Mercury by Cold Vapor	189	189	mg/Kg	SW846-7471A		08/24/00	08/26/00	JDT
Metals by ICP/MS								
Antimony	183	0.853	mg/Kg	SW846 6020		08/24/00	09/11/00	KG
Arsenic	402	0.427	mg/Kg	SW846 6020		08/24/00	09/11/00	KG
Lead	23.6	2.56	mg/Kg	SW846 6020		08/24/00	09/11/00	KGF

F-701

CT&E Environmental Services Inc.

CT&E Ref.#	1004863014	**Client PO#**	Auth 48 Job #39551
Client Name	Harding Lawson & Assoc	**Printed Date/Time**	09/14/2000 9:47
Project Name/#	BLM-Red Devil	**Collected Date/Time**	08/01/2000 0:00
Client Sample ID	FS016	**Received Date/Time**	08/22/2000 13:30
Matrix	Soil/Solid	**Technical Director**	**Stephen C. Ede**
Ordered By		**Released By**	J Windebank

Sample Remarks:

Parameter	Results	PQL	Units	Method	Allowable Limits	Prep Date	Analysis Date	Init
Solids								
Total Solids	99.4		%	SM20 2540G			08/24/00	JCO
Metals Department								
Mercury by Cold Vapor	530	188	mg/Kg	SW846-7471A		08/24/00	08/26/00	JDT
Metals by ICP/MS								
Antimony	650	0.772	mg/Kg	SW846 6020		08/24/00	09/11/00	KGF
Arsenic	726	0.386	mg/Kg	SW846 6020		08/24/00	09/11/00	KGF
Lead	7.38	2.31	mg/Kg	SW846 6020		08/24/00	09/11/00	KGF

F-701

CT&E Environmental Services Inc.

CT&E Ref.#	1004863015	**Client PO#**	Auth 48 Job #39551
Client Name	Harding Lawson & Assoc	**Printed Date/Time**	09/14/2000 9:47
Project Name/#	BLM-Red Devil	**Collected Date/Time**	08/06/2000 0:00
Client Sample ID	RT49/5-6.5	**Received Date/Time**	08/22/2000 13:30
Matrix	Soil/Solid	**Technical Director**	**Stephen C. Ede**
Ordered By		**Released By**	J Windebank

Sample Remarks:

Parameter	Results	PQL	Units	Method	Allowable Limits	Prep Date	Analysis Date	Init
Solids								
Total Solids	98.7		%	SM20 2540G			08/24/00	JC
Metals Department								
Mercury by Cold Vapor	3.82	1.92	mg/Kg	SW846-7471A		08/24/00	08/26/00	JDT
Metals by ICP/MS								
Antimony	1.33	0.957	mg/Kg	SW846 6020		08/24/00	09/11/00	K
Arsenic	17.9	0.478	mg/Kg	SW846 6020		08/24/00	09/11/00	K
Lead	19.1	2.87	mg/Kg	SW846 6020		08/24/00	09/11/00	KGF

F-701

CT&E Environmental Services Inc.

CT&E Ref.#	1004863016	**Client PO#**	Auth 48 Job #39551
Client Name	Harding Lawson & Assoc	**Printed Date/Time**	09/14/2000 9:47
Project Name/#	BLM-Red Devil	**Collected Date/Time**	08/08/2000 0:00
Client Sample ID	FS079	**Received Date/Time**	08/22/2000 13:30
Matrix	Soil/Solid	**Technical Director**	**Stephen C. Ede**
Ordered By		**Released By**	J W Undebank

Sample Remarks:

Parameter	Results	PQL	Units	Method	Allowable Limits	Prep Date	Analysis Date	Init
Solids								
Total Solids	98.8		%	SM20 2540G			08/24/00	JCO
Metals Department								
Mercury by Cold Vapor	2410	179	mg/Kg	SW846-7471A		08/24/00	08/26/00	JDT
Metals by ICP/MS								
Antimony	1290	0.987	mg/Kg	SW846 6020		08/24/00	09/11/00	KGF
Arsenic	3860	0.494	mg/Kg	SW846 6020		08/24/00	09/11/00	KGF
Lead	894	2.96	mg/Kg	SW846 6020		08/24/00	09/11/00	KGF

F-701

CT&E Environmental Services Inc.

CT&E Ref.#	326035	Method Blank	**Printed Date/Time**	09/14/2000 9:48
Client Name	Harding Lawson & Assoc		**Prep**	**Batch**
Project Name/#	BLM-Red Devil			**Method**
Matrix	Soil/Solid			**Date**

QC results affect the following production samples:

1004863001, 1004863002, 1004863003, 1004863004, 1004863005, 1004863006, 1004863007, 1004863008, 1004863009, 1004863010, 1004863011, 1004863012, 1004863013, 1004863014, 1004863015, 1004863016

Parameter	Results	PQL	Units	Analysis Date	Init
Solids					
Total Solids		100	%	08/24/00	JCO

Batch SPT 3477
Method SM20 2540G
Instrument

F-701

CT&E Environmental Services Inc.

CT&E Ref.#	326036	Duplicate	**Printed Date/Time**	09/14/2000 9:48
Client Name	Harding Lawson & Assoc		**Prep**	**Batch**
Project Name/#	BLM-Red Devil			**Method**
Original	1004909014			**Date**
Matrix	Soil/Solid			

QC results affect the following production samples:

1004863001, 1004863002, 1004863003, 1004863004, 1004863005, 1004863006, 1004863007, 1004863008, 1004863009, 1004863010, 1004863011, 1004863012, 1004863013, 1004863014, 1004863015, 1004863016

Parameter	Original Result	QC Result	RPD	RPD Limits	Analysis Date	Init
Solids						
Total Solids	84.4	85.1	0.79		08/24/00	JCO

Batch SPT 3477
Method SM20 2540G
Instrument

F-701

CT&E Environmental Services Inc.

CT&E Ref.#	325751	Method Blank	**Printed Date/Time**	09/14/2000 9:48	
Client Name	Harding Lawson & Assoc		**Prep** **Batch**	MXX	7757
Project Name/#	BLM-Red Devil		**Method**		
Matrix	Soil/Solid		**Date**	08/24/2000	

QC results affect the following production samples:

1004863001, 1004863002, 1004863003, 1004863004, 1004863005, 1004863006, 1004863007, 1004863008, 1004863009, 1004863010, 1004863011, 1004863012, 1004863013, 1004863014, 1004863015, 1004863016

Parameter	Results	PQL	Units	Analysis Date	Init
Thallium	0.00485	0.00100	mg/Kg	09/11/00	KGF

Batch MMS 1237
Method SW846 6020
Instrument Perkin Elmer Sciex ICP-MS P3

UST Metals

Aluminum	2.50 U	2.50	mg/Kg	09/11/00	KGF
Antimony	0.0385 J	0.100	mg/Kg	09/11/00	KGF
Arsenic	0.0500 U	0.0500	mg/Kg	09/11/00	KGF
Barium	0.100 U	0.100	mg/Kg	09/11/00	KGF
Beryllium	0.00400 U	0.00400	mg/Kg	09/11/00	KGF
Cadmium	0.00330 J	0.00500	mg/Kg	09/11/00	KGF
Calcium	3.75 U	3.75	mg/Kg	09/11/00	KGF
Chromium	0.0709 J	0.100	mg/Kg	09/11/00	KGF
Copper	0.300 U	0.300	mg/Kg	09/11/00	KGF
Iron	2.50 U	2.50	mg/Kg	09/11/00	KGF
Lead	0.300 U	0.300	mg/Kg	09/11/00	KGF
Potassium	5.00 U	5.00	mg/Kg	09/11/00	KGF
Selenium	0.0159 J	0.0500	mg/Kg	09/11/00	KGF
Silver	0.00935 J	0.0200	mg/Kg	09/11/00	KGF
Sodium	1.75 J	5.00	mg/Kg	09/11/00	KGF
Vanadium	0.0100 U	0.0100	mg/Kg	09/11/00	KGF
Zinc	0.120 J	0.250	mg/Kg	09/11/00	KGF
Cobalt	0.0150 U	0.0150	mg/Kg	09/11/00	KGF
Magnesium	0.221 J	0.500	mg/Kg	09/11/00	KGF
Manganese	0.500 U	0.500	mg/Kg	09/11/00	KGF
Molybdenum	0.0294	0.0250	mg/Kg	09/11/00	KGF
Nickel	0.300 U	0.300	mg/Kg	09/11/00	KGF

Batch MMS 1237
Method SW846 6020
Instrument Perkin Elmer Sciex ICP-MS P3

F-701

CT&E Environmental Services Inc.

CT&E Ref.#	325752 Lab Control Sample	**Printed Date/Time**	09/14/2000 9:48
		Prep Batch	MXX 7757
Client Name	Harding Lawson & Assoc	**Method**	
Project Name/#	BLM-Red Devil	**Date**	08/24/2000
Matrix	Soil/Solid		

QC results affect the following production samples:

1004863001, 1004863002, 1004863003, 1004863004, 1004863005, 1004863006, 1004863007, 1004863008, 1004863009, 1004863010, 1004863011, 1004863012, 1004863013, 1004863014, 1004863015, 1004863016

Parameter		QC Results	Pct Recov	LCS/LCSD Limits	RPD	RPD Limits	Spiked Amount	Analysis Date	Init
Thallium	LCS	52.8	104	(85-115)			50.5 mg/Kg	09/11/00	KGF

Batch MMS 1237
Method SW846 6020
Instrument Perkin Elmer Sciex ICP-MS P3

UST Metals

Aluminum	LCS	54.6	109	(85-115)			50 mg/Kg	09/11/00	KGF
Antimony	LCS	54.6	109	(85-115)			50 mg/Kg	09/11/00	KGF
Arsenic	LCS	54.3	109	(85-115)			50 mg/Kg	09/11/00	KGF
Barium	LCS	56.7	113	(85-115)			50 mg/Kg	09/11/00	KGF
Beryllium	LCS	21.6	107	(85-115)			20.1 mg/Kg	09/11/00	KGF
Cadmium	LCS	27.1	108	(85-115)			25 mg/Kg	09/11/00	KGF
Calcium	LCS	577	115	(85-115)			500 mg/Kg	09/11/00	KGF
Chromium	LCS	52.4	105	(85-115)			50 mg/Kg	09/11/00	KGF
Copper	LCS	55.3	111	(85-115)			50 mg/Kg	09/11/00	KGF
Iron	LCS	53.4	107	(85-115)			50.1 mg/Kg	09/11/00	KGF
Lead	LCS	51.9	104	(85-115)			50 mg/Kg	09/11/00	KGF
Potassium	LCS	485	97	(85-115)			500 mg/Kg	09/11/00	KGF
Selenium	LCS	54.4	109	(85-115)			50 mg/Kg	09/11/00	KGF
Silver	LCS	11.4	114	(85-115)			10 mg/Kg	09/11/00	KGF
Sodium	LCS	516	103	(85-115)			500 mg/Kg	09/11/00	KGF
Vanadium	LCS	51.4	103	(85-115)			50 mg/Kg	09/11/00	KGF
Zinc	LCS	55.1	110	(85-115)			50 mg/Kg	09/11/00	KGF
Cobalt	LCS	52.2	104	(85-115)			50 mg/Kg	09/11/00	KGF
Magnesium	LCS	521	104	(85-115)			500 mg/Kg	09/11/00	KGF
Manganese	LCS	52.7	105	(85-115)			50 mg/Kg	09/11/00	KGF
Molybdenum	LCS	51.9	104	(85-115)			50 mg/Kg	09/11/00	KGF
Nickel	LCS	54.9	110	(85-115)			50 mg/Kg	09/11/00	KGF

Batch MMS 1237
Method SW846 6020
Instrument Perkin Elmer Sciex ICP-MS P3

F-701

CT&E Environmental Services Inc.

CT&E Ref.#	326367	Method Blank	**Printed Date/Time**	09/14/2000 9:48	
Client Name	Harding Lawson & Assoc		**Prep Batch**	MXX	7771
Project Name/#	BLM-Red Devil		**Method**		
Matrix	Water (Surface, Eff., Ground)		**Date**	08/24/2000	

QC results affect the following production samples:

1004863001, 1004863002, 1004863003, 1004863004, 1004863005, 1004863006, 1004863007, 1004863008, 1004863009, 1004863010, 1004863011, 1004863012, 1004863013, 1004863014, 1004863015, 1004863016

Parameter	Results	PQL	Units	Analysis Date	Init
Metals Department					
Mercury by Cold Vapor	0.000200 U	0.00020	mg/L	08/26/00	JDT

Batch MCV 2178
Method SW846-7471A
Instrument HgAA Leeman AutoAnalyzer PS200

F-701

CT&E Environmental Services Inc.

CT&E Ref.#	326368 Lab Control Sample	**Printed Date/Time**	09/14/2000 9:48	
		Prep	**Batch**	MXX 7771
Client Name	Harding Lawson & Assoc		**Method**	
Project Name/#	BLM-Red Devil		**Date**	08/24/2000
Matrix	Water (Surface, Eff., Ground)			

QC results affect the following production samples:

1004863001, 1004863002, 1004863003, 1004863004, 1004863005, 1004863006, 1004863007, 1004863008, 1004863009, 1004863010, 1004863011, 1004863012, 1004863013, 1004863014, 1004863015, 1004863016

Parameter		QC Results	Pct Recov	LCS/LCSD Limits	RPD	RPD Limits	Spiked Amount	Analysis Date	Init
Metals Department									
Mercury by Cold Vapor	LCS	0.00191	96	(85-115)			0.002 mg/L	08/26/00	JDT

Batch MCV 2178
Method SW846-7471A
Instrument HgAA Leeman AutoAnalyzer PS200

F-701

DATA QUALITY ASSESSMENT

Laboratory: CTE Environmental Services
Batch No.: 1004864
Sampled: 00RDV41SL, 00RDV42SL, 00RDV43SL, 00RDV44SL, 00RDV45SL, 00RDV46SL, 00RDV47SL, 00RDV48SL, 00RDV49SL, 00RDV50SL, 00RDV51SL, 00RDV52SL, 00RDV53SL, 00RDV54SL, 00RDV55SL, 00RDV56SL, 00RDV57SL, 00RDV58SL

	Yes	No	Not Required
1. Were samples analyzed for requested parameters?	X		
2. Is the USACE Data Deliverables package complete?			X
3. Were samples extracted within holding time acceptance criteria?		X	
4. Were samples analyzed within holding time acceptance criteria?	X		
5. For soils, were sample results reported on a "dry weight" basis?		X	
6. Were method blanks analytes all reported as ND?	X		
7. For water, were trip blank analytes all reported as ND?			X
8. Are the surrogate percent recoveries within acceptance criteria?			X
9. Are the matrix spike percent recoveries within acceptance criteria?	X		
10. Are the matrix spike relative percent differences within acceptance criteria?			X
11. Are the field duplicate relative percent differences less than 50 percent?	X		

Comments:

3) Sample numbers 00RDV41SL, 00RDV47SL, and 00RDV48SL were collected 8/1/00 and mercury extracted on 8/30/00 (29 days). The limit is 28 days.

5) TCLP results reported on a wet weight basis, which is the standard of practice.

Date: 3-30-01
Reviewer: [signature]

RECEIVED
SEP 26 2000
HARDING LAWSON
ASSOCIATES

CTE Environmental Services
Alaska Division
Laboratory Data Report

Project: 51192 Red Devil

Client: Harding Lawson & Assoc

CTE Work Order: 1004864

Contents:

Chain of Custody
Quality Control Summary Forms

Note:

Unless otherwise noted, all quality assurance/quality control criteria is in compliance with the proper regulatory authority and/or CTE's Quality Assurance Program Plan.

Case Narrative

Customer: HARLAWP **Harding Lawson & Assoc**

Project: 1004864 **51192 Red Devil**

There were no analytical anomalies associated with your data.

Harding Lawson Associates
601 East 57th Place
Anchorage, AK 99518
907 / 563-8102
907 / 561-4574 FAX

CHAIN OF CUSTODY FORM

1004864

Samplers: K Vincent, B. Miller

Project Number: 51192

Name/Location: Red Devil

Project Manager: Bryan Lund

Recorder: B. Miller (Signature Required)

	SOURCE CODE	MATRIX: Water	Sediment	Soil	Oil	#CONTAINERS & PRESERV.: Unpres.	H_2SO_4	HNO_3	SAMPLE NUMBER OR LAB NUMBER: Yr	Wk	Seq	DATE: Yr	Mo	Dy	Time	STATION DESCRIPTION/ NOTES	EPA 601/8010	EPA 602/8020	EPA 624/8240	EPA 625/8270	ICP METALS	EPA 8015M/TPH	TCLP/Hg 1311/7470	TCLP/As 1311/7060	TCLP/Sb 1311/7041	TCLP/Pb 1311/7421
1	50			X		1						00	08	01	1608	00RDV41SL							X	X	X	X
2	50			X		1						00	08	08	0745	00RDV42SL							X	X	X	X
3	50			X		1						00	08	08	1430	00RDV43SL							X	X	X	X
4	50			X		1						00	08	09	0850	00RDV44SL							X	X	X	X
5	50			X		1						00	08	09	1400	00RDV45SL							X	X	X	X
6	50			X		1						00	08	10	0815	00RDV46SL							X	X	X	X
7	50			X		1						00	08	01	1122	00RDV47SL							X	X	X	X
8	50			X		1						00	08	01	1157	00RDV48SL							X	X	X	X
9	50			X		1						00	08	05	1005	00RDV49SL							X	X	X	X
10	50			X		1						00	08	07	1355	00RDV50SL							X	X	X	X

LAB NUMBER: Yr	Wk	Seq	DEPTH IN FEET	COL MTD CD	QA CODE	MISCELLANEOUS

CHAIN OF CUSTODY RECORD

RELINQUISHED BY: (Signature)	RECEIVED BY: (Signature)	DATE/TIME
Beth V		
RELINQUISHED BY: (Signature)	RECEIVED BY: (Signature)	DATE/TIME
RELINQUISHED BY: (Signature)	RECEIVED BY: (Signature)	DATE/TIME
RELINQUISHED BY: (Signature)	RECEIVED BY: (Signature)	DATE/TIME
DISPATCHED BY: (Signature) DATE/TIME	RECEIVED FOR LAB BY: (Signature)	DATE/TIME
METHOD OF SHIPMENT		

6533

Laboratory Copy White | Project Office Copy Yellow | Field or Office Copy Pink

Harding Lawson Associates
601 East 57th Place
Anchorage, AK 99518
907 / 563-8102
907 / 561-4574 FAX

CHAIN OF CUSTODY FORM

1004864

Lab: C

Samplers: K. Vincent, B. Miller

Project Number: 51192
Name/Location: Red Devil
Project Manager: Bryan Lund

Recorder: B. Miller
(Signature Required)

	SOURCE CODE	MATRIX: Water	Sediment	Soil	Oil	#CONTAINERS & PRESERV.: Unpres.	H_2SO_4	HNO_3	SAMPLE NUMBER OR LAB NUMBER (Yr Wk Seq)	DATE (Yr Mo Dy Time)	STATION DESCRIPTION/ NOTES	EPA 601/8010	EPA 602/8020	EPA 624/8240	EPA 625/8270	ICP METALS	EPA 8015M/TPH	TCLP/Hg 1311/7470	TCLP/As 1311/7060	TCLP/Sb 1311/7471	TCLP/Pb 1311/6010
11	50			X		1				008071530	00RDV51SL							X	X	X	X
12	50			X		1				008071355	00RDV52SL							X	X	X	X
13	50			X		1				008081130	00RDV53SL							X	X	X	X
14	50			X		1				007301000	00RDV54SL							X	X	X	X
15	50			X		1				008031535	00RDV55SL							X	X	X	X
16	50			X		1				008071605	00RDV56SL							X	X	X	X
17	50			X		1				008071405	00RDV57SL							X	X	X	X
18	50			X		1				008071435	00RDV58SL							X	X	X	X

LAB NUMBER (Yr Wk Seq)	DEPTH IN FEET	COL MTD CD	QA CODE	MISCELLANEOUS

CHAIN OF CUSTODY RECORD

RELINQUISHED BY: (Signature) [signature]	RECEIVED BY: (Signature)	DATE/TIME
RELINQUISHED BY: (Signature)	RECEIVED BY: (Signature)	DATE/TIME
RELINQUISHED BY: (Signature)	RECEIVED BY: (Signature)	DATE/TIME
RELINQUISHED BY: (Signature)	RECEIVED BY: (Signature)	DATE/TIME
DISPATCHED BY: (Signature) DATE/TIME	RECEIVED FOR LAB BY: (Signature) [signature]	DATE/TIME 8/22/00 14:05
METHOD OF SHIPMENT		

6533

Laboratory Copy White — Project Office Copy Yellow — Field or Office Copy

CT&E Environmental Services Inc.

SAMPLE RECEIPT FORM

1004864

01 E WO#: 1004864

Yes	No	
	✓	Are samples **RUSH**, priority, or *within 72 hrs* of **hold time**?
✓	✓	If yes, have you done *e-mail notification*?
		Are samples *within 24 hrs* of **hold time** or **due date**?
		If yes, have you *spoken with* Supervisor?
	✓	Are there any **problems** (e.g., ids, analyses)?
✓		Were samples preserved correctly and pH verified?
		Has Project Manager been notified of problems?
		Is this an ACOE/AFCEE/ADEC project?
	✓	Will a **data package** be required?
		If this is for PWS, provide **PWSID**.
		Is there a **quote** for this project?
	✓	Will **courier** charges apply?

Completed by (sign): [signature] (print): Eva Thiemann

Due Date: 9/5/00
Received Date/Time: 8/22 - 14:05
Cooler Temperature: 3.1°C
Sample Condition: (Good) / Poor

Matrix of each Sample:

2	" "	1 - 18
	" "	
	" "	
	" "	
	Trip Blank	
	MS/MSD	

Additional Sample Remarks:

- AK101s/_____ 8260s field pres'd?
- Field-filtered for dissolved_____?
- Lab-filter for dissolved_____?
- Ref Lab required?

Notes:

*** The following *must* be completed for *all* ACOE & AFCEE projects: ***

Yes	No		Notes:
		Is cooler temperature 4 ± C?	
		thermometer used:	
		Was there an airbill, etc? note #:	
		Was cooler sealed with custody seals?	
		#/where?	
		Were seals intact upon arrival?	
		Was there a COC with cooler?	
		Was the COC filled out properly?	
		Did the COC indicate ACOE/AFCEE project?	
		Did the COC and samples correspond?	
		Were samples screened with Geiger counter?	
		Were all samples packed to prevent breakage?	
		packing material:	
		Were all samples unbroken and clearly labelled?	
		Were all samples sealed in separate plastic bags?	
		Were all bottles for volatiles free of headspace?	
		Were correct container/sample sizes submitted?	
		Was client notified of problems? (specify below)	

Individual contacted:
Date & Time: _____ Phone/Fax #: _____

# of each Container Received:

	950 ml amber	unpres'd
	950 ml amber	w/ HCl
	500 ml amber	w/ H2SO4
	1L cubies	unpres'd
	1L cubies	w/ HNO3
	1L cubies	w/ H2SO4
	1L cubies	w/ NaOH + ZnAc
	120 ml coli	bottles
	60 ml	Nalg
18	8 oz amber	unpres'd
	4 oz amber	unpres'd
	4 oz w/ septa	w/ MeOH
	40 ml vials	w/ HCl
	Other (specify)	
	Other (specify)	

#/Log In Proofed by: DS

Form Number: F004r2
Printed: 7/12/99

CT&E Environmental Services Inc.
Laboratory Division

Laboratory Analysis Report

200 W. Potter Drive
Anchorage, AK 99518-1605
Tel: (907) 562-2343
Fax: (907) 561-5301
Web: http://www.cteesi.com

Brian Lund
Harding Lawson & Assoc
601 East 57th Place
Anchorage, AK 99518

Work Order:	1004864
	51192 Red Devil
Client:	Harding Lawson & Assoc
Report Date:	September 19, 2000

Enclosed are the analytical results associated with the above workorder.

As required by the state of Alaska and the USEPA, a formal Quality Assurance/Quality Control Program is maintaned 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 analyte 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
!	Surrogate out of range

CT&E Environmental Services Inc.

CT&E Ref.#	1004864001	**Client PO#**	Auth 48 Job #39551
Client Name	Harding Lawson & Assoc	**Printed Date/Time**	09/19/2000 8:02
Project Name/#	51192 Red Devil	**Collected Date/Time**	08/01/2000 16:08
Client Sample ID	00RDV41SL	**Received Date/Time**	08/22/2000 14:05
Matrix	Other Solids (Wet Weight)	**Technical Director**	**Stephen C. Ede**
Ordered By		**Released By**	J Windebank

Sample Remarks:

Parameter	Results	PQL	Units	Method	Allowable Limits	Prep Date	Analysis Date	Init
Characterization								
Aqueous Phase, Total	0.00		%	SW846-1311 TCLP			08/22/00	BJS
Oil Phase, Total	0.00		%	SW846-1311 TCLP			08/22/00	BJS
Solid Phase, Total	100		%	SW846-1311 TCLP			08/22/00	BJS
TCLP Metals								
Antimony	2.00 U	2.00	mg/L	SW846-6010B TCLP		08/25/00	08/28/00	CMO
Arsenic	0.0500 U	0.0500	mg/L	SW846-7060A TCLP	5 max	08/25/00	09/08/00	JMO
Lead	1.00 U	1.00	mg/L	SW846-6010B TCLP	5 max	08/25/00	08/28/00	CMO
Mercury by Cold Vapor	0.00200 U	0.00200	mg/L	SW846-7470A TCLP	.2 max	08/30/00	09/01/00	JD

F-701

CT&E Environmental Services Inc.

CT&E Ref.#	1004864002	**Client PO#**	Auth 48 Job #39551
Client Name	Harding Lawson & Assoc	**Printed Date/Time**	09/19/2000 8:02
Project Name/#	51192 Red Devil	**Collected Date/Time**	08/08/2000 7:45
Client Sample ID	00RDV42SL	**Received Date/Time**	08/22/2000 14:05
Matrix	Other Solids (Wet Weight)	**Technical Director**	**Stephen C. Ede**
Ordered By		**Released By**	JWindebank

Sample Remarks:

Parameter	Results	PQL	Units	Method	Allowable Limits	Prep Date	Analysis Date	Init
Characterization								
Aqueous Phase, Total	0.00		%	SW846-1311 TCLP			08/22/00	BJS
Oil Phase, Total	0.00		%	SW846-1311 TCLP			08/22/00	BJS
Solid Phase, Total	100		%	SW846-1311 TCLP			08/22/00	BJS
TCLP Metals								
Antimony	2.00 U	2.00	mg/L	SW846-6010B TCLP		08/25/00	08/28/00	CMO
Arsenic	0.0170	0.00500	mg/L	SW846-7060A TCLP	5 max	08/25/00	09/08/00	JMO
Lead	1.00 U	1.00	mg/L	SW846-6010B TCLP	5 max	08/25/00	08/28/00	CMO
Mercury by Cold Vapor	0.00200 U	0.00200	mg/L	SW846-7470A TCLP	.2 max	08/30/00	09/01/00	JDT

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CT&E Environmental Services Inc.

CT&E Ref.#	1004864003	**Client PO#**	Auth 48 Job #39551
Client Name	Harding Lawson & Assoc	**Printed Date/Time**	09/19/2000 8:02
Project Name/#	51192 Red Devil	**Collected Date/Time**	08/08/2000 14:30
Client Sample ID	00RDV43SL	**Received Date/Time**	08/22/2000 14:05
Matrix	Other Solids (Wet Weight)	**Technical Director**	**Stephen C. Ede**
Ordered By		**Released By**	J Windebank

Sample Remarks:

Parameter	Results	PQL	Units	Method	Allowable Limits	Prep Date	Analysis Date	Init
Characterization								
Aqueous Phase, Total	0.00		%	SW846-1311 TCLP			08/22/00	BJS
Oil Phase, Total	0.00		%	SW846-1311 TCLP			08/22/00	BJS
Solid Phase, Total	100		%	SW846-1311 TCLP			08/22/00	BJS
TCLP Metals								
Antimony	7.83	2.00	mg/L	SW846-6010B TCLP		08/25/00	08/28/00	CMO
Arsenic	1.75	0.500	mg/L	SW846-7060A TCLP	5 max	08/25/00	09/14/00	JMO
Lead	1.00 U	1.00	mg/L	SW846-6010B TCLP	5 max	08/25/00	08/28/00	CMO
Mercury by Cold Vapor	0.00710	0.00200	mg/L	SW846-7470A TCLP	.2 max	08/30/00	09/01/00	JI

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CT&E Environmental Services Inc.

CT&E Ref.#	1004864004	**Client PO#**	Auth 48 Job #39551
Client Name	Harding Lawson & Assoc	**Printed Date/Time**	09/19/2000 8:02
Project Name/#	51192 Red Devil	**Collected Date/Time**	08/09/2000 8:50
Client Sample ID	00RDV44SL	**Received Date/Time**	08/22/2000 14:05
Matrix	Other Solids (Wet Weight)	**Technical Director**	**Stephen C. Ede**
Ordered By		**Released By**	J Windebank

Sample Remarks:

Parameter	Results	PQL	Units	Method	Allowable Limits	Prep Date	Analysis Date	Init
Characterization								
Aqueous Phase, Total	0.00		%	SW846-1311 TCLP			08/22/00	BJS
Oil Phase, Total	0.00		%	SW846-1311 TCLP			08/22/00	BJS
Solid Phase, Total	100		%	SW846-1311 TCLP			08/22/00	BJS
TCLP Metals								
Antimony	6.87	2.00	mg/L	SW846-6010B TCLP		08/25/00	08/28/00	CMO
Arsenic	0.761	0.0500	mg/L	SW846-7060A TCLP	5 max	08/25/00	09/08/00	JMO
Lead	1.00 U	1.00	mg/L	SW846-6010B TCLP	5 max	08/25/00	08/28/00	CMO
Mercury by Cold Vapor	0.00200 U	0.00200	mg/L	SW846-7470A TCLP	.2 max	08/30/00	09/01/00	JDT

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CT&E Environmental Services Inc.

CT&E Ref.#	1004864005	**Client PO#**	Auth 48 Job #39551
Client Name	Harding Lawson & Assoc	**Printed Date/Time**	09/19/2000 8:02
Project Name/#	51192 Red Devil	**Collected Date/Time**	08/09/2000 14:00
Client Sample ID	00RDV45SL	**Received Date/Time**	08/22/2000 14:05
Matrix	Other Solids (Wet Weight)	**Technical Director**	**Stephen C. Ede**
Ordered By		**Released By**	J Windebank

Sample Remarks:

Parameter	Results	PQL	Units	Method	Allowable Limits	Prep Date	Analysis Date	Init
Characterization								
Aqueous Phase, Total	0.00		%	SW846-1311 TCLP			08/22/00	BJS
Oil Phase, Total	0.00		%	SW846-1311 TCLP			08/22/00	BJS
Solid Phase, Total	100		%	SW846-1311 TCLP			08/22/00	BJS
TCLP Metals								
Antimony	9.67	2.00	mg/L	SW846-6010B TCLP		08/25/00	08/28/00	CMO
Arsenic	3.05	0.500	mg/L	SW846-7060A TCLP	5 max	08/25/00	09/08/00	JMO
Lead	1.00 U	1.00	mg/L	SW846-6010B TCLP	5 max	08/25/00	08/28/00	CMO
Mercury by Cold Vapor	0.00200 U	0.00200	mg/L	SW846-7470A TCLP	.2 max	08/30/00	09/01/00	JDT

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CT&E Environmental Services Inc.

CT&E Ref.#	1004864006	**Client PO#**	Auth 48 Job #39551
Client Name	Harding Lawson & Assoc	**Printed Date/Time**	09/19/2000 8:02
Project Name/#	51192 Red Devil	**Collected Date/Time**	08/10/2000 8:15
Client Sample ID	00RDV46SL	**Received Date/Time**	08/22/2000 14:05
Matrix	Other Solids (Wet Weight)	**Technical Director**	**Stephen C. Ede**
Ordered By		**Released By**	J Windebank

Sample Remarks:

Parameter	Results	PQL	Units	Method	Allowable Limits	Prep Date	Analysis Date	Init
Characterization								
Aqueous Phase, Total	0.00		%	SW846-1311 TCLP			08/22/00	BJS
Oil Phase, Total	0.00		%	SW846-1311 TCLP			08/22/00	BJS
Solid Phase, Total	100		%	SW846-1311 TCLP			08/22/00	BJS
TCLP Metals								
Antimony	4.96	2.00	mg/L	SW846-6010B TCLP		08/25/00	08/28/00	CMO
Arsenic	4.97	0.500	mg/L	SW846-7060A TCLP	5 max	08/25/00	09/08/00	JMO
Lead	1.00 U	1.00	mg/L	SW846-6010B TCLP	5 max	08/25/00	08/28/00	CMO
Mercury by Cold Vapor	0.00200 U	0.00200	mg/L	SW846-7470A TCLP	.2 max	08/30/00	09/01/00	JDT

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CT&E Environmental Services Inc.

CT&E Ref.#	1004864007	**Client PO#**	Auth 48 Job #39551
Client Name	Harding Lawson & Assoc	**Printed Date/Time**	09/19/2000 8:02
Project Name/#	51192 Red Devil	**Collected Date/Time**	08/01/2000 11:22
Client Sample ID	00RDV47SL	**Received Date/Time**	08/22/2000 14:05
Matrix	Other Solids (Wet Weight)	**Technical Director**	**Stephen C. Ede**
Ordered By		**Released By**	J Windebank

Sample Remarks:

Parameter	Results	PQL	Units	Method	Allowable Limits	Prep Date	Analysis Date	Init
Characterization								
Aqueous Phase, Total	0.00		%	SW846-1311 TCLP			08/22/00	B
Oil Phase, Total	0.00		%	SW846-1311 TCLP			08/22/00	BJS
Solid Phase, Total	100		%	SW846-1311 TCLP			08/22/00	B
TCLP Metals								
Antimony	2.88	2.00	mg/L	SW846-6010B TCLP		08/25/00	08/28/00	CM
Arsenic	0.266	0.0500	mg/L	SW846-7060A TCLP	5 max	08/25/00	09/08/00	JMO
Lead	1.00 U	1.00	mg/L	SW846-6010B TCLP	5 max	08/25/00	08/28/00	CM
Mercury by Cold Vapor	0.00207	0.00200	mg/L	SW846-7470A TCLP	.2 max	08/30/00	09/01/00	JL

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CT&E Environmental Services Inc.

CT&E Ref.#	1004864008	**Client PO#**	Auth 48 Job #39551
Client Name	Harding Lawson & Assoc	**Printed Date/Time**	09/19/2000 8:02
Project Name/#	51192 Red Devil	**Collected Date/Time**	08/01/2000 11:57
Client Sample ID	00RDV48SL	**Received Date/Time**	08/22/2000 14:05
Matrix	Other Solids (Wet Weight)	**Technical Director**	**Stephen C. Ede**
Ordered By		**Released By**	J Windebank

Sample Remarks:

Parameter	Results	PQL	Units	Method	Allowable Limits	Prep Date	Analysis Date	Init
Characterization								
Aqueous Phase, Total	0.00		%	SW846-1311 TCLP			08/22/00	BJS
Oil Phase, Total	0.00		%	SW846-1311 TCLP			08/22/00	BJS
Solid Phase, Total	100		%	SW846-1311 TCLP			08/22/00	BJS
TCLP Metals								
Antimony	2.00 U	2.00	mg/L	SW846-6010B TCLP		08/25/00	08/28/00	CMO
Arsenic	0.760	0.0500	mg/L	SW846-7060A TCLP	5 max	08/25/00	09/08/00	JMO
Lead	1.00 U	1.00	mg/L	SW846-6010B TCLP	5 max	08/25/00	08/28/00	CMO
Mercury by Cold Vapor	0.00200 U	0.00200	mg/L	SW846-7470A TCLP	.2 max	08/30/00	09/01/00	JDT

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CT&E Environmental Services Inc.

CT&E Ref.#	1004864009	**Client PO#**	Auth 48 Job #39551
Client Name	Harding Lawson & Assoc	**Printed Date/Time**	09/19/2000 8:02
Project Name/#	51192 Red Devil	**Collected Date/Time**	08/05/2000 10:05
Client Sample ID	00RDV49SL	**Received Date/Time**	08/22/2000 14:05
Matrix	Other Solids (Wet Weight)	**Technical Director**	**Stephen C. Ede**
Ordered By		**Released By**	J Windebank

Sample Remarks:

Parameter	Results	PQL	Units	Method	Allowable Limits	Prep Date	Analysis Date	Init
Characterization								
Aqueous Phase, Total	0.00		%	SW846-1311 TCLP			08/22/00	BJ
Oil Phase, Total	0.00		%	SW846-1311 TCLP			08/22/00	BJ
Solid Phase, Total	100		%	SW846-1311 TCLP			08/22/00	BJS
TCLP Metals								
Antimony	26.7	2.00	mg/L	SW846-6010B TCLP		08/25/00	08/28/00	CM
Arsenic	1.20	0.500	mg/L	SW846-7060A TCLP	5 max	08/25/00	09/08/00	JMO
Lead	1.00 U	1.00	mg/L	SW846-6010B TCLP	5 max	08/25/00	08/28/00	CMO
Mercury by Cold Vapor	0.0219	0.00200	mg/L	SW846-7470A TCLP	.2 max	08/30/00	09/01/00	JD

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CT&E Environmental Services Inc.

CT&E Ref.#	1004864010	**Client PO#**	Auth 48 Job #39551
Client Name	Harding Lawson & Assoc	**Printed Date/Time**	09/19/2000 8:02
Project Name/#	51192 Red Devil	**Collected Date/Time**	08/07/2000 13:55
Client Sample ID	00RDV50SL	**Received Date/Time**	08/22/2000 14:05
Matrix	Other Solids (Wet Weight)	**Technical Director**	**Stephen C. Ede**
Ordered By		**Released By**	J Windebank

Sample Remarks:

Parameter	Results		PQL	Units	Method	Allowable Limits	Prep Date	Analysis Date	Init
Characterization									
Aqueous Phase, Total	0.00			%	SW846-1311 TCLP			08/22/00	BJS
Oil Phase, Total	0.00			%	SW846-1311 TCLP			08/22/00	BJS
Solid Phase, Total	100			%	SW846-1311 TCLP			08/22/00	BJS
TCLP Metals									
Antimony	18.5		2.00	mg/L	SW846-6010B TCLP		08/25/00	08/28/00	CMO
Arsenic	31.3	*	5.00	mg/L	SW846-7060A TCLP	5 max	08/25/00	09/08/00	JMO
Lead	1.00 U		1.00	mg/L	SW846-6010B TCLP	5 max	08/25/00	08/28/00	CMO
Mercury by Cold Vapor	0.0169		0.00200	mg/L	SW846-7470A TCLP	.2 max	08/30/00	09/01/00	JDT

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CT&E Environmental Services Inc.

CT&E Ref.#	1004864011	**Client PO#**	Auth 48 Job #39551
Client Name	Harding Lawson & Assoc	**Printed Date/Time**	09/19/2000 8:02
Project Name/#	51192 Red Devil	**Collected Date/Time**	08/07/2000 15:30
Client Sample ID	00RDV51SL	**Received Date/Time**	08/22/2000 14:05
Matrix	Other Solids (Wet Weight)	**Technical Director**	**Stephen C. Ede**
Ordered By		**Released By**	J Windebank

Sample Remarks:

Parameter	Results		PQL	Units	Method	Allowable Limits	Prep Date	Analysis Date	Init
Characterization									
Aqueous Phase, Total	0.00			%	SW846-1311 TCLP			08/22/00	BJ
Oil Phase, Total	0.00			%	SW846-1311 TCLP			08/22/00	BJS
Solid Phase, Total	100			%	SW846-1311 TCLP			08/22/00	BJS
TCLP Metals									
Antimony	10.8		2.00	mg/L	SW846-6010B TCLP		08/25/00	08/28/00	CM
Arsenic	8.76	*	0.500	mg/L	SW846-7060A TCLP	5 max	08/25/00	09/08/00	JMO
Lead	1.00 U		1.00	mg/L	SW846-6010B TCLP	5 max	08/25/00	08/28/00	CMO
Mercury by Cold Vapor	0.429	*	0.0200	mg/L	SW846-7470A TCLP	.2 max	08/30/00	09/01/00	JD

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CT&E Environmental Services Inc.

CT&E Ref.#	1004864012	**Client PO#**	Auth 48 Job #39551
Client Name	Harding Lawson & Assoc	**Printed Date/Time**	09/19/2000 8:02
Project Name/#	51192 Red Devil	**Collected Date/Time**	08/07/2000 13:55
Client Sample ID	00RDV52SL	**Received Date/Time**	08/22/2000 14:05
Matrix	Other Solids (Wet Weight)	**Technical Director**	Stephen C. Ede
Ordered By		**Released By**	J Windebank

Sample Remarks:

Parameter	Results		PQL	Units	Method	Allowable Limits	Prep Date	Analysis Date	Init
Characterization									
Aqueous Phase, Total	0.00			%	SW846-1311 TCLP			08/22/00	BJS
Oil Phase, Total	0.00			%	SW846-1311 TCLP			08/22/00	BJS
Solid Phase, Total	100			%	SW846-1311 TCLP			08/22/00	BJS
TCLP Metals									
Antimony	45.8		2.00	mg/L	SW846-6010B TCLP		08/25/00	08/28/00	CMO
Arsenic	373	*	50.0	mg/L	SW846-7060A TCLP	5 max	08/25/00	09/08/00	JMO
Lead	1.00 U		1.00	mg/L	SW846-6010B TCLP	5 max	08/25/00	08/28/00	CMO
Mercury by Cold Vapor	0.00200 U		0.00200	mg/L	SW846-7470A TCLP	.2 max	08/30/00	09/01/00	JDT

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CT&E Environmental Services Inc.

CT&E Ref.#	1004864013	**Client PO#**	Auth 48 Job #39551
Client Name	Harding Lawson & Assoc	**Printed Date/Time**	09/19/2000 8:02
Project Name/#	51192 Red Devil	**Collected Date/Time**	08/08/2000 11:30
Client Sample ID	00RDV53SL	**Received Date/Time**	08/22/2000 14:05
Matrix	Other Solids (Wet Weight)	**Technical Director**	Stephen C. Ede
Ordered By		**Released By**	J Windebank

Sample Remarks:

Parameter	Results		PQL	Units	Method	Allowable Limits	Prep Date	Analysis Date	Init
Characterization									
Aqueous Phase, Total	0.00			%	SW846-1311 TCLP			08/22/00	BJS
Oil Phase, Total	0.00			%	SW846-1311 TCLP			08/22/00	BJS
Solid Phase, Total	100			%	SW846-1311 TCLP			08/22/00	BJS
TCLP Metals									
Antimony	2.31		2.00	mg/L	SW846-6010B TCLP		08/25/00	08/28/00	CMO
Arsenic	7.93	*	0.500	mg/L	SW846-7060A TCLP	5 max	08/25/00	09/08/00	JMO
Lead	1.00 U		1.00	mg/L	SW846-6010B TCLP	5 max	08/25/00	08/28/00	CMO
Mercury by Cold Vapor	0.00200 U		0.00200	mg/L	SW846-7470A TCLP	.2 max	08/30/00	09/01/00	JD

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CT&E Environmental Services Inc.

CT&E Ref.#	1004864014	**Client PO#**	Auth 48 Job #39551
Client Name	Harding Lawson & Assoc	**Printed Date/Time**	09/19/2000 8:02
Project Name/#	51192 Red Devil	**Collected Date/Time**	07/30/2000 10:00
Client Sample ID	00RDV54SL	**Received Date/Time**	08/22/2000 14:05
Matrix	Other Solids (Wet Weight)	**Technical Director**	**Stephen C. Ede**
Ordered By		**Released By**	J Windebank

Sample Remarks:

Parameter	Results	PQL	Units	Method	Allowable Limits	Prep Date	Analysis Date	Init
Characterization								
Aqueous Phase, Total	0.00		%	SW846-1311 TCLP			08/22/00	BJS
Oil Phase, Total	0.00		%	SW846-1311 TCLP			08/22/00	BJS
Solid Phase, Total	100		%	SW846-1311 TCLP			08/22/00	BJS
TCLP Metals								
Antimony	4.81	2.00	mg/L	SW846-6010B TCLP		08/25/00	08/28/00	CMO
Arsenic	1.16	0.500	mg/L	SW846-7060A TCLP	5 max	08/25/00	09/08/00	JMO
Lead	1.00 U	1.00	mg/L	SW846-6010B TCLP	5 max	08/25/00	08/28/00	CMO
Mercury by Cold Vapor	0.00200 U	0.00200	mg/L	SW846-7470A TCLP	.2 max	08/30/00	09/01/00	JDT

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CT&E Environmental Services Inc.

CT&E Ref.#	1004864015	**Client PO#**	Auth 48 Job #39551
Client Name	Harding Lawson & Assoc	**Printed Date/Time**	09/19/2000 8:02
Project Name/#	51192 Red Devil	**Collected Date/Time**	08/03/2000 15:35
Client Sample ID	00RDV55SL	**Received Date/Time**	08/22/2000 14:05
Matrix	Other Solids (Wet Weight)	**Technical Director**	**Stephen C. Ede**
Ordered By		**Released By**	J Windebank

Sample Remarks:

Parameter	Results		PQL	Units	Method	Allowable Limits	Prep Date	Analysis Date	Init
Characterization									
Aqueous Phase, Total	0.00			%	SW846-1311 TCLP			08/22/00	B
Oil Phase, Total	0.00			%	SW846-1311 TCLP			08/22/00	BJS
Solid Phase, Total	100			%	SW846-1311 TCLP			08/22/00	BJS
TCLP Metals									
Antimony	5.13		2.00	mg/L	SW846-6010B TCLP		08/25/00	08/28/00	CM
Arsenic	8.88	*	0.500	mg/L	SW846-7060A TCLP	5 max	08/25/00	09/08/00	JMO
Lead	1.00 U		1.00	mg/L	SW846-6010B TCLP	5 max	08/25/00	08/28/00	CM
Mercury by Cold Vapor	0.0248		0.00200	mg/L	SW846-7470A TCLP	.2 max	08/30/00	09/01/00	JD

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CT&E Environmental Services Inc.

CT&E Ref.#	1004864016	**Client PO#**	Auth 48 Job #39551
Client Name	Harding Lawson & Assoc	**Printed Date/Time**	09/19/2000 8:02
Project Name/#	51192 Red Devil	**Collected Date/Time**	08/07/2000 16:05
Client Sample ID	00RDV56SL	**Received Date/Time**	08/22/2000 14:05
Matrix	Other Solids (Wet Weight)	**Technical Director**	**Stephen C. Ede**
Ordered By		**Released By**	J Windebank

Sample Remarks:

Parameter	Results		PQL	Units	Method	Allowable Limits	Prep Date	Analysis Date	Init
Characterization									
Aqueous Phase, Total	0.00			%	SW846-1311 TCLP			08/22/00	BJS
Oil Phase, Total	0.00			%	SW846-1311 TCLP			08/22/00	BJS
Solid Phase, Total	100			%	SW846-1311 TCLP			08/22/00	BJS
TCLP Metals									
Antimony	29.4		2.00	mg/L	SW846-6010B TCLP		08/25/00	08/28/00	CMO
Arsenic	6.43	*	0.500	mg/L	SW846-7060A TCLP	5 max	08/25/00	09/08/00	JMO
Lead	1.00 U		1.00	mg/L	SW846-6010B TCLP	5 max	08/25/00	08/28/00	CMO
Mercury by Cold Vapor	0.00665		0.00200	mg/L	SW846-7470A TCLP	.2 max	08/30/00	09/01/00	JDT

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CT&E Environmental Services Inc.

CT&E Ref.#	1004864017	**Client PO#**	Auth 48 Job #39551
Client Name	Harding Lawson & Assoc	**Printed Date/Time**	09/19/2000 8:02
Project Name/#	51192 Red Devil	**Collected Date/Time**	08/07/2000 14:05
Client Sample ID	00RDV57SL	**Received Date/Time**	08/22/2000 14:05
Matrix	Other Solids (Wet Weight)	**Technical Director**	**Stephen C. Ede**
Ordered By		**Released By**	J W Windebank

Sample Remarks:

Parameter	Results		PQL	Units	Method	Allowable Limits	Prep Date	Analysis Date	Init
Characterization									
Aqueous Phase, Total	0.00			%	SW846-1311 TCLP			08/22/00	BJ
Oil Phase, Total	0.00			%	SW846-1311 TCLP			08/22/00	BJS
Solid Phase, Total	100			%	SW846-1311 TCLP			08/22/00	BJS
TCLP Metals									
Antimony	26.4		2.00	mg/L	SW846-6010B TCLP		08/25/00	08/28/00	CM
Arsenic	34.3	*	5.00	mg/L	SW846-7060A TCLP	5 max	08/25/00	09/08/00	JMO
Lead	1.00 U		1.00	mg/L	SW846-6010B TCLP	5 max	08/25/00	08/28/00	CM
Mercury by Cold Vapor	0.0125		0.00200	mg/L	SW846-7470A TCLP	.2 max	08/30/00	09/01/00	JD

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CT&E Environmental Services Inc.

CT&E Ref.#	1004864018	**Client PO#**	Auth 48 Job #39551
Client Name	Harding Lawson & Assoc	**Printed Date/Time**	09/19/2000 8:02
Project Name/#	51192 Red Devil	**Collected Date/Time**	08/07/2000 14:35
Client Sample ID	00RDV58SL	**Received Date/Time**	08/22/2000 14:05
Matrix	Other Solids (Wet Weight)	**Technical Director**	**Stephen C. Ede**
Ordered By		**Released By**	J Windlebank

Sample Remarks:

Parameter	Results		PQL	Units	Method	Allowable Limits	Prep Date	Analysis Date	Init
Characterization									
Aqueous Phase, Total	0.00			%	SW846-1311 TCLP			08/22/00	BJS
Oil Phase, Total	0.00			%	SW846-1311 TCLP			08/22/00	BJS
Solid Phase, Total	100			%	SW846-1311 TCLP			08/22/00	BJS
TCLP Metals									
Antimony	30.1		2.00	mg/L	SW846-6010B TCLP		08/25/00	08/28/00	CMO
Arsenic	9.64	*	0.500	mg/L	SW846-7060A TCLP	5 max	08/25/00	09/08/00	JMO
Lead	1.00 U		1.00	mg/L	SW846-6010B TCLP	5 max	08/25/00	08/28/00	CMO
Mercury by Cold Vapor	0.0150		0.00200	mg/L	SW846-7470A TCLP	.2 max	08/30/00	09/01/00	JDT

F-701

CT&E Environmental Services Inc.

CT&E Ref.#	326197 Method Blank		**Printed Date/Time**	09/18/2000 13:58	
Client Name	Harding Lawson & Assoc		**Prep**	**Batch**	MXT 2836
Project Name/#	51192 Red Devil			**Method**	
Matrix	Water (Surface, Eff., Ground)			**Date**	08/25/2000

QC results affect the following production samples:

1004864001, 1004864002, 1004864003, 1004864004, 1004864005, 1004864006, 1004864007, 1004864008, 1004864009, 1004864010, 1004864011, 1004864012, 1004864013, 1004864014, 1004864015, 1004864016, 1004864017, 1004864018

Parameter	Results	PQL	Units	Analysis Date	Init
TCLP Metals					
Antimony	0.200 U	0.200	mg/L	08/28/00	CMO
Lead	0.100 U	0.100	mg/L	08/28/00	CMO

Batch MIP 3273
Method SW846-6010B TCLP
Instrument TJA Enviro II ICP P2

F-701

CT&E Environmental Services Inc.

CT&E Ref.#	326198 Lab Control Sample	**Printed Date/Time**	09/18/2000 13:58
		Prep Batch	MXT 2836
Client Name	Harding Lawson & Assoc	**Method**	
Project Name/#	51192 Red Devil	**Date**	08/25/2000
Matrix	Water (Surface, Eff., Ground)		

QC results affect the following production samples:

1004864001, 1004864002, 1004864003, 1004864004, 1004864005, 1004864006, 1004864007, 1004864008, 1004864009, 1004864010, 1004864011, 1004864012, 1004864013, 1004864014, 1004864015, 1004864016, 1004864017, 1004864018

Parameter		QC Results	Pct Recov	LCS/LCSD Limits	RPD	RPD Limits	Spiked Amount	Analysis Date	Init
TCLP Metals									
Antimony	LCS	1.88	94	(85-115)			2 mg/L	08/28/00	CMO
Lead	LCS	2.04	102	(85-115)			2 mg/L	08/28/00	CMO

Batch MIP 3273
Method SW846-6010B TCLP
Instrument TJA Enviro II ICP P2

F-701

CT&E Environmental Services Inc.

CT&E Ref.#	326204	Method Blank	**Printed Date/Time**	09/18/2000 13:58	
Client Name	Harding Lawson & Assoc		**Prep Batch**	MXT	2837
Project Name/#	51192 Red Devil		**Method**		
Matrix	Water (Surface, Eff., Ground)		**Date**	08/25/2000	

QC results affect the following production samples:

1004864001, 1004864002, 1004864003, 1004864004, 1004864005, 1004864006, 1004864007, 1004864008, 1004864009, 1004864010, 1004864011, 1004864012, 1004864013, 1004864014, 1004864015, 1004864016, 1004864017, 1004864018

Parameter	Results	PQL	Units	Analysis Date	Init
TCLP Metals					
Arsenic			mg/L	09/08/00	JMC

Batch MGF 9076
Method SW846-7060A TCLP
Instrument GFAA Perkin Elmer 5000

F-701

CT&E Environmental Services Inc.

CT&E Ref.#	326205 Lab Control Sample	**Printed Date/Time**	09/18/2000 13:58
		Prep Batch	MXT 2837
Client Name	Harding Lawson & Assoc	**Method**	
Project Name/#	51192 Red Devil	**Date**	08/25/2000
Matrix	Water (Surface, Eff., Ground)		

QC results affect the following production samples:

1004864001, 1004864002, 1004864003, 1004864004, 1004864005, 1004864006, 1004864007, 1004864008, 1004864009, 1004864010, 1004864011, 1004864012, 1004864013, 1004864014, 1004864015, 1004864016, 1004864017, 1004864018

Parameter	QC Results	Pct Recov	LCS/LCSD Limits	RPD	RPD Limits	Spiked Amount	Analysis Date	Init
TCLP Metals								
Arsenic	LCS	93	(85-115)			0.2 mg/L	09/08/00	JMO

Batch MGF 9076
Method SW846-7060A TCLP
Instrument GFAA Perkin Elmer 5000

F-701

CT&E Environmental Services Inc.

CT&E Ref.#	327909	Method Blank	**Printed Date/Time**	09/18/2000 13:58	
Client Name	Harding Lawson & Assoc		**Prep Batch**	MXX	7797
Project Name/#	51192 Red Devil		**Method**		
Matrix	Water (Surface, Eff., Ground)		**Date**	08/30/2000	

QC results affect the following production samples:

1004864001, 1004864002, 1004864003, 1004864004, 1004864005, 1004864006, 1004864007, 1004864008, 1004864009, 1004864010, 1004864011, 1004864012, 1004864013, 1004864014, 1004864015, 1004864016, 1004864017, 1004864018

Parameter	Results	PQL	Units	Analysis Date	Init
Metals Department					
Mercury by Cold Vapor	0.000200 U	0.00020	mg/L	09/01/00	JDT

Batch MCV 2186
Method SW7470/E245.1
Instrument HgAA Leeman AutoAnalyzer PS200

F-701

CT&E Environmental Services Inc.

CT&E Ref.#	327910 Lab Control Sample	**Printed Date/Time**	09/18/2000 13:58
		Prep Batch	MXX 7797
Client Name	Harding Lawson & Assoc	**Method**	
Project Name/#	51192 Red Devil	**Date**	08/30/2000
Matrix	Water (Surface, Eff., Ground)		

QC results affect the following production samples:

1004864001, 1004864002, 1004864003, 1004864004, 1004864005, 1004864006, 1004864007, 1004864008, 1004864009, 1004864010, 1004864011, 1004864012, 1004864013, 1004864014, 1004864015, 1004864016, 1004864017, 1004864018

Parameter		QC Results	Pct Recov	LCS/LCSD Limits	RPD	RPD Limits	Spiked Amount	Analysis Date	Init
Metals Department									
Mercury by Cold Vapor	LCS	0.00209	105	(85-115)			0.002 mg/L	09/01/00	JDT

Batch MCV 2186
Method SW7470/E245.1
Instrument HgAA Leeman AutoAnalyzer PS200

F-701

INVOICE

CT&E Environmental Services Inc.

Alaska Division
200 W. Potter Drive
Anchorage, AK 99518-1605

Phone: (907) 562-2343
Fax: (907) 561-5301
Web: http://www.cteesi.com

COPY

No. 52255680
Date 09/22/2000

BILL TO	SHIP TO
Harding Lawson & Assoc Accounts Payable 601 E 57th Place Anchorage, AK 99518	Brian Lund Harding Lawson & Assoc 601 East 57th Place Anchorage, AK 99518

CLIENT ID	CLIENT No.	P.O. NO.	TERMS	PRINTED
HARLAWP	5222851	Auth 48 Job #39551	NET 30	09/22/2000

ITEM/DESCRIPTION	AMOUNT
Workorder : 1004864 51192 Red Devil **Login Date:** 08/22/2000 **Comments:**	
CT&E Sample ID: 1004864001 **Client Sample ID:** 00RDV41SL	
TCLP Antimony by 6010 ICP	16.54
TCLP Arsenic SW7060 GF	16.54
TCLP Extraction for Metals	55.13
TCLP HG SW846-7470	27.56
TCLP Lead by SW846-6010	11.03
CT&E Sample ID: 1004864002 **Client Sample ID:** 00RDV42SL	
TCLP Antimony by 6010 ICP	16.54
TCLP Arsenic SW7060 GF	16.54
TCLP Extraction for Metals	55.13
TCLP HG SW846-7470	27.56
TCLP Lead by SW846-6010	11.03
CT&E Sample ID: 1004864003 **Client Sample ID:** 00RDV43SL	
TCLP Antimony by 6010 ICP	16.54
TCLP Arsenic SW7060 GF	16.54
TCLP Extraction for Metals	55.13
TCLP HG SW846-7470	27.56
TCLP Lead by SW846-6010	11.03
CT&E Sample ID: 1004864004 **Client Sample ID:** 00RDV44SL	
TCLP Antimony by 6010 ICP	16.54
TCLP Arsenic SW7060 GF	16.54
TCLP Extraction for Metals	55.13

A Finance Charge of 1.5% Per Month (18% Annual) Will Be Charged On Past Due Accounts

Please Remit To: **CT&E Environmental Services, Inc.**
P.O. Box 10001-1019
Pasadena, CA 91110-1019

Federal ID: 22-3334380

F-714

INVOICE

CT&E Environmental Services Inc.

Alaska Division
200 W. Potter Drive
Anchorage, AK 99518-1605

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Fax: (907) 561-5301
Web: http://www.cteesi.com

COPY

No. 52255680
Date 09/22/2000

BILL TO	SHIP TO
Harding Lawson & Assoc Accounts Payable 601 E 57th Place Anchorage, AK 99518	Brian Lund Harding Lawson & Assoc 601 East 57th Place Anchorage, AK 99518

CLIENT ID	CLIENT No.	P.O. NO.	TERMS	PRINTED
HARLAWP	5222851	Auth 48 Job #39551	NET 30	09/22/2000

ITEM/DESCRIPTION	AMOUNT
TCLP HG SW846-7470	27.56
TCLP Lead by SW846-6010	11.03
CT&E Sample ID: 1004864005 **Client Sample ID:** 00RDV45SL	
TCLP Antimony by 6010 ICP	16.54
TCLP Arsenic SW7060 GF	16.54
TCLP Extraction for Metals	55.13
TCLP HG SW846-7470	27.56
TCLP Lead by SW846-6010	11.03
CT&E Sample ID: 1004864006 **Client Sample ID:** 00RDV46SL	
TCLP Antimony by 6010 ICP	16.54
TCLP Arsenic SW7060 GF	16.54
TCLP Extraction for Metals	55.13
TCLP HG SW846-7470	27.56
TCLP Lead by SW846-6010	11.03
CT&E Sample ID: 1004864007 **Client Sample ID:** 00RDV47SL	
TCLP Antimony by 6010 ICP	16.54
TCLP Arsenic SW7060 GF	16.54
TCLP Extraction for Metals	55.13
TCLP HG SW846-7470	27.56
TCLP Lead by SW846-6010	11.03
CT&E Sample ID: 1004864008 **Client Sample ID:** 00RDV48SL	
TCLP Antimony by 6010 ICP	16.54
TCLP Arsenic SW7060 GF	16.54
TCLP Extraction for Metals	55.13
TCLP HG SW846-7470	27.56

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F-714

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COPY

No. 52255680
Date 09/22/2000

BILL TO	SHIP TO
Harding Lawson & Assoc Accounts Payable 601 E 57th Place Anchorage, AK 99518	Brian Lund Harding Lawson & Assoc 601 East 57th Place Anchorage, AK 99518

CLIENT ID	CLIENT No.	P.O. NO.	TERMS	PRINTED
HARLAWP	5222851	Auth 48 Job #39551	NET 30	09/22/2000

ITEM/DESCRIPTION	AMOUNT
TCLP Lead by SW846-6010	11.03
CT&E Sample ID: 1004864009 **Client Sample ID:** 00RDV49SL	
TCLP Antimony by 6010 ICP	16.54
TCLP Arsenic SW7060 GF	16.54
TCLP Extraction for Metals	55.13
TCLP HG SW846-7470	27.56
TCLP Lead by SW846-6010	11.03
CT&E Sample ID: 1004864010 **Client Sample ID:** 00RDV50SL	
TCLP Antimony by 6010 ICP	16.54
TCLP Arsenic SW7060 GF	16.54
TCLP Extraction for Metals	55.13
TCLP HG SW846-7470	27.56
TCLP Lead by SW846-6010	11.03
CT&E Sample ID: 1004864011 **Client Sample ID:** 00RDV51SL	
TCLP Antimony by 6010 ICP	16.54
TCLP Arsenic SW7060 GF	16.54
TCLP Extraction for Metals	55.13
TCLP HG SW846-7470	27.56
TCLP Lead by SW846-6010	11.03
CT&E Sample ID: 1004864012 **Client Sample ID:** 00RDV52SL	
TCLP Antimony by 6010 ICP	16.54
TCLP Arsenic SW7060 GF	16.54
TCLP Extraction for Metals	55.13
TCLP HG SW846-7470	27.56
TCLP Lead by SW846-6010	11.03

A Finance Charge of 1.5% Per Month (18% Annual) Will Be Charged On Past Due Accounts

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P.O. Box 10001-1019
Pasadena, CA 91110-1019

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F-714

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COPY

No. 52255680
Date 09/22/2000

BILL TO	SHIP TO
Harding Lawson & Assoc Accounts Payable 601 E 57th Place Anchorage, AK 99518	Brian Lund Harding Lawson & Assoc 601 East 57th Place Anchorage, AK 99518

CLIENT ID	CLIENT No.	P.O. NO.	TERMS	PRINTED
HARLAWP	5222851	Auth 48 Job #39551	NET 30	09/22/2000

ITEM/DESCRIPTION	AMOUNT
CT&E Sample ID: 1004864013 **Client Sample ID:** 00RDV53SL	
TCLP Antimony by 6010 ICP	16.54
TCLP Arsenic SW7060 GF	16.54
TCLP Extraction for Metals	55.13
TCLP HG SW846-7470	27.56
TCLP Lead by SW846-6010	11.03
CT&E Sample ID: 1004864014 **Client Sample ID:** 00RDV54SL	
TCLP Antimony by 6010 ICP	16.54
TCLP Arsenic SW7060 GF	16.54
TCLP Extraction for Metals	55.13
TCLP HG SW846-7470	27.56
TCLP Lead by SW846-6010	11.03
CT&E Sample ID: 1004864015 **Client Sample ID:** 00RDV55SL	
TCLP Antimony by 6010 ICP	16.54
TCLP Arsenic SW7060 GF	16.54
TCLP Extraction for Metals	55.13
TCLP HG SW846-7470	27.56
TCLP Lead by SW846-6010	11.03
CT&E Sample ID: 1004864016 **Client Sample ID:** 00RDV56SL	
TCLP Antimony by 6010 ICP	16.54
TCLP Arsenic SW7060 GF	16.54
TCLP Extraction for Metals	55.13
TCLP HG SW846-7470	27.56
TCLP Lead by SW846-6010	11.03

A Finance Charge of 1.5% Per Month (18% Annual) Will Be Charged On Past Due Accounts

Please Remit To: **CT&E Environmental Services, Inc.**
P.O. Box 10001-1019
Pasadena, CA 91110-1019

Federal ID: 22-3334380

F-714

INVOICE

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200 W. Potter Drive
Anchorage, AK 99518-1605

Phone: (907) 562-2343
Fax: (907) 561-5301
Web: http://www.cteesi.com

COPY

No. 52255680
Date 09/22/2000

BILL TO	SHIP TO
Harding Lawson & Assoc Accounts Payable 601 E 57th Place Anchorage, AK 99518	Brian Lund Harding Lawson & Assoc 601 East 57th Place Anchorage, AK 99518

CLIENT ID	CLIENT No.	P.O. NO.	TERMS	PRINTED
HARLAWP	5222851	Auth 48 Job #39551	NET 30	09/22/2000

ITEM/DESCRIPTION			AMOUNT
CT&E Sample ID:	1004864017	**Client Sample ID:** 00RDV57SL	
	TCLP Antimony by 6010 ICP		16.54
	TCLP Arsenic SW7060 GF		16.54
	TCLP Extraction for Metals		55.13
	TCLP HG SW846-7470		27.56
	TCLP Lead by SW846-6010		11.03
CT&E Sample ID:	1004864018	**Client Sample ID:** 00RDV58SL	
	TCLP Antimony by 6010 ICP		16.54
	TCLP Arsenic SW7060 GF		16.54
	TCLP Extraction for Metals		55.13
	TCLP HG SW846-7470		27.56
	TCLP Lead by SW846-6010		11.03

Please Pay This Amount **$2,282.40**

A Finance Charge of 1.5% Per Month (18% Annual) Will Be Charged On Past Due Accounts

Please Remit To: **CT&E Environmental Services, Inc.**
P.O. Box 10001-1019
Pasadena, CA 91110-1019

Federal ID: 22-3334380

F-714

DATA QUALITY ASSESSMENT

Laboratory: CTE Environmental Services
Batch No.: 3003749
Sampled: 00RDV11MI

	Yes	No	Not Required/Applicable
1. Were samples analyzed for requested parameters?	X		
2. Is the USACE Data Deliverables package complete?			X
3. Were samples extracted within holding time acceptance criteria?	X		
4. Were samples analyzed within holding time acceptance criteria?	X		
5. For soils, were sample results reported on a "dry weight" basis?			X
6. Were method blanks analytes all reported as ND?			X
7. For water, were trip blank analytes all reported as ND?			X
8. Are the surrogate percent recoveries within acceptance criteria?	X		
9. Are the matrix spike percent recoveries within acceptance criteria?			X
10. Are the matrix spike relative percent differences within acceptance criteria?			X
11. Are the field duplicate relative percent differences less than 50 percent?	X		

Comments:

Date: 3-30-01
Reviewer: JEL

CT&E Environmental Services Inc.

RECEIVED
AUG 3 0 2000
HARDING LAWSON
ASSOCIATES

CTE Environmental Services
Alaska Division
Laboratory Data Report

Project: Red Devil 51192.2 8/5/00

Client: Harding Lawson Associates

CTE Work Order: 3003749

Contents:

Case Narrative
Chain of Custody
Sample Receipt Form
Quality Control Summary Forms

Note:

Unless otherwise noted, all quality assurance/quality control criteria is in compliance with the proper regulatory authority and/or CTE's Quality Assurance Program Plan.

CT&E Environmental Services Inc.

Case Narrative

Customer: HLA **Harding Lawson Associates**

Project: 3003749 **Red Devil 51192.2 8/5/00**

3003749001 PS

Sample analyzed by CT&E ESI, Michigan Division.

T004355

Harding Lawson Associates
601 East 57th Place
Anchorage, AK 99518
907 / 563-8102
907 / 561-4574 FAX

CHAIN OF CUSTODY FORM

Lab: C

Samplers: BDLUND

Project Number: 51192.2

Name/Location: RED DEVIL

Project Manager: BRYAN LUND

Recorder: BDL (Signature Required)

SOURCE CODE	MATRIX: Water	Sediment	Soil	Oil	#CONTAINERS & PRESERV.: Unpres.	H_2SO_4	HNO_3	HCL	SAMPLE NUMBER OR LAB NUMBER: Yr	Wk	Seq	DATE: Yr	Mo	Dy	Time	STATION DESCRIPTION/ NOTES	EPA 601/8010	EPA 602/8020	EPA 624/8240	EPA 625/8270	ICP METALS	EPA 8015M/TPH	TAH EPA 610
1	X				2			2				000	80	5	1210	COORDV11MI							X

RUSH

LAB NUMBER: Yr	Wk	Seq	DEPTH IN FEET	COL MTD CD	QA CODE	MISCELLANEOUS
						RUSH TAT EPA ACIDIFIED CONTAINERS MAY NOT BE NECESSARY

CHAIN OF CUSTODY RECORD

2.8 °C

RELINQUISHED BY: (Signature) BDL 8/7/00 4:[illegible]	RECEIVED BY: (Signature)	DATE/TIME
RELINQUISHED BY: (Signature)	RECEIVED BY: (Signature)	DATE/TIME
RELINQUISHED BY: (Signature)	RECEIVED BY: (Signature)	DATE/TIME
RELINQUISHED BY: (Signature)	RECEIVED BY: (Signature)	DATE/TIME
DISPATCHED BY: (Signature) DATE/TIME	RECEIVED FOR LAB BY: (Signature) [illegible]	DATE/TIME 8/8/00 8:[illegible]

METHOD OF SHIPMENT HLA PERSONNEL

Laboratory Copy White | Project Office Copy Yellow | Field or Office Copy Pink

1004355

01

1004355

CT&E Environmental Services Inc.

SAMPLE RECEIPT FORM

CT&E WO#:

Yes	No	
✓		Are samples **RUSH**, priority, or *within 72 hrs* of **hold time**?
✓		If yes, have you done *e-mail notification*?
	✓	Are samples *within 24 hrs* of **hold time** or **due date**?
		If yes, have you *spoken with* Supervisor?
	✓	Are there any **problems** (e.g., ids, analyses)?
✓		Were samples preserved correctly and pH verified?
	✓	Has Project Manager been notified of problems?
	✓	Is this an ACOE/AFCEE/ADEC project?
		Will a **data package** be required?
		If this is for PWS, provide **PWSID**.
		Is there a **quote** for this project?
	✓	Will **courier** charges apply?

Due Date: 8/10/00
Received Date/Time: 8-8 – 8:20
Cooler Temperature: 3.9°C
Sample Condition: (Good) / Poor

Matrix of each Sample:

1	" "	1
	" "	
	" "	
	" "	
	Trip Blank	
	MS/MSD	

Additional Sample Remarks:

- AK101s/_____ 8260s field pres'd?
- Field-filtered for dissolved_____?
- Lab-filter for dissolved_____?
- Ref Lab required?

Completed by (sign): [signature] (print): Eva Thuemer

Notes:

*** The following *must* be completed for *all* ACOE & AFCEE projects: ***

Yes	No		Notes:
		Is cooler temperature 4 ± C?	
		thermometer used:	
		Was there an airbill, etc? note #:	
		Was cooler sealed with custody seals?	
		#/where?	
		Were seals intact upon arrival?	
		Was there a COC with cooler?	
		Was the COC filled out properly?	
		Did the COC indicate ACOE/AFCEE project?	
		Did the COC and samples correspond?	
		Were samples screened with Geiger counter?	
		Were all samples packed to prevent breakage?	
		packing material:	
		Were all samples unbroken and clearly labelled?	
		Were all samples sealed in separate plastic bags?	
		Were all bottles for volatiles free of headspace?	
		Were correct container/sample sizes submitted?	
		Was client notified of problems? (specify below)	

RUSH

# of each Container Received:

2	950 ml amber	unpres'd
2	950 ml amber	w/ HCl
	500 ml amber	w/ H2SO4
	1L cubies	unpres'd
	1L cubies	w/ HNO3
	1L cubies	w/ H2SO4
	1L cubies	w/ NaOH + ZnAc
	120 ml coli	bottles
	60 ml	Nalg
	8 oz amber	unpres'd
	4 oz amber	unpres'd
	4 oz w/ septa	w/ MeOH
	40 ml vials	w/ HCl
	Other (specify)	
	Other (specify)	

Individual contacted:
Date & Time: _____ Phone/Fax #: _____

#/Log In Proofed by: _____

Form Number: F004r2
Printed: 7/12/99

CT&E Environmental Services Inc.

CTE Environmental Services
Alaska Division
Laboratory Data Report

Project: Red Devil 51192.2 8/5/00

Client: Harding Lawson Associates

CTE Work Order: 3003749

Contents:

Case Narrative
Chain of Custody
Sample Receipt Form
Quality Control Summary Forms

Note:

Unless otherwise noted, all quality assurance/quality control criteria is in compliance with the proper regulatory authority and/or CTE's Quality Assurance Program Plan.

CT&E Environmental Services Inc.

200 W. Potter Drive
Anchorage, AK 99518-1605
Tel: (907) 562-2343
Fax: (907) 561-5301
Web: http://www.cteesi.com

Bryan Lund
Harding Lawson Associates

,

Work Order:	3003749
	Red Devil 51192.2 8/5/00
Client:	Harding Lawson Associates
Report Date:	August 10, 2000

Enclosed are the analytical results associated with the above workorder.

As required by the state of Alaska and the USEPA, a formal Quality Assurance/Quality Control Program is maintaned 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 analyte 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
!	Surrogate out of range

CT&E Environmental Services Inc.

CT&E Ref.#	3003749001	Client PO#	
Client Name	Harding Lawson Associates	Printed Date/Time	08/10/2000 15:33
Project Name/#	Red Devil 51192.2 8/5/00	Collected Date/Time	08/05/2000 12:10
Client Sample ID	OORDV11MI (1004355001)	Received Date/Time	08/09/2000 12:01
Matrix	Aqueous	Technical Director	Jason Asher
Ordered By		Released By	Jason A Asher

Sample Remarks:

Sample analyzed by CT&E ESI, Michigan Division.

Parameter	Results	PQL	Units	Method	Allowable Limits	Prep Date	Analysis Date	Init
HPLC SEMIVOLATILE ORGANIC ANALYSIS								
Acenaphthene	1.00 U	1.00	ug/L	EPA 610		08/09/00	08/09/00	JLS
Acenaphthylene	1.00 U	1.00	ug/L	EPA 610		08/09/00	08/09/00	JLS
Anthracene	0.200 U	0.200	ug/L	EPA 610		08/09/00	08/09/00	JLS
Benzo(a)anthracene	0.200 U	0.200	ug/L	EPA 610		08/09/00	08/09/00	JLS
Benzo[a]pyrene	0.200 U	0.200	ug/L	EPA 610		08/09/00	08/09/00	JLS
Benzo[b]fluoranthene	0.200 U	0.200	ug/L	EPA 610		08/09/00	08/09/00	JLS
Benzo[g,h,i]perylene	0.200 U	0.200	ug/L	EPA 610		08/09/00	08/09/00	JLS
Benzo[k]fluoranthene	0.200 U	0.200	ug/L	EPA 610		08/09/00	08/09/00	JLS
Chrysene	0.200 U	0.200	ug/L	EPA 610		08/09/00	08/09/00	JLS
Dibenzo[a,h]anthracene	0.200 U	0.200	ug/L	EPA 610		08/09/00	08/09/00	JLS
Fluoranthene	0.200 U	0.200	ug/L	EPA 610		08/09/00	08/09/00	JLS
Fluorene	0.200 U	0.200	ug/L	EPA 610		08/09/00	08/09/00	JLS
Indeno[1,2,3-c,d] pyrene	0.200 U	0.200	ug/L	EPA 610		08/09/00	08/09/00	JLS
Naphthalene	0.500 U	0.500	ug/L	EPA 610		08/09/00	08/09/00	JLS
Phenanthrene	0.200 U	0.200	ug/L	EPA 610		08/09/00	08/09/00	JLS
Pyrene	0.200 U	0.200	ug/L	EPA 610		08/09/00	08/09/00	JLS
Surrogates								
P-Terphenyl <Surr>	68.1		%	EPA 610		08/09/00	08/09/00	JLS

300374

CHAIN OF CUSTOI

CT&E Environmental Services Inc.

112352

COC Serial

ia

ıs Nationwide

• Maryland
• New Jersey

www.cteesi.com

CT&E Environmental Services Inc.
Laboratory Division

1

CLIENT: Harding & Lawson Assoc.

CONTACT: Bryan Lund PHONE NO: 9075622343

PROJECT: 51192.2 SITE: Red Devil

REPORTS TO: CTE Anc / Rhonda FAX NO: 9075615301

INVOICE TO: ↓

P.O. NUMBER:

CT&E Reference: CTE 11

PAGE 1 OF 1

2

LAB NO.	SAMPLE IDENTIFICATION	DATE	TIME	MATRIX	No. CONTAINERS	SAMPLE TYPE C=COMP G=GRAB	Preservatives Used	Analysis Required ③ 610 PAH	AMUP								REMARKS
001	1004355001	8/5/00	1210	H2O	1			✓									OORDV11MI

5

Collected/Relinquished By: (1)	Date	Time	Received By:
Rhonda Trucka	8/8/00	1010	Fedex
Relinquished By: (2)	Date	Time	Received By:
Fedex	8/9/00	1039	[illegible]
Relinquished By: (3)	Date	Time	Received By:
Relinquished By: (4)	Date	Time	Received For Laboratory By:

4

Shipping Carrier:

Shipping Ticket No:

Samples Received Cold? (Circle) YES NO

Temperature °C: 8°

Data Deliverables Required

Level I Level II Level III

Chain of Custody Seal: (Circle)

INTACT BROKEN ABSENT

Requested Turnaround Time and Special Instructions:

Rush by 8/10

#2

200 W. Potter Drive Anchorage, AK 99518 Tel: (907) 562-2343 Fax: (907) 561-5301
3180 Peger Road Fairbanks, AK 99701 Tel: (907) 474-8656 Fax: (907) 474-9685

White - Retained by Lab (Project File) Yellow - Returned with Report Pink - Retained by Sampler

0-720

CT&E Environmental Services Inc.

SAMPLE RECEIPT FORM

CT&E WO#: 300374

Yes	No	
✓		Are samples **RUSH**, priority, or *within 72 hrs* of **hold time**?
✓		If yes, have you done *e-mail notification*?
✓		Are samples *within 24 hrs* of **hold time** or **due date**?
✓		If yes, have you *spoken with* Supervisor?
	✓	Are there any **problems** (e.g., ids, analyses)?
N/A		Were samples preserved correctly and pH verified?
N/A		Has Project Manager been notified of problems?
		Is this an ACOE/AFCEE/ADEC project?
		Will a **data package** be required?
		If this is for PWS, provide **PWSID**.
		Is there a **quote** for this project?
✓		Will **courier** charges apply?

Due Date: 8/10/00
Received Date/Time: 8/9/00 1030
Cooler Temperature: 8°C
Sample Condition: Good / Poor

Matrix of each Sample:

1	" "	001
	" "	
	" "	
	" "	
	Trip Blank	
	MS/MSD	

Additional Sample Remarks:

_____ AK101s/_____ 8260s field pres'd?
_____ Field-filtered for dissolved_____?
_____ Lab-filter for dissolved_____?
_____ Ref Lab required?

Notes:

Completed by (sign): [signature] (print): S Feldman

*** The following *must* be completed for *all* ACOE & AFCEE projects: ***

Yes	No		Notes:
✓	✓	Is cooler temperature 4 ± C?	<6°
		thermometer used:	
✓		Was there an airbill, etc? note #:	
✓		Was cooler sealed with custody seals?	
		#/where?	2/front
✓		Were seals intact upon arrival?	
✓		Was there a COC with cooler?	
✓		Was the COC filled out properly?	
N/A		Did the COC indicate ACOE/AFCEE project?	
✓		Did the COC and samples correspond?	
N/A		Were samples screened with Geiger counter?	
✓		Were all samples packed to prevent breakage?	
		packing material:	Bubblewrap
✓		Were all samples unbroken and clearly labelled?	
	✓	Were all samples sealed in separate plastic bags?	
N/A		Were all bottles for volatiles free of headspace?	
✓		Were correct container/sample sizes submitted?	
N/A		Was client notified of problems? (specify below)	

Individual contacted: _____
Date & Time: _____ Phone/Fax #: _____

# of each Container Received:

1	950 ml amber	unpres'd
	950 ml amber	w/ HCl
	500 ml amber	w/ H2SO4
	1L cubies	unpres'd
	1L cubies	w/ HNO3
	1L cubies	w/ H2SO4
	1L cubies	w/ NaOH + ZnAc
	120 ml coli	bottles
	60 ml	Nalg
	8 oz amber	unpres'd
	4 oz amber	unpres'd
	4 oz w/ septa	w/ MeOH
	40 ml vials	w/ HCl
	Other (specify)	
	Other (specify)	

#/Log In Proofed by: [signature]

Form Number: F004r2
[redacted]: 7/12[redacted]

CT&E Environmental Services Inc.

Lab Control Spike / Lab Control Spike Duplicate Summary

HPLC SEMIVOLATILE ORGANIC ANALYSIS

Sample ID	65102	Lab Control Spike	**Reported**	08/10/2000	15:34
	65103	Lab Control Spike Dup	**Analysis**		
Prep Batch	XXX	2301	**Batch**	XLC	1031
Client	Harding Lawson Associates		**Method**	SW-846 8310	
Project	Red Devil 51192.2		**Instrument**	HPLC	
			Date	08/09/2000	
			By	JLS	

QC results affect the following production samples:

3003749001

Analyte	LCS,LCSD Spike Added ug/L	LCS Concentration ug/L	LCS Recovery %	LCSD Concentration ug/L	LCSD Recovery %	LCS/LCSD Limits	RPD	RPD Limits
Acenaphthene	5, 5	2.86	57	2.25	45		24	
Acenaphthylene	5, 5	3.88	78	3.04	61		24	
Anthracene	1, 1	0.751	75	0.823	82		9	
Benzo(a)anthracene	1, 1	0.972	97	1.03	103		6	
Benzo[a]pyrene	1, 1	1.02	102	1.08	108		6	
Benzo[b]fluoranthene	1, 1	1.11	111	1.14	114		3	
Benzo[g,h,i]perylene	1, 1	1.00	100	1.03	103		3	
Benzo[k]fluoranthene	1, 1	1.06	106	1.11	111		5	
Chrysene	1, 1	1.00	100	1.07	107		7	
Dibenzo[a,h]anthracene	1, 1	0.981	98	1.08	108		10	
Fluoranthene	1, 1	0.908	91	1.06	106		15	
Fluorene	1, 1	0.665	67	0.631	63		5	
Indeno[1,2,3-c,d] pyrene	1, 1	1.08	108	1.12	112		4	
Naphthalene	5, 5	2.23	45	1.70	34		27	
Phenanthrene	1, 1	0.847	85	0.876	88		3	
Pyrene	1, 1	0.877	88	0.932	93		6	

ENVIRONMENTAL HAZARD SERVICES
07-00-2351

ENVIRONMENTAL HAZARDS SERVICES, L.L.C.

7469 WHITE PINE ROAD - RICHMOND, VA 23237
804-275-4788 FAX 804-275-4907

METAL TCLP ANALYSIS SUMMARY

CLIENT: Harding Lawson Associates
601 East 57th Place
Anchorage, AK 99518

DATE OF RECEIPT: 22 JUL 2000
DATE OF ANALYSIS: 27 JUL 2000
DATE OF REPORT: 28 JUL 2000

CLIENT NUMBER: 2-2141 D
EHS PROJECT #: 07-00-2351
PROJECT: 47411.3; Red Devil

EHS SAMPLE #: 07-00-2351-01
CLIENT SAMPLE #: 00RDV01MI
LAB. GROSS DESCRIPTION: Building Materials

SAMPLE DATE:
TCLP INITIAL pH: 5.47
SAMPLE WEIGHT (g): 100

ANALYTE	RESULT (mg/L)	REPORT LIMIT (mg/L)	MDL (mg/L)	METHOD	REGULATORY LIMIT (mg/L)
ARSENIC (As)	3.3	0.20	0.038	SW 846 1311/3010A/6010B	5.00
SELENIUM (Se)	<0.35	0.35	0.067	SW 846 1311/3010A/6010B	1.00
CHROMIUM (Cr)	<0.080	0.08	0.008	SW 846 1311/3010A/6010B	5.00
CADMIUM (Cd)	0.28	0.10	0.016	SW 846 1311/3010A/6010B	1.00
LEAD (Pb)	0.83	0.40	0.073	SW 846 1311/3010A/6010B	5.00
SILVER (Ag)	<0.10	0.10	0.010	SW 846 1311/3010A/6010B	5.00
BARIUM (Ba)	<0.10	0.10	0.011	SW 846 1311/3010A/6010B	100
MERCURY (Hg)	0.31	0.001	0.0002	SW 846 1311/7470A	0.200

EHS SAMPLE #: 07-00-2351-02
CLIENT SAMPLE #: 00RDV02MI
LAB. GROSS DESCRIPTION: Building Materials

SAMPLE DATE:
TCLP INITIAL pH: 5.39
SAMPLE WEIGHT (g): 100

ANALYTE	RESULT (mg/L)	REPORT LIMIT (mg/L)	MDL (mg/L)	METHOD	REGULATORY LIMIT (mg/L)
ARSENIC (As)	0.42	0.20	0.038	SW 846 1311/3010A/6010B	5.00
SELENIUM (Se)	<0.35	0.35	0.067	SW 846 1311/3010A/6010B	1.00
CHROMIUM (Cr)	0.20	0.08	0.008	SW 846 1311/3010A/6010B	5.00
CADMIUM (Cd)	<0.10	0.10	0.016	SW 846 1311/3010A/6010B	1.00
LEAD (Pb)	<0.40	0.40	0.073	SW 846 1311/3010A/6010B	5.00
SILVER (Ag)	<0.10	0.10	0.010	SW 846 1311/3010A/6010B	5.00
BARIUM (Ba)	<0.10	0.10	0.011	SW 846 1311/3010A/6010B	100
MERCURY (Hg)	0.17	0.001	0.0002	SW 846 1311/7470A	0.200

ENVIRONMENTAL HAZARDS SERVICES, L.L.C.

CLIENT NUMBER: 2-2141 D
EHS PROJECT #: 07-00-2351
PROJECT: 47411.3; Red Devil

QUALITY CONTROL ANALYTE	SPIKE RECOVERY	DUPLICATE RELATIVE PERCENT DIFFERENCE (RPD)
ARSENIC (As)	90.0%	0.00%
SELENIUM (Se)	91.0%	0.00%
CHROMIUM (Cr)	87.0%	0.00%
CADMIUM (Cd)	89.0%	0.00%
LEAD (Pb)	84.5%	0.00%
SILVER (Ag)	119%	0.00%
BARIUM (Ba)	88.6%	0.00%
MERCURY (Hg)	100%	0.25%

ANALYST: David Xu

Reviewed By Authorized Signatory:

Howard Varner, Laboratory Director
Irma Faszewski, Quality Assurance Coordinator
David Xu, MS, Senior Chemist
Feng Jiang, MS, Senior Geologist

Method EPA SW846 1311 recommends 100g for analysis.

Results represent the analysis of samples submitted by the client. Sample location, description, area, volume etc., was provided by the client. This report shall not be reproduced, except in full, without the written consent of Environmental Hazards Services, L.L.C.
California Certification #2272

LEGEND	g = gram	ug = microgram	ppm = parts per million	MDL = method detection limit
	ml = milliliter	Pb = lead	mg/L = milligrams per liter	

tclp8mt1.1dot/10MAY1999/MR

Harding Lawson Associates
601 East 57th Place
Anchorage, AK 99518
907 / 563-8102
907 / 561-4574 FAX

EHS 07-00-2351

CHAIN OF CUSTODY FORM

Lab: EHS

2 TCLP RCRA 8

Samplers: CHARLIE MARSHALL

Project Number: 47411.3

Name/Location: RED DEVIL

Project Manager: BRYAN LUND

Recorder: BDL (Signature Required)

SOURCE CODE	MATRIX: Water	Sediment	Soil	Oil	#CONTAINERS & PRESERV.: Unpres.	H_2SO_4	HNO_3	SAMPLE NUMBER OR LAB NUMBER: Yr	Wk	Seq	DATE: Yr	Mo	Dy	Time	STATION DESCRIPTION/ NOTES	EPA 601/8010	EPA 602/8020	EPA 624/8240	EPA 625/8270	ICP METALS	EPA 8015M/TPH	TCLP RCRA 8
X					1						0	0	0 7	2 0 1 0 1 0	00 RDV 01 MI							
X					1						0	0	0 7	2 0 1 0 1 5	00 RDV 02 MI							X

LAB NUMBER: Yr	Wk	Seq	DEPTH IN FEET	COL MTD CD	QA CODE	MISCELLANEOUS
						72HRTAT PLS FAX RESULTS TO ABOVE #. BDL

CHAIN OF CUSTODY RECORD

RELINQUISHED BY: (Signature) BDL	RECEIVED BY: (Signature) Michelle Mason	DATE/TIME 7/22/00 9:45
RELINQUISHED BY: (Signature)	RECEIVED BY: (Signature)	DATE/TIME
RELINQUISHED BY: (Signature)	RECEIVED BY: (Signature)	DATE/TIME
RELINQUISHED BY: (Signature)	RECEIVED BY: (Signature)	DATE/TIME
DISPATCHED BY: (Signature) DATE/TIME	RECEIVED FOR LAB BY: (Signature)	DATE/TIME
METHOD OF SHIPMENT: FEDEX		

6533

Laboratory Copy White | Project Office Copy Yellow | Field or Office Copy Pink

ENVIRONMENTAL HAZARD SERVICES
07-00-3046

ENVIRONMENTAL HAZARDS SERVICES, L.L.C.

7469 WHITE PINE ROAD - RICHMOND, VA 23237
804-275-4788 FAX 804-275-4907

METAL TCLP ANALYSIS SUMMARY

CLIENT: Harding Lawson Associates
601 East 57th Place
Anchorage, AK 99518

DATE OF SAMPLING: 26 JUL 2000
DATE OF RECEIPT: 28 JUL 2000
DATE OF ANALYSIS: 28 JUL-01 AUG 2000
DATE OF REPORT: 01 AUG 2000

CLIENT NUMBER: 2-2141 D
EHS PROJECT #: 07-00-3046
PROJECT: 47411; Red Devil Mine

EHS SAMPLE #: 07-00-3046-01
CLIENT SAMPLE #: 00RDV05MI
LAB. GROSS DESCRIPTION: Brick

SAMPLE DATE: 26 JUL 2000
TCLP INITIAL pH: 4.35
SAMPLE WEIGHT (g): 100

ANALYTE	RESULT (mg/L)	REPORT LIMIT (mg/L)	MDL (mg/L)	METHOD	REGULATORY LIMIT (mg/L)
ARSENIC (As)	6.4	0.20	0.038	SW 846 1311/3010A/6010B	5.00
SELENIUM (Se)	<0.35	0.35	0.067	SW 846 1311/3010A/6010B	1.00
CHROMIUM (Cr)	<0.080	0.08	0.008	SW 846 1311/3010A/6010B	5.00
CADMIUM (Cd)	<0.10	0.10	0.016	SW 846 1311/3010A/6010B	1.00
LEAD (Pb)	<0.40	0.40	0.073	SW 846 1311/3010A/6010B	5.00
SILVER (Ag)	<0.10	0.10	0.010	SW 846 1311/3010A/6010B	5.00
BARIUM (Ba)	<0.10	0.10	0.011	SW 846 1311/3010A/6010B	100
MERCURY (Hg)	0.22	0.001	0.0002	SW 846 1311/7470A	0.200

QUALITY CONTROL ANALYTE	SPIKE RECOVERY	DUPLICATE RELATIVE PERCENT DIFFERENCE (RPD)
ARSENIC (As)	110%	0.464%
SELENIUM (Se)	95.5%	0.00%
CHROMIUM (Cr)	90.5%	0.00%
CADMIUM (Cd)	95.0%	0.00%
LEAD (Pb)	89.0%	0.00%
SILVER (Ag)	95.5%	0.00%
BARIUM (Ba)	94.5%	0.00%
MERCURY (Hg)	100%	6.25%

ANALYST: David Xu

Reviewed By Authorized Signatory:

Howard Varner, Laboratory Director
Irma Faszewski, Quality Assurance Coordinator
David Xu, MS, Senior Chemist
Feng Jiang, MS, Senior Geologist

ENVIRONMENTAL HAZARDS SERVICES, L.L.C.

CLIENT NUMBER: 2-2141 D
EHS PROJECT #: 07-00-3046
PROJECT: 47411; Red Devil Mine

Method EPA SW846 1311 recommends 100g for analysis.

Results represent the analysis of samples submitted by the client. Sample location, description, area, volume etc., was provided by the client. This report shall not be reproduced, except in full, without the written consent of Environmental Hazards Services, L.L.C.
California Certification #2272

LEGEND	g = gram	ug = microgram	ppm = parts per million	MDL = method detection limit
	ml = milliliter	Pb = lead	mg/L = milligrams per liter	

tclp8mt1.1dot/10MAY1999/mec

Harding Lawson Associates
601 East 57th Place
Anchorage, AK 99518
907 / 563-8102
907 / 561-4574 FAX

EHS 07-00-3046 CHAIN OF CUSTODY FORM

Lab: CT&E

Project Number: 47411 / TCLP RCRA 8

Samplers: C. Marshall

Name/Location: Red Devil Mine

Project Manager: Brian Linard

Recorder: (Signature Required)

SOURCE CODE	MATRIX: Other	Water	Sediment	Soil	Oil	#CONTAINERS & PRESERV.: Unpres.	H_2SO_4	HNO_3	SAMPLE NUMBER OR LAB NUMBER: Yr	Wk	Seq	DATE: Yr	Mo	Dy	Time	STATION DESCRIPTION/ NOTES	EPA 601/8010	EPA 602/8020	EPA 624/8240	EPA 625/8270	ICP METALS	EPA 8015M/TPH	TCLP & RCRA 8
00	X											00	07	26	0950	00 RAVDSMI							X

LAB NUMBER: Yr	Wk	Seq	DEPTH IN FEET	COL MTD CD	QA CODE	MISCELLANEOUS
						BD 27
						* Mercury, Arsenic, Antimony & Lead
						RAPID TAT 72 HR

CHAIN OF CUSTODY RECORD

RELINQUISHED BY: (Signature)	RECEIVED BY: (Signature)	DATE/TIME
7/26/00	7/26/00	1206
RELINQUISHED BY: (Signature)	RECEIVED BY: (Signature)	DATE/TIME
	7/28/00	1240
RELINQUISHED BY: (Signature)	RECEIVED BY: (Signature)	DATE/TIME
RELINQUISHED BY: (Signature)	RECEIVED BY: (Signature)	DATE/TIME
DISPATCHED BY: (Signature) DATE/TIME	RECEIVED FOR LAB BY: (Signature)	DATE/TIME
METHOD OF SHIPMENT: Hand Returned	DHL	

Laboratory Copy White | Project Office Copy Yellow | Field or Office Copy Pink

6533

ENVIRONMENTAL HAZARD SERVICES
08-00-0607

ENVIRONMENTAL HAZARDS SERVICES, L.L.C.

7469 WHITE PINE ROAD - RICHMOND, VA 23237
804-275-4788 FAX 804-275-4907

METAL TCLP ANALYSIS SUMMARY

CLIENT: Harding Lawson Associates
601 East 57th Place
Anchorage, AK 99518

DATE OF RECEIPT: 05 AUG 2000
DATE OF ANALYSIS: 08 AUG 2000
DATE OF REPORT: 09 AUG 2000

CLIENT NUMBER: 2-2141 D
EHS PROJECT #: 08-00-0607
PROJECT: 47411; Red Devil Mine

EHS SAMPLE #: 08-00-0607-01
CLIENT SAMPLE #: 00RDV06MI
LAB. GROSS DESCRIPTION: Wood

SAMPLE DATE:
TCLP INITIAL pH: 4.86
SAMPLE WEIGHT (g): 72

ANALYTE	RESULT (mg/L)	REPORT LIMIT (mg/L)	MDL (mg/L)	METHOD	REGULATORY LIMIT (mg/L)
ARSENIC (As)	1.2	0.20	0.038	SW 846 1311/3010A/6010B	5.00
MERCURY (Hg)	0.044	0.001	0.0002	SW 846 1311/7470A	0.200

EHS SAMPLE #: 08-00-0607-02
CLIENT SAMPLE #: 00RDV07MI
LAB. GROSS DESCRIPTION: Wood

SAMPLE DATE:
TCLP INITIAL pH: 5.10
SAMPLE WEIGHT (g): 100

ANALYTE	RESULT (mg/L)	REPORT LIMIT (mg/L)	MDL (mg/L)	METHOD	REGULATORY LIMIT (mg/L)
ARSENIC (As)	3.4	0.20	0.038	SW 846 1311/3010A/6010B	5.00
MERCURY (Hg)	0.059	0.001	0.0002	SW 846 1311/7470A	0.200

EHS SAMPLE #: 08-00-0607-03
CLIENT SAMPLE #: 00RDV08MI
LAB. GROSS DESCRIPTION: Bldg. Materials

SAMPLE DATE:
TCLP INITIAL pH: 4.53
SAMPLE WEIGHT (g): 100

ANALYTE	RESULT (mg/L)	REPORT LIMIT (mg/L)	MDL (mg/L)	METHOD	REGULATORY LIMIT (mg/L)
ARSENIC (As)	<0.20	0.20	0.038	SW 846 1311/3010A/6010B	5.00
MERCURY (Hg)	0.007	0.001	0.0002	SW 846 1311/7470A	0.200

QUALITY CONTROL ANALYTE	SPIKE RECOVERY	DUPLICATE RELATIVE PERCENT DIFFERENCE (RPD)
ARSENIC (As)	112%	0.00%
MERCURY (Hg)	100%	0.00%

ENVIRONMENTAL HAZARDS SERVICES, L.L.C.

CLIENT NUMBER: 2-2141 D
EHS PROJECT #: 08-00-0607
PROJECT: 47411; Red Devil Mine

ANALYST: David Xu

Reviewed By Authorized Signatory:

Howard Varner, Laboratory Director
Irma Faszewski, Quality Assurance Coordinator
David Xu, MS, Senior Chemist
Feng Jiang, MS, Senior Geologist

Method EPA SW846 1311 recommends 100g for analysis.

Results represent the analysis of samples submitted by the client. Sample location, description, area, volume etc., was provided by the client. This report shall not be reproduced, except in full, without the written consent of Environmental Hazards Services, L.L.C. California Certification #2319

LEGEND	g = gram	ug = microgram	ppm = parts per million	MDL = method detection limit
	ml = milliliter	Pb = lead	mg/L = milligrams per liter	

tclpmt2.dot/10MAY1999/mec

Harding Lawson Associates
601 East 57th Place
Anchorage, AK 99518
907 / 563-8102
907 / 561-4574 FAX

EHS 08-00-0607

CHAIN OF CUSTODY FORM

3as, hg TCLP

Lab: ~~CTE~~ EHS

Samplers: C Marshall

Project Number: 47411

Name/Location: RED DRILL MINE

Project Manager: Brian Lund

Recorder: Charles K. Mahle (Signature Required)

SOURCE CODE	MATRIX: Bldg Mat	Water	Sediment	Soil	Oil	#CONTAINERS & PRESERV.: Unpres.	H_2SO_4	HNO_3	SAMPLE NUMBER OR LAB NUMBER (Yr Wk Seq)	DATE (Yr Mo Dy)	Time	STATION DESCRIPTION/ NOTES	EPA 601/8010	EPA 602/8020	EPA 624/8240	EPA 625/8270	ICP METALS	EPA 8015M/TPH	TCLP As, Hg
00	X										1345	00RDV06MI							X
00	X										1350	00RDV07MI							X
00	X										1400	00RDV08MI							X

ANALYSIS REQUESTED

LAB NUMBER (Yr Wk Seq)	DEPTH IN FEET	COL MTD CD	QA CODE	MISCELLANEOUS
				72HR TAT
				PLS FAX 907561 4574

CHAIN OF CUSTODY RECORD

RELINQUISHED BY: (Signature)	RECEIVED BY: (Signature)	DATE/TIME
Charles K. Mahle	[signature]	8/1/00 9:00
[signature] 8/4/00 12:00		
RELINQUISHED BY: (Signature)	RECEIVED BY: (Signature)	DATE/TIME
RELINQUISHED BY: (Signature)	RECEIVED BY: (Signature)	DATE/TIME
RELINQUISHED BY: (Signature)	RECEIVED BY: (Signature)	DATE/TIME
DISPATCHED BY: (Signature) DATE/TIME	RECEIVED FOR LAB BY: (Signature) [signature]	DATE/TIME 8/5/00 9:45

METHOD OF SHIPMENT ~~Hand Delivered~~ OVERNIGHT

PROPERT

Laboratory Copy White · Project Office Copy Yellow · Field or Office Copy Pink

6533

WHITE ENVIRONMENTAL CONSULTANTS
00-469

WEC WHITE ENVIRONMENTAL CONSULTANTS INC.
731 I St. Suite 201 Anchorage, Ak 99501 (907) 258-8661

NVLAP
NVLAP ID# 200124-0

RECEIVE
JUL 2 6 20
HARDING LAWS
ASSOCIATES

Bulk Sample Analysis for Asbestos

Analysis by Polarized Light Microscope with Dispersion Staining
Analytical Method: EPA Method 600/R-93/116

WEC Project #: 00-469
Client Project#:

Report #: 3899
Rpt Date: 7/24/00

Client: HLA
601 E. 57th Pl.
Anchorage, AK 99518

Collected Date: 21-Jul-00
Collected by: CLIENT
TAT: 24 Hour
Samples: 2 **# Layers:** 2

Project Name/Location: Red Devil

Sample Lab#	Client ID#	Location	Layer
B00-2356	00RDV03Mi	Main retort unit.	1 of 1

Asbestos

Type	*%*
Chrysotile	14%
Amosite	9%

Friable/Non	Fiberous?	Homo-genous	Material	Color
Friable	Yes	Yes	TSI	Brown

% Asbestos: 23%

Other Fiberous Materials

Type	*%*
Cellulose	12%
Mineral Wool	18%

% Other Fiberous Materials: 30%

% Non Fiberous Materials: 47%

Sample Comments:

Sample Lab#	Client ID#	Location	Layer
B00-2357	00RDV04Mi	Main retort unit.	1 of 1

Asbestos

None Detected

Friable/Non	Fiberous?	Homo-genous	Material	Color
Non Friable	No	Yes	Fire Brick	Brown

Other Fiberous Materials

None Detected

% Non Fiberous Materials: 100%

Sample Comments:

Comments:

Analyst _____ **Date** 7/24/00
QC _____ **Date** 7/24/00

All quantities reported are based on visual estimation by PLM, unless point counted. Test report relates only to items tested and must not be used by client to claim product endorsement by NVLAP or any agency of the U.S. Government. Test reports must not be reproduced without the approval of WEC, and subject to WEC general terms and conditions (see reverse).

Harding Lawson Associates
601 East 57th Place
Anchorage, AK 99518
907 / 563-8102
907 / 561-4574 FAX

CHAIN OF CUSTODY FORM

Lab: ~~To HLA - Anch~~ WHITE ENVIRO

Samplers: C Marshall

Project Number: 47411

Name/Location: Red Devil

Project Manager: Brian Lund

Recorder: (Signature Required)

SOURCE CODE		MATRIX: Bldg. Material	Water	Sediment	Soil	Oil	#CONTAINERS & PRESERV.: Unpres.	H_2SO_4	HNO_3	None	SAMPLE NUMBER OR LAB NUMBER: Yr	Wk	Seq	DATE: Yr	Mo	Dy	Time	STATION DESCRIPTION/ NOTES	ANALYSIS REQUESTED: EPA 601/8010	EPA 602/8020	EPA 624/8240	EPA 625/8270	ICP METALS	EPA 8015M/TPH	PLM Refactory
0	0	X								X				0	0	0	7 2 1 1 1 2 0	00RAU03MI						X	
0	0	X								X				0	0	0	7 2 1 1 1 3 0	00RAU04MI						X	

24 HR TAT

LAB NUMBER: Yr	Wk	Seq	DEPTH IN FEET	COL MTD CD	QA CODE	MISCELLANEOUS
						PLEASE FAX RESULTS TO 561 4574 ATTN BRYAN Thanks

CHAIN OF CUSTODY RECORD

RELINQUISHED BY: (Signature)	RECEIVED BY: (Signature)	DATE/TIME
7/21/00		7/21/00
RELINQUISHED BY: (Signature) 7/22/00 12:00	RECEIVED BY: (Signature)	DATE/TIME
RELINQUISHED BY: (Signature)	RECEIVED BY: (Signature)	DATE/TIME
RELINQUISHED BY: (Signature)	RECEIVED BY: (Signature)	DATE/TIME
DISPATCHED BY: (Signature) DATE/TIME	RECEIVED FOR LAB BY: (Signature)	DATE/TIME

METHOD OF SHIPMENT: Sent w/ hilden / HLA TO LAB DROP BOX

Laboratory Copy White | Project Office Copy Yellow | Field or Office Copy Pink

6533

APPENDIX K

APPENDIX K

ALASKA ABATEMENT CORPORATION'S HAZARD ABATEMENT CLOSEOUT SUBMITTAL

RED DEVIL MINE

HAZARDOUS ABATEMENT

CLOSE OUT SUBMITTAL

TABLE OF CONTENTS

1. NOTIFICATIONS
2. DAILY REPORTS & SIGN IN SHEETS
3. AIR MONITORING RESULTS
4. DISPOSAL MANIFESTS

Alaska Abatement Corporation

520 W 58th Ave, Suite J
Anchorage, AK 99518

Tel: (907) 563-0088
Fax: (907) 563-0080

August 15, 2000

U.S. Environmental Protection Agency
Region X, OAQ-107
1200 Sixth Avenue
Seattle, WA 98101

AUG 1 5 2000

OFFICE OF AIR

Attn: Ann Wawruldewicz

Operator Project #254-00
Red Devil Mine, Red Devil, Alaska

The above referenced project is complete.

Respectfully,

Harvey Frankel
Operations Manager
Alaska Abatement Corporation

Alaska Abatement Corporation

520 W. 58th Ave, Suite J
Anchorage, AK 99518

Tel: (907) 563-0088
Fax: (907) 563-0080

August 15, 2000

SUBMITTED BY: Harvey Frankel
Alaska Abatement Corp.
520 West 58th Avenue, Suite J
Anchorage, AK. 99518

APPROVED ASBESTOS PLAN CHANGE
DATE 8/15/00
APPROVED BY:
STATE OF ALASKA • DOL/OSH
MAINTAIN AT WORKSITE

DEPARTMENT OF LABOR
DIV.OF LABOR & STANDARD SAFETY
POUCH 7-022
ANCHORAGE, AK 99510

RE: Date Change

This date change notification is to inform the Department of Labor that said project, Red Devil Mine, Red Devil, Alaska, is complete.

Respectfully,

Harvey Frankel
Operations Manager
Alaska Abatement Corporation

Alaska Abatement Corporation

520 W. 58th Ave, Suite J
Anchorage, AK 99518

Tel: (907) 563-0088
Fax: (907) 563-0080

July 31, 2000

SUBMITTED BY: Harvey Frankel
Alaska Abatement Corp.
520 West 58th Avenue, Suite J
Anchorage, AK. 99518

DEPARTMENT OF LABOR
DIV.OF LABOR & STANDARD SAFETY
POUCH 7-022
ANCHORAGE, AK 99510

RE: Date Change

This date change notification is to inform the Department of Labor that said project, Red Devil Mine, Red Devil, Alaska, will commence again on August 2, 2000 and will be complete on August 31, 2000. Due to the owner's schedule these dates may change again, if this occurs I will notify you.

Respectfully,

Harvey Frankel
Operations Manager
Alaska Abatement Corporation

APPROVED ASBESTOS PLAN CHANGE
DATE 7/31/00
APPROVED BY:
STATE OF ALASKA • DOL/OSH
MAINTAIN AT WORKSITE

Alaska Abatement Corporation

520 W. 58th Ave, Suite J
Anchorage, AK 99518

Tel: (907) 563-0088
Fax: (907) 563-0080

July 31, 2000

State Of Alaska
Department of Labor
3301 Eagle Street, Suite 303
Anchorage, Alaska 99510

Attn: Jo Hardy

Re: Additional workers for Red Devil Mine

Start Date: 08/02/00

Completion Date: 08/31/00

Please add the following to our list of approved workers:

Duane Hart	**5802**	**04/15/01**

Respectfully,

Harvey Frankel
Operations Manager
Alaska Abatement Corporation

APPROVED ASBESTOS PLAN CHANGE
DATE 7/31/00
APPROVED BY: [illegible]
STATE OF ALASKA - DOL/OSH
MAINTAIN AT WORKSITE

Alaska Abatement Corporation

520 W. 58th Ave, Suite J
Anchorage AK 99518

Tel: (907) 563-0088
Fax: (907) 563-0080

July 31, 2000

U.S. Environmental Protection Agency
Region X, OAQ-107
1200 Sixth Avenue
Seattle, WA 98101

JUL 3 1 2000

OFFICE OF AIR

Attn: Ann Wawrukiewicz

Operator Project #254-00
Red Devil Mine, Red Devil, Alaska

The above referenced project will commence again on August 2 2000 and will be complete on August 31, 2000. Due to the Owner's schedule this may change again and I will notify you if that happens.

Respectfully,

Harvey Frankel
Operations Manager
Alaska Abatement Corporation

Alaska Abatement Corporation

520 W. 58th Ave, Suite J
Anchorage, AK 99518

Tel: (907) 563-0088
Fax: (907) 563-0080

July 26, 2000

U.S. Environmental Protection Agency
Region X, OAQ-107
1200 Sixth Avenue
Seattle, WA 98101

JUL 26 2000
OFFICE OF AIR

Attn: Ann Wawrukiewicz

Operator Project #254-00
Red Devil Mine, Red devil, Alaska

The above referenced project is now on hold. Additional asbestos has been identified. I will notify you as soon as the Owner gives AAC direction on dealing with the additional quantities.

Respectfully,

Harvey Frankel
Operations Manager
Alaska Abatement Corporation

Alaska Abatement Corporation

520 W. 58th Ave, Suite J
Anchorage, AK 99518

Tel: (907) 563-0088
Fax: (907) 563-0080

July 26, 2000

SUBMITTED BY: Harvey Frankel
Alaska Abatement Corp.
520 West 58th Avenue, Suite J
Anchorage, AK. 99518

DEPARTMENT OF LABOR
DIV.OF LABOR & STANDARD SAFETY
POUCH 7-022
ANCHORAGE, AK 99510

RE: Date Change

This date change notification is to inform the Department of Labor that said project, Red Devil Mine, Red Devil, Alaska, is now on hold.

Respectfully,

Harvey Frankel
Operations Manager
Alaska Abatement Corporation

APPROVED ASBESTOS PLAN CHANGE
DATE 7/26/00
APPROVED BY:
STATE OF ALASKA • DOL/OSH
MAINTAIN AT WORKSITE

Alaska
Abatement
Corporation

520 W. 58th Ave, Suite J
Anchorage, AK 99518

Tel: (907) 563-0088
Fax: (907) 563-0080

July 14, 2000

State Of Alaska
Department of Labor
3301 Eagle Street, Suite 303
Anchorage, Alaska 99510

Alaska Abatement Corp., hereby gives notification and submits the names & certification numbers of the following personnel for the review and approval by the Department of Labor prior to the commencement of work for the project as stated below.

Name of Project: Red Devil Mine Clean-up

Location of Project: Red Devil, Alaska

Start Date: 07/20/00 Completion Date: 07/31/00

Fritz Corpuz	3649	03/17/01
Lance Willard	19990979	06/05/01
Matthew Melton	20000612	05/12/01
Richard Scheideman	3115	10/08/00

Thank you,

Respectfully,

INITIAL ASBESTOS PLAN APPROVAL
DATE 7/14/00
APPROVED BY:
STATE OF ALASKA • DOL/OSH
MAINTAIN AT WORKSITE

Harvey Frankel
Operations Manager
Alaska Abatement Corporation

Alaska
Abatement
Corporation

520 W. 58th Ave, Suite J
Anchorage, AK 99518

Tel: (907) 563-0088
Fax: (907) 563-0080

NOTIFICATION OF DEMOLITION AND RENOVATION

U.S. Environmental Protection Agency
Region X, OAQ-107
1200 Sixth Avenue
Seattle, WA 98101

JUL 3 1 2000

OFFICE OF AIR

Attn: Ann Wawrukiewicz

Operator Project #254-00

Postmark Date Received Modification

1. TYPE OF NOTIFICATION: REVISED

2. FACILITY INFORMATION:

OWNER NAME: Bureau of Land Management

ADDRESS: 222 West 7th Avenue

CITY: Anchorage STATE: AK. ZIP: 99513

CONTACT: Mike Alcorn TELEPHONE: (907) 267-1442

REMOVAL CONTRACTOR: Alaska Abatement Corporation

ADDRESS: 520 West 58th Avenue

CITY: Anchorage STATE: AK. ZIP: 99518

CONTACT: Harvey Frankel TELEPHONE: (907) 563-0088

OTHER OPERATOR: Wilder Construction Co.

ADDRESS: 11301 Lang Street

CITY: Anchorage STATE: AK ZIP: 99515

CONTACT: Mark Erickson TELEPHONE: (907) 344-2573

Alaska
Abatement
Corporation

520 W. 58th Ave, Suite J
Anchorage, AK 99518

Tel: (907) 563-0088
Fax: (907) 563-0080

NOTIFICATION OF DEMOLITION AND RENOVATION

U.S. Environmental Protection Agency
Region X, OAQ-107
1200 Sixth Avenue
Seattle, WA 98101

Attn: Ann Wawrukiewicz

JUL 11 2000
OFFICE OF AIR

Operator Project #254-00

Postmark Date Received Modification

1. TYPE OF NOTIFICATION: REVISED

2. FACILITY INFORMATION:

OWNER NAME: Bureau of Land Managrmrnt

ADDRESS: 222 West 7th Avenue

CITY: Anchorage STATE: AK. ZIP: 99513

CONTACT: Mike Alcorn TELEPHONE: (907) 267-1442

REMOVAL CONTRACTOR: Alaska Abatement Corporation

ADDRESS: 520 West 58th Avenue

CITY: Anchorage STATE: AK. ZIP: 99518

CONTACT: Harvey Frankel TELEPHONE: (907) 563-0088

OTHER OPERATOR: Wilder Construction Co.

ADDRESS: 11301 Lang Street

CITY: Anchorage STATE: AK ZIP: 99515

CONTACT: Mark Erickson TELEPHONE: (907) 344-2573

3. TYPE OF OPERATION: Renovation

Alaska
Abatement
Corporation

520 W. 58th Ave, Suite J
Anchorage, AK 99518

Tel: (907) 563-0088
Fax: (907) 563-0080

NOTIFICATION OF DEMOLITION AND RENOVATION

U.S. Environmental Protection Agency
Region X, OAQ-107
1200 Sixth Avenue
Seattle, WA 98101

Attn: Ann Wawrukiewicz

Operator Project #254-00

Postmark Date Received Modification

1. TYPE OF NOTIFICATION: REVISED

2. FACILITY INFORMATION:

OWNER NAME: Bureau of Land Managrmrnt

ADDRESS: 222 West 7th Avenue

CITY: Anchorage STATE: AK. ZIP: 99513

CONTACT: Mike Alcorn TELEPHONE: (907) 267-1442

REMOVAL CONTRACTOR: Alaska Abatement Corporation

ADDRESS: 520 West 58th Avenue

CITY: Anchorage STATE: AK. ZIP: 99518

CONTACT: Harvey Frankel TELEPHONE: (907) 563-0088

OTHER OPERATOR: Wilder Construction Co.

ADDRESS: 11301 Lang Street

CITY: Anchorage STATE: AK ZIP: 99515

CONTACT: Mark Erickson TELEPHONE: (907) 344-2573

3. TYPE OF OPERATION: Renovation

4. IS ASBESTOS PRESENT? Yes

5. FACILITY DESCRIPTION

BLDG. NAME: Retort Building

ADDRESS: Approximately 2 miles East of Red Devil, Alaska

CITY: Red Devil STATE: Alaska

SITE LOCATION: Same

BLDG. SIZE: 5,000 SF # OF FLOORS: 1 AGE IN YEARS: 43

PRESENT USE: Abandoned PRIOR USE: N/A

6. PROCEDURE, INCLUDING ANALYTICAL METHOD, IF APPROPRIATE, USED TO DETECT THE PRESENCE OF ASBESTOS MATERIAL: The owner is responsible for the location and identification of all ACM.

7. APPROXIMATE AMOUNT OF ASBESTOS, INCLUDING:

PIPES: APPRX. LN.FT. 254

SURFACE AREA: APPRX.SQ. FT. 40

8. SCHEDULED DATES OF ASBESTOS REMOVAL:

START: 07/20/00 COMPLETE: 07/31/00

9. SCHEDULED DATES OF DEMOLITION: N/A

10. DESCRIPTION OF PLANNED DEMOLITION OR RENOVATION WORK AND METHODS TO BE USED: The Owner has scheduled this facility for demolition. The demolition will be performed by Wilder Construction Co..

11. **DESCRIPTION OF WORK PRACTICE AND ENGINEERING CONTROLS TO BE USED TO PREVENT EMISSIONS OF THE ASBESTOS AT THE DEMOLITION AND RENOVATION SITE: Using wet methods in conjunction with highly trained state certified asbestos abaters remove and dispose of approx. 35 square feet of cement asbestos board, 5 square feet of asbestos containing debris, 4 linear feet of asbestos containing TSI and 250 linear feet of asbestos containing rope packing insulation/flange gaskets. On site "Competent Person" at all times during abatement and disposal. On site air monitoring will be employed.**

12. **WASTE TRANSPORTER: To be detemined**

    ADDRESS:

    CITY: STATE: ZIP:

    CONTACT: TELEPHONE: (907)

13. **WASTE DISPOSAL SITE:**

    NAME:

    LOCATION:

    CITY: STATE: ZIP:

    CONTACT: TELEPHONE:

14. **FOR EMERGENCY RENOVATIONS:**

    DATE AND HOUR OF EMERGENCY:

    DESCRIPTION OF THE SUDDEN, UNEXPECTED EVENT:

    EXPLANATION OF HOW THE EVENT CAUSED UNSAFE CONDITIONS OR WOULD CAUSE EQUIPMENT DAMAGE OR AN UNREASONABLE FINANCIAL BURDEN:

15. **DESCRIPTION OF PROCEDURES TO BE FOLLOWED IN THE EVENT THAT UNEXPECTED ASBESTOS IS FOUND OR PREVIOUSLY NONFRIABLE MATERIAL BECOMES CRUMBLED, PULVERIZED, OR REDUCED TO POWDER: Isolate the area and control the release. Inform the owner. Decontaminate the area using wet methods and/or HEPA vacuums. Personnel to**

wear PPE.

16. I CERTIFY THAT AN INDIVIDUAL TRAINED IN THE PROVISIONS OF THIS REGULATION(40 CFR PART 61, SUBPART M)WILL BE ON-SITE DURING THE DEMOLITION OR RENOVATION AND EVIDENCE THAT THE REQUIRED TRAINING HAS BEEN ACCOMPLISHED BY THIS PERSON WILL BE AVAILABLE FOR INSPECTION DURING NORMAL BUSINESS HOURS. (REQUIRED 1 YEAR AFTER PROMULGATION)

07/11/00

Signature of Operator Date

17. I CERTIFY THAT THE ABOVE INFORMATION IS CORRECT.

07/11/00

Signature of Operator Date

FAX

FACSIMILE TRANSMISSION

To: ANN WAWRUKIEWICZ - REGION 10

Fax Number: 206 553 0110 #44

From: BRYAN LUND

Date: 6/30/00

Subject: ORIGINAL NOTICE

Project Number: 47411

Number of pages (including this cover sheet): 4

Remarks:

ANN - ORIG NOTICE FOR BLM RED DEVIL.

By

cc: MIKE ALCORN - BLM

Transmitted by: BDL

This facsimile message contains confidential information intended only for the use of the person to whom it is addressed. Anyone reading this message other than the intended recipient or the employee responsible for delivering this facsimile to the intended recipient is strictly prohibited under applicable law from distributing or copying this information. Please notify us immediately by telephoning us collect at (907) 563-8102 if you have received this facsimile due to a transmission error. Thank you.

Harding Lawson Associates
Engineering and Environmental Services
601 East 57th Place
Anchorage, Alaska 99518 - (907) 563-8102

FAX (907) 561-4574

563 0030

EPA NOTIFICATION OF DEMOLITION AND RENOVATION

Operator Project #	Postmark	Date Received	Notification #

I. TYPE OF NOTIFICATION: ORIGINAL

II: FACILITY INFORMATION:

OWNER NAME:	BUREAU OF LAND MANAGEMENT				
Address:	222 WEST SEVENTH AVENUE				
City:	ANCHORAGE	**State:**	AK	**Zip:**	99513
Contact:	Mike Alcorn			**Tel:**	907-267-1442

REMOVAL CONTRACTOR #1:	TO BE DETERMINED				
Address:					
City:		**State:**		**Zip:**	
Contact:				**Tel:**	

REMOVAL CONTRACTOR #2:					
Address:					
City:		**State:**		**Zip:**	
Contact:				**Tel:**	

OTHER OPERATOR:					
Address:					
City:		**State:**		**Zip:**	
Contact:				**Tel:**	

III. TYPE OF OPERATION: DEMOLITION

IV. IS ASBESTOS PRESENT? YES - SURVEY CONDUCTED JUNE 12, 2000

V. FACILITY DESCRIPTION (Include building name, number and floor or room number.)

Bldg Name:	RETORT BUILDING				
Address:	APPROXIMATELY 2 MILES EAST OF RED DEVIL, AK				
City:	RED DEVIL	**State:**	AK	**County:**	NA
Site Location:	ABANDONED MINE SITE				
Building Size:	APPROX 5,000 SF	**# of Floors:**	1	**Age in Years:**	43
Present Use:	ABANDONED SITE	**Prior Use:**	NA		

VI. PROCEDURE, INCLUDING ANALYTICAL METHOD, IF APPROPRIATE, USED TO DETECT THE PRESENCE OF ASBESTOS MATERIAL.

LABORATORY BULK ANALYSIS USING PLM METHODS

JUL.11.2000 2:53PM HLA ANCHORAGE NO.191 P.1/4

EPA NOTIFICATION OF DEMOLITION AND RENOVATION

VII. APPROXIMATE AMOUNT OF ASBESTOS, INCLUDING: 1. Regulated ACM To Be Removed 2. Category I ACM Not Removed 3. Category II ACM Not Removed	RACM To Be Removed	Nonfriable Asbestos Material Not To Be Removed		Indicate Unit of Measurement Below
		Cat I	Cat II	Unit
Pipe lagging	4	0	0	LF
Rope Packing Insulation/Flange Gaskets	250	0	0	LF
CAB Flue	35	0	0	SF
RACM-contaminated debris on ground	5	0	0	CY
surface below pipe run				
All ACM to be removed before demo				

VIII. SCHEDULED DATES ASBESTOS REMOVAL (mm/dd/yy) :

Start: 7/17/2000 Complete: 7/18/2000

IX. SCHEDULED DATES DEMO/RENOVATION (mm/dd/yy):

Start: 7/19/2000 Complete: 8/1/2000

X. DESCRIPTION OF PLANNED DEMOLITION OR RENOVATION WORK AND METHOD(S) TO BE USED:

AFTER REMOVAL OF ALL ACM, STRUCTURE WILL BE DEMOLISHED USING EXCAVATOR. WATER WILL BE USED FOR DUST SUPPRESSION IF NECESSARY DURING DEMOLITION ACTIVITIES.

XI. DESCRIPTION OF WORK PRACTICES AND ENGINEERING CONTROLS TO BE USED TO PREVENT EMISSIONS OF ASBESTOS AT THE DEMOLITION AND RENOVATION SITE:

WET METHODS, CRITICAL BARRIERS AND HEPA VACUUMING

XII. WASTE TRANSPORTER #1 TO BE DETERMINED

Name:

Address:

City: State: Zip:

Contact Person: Telephone:

WASTE TRANSPORTER #2

Name:

Address:

City: State: Zip

Contact Person:

XIII. WASTE DISPOSAL SITE

Name: TO BE DETERMINED

Location:

City: State: Zip:

Telephone:

JUL.11.2000 2:53PM HLA ANCHORAGE NO.191 P.2/4

EPA NOTIFICATION OF DEMOLITION AND RENOVATION

XIV: IF DEMOLITION ORDERED BY A GOVERNMENT AGENCY, PLEASE IDENTIFY THE AGENCY BELOW:	
Name:	Title:
Authority:	
Date of Order (mm/dd/yy):	Date Ordered To Begin (mm/dd/yy):

XV: FOR EMERGENCY RENOVATIONS	N/A
Date and Hour of Emergency (mm/dd/yy):	
Description of the Sudden, Unexpected Event:	
Explanation of how the event caused unsafe conditions or would cause equipment damage or an unreasonable financial burden:	

XVI. DESCRIPTION OF PROCEDURES TO BE FOLLOWED IN THE EVENT THAT UNEXPECTED ASBESTOS IS FOUND OR PREVIOUSLY NON FRIABLE ASBESTOS MATERIAL BECOMES CRUMBLED, PULVERIZED, OR REDUCED TO POWDER.

Isolate the area and control the release. Inform the owner. Decontaminate the area using wet methods and/or HEPA vacuums. Personnel to wear PPE.

XVII. I CERTIFY THAT AN INDIVIDUAL TRAINED IN THE PROVISIONS OF THIS REGULATION (40 CFR PART 61, SUBPART M) WILL BE ON-SITE DURING THE DEMOLITION OR RENOVATION AND EVIDENCE THAT THE REQUIRED TRAINING HAS BEEN ACCOMPLISHED BY THIS PERSON WILL BE AVAILABLE FOR INSPECTION DURING NORMAL BUSINESS HOURS. (Required 1 year after promulgation)

(Signature of Owner/Operator) 6/30/00 (Date)

XVII. I CERTIFY THAT THE ABOVE INFORMATION IS CORRECT.

(Signature of Owner/Operator) 6/30/00 (Date)

JUL.11.2000 2:54PM HLA ANCHORAGE NO.191 P.3/4

ALASKA ABATEMENT CORPORATION

DAILY PROJECT COVER SHEET

Date: 7-20-00 Competent Person: Rich Schneider

Project No.: 254 Project Name: Red Devil mine

Work Area: Airport Reddevic Shift Hours: 7Am - 530

Description of work performed: Anch to Reddevic - move site

Air Technician: NA Company:

ACM waste stored on site? NA Location:

# of loads removed from site? NA Type of ACM:

Disposal Manifest filled out by: —

Transporter: —

THE FOLLOWING *MUST* BE ATTACHED TO THIS FORM IF APPLICABLE

1) Sign-In Sheets ☐
2) Daily Project Log ☐
3) Safety Meeting Sheets ☐
4) Accident Reports ☐
Containment Entry Log ☐
6) Daily T & M ☐
7) Weekly T & M ☐
8) Disposal Manifests ☐
9) Air Field Data Sheets & Results ☐
10) _____ ☐
Other

ALASKA ABATEMENT CORPORATION

PROJECT DAILY SIGN-IN LOG

PROJECT NAME: Red Devil mine	AAC PROJECT #: 254
SUPERINTENDANT: Rich Schneider	DATE: 7-20-00

NAME (PRINT)	CERT #	RESP TYPE	TASK	TIME IN	TIME OUT	SIGNATURE
Rich Schneider SSN: 574 96 3231	3115	N/A	Supervison	630am		
Fritz Corpuz SSN: 574-20-8425	3649	11	LABORER	7:00		
LANCE T. WALLARD SSN: 574 21 6036	0979	N 7700	LABORER	7AM		Lance Willard
Matt McIlroy SSN: 574-34-7467	00612	N 7700	Laborer	7AM		
SSN:						
SSN:						
SSN:						
SSN:						
SSN:						
SSN:						
SSN:						
SSN:						

Alaska Abatement Corporation

PROJECT NAME	AAC PROJECT NO.
SUPERVISOR	

CONTAINMENT ENTRY LOG

NAME (please print)	IN	OUT	IN	OUT

ALASKA ABATEMENT CORPORATION

DAILY PROJECT LOG

Date: 7-20-00 Project Number: 254

Project Name: Red devic mine

Visitors: —

Air Monitoring Performed By: —

Air Monitoring Comments: —

PPE General: hard hats boots gloves & SAFETY glasses

Project Changes, Directives & Instructions: none

Daily Exposure Assessment *(Based on previous days air monitoring)* NA

This form can be used as a legal document.

Date: 7-20-00 Project #: 254

First Daily Work Area Inspection: 7am at airport get tickets for crew

Second Daily Work Area Inspection: on site 1230pm checkout Entire work scope - walk thru area

Progress Hindrances & Delays: none

Date: 7-20-00 Project # 254

Work Activities Performed this Date: 7am Airport Anch to Aniak Aniak to Red dog arrive 1150am go to lodge get Rooms go to site with trevor walk thru job return to lodge get crew return to site Build Dry tent check all gear ect... until 5:30 pm Return to lodge do daily log & time cards

Date: 7-20-00 Project #: 254

Field Personnel	PPE Used	S/T	O/T
Rich Schudin	hard hats boots & gloves	8	3
FRITZ Corpuz	& SAFETY glasses	8	
Lance Williams		8	
Matt Melton		8	

Supervisor/Competent Person's Signature

7-20-00
Date

This form can be used as a legal document.

ALASKA ABATEMENT CORPORATION

DAILY PROJECT COVER SHEET

Date: 7-21-00 Competent Person: Rich Schriedman

Project No.: 254 Project Name: Red Devil mine

Work Area: Mine Shift Hours: 7-530

Description of work performed: ABATE TSI

Air Technician: Rich Schriedman Company: WCC

ACM waste stored on site? yes Location: next to mine covered demarcated

# of loads removed from site? None Type of ACM:

Disposal Manifest filled out by:

Transporter:

THE FOLLOWING *MUST* BE ATTACHED TO THIS FORM IF APPLICABLE

1) Sign-In Sheets ☐
2) Daily Project Log ☐
3) Safety Meeting Sheets ☐
4) Accident Reports ☐
Containment Entry Log ☐
6) Daily T & M ☐
7) Weekly T & M ☐
8) Disposal Manifests ☐
9) Air Field Data Sheets & Results ☐
10) _____ ☐
Other

ALASKA ABATEMENT CORPORATION

PROJECT DAILY SIGN-IN LOG

PROJECT NAME: Red Devil mine	AAC PROJECT #: 245
SUPERINTENDANT: Rich Schneider	DATE: 7-21-00

NAME (PRINT)	CERT #	RESP TYPE	TASK	TIME IN	TIME OUT	SIGNATURE
Rich Schneider SSN: 524963231	3115	N 7700	Supervisor	7am	630	[illegible]
Matt Melton SSN: 574-34-7967	06612	N 7700	Laborer	7am	530	[illegible]
Fritz Carpez SSN: 574-20-9428	3649	K2	11	7	530	[illegible]
LANCE A. WILLARD SSN: 534 26 6036	1999 0979	N 7700	LABORER	7AM	530	Lance Willard
SSN:						
SSN:						
SSN:						
SSN:						
SSN:						
SSN:						
SSN:						
SSN:						

ALASKA ABATEMENT CORPORATION

DAILY PROJECT LOG

Date: 7-21-00 Project Number: 254

Project Name: Red devil mine

Visitors: —

Air Monitoring Performed By: Rich Schuchmen

Air Monitoring Comments: TSI - 30' in air very bad condition wrap gone hanging by wire barley - but is wet due to weather spray down all acm Glove bag where possible hepavacuum wet methods used AREA is mostly a clean up site

PPE General: N7700-30 NPR gloves boots glasses & hard hats

Project Changes, Directives & Instructions: asked to sample Retort brick and insulation

Daily Exposure Assessment *(Based on previous days air monitoring)* 1st day

Date: 7-21-00 Project #: 254

First Daily Work Area Inspection: 8AM onsite make sure all equipt & supplies are working and ready
ensure proper decon setup and demarcate entire area prior to any removal

Second Daily Work Area Inspection: Thru-out day various inspections made manlift box - laundy bags/safety harnesses, wet bags ect.... end of shift make sure proper breakdown takes place

Some ACM is contaminated with mercury
Ask for 3 metal drums to be shipped with liners

Progress Hindrances & Delays: none today

Date: 7-21-00 Project # 254

Work Activities Performed this Date: 7AM lg Haz com safty meeting held Go over work plan site conditions discuss hazards ect... go to site by Boat & 4 wheeler - demarcate work area signs and ribbon Build decon build manlift box with wilder Crew donning P.P.E which included N7700-30 Tyvek gloves boots safety glasses & hard hats hung glove bags on pipe seal with duct tape using hudson sprayers with amended H_2O wet asm add euroclean vac remove asm wet scrub encap seal bag remove double bag seal continue thru out day until 5:15 pm general site breakdown until 530 - decon, cover demarcate bags, house keeping ect...

Return to lodge do daily log timecards & Air sample report sheets

Date: 7-21-00 Project #: 254

Field Personnel	PPE Used	S/T	O/T
Rich Schulman	N700 NPR Tyvek gloves	8	3
ERITZ Corpuz	boots glasses SAFETY	8	2
Lance Villaro	belts & hard hats	8	2
MATT Melton		8	2

Supervisor/Competent Person's Signature

7-21-00
Date

This form can be used as a legal document.

ALASKA ABATEMENT CORPORATION

DAILY PROJECT COVER SHEET

Date: 7-22-00 Competent Person: Rich Scheideman

Project No.: 254 Project Name: Red devil mine

Work Area: Retort Shift Hours: 7-530

Description of work performed: Remove TS1 clean beams

Air Technician: Rich Scheideman Company: AAC

ACM waste stored on site? yes Location: ABESTOS HOLD Cell

# of loads removed from site? none Type of ACM: —

Disposal Manifest filled out by: —

Transporter: —

THE FOLLOWING *MUST* BE ATTACHED TO THIS FORM IF APPLICABLE

1) Sign-In Sheets ☐
2) Daily Project Log ☐
3) Safety Meeting Sheets ☐
4) Accident Reports ☐
Containment Entry Log ☐
6) Daily T & M ☐
7) Weekly T & M ☐
8) Disposal Manifests ☐
9) Air Field Data Sheets & Results ☐
10) _____ ☐
Other

ALASKA ABATEMENT CORPORATION

PROJECT DAILY SIGN-IN LOG

PROJECT NAME: Reed devic	AAC PROJECT #: 245
SUPERINTENDANT: Rich Scheuchman	DATE: 7-22-00

NAME (PRINT)	CERT #	RESP TYPE	TASK	TIME IN	TIME OUT	SIGNATURE
Rich Scheuchman SSN: 574963231	315	N 7100	Supervisor	700	630	
Matt Melton SSN: 574347967	06612	N 7200	Laborer	7 AM	530	
LANCE T. WILLARD SSN: 574-26-6036	1999 6979	N 7100	LABORER	7AM	530	Lance Willard
FRITZ CORDUZ SSN: 574-20-8428	3649	1/2	"	7AM	530	
SSN:						
SSN:						
SSN:						
SSN:						
SSN:						
SSN:						
SSN:						
SSN:						

ALASKA ABATEMENT CORPORATION

DAILY PROJECT LOG

Date: 7-22 Project Number: 254

Project Name: Red Devil mine

Visitors: NA

Air Monitoring Performed By: Rich Schriedemann AAC supervisor

Air Monitoring Comments: Glove bag - 2 man wet method
hepa vacuums used - clean Red Iron

PPE General: N7700-30 NPR Tyvek gloves boots SAFETY glasses & hard hats

Project Changes, Directives & Instructions: —

Daily Exposure Assessment *(Based on previous days air monitoring)*

Date: 7-22-00 Project #: 254

First Daily Work Area Inspection: 7am on site review work scope with wilder super - KC safety meeting held

Second Daily Work Area Inspection: Thru out day analize structure stability, access points, proper acm removal techniques ect.. - 5:15 ensure proper break down all acm sealed covered and demarcated

Progress Hindrances & Delays: slow going at the heights we are working at

AMB yoyo

Date: 7-22-00 Project # 254

Work Activities Performed this Date: 7AM SAFETY MEETING held - crew donning N7700-30 Tyvek gloves boots glasses & hard hats ATTACH Glovebags to Horz pipe 26' in air add hepa vac smoke test for leaks remove wet, scrub, encap, seal bag remove & double bag, seal repeate process until complete All bags are place on poly in a demarcated Zone Rest of day class 4 clean up ACM on Beams soaking wet use hepa vacuums shovels assort. hand tools to gather & Bag encapsulate Beams 5:15 Decon out general site break down until 5:30 BOAT to Lodge do daily log & time cards sample report sheets until 630pm

Date: 7-22-00 Project #: 254

Field Personnel	PPE Used	S/T	O/T
Rich Schuchemann	N7700 Tyvek gloves boot	8	3 1
FRITZ Corpuz	glasses & hard hats		10
Lance Williams			10
Matt Melton			10

Supervisor/Competent Person's Signature

7-22-00
Date

This form can be used as a legal document.

ALASKA ABATEMENT CORPORATION

DAILY PROJECT COVER SHEET

Date: 7-23-00 Competent Person: Rich Scheidemann

Project No.: 254 Project Name: Red Devil mine

Work Area: Retort pipes Shift Hours: 7am – 530 pm

Description of work performed: remove rope gaskets, flange gaskets

Air Technician: Rich Scheidemann Company: AAC

ACM waste stored on site? yes Location: ACM hold cell

# of loads removed from site? none Type of ACM:

Disposal Manifest filled out by: —

Transporter: —

THE FOLLOWING *MUST* BE ATTACHED TO THIS FORM IF APPLICABLE

1)	Sign-In Sheets	☐	6)	Daily T & M	☐
2)	Daily Project Log	☐	7)	Weekly T & M	☐
3)	Safety Meeting Sheets	☐	8)	Disposal Manifests	☐
4)	Accident Reports	☐	9)	Air Field Data Sheets & Results	☐
	Containment Entry Log	☐	10)	_____ Other	☐

ALASKA ABATEMENT CORPORATION

PROJECT DAILY SIGN-IN LOG

PROJECT NAME:	AAC PROJECT #:
Red Devil Mine	254
SUPERINTENDANT: Rich Schindman	DATE: 7-23-00

NAME (PRINT)	CERT #	RESP TYPE	TASK	TIME IN	TIME OUT	SIGNATURE
Rich Schindman SSN: 574 96-3231	3115	N 7100	Supervisor	7Am	630	[illegible]
Matt Melton SSN: 574-34-796T	00612	N 7200	Laborer	7 Am	530	[illegible]
Fritz Corgiez SSN: 574-20-8428	3649	11	11	7am	530	[illegible]
Lance T Willard SSN: 574 26 6036	0979	N 7100	LABORER	7AM	530	Lance Willard
SSN:						
SSN:						
SSN:						
SSN:						
SSN:						
SSN:						
SSN:						
SSN:						

Alaska Abatement Corporation

PROJECT NAME	AAC PROJECT NO.
SUPERVISOR	

CONTAINMENT ENTRY LOG

NAME (please print)	IN	OUT	IN	OUT

ALASKA ABATEMENT CORPORATION

DAILY PROJECT LOG

Date: 7-23-00 Project Number: 254

Project Name: Red Devil mine

Visitors: — NA —

Air Monitoring Performed By: Rick Scheidemann AAC

Air Monitoring Comments: Demo retort pipes - rope gaskets & flange gaskets — cut metal only

PPE General: N700-30 NPR Tyvek gloves boots glasses & hard hats

Project Changes, Directives & Instructions: NA

Daily Exposure Assessment *(Based on previous days air monitoring)*

Date: 7-23-00 Project #: 254

First Daily Work Area Inspection: 7am SAFETY meeting discuss general site SAFETY √ all work areas Acin bags decon & demarcation

Second Daily Work Area Inspection: Thruout day meetings held with HLA & Wilder About demolition & decontamination unstable structures

prior to leaving site review all areas check all bags demarcation & decon seal up Dry AREA

Progress Hindrances & Delays: Slow process demoing Redort pipes

Date: 7-23-00 Project # 254

Work Activities Performed this Date: 7am on site crew donning N7700-30 NPR Tyvek gloves boots glasses & hard hats set up for Retort pipe removal lay poly on ground welder cuts Iron Bracing - SAC & welders Excavator remove Retort pipes intact lower to ground Rope gaskets are wet Remove Rope gaskets thru out day long process lots of steel cuting Chop saw & torches used All Rope gasket/and some cast Iron is bagged wet and sealed - super sacks used - generator labels added Along with Acm stickers 5:15 pm Decon out general site break down until 5:30 walk to Boat launch Boat To lodge do daily log time cards & Sample report sheets until 6:30pm

Date: 7-23-00 Project #: 254

Field Personnel	PPE Used	S/T	O/T
Rick Schullman	N1700-30NPR, Tyvek,	8	3
FRITZ Corpuz	gloves boots glasses		10
Lance Willard	& hard hats All personell		10
Matt Melton	don appropiate PPE		10
	AT ALL Times		
	7-23-00		

Supervisor/Competent Person's Signature

7-23-00
Date

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ALASKA ABATEMENT CORPORATION

DAILY PROJECT COVER SHEET

Date: 7-24-00 Competent Person: Rick Schreckman

Project No.: 254 Project Name: Red devil mine

Work Area: Retort Bldg. Shift Hours: 7Am - 530pm

Description of work performed: cut flange gaskets & clean merc troft

Air Technician: Rick Schreckman Company: AAC

ACM waste stored on site? yes Location: ACM Holding Cell

# of loads removed from site? None Type of ACM:

Disposal Manifest filled out by: —

Transporter: —

THE FOLLOWING *MUST* BE ATTACHED TO THIS FORM IF APPLICABLE

1)	Sign-In Sheets	☐	6)	Daily T & M	☐
2)	Daily Project Log	☐	7)	Weekly T & M	☐
3)	Safety Meeting Sheets	☐	8)	Disposal Manifests	☐
4)	Accident Reports	☐	9)	Air Field Data Sheets & Results	☐
	Containment Entry Log	☐	10)	_____ Other	☐

ALASKA ABATEMENT CORPORATION

PROJECT DAILY SIGN-IN LOG

PROJECT NAME:	AAC PROJECT #:
Red Devil mine	254
SUPERINTENDANT: Rich Scheideman	DATE: 7-24-00

NAME (PRINT)	CERT #	RESP TYPE	TASK	TIME IN	TIME OUT	SIGNATURE
Rich Scheideman SSN: 574-96-3231	3115	N 7700	Supervisor	7am	530	[illegible]
Matt Melton SSN: 574-31-7967	00612	N 7200	Laborer	7am		[illegible]
Fritz Corpuz SSN: 574-20-8426	3619	"	"	7		[illegible]
LANCE T. WILLARD SSN: Lance Willard	0571	N 7700	LABORER	7AM		Lance Willard
SSN:						
SSN:						
SSN:						
SSN:						
SSN:						
SSN:						
SSN:						
SSN:						

ALASKA ABATEMENT CORPORATION

DAILY PROJECT LOG

Date: 7-24-00 Project Number: 254

Project Name: Red Devil mine

Visitors:

Air Monitoring Performed By: Rich Schroeder

Air Monitoring Comments: clean Retort troft & Bins N7700-30 NPR Tyvek gloves boots glasses & hard hats hand tools All ACM bagged wet "rain" & amended H_2O used HEPA vacuums & shovels

PPE General: N7700-30 Tyvek gloves boots SAFETY glasses & hard hats

Project Changes, Directives & Instructions: ~~PCM~~ PCMs - interior wall Amosite & crysotile cut 1' square hole N side 4" thick

Daily Exposure Assessment *(Based on previous days air monitoring)*

Date: 7-24-00 Project #: 254

First Daily Work Area Inspection: 7am SAFETY MEETING
on site 7:30 inspect work area last nights rain
soaked everything Repair decon & demarcation

Second Daily Work Area Inspection: AFTER lunch cut 1' by 1' hole
IN side of Retort ACM is 4" thick as requested by
AAC owner J. Seaman

Prior to leaving site make sure All ACM is bagged
& sealed covered in poly & demarcated
All gear put up and general site cleanup
is compleate

Progress Hindrances & Delays: none today

Date: 7-24-00 Project # 254

Work Activities Performed this Date: 7am safety meeting drive to site repair Decon and ACM demarcation Flange gasket removal donning P.P.E. seal flange with duct tape & spray glue cut Both sides of metal flanges ~~cut~~ metal only bag and seal all morning long
AFTER lunch Donning N7700 Tyvek gloves boots glasses & hard hats use hand tools hepa vacuums & wet methods to clean Retort troffs and collection pits BAG All debris As Mercury with ACM in it until 515 decon out all P.P.E. added to Merc. ACM Bags sealed cover with poly demarcate area general site clean up until 530 pm Boat to Lodge do daily logs Air samples & Time cards

Date: 7-24-00 Project #: 254

Field Personnel	PPE Used	S/T	O/T
Rick Schachman	~~Pl~~ N7100 Tyvek	10	1
Matt Melton	gloves boots glasses	10	
FRITZ Lorpuz	Chemical hats	10	
Lance Willard		10	

Supervisor/Competent Person's Signature

7-24-00
Date

This form can be used as a legal document.

ALASKA ABATEMENT CORPORATION

DAILY PROJECT COVER SHEET

Date: 7-25-00 Competent Person Rich Schuchman

Project No.: 254 Project Name: Red Devil mine

Work Area: Retort Shift Hours: 7-530

Description of work performed: finish Retort trofts / Pack - inventory gear

Air Technician: Rich Schuchman Company: AAC

ACM waste stored on site? yes Location: Acm Hold cell

# of loads removed from site? None Type of ACM: various

Disposal Manifest filled out by: Rich Schuchman

Transporter: Wilder / HLA

THE FOLLOWING *MUST* BE ATTACHED TO THIS FORM IF APPLICABLE

1)	Sign-In Sheets	☐	6)	Daily T & M	☐
2)	Daily Project Log	☐	7)	Weekly T & M	☐
3)	Safety Meeting Sheets	☐	8)	Disposal Manifests	☐
4)	Accident Reports	☐	9)	Air Field Data Sheets & Results	☐
	Containment Entry Log	☐	10)	_____ Other	☐

ALASKA ABATEMENT CORPORATION

PROJECT DAILY SIGN-IN LOG

PROJECT NAME: Red Dog mine	AAC PROJECT #: 254
SUPERINTENDANT: Rich Schudmer	DATE: 7-25-00

NAME (PRINT)	CERT #	RESP TYPE	TASK	TIME IN	TIME OUT	SIGNATURE
Rich Schudmer SSN: 574 96 3231	3115	PAPR	Supervision	7am	630	[illegible]
Matt Miller SSN: 574-34-7967	00612	N 7100	Laborer	7AM	530	[illegible]
FRITZ CORPUZ SSN: 574-20-8424	3649	11	11	7Am	530	[illegible]
LANCE T WILLARD SSN: 574-26-6036	0979	N 7100	LABORER	7am	530	Lance Willard
SSN:						
SSN:						
SSN:						
SSN:						
SSN:						
SSN:						
SSN:						
SSN:						

ALASKA ABATEMENT CORPORATION

DAILY PROJECT LOG

Date: 7-25-00 Project Number: 254

Project Name: Red Devil mine

Visitors:

Air Monitoring Performed By: Ron Schulman

Air Monitoring Comments: Class 4 clean up wet Acm in trofts below Retort piping
N7700-30 NPR with hepa merc. vapor cartriges & SARANAC used

PPE General: N7700, Tyvek, SARANAC, Nitric #1 & leather #2 gloves boots with Rubber covers safety glasse's & hard hats

Project Changes, Directives & Instructions: Retort has 4" Acm ~~Fbg~~ lining
Power house has many! Acm gaskets
Triple bag All merc containing Acms - Drum & seal

Daily Exposure Assessment *(Based on previous days air monitoring)*

This form can be used as a legal document.

Date: 7-25-00 Project #: 254

First Daily Work Area Inspection: 7am Safety meeting held to discuss M/V traffic on site 730am check out ACM work areas, demarcation & ACM hold cell all ok

Prior to ABATEMENT make sure Laborers are donning "correctly" correct P.P.E.

Second Daily Work Area Inspection: Prior to Encapsulating site walk thru Entire AREA Some VAT found bagged & sealed

Progress Hindrances & Delays: metal Drums?

Date: 7-25-00 Project # 254

Work Activities Performed this Date: 7AM SAFETY mtng BOAT to site Crew donning PPE. which included N7700-30 OV filters Nitric gloves boots tyvek with SARANAC COVERS SAFETY glasses & hard hats use wet methods & hepa vacuums and hand tools to clean lower pit, bag all debris as merc with Asbestos all day long All bags are sealed and tripled hand placed in Supersacks and Drums encapsulate work site crew decons out AT 4:30 START inventory & pack up until 5:30 pm BOAT to lodge Do Daily log time cards & sample report sheets until 6:30

walkthru report with trevor Wilder supervisor
1hr lunch AT NOON
Drums arrived AT 1:30 pm

Date: 7-25-00 Project #: 254

Field Personnel	PPE Used	S/T	O/T
Rich Schindlmann	N7700 Tyvek gloves boots	10	1
FRITZ Corpuz	glasses & hard hats	10	
LANCE Williams		10	
Matt Melton		10	

Supervisor/Competent Person's Signature

7-25-00
Date

This form can be used as a legal document.

ALASKA ABATEMENT CORPORATION

DAILY PROJECT COVER SHEET

Date: 7-26-00 Competent Person: Rich Schuchman

Project No.: 254 Project Name: Red Devil Mine

Work Area: Retort/Lodge Shift Hours: 7-530

Description of work performed: Inventory – store gear & supplies fly to Anch

Air Technician: — Company: —

ACM waste stored on site? yes Location: ACM hold cells

# of loads removed from site? none Type of ACM: Various

Disposal Manifest filled out by: Rich Schuchman

Transporter: _____

THE FOLLOWING *MUST* BE ATTACHED TO THIS FORM IF APPLICABLE

1)	Sign-In Sheets	☐	6)	Daily T & M	☐
2)	Daily Project Log	☐	7)	Weekly T & M	☐
3)	Safety Meeting Sheets	☐	8)	Disposal Manifests	☐
4)	Accident Reports	☐	9)	Air Field Data Sheets & Results	☐
	Containment Entry Log	☐	10)	_____ Other	☐

ALASKA ABATEMENT CORPORATION

PROJECT DAILY SIGN-IN LOG

PROJECT NAME: Red Devil mine	AAC PROJECT #: 254
SUPERINTENDANT: Rich Scheidemann	DATE: 7-26-00

NAME (PRINT)	CERT #	RESP TYPE	TASK	TIME IN	TIME OUT	SIGNATURE
Rich Scheidemann SSN: 574-96-3231	3115	N/A	Supervisor	7am	630	[illegible]
FRITZ Cooper SSN: 574-20-8424	3649	NA 1/2	LEADMAN	7:00	530	[illegible]
Matt Melton SSN: 574-34-7967	0612	N/A	Laborer	7am	530	[illegible]
LANCE T. WILLARD SSN: 574 26 6036	0979	N/A	LABORER	7am	530	Lance T. Willard
SSN:						
SSN:						
SSN:						
SSN:						
SSN:						
SSN:						
SSN:						
SSN:						

ALASKA ABATEMENT CORPORATION

DAILY PROJECT LOG

Date: 7-26-00 Project Number: 254

Project Name: Red Devil mine

Visitors:

Air Monitoring Performed By: —

Air Monitoring Comments: —

PPE General: hard hats Boots gloves & safety glasses

Project Changes, Directives & Instructions: —

Daily Exposure Assessment *(Based on previous days air monitoring)* —

This form can be used as a legal document.

Date: 7-26-00 Project #: 254

First Daily Work Area Inspection: 7am inventory equipt & supplies check on bags and decontamination

Second Daily Work Area Inspection: 13 supersacks 3 drums manifest filled out handed over to HLA supervisor Charlie

Inspect entire site prior to leaving Red alert

Progress Hindrances & Delays: ———

Date: 7-26-00 Project # 254

Work Activities Performed this Date: 7am crew on site gather inspect inventory all equipt palletize and shrink wrap walk back to lodge pack chow up manifest 1230 fly to Anian - 250 to Anch Arrive 515 get gear drop at shop with samples to wea - Do Daily log & time cards

Tommorrow wire drop HLA TCCP nece Sample & closeout work at shop

Date: 7-26-00 Project #: 254

Field Personnel	PPE Used	S/T	O/T
Ken Shulman	hard hats boots & gloves	10	1
FRITZ CORPUZ	& SAFETY glasses	X8	
LANCE WILLIAMS		X8	
Matt Melton		X8	
	3 jon		
	5 travel		
	Laborers		

Supervisor/Competent Person's Signature

7-26-00
Date

This form can be used as a legal document.

ALASKA ABATEMENT CORPORATION

DAILY PROJECT COVER SHEET

Date: 8-3-00 Competent Person: Rick Schuchmann

Project No.: 254 Project Name: Red Devil mine

Work Area: mine Shift Hours: 7-530

Description of work performed: Set up cut meter from Retort

Air Technician: NA Company:

ACM waste stored on site? NA Location:

# of loads removed from site? NA Type of ACM:

Disposal Manifest filled out by: NA

Transporter: NA

THE FOLLOWING *MUST* BE ATTACHED TO THIS FORM IF APPLICABLE

1) Sign-In Sheets ☐
2) Daily Project Log ☐
3) Safety Meeting Sheets ☐
4) Accident Reports ☐
Containment Entry Log ☐
6) Daily T & M ☐
7) Weekly T & M ☐
8) Disposal Manifests ☐
9) Air Field Data Sheets & Results ☐
10) _____ ☐
Other

ALASKA ABATEMENT CORPORATION

PROJECT DAILY SIGN-IN LOG

PROJECT NAME: Red Devil mine	AAC PROJECT #: 254
SUPERINTENDANT: Rich Schneideman	DATE: 8-3-00

NAME (PRINT)	CERT #	RESP TYPE	TASK	TIME IN	TIME OUT	SIGNATURE
Rich Schneideman SSN: 574-96-3231	3115	N 7100	Supervisor	7am	630	
FRED Colquit SSN: 574-20-4424	3649	1/2	ASBESTOS	7	530	
LANCE E WILLARD SSN: 574 26 6331	0979	1/2	LABORER	7AM	530	Lance Willard
Duane Hart SSN: 574 24 4095	5802	N 7100	Foreman	700	530	
SSN:						
SSN:						
SSN:						
SSN:						
SSN:						
SSN:						
SSN:						
SSN:						

Alaska Abatement Corporation
HOT WORK PERMIT
Red Devil Demolition

PROCEDURE - A hot work permitting program will be required on all sites when sources may be introduced. The Site Safety Office (SSO) is responsible for all site hot work permitting programs. This permit must be approved by the Site Safety Manager unless a special variance is granted.

DEFINITION - Hot work is any process which because of its design or function can cause ignition of a gaseous or vaporous atmosphere due to direct or indirect contact.

The (SSO) and/or (PM) have surveyed the site and found the following Hot Work condition(s) do or may exist at Retort and will require permitting:

CONDITION	YES	NO	CONDITION	YES	NO
Welding			Electrical equipment, fixed		
Cutting	✓		Electrical equipment, portable	✓	
Use of power tools	✓		Electrical equipment, hand-held		
Space heaters			Others		

PRE-WORK CHECKLIST All items must be completed for Permit to be valid	YES	NO	N/A
Work area inspected by SSO prior to Hot Work beginning?	✓		
Fire watch established? Name: Lance Willard	✓		
Fire extinguisher appropriate for media?/Readily accessible?	✓		
Work area clear of all trash and combustible debris?/Equipment properly grounded?	✓		
Area in which hot work is to be performed has been monitored for combustible atmosphere?	✓		
Will combustible gas indicator(s) be used constantly during Hot Work? Lumidor 4 GAS			
If no, why?:			
List additional personal protective equipment worn: Leathers tyvek N7700 PAV/HepA			
[illegible]ng or cutting on closed systems prohibited?			✓
Closed system cutting procedures?			✓
*Has variance been granted to the contractor to perform Hot Work without SSE signoff?			

DATE 8/3/00 TIME 1:20 pm **Permit Expiration time** 7:30 pm

(There should be no more than 15 minutes elapse between time of issuance and beginning of work).

CERTIFICATION OF CONTRACTOR SSO THAT HOT WORK MAY ~~COMMENCE~~

CERTIFICATION OF SSO THAT HOT WORK MAY COMMENCE **Yes " No " N/A "**

A NEW HOT WORK PERMIT WILL BE REQUIRED FOR Retort **(location) at the beginning of each shift or after more than one (1) hour intervals of no hot work procedure.**

HOT WORK TEAM SIGN-OFF		
I/we have read and understand the terms of the above **Hot Work Permit**.		
NAME (PLEASE PRINT CLEARLY)	SIGNATURE	DATE/TIME (24 HR.)
FRITZ CORPUZ	[signature]	8-3-00 1:30 pm
DUANE HART	[signature]	" "
LANCE T. WILLARD	Lance T. Willard	" "

CERTIFICATION OF CONTRACTOR SSO THAT THE HOT WORK AREA HAS BEEN SHUT DOWN AND THAT NO IGNITION POTENTIAL EXISTS: [signature]

Time: Must be reinspected and signed no earlier than 30 minutes after all hot work has been completed.

ALASKA ABATEMENT CORPORATION

DAILY PROJECT LOG

Date: 8-9-00 Project Number: 254

Project Name: Red Devil mine

Visitors:

Air Monitoring Performed By: HLA Beth Ruschedman

Air Monitoring Comments: 4 gas while cutting metal
9 ppm H_2S stop work reevaluate talk to
BLM Toxicolgist Carl (PHD) other sulfers exist in
retort this will cause H_2S to show up
CO Levels up and down none over 14 heavy
wind 30+ NOT IN Breathing zone but 4 Gas
is placed next to cut

PPE General: Gloves, boots, glasses, hepa /m.v. c.c. WITH
N7700-30 NPR tyvek SAN ANTE leather gloves
leather coat sheild for light

Project Changes, Directives & Instructions: XRF sample of deposit
taken from furnace door 20,000—30,000 ppm ARSNIC
inorganic form? 3500 merc

Daily Exposure Assessment *(Based on previous days air monitoring)*

This form can be used as a legal document.

Date: 8-3-00 Project #: 254

First Daily Work Area Inspection: I am on site HLA merc vapor monitor - NOT working! crew goes thru gear sorts out equiptect... All there

Second Daily Work Area Inspection: Inspect area Draw up Hot work permit cut excess metal of Retort and start skin stop work H_2S

Progress Hindrances & Delays: Pressure Demand system NOT here High winds prevent poly work

Date: 8-3-00 Project # 254

Work Activities Performed this Date: 7am safety meeting held boat to site change Boots - go to poly dry tent go thru gear walkthru site set up for cutting lunch return to site donning ppe Tyvek/Saranac leather N7700-30 mv cl HEPA stacks gloves boots glasses and hard hats cut metal from Retort 4 Gas test 1:30pm Ø H2S Ø CO Ø LEL 21% O2 2 men fire watch 1 man cuts rest of Day (4 Gas Rises see notes) 5pm decon out of site lock up clean up to Boat Launch change Boots return to Red Devil lodge do daily log & time cards

Date: 8-3-00 Project #: 254

Field Personnel	PPE Used	S/T	O/T
Kell Schuchman	N7760-30 NPR or stacks MVCL	10	1
Duane Hunt	Hkpr gloves boots	10	
Erik Corpuz	glasses tyvek & saranac	10	
Lance Willars	leathers & hard hats	10	

Supervisor/Competent Person's Signature

8-3-00
Date

This form can be used as a legal document.

ALASKA ABATEMENT CORPORATION

DAILY PROJECT COVER SHEET

Date: 8-4-00 Competent Person: Rich Schneider

Project No.: 254 Project Name: Red Devil mine

Work Area: Retort / mine side Shift Hours: 7am - 530pm

Description of work performed: cut Retort - search for Gaskets demarcate Bldgs

Air Technician: _____ Company: _____

ACM waste stored on site? yes Location: ACM hold cell

# of loads removed from site? none Type of ACM: _____

Disposal Manifest filled out by: NA

Transporter: NA

THE FOLLOWING *MUST* BE ATTACHED TO THIS FORM IF APPLICABLE

1) Sign-In Sheets ☐
2) Daily Project Log ☐
3) Safety Meeting Sheets ☐
4) Accident Reports ☐
Containment Entry Log ☐
6) Daily T & M ☐
7) Weekly T & M ☐
8) Disposal Manifests ☐
9) Air Field Data Sheets & Results ☐
10) _____ ☐
Other

ALASKA ABATEMENT CORPORATION

PROJECT DAILY SIGN-IN LOG

PROJECT NAME: Red Devil mine	AAC PROJECT #: 254
SUPERINTENDANT: Rich Schuchman	DATE: 8-4-00

NAME (PRINT)	CERT #	RESP TYPE	TASK	TIME IN	TIME OUT	SIGNATURE
Rich Schuchman SSN: 574-96-3231	3115	N 7000-30	Supervision	7am	630	[illegible]
DUANE HART SSN: 574 74 4098	58 02			700	530	[illegible]
LANCE WILLARD SSN: 574 26 6036	0979	N 7700	LABORER	7AM	530	Lance Willard
FRITZ CORPUZ SSN: 574-20-8428	3649	1/2	"	7	530	[illegible]
SSN:						
SSN:						
SSN:						
SSN:						
SSN:						
SSN:						
SSN:						
SSN:						

Alaska Abatement Corporation

PROJECT NAME	AAC PROJECT NO.
SUPERVISOR	

CONTAINMENT ENTRY LOG

NAME (please print)	IN	OUT	IN	OUT

ALASKA ABATEMENT CORPORATION

DAILY PROJECT LOG

Date: 8-4-00 Project Number: 254

Project Name: Red Devil mine

Visitors:

Air Monitoring Performed By: HLA + Bert (merc vapor) Rick Schneider (4 GAS)

Air Monitoring Comments: out retort full PPE 1.999 m/v reading Stop work on retort

PPE General: N7700-30 Tyvek gloves boots glasses & hard hats Leathers or stack m.v. c.l. Hepa

Project Changes, Directives & Instructions: stop work on retort called shop - New hazzards found givin copy of HLA sample 6 hazz ARS now retest are Contragous amounts of Arsenic (83,400), new one Selinium (408), Lead, Antimony, mercury (6620) ect ... reevaluate wait for answers & MSDS's

Daily Exposure Assessment (Based on previous days air monitoring)

NA

This form can be used as a legal document.

Date: 8-4-00 Project #: 254

First Daily Work Area Inspection: 7:am SAFETY meeting held - go to site set up for cutting breathing zone cutting 1.999 stop work go to Lodge - pressure demand system on site go to airport retreive back to Lodge set up system recalibrate add new charcoal filter

Second Daily Work Area Inspection: As requested return to site to figure out how much airlines are needed have retest on Retort ore done by CARC Blm toxicolgist Arsenic very high 62000 + call shop explain site problems

Progress Hindrances & Delays: Finally got HLAS site Access meet work plan ~~[illegible]~~ Boon. review call shop with new information Joe Seaman / Wayne Schmidt Stop work order until further info is obtained

Date: 8-40 0 Project # 254

Work Activities Performed this Date: 7AM SAFETY MEETING held set up for cutting Donning full P.P.E. cut retort ask for m/vapor reading shut down work 1.999 need better resp. go to lodge get pressure demand system from airport set up AT Lodge recalibrate test run fit test — return to site donning P.P.E. merc vapor test power plant area Ø m/v GATHER wet gaskets from work benches & ground bag wet seal double bag Also ropes Brake pads clutch pads — go to mine side demarcated ALL Buildings WITH visable ACMS 5pm Break down & site lock up return to Lodge do daily log & time CARDS

Date: 8-4-00 Project #: 254

Field Personnel	PPE Used	S/T	O/T
Rich Scheideman	N7700-30 Tyvek gloves	10	/
Duane HART	boots glasses & hard	10	
Lance Williams	hats	10	
FRITZ CORPUS		10	

Supervisor/Competent Person's Signature

8-4-00
Date

This form can be used as a legal document.

ALASKA ABATEMENT CORPORATION

DAILY PROJECT COVER SHEET

Date: 8-5-00 Competent Person Rich Scheideman

Project No.: 254 Project Name: Red Devic mine

Work Area: mineside housing Shift Hours: 7-530

Description of work performed: Survey mine-side Buildings for ACMs

Air Technician: Ron Scheideman Company: AAC

ACM waste stored on site? yes Location: Hold cell

# of loads removed from site? none Type of ACM:

Disposal Manifest filled out by: none

Transporter: NA

THE FOLLOWING *MUST* BE ATTACHED TO THIS FORM IF APPLICABLE

1) Sign-In Sheets ☐
2) Daily Project Log ☐
3) Safety Meeting Sheets ☐
4) Accident Reports ☐
Containment Entry Log ☐
6) Daily T & M ☐
7) Weekly T & M ☐
8) Disposal Manifests ☐
9) Air Field Data Sheets & Results ☐
10) _____ ☐
Other

ALASKA ABATEMENT CORPORATION

PROJECT DAILY SIGN-IN LOG

PROJECT NAME: Red Devil mine	AAC PROJECT #: 254
SUPERINTENDANT: Rich Scheideman	DATE: 8/5/2000

NAME (PRINT)	CERT #	RESP TYPE	TASK	TIME IN	TIME OUT	SIGNATURE
Rich Scheideman SSN: 574963231	3115	N 7100-30 NPR	Supervisor	7am	6:30	[illegible]
DUANE HART SSN: 574-74-4098	5802	1/2	merc	7:00	5:30	[illegible]
FRITZ CORONA SSN: 574-20-8429	3649	N 7100	↓	7	5:30	[illegible]
LANCE T. WILLARD SSN: 574 26 6036	0979	"	↓	7am	5:30	Lance Willard
SSN:						
SSN:						
SSN:						
SSN:						
SSN:						
SSN:						
SSN:						
SSN:						

ALASKA ABATEMENT CORPORATION

DAILY PROJECT LOG

Date: 8-5-00 Project Number: 254

Project Name: Red Devic mine

Visitors:

Air Monitoring Performed By: Rich Scheidemann → M/V test 730am Ø MV formed

Air Monitoring Comments: Class 4 pick up of NON FRIABLE CAB VAT Brake pads clutch pads laying Around site personals only every thing is wet collect some soil around Acm if it's in poor condition

PPE General: N7700-30 NPR Tyven gloves boots glasses & hard hats

Project Changes, Directives & Instructions: Wait on Further instructions prior to working on Retort

Daily Exposure Assessment *(Based on previous days air monitoring)* - NA -

Date: 8-5-00 Project #: 254

First Daily Work Area Inspection: 7AM SAFETY MEETING HELD 7:30 on site Merc Vapor test Lower mine side housing 1st reading .006 retest -.000 walk around Lower housing 4 samples taken .000's Men use hepa/m.v.s just incase of a bmb or BAD wind from Retort side

Second Daily Work Area Inspection: Thru out AFTERNOON inspect hill side for ACMS on ground lying about Buildings bag & seal

Progress Hindrances & Delays: Wait on Further intructions on Retort TAKE tommorrow off

Date: 8-5-00 Project # 8-5-00

Work Activities Performed this Date: 7AM on site SAFETY MEETING held Don P.P.E. NIOSH -30 MV/HEPA filters gloves boots glasses & hard hats WITH SARANAC coveralls work on mine side of site go thru each Building gatering Gaskets - loose Brake pads Clutch pads Brake shoes rope & hot gloves bag wet and seal AREA covered is 1 mile sq personals only open area demarkated AT entrance WITH SIGNS GATHERING only No Removal of intact ACMS on Buildings AFTERNOON spent picking up flooring and loose CAS place in supersacks until 3:30pm seal up ALL BAGS decon out walk to ~~BOAT launch START to~~ Lodge 1.5 miles pack up Pressure demand system for transport to mine when lines arrive until 5:30pm Do Daily log & time cards until 6:30 pm

Date: 8-5-00 Project #: 254

Field Personnel	PPE Used	S/T	O/T
Rich Scheideman	N77100WPR Tyvek gloves		11
Duane Hart	boots, glasses & hard		10
Fritz Corpuz	hats		10
Lance Willman			10

Supervisor/Competent Person's Signature

8-5-00

Date

This form can be used as a legal document.

ALASKA ABATEMENT CORPORATION

DAILY PROJECT COVER SHEET

Date: 8-7-00 Competent Person Rich Scheideman

Project No.: 254 Project Name: Red Devil mine

Work Area: Mine Retort Shift Hours: 7Am - 530 pm

Description of work performed: Remove Brick from Retort

Air Technician: Rich Scheideman Company: AAC

ACM waste stored on site? yes Location: ACM Holdcell

# of loads removed from site? none Type of ACM:

Disposal Manifest filled out by: —

Transporter: Phillips / Wilder

THE FOLLOWING *MUST* BE ATTACHED TO THIS FORM IF APPLICABLE

1) Sign-In Sheets ☐
2) Daily Project Log ☐
3) Safety Meeting Sheets ☐
4) Accident Reports ☐
Containment Entry Log ☐
6) Daily T & M ☐
7) Weekly T & M ☐
8) Disposal Manifests ☐
9) Air Field Data Sheets & Results ☐
10) _____ ☐
Other

ALASKA ABATEMENT CORPORATION

PROJECT DAILY SIGN-IN LOG

PROJECT NAME: Red Devic mine	AAC PROJECT #: 254
SUPERINTENDANT: Rich Scheideman	DATE: 8-7-00

NAME (PRINT)	CERT #	RESP TYPE	TASK	TIME IN	TIME OUT	SIGNATURE
Rich Scheideman SSN: 574963231	3115	N 7100	Supervisor	7AM	630	
LANCE T. WILLARD SSN: 574 26 6036	0929	N 7100	LABORER	7AM	530	Lance Willard
DUANE HATTS SSN: 574 74 4098	802	N 7100		700	530	
FRITZ CORPUZ SSN: 574-20-8428	3649	"	"	700	530	
SSN:						
SSN:						
SSN:						
SSN:						
SSN:						
SSN:						
SSN:						
SSN:						

ALASKA ABATEMENT CORPORATION

DAILY PROJECT LOG

Date: 8-7-00 Project Number: 254

Project Name: Red Devil mine

Visitors:

Air Monitoring Performed By: Rich Scheideman Alaska Abatement Corp.

Air Monitoring Comments: Brick Removal - Retort
Acm is soaking wet by Nature AMENED H2O used
Bricks scrubed hand dipped in encap hand hand placed
into concreate vault as requested By Blm - they contain 3500ppm
merc. All Day long
mv readings thruout day for Hwy RAIN N/E wind

PPE General: N7700-30 NPR-MV/Hepa stack, Tyvek & Saranac, Rubber
gloves with Leather overlays work boots

Project Changes, Directives & Instructions: NA

Daily Exposure Assessment *(Based on previous days air monitoring)*

This form can be used as a legal document.

Date: 8-7-00 Project #: 254

First Daily Work Area Inspection: on site AT 7:30 Am set up containment Poly decon NAMS M/V reading .092 & check all Barriers demarcation all ok 4 gas check 21% O2 ØLEL Ø C° Ø H2S

Auger was removed By Wilkinson

Second Daily Work Area Inspection: Thru out day constant 4 Gas and M/Vapor √s All ok M/V reading actually drop in AFTERNOON

Progress Hindrances & Delays: none

Date: 8-7-00 Project # 254

Work Activities Performed this Date: 7 AM SAFETY meeting boat to site set up work area — crew donning PPE N7700-30 NPRS with HEPA/M.V./C.L. stack filters tyvek with SARANAC overlays rubber gloves covered with leather gloves work boots SAFETY glasses & hard hats remove Bricks with hand tools hand clean dip in encap load out to lined concreate PAD & covered as requested By B/m All day long 4:45 decon out site Break down general clean up until 530 Boat to lodge Do Daily log & time cards

Date: 8-7-00 Project #: 254

Field Personnel	PPE Used	S/T	O/T
Rich Schickman	as previously listed	10	1
Duane Hart		10	
Fritz Corpuz		10	
Lance Willard		10	

Supervisor/Competent Person's Signature

8-7-00
Date

This form can be used as a legal document.

ALASKA ABATEMENT CORPORATION

DAILY PROJECT COVER SHEET

Date: 8-8-00 Competent Person: Rich Schulman

Project No.: 254 Project Name: Red Devil mine

Work Area: Retort Shift Hours: 7-530

Description of work performed: Bricks Bag acm final clean & encap

Air Technician: Rich Schulman Company: AAC

ACM waste stored on site? yes Location: Hold cell

# of loads removed from site? None Type of ACM: TSI

Disposal Manifest filled out by: —

Transporter: —

THE FOLLOWING *MUST* BE ATTACHED TO THIS FORM IF APPLICABLE

1) Sign-In Sheets ☐
2) Daily Project Log ☐
3) Safety Meeting Sheets ☐
4) Accident Reports ☐
Containment Entry Log ☐
6) Daily T & M ☐
7) Weekly T & M ☐
8) Disposal Manifests ☐
9) Air Field Data Sheets & Results ☐
10) _____ ☐
Other

ALASKA ABATEMENT CORPORATION

PROJECT DAILY SIGN-IN LOG

PROJECT NAME: Rex Davis mine	AAC PROJECT #: 254
SUPERINTENDANT: Rich Schuchman	DATE: 8-8-00

NAME (PRINT)	CERT #	RESP TYPE	TASK	TIME IN	TIME OUT	SIGNATURE
Rich Schuchman SSN: 574-96-3237	3115	N 7700	Retort	7am	630	
Duane Hall SSN: 374 74 4098	5802	N 7700		7	530	
Fritz Corona SSN: 574-20-8428	3649	11		7	530	
Lanert Willard SSN: 574 26 4036	0979	N 7700		7AM	530	Lanert Willard
SSN:						
SSN:						
SSN:						
SSN:						
SSN:						
SSN:						
SSN:						
SSN:						

ALASKA ABATEMENT CORPORATION

DAILY PROJECT LOG

Date: 8-8-00 Project Number: 254

Project Name: Red Devil mine

Visitors: —

Air Monitoring Performed By: Rick Schindler

Air Monitoring Comments: Bricks bag area final clean

4 gas ✓ throughout Day all ok

m/v ✓ throughout Day all ok

PPE General: N7100-30 NPR m v/CL/Hepa stacks Tyvek SARANAC gloves boots glasses and hard hats

Project Changes, Directives & Instructions: —

Daily Exposure Assessment *(Based on previous days air monitoring)*

This form can be used as a legal document.

Date: 8-8-00 Project #: 254

First Daily Work Area Inspection: 7:30 am 4 GAS ✓ all ok 21% O2 Ø H2S Ø CO Ø LEL M/V .162 oked to start Brick removal

Second Daily Work Area Inspection: Through out day check all equiptment Generator BAGS Bricks work practices all ok

prior to encap double check Retort shell full of merc but ACM FKEE

Progress Hindrances & Delays: None

Date: 8-8-00 Project # 254

Work Activities Performed this Date: 7am SAFETY meeting held at 730 on site 4 gas & m/v readings okéd to start crew donning correct PPE (as listed) enter work area hand tools wetted methods & hepa vacs used remove rest of Bricks, remove very wetted ACM Drum, seal, demarcate until done final clean, scrub tank, filter water thru micron unit to merc water hold cell encap tank remove tank to concrete PAD to pressure wash to remove mercury all Bags sealed in drums general site clean up breakdown for day until 530 Boat to Lodge Do Daily log & time cards

Date: 8-8-00 Project #: 254

Field Personnel	PPE Used	S/T	O/T
Rick Schrodum	N7700-30 stack filters	10	1
Lance Williams	tyvek & SARANACS	10	
Duane Hart	rubber & leather gloves	10	
FRIR Corpuz	boots, safety glasses, & hard hats	10	

Supervisor/Competent Person's Signature

8-8-00
Date

This form can be used as a legal document.

ALASKA ABATEMENT CORPORATION

DAILY PROJECT COVER SHEET

Date: 6-9-00 Competent Person: Rich Schulen

Project No.: 254 Project Name: Red Devil mine

Work Area: mine Lodge Shift Hours: 7-830

Description of work performed: clean equipt pack move bags

Air Technician: NA Company:

ACM waste stored on site? yes Location: holdcell

# of loads removed from site? none Type of ACM:

Disposal Manifest filled out by: —

Transporter: —

THE FOLLOWING *MUST* BE ATTACHED TO THIS FORM IF APPLICABLE

1) Sign-In Sheets ☐
2) Daily Project Log ☐
3) Safety Meeting Sheets ☐
4) Accident Reports ☐
Containment Entry Log ☐
6) Daily T & M ☐
7) Weekly T & M ☐
8) Disposal Manifests ☐
9) Air Field Data Sheets & Results ☐
10) _____ ☐
Other

ALASKA ABATEMENT CORPORATION

PROJECT DAILY SIGN-IN LOG

PROJECT NAME: Red Devil mine	AAC PROJECT #: 254
SUPERINTENDANT: Rick Schulen	DATE: 8-9-00

NAME (PRINT)	CERT #	RESP TYPE	TASK	TIME IN	TIME OUT	SIGNATURE
Rick Schulen SSN: 574-96-3231	3115	✓	Supervisor	7am	930	[illegible]
DUANE HART SSN: 574 74 4088	5802	✓	PACK	7	830	[illegible]
FRITZ CORPUZ SSN: 574-20-8429	3649	✓	✓	7	830	[illegible]
LANCE T. WILLARD SSN: 574 26 6036	0979	✓	✓	7am	830	Lance Willard
SSN:						
SSN:						
SSN:						
SSN:						
SSN:						
SSN:						
SSN:						
SSN:						

ALASKA ABATEMENT CORPORATION

DAILY PROJECT LOG

Date: 8-9-00 Project Number: 254

Project Name: Red Devil Mine

Visitors:

Air Monitoring Performed By: NA

Air Monitoring Comments: —

PPE General: M7700-30 Tyvek gloves boots glasses & hard hats

Project Changes, Directives & Instructions: —

Daily Exposure Assessment *(Based on previous days air monitoring)* —

This form can be used as a legal document.

Date: 8-9-00 Project #: 254

First Daily Work Area Inspection: 7:30 on site check all BAGS gear M/U readings will wear PPE while packing up

Second Daily Work Area Inspection: Inspect all equipt & packing of it

Progress Hindrances & Delays: none

Date: 8-9-00 Project # 254

Work Activities Performed this Date: 7am SAFETY meeting held 730 on site move bags load drums WITH ore START Break down & clean all tools in pit hand load to staging AREA go to lodge pick up AIR port AT 515 to ANIAK ANIAK to ANCH ARRIVE 8:30 do daily log & time cards

Date: 8-9-00 Project #: 254

Field Personnel	PPE Used	S/T	O/T
Rich Schudean	N7300-30 Tyvek gloves	13	1
Duane Hart	boots glasses & hard hats	13	
FRITZ Corpuz		13	
Lance Willard		13	

Supervisor/Competent Person's Signature

8-9-00
Date

This form can be used as a legal document.

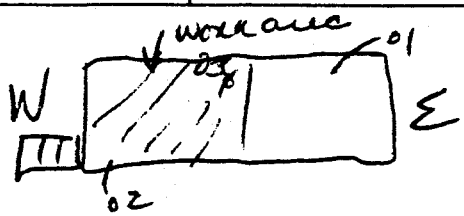
Alaska Abatement Corporation

PROJECT NAME	AAC PROJECT NO
Red devil mine	245
LOCATION: Red devil AK	
CLIENT: Wilder/BLM/HLA	CLIENT PROJECT NO
DATE: 7-21-00	SHEET NO: 1 OF [/]

FIELD DATA SHEET - ASBESTOS AIR MONITORING

ANALYSIS REQUESTED (CIRCLE)	TURNAROUND REQUESTED	NUMBER OF SAMPLES	COLLECTION DATE
PCM TEM	Reg	7	7-21-00
COLLECTED BY: Rich Scheidemann	ROTOMETER IDENTIFIATION: AAC 1102	SELECTED LABORATORY: NEC	SHIPPING METHOD: hand deliver
SAMPLES RECIEVED BY	DATE/TIME	ANALYSIS SIGNATURE	DATE/TIME

COMMENTS



All acm damaged hanging wet
Barely by wire unable to glove
bag (willfull wet thoroughly BAG
N. west wind

SAMPLE ID # / SAMPLE TYPE / PUMP ID #	LOCATION / TASK / SS # AND PPE	START TIME / STOP TIME / TOTAL TIME	FLOW L/MIN / FLOW L/MIN / AVG FLOW	FIBERS/FIELDS / VOLUME (L)	RESULTS Fibers/cc
RD01 / OWA / LU60	East End of structure / Remove TSI / ½ face NPR Tyvek	1052 / 516	3.5 / 3.5		
RD02 / OWA / LU78	West end structure / Remove tsi / N7700-30 NPR Tyvek	1055 / 517	3.5 / 3.5		
RD03 / IWA / LU91	Below Condinsate pipes / remove TSI / N7700-30 NPR Tyvek	1057 / 519	3.5 / 3.5		
RD04 / EX / LU94	FRITZ Corpuz # 3649 / Remove/clean TSI / 574-20-8428 N7700-Tyvek	1101 / 1131	1.5 / 1.5		
RD05 / Per / LU94	FRITZ Corpuz # 3649 / Glove bag + SI / As listed Above	107 / 515	1.5 / 1.5		
RD06 / FB					
RD07 / FB					

WHITE - Laboratory YELLOW - Job Book PINK - Supervisor's Copy

WHITE ENVIRONMENTAL CONSULTANTS INC.
731 I St. Suite 201 Anchorage, Ak 99501 (907) 258-8661

PCM Air Sample Report

Airborne Fiber Analysis by NIOSH Method 7400
"A" Counting Rules; issue 2, 8/15/94
PAT Lab #102739

WEC Project #: 00-485
Client Project#: 254

Report #: 4019
Rpt Date: 7/28/00

Client: **Alaska Abatement Corporation**
520 W. 58th Avenue, Suite J
Anchorage, AK 99501

Collection Date: 21-Jul-00
Collected by: CLIENT
TAT: 24 Hour
 # Samples: 7

Project Name/Location: Red Devil Mine
Notes:

WEC Lab ID#	Client ID#	Sample Type	Vol (l)	Fibers/Field:	Fiber Density (F/mm2)	LOD	F/cc
A00-10425	RD-01	OWA	1344.0	0.038	4.777	0.002	<LOD
Location: East end of structure - remove TSI.							
Comments:							
A00-10426	RD-02	OWA	1337.0	0.023	2.866	0.002	<LOD
Location: West end of structure - remove TSI.							
Comments:							
A00-10427	RD-03	IWA	1358.0	0.053	6.688	0.002	<LOD
Location: Below condinsate pipes - remove TSI.							
Comments:							
A00-10428	RD-04	Excursion	45.0	0.133	16.879	0.060	0.144
Location: Fritz Corpuz: remove/ clean TSI.							
Comments:							
A00-10429	RD-05	Personal	372.0	0.273	34.713	0.007	0.036
Location: Fritz Corpuz: glovebag TSI.							
Comments:							
A00-10430	RD-06	Field Blank	0.0	0.000	0.000	N/A	N/A
Location: Field Blank							
Comments:							

WHITE ENVIRONMENTAL CONSULTANTS INC.
731 I St. Suite 201 Anchorage, Ak 99501 (907) 258-8661

PCM Air Sample Report

Airborne Fiber Analysis by NIOSH Method 7400
"A" Counting Rules; issue 2, 8/15/94
PAT Lab #102739

WEC Project #: 00-485
Client Project#: 254

Report #: 4019
Rpt Date: 7/28/00

WEC Lab ID#	Client ID#	Sample Type	Vol (l)	Fibers/Field:	Fiber Density (F/mm2)	LOD	F/cc
A00-10431	RD-07	Field Blank	0.0	0.005	0.637	N/A	N/A

Location: Field Blank

Comments:

PCM Air Sample TWA Report

Worker	*Sample Date*	*SSN*	*Cert #*	*PPE*	*TWA*
Fritz Corpuz	21-Jul-00	574208428	3649	North 7700 Tyvek	0.028

Unable to include overloaded or voided samples in TWA calculations. Samples below the LOD are calculated as if those concentrations were equal to LOD value.

Unable create TWAs using overloaded and/or voided samples.

Analyst _____ **Date** 7/28/00
QC _____ **Date** 7/28/00

The Limit of Detection (LOD) is calculated based on 5 1/2 fibers in 100 fields(estimated as 3 times our average blank value), and is dependant on volume. Samples with concentrations below this calculated LOD are reported as " LOD". Our Walton-Beckett Graticule area is 0.00785 mm2, as verified by stage micrometer quarterly "Overload " means sample particulate excees the maximum loading allowable by the method counting rules. "VOID" implies either damage to the cassette observed in the lab, or field conditions determined by the Air Monitoring technician as sub-standard TWA's are calculated on the basis of 480 minutes (8-hour TWA) Results are corrected by average blank count if blanks are provided with set. ENV=Enviornmental

Alaska Abatement Corporation

PROJECT NAME	AAC PROJECT NO
Red Devil mine	254
LOCATION: Red Devil Lake	
CLIENT: BLM/HLA/Wilder	CLIENT PROJECT NO.
DATE: 7-22-00	SHEET NO [ ] OF [ ]

Sampler: PCM – Rotometer #.1902
WEC – 7-22-00 R. Schechter

FIELD DATA SHEET - ASBESTOS AIR MONITORING – (~~Continued~~)

SAMPLE ID# / SAMPLE TYPE / PUMP ID#	LOCATION / TASK / SS# AND PPE	START TIME / STOP TIME / TOTAL TIME	FLOW L/MIN / FLOW L/MIN / AVG. FLOW	FIBERS/FIELDS / VOLUME (L)	RESULTS Fibers/cc
RD08 / PER / LV94	Lance Willard / Glovebag / clean Beams / 574-26-6036 Nmootyuk	752 / 350 /	1.5 / 1.5 /		
RD09 / OWA / LV60	W end of Retort / Glovebag clean Beam / As listed	754 / 5:15 /	3.5 / 3.5 /		
RD10 / OWA / LV78	E end of Retort / Glove bag clean Beams / As listed	758 / 519 /	3.5 / 3.5 /		
RD11 / IWA / LV91	Below Condinsate piping / Glove bag clean beam / As listed	759 / 516 /	3.5 / 3.5 /		
RD12 / EX / LV94	Lance Willard / final Clean upper I beams / As listed ABOVE	350 / 420 /	1.5 / 1.5 /		
RD13 / FB /					
RD14 / FB /					

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PCM Air Sample Report

Airborne Fiber Analysis by NIOSH Method 7400
"A" Counting Rules; issue 2, 8/15/94
PAT Lab #102739

WEC Project #: 00-485
Client Project#: 254

Report #: 4015
Rpt Date: 7/28/00

Client **Alaska Abatement Corporation**
520 W. 58th Avenue, Suite J
Anchorage, AK 99501

Collection Date: 22-Jul-00
Collected by: CLIENT
TAT: 24 Hour
 # Samples: 7

Project Name/Location: Red Devil Mine
Notes:

WEC Lab ID#	Client ID#	Sample Type	Vol (l)	Fibers/Field:	Fiber Density (F/mm2)	LOD	F/cc
A00-10418	RD-08	Personal	717.0	0.005	0.637	0.004	<LOD
Location: Lance Willard: glovebag/ clean beams.							
Comments:							
A00-10419	RD-09	OWA	1963.5	0.005	0.637	0.001	<LOD
Location: West end of retort - glovebag/ clean beams - as listed.							
Comments:							
A00-10420	RD-10	OWA	1963.5	0.020	2.548	0.001	<LOD
Location: East end of retort - glovebag/ clean beams - as listed.							
Comments:							
A00-10421	RD-11	IWA	1949.5	0.020	2.548	0.001	<LOD
Location: Below condinsate piping - glovebag/ clean beams - as listed.							
Comments:							
A00-10422	RD-12	Excursion	45.0	-0.010	-1.274	0.060	<LOD
Location: Lance Willard: final clean - upper I beams - as listed above.							
Comments:							
A00-10423	RD-13	Field Blank	0.0	0.020	2.548	N/A	N/A
Location: Field Blank							
Comments:							

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PCM Air Sample Report

Airborne Fiber Analysis by NIOSH Method 7400
"A" Counting Rules; issue 2, 8/15/94
PAT Lab #102739

WEC Project #: 00-485
Client Project#: 254

Report #: 4015
Rpt Date: 7/28/00

WEC Lab ID#	Client ID#	Sample Type	Vol (l)	Fibers/Field:	Fiber Density (F/mm2)	LOD	F/cc
A00-10424	RD-14	Field Blank	0.0	0.000	0.000	N/A	N/A

Location: Field Blank

Comments:

PCM Air Sample TWA Report

Worker	*Sample Date*	*SSN*	*Cert #*	*PPE*	*TWA*
Lance Willard	22-Jul-00	574266036	19990979	North 7700 Tyvek	0.007

Unable to include overloaded or voided samples in TWA calculations. Samples below the LOD are calculated as if those concentrations were equal to LOD value

Unable create TWAs using overloaded and/or voided samples.

Analyst _____ **Date** 7/28/00
QC _____ **Date** 7/28/00

The Limit of Detection (LOD) is calculated based on 5 1/2 fibers in 100 fields(estimated as 3 times our average blank value), and is dependant on volume. Samples with concentrations below this calculated LOD are reported as "<LOD" Our Walton-Beckett Graticule area is 0.00785 mm2, as verified by stage micrometer quarterly "Overload " means sample particulate excees the maximum loading allowable by the method counting rules. "VOID" implies either damage to the cassette observed in the lab, or field conditions determined by the Air Monitoring technician as sub-standard. TWA's are calculated on the basis of 480 minutes (8-hour TWA). Results are corrected by average blank count if blanks are provided with set. ENV=Enviommental

Alaska Abatement Corporation

PROJECT NAME	AAC PROJECT NO
Red Devil mine	254
LOCATION: Red Devil Ak	
CLIENT: BLM/HLA/Wilden	CLIENT PROJECT NO
DATE: 7-23-00	SHEET NO [1] OF [1]

7 samples PCM Rotometer AAC #1902 WEC 7-23-00 R. Schedum

FIELD DATA SHEET - ASBESTOS AIR MONITORING – ([redacted])

SAMPLE ID # / SAMPLE TYPE / PUMP ID #	LOCATION / TASK / SS # AND PPE	START TIME / STOP TIME / TOTAL TIME	FLOW L/MIN / FLOW L/MIN / AVG FLOW	FIBERS/FIELDS / VOLUME (L)	RESULTS Fibers/cc
RD15 / per / LV78	Matt Melton / Rope Gasket Removal / 574-34 7967 N7700 Tyvek	920 / 45 min /	1.5 / 1.5 /		
RD16 / OWA / LV60	S/West end of Retort / Rope Gasket Removal / As listed	910 / 516 /	3.5 / 3.5 /		
RD17 / OWA / LV91	N/East end of Retort / Rope Gasket Removal / As listed above	918 / 517 /	3.5 / 3.5 /		
RD18 / IWA / LV94	Mercury collection pods / remove rope/flange gaskets / As listed above	921 / 522 /	3.5 / 3.5 /		
RD19 / EX / LV78	Matt Melton / Cut metal flange gaskets / As listed	500 / 530 /	1.5 / 1.5 /		
RD20 / FB /					
RD21 / FB /					

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PCM Air Sample Report

Airborne Fiber Analysis by NIOSH Method 7400
"A" Counting Rules; issue 2, 8/15/94
PAT Lab #102739

WEC Project #: 00-485
Client Project#: 254

Report #: 4018
Rpt Date: 7/28/00

Alaska Abatement Corporation
520 W. 58th Avenue, Suite J
Anchorage, AK 99501

Collection Date: 23-Jul-00
Collected by: CLIENT
TAT: 24 Hour
 # Samples: 7

Project Name/Location: Red Devil Mine
Notes:

WEC Lab ID#	Client ID#	Sample Type	Vol (l)	Fibers/Field:	Fiber Density (F/mm2)	LOD	F/cc
A00-10432	RD-15	Personal	675.0	0.150	19.108	0.004	0.011
Location: Matt Milton: rope gasket removal.							
Comments:							
A00-10433	RD-16	OWA	1701.0	0.145	18.471	0.002	0.004
Location: Southwest end of retort - rope gasket removal - as lited.							
Comments:							
A00-10434	RD-17	OWA	1676.5	0.095	12.102	0.002	0.003
Location: North east end of retort - rope gasket removal - as listed above.							
Comments:							
A00-10435	RD-18	IWA	1683.5	0.050	6.369	0.002	<LOD
Location: Mercury collection pods - remove rope/ flauge gaskets.							
Comments:							
A00-10436	RD-19	Excursion	45.0	0.045	5.732	0.060	<LOD
Location: Matt Milton: cut metal - flauge gaskets - as listed.							
Comments:							
A00-10437	RD-20	Field Blank	0.0	0.000	0.000	N/A	N/A
Location: Field Blank							
Comments:							

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PCM Air Sample Report

Airborne Fiber Analysis by NIOSH Method 7400
"A" Counting Rules; issue 2, 8/15/94
PAT Lab #102739

WEC Project #: 00-485
Client Project#: 254

Report #: 4018
Rpt Date: 7/28/00

WEC Lab ID#	Client ID#	Sample Type	Vol (l)	Fibers/Field:	Fiber Density (F/mm2)	LOD	F/cc
A00-10438	RD-21	Field Blank	0.0	0.000	0.000	N/A	N/A

Location: Field Blank

Comments:

PCM Air Sample TWA Report

Worker	*Sample Date*	*SSN*	*Cert #*	*PPE*	*TWA*
Matt Milton	23-Jul-00	574347967	20000612	North 7700 Tyvek	0.014

Unable to include overloaded or voided samples in TWA calculations. Samples below the LOD are calculated as if those concentrations were equal to LOD value.

Unable create TWAs using overloaded and/or voided samples.

Analyst _____ **Date** 7/28/00
QC _____ **Date** 7/28/00

The Limit of Detection (LOD) is calculated based on 5 1/2 fibers in 100 fields(estimated as 3 times our average blank value), and is dependant on volume. Samples with concentrations below this calculated LOD are reported as "<LOD". Our Walton-Beckett Graticule area is 0.00785 mm2, as verified by stage micrometer quarterly. "Overload" means sample particulate excees the maximum loading allowable by the method counting rules. "VOID" implies either damage to the cassette observed in the lab. or field conditions determined by the Air Monitoring technician as sub-standard. TWA's are calculated on the basis of 480 minutes (8-hour TWA). Results are corrected by average blank count if blanks are provided with set. ENV=Enviornmental

Alaska Abatement Corporation

PROJECT NAME	AAC PROJECT NO
Red Devil mine	254
LOCATION: Red Devil AK	
CLIENT: BLM/HLA & Wilder	CLIENT PROJECT NO
DATE: 7-24-00	SHEET NO [1] OF [1]

FIELD DATA SHEET - ASBESTOS AIR MONITORING – (Continued)

SAMPLE ID# / SAMPLE TYPE / PUMP ID#	LOCATION / TASK / SS# AND PPE	START TIME / STOP TIME / TOTAL TIME	FLOW L/MIN / FLOW L/MIN / AVG. FLOW	FIBERS/FIELDS / VOLUME (L)	RESULTS Fibers/cc
22 / PER / LV78	FRITZ Corpuz / Lower Retort tubes / troft / N7100NPR Tyvek	105 / 445	1.5 / 1.5		
23 / OWA / LV60	EAST END of Retort Bldg. / clean Retort tubes / as listed above	106 / 515	3.5 / 3.5		
24 / OWA / LV91	west END of Retort Bldg / clean Retort tubes / as listed above	106 / 516	3.5 / 3.5		
25 / INA / LV94	Retort tube Building / clean tubes / As listed above	109 / 515	3.5 / 3.5		
26 / EX / LV78	FRITZ Corpuz / Double bag Accum / AS listed ABOVE	445 / 515	1.5 / 1.5		
27 / FB /	/ FB				
28 / FB /	/ FB				

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PCM Air Sample Report

Airborne Fiber Analysis by NIOSH Method 7400
"A" Counting Rules; issue 2, 8/15/94
PAT Lab #102739

WEC Project #: 00-485
Client Project#: 254

Report #: 4014
Rpt Date: 7/28/00

Client: **Alaska Abatement Corporation**
520 W. 58th Avenue, Suite J
Anchorage, AK 99501

Collection Date: 24-Jul-00
Collected by: CLIENT
TAT: 24 Hour
 # Samples: 7

Project Name/Location: Red Devil Mine
Notes:

WEC Lab ID#	Client ID#	Sample Type	Vol (l)	Fibers/Field:	Fiber Density (F/mm2)	LOD	F/cc
A00-10439	RD-22	Personal	330.0	-0.005	-0.637	0.008	<LOD
Location: Fritz Corpuz: lower retort tubes/ troft.							
Comments:							
A00-10440	RD-23	OWA	871.5	0.015	1.911	0.003	<LOD
Location: East end of retort building - clean retort tubes.							
Comments:							
A00-10441	RD-24	OWA	875.0	0.000	0.000	0.003	<LOD
Location: West end of retort building - clean tubes.							
Comments:							
A00-10442	RD-25	IWA	875.0	0.010	1.274	0.003	<LOD
Location: Retort tube building - clean tubes.							
Comments:							
A00-10443	RD-26	Excursion	45.0	0.025	3.185	0.060	<LOD
Location: Fritz Corpuz: double bag ACM.							
Comments:							
A00-10444	RD-27	Field Blank	0.0	0.000	0.000	N/A	N/A
Location: Field Blank							
Comments:							

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PCM Air Sample Report

Airborne Fiber Analysis by NIOSH Method 7400
"A" Counting Rules; issue 2, 8/15/94
PAT Lab #102739

WEC Project #: 00-485
Client Project#: 254

Report #: 4014
Rpt Date: 7/28/00

WEC Lab ID#	Client ID#	Sample Type	Vol (l)	Fibers/Field:	Fiber Density (F/mm2)	LOD	F/cc
A00-10445	RD-28	Field Blank	0.0	0.010	1.274	N/A	N/A

Location: Field Blank

Comments:

PCM Air Sample TWA Report

Worker	*Sample Date*	*SSN*	*Cert #*	*PPE*	*TWA*
Fritz Corpuz	24-Jul-00	574208428	3649	North 7700 Tyvek	0.007

Unable to include overloaded or voided samples in TWA calculations. Samples below the LOD are calculated as if those concentrations were equal to LOD value.

Unable create TWAs using overloaded and/or voided samples.

Analyst _____ **Date** 7/28/00
QC _____ **Date** 7/28/00

The Limit of Detection (LOD) is calculated based on 5 1/2 fibers in 100 fields(estimated as 3 times our average blank value), and is dependant on volume. Samples with concentrations below this calculated LOD are reported as "<LOD". Our Walton-Beckett Graticule area is 0.00785 mm2, as verified by stage micrometer quarterly "Overload" means sample particulate excees the maximum loading allowable by the method counting rules. "VOID" implies either damage to the cassette observed in the lab, or field conditions determined by the Air Monitoring technician as sub-standard. TWA's are calculated on the basis of 480 minutes (8-hour TWA). Results are corrected by average blank count if blanks are provided with set. ENV=Enviornmental

Alaska Abatement Corporation

PROJECT NAME	AAC PROJECT NO
Red Devil mine	254
LOCATION: Red Devil AK	
CLIENT: BLM/HLA & wilder	CLIENT PROJECT NO
DATE: 7-25-00	SHEET NO [1] OF [1]

FIELD DATA SHEET - ASBESTOS AIR MONITORING – (Continued)

SAMPLE ID# / SAMPLE TYPE / PUMP ID#	LOCATION / TASK / SS# AND PPE	START TIME / STOP TIME / TOTAL TIME	FLOW L/MIN / FLOW L/MIN / AVG. FLOW	FIBERS/FIELDS / VOLUME (L)	RESULTS Fibers/cc
RD 29 / per / LV78	Lance Willard / Clean merc trafts / N7700-OV SARANAC & tyvek 574-26-6036	731 / 400 /	1.5 / 1.5 /		
RD 30 / GWA / LV60	EAST end of Bldg / clean trafts / As listed	730 / 429 /	3.5 / 3.5 /		
RD 31 / GWA / LV91	West End of Bldg / clean trafts / As listed	729 / 428 /	3.5 / 3.5 /		
RD 32 / Iwa / LV94	Retort traft / clean trafts / As listed Above	736 / 427 /	3.5 / 3.5 /		
RD 33 / EX / LV78	Lance Willard 574-26-6036 / final clean work area / As listed	400 / 430 /	1.5 / 1.5 /		
RD 34 / FB /					
RD 35 / IB /					

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PCM Air Sample Report

Airborne Fiber Analysis by NIOSH Method 7400
"A" Counting Rules; issue 2, 8/15/94
PAT Lab #102739

WEC Project #: 00-485
Client Project#: 254

Report #: 4028
Rpt Date: 7/31/00

Alaska Abatement Corporation
520 W. 58th Avenue, Suite J
Anchorage, AK 99501

Collection Date: 25-Jul-00
Collected by: CLIENT
TAT: 24 Hour
 # Samples: 7

Project Name/Location: Red Devil Mine
Notes:

WEC Lab ID#	Client ID#	Sample Type	Vol (l)	Fibers/Field:	Fiber Density (F/mm2)	LOD	F/cc
A00-10446	RD-29	Personal	763.5	0.018	2.229	0.004	<LOD
Location: Lance Willard: clean merc trofts.							
Comments:							
A00-10447	RD-30	OWA	1886.5	0.003	0.318	0.001	<LOD
Location: East side of building - clean trofts.							
Comments:							
A00-10448	RD-31	OWA	1886.5	-0.003	-0.318	0.001	<LOD
Location: West side of building - clean trofts - as listed.							
Comments:							
A00-10449	RD-32	IWA	1858.5	0.018	2.229	0.001	<LOD
Location: Retort troft - clean trofts - as listed above.							
Comments:							
A00-10450	RD-33	Excursion	45.0	0.018	2.229	0.060	<LOD
Location: Lance Willard: final clean work area.							
Comments:							
A00-10451	RD-34	Field Blank	0.0	0.005	0.637	N/A	N/A
Location: Field Blank							
Comments:							

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PCM Air Sample Report

Airborne Fiber Analysis by NIOSH Method 7400
"A" Counting Rules; issue 2, 8/15/94
PAT Lab #102739

WEC Project #: 00-485
Client Project#: 254

Report #: 4028
Rpt Date: 7/31/00

WEC Lab ID#	Client ID#	Sample Type	Vol (l)	Fibers/Field:	Fiber Density (F/mm2)	LOD	F/cc
A00-10452	RD-35	Field Blank	0.0	0.000	0.000	N/A	N/A

Location: Field Blank

Comments:

PCM Air Sample TWA Report

Worker	*Sample Date*	*SSN*	*Cert #*	*PPE*	*TWA*
Lance Willard	25-Jul-00	574266036	19990979	Tyvek Saranac	0.007

Unable to include overloaded or voided samples in TWA calculations. Samples below the LOD are calculated as if those concentrations were equal to LOD value

Unable create TWAs using overloaded and/or voided samples.

Analyst _____ **Date** 7/31/00
QC _____ **Date** 7/31/00

The Limit of Detection (LOD) is calculated based on 5 1/2 fibers in 100 fields(estimated as 3 times our average blank value), and is dependant on volume. Samples with concentrations below this calculated LOD are reported as " LOD". Our Walton-Beckett Graticule area is 0.00785 mm2, as verified by stage micrometer quarterly. "Overload " means sample particulate excees the maximum loading allowable by the method counting rules. "VOID" implies either damage to the cassette observed in the lab, or field conditions determined by the Air Monitoring technician as sub-standard. TWA's are calculated on the basis of 480 minutes (8-hour TWA). Results are corrected by average blank count if blanks are provided with set. ENV=Enviornmental

Alaska Abatement Corporation

PROJECT NAME	AAC PROJECT NO.
Red Devil mine	254
LOCATION: Red Devil AK	
CLIENT: BLM HLA WILDER	CLIENT PROJECT NO.
DATE: 8-4-00	SHEET NO: 1 OF [1]

FIELD DATA SHEET - ASBESTOS AIR MONITORING

ANALYSIS REQUESTED (CIRCLE)	TURNAROUND REQUESTED	NUMBER OF SAMPLES	COLLECTION DATE
PCM TEM	Reg	4	8-4-00
COLLECTED BY: Rich Schedin	ROTOMETER IDENTIFIATION: AAC 19C6	SELECTED LABORATORY: WEC	SHIPPING METHOD: Hand deliver
SAMPLES RECIEVED BY: [illegible]	DATE/TIME: 8/10/00 12:10pm	ANALYSIS SIGNATURE	DATE/TIME

COMMENTS: Walk around entire mine site GATHER loose ACM VAT CAB & Gaskets Brake shoes Clutch pads NO Removal N7700 - Tyvek

SAMPLE ID #	LOCATION	START TIME	FLOW L/MIN	FIBERS/FIELDS	RESULTS Fibers/cc
1	Duane HART	1030	1.5		
SAMPLE TYPE: PCM	TASK: GATHER loose ACM	STOP TIME: 230	FLOW L/MIN: 1.5		
PUMP ID #: LV12	SS # AND PPE: North 7700-30 Tyvek 5747 4098	TOTAL TIME	AVG. FLOW	VOLUME (L)	
SAMPLE ID # 2	LOCATION: Duane HART	START TIME: 230	FLOW L/MIN: 1.5	FIBERS/FIELDS	RESULTS Fibers/cc
SAMPLE TYPE: EX	TASK: Bag ACM	STOP TIME: 300	FLOW L/MIN: 1.5		
PUMP ID #: LV12	SS # AND PPE: As listed	TOTAL TIME	AVG. FLOW	VOLUME (L)	
SAMPLE ID # 3	LOCATION	START TIME	FLOW L/MIN	FIBERS/FIELDS	RESULTS Fibers/cc
SAMPLE TYPE: FB	TASK	STOP TIME	FLOW L/MIN		
PUMP ID #	SS # AND PPE	TOTAL TIME	AVG. FLOW	VOLUME (L)	
SAMPLE ID # 4	LOCATION	START TIME	FLOW L/MIN	FIBERS/FIELDS	RESULTS Fibers/cc
SAMPLE TYPE: FB	TASK	STOP TIME	FLOW L/MIN		
PUMP ID #	SS # AND PPE	TOTAL TIME	AVG. FLOW	VOLUME (L)	
SAMPLE ID #	LOCATION	START TIME	FLOW L/MIN	FIBERS/FIELDS	RESULTS Fibers/cc
SAMPLE TYPE	TASK	STOP TIME	FLOW L/MIN		
PUMP ID #	SS # AND PPE	TOTAL TIME	AVG. FLOW	VOLUME (L)	
SAMPLE ID #	LOCATION	START TIME	FLOW L/MIN	FIBERS/FIELDS	RESULTS Fibers/cc
SAMPLE TYPE	TASK	STOP TIME	FLOW L/MIN		
PUMP ID #	SS # AND PPE	TOTAL TIME	AVG. FLOW	VOLUME (L)	

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Air Sample Report

Airborne Fiber Analysis by NIOSH Method 7400
"A" Counting Rules; issue 2, 8/15/94
PAT Lab #102739

WEC Project #: 00-485
Client Project#: 254

Report #: 4203
Rpt Date: 8/11/00

Alaska Abatement Corporation
520 W. 58th Avenue, Suite J
Anchorage, AK 99501

Collection Date: 04-Aug-00
Collected by: CLIENT
TAT: 24 Hour
 # Samples: 4

Project Name/Location: Red Devil Mine
Notes:

WEC Lab ID#	Client ID#	Sample Type	Vol (l)	Fibers/Field:	Fiber Density (F/mm2)	LOD	F/cc
A00-11333	1	Personal	360.0	0.125	15.924	0.007	0.017
Location: Duane Hart: gather loose ACM.							
Comments:							
A00-11334	2	Excursion	45.0	0.010	1.274	0.060	<LOD
Location: Duane Hart: bag ACM as listed.							
Comments:							
A00-11335	3	Field Blank	0.0	0.000	0.000	N/A	N/A
Location: Field Blank							
Comments:							
A00-11336	4	Field Blank	0.0	0.000	0.000	N/A	N/A
Location: Field Blank							
Comments:							

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PCM Air Sample Report

Airborne Fiber Analysis by NIOSH Method 7400
"A" Counting Rules; issue 2, 8/15/94
PAT Lab #102739

WEC Project #: 00-485
Client Project#: 254

Report #: 4203
Rpt Date: 8/11/00

WEC Lab ID#	Client ID#	Sample Type	Vol (l)	Fibers/Field:	Fiber Density (F/mm2)	LOD	F/cc

PCM Air Sample TWA Report

Worker	*Sample Date*	*SSN*	*Cert #*	*PPE*	*TWA*
Duane Hart	04-Aug-00	574744098	not provided	North 7700 Tyvek	0.012

Unable to include overloaded or voided samples in TWA calculations. Samples below the LOD are calculated as if those concentrations were equal to LOD value.

Unable create TWAs using overloaded and/or voided samples.

Analyst _____ **Date** 8-11-00
QC _____ **Date** 8-11-00

The Limit of Detection (LOD) is calculated based on 5 1/2 fibers in 100 fields(estimated as 3 times our average blank value), and is dependant on volume. Samples with concentrations below this calculated LOD are reported as " LOD" Our Walton-Beckett Graticule area is 0.00785 mm2, as verified by stage micrometer quarterly "Overload " means sample particulate excees the maximum loading allowable by the method counting rules. "VOID" implies either damage to the cassette observed in the lab or field conditions determined by the Air Monitoring technician as sub-standard. TWA's are calculated on the basis of 480 minutes (8-hour TWA). Results are corrected by average blank count if blanks are provided with set. ENV=Enviornmental

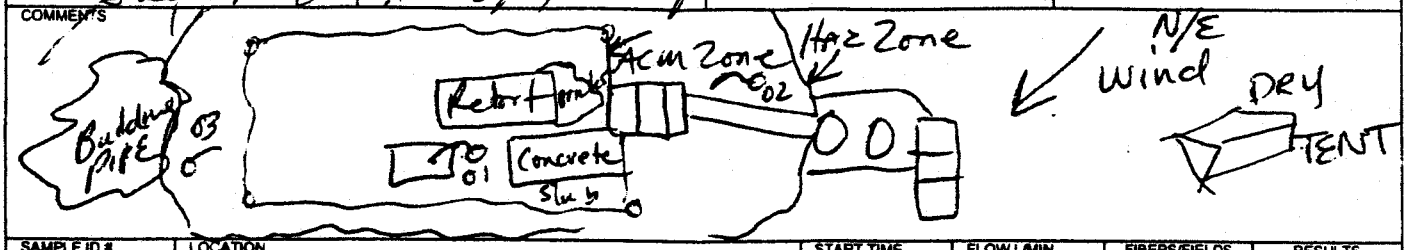
Alaska Abatement Corporation

PROJECT NAME: RED Devil mine	AAC PROJECT NO.: 254
LOCATION: Red Devil mine	
CLIENT: HLA/BLM/WILDER	CLIENT PROJECT NO:
DATE: 8-7-00	SHEET NO: 1 OF [1]

FIELD DATA SHEET - ASBESTOS AIR MONITORING

ANALYSIS REQUESTED (CIRCLE)	TURNAROUND REQUESTED	NUMBER OF SAMPLES	COLLECTION DATE
PCM TEM	Reg	7	8-7-00
COLLECTED BY: Rich Scheideman	ROTOMETER IDENTIFIATION: AAC 1906	SELECTED LABORATORY: WEC	SHIPPING METHOD: hand deliver
SAMPLES RECIEVED BY: Sabel Cruz	DATE/TIME: 08/10/00 12:10 p	ANALYSIS SIGNATURE:	DATE/TIME:

COMMENTS



SAMPLE ID #	LOCATION	START TIME	FLOW L/MIN	FIBERS/FIELDS	RESULTS Fibers/cc
RD01	on Furnace	902	3.5		
SAMPLE TYPE: EWA	TASK: Remove bricks	STOP TIME: 447	FLOW L/MIN: 3.5		
PUMP ID #: LV6	SS # AND PPE: N7700 HEPA/MV SARANAC	TOTAL TIME	AVG FLOW	VOLUME (L)	
SAMPLE ID # RD02	LOCATION: next to Haz Decon	START TIME 905	FLOW L/MIN 3.5	FIBERS/FIELDS	RESULTS Fibers/cc
SAMPLE TYPE OWA	TASK: Remove bricks	STOP TIME 448	FLOW L/MIN 3.5		
PUMP ID # LV69	SS # AND PPE: As listed	TOTAL TIME	AVG FLOW	VOLUME (L)	
SAMPLE ID # RD03	LOCATION: Next to Retort Building pile	START TIME 907	FLOW L/MIN 3.5	FIBERS/FIELDS	RESULTS Fibers/cc
SAMPLE TYPE OWA	TASK: Remove Bricks	STOP TIME 448	FLOW L/MIN 3.5		
PUMP ID # LV2	SS # AND PPE: As listed	TOTAL TIME	AVG. FLOW	VOLUME (L)	
SAMPLE ID # RD04	LOCATION: FRITZ Corpuz	START TIME 908	FLOW L/MIN 1.5	FIBERS/FIELDS	RESULTS Fibers/cc
SAMPLE TYPE per	TASK: Remove Bricks	STOP TIME 410	FLOW L/MIN 1.5		
PUMP ID # LV12	SS # AND PPE: 574204424 N7700 SARANAC	TOTAL TIME	AVG. FLOW	VOLUME (L)	
SAMPLE ID # RD05	LOCATION: FRITZ Corpuz	START TIME 415	FLOW L/MIN 1.5	FIBERS/FIELDS	RESULTS Fibers/cc
SAMPLE TYPE EX	TASK: Remove Bricks /Seal bags	STOP TIME 445	FLOW L/MIN 1.5		
PUMP ID # LV12	SS # AND PPE: 574204424 N7700 SARANAC	TOTAL TIME	AVG FLOW	VOLUME (L)	
SAMPLE ID # RD06	LOCATION	START TIME	FLOW L/MIN	FIBERS/FIELDS	RESULTS Fibers/cc
SAMPLE TYPE FB	TASK	STOP TIME	FLOW L/MIN		
PUMP ID #	SS # AND PPE	TOTAL TIME	AVG. FLOW	VOLUME (L)	

RD07 FB

WHITE - Laboratory YELLOW - Job Book PINK - Supervisor's Copy

WHITE ENVIRONMENTAL CONSULTANTS INC.
731 I St. Suite 201 Anchorage, Ak 99501 (907) 258-8661

Air Sample Report

Airborne Fiber Analysis by NIOSH Method 7400
"A" Counting Rules; issue 2, 8/15/94
PAT Lab #102739

WEC Project #: 00-485
Client Project#: 254

Report #: 4202
Rpt Date: 8/11/00

Alaska Abatement Corporation
520 W. 58th Avenue, Suite J
Anchorage, AK 99501

Collection Date: 10-Aug-00
Collected by: CLIENT
TAT: 24 Hour
Samples: 7

Project Name/Location: Red Devil Mine
Notes:

WEC Lab ID#	Client ID#	Sample Type	Vol (l)	Fibers/Field:	Fiber Density (F/mm2)	LOD	F/cc
A00-11344	RD01	IWA	1627.5	-0.005	-0.637	0.002	<LOD
Location: On finance - remove bricks.							
Comments:							
A00-11345	RD02	OWA	1620.5	0.030	3.822	0.002	<LOD
Location: Next to decon - remove bricks as listed.							
Comments:							
A00-11346	RD03	OWA	1613.5	0.020	2.548	0.002	<LOD
Location: Next to retort building pile - remove bricks as listed.							
Comments:							
A00-11347	RD04	Personal	633.0	0.030	3.822	0.004	<LOD
Location: Fritz Corpuz: remove bricks.							
Comments:							
A00-11348	RD05	Excursion	45.0	0.000	0.000	0.060	<LOD
Location: Fritz Corpuz: remove bricks/ seal bags.							
Comments:							
A00-11349	RD06	Field Blank	0.0	0.010	1.274	N/A	N/A
Location: Field Blank							
Comments:							

WHITE ENVIRONMENTAL CONSULTANTS INC.
731 I St. Suite 201 Anchorage, Ak 99501 (907) 258-8661

Sample Report

Airborne Fiber Analysis by NIOSH Method 7400
"A" Counting Rules; issue 2, 8/15/94
PAT Lab #102739

WEC Project #: 00-485
Client Project#: 254
Report #: 4202
Rpt Date: 8/11/00

WEC Lab ID#	Client ID#	Sample Type	Vol (l)	Fibers/Field:	Fiber Density (F/mm2)	LOD	F/cc
A00-11350	RD06	Field Blank	0.0	0.000	0.000	N/A	N/A

Location: Field Blank

Comments:

PCM Air Sample TWA Report

Worker	*Sample Date*	*SSN*	*Cert #*	*PPE*	*TWA*
Fritz Corpuz	10-Aug-00	574208428	3649	North 7700	0.007

Unable to include overloaded or voided samples in TWA calculations. Samples below the LOD are calculated as if those concentrations were equal to LOD value.

Unable create TWAs using overloaded and/or voided samples.

Analyst _____ **Date** 8-11-00
QC _____ **Date** 8-11-00

The Limit of Detection (LOD) is calculated based on 5 1/2 fibers in 100 fields(estimated as 3 times our average blank value), and is dependant on volume. Samples with concentrations below this calculated LOD are reported as " LOD". Our Walton-Beckett Graticule area is 0.00785 mm2, as verified by stage micrometer quarterly. *"Overload " means sample particulate excees the maximum loading allowable by the method counting rules.* "VOID" implies either damage to the cassette observed in the lab. or field conditions determined by the Air Monitoring technician as sub-standard. TWA's are calculated on the basis of 480 minutes (8-hour TWA). Results are corrected by *average blank count if blanks are provided with set* ENV=Enviommental

Alaska Abatement Corporation

PROJECT NAME	AAC PROJECT NO.
Red Devil Mine	254
LOCATION: Red Devil	
CLIENT: BLM #LA/WILDER	CLIENT PROJECT NO
DATE: 8-8-00	SHEET NO: 1 OF [1]

FIELD DATA SHEET - ASBESTOS AIR MONITORING

ANALYSIS REQUESTED (CIRCLE)	TURNAROUND REQUESTED	NUMBER OF SAMPLES	COLLECTION DATE
PCM TEM	Reg	7	8-8-00
COLLECTED BY: Rick Schuchmann	ROTOMETER IDENTIFIATION: AAC	SELECTED LABORATORY: WEC	SHIPPING METHOD: hand deliver
SAMPLES RECIEVED BY: [signature]	DATE/TIME: 8/10/00 12:10 p	ANALYSIS SIGNATURE	DATE/TIME

COMMENTS: Brick Removal Retort N7700-30 NPR Saranac. Rain All day off and on 47° No wind

SAMPLE ID #	LOCATION	START TIME	FLOW L/MIN	FIBERS/FIELDS	RESULTS Fibers/cc
RD08	On Furnace	835	3.5		
SAMPLE TYPE: Twa	TASK: Remove Bricks	STOP TIME: 445	FLOW L/MIN: 3.5		
PUMP ID #: LV6	SS # AND PPE	TOTAL TIME	AVG. FLOW	VOLUME (L)	

SAMPLE ID #	LOCATION	START TIME	FLOW L/MIN	FIBERS/FIELDS	RESULTS Fibers/cc
RD09	Next to Haz decon	837	3.5		
SAMPLE TYPE: Twa	TASK: Remove Bricks	STOP TIME: 447	FLOW L/MIN: 3.5		
PUMP ID #: LV69	SS # AND PPE	TOTAL TIME	AVG. FLOW	VOLUME (L)	

SAMPLE ID #	LOCATION	START TIME	FLOW L/MIN	FIBERS/FIELDS	RESULTS Fibers/cc
RD10	Retort Building pile	842	3.5		
SAMPLE TYPE: Twa	TASK: Remove Bricks	STOP TIME: 4:43pm	FLOW L/MIN: 3.5		
PUMP ID #: LV2	SS # AND PPE	TOTAL TIME	AVG. FLOW	VOLUME (L)	

SAMPLE ID #	LOCATION	START TIME	FLOW L/MIN	FIBERS/FIELDS	RESULTS Fibers/cc
RD11	Lance Willard	930am	1.5		
SAMPLE TYPE: Per	TASK: Remove Bricks	STOP TIME: 410	FLOW L/MIN: 1.5		
PUMP ID #: LV12	SS # AND PPE: 574266035 N7700 NPR Saranac	TOTAL TIME	AVG. FLOW	VOLUME (L)	

SAMPLE ID #	LOCATION	START TIME	FLOW L/MIN	FIBERS/FIELDS	RESULTS Fibers/cc
RD12	Lance Willard	410	1.5		
SAMPLE TYPE: ex	TASK: Pack bags into S/stack	STOP TIME: 440	FLOW L/MIN: 1.5		
PUMP ID #: LV12	SS # AND PPE: 574266035 N7700 NPR Saranac	TOTAL TIME	AVG. FLOW	VOLUME (L)	

SAMPLE ID #	LOCATION	START TIME	FLOW L/MIN	FIBERS/FIELDS	RESULTS Fibers/cc
RD13					
SAMPLE TYPE: FB	TASK	STOP TIME	FLOW L/MIN		
PUMP ID #	SS # AND PPE	TOTAL TIME	AVG. FLOW	VOLUME (L)	

RD14 FB

WHITE - Laboratory YELLOW - Job Book PINK - Supervisor's Copy

WHITE ENVIRONMENTAL CONSULTANTS INC.
731 I St. Suite 201 Anchorage, Ak 99501 (907) 258-8661

Fiber Air Sample Report

Airborne Fiber Analysis by NIOSH Method 7400
"A" Counting Rules; issue 2, 8/15/94
PAT Lab #102739

WEC Project #: 00-485
Client Project#: 254

Report #: 4204
Rpt Date: 8/11/00

Alaska Abatement Corporation
520 W. 58th Avenue, Suite J
Anchorage, AK 99501

Collection Date: 10-Aug-00
Collected by: CLIENT
TAT: 24 Hour
 # Samples: 7

Project Name/Location: Red Devil Mine
Notes:

WEC Lab ID#	Client ID#	Sample Type	Vol (l)	Fibers/Field:	Fiber Density (F/mm2)	LOD	F/cc
A00-11337	RD08	IWA	1715.0	0.010	1.274	0.002	<LOD
Location: On furnance - remove bricks.							
Comments:							
A00-11338	RD09	OWA	1715.0	0.000	0.000	0.002	<LOD
Location: Next to haz decon - remove bricks.							
Comments:							
A00-11339	RD10	OWA	1683.5	0.000	0.000	0.002	<LOD
Location: Retort building pile - remove bricks.							
Comments:							
A00-11340	RD11	Personal	600.0	0.000	0.000	0.004	<LOD
Location: Lance Willard: remove bricks.							
Comments:							
A00-11341	RD12	Excursion	45.0	0.000	0.000	0.060	<LOD
Location: Lance Willard: pack bags into s/sack.							
Comments:							
A00-11342	RD13	Field Blank	0.0	0.010	1.274	N/A	N/A
Location: Field Blank							
Comments:							

WHITE ENVIRONMENTAL CONSULTANTS INC.
731 I St. Suite 201 Anchorage, Ak 99501 (907) 258-8661

Sample Report

Airborne Fiber Analysis by NIOSH Method 7400
"A" Counting Rules; issue 2, 8/15/94
PAT Lab #102739

WEC Project #: 00-485
Client Project#: 254

Report #: 4204
Rpt Date: 8/11/00

WEC Lab ID#	Client ID#	Sample Type	Vol (l)	Fibers/Field:	Fiber Density (F/mm2)	LOD	F/cc
A00-11343	RD14	Field Blank	0.0	0.010	1.274	N/A	N/A

Location: Field Blank

Comments:

PCM Air Sample TWA Report

Worker	*Sample Date*	*SSN*	*Cert #*	*PPE*	*TWA*
Lance Willard	10-Aug-00	574266036	19990979	North 7700	0.007

Unable to include overloaded or voided samples in TWA calculations. Samples below the LOD are calculated as if those concentrations were equal to LOD value.

Unable create TWAs using overloaded and/or voided samples.

Analyst _____ **Date** 8-11-00
QC _____ **Date** 8-11-00

The Limit of Detection (LOD) is calculated based on 5 1/2 fibers in 100 fields(estimated as 3 times our average blank value), and is dependant on volume. Samples with concentrations below this calculated LOD are reported as " LOD". Our Walton-Beckett Graticule area is 0.00785 mm2, as verified by stage micrometer quarterly. "Overload" means sample particulate excees the maximum loading allowable by the method counting rules. "VOID" implies either damage to the cassette observed in the lab, or field conditions determined by the Air Monitoring technician as sub-standard. TWA's are calculated on the basis of 480 minutes (8-hour TWA). Results are corrected by average blank count if blanks are provided with set. ENV=Environmental

Municipality of Anchorage

Solid Waste Services
1111 East 56th Avenue, 99518
P.O. Box 196650 Anchorage, Alaska 99519-6650
Telephone: (907) 343-6262
Fax: (907) 561-1357
email:wwsws@ci.anchorage.ak.us

George P. Wuerch,
Mayor

July 31, 2000

Harvey Frankel
Alaska Abatement Corporation
520 West 58th Avenue, Suite J
Anchorage, AK 99518

Re: **ASBESTOS DISPOSAL AUTHORIZATION NUMBER AS20150** Retort Building, Red Devil Mine, Red Devil, Alaska AAC#254-00 (your July 31, 2000, EPA notification)

Dear Mr. Frankel:

This is in response to your request for authorization to dispose of approximately 25,000 pounds of various regulated friable and nonregulated nonfriable ACM generated from the renovation activities at the referenced location (AAC#254-00). You are authorized to dispose of this ACM at the Anchorage Regional Landfill (ARL) providing the following provisos are met:

1. Specific disposal arrangements are made via facsimile transmission with the ARL General Foreman, Mr. Nissen, 428-1697, at least 24 hours prior to bringing the ACM to the ARL. Please include the approximate delivery time by specifying the hour of the day between 09:00-12:00 AM and 13:00 –16:00 PM on Wednesdays or Thursdays. **If you are unable to deliver this material at the pre-arranged time, you must reschedule for a different time and date. If you miss the pre-arranged time, and do not reschedule for a different time and date, do not attempt to bring the material to the ARL, for the load will be considered as an unscheduled ACM disposal and refused at the Scalehouse.**

2. ACM will be accepted only on Wednesdays and Thursdays between 09:00 AM - 12:00 M and 13:00 - 16:00 PM. Off loading of ACM will not be permitted during the Noon Lunch hour; please adjust your transportation schedule accordingly. Regardless of the type of ACM, **NO** asbestos will be accepted at the working face after 16:00 P.M.; the ACM transporter **MUST** remove his vehicle from the working face no later than 16:00 P.M. If the ACM transporter is not finished off loading the ACM load by 16:00 P.M., he **MUST** leave the working face and reschedule another disposal date to finish the ACM off loading. Advise your ACM transporter that no transport vehicle or trailer will be left, either attended or unattended, at the working face without a means of being moved by the ACM transporter.

3. The ACM Disposer will weigh in and out at the Scalehouse for each load brought to the ARL. This letter and the enclosed SWS ASBESTOS WASTE SHIPPING RECORD (AWSR) must be shown to the ARL Scalehouse Attendant at the time the Disposer brings the ACM to the Landfill. I have annotated the SWS ACM Authorization Number, **AS20150** on your copy of the AWSR. I ask that you provide SWS with a copy of the AWSR with Sections 1 through 11 completed when each load is brought to the Landfill.

4. ACM must be packaged, marked, transported and placed in the ARL in accordance with all Federal, State, and Municipal regulations. You are reminded that unless the composite samples for the wall system meet the NESHAPS and ADEC criteria for ACM, SWS considers the wall system debris to be general demolition debris and not subject to the provisos of the SWS Asbestos Waste Disposal Policy.

5. The ACM Disposer is responsible for the safe placement of the ACM in the Landfill.

6. Any ACM containers determined by SWS to be inadequate will be repackaged or removed immediately from the ARL by the Disposer.

7. The disposal fee for ACM generated outside the Municipality of Anchorage is at a rate of ***$90.00 per ton***. A special ACM handling fee of ***$40.00 per one-half hour*** will be charged based on the time the ACM transporter arrives at the designated ACM disposal area until the transport vehicle departs the area for weigh out. If you have questions concerning the method of payment, please contact Ms. Nistler, SWS Customer Service Supervisor, **343-6251**.

8. Scrounging at the ARL is in violation of SWS regulations and the ADEC Operating Permit. Should a transporter be observed scrounging at the ARL working face, that individual will be subject to being barred from the landfill.

9. **This authorization expires at 16:00 October 31, 2000.** The Authorization Number will be deactivated at the same time.

The Alaska Department of Environmental Conservation Landfill Operating Permit 9621 BA001 authorizes the Anchorage Regional Landfill to accept asbestos waste materials for disposal. Please call me if you have need of further assistance.

Sincerely,

Michael I. Blair
Project Administrator

Encl.: SWS AWSR # AS20150

cc: Rick Nissen, ARL General Foreman
Mia Nistler, Customer Service Supervisor
ARL Scalehouse Attendant
Ann Wawrukiewicz, Environmental Specialist, USEPA Region 10, OAQ-107, 1200 Sixth Avenue, Seattle, WA 98101

MUNICIPALITY OF ANCHORAGE, SOLID WASTE SERVICES
ASBESTOS WASTE SHIPMENT RECORD

1. Work Site Name & Mailing Address: Retort Building, Red Devil Mine, Red Devil, AK 99656 AAC #254-00
Owner's Name: US Dept. of Interior, BLM
Owner's Phone: 907-267-14[illegible]

2. Operator's Name & Address: Alaska Abatement Corp., 520 W. 58th Ave., Suite J, Anchorage, AK 99518
Operator's Phone: 907-563-0086

3. Waste Disposal Site: MUNICIPALITY OF ANCHORAGE, SOLID WASTE SERVICES
ANCHORAGE REGIONAL LANDFILL, HILAND ROAD
ANCHORAGE, ALASKA
TELE 907-428-0864 FAX 907-428-1697
SWS Authorization: AS# 20150 expires 1600 10/31/00
SWS Contact Phone: 907-343-6278

4. Name & Address of Responsible Agency: EPA REGION 10, ASBESTOS PROGRAM
1200 Sixth Avenue, Seattle, WA 98101
1-800-424-4372

GENERATOR

5. Description of Materials: VAT CAPS GASKETS Brake pads clutch pads

6. Containers No.	Type	7. Total Quantity (Cubic Yards)
3	BA	2

8. Special Handling Instructions & Additional Information: K.Q. ASBESTOS NA2212 Class 9 PG-III

9. Operator's Certification: I HEREBY DECLARE THAT THE CONTENTS OF THIS CONSIGNMENT ARE FULLY AND ACCURATELY DESCRIBED ABOVE BY PROPER SHIPPING NAME & ARE CLASSIFIED, PACKED, MARKED, AND LABELED AND ARE IN ALL RESPECTS IN PROPER CONDITION FOR TRANSPORT BY HIGHWAY ACCORDING TO APPLICABLE INTERNATIONAL & GOVERNMENTAL REGULATIONS.

Printed/Typed Name & Title: Rich Scheidemann Supervisor
Signature: [signature]
Date: 8-9-00

TRANSPORTER

10. Transporter 1 (Acknowledgment of Receipt of Materials)
Printed/Typed Name & Title: Jason Wells Pivot LLC
Address & Telephone: [illegible] Anchorage AK
Signature: [signature]
Date: 8/1[illegible]/00

11. Transporter 2 (Acknowledgment of Receipt of Materials)
Printed/Typed Name & Title: Phillip Roberson Driver
Address & Telephone: 520 W. 58th Ave., Ste J Anchorage, AK 99518 563-0088
Signature: [signature]
Date: 08/23/00

DISPOSAL SITE

12. Discrepancies Noted:

13. Waste Disposal Site Owner or Operator:
I certify that I have received the asbestos materials noted in Section 5 except as noted in Section 12, Discrepancies.
Arrival Time: 2:05 Departure Time: 2:10 Total Time: 5 min.

Printed/Typed Names & Title	Signature	Date	SWS Weight Invoice #
[illegible] W. Bernstine RDU 1	[signature]	8-23-00	150467

MUNICIPALITY OF ANCHORAGE, SOLID WASTE SERVICES
ASBESTOS WASTE SHIPMENT RECORD

1. Work Site Name & Mailing Address: Retort Building, Red Devil Mine, Red Devil, AK 99656 AAC #254-00
Owner's Name: US Dept. of Interior, BLM
Owner's Phone: 907-267-1442

2. Operator's Name & Address: Alaska Abatement Corp., 520 W. 58th Ave., Suite J, Anchorage, AK 99518
Operator's Phone: 907-563-0088

3. Waste Disposal Site: MUNICIPALITY OF ANCHORAGE, SOLID WASTE SERVICES
ANCHORAGE REGIONAL LANDFILL, HILAND ROAD
ANCHORAGE, ALASKA
TELE 907-428-0684 FAX 907-428-1697
SWS Authorization: AS# 20150 expires 1600 10/31/00
SWS Contact Phone: 907-343-6278

4. Name & Address of Responsible Agency: EPA REGION 10, ASBESTOS PROGRAM
1200 Sixth Avenue, Seattle, WA 98101
1-800-424-4372

GENERATOR

5. Description of Materials: TSF, VAT & CAB

6. Containers No.	Type	7. Total Quantity (Cubic Yards)
3	C.BA	3-D

8. Special Handling Instructions & Additional Information: "Asbestos 9, NA 2212 III, RQ"

9. Operator's Certification: I HEREBY DECLARE THAT THE CONTENTS OF THIS CONSIGNMENT ARE FULLY AND ACCURATELY DESCRIBED ABOVE BY PROPER SHIPPING NAME & ARE CLASSIFIED, PACKED, MARKED, AND LABELED AND ARE IN ALL RESPECTS IN PROPER CONDITION FOR TRANSPORT BY HIGHWAY ACCORDING TO APPLICABLE INTERNATIONAL & GOVERNMENTAL REGULATIONS.

Printed/Typed Name & Title: Richard Scheideman - Supervisor
Signature: [signature]
Date: 7-26-00

TRANSPORTER

10. Transporter 1 (Acknowledgment of Receipt of Materials)
Printed/Typed Name & Title: Lynden Air Cargo
Address & Telephone: 6441 So. Airpark Place, Anchorage, AK 99502 243-6150
Signature: [signature]
Date: 7-31-00

11. Transporter 2 (Acknowledgment of Receipt of Materials)
Printed/Typed Name & Title: Rich Schuchman Driver
Address & Telephone: 520 W. 58th Ave. Ste J. Anchorage, AK 99518 563-0088
Signature: [signature]
Date: 8-2-00

DISPOSAL SITE

12. Discrepancies Noted:

13. Waste Disposal Site Owner or Operator:
I certify that I have received the asbestos materials noted in Section 5 except as noted in Section 12. Discrepancies.
Arrival Time: 9:20 Departure Time: 9:30 Total Time: 10 min

Printed/Typed Names & Title	Signature	Date	SWS Weight Invoice #
Ruth W. Bernstein RDM	[signature]	8-2-00	147864

Recieved Time Jul.31. 9:05AM

MUNICIPALITY OF ANCHORAGE, SOLID WASTE SERVICES
ASBESTOS WASTE SHIPMENT RECORD

GENERATOR

1. Work Site Name & Mailing Address: Retort Building, Red Devil Mine, Red Devil, AK 99656 AAC #254-00
Owner's Name: US Dept. of Interior, BLM
Owner's Phone: 907-267-1442

2. Operator's Name & Address: Alaska Abatement Corp., 520 W. 58th Ave., Suite J, Anchorage, AK 99518
Operator's Phone: 907-563-0088

3. Waste Disposal Site: MUNICIPALITY OF ANCHORAGE, SOLID WASTE SERVICES
ANCHORAGE REGIONAL LANDFILL, HILAND ROAD
ANCHORAGE, ALASKA
TELE 907-428-0884 FAX 907-428-1697
SWS Authorization: AS# 20150 expires 1600 10/31/00
SWS Contact Phone: 907-343-6278

4. Name & Address of Responsible Agency: EPA REGION 10, ASBESTOS PROGRAM
1200 Sixth Avenue, Seattle, WA 98101
1-800-424-4372

5. Description of Materials: T, SF, VAT & CAB

6. Containers No.	Type	7. Total Quantity (Cubic Yards)
3	5 BA	3-D

8. Special Handling Instructions & Additional Information: "Asbestos 9, NA 2212 III, RQ"

9. Operator's Certification: I HEREBY DECLARE THAT THE CONTENTS OF THIS CONSIGNMENT ARE FULLY AND ACCURATELY DESCRIBED ABOVE BY PROPER SHIPPING NAME & ARE CLASSIFIED, PACKED, MARKED, AND LABELED AND ARE IN ALL RESPECTS IN PROPER CONDITION FOR TRANSPORT BY HIGHWAY ACCORDING TO APPLICABLE INTERNATIONAL & GOVERNMENTAL REGULATIONS.

Printed/Typed Name & Title: Richard Scheideman - Supervisor
Signature: [signature]
Date: 7-26-00

TRANSPORTER

10. Transporter 1 (Acknowledgment of Receipt of Materials)
Printed/Typed Name & Title: Lynden Air ~~Freight~~ CARGO
Address & Telephone: 6441 So. Airpark Place Anchorage, AK 99502 243-6150
Signature: [signature]
Date: 7-31-00

11. Transporter 2 (Acknowledgment of Receipt of Materials)
Printed/Typed Name & Title: Rich Saldin DRIVER
Address & Telephone: 520 West 58th Ave. Ste J. Anchorage, AK 99518 563-0088
Signature: [signature]
Date: 8-2-00

DISPOSAL SITE

12. Discrepancies Noted:

13. Waste Disposal Site Owner or Operator:
I certify that I have received the asbestos materials noted in Section 5 except as noted in Section 12, Discrepancies.
Arrival Time: 9:20 Departure Time: 9:30 Total Time: 10 min.

Printed/Typed Names & Title	Signature	Date	SWS Weight Invoice #
Kurt W. Beerstin RDU1	[signature]	8-2-00	147864

Recieved Time Jul.31. 9:06AM

APPENDIX L

APPENDIX L

SURVEY REPORT

Project Notes for
the
Control, Locative and Topographic Surveys
of

Red Devil Mine Site

Red Devil, Alaska

Survey of: October 11-12, 2000

Prepared for : **Harding-Lawson Associates**
601 East 57th Place
Anchorage, Alaska 99518

Attn: Mike Schmetzer

Prepared by : **Terra Surveys, LLC**
1930 South Whiting Circle
P.O.Box 1549
Palmer, Alaska 99645

Attn: Thomas Newman or Larry Whiting
(907) 745-7215

Terra Project ID: 00-036
Hand Delivered: 6 November, 2000

Red Devil, Alaska
Red Devil Mine Site
Control, Locative and Topographic Surveys
October 11-12, 2000

This survey was performed for Harding Lawson Associates by Terra Surveys, LLC on October 11-12, 2000. Three survey control monuments were established in reasonably permanent and stable locations and five additional temporary survey control points were set. Five Monitor Well locations and two soil Boring locations were tied in addition to four Geo-Tech boring locations. 28 Sample Locations were tied as well as 82 Field Screening locations. A topographic survey was conducted of the tailings area bound on the south by the Retort Building and extending to the edge of Red Devil Creek to the north; bound on the east by the settling pond and extending west to the edge of the steam plant pad. The topography required approximately 180 ground shots.

The survey control monuments set for this project consist of a 2" aluminum survey cap fixed to a 5/8" x 30" rebar driven to approximately 0.2' below existing ground surface. The Al-caps were stamped with unique identifying marks which included Terra Surveys, HLA, the monument name and year set (2000). Alaska State Plane Coordinates were assigned to these monuments using GPS data observed at each monument processed with CORS data obtained through the NGS/NOAA CORS web-site. CORS is an acronym for a system of Continuously Operating Reference Stations maintained by the National Geodetic Survey. Data from the Kenai and Cold Bay CORS sites were utilized for this project.

Conventional (optical) survey instruments were utilized in performing a closed loop traverse through the survey control monuments and additional survey control points were established, as needed, using spur point traverse techniques (doubled angle with a horizon closure). All horizontal closures were well within prescribed accuracy requirements. The locative ties and topographic points were side-shot from these control points.

Vertical control was based on an assumed elevation of 500.00' assigned to survey control monument "RDM-03 2000". A differential level-loop was run through all survey control points and loop closure was well within prescribed accuracy requirements.

Prior to commencement of this field survey, Haz-mat safety issues were discussed at length with HLA Field Engineer, Charlie Marshall. Protective over-boots were worn at all times while on site and several tail-gate safety sessions were performed during the course of work.

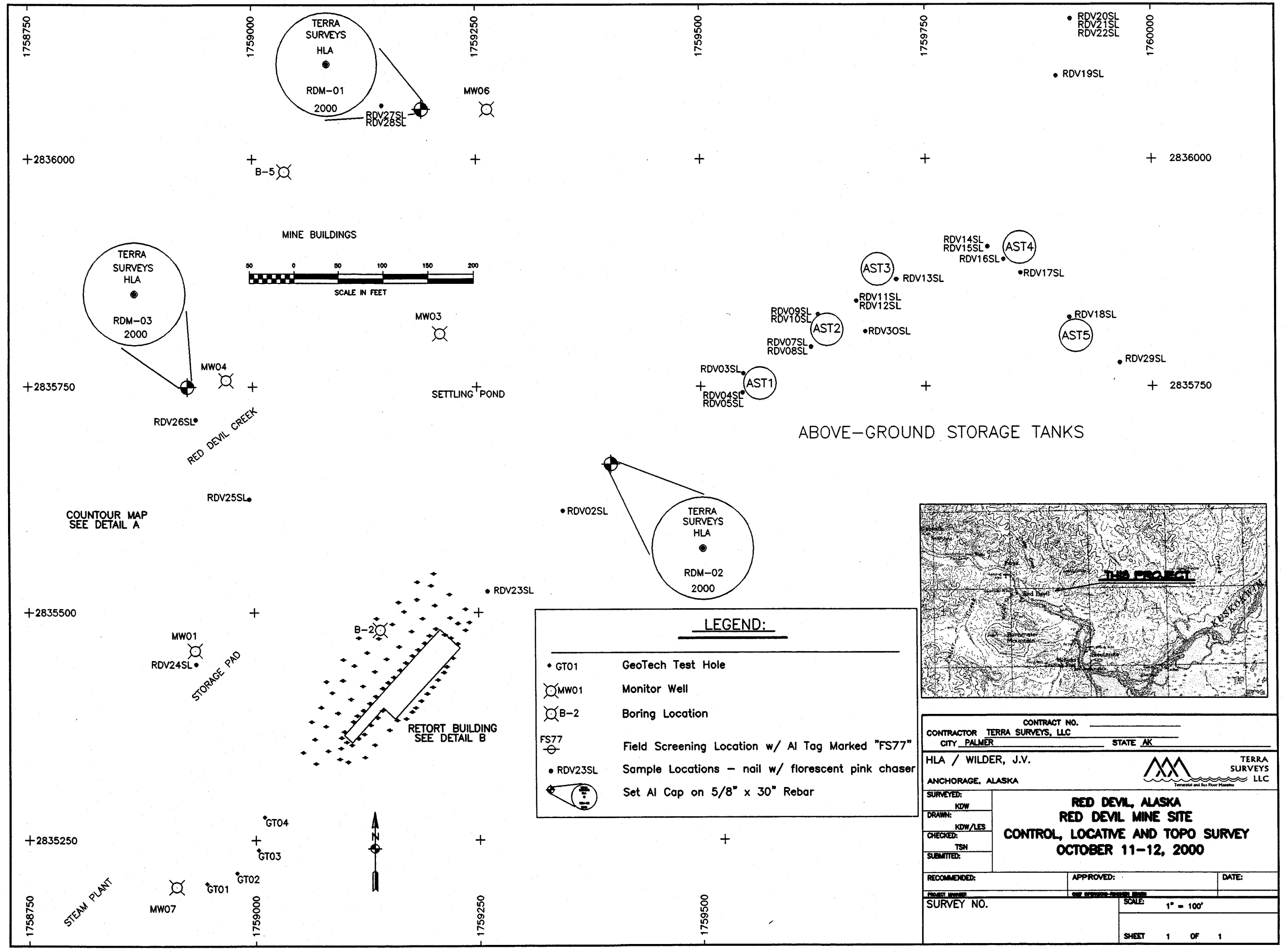
Thomas S. Newman, PLS
Registration No. 8034
ACSM Inshore Hydrographer No. 173

11/6/00
Date

Red Devil, Alaska
Red Devil Mine Site
Control, Locative and Topographic Surveys
October 11-12, 2000

Table of Contents:

- Project Photos
- Drawing and Details
- Survey Control Data (Final) in Excel format
- Locative Survey Ties (monitor wells, soil borings, sample locations and field screening locations) in Excel format
- Field Sketches Provided by HLA
- Final survey data text files for ACAD map production
- Supporting documentation:
  - Copies of the original Field Books
  - Raw data files from field instruments and data collectors
  - GPS processing notes and reports


1758750
1759000
1759250
1759500
1759750
1760000
2836000
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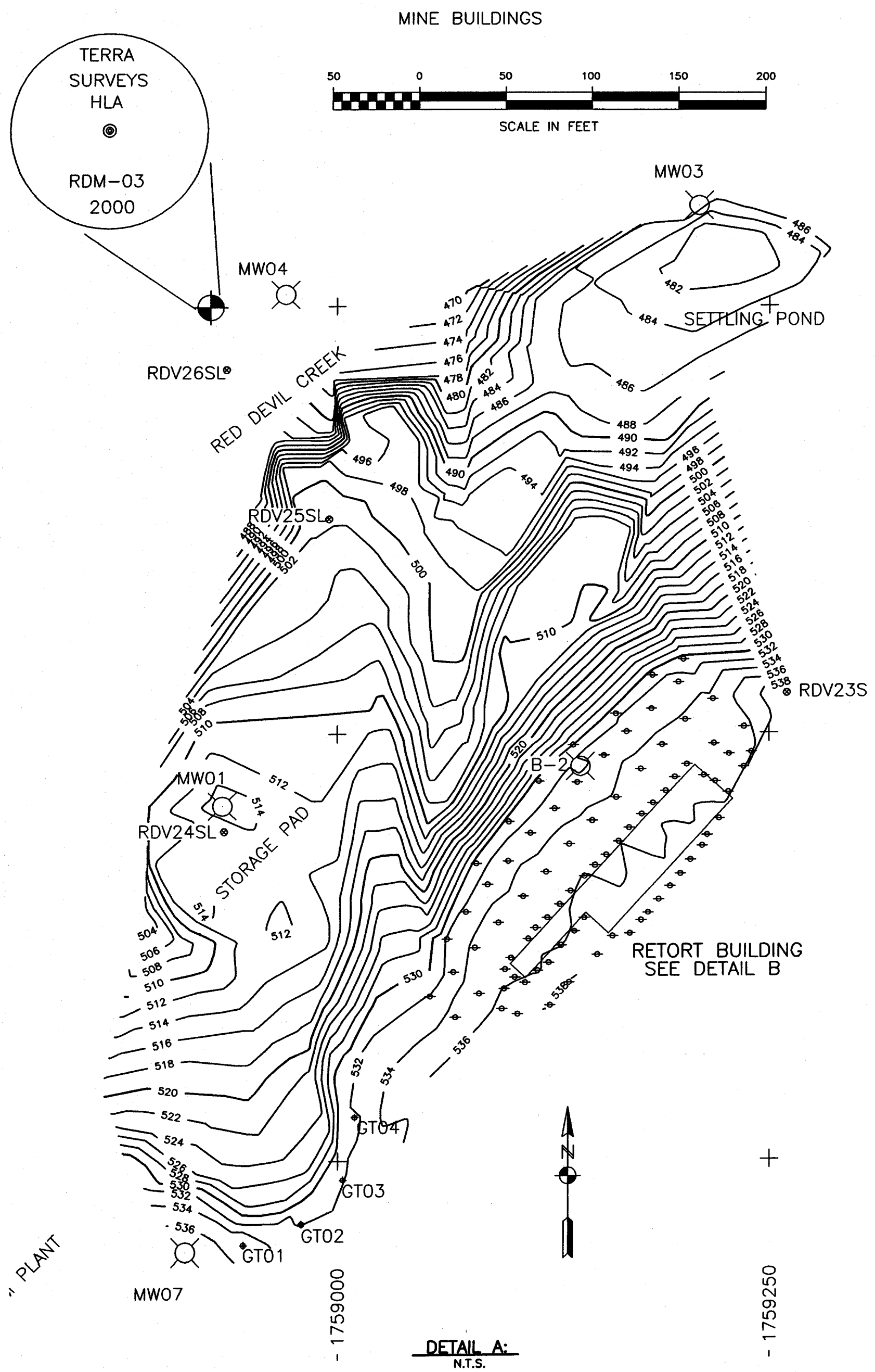
TERRA SURVEYS HLA
RDM-01
2000
RDV27SL
RDV28SL
MW06
B-5
MINE BUILDINGS
50 0 50 100 150 200
SCALE IN FEET
TERRA SURVEYS HLA
RDM-03
2000
MW03
MW04
RDV26SL
RED DEVIL CREEK
SETTLING POND
RDV20SL
RDV21SL
RDV22SL
RDV19SL
RDV14SL
RDV15SL
RDV16SL
AST4
RDV17SL
AST3
RDV13SL
RDV11SL
RDV12SL
RDV09SL
RDV10SL
AST2
RDV30SL
RDV07SL
RDV08SL
RDV18SL
AST5
RDV29SL
RDV03SL
AST1
RDV04SL
RDV05SL
ABOVE-GROUND STORAGE TANKS
RDV25SL
COUNTOUR MAP
SEE DETAIL A
RDV02SL
TERRA SURVEYS HLA
RDM-02
2000
RDV23SL
MW01
RDV24SL
STORAGE PAD
B-2
RETORT BUILDING
SEE DETAIL B
GT04
GT03
GT02
GT01
MW07
STEAM PLANT
N
LEGEND:
GT01 GeoTech Test Hole
MW01 Monitor Well
B-2 Boring Location
FS77 Field Screening Location w/ Al Tag Marked "FS77"
RDV23SL Sample Locations – nail w/ florescent pink chaser
Set Al Cap on 5/8" x 30" Rebar
THIS PROJECT
Red Devil
Bonanza Mountain
Stony River
CONTRACT NO.
CONTRACTOR TERRA SURVEYS, LLC
CITY PALMER
STATE AK
HLA / WILDER, J.V.
ANCHORAGE, ALASKA
TERRA SURVEYS LLC
SURVEYED: KDW
DRAWN: KDW/LES
CHECKED: TSN
SUBMITTED:
RED DEVIL, ALASKA
RED DEVIL MINE SITE
CONTROL, LOCATIVE AND TOPO SURVEY
OCTOBER 11-12, 2000
RECOMMENDED:
APPROVED:
DATE:
PROJECT MANAGER
CHIEF SUPERVISOR-PROFESSIONAL ENGINEER
SURVEY NO.
SCALE: 1" = 100'
SHEET 1 OF 1

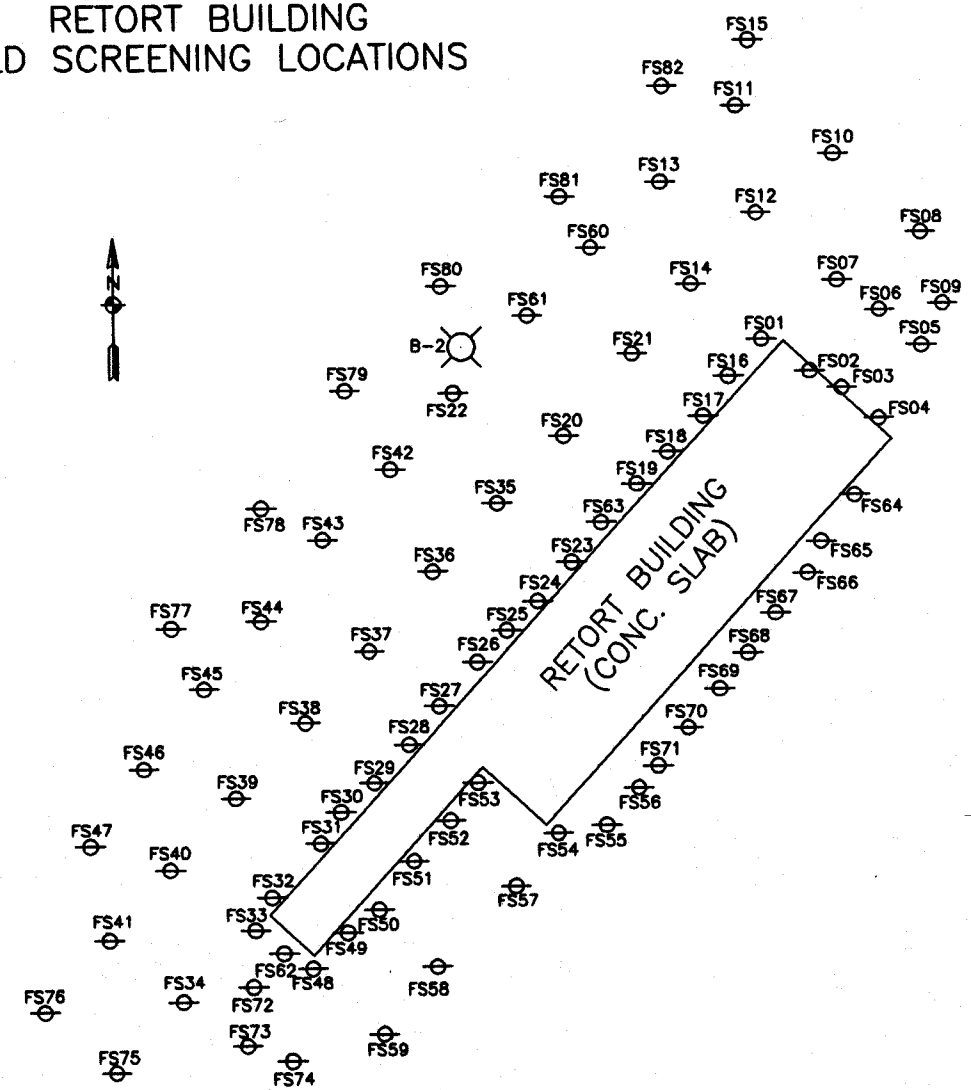


DETAIL A:
N.T.S.

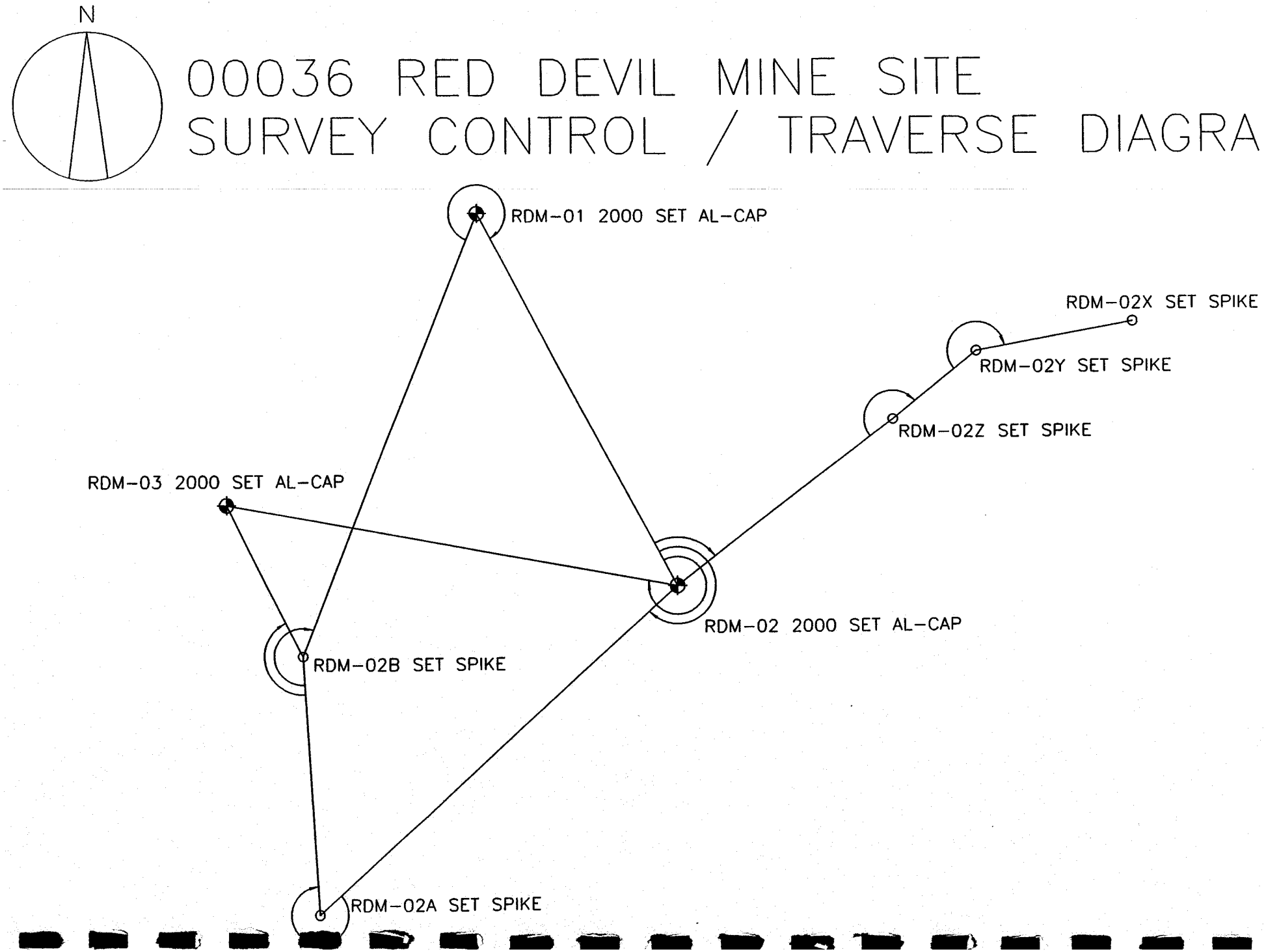
CONTOUR MAP

DETAIL B:
N.T.S.

RETORT BUILDING
FIELD SCREENING LOCATIONS



00036 RED DEVIL MINE SITE
SURVEY CONTROL / TRAVERSE DIAGRAM



TERRA SURVEYS, LLC / HLA

00036 - RED DEVIL MINE SITE

SURVEY CONTROL DATA

NOTE: ELEVATIONS ARE BASED ON AN ASSUMED 500.00' AT CONTROL MONUMENT **RDM-03 2000**

PT NO	ASPC Z6, NAD83, US FT NORTHING	EASTING	ASSUMED ELEV	DESCRIPTION	NOTES
1	2836054.78	1759190.39	488.11	**RDM-01 2000**	CONTROL MONUMENT, SET 2" ALCAP ON 5/8"X30" REBAR
2	2835664.10	1759399.35	551.22	**RDM-02 2000**	CONTROL MONUMENT, SET 2" ALCAP ON 5/8"X30" REBAR
3	2835749.84	1758927.11	500.00	**RDM-03 2000**	CONTROL MONUMENT, SET 2" ALCAP ON 5/8"X30" REBAR
21	2835321.88	1759021.92	532.17	RDM-02A SPK	SET 10" SPIKE, TEMP PT, FOR RETORT BLDG LOCATIVE TIES
22	2835592.05	1759005.46	504.40	RDM-02B SPK	SET 10" SPIKE, TEMP PT, FOR TOPOGRAPHIC SURVEY
31	2835837.87	1759626.36	552.10	RDM-02Z SPK	SET 10" SPIKE, TEMP PT, FOR AST LOCATIVE TIES
32	2835909.44	1759713.84	548.77	RDM-02Y SPK	SET 10" SPIKE, TEMP PT, FOR AST LOCATIVE TIES
33	2835939.27	1759877.02	548.45	RDM-02X SPK	SET 10" SPIKE, TEMP PT, FOR AST LOCATIVE TIES

STATIC GPS OBSERVATIONS: COORDINATES BASED ON CORS DATA FROM STATIONS KEN1 (KENAI) AND BAY2 (COLD BAY)

	NAD83 GEOGRAPHIC (DDD.MMSSsss) LATITUDE	LONGITUDE	E Ht (m)	STATION
1001	61.4537887	157.1851805	81.39	RDM-01 GPS
1002	61.4534018	157.1847549	100.60	RDM-02 GPS
1003	61.4534912	157.1857343	84.96	RDM-03 GPS
CORPSCON CONVERSION (ASPC Z6, NAD83, US FT)				
1001	2836054.78	1759190.39	488.11	RDM-01 GPS
1002	2835664.10	1759399.35	551.22	RDM-02 GPS
1003	2835749.84	1758927.11	500.00	RDM-03 GPS

TERRA SURVEYS, LLC / HLA

00036 - RED DEVIL MINE SITE

LOCATIVE SURVEY TIES

PT NO	ASPC Z6, NAD83, US FT NORTHING	EASTING	ELEV	DESCRIPTION	NOTES
				MONITOR WELL AND SOIL BORING LOCATIONS	
201	2835457.86	1758933.83	515.34	MW01	AT REFERENCE MARK ON TOP OF PVC MONITOR TUBE
221	2835458.01	1758936.79	512.27	RAN	GROUND SURFACE SHOT AT MW01
202	2835480.66	1759141.16	531.25	B-2	BORING LOCATION AT GROUND SURFACE
203	2835808.54	1759209.38	488.67	MW03	AT REFERENCE MARK ON TOP OF PVC MONITOR TUBE
223	2835807.86	1759206.7	486.08	RAN	GROUND SURFACE SHOT AT MW03
204	2835757.03	1758970.40	500.02	MW04	AT REFERENCE MARK ON TOP OF PVC MONITOR TUBE
224	2835755.65	1758969.31	497.65	RAN	GROUND SURFACE SHOT AT MW04
205	2835986.39	1759036.10	500.26	B-5	BORING LOCATION AT GROUND SURFACE
206	2836054.77	1759263.07	475.29	MW06	AT REFERENCE MARK ON TOP OF PVC MONITOR TUBE
226	2836053.55	1759263.95	472.73	RAN	GROUND SURFACE SHOT AT MW06
207	2835198.81	1758912.07	538.55	MW07	AT REFERENCE MARK ON TOP OF PVC MONITOR TUBE
227	2835201.05	1758909.48	535.81	RAN	GROUND SURFACE SHOT AT MW07
				GEOTECH BORING LOCATIONS	
211	2835202.50	1758945.52	534.97	GT01	BORING LOCATION AT GROUND SURFACE
212	2835213.98	1758978.96	531.90	GT02	BORING LOCATION AT GROUND SURFACE
213	2835239.10	1759003.01	531.84	GT03	BORING LOCATION AT GROUND SURFACE
214	2835275.34	1759009.93	531.24	GT04	BORING LOCATION AT GROUND SURFACE
				SAMPLE LOCATIONS	
302	2835612.32	1759345.68	548.97	RDV02SL	RECOVERED ALUM. TAG, SHOT TAKEN AT GROUND SURFACE
303	2835764.20	1759547.69	554.26	RDV03SL	RECOVERED ALUM. TAG, SHOT TAKEN AT GROUND SURFACE
304	2835742.96	1759546.75	554.00	RDV04SL	RECOVERED ALUM. TAG, SHOT TAKEN AT GROUND SURFACE
305	2835742.96	1759546.75	554.00	RDV05SL	RECOVERED ALUM. TAG, SHOT TAKEN AT GROUND SURFACE
307	2835793.53	1759623.21	554.38	RDV07SL	RECOVERED ALUM. TAG, SHOT TAKEN AT GROUND SURFACE
308	2835793.37	1759623.21	554.39	RDV08SL	RECOVERED ALUM. TAG, SHOT TAKEN AT GROUND SURFACE
309	2835829.45	1759631.03	552.52	RDV09SL	RECOVERED ALUM. TAG, SHOT TAKEN AT GROUND SURFACE

(CONT'D)

SAMPLE LOCATIONS (CONT'D)

310	2835829.42	1759631.04	552.52	RDV10SL	RECOVERED ALUM. TAG, SHOT TAKEN AT GROUND SURFACE
311	2835844.16	1759674.04	551.63	RDV11SL	RECOVERED ALUM. TAG, SHOT TAKEN AT GROUND SURFACE
312	2835844.16	1759674.10	551.63	RDV12SL	RECOVERED ALUM. TAG, SHOT TAKEN AT GROUND SURFACE
313	2835867.81	1759718.03	551.15	RDV13SL	RECOVERED ALUM. TAG, SHOT TAKEN AT GROUND SURFACE
314	2835903.76	1759819.19	549.09	RDV14SL	RECOVERED ALUM. TAG, SHOT TAKEN AT GROUND SURFACE
315	2835903.76	1759819.15	549.09	RDV15SL	RECOVERED ALUM. TAG, SHOT TAKEN AT GROUND SURFACE
316	2835889.82	1759836.64	549.26	RDV16SL	RECOVERED ALUM. TAG, SHOT TAKEN AT GROUND SURFACE
317	2835874.82	1759855.24	555.22	RDV17SL	RECOVERED ALUM. TAG, SHOT TAKEN AT GROUND SURFACE
318	2835826.00	1759909.08	568.27	RDV18SL	RECOVERED ALUM. TAG, SHOT TAKEN AT GROUND SURFACE
319	2836090.74	1759895.67	467.01	RDV19SL	RECOVERED ALUM. TAG, SHOT TAKEN AT GROUND SURFACE
320	2836153.21	1759911.52	434.75	RDV20SL	RECOVERED ALUM. TAG, SHOT TAKEN AT GROUND SURFACE
321	2836153.21	1759911.52	434.75	RDV21SL	RECOVERED ALUM. TAG, SHOT TAKEN AT GROUND SURFACE
322	2836153.21	1759911.52	434.75	RDV22SL	RECOVERED ALUM. TAG, SHOT TAKEN AT GROUND SURFACE
323	2835523.29	1759260.26	539.96	RDV23SL	RECOVERED ALUM. TAG, SHOT TAKEN AT GROUND SURFACE
324	2835442.99	1758934.75	512.87	RDV24SL	RECOVERED ALUM. TAG, SHOT TAKEN AT GROUND SURFACE
325	2835625.33	1758995.61	501.68	RDV25SL	RECOVERED ALUM. TAG, SHOT TAKEN AT GROUND SURFACE
326	2835713.39	1758936.32	498.20	RDV26SL	RECOVERED ALUM. TAG, SHOT TAKEN AT GROUND SURFACE
327	2836058.95	1759146.41	490.70	RDV27SL	RECOVERED ALUM. TAG, SHOT TAKEN AT GROUND SURFACE
328	2836058.95	1759146.41	490.70	RDV28SL	RECOVERED ALUM. TAG, SHOT TAKEN AT GROUND SURFACE
329	2835775.67	1759963.77	576.90	RDV29SL	RECOVERED ALUM. TAG, SHOT TAKEN AT GROUND SURFACE
330	2835810.61	1759683.89	566.09	RDV30SL	RECOVERED ALUM. TAG, SHOT TAKEN AT GROUND SURFACE

FIELD SCREENING LOCATIONS

101	2835481.83	1759202.67	534.96	FS01	RECOVERED ALUM. TAG, SHOT TAKEN AT GROUND SURFACE
102	2835475.23	1759212.55	535.07	FS02	RECOVERED ALUM. TAG, SHOT TAKEN AT GROUND SURFACE
103	2835471.75	1759219.04	535.16	FS03	RECOVERED ALUM. TAG, SHOT TAKEN AT GROUND SURFACE
104	2835465.42	1759226.55	535.57	FS04	RECOVERED ALUM. TAG, SHOT TAKEN AT GROUND SURFACE
105	2835480.30	1759235.44	535.22	FS05	RECOVERED ALUM. TAG, SHOT TAKEN AT GROUND SURFACE
106	2835487.78	1759226.91	535.02	FS06	RECOVERED ALUM. TAG, SHOT TAKEN AT GROUND SURFACE
107	2835493.91	1759218.28	535.13	FS07	RECOVERED ALUM. TAG, SHOT TAKEN AT GROUND SURFACE
108	2835503.60	1759235.50	535.36	FS08	RECOVERED ALUM. TAG, SHOT TAKEN AT GROUND SURFACE
109	2835488.95	1759239.83	535.51	FS09	RECOVERED ALUM. TAG, SHOT TAKEN AT GROUND SURFACE
110	2835519.86	1759217.77	534.50	FS10	RECOVERED ALUM. TAG, SHOT TAKEN AT GROUND SURFACE
111	2835529.71	1759197.88	533.03	FS11	RECOVERED ALUM. TAG, SHOT TAKEN AT GROUND SURFACE
112	2835507.80	1759201.81	534.20	FS12	RECOVERED ALUM. TAG, SHOT TAKEN AT GROUND SURFACE

(CONT'D)

FIELD SCREENING LOCATIONS (CONT'D)

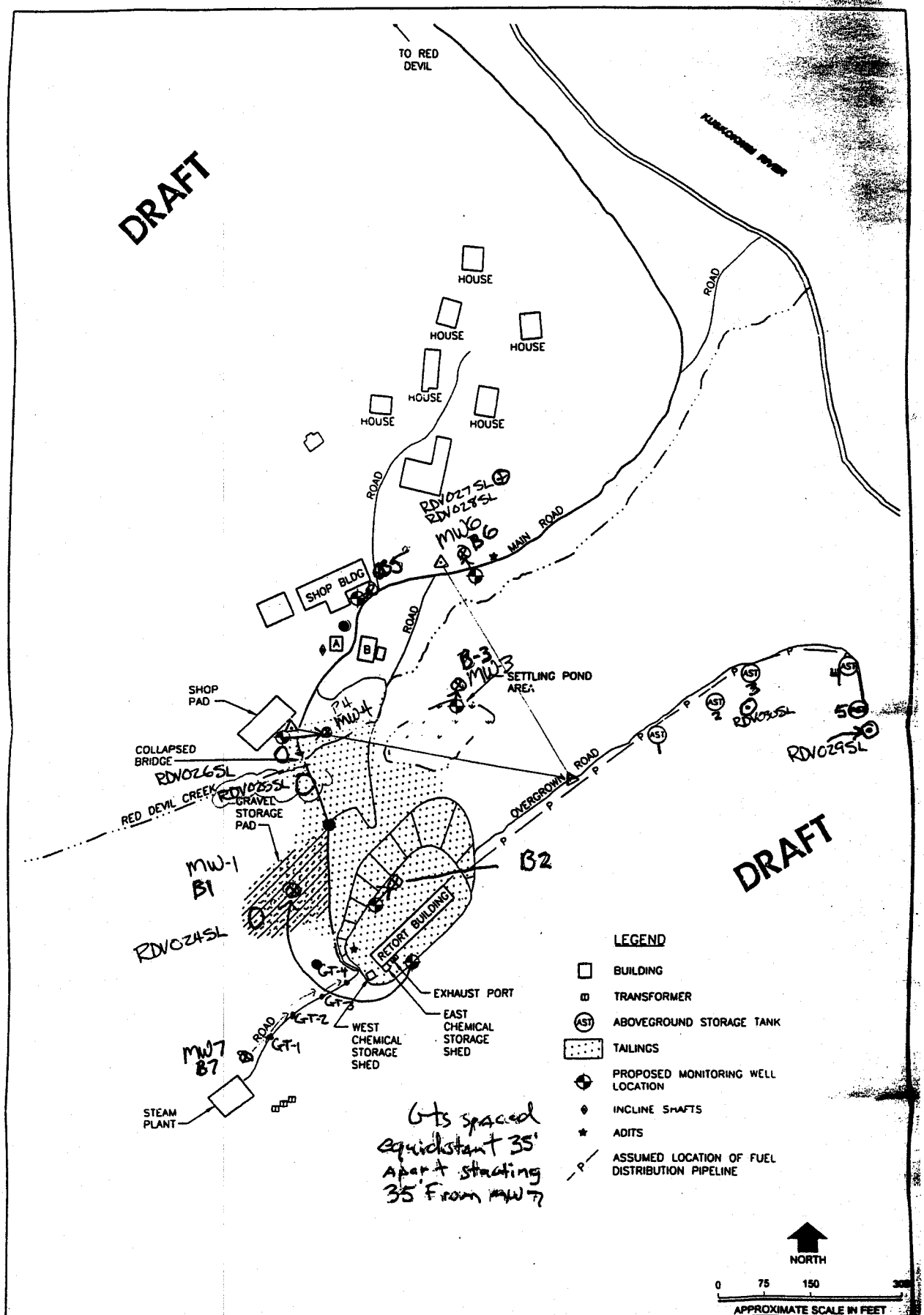
113	2835514.17	1759182.24	533.10	FS13	RECOVERED ALUM. TAG, SHOT TAKEN AT GROUND SURFACE
114	2835493.31	1759188.36	534.50	FS14	RECOVERED ALUM. TAG, SHOT TAKEN AT GROUND SURFACE
115	2835542.95	1759200.70	530.44	FS15	RECOVERED ALUM. TAG, SHOT TAKEN AT GROUND SURFACE
116	2835474.28	1759195.81	535.22	FS16	RECOVERED ALUM. TAG, SHOT TAKEN AT GROUND SURFACE
117	2835466.15	1759190.59	535.36	FS17	RECOVERED ALUM. TAG, SHOT TAKEN AT GROUND SURFACE
118	2835458.85	1759183.18	535.43	FS18	RECOVERED ALUM. TAG, SHOT TAKEN AT GROUND SURFACE
119	2835452.32	1759176.78	535.63	FS19	RECOVERED ALUM. TAG, SHOT TAKEN AT GROUND SURFACE
120	2835462.28	1759161.93	534.14	FS20	RECOVERED ALUM. TAG, SHOT TAKEN AT GROUND SURFACE
121	2835479.04	1759176.15	534.58	FS21	RECOVERED ALUM. TAG, SHOT TAKEN AT GROUND SURFACE
122	2835471.23	1759139.38	532.97	FS22	RECOVERED ALUM. TAG, SHOT TAKEN AT GROUND SURFACE
123	2835436.50	1759163.21	535.95	FS23	RECOVERED ALUM. TAG, SHOT TAKEN AT GROUND SURFACE
124	2835428.70	1759156.10	535.51	FS24	RECOVERED ALUM. TAG, SHOT TAKEN AT GROUND SURFACE
125	2835422.80	1759149.65	535.47	FS25	RECOVERED ALUM. TAG, SHOT TAKEN AT GROUND SURFACE
126	2835416.50	1759143.52	536.05	FS26	RECOVERED ALUM. TAG, SHOT TAKEN AT GROUND SURFACE
127	2835407.66	1759135.57	535.79	FS27	RECOVERED ALUM. TAG, SHOT TAKEN AT GROUND SURFACE
128	2835399.87	1759129.23	535.57	FS28	RECOVERED ALUM. TAG, SHOT TAKEN AT GROUND SURFACE
129	2835392.13	1759121.95	535.40	FS29	RECOVERED ALUM. TAG, SHOT TAKEN AT GROUND SURFACE
130	2835386.27	1759115.06	535.34	FS30	RECOVERED ALUM. TAG, SHOT TAKEN AT GROUND SURFACE
131	2835379.88	1759110.84	535.26	FS31	RECOVERED ALUM. TAG, SHOT TAKEN AT GROUND SURFACE
132	2835368.86	1759100.82	535.23	FS32	RECOVERED ALUM. TAG, SHOT TAKEN AT GROUND SURFACE
133	2835362.17	1759097.34	534.93	FS33	RECOVERED ALUM. TAG, SHOT TAKEN AT GROUND SURFACE
134	2835347.73	1759082.29	535.23	FS34	RECOVERED ALUM. TAG, SHOT TAKEN AT GROUND SURFACE
135	2835448.59	1759148.11	534.51	FS35	RECOVERED ALUM. TAG, SHOT TAKEN AT GROUND SURFACE
136	2835434.90	1759134.64	535.02	FS36	RECOVERED ALUM. TAG, SHOT TAKEN AT GROUND SURFACE
137	2835418.93	1759121.30	534.94	FS37	RECOVERED ALUM. TAG, SHOT TAKEN AT GROUND SURFACE
138	2835404.52	1759108.00	534.68	FS38	RECOVERED ALUM. TAG, SHOT TAKEN AT GROUND SURFACE
139	2835389.28	1759093.57	535.02	FS39	RECOVERED ALUM. TAG, SHOT TAKEN AT GROUND SURFACE
140	2835374.73	1759079.93	534.42	FS40	RECOVERED ALUM. TAG, SHOT TAKEN AT GROUND SURFACE
141	2835360.49	1759067.33	533.12	FS41	RECOVERED ALUM. TAG, SHOT TAKEN AT GROUND SURFACE
142	2835455.71	1759126.24	532.97	FS42	RECOVERED ALUM. TAG, SHOT TAKEN AT GROUND SURFACE
143	2835441.46	1759112.13	532.96	FS43	RECOVERED ALUM. TAG, SHOT TAKEN AT GROUND SURFACE
144	2835425.16	1759099.24	533.51	FS44	RECOVERED ALUM. TAG, SHOT TAKEN AT GROUND SURFACE
145	2835411.61	1759087.29	532.99	FS45	RECOVERED ALUM. TAG, SHOT TAKEN AT GROUND SURFACE
146	2835395.47	1759074.75	532.78	FS46	RECOVERED ALUM. TAG, SHOT TAKEN AT GROUND SURFACE
147	2835379.77	1759063.64	532.25	FS47	RECOVERED ALUM. TAG, SHOT TAKEN AT GROUND SURFACE

(CONT'D)

FIELD SCREENING LOCATIONS (CONT'D)

148	2835354.26	1759108.94	536.59	FS48	RECOVERED ALUM. TAG, SHOT TAKEN AT GROUND SURFACE
149	2835361.50	1759116.20	535.82	FS49	RECOVERED ALUM. TAG, SHOT TAKEN AT GROUND SURFACE
150	2835366.15	1759122.70	536.34	FS50	RECOVERED ALUM. TAG, SHOT TAKEN AT GROUND SURFACE
151	2835376.06	1759130.00	535.95	FS51	RECOVERED ALUM. TAG, SHOT TAKEN AT GROUND SURFACE
152	2835384.25	1759137.59	536.10	FS52	RECOVERED ALUM. TAG, SHOT TAKEN AT GROUND SURFACE
153	2835391.95	1759143.36	536.67	FS53	RECOVERED ALUM. TAG, SHOT TAKEN AT GROUND SURFACE
154	2835381.43	1759159.71	537.69	FS54	RECOVERED ALUM. TAG, SHOT TAKEN AT GROUND SURFACE
155	2835382.98	1759169.67	537.18	FS55	RECOVERED ALUM. TAG, SHOT TAKEN AT GROUND SURFACE
156	2835390.52	1759176.29	537.11	FS56	RECOVERED ALUM. TAG, SHOT TAKEN AT GROUND SURFACE
157	2835370.62	1759150.92	537.77	FS57	RECOVERED ALUM. TAG, SHOT TAKEN AT GROUND SURFACE
158	2835354.35	1759134.56	538.08	FS58	RECOVERED ALUM. TAG, SHOT TAKEN AT GROUND SURFACE
159	2835340.79	1759123.43	538.13	FS59	RECOVERED ALUM. TAG, SHOT TAKEN AT GROUND SURFACE
160	2835500.91	1759167.88	533.10	FS60	RECOVERED ALUM. TAG, SHOT TAKEN AT GROUND SURFACE
161	2835487.02	1759154.73	533.42	FS61	RECOVERED ALUM. TAG, SHOT TAKEN AT GROUND SURFACE
162	2835357.40	1759103.06	535.60	FS62	RECOVERED ALUM. TAG, SHOT TAKEN AT GROUND SURFACE
163	2835444.51	1759169.39	535.49	FS63	RECOVERED ALUM. TAG, SHOT TAKEN AT GROUND SURFACE
164	2835449.64	1759221.33	536.57	FS64	RECOVERED ALUM. TAG, SHOT TAKEN AT GROUND SURFACE
165	2835440.15	1759214.34	536.28	FS65	RECOVERED ALUM. TAG, SHOT TAKEN AT GROUND SURFACE
166	2835433.83	1759211.50	536.75	FS66	RECOVERED ALUM. TAG, SHOT TAKEN AT GROUND SURFACE
167	2835425.75	1759204.74	536.36	FS67	RECOVERED ALUM. TAG, SHOT TAKEN AT GROUND SURFACE
168	2835417.73	1759199.01	536.24	FS68	RECOVERED ALUM. TAG, SHOT TAKEN AT GROUND SURFACE
169	2835410.47	1759193.10	536.76	FS69	RECOVERED ALUM. TAG, SHOT TAKEN AT GROUND SURFACE
170	2835402.64	1759186.54	536.77	FS70	RECOVERED ALUM. TAG, SHOT TAKEN AT GROUND SURFACE
171	2835394.99	1759180.29	536.61	FS71	RECOVERED ALUM. TAG, SHOT TAKEN AT GROUND SURFACE
172	2835350.63	1759096.76	536.06	FS72	RECOVERED ALUM. TAG, SHOT TAKEN AT GROUND SURFACE
173	2835338.71	1759095.41	536.32	FS73	RECOVERED ALUM. TAG, SHOT TAKEN AT GROUND SURFACE
174	2835335.56	1759104.52	537.23	FS74	RECOVERED ALUM. TAG, SHOT TAKEN AT GROUND SURFACE
175	2835333.67	1759068.41	534.75	FS75	RECOVERED ALUM. TAG, SHOT TAKEN AT GROUND SURFACE
176	2835346.07	1759053.92	532.13	FS76	RECOVERED ALUM. TAG, SHOT TAKEN AT GROUND SURFACE
177	2835423.88	1759080.76	531.16	FS77	RECOVERED ALUM. TAG, SHOT TAKEN AT GROUND SURFACE
178	2835448.01	1759099.64	530.98	FS78	RECOVERED ALUM. TAG, SHOT TAKEN AT GROUND SURFACE
179	2835471.93	1759117.10	531.08	FS79	RECOVERED ALUM. TAG, SHOT TAKEN AT GROUND SURFACE
180	2835493.21	1759136.99	529.98	FS80	RECOVERED ALUM. TAG, SHOT TAKEN AT GROUND SURFACE
181	2835511.27	1759161.59	531.65	FS81	RECOVERED ALUM. TAG, SHOT TAKEN AT GROUND SURFACE
182	2835533.72	1759182.88	531.19	FS82	RECOVERED ALUM. TAG, SHOT TAKEN AT GROUND SURFACE

END



Site Plan with Sampling Locations

Harding Lawson Associates/
Wilder Construction Company
Joint Venture

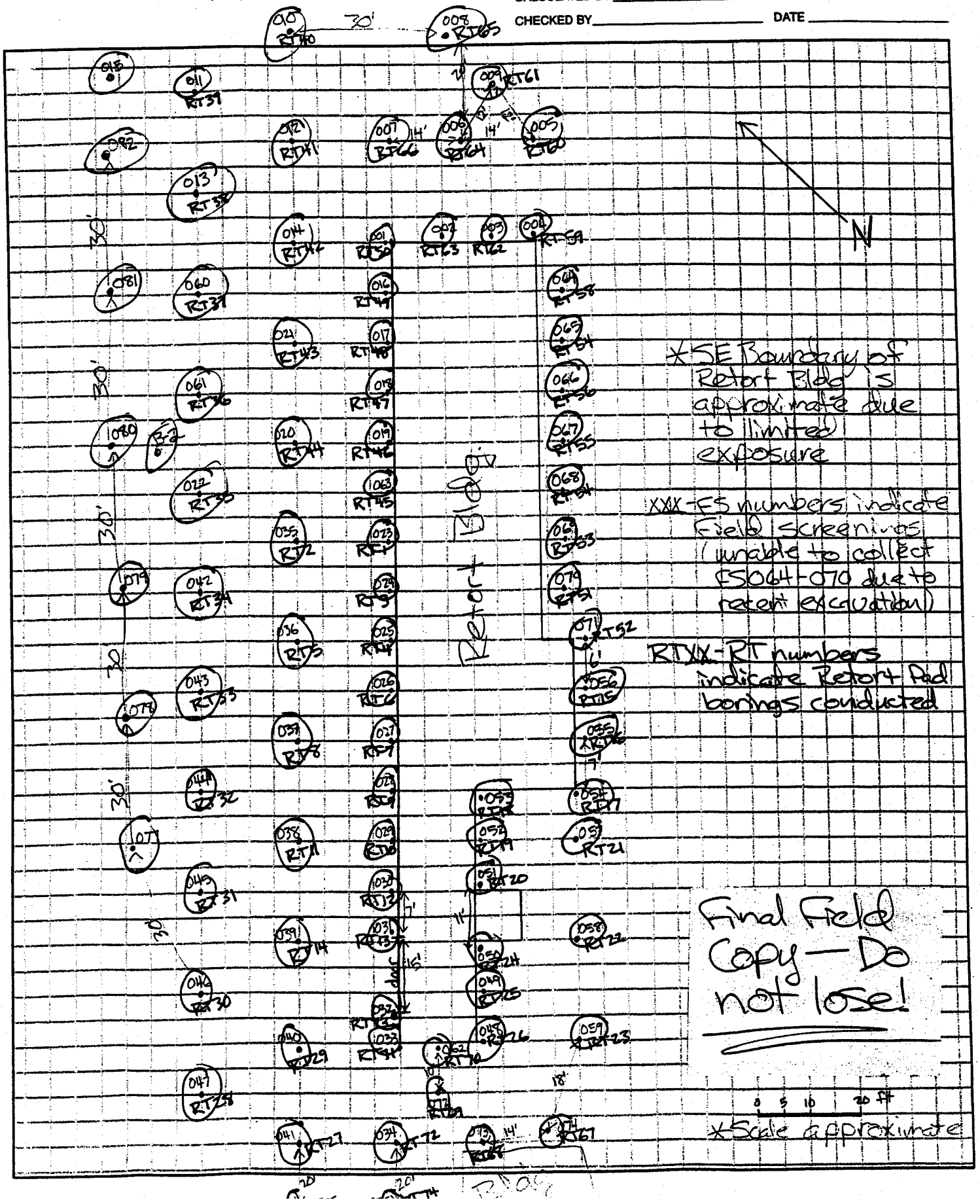
Work Plan
Red Devil, Alaska

DRAWN	PROJECT NUMBER	APPROVED	DATE	FILE NAME
CEH	47411		6/00	47411a1a.dwg

(2)

HARDING-LAWSON ASSOCIATES
601 East 57th Place
Anchorage, Alaska 99518
Phone (907) 563-8102

PROJECT NAME Red Devil Mine
~~NUMBER~~ Retort Pad Field Screenings + Borings
SHEET NO. 1 of 1
CALCULATED BY KJ DATE 8-15-00
CHECKED BY _____ DATE _____

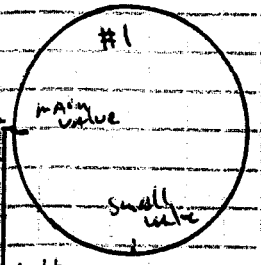


HARDING-LAWSON ASSOCIATES
601 East 57th Place
Anchorage, Alaska 99518
Phone (907) 563-8102

Attn. Brian Lund

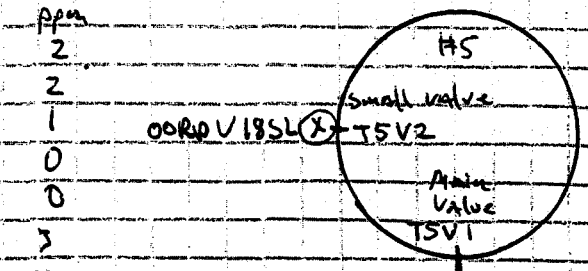
PROJECT NAME Red Devil
NUMBER 47411
SHEET NO. _____ OF _____
CALCULATED BY _____ DATE 7/24/00
CHECKED BY _____ DATE _____

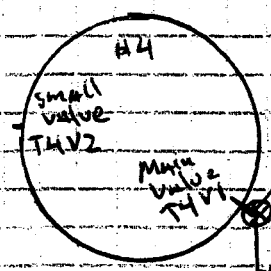
	Stat.	ppm
	1-1	1
	1-2	0
	1-3	0
	1-4	1
	1-5	2
*	1-6	2
	1-7	1
	1-8	2
	1-9	1
	1-10	1
	1-11	1
	1-12	1
	1-13	0
	1-14	1
	1-15	1
	1-16	1
	1-17	1
*	1-18	1
	T1V1	3
DXX	T1V2	41
	2-1	1
	2-2	22
	2-3	3
DXX	2-4	535
	2-5	24
	T2V1	171
DXX	T2V2	231
	3-1	2
	3-2	4
DXX	3-3	310
	3-4	30
X	T3V1	9
	T3V2	8
	T3V3	1
	4-1	5
	4-2	5
	4-3	1
	4-4	0
	4-5	0
DXX	4-6	123
X	T4V1	7
	T4V2	1

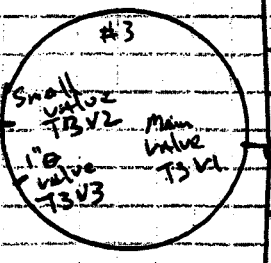


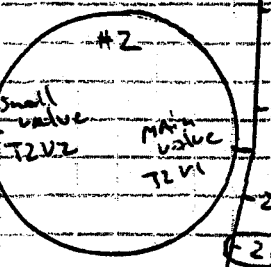
Reboot bldg.

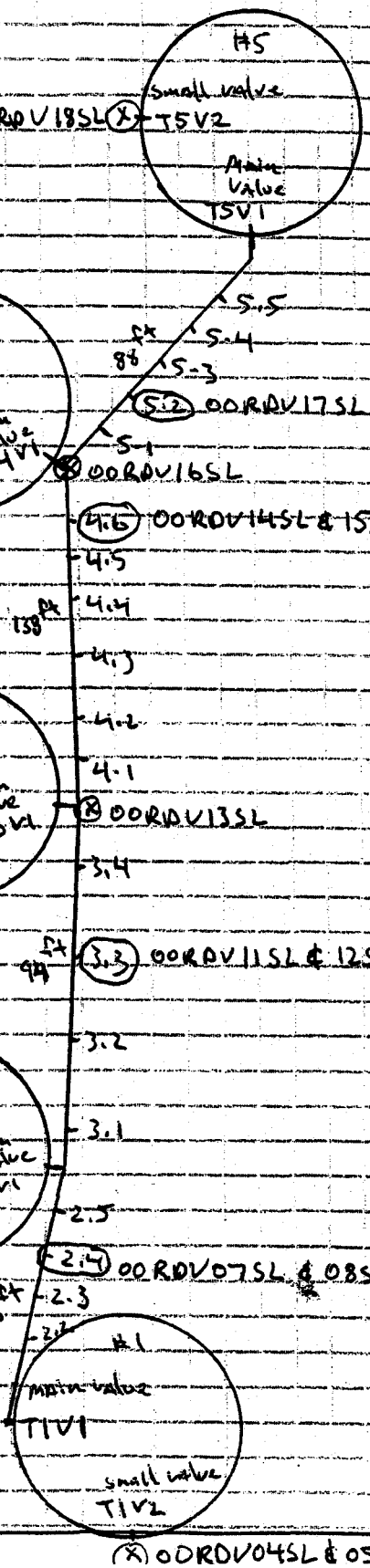
Stat.	ppm
5-1	2
*5-2	2
5-3	1
5-4	0
5-5	0
T5V1	3
*T5V2	12





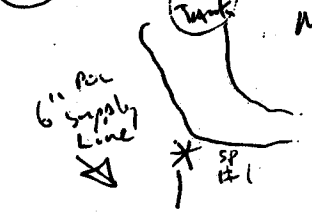






00RDV04SL & 05SL & 06SL

(7)



After lunch - Con & SLM's Mike Alcorn & Harry Griffin hike down inspect 6"Θ Supply Line, collect Headspace Samples from (unions/couplers)

1 ppm

Diesel smell & staining present. Bum Mike Alcorn wants welder to drain any fuel from this Line. By 1:00 End start 10 inr work.

Chuck Hill

0 ppm

46 ppm

47 ppm

Stress vey w/fuel odour Headspace taken 17 ppm

Tapon 36 ppm

End stress vey 68 ppm Headspace taken

11/25/03 Con

@ 0700 H&S meeting - Use correct PPE

Low level clearance for Asbestos workers today

Summary P-100 + MV charts use for any pool clean up work.

Welder checks fuel/water levels in

Tank #1 =	Approx 1" inch	16'H x 68' around
Tank #2	Empty	16'H x 68' "
Tank #3	Empty	24'H x 93.7
Tank #4	Empty	16'H x 93.7
Tank #5	30 gallons?	16'H x 93.6

Fuel/waste fuel from pipe Assoc RDV AST - is approx 1/3 of a 55 gallon drum vol. Labled Contaminated Diesel from AST piping

Mercury Vapor Monitoring

Time	Reading	Location
0740	0 mg/m³	S - Retort at Burner
0745	3 mg/m³	E " " "
0748	4 mg/m³	NE " " "
0750	0 mg/m³	N " " "

CWH - Neither, all worker at M. Vapor levels

Final Text Files
for
DWg

control_final.txt
10/26/2000
KH

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558,2835596.18,1759143.24,509.76,RAN
559,2835568.00,1759127.25,509.32,RAN
560,2835697.52,1759134.31,487.93,TOP
561,2835730.43,1759126.47,487.07,TOP
562,2835751.23,1759130.09,486.30,TOP
563,2835776.36,1759162.58,485.76,TOP
564,2835799.23,1759200.50,485.78,TOP
565,2835700.28,1759214.12,488.68,TOE
566,2835729.05,1759239.60,486.87,TOE
567,2835757.23,1759264.40,484.57,TOE
568,2835777.75,1759274.76,482.46,TOE
569,2835792.86,1759244.18,481.95,TOE
570,2835796.82,1759212.18,481.68,TOE
571,2835785.02,1759183.82,483.28,TOE
572,2835773.50,1759164.35,483.27,TOE
573,2835757.40,1759140.91,484.39,TOE
574,2835749.16,1759133.81,484.50,TOE
575,2835732.98,1759130.69,484.77,TOE
576,2835701.33,1759137.74,486.91,TOE
577,2835741.94,1759164.18,484.39,RAN
578,2835769.96,1759202.88,481.10,RAN
579,2835768.26,1759237.44,481.58,RAN
580,2835730.74,1759204.62,484.32,RAN
```

GPS Control Final

TERRA SURVEYS, LLC - KARL WOODS
RED DEVIL MINE SITE - CONTROL SURVEY
10/25/2000

Input
  Horizontal: NAD 83 Geographic
Output
  Horizontal: NAD 83, Alaska 6 - 5006, U.S. Survey Feet

Name	Input	Output
RDM-01 2000 AL-CAP	61 45 37.88687 N	2836054.77727 N
	157 18 51.80523 W	1759190.39066 E
Convergence		00 36 14.44780
Scale Factor		0.999916051

TERRA SURVEYS, LLC - KARL WOODS
RED DEVIL MINE SITE - CONTROL SURVEY
10/25/2000

Input
  Horizontal: NAD 83 Geographic
Output
  Horizontal: NAD 83, Alaska 6 - 5006, U.S. Survey Feet

Name	Input	Output
RDM-02 2000 AL-CAP	61 45 34.01830 N	2835664.09531 N
	157 18 47.54903 W	1759399.34946 E
Convergence		00 36 18.17560
Scale Factor		0.999916107

TERRA SURVEYS, LLC - KARL WOODS
RED DEVIL MINE SITE - CONTROL SURVEY
10/25/2000

Input
  Horizontal: NAD 83 Geographic
Output
  Horizontal: NAD 83, Alaska 6 - 5006, U.S. Survey Feet

Name	Input	Output
RDM-03 2000 AL-CAP	61 45 34.91161 N	2835749.84142 N
	157 18 57.34261 W	1758927.10755 E
Convergence		00 36 09.55253
Scale Factor		0.999915980

TERRA SURVEYS, LLC - KARL WOODS
RED DEVIL MINE SITE - CONTROL SURVEY
10/25/2000

Input
  Horizontal: NAD 83 Geographic
Output
  Horizontal: NAD 83, Alaska 4 - 5004, Meters

Name	Input	Output
KEN1 CORS	60 40 30.28636 N	744056.50391 N
	151 21 00.57211 W	426212.22799 E
Convergence		-01 10 37.90965
Scale Factor		0.999966694

TERRA SURVEYS, LLC - KARL WOODS
RED DEVIL MINE SITE - CONTROL SURVEY
10/25/2000

Input
  Horizontal: NAD 83 Geographic
Output
  Horizontal: NAD 83, Alaska 7 - 5007, Meters

Name	Input	Output
BAY2 CORS	55 11 25.51124 N	132727.48824 N
	162 42 24.27134 W	454992.00009 E
Convergence		-00 34 49.01833
Scale Factor		0.999924842

Comma delimited point lat/long/height listing

Project name	red		
Coordinate Units	Meters		
Distance Units	Meters		
Height Units	Meters		
Date printed	10/25/00 11:12:40 AM		
Coordinate System	Not selected	**Zone**	Not selected
Datum	WGS 1984	**Geoid model**	Not selected

```
Coordinate units: Meters
Elevation units:  Meters

Point listing
Name,Latitude,Longitude,Height,Feature Code
ken1,60°40'30.28636"N,151°21'00.57211"W,56.072,
rdm-01,61°45'37.88687"N,157°18'51.80523"W,81.385,
bay2,55°11'25.51124"N,162°42'24.27134"W,50.637,
rdm-02,61°45'34.01830"N,157°18'47.54903"W,100.595,
rdm-03,61°45'34.91161"N,157°18'57.34261"W,84.964,
1,60°40'30.28636"N,151°21'00.57211"W,50.760, ken1
2,55°11'25.51124"N,162°42'24.27134"W,49.940, bay2
```

NAD 83

Back to top

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00036 Red Devil Mine
HLA/Wilder
Control and Locative
Survey

FB 1 of 2

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00036 Red Devil FB 1 of 2

CONTENTS

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4-5	site sketch	"
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10-15	vertical control	"
16-17	primary horiz control (mons)	"
16-19	horiz. control (retort area)	"
20-29	retort bldg (boring, screening,	
	and sample locations)	"
30-31	steamplant and storage pad	
	areas (geotech, monitor wells)	"
32-33	cont vertical control	10.12
34-43	tank farm area (control and	
	sample locations)	"
44-47	topographic survey (W. extents)	"
	cont in FB 2 of 2	
48	peg notes	

00036 Red Devil

Mine Site Locative Survey
Soil Borings, Monitor Wells, Control
and Topography

HLA / Wilder JV
(907) 563 8102
Mike Schmetzer
Charlie Marshall ; Engineer (field)
Kathy Vincent

C. Marshall provided photo copies
of HLA field work notes ...

10 October, 2000
+30°f, clear ; calm

K. Woods
Cody McCrary

Survey Eqpt :

GPS : Trimble 4000 SSE No. 8911
Compact L1/L2 Antenna

Optical : Topcon GTS-3 Total Sta No. Q33530
TDS48 Data Collector
Topcon Tribrachs, Prism Assbly
Wild NA2 Auto Level No. 5046382
Swede Rod (Control)
25' tele, fiber rod

Safety Eqpt. :

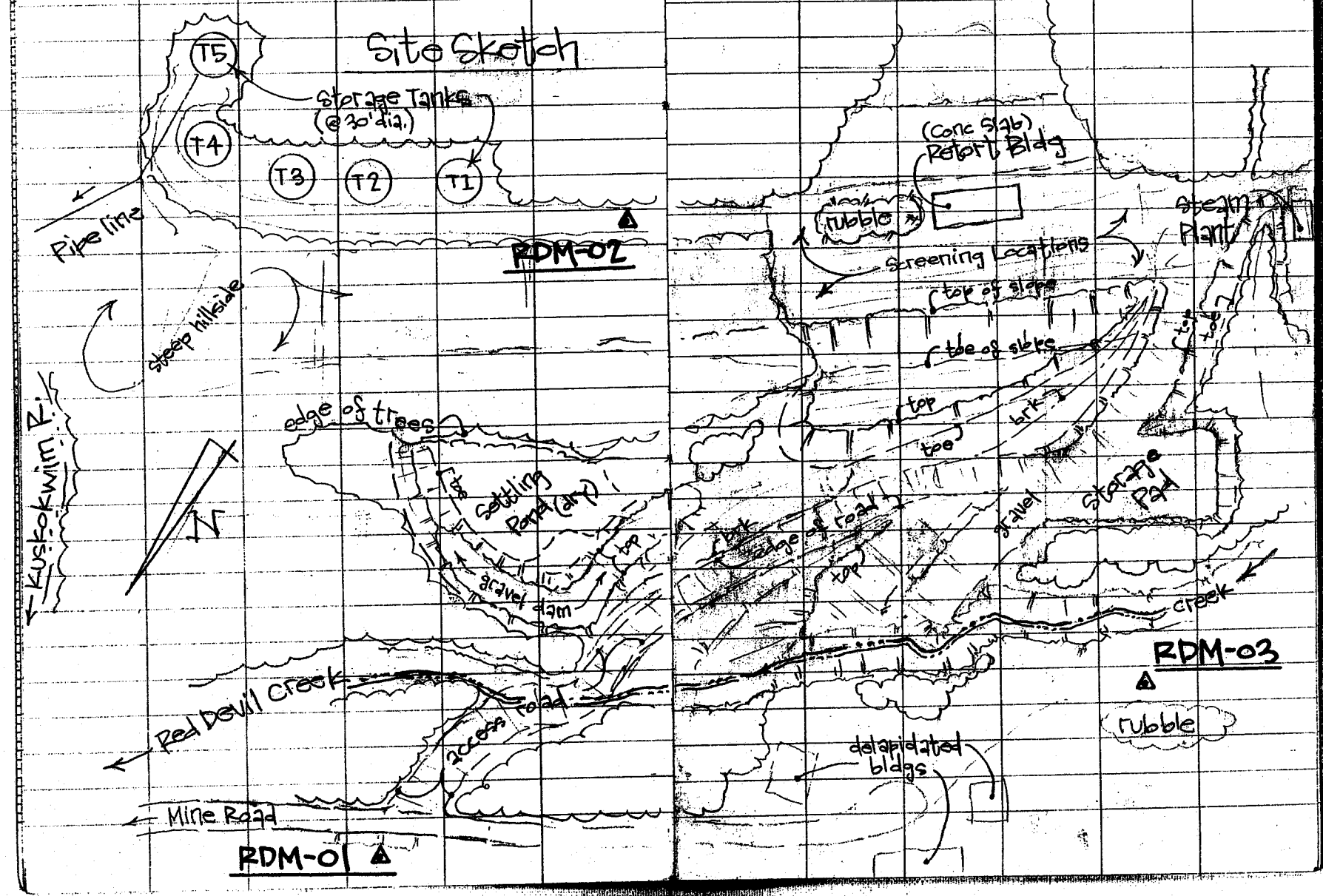
protective over boots
ppe

000036 Red Devil

10.10.2000
same conditions

same crew

Site Sketch



000366 Red Devil

ASPC Control (GPS)

(see sketch pp 4-5)

CP RDM-01 2000

set 2" Al cap on 5/8" x 30" rebar; flush w/ ground, atop tailing pile @ Intx of Mine Road and Retort Bldg Access Road.

cap mk'd: // TERRA SURVEYS // HLA • RDM-01 // 2000 //

Static Survey:

↑ file: 8911-285-0

HA: 1.413m (to bottom of mount)

logging: ↑ 17:30 UTC

↓ 21:28 UTC

Δ @ 4hr

10.20/CORS ↓ loads

		10.11		10.12
kenai	ken12851.zip	1700 UTC	→	0300 UTC
cold bay	bar22851.zip	9 hrs		

11 October, 2000

+20°f, clear; NW 8-10

same ofeW

GPS Gear p's

single point positioning (x CORS Data (KEN1/BAT2))

CP RDM-03 2000

set 2" Al cap on 5/8" x 30" rebar; subgraded @ 02' @ 50' N. of old bridge location at W. end of Mine Road.

cap mk'd: // TERRA SURVEYS // HLA • RDM-03 // 2000 //

Static Survey:

↑ file: 8911-285-1

HA: 1.451m (to bottom of mount)

logging: ↑ 22:56 UTC

↓ 02:11 (10.12.2000 UTC)

Δ @ 3hr 15m

fair banks fair2851.zip

000036 Red Devil

(cont)

CP RDM-02 2000
set 2" Al cap on 5/8" x 30" rebar;
subgrade @ 02; located in
center of storage Tank access
road at clearing over-looking
Red Devil Creek (the only clearing!)
cap mk'd: // TERRA SURVEYS //
HLA
•
RDM-02
// 2000 //

Static survey:
↑ file: 8911-286-0
HA: 1.475m (to bottom of mount)
logging: ↑ 19:09 UTC
↓ 23:24 UTC
Δ@ 5.5 hr

12 October, 2000
contns p 33
same cmpt, p 7

same crew

end GPS survey

10:20 / CORS ↓ loads

10:12 1800 UTC

Bay 2 2861.zip
kenl 2861.zip

→ 10:13 0100 UTC

000036 Red Devil

Vertical Control

10/11/2000
same conditions
Wild NA2 Auto Level 5046382
25' Tele/Silver Pad
same crew

Sta	+	HI	ifs	−	Elev	Notes
RDM-03 calk					*500.00*	// Assumed
	10.82	510.82				
						* use *
RDM-03A spk				9.88	*500.94*	//
	9.74	510.68				
					504.39	
RDM-02B spk				(5.27)	~~505.39~~	
	24.84	530.23				
						the bust!! (see pp 32-33)
TP 1				4.44	525.79	top edge drum
	13.07	538.86				
					532.19	
RDM-02A spk				5.67	~~533.19~~	
	5.46	538.65				
					534.66	
			2.99		~~535.66~~	SW X of Retort Bldg FF Conc Pad (inside X)
TP 2				0.25	538.40	set spike
	14.76	(553.16)				

(cont p12)

00036 Red Devil

(cont)

10/11/2000
same conditions
and eqpt. pll

same crew

Sta	+	HI	ifs	-	Elev	Notes
		(553.16)				
					551.22	
RDM-02 cap				0.94	~~552.22~~	
	7.55	559.77				
					552.04	
RDM-02Z spk				6.73	~~553.04~~	
	6.58	559.62				
					548.70	
RDM-02Y spk				9.92	~~549.70~~	
	4.84	554.54				
					548.38	
RDM-02X spk				5.16	~~549.38~~	
	4.93	554.31				
		(return loop)			548.70	
RDM-02Y				4.61	~~549.70~~	
	9.92	559.62				
					551.21	
RDM-02				7.41	~~552.21~~	to.01
	1.04	(553.25)				

(cont p14)

same data

10/11/2000
same conditns
2nd eqpt. p11

00036 Red Devil

(cont)

Sta	+	HI	ifs	−	Elev.	Notes
		(553.25)				
TP 2'				14.86	538.39	-0.01
	0.12	538.51				
TP 1'				12.78	525.73	
	0.39	526.12				
				*	504.39 *	
RDM-02 B				20.73	~~505.39~~	flt!
	2.09	6" 507.48				
RDM-01	12 cap			17 (18.39) OK	~~90~~ 489.09 488.09	
	18.12 OK	6" 507.21				
~~RDM-03~~	~~cap~~			6.21	~~500.00~~	

Void

See pp 32-33

end vertical
(cont p32)

000306 Red Devil

Horizontal Control

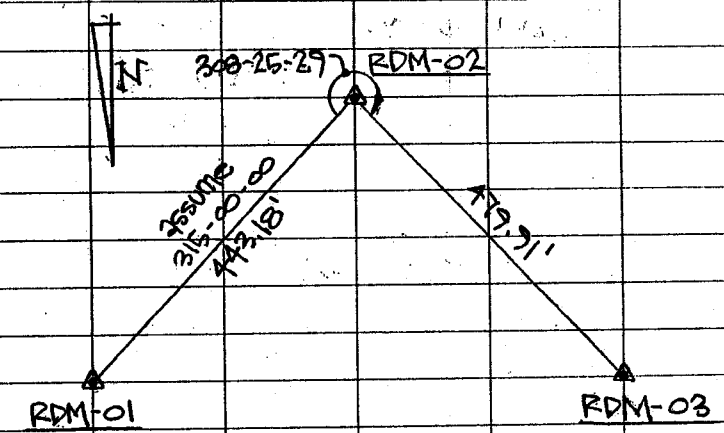
Sta	∡Rt	Z∡/SD	HR
2	TR RDM-02	cap	HI = 5.34'
1	BS RDM-01	cap	HR = 6.17'
	D) 00 00 00	97-59-41	
	R) 180 00 00	261-59-40	
	M) 00 00 00	< 98-00-01 >	
		447.540' =	
		HD = 443.18 =	
3	FS RDM-03	cap	HR = 4.94'
	D) 308 25 35	96 08 04	
	R) 128 25 09	263 51 30	
	BS) 179 59 40	< 96 08 17 >	
	M) 308 25 29	482.675' =	
		HD = 479.91' =	

(cont p18)

10/11/2000
same cond'ns
GTS 3 p3
TDS48 DC file: RDM1011.TWS / .CRS

same crew

Assume BS Az = 315°



Primary Control Sketch

10/11/2000

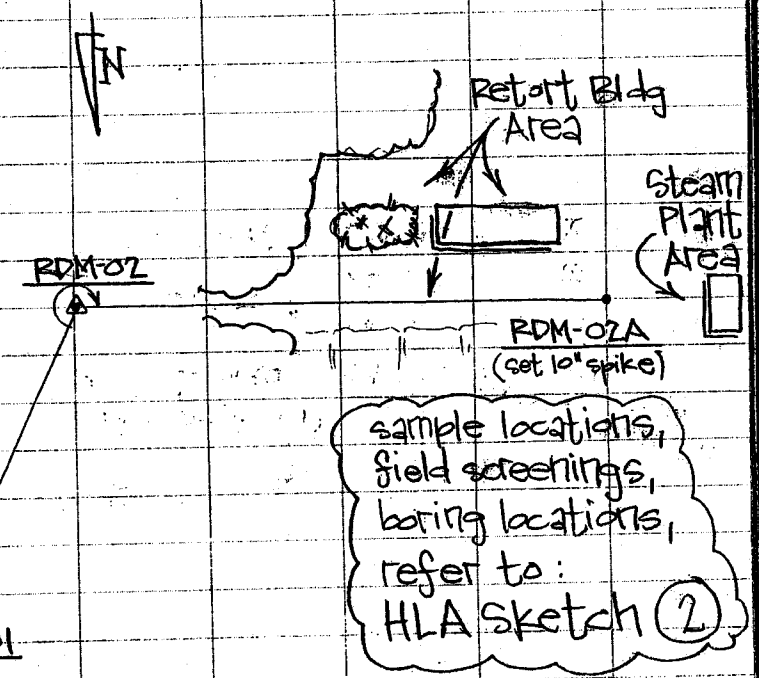
000036 Red Devil

cont

Sta	~~x~~ Rt	~~Z~~/SD	HR
21	FS RDM-02A	spike	6.17
	D) 255 57 27	9202 40	
	R) 75 57 04	267 56 50	
	BS) 179 59 41	<9202 55>	
	M) 255 57 23	509.775	
		HP: 509.45'	

— end control day —

cont p20



000360 Red Devil

10/11/2000
same cond'ns
3rd eqpt p17

same crew
w/C. Marshall, HLA

Retort Bldg
Field Screening Locations

TDS#	Desc	HR	Notes
	⅄ @ RDM-02A spk	5.11	
	BS RDM-02 cap	5.66	
100	BS chk RDM-02	5.66	
111	FS11	"	edit ⅄ HI = 5.11
182	FS82	"	Field Screening Location w/ Al tag mk'd "FS82"
115	FS 15	"	"
113	FS 13	"	"
181	FS 81	"	"
160	FS60	"	"
161	FS61	"	"
180	FS80	"	"
202	B-2	"	boring location Yawn!!
122	FS 22	"	"
179	FS79	"	"
142	FS 42	"	"
143	FS 43	"	"

(cont p22)

10/11/2000

00036 Red Devil

cont

TDS #	Desc	HR	Notes
			see p21
178	FS 78	5.66	edit ↑ HI = 5.11
144	FS 44	"	
177	FS 77	"	
145	FS 45	"	
146	FS 46	"	
147	FS 47	"	
141	FS 41	"	
> 176	FS 76	"	
140	FS 40	"	BS chk ✓
139	FS 39	"	
138	FS 38	"	
137	FS 37	"	
136	FS 36	"	
135	FS 35	"	
120	FS 20	"	
121	FS 21	"	
114	FS 14	"	
112	FS 12	"	

(cont p24)

000326 Red Devil

10/11/2000

(cont)

TDS #	Desc	HR	Notes
110	FS10	5.66	see p21
108	FS08	"	
107	FS07	"	
101	FS01	"	
116	FS16	"	
117	FS17	"	
118	FS18	"	
119	FS19	"	
163	FS63	"	
123	FS23	"	
124	FS24	"	
125	FS25	"	
126	FS26	"	
127	FS27	"	
128	FS28	"	
129	FS29	"	
130	FS30	"	
131	FS31	"	

(cont p26)

10/11/2000

00036 Red Devil

(cont)

TDB#	Desc	HR	Notes
132	FS 32	5.6	see p21
133	FS 33	"	
134	FS 34	"	
175	FS 75	"	
173	FS 73	"	
174	FS 74	"	
175	FS 75	"	
172	FS 72	"	
162	FS 62	"	
148	FS 48	"	
149	FS 49	"	
150	FS 50	"	
151	FS 51	"	
152	FS 52	"	
153	FS 53	"	
154	FS 54	"	
155	FS 55	"	
156	FS 56	"	

(cont p28)

10/11/2000

000 36 Red Devil

(cont)

TDS#	Desc	HR	Notes
171	FS 71	5.66	see p 21
170	FS 70	"	
169	FS 69	"	
168	FS 68	8.98	
167	FS 67	"	
166	FS 66	"	
157	FS 57	5.66	
158	FS 58	"	
159	FS 59	"	
165	FS 65	21.93	
164	FS 64	21.93	
104	FS 04	"	
103	FS 03	"	
102	FS 02	"	
106	FS 06	"	
105	FS 05	"	
109	FS 09	"	

end Report Bldg

(cont p30)

000836 Red Devil

10/11/2000
same conditns
and eqpt p17

same crew

Steam Plant Area

Refer to: HLA Sketch ① "Site Plan"

TDS #	Desc	HR	Notes
214	GT04	5.66	GeoTech test hole 4
213	GT03	"	" " 3
212	GT02	"	" " 2
211	GT01	"	" " 1
207	MW07	"	Monitor Well 07 top of PVC @ ref mk
227	RAM	"	random ground @ MW07
	Storage Pad Area		
201	MW01	"	same desc as above
221	RAM		"
324	RDV024SL	"	Sample Location (find nail w/ flo pink chaset) (typ)
325	RDV025SL	"	"
200	BS Chk FDM-02	6.17	

end day 10/11/2000

00036 Red Devil

12 October, 2000
+10°f; clear; calm
same eqpt, p11

same crew

cont Vertical Control
from p14

find 1' rod bust!!

Sta	+	HI	ifs	-	Elev	Notes
					504.39 ~~505.39~~	
RDM-02B	spk	505.00				see pp 0-14
	0.61	~~506.00~~				
					500.00	//
RDM-03	cap	504.80		5.00	~~501.00~~	<500.00>
	4.80	~~505.80~~				
					500.96	
RDM-03A	spk	501.42		3.84	~~501.96~~	<500.94>
	0.46	~~502.42~~				
					490.81	
TP3						
~~RDM-01~~	~~cap~~	500.74		10.61	~~491.81~~	x on rock
	9.93	~~501.74~~				
					488.11	
RDM-01	cap	501.13		12.63	~~489.11~~	
	13.02	~~502.13~~				
					500.96	//
RDM-03A'		506.81		0.17	~~501.96~~	
	5.85	~~507.81~~				
					504.38	//
RDM-02B				2.43	~~505.38~~	// <504.39>

— end vertical —

use

00036 Red Devil

Tank Farm Area
Tie Sample Locations

10/12/2000
same cond'ns p33
same crew
same cmpt p17
same TDS48 DC file:

TDS #	Desc	HR	Notes
2	T@ RDM-02 cap	5.39	
	BS RDM-01 cap	0.23	
400	BSchk RDM-01	"	"
302	RDV02SL	5.66	sample location
31	D) ∡ dbld in DC	6.17	[RDV-02Z spike]
	R) split =		
	M) 80 40 52	285.915'	
	horizon ∡		
	D) 279 19 23		
	R) 99 19 02		
	BSR) 179 59 40		
	M) 279 19 23		
	⟨Mn) 80 40 45	285.92 ⟩	

(cont p36)

00036 Red Devil

(cont)

10/12/2000
same conditions
and eqpt p 35

same crew

TDS #	Desc	HR	Notes
31	T@ RDM-02 Z	5.24	
	BS RDM-02	–	
303	RDV03SL	5.66	Sample Location @ T1
304	RDV04SL	21.93	"
305	RDV05SL	"	"
307	RDV07SL	5.66	" @ T2
308	RDV08SL	"	" "
309	RDV09SL	"	" "
310	RDV10SL	"	" "
330	RDV30SL	"	" "
311	RDV11SL	"	" @ T3
312	RDV12SL	"	" – "
313	RDV13SL	"	" "

(cont p38)

00036 Red Devil

(cont)

TDS #	Desc		HR	Notes
32	[RDM-02Y spk]		6.17	
	D) dbld in DC			
	R) split=			
	M) 178 10 05	113.02'		
	horizon ∡			
	D) 181 49 39			
	R) 01 49 20			
	BSR) 179 59 41			
	M) 181 49 39			
	Mrr) 178 10 13	113.02'		

(cont p40)

10/12/2000
same contrs
and cont p35

same ctrs

000366 Red Devil

(cont)

10/12/2000
same contins
3rd eqpt p35

same crew

TDS #	Desc		HR	Notes
32	TQ RDM-02Y		5.27	
31	BS RDM-02Z		–	
33	RDM-02X spk		6.17	
	D) dbld in DC			
	R) split=			
	M) 208 56 11	165.89		
	horizon ∡			
	D) 151 03 37			
	R) 331 03 25			
	BSR) 179 59 35			
	M) 151 03 50			
	(MT) 208 56 10	165.89)		
314	RDV14SL		5.66	sample Location @ T4
315	RDV15 SL		"	" "
316	RDV16 SL		"	" "
317	RDV17 SL		18.67	" "

(cont p42)

00036 Red Devil

(cont)

TDS#	Desc	HR	Notes
33	T @ RDM-02X	5.17	
32	BS RDM-02Y	—	
318	RDV18SL	5.66	Sample Location @ TS
329	RDV29SL	"	" "
319	RDV19SL	21.93	" along pipeline → Kusko.
320	RDV20SL	25.5	@ end of pipeline
321	RDV21SL		3 samples
322	RDV22SL		

end Tank Farm Area

" Setup

10/12/2000

same contdns

and opt p35

same crew

00036 Red Devil

cont from pp 20-31

TDS #		Desc	HR
21		Tie RDM-02A	5.40
2		BS RDM-02 cap	—
323		RDV23SL	5.66
		Topo Survey	
401	-	Toe	"
416	-	Toe	"
421	-	Ran	"
429	-	Top	
443	-	Brk	
447	- 453	Brk	

cont p46

10/12/2000
same contrs
and eqpt p35

same crew

Notes

@ breakline strings

along toe of Steam Plant Pad
along toe of Storage Pad
random fill in
top edge of Steam Plant Pad
brk line
" along roadway

00036 Red Devil

(cont)

TDS #	Desc	HR
22	RDM-02B spike D) dbld in DC E) split= M) 308 41 53 270.68	6.17

cont in FB 2 of 2
pp 2-3

10/12/2000
same contns
2nd eqpt p35

Notes

same ctrN

48

01 Δ 3:57 ↓21:28

@ 03 HR = 4.94 (1.506m)

3:16

Bo dP

8911 @ 03 HA = 4.94 ↑ 22:56

8911-285-1 ↓ 02:11

exit 1.45

1.45

trips 0.18 −0.055

Rd hts

# secs	HR
1	5.66
2	8.98
3	12.21
4	15.48
5	18.67
6	21.93
all 7	25.21

0.37 | 0.23

10/12

1.475m =

8911 @ RDM-02 cap 484 BOAM

↑19:09 ↓24:23 UTC

5.24

5.27

8911-286-0

Q33530

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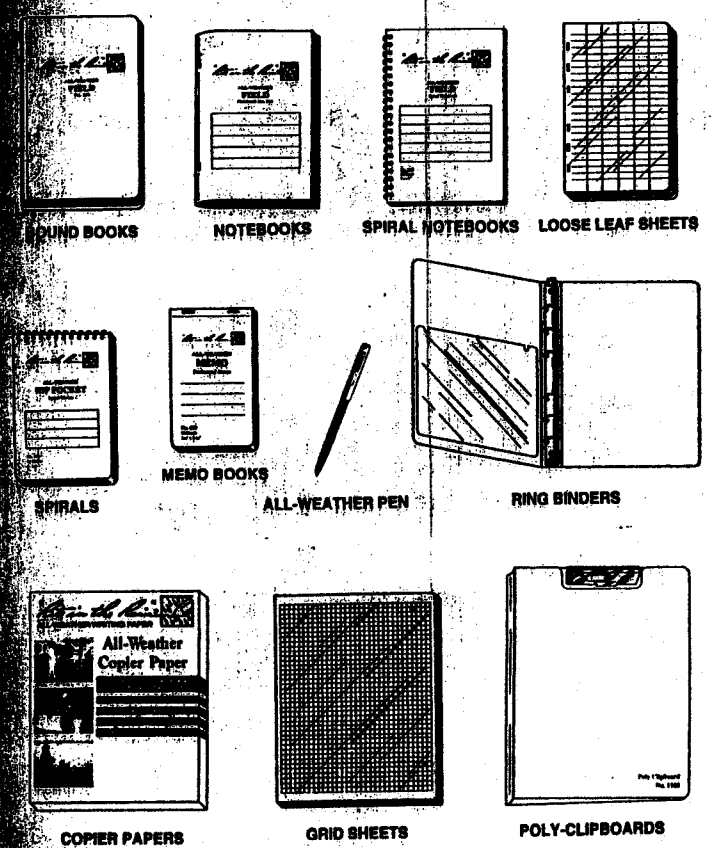

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CONTENTS

PAGE	REFERENCE	DATE
1	index	2000
2-5	ties MW/SL Control	10.12
4-9	topo survey	"
8-9	traverse closure/info	"
	end	

12 octobeti 2000

00036 Red Devil

cont from FB 1 of 2 pp 46-47

TDS #	Desc	HR	Notes
	TC RDM-02B	5.20	
	BG RDM-02A	—	
203	MW03	5.66	Monitor Well 03 top of PVC @ ref mk
223	Rain	"	random ground @ MW03
327	RDV27SL	21.93	sample Location @ Stop Bldg
328	RDV28SL	"	
205	BG	5.66	Boring Location
204	MW04	"	Monitor Well 04 top of PVC @ ref mk
224	Rain	"	random ground @ MW04
326	RDV26SL	"	sample Location

(cont p4)

000036 Red Devil

cont

TDS#	Desc	HR	Notes
13.	RDM-03 cap[2]	6.17	
	D) dbld in DC		
	R) split =		
	M) 157 06 54 175.98'		
	horizon ∡		
	D) 202 53 28		
	R) 22 52 59		
	BSR) 179 59 35		
	M) 202 53 24		
	⟨M 157 06 43 175.98'⟩		
206	MW06	5.66	Monitor Well 06
224	Ran	8.98	Random Ground @ MW06
	cont Topo Survey		
454 - 464	Top	5.66	Top of Settling Pond
465	ER BTK = edits =	"	~~edge of pond~~, ~~along toe of slope~~ → ok
468	ER BTK	12.21	

(cont pg 6)

10/12/2000

000036 Red Devil

(cont)

TDS#	Desc	HR	Notes
469 - 471	ER Brk edit	15.48	
472 - 476	ER	"	edge of road, along toe of slope E side
477 -	"	"	" " W side
482 -		21.93	
483	ER/TOE	"	@ toe of slope @ ck
484	TOE	"	
485 - 487	TOE	15.48	
488 -	Top	5.66	
503 -	"	"	top of storage pad
504 -	"	8.98	"
506 -	"	15.48	"
509	"	5.66	"
510 -	Brk	"	
519 - 525	Top	"	top of main slope
527 -	Brk	"	
534	Brk		along toe of "
540 - 550	"	12.21	" " " bump
551 -	Top	5.66	" top " "
			edit 551 & 552 ~~subtract~~ add 6.55 to elevs 551-554

(cont p8)

10/12/2000

00036 Red Devil

cont.

TDS #	Desc	HR	Notes
558 -	Ran	5.66	
560 -	Top	"	inside top of settling pond
565 -	Toe	"	along toe " "
577 - 580	Ran	"	inside "

traverse closure (coord)

11 RDM-01 cap
D) held in DC
R) split
⟨M) 205 17 21 498.27'⟩

∡ close

To RDM-01 cap
BS RDM-02B
FS RDM-02 cap
D) 310 03 15
R) 260 06 43
⟨M) 310 03 22⟩ ∡ only

Raw Closure Info.

Σ ∡'s = 1079-59-59
Σ HD = 1721.58
radial error = 153-17-05 0.16'
rel. prec = 1:11,000'
coord error = lat -0.14'
dep +0.07'

End Survey

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TDS48 Red Devil Raw Data


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OC,OP1,N 5000.0000,E 5000.0000,EL488.090,--RDM-01 CAP
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SS,OP2,FP3,AR308.25290,ZE96.08170,SD482.675,--RDM-03 CAP
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SS,OP21,FP146,AR347.51390,ZE89.16040,SD90.605,--FS46
SS,OP21,FP147,AR347.57580,ZE89.29560,SD71.365,--FS47
SS,OP21,FP141,AR1.48410,ZE88.33320,SD59.630,--FS41
LS,HI5.110,HR8.980
SS,OP21,FP214,AR146.37300,ZE90.27090,SD48.060,--GT04
SS,OP21,FP213,AR145.03070,ZE89.51090,SD84.910,--GT03
SS,OP21,FP212,AR153.53370,ZE89.51440,SD116.130,--GT02
SS,OP21,FP211,AR164.47560,ZE88.38480,SD141.770,--GT01
SS,OP21,FP207,AR173.56170,ZE87.35470,SD165.110,--MW07
SS,OP21,FP227,AR175.07210,ZE88.32500,SD165.100,--RAN
SS,OP21,FP201,AR279.15070,ZE95.44160,SD162.835,--MW01
SS,OP21,FP221,AR280.09540,ZE96.52180,SD161.720,--RAN
SS,OP21,FP324,AR276.26250,ZE97.09470,SD150.395,--RDV024SL
SS,OP21,FP325,AR307.13450,ZE95.36510,SD306.060,--RDV025SL
LS,HI5.110,HR6.170
SS,OP21,FP200,AR359.59330,ZE87.45020,SD509.855,--BS
--END DAY 10/11/2000
--BEGIN DAY 10/12/2000
--TANK FARM AREA
OC,OP2,N 10000.0000,E 10000.0000,EL552.220,--RDM-02 CAP
BK,OP2,BP1,BS315.0000,BC0.0000
LS,HI5.390,HR0.230
SS,OP2,FP400,AR0.00000,ZE98.45290,SD448.400,--BS CHK RDM-01
LS,HI5.390,HR5.660
SS,OP2,FP302,AR254.16110,ZE91.31190,SD74.565,--RDV02SL
RD,BD 1:359.59590
RD,FD 1:80.40450
RD,ZD 1:89.39580
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MD,SD 1:285.910
RD,BV 1:179.59320
RD,FV 1:260.40290
RD,ZV 1:270.19490
MD,SD 1:285.920
LS,HI5.390,HR6.170
SS,OP2,FP31,AR80.40515,ZE89.40045,SD285.915,--RDM-02Z SPK
OC,OP31,N 10232.2383,E 10166.7633,EL553.099,--RDM-02Z SPK
BK,OP31,BP2,BS215.4051,BC0.0000
BK,OP31,BP2,BS215.4051,BC0.0000
BK,OP31,BP2,BS215.4051,BC0.0000
RD,BD 1:354.20320
LS,HI5.240,HR5.660
SS,OP31,FP303,AR354.20320,ZE88.37510,SD107.810,--RDV03SL
LS,HI5.240,HR21.930
SS,OP31,FP304,AR347.26560,ZE81.28000,SD125.260,--RDV04SL
SS,OP31,FP305,AR347.26550,ZE81.28010,SD125.265,--RDV05SL
LS,HI5.240,HR5.660
SS,OP31,FP307,AR311.31020,ZE86.31270,SD44.535,--RDV07SL
SS,OP31,FP308,AR311.31010,ZE86.31250,SD44.695,--RDV08SL
SS,OP31,FP309,AR278.28060,ZE85.00210,SD9.665,--RDV09SL
SS,OP31,FP310,AR278.28070,ZE85.00200,SD9.690,--RDV10SL
SS,OP31,FP330,AR242.49050,ZE77.14410,SD65.265,--RDV30SL
SS,OP31,FP311,AR209.57250,ZE90.03280,SD48.090,--RDV11SL
SS,OP31,FP312,AR209.57250,ZE90.03280,SD48.150,--RDV12SL
SS,OP31,FP313,AR199.22120,ZE90.18500,SD96.440,--RDV13SL
RD,BD 1:0.00000
RD,FD 1:178.10070
RD,ZD 1:91.13070
MD,SD 1:113.035
RD,BV 1:179.59430
RD,FV 1:358.09460
RD,ZV 1:268.47060
MD,SD 1:113.060
LS,HI5.240,HR6.170
TR,OP31,FP32,AR178.10050,ZE91.13005,SD113.048,--RDM-02Y SPK
OC,OP32,N 10326.1040,E 10229.7173,EL549.768,--RDM-02Y SPK
BK,OP32,BP31,BS213.5056,BC0.0000
RD,BD 1:0.00010
RD,FD 1:208.56040
RD,ZD 1:89.47550
MD,SD 1:165.890
RD,BV 1:179.59350
RD,FV 1:28.55530
RD,ZV 1:270.12020
MD,SD 1:165.885
LS,HI5.270,HR6.170
SS,OP32,FP33,AR208.56105,ZE89.47565,SD165.888,--RDM-02X SPK
LS,HI5.270,HR5.660
SS,OP32,FP314,AR222.22500,ZE89.36520,SD105.510,--RDV14SL
SS,OP32,FP315,AR222.22500,ZE89.36500,SD105.470,--RDV15SL
SS,OP32,FP316,AR228.22110,ZE89.35460,SD124.375,--RDV16SL
LS,HI5.270,HR18.670
SS,OP32,FP317,AR233.02540,ZE82.14070,SD146.935,--RDV17SL
OC,OP33,N 10401.9683,E 10377.2399,EL549.451,--RDM-02X SPK
BK,OP33,BP32,BS242.4707,BC0.0000
LS,HI5.170,HR5.660
SS,OP33,FP318,AR264.32580,ZE80.12410,SD119.450,--RDV18SL
SS,OP33,FP329,AR252.25090,ZE81.07080,SD187.420,--RDV29SL
LS,HI5.170,HR21.930
SS,OP33,FP319,AR107.22380,ZE112.58070,SD165.760,--RDV19SL
LS,HI5.170,HR25.500
SS,OP33,FP320,AR109.31030,ZE113.18310,SD235.970,--RDV20SL
SP,PN321,N 10616.7283,E 10348.2138,EL435.7524,--RDV21SL
SP,PN322,N 10616.7283,E 10348.2138,EL435.7524,--RDV22SL
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--END TANK FARM AREA
OC,OP21,N 9563.1169,E 9737.9465,EL533.172,--RDM-02A SPK
BK,OP21,BP2,BS30.5723,BC0.0000
BK,OP21,BP2,BS30.5723,BC0.0000
LS,HI5.400,HR5.660
SS,OP21,FP323,AR1.59020,ZE88.31260,SD312.150,--RDV23SL
SS,OP21,FP401,AR204.06180,ZE93.12250,SD157.440,--TOE
SS,OP21,FP402,AR199.20020,ZE93.26330,SD139.090,--TOE
SS,OP21,FP403,AR186.56400,ZE92.15150,SD135.450,--TOE
SS,OP21,FP404,AR179.27400,ZE93.27590,SD118.675,--TOE
SS,OP21,FP405,AR169.16350,ZE91.47300,SD122.715,--TOE
SS,OP21,FP406,AR160.51320,ZE91.54520,SD109.140,--TOE
SS,OP21,FP407,AR159.36590,ZE94.22310,SD84.355,--TOE
SS,OP21,FP408,AR161.05580,ZE97.06100,SD59.250,--TOE
SS,OP21,FP409,AR193.08500,ZE102.24500,SD44.620,--TOE
SS,OP21,FP410,AR226.54220,ZE109.00400,SD40.770,--TOE
SS,OP21,FP411,AR263.15540,ZE109.43200,SD46.255,--TOE
SS,OP21,FP412,AR286.30020,ZE106.01100,SD66.445,--TOE
SS,OP21,FP413,AR296.22370,ZE101.03140,SD89.555,--TOE
SS,OP21,FP414,AR301.58080,ZE98.51400,SD119.040,--TOE
SS,OP21,FP415,AR304.29040,ZE97.31270,SD149.930,--TOE
SS,OP21,FP416,AR273.57430,ZE103.24130,SD87.710,--TOE
SS,OP21,FP417,AR258.53080,ZE101.29160,SD97.135,--TOE
SS,OP21,FP418,AR244.17570,ZE101.51090,SD104.090,--TOE
SS,OP21,FP419,AR248.30280,ZE101.18160,SD128.415,--TOE
SS,OP21,FP420,AR250.28200,ZE101.03300,SD153.790,--TOE
SS,OP21,FP421,AR251.09160,ZE104.01500,SD74.795,--RAN
SS,OP21,FP422,AR228.03070,ZE102.55180,SD72.305,--RAN
SS,OP21,FP423,AR205.13070,ZE99.30580,SD79.540,--RAN
SS,OP21,FP424,AR187.15000,ZE96.54420,SD87.715,--RAN
SS,OP21,FP425,AR173.35020,ZE95.27590,SD90.820,--RAN
SS,OP21,FP426,AR196.50500,ZE95.37060,SD107.215,--RAN
SS,OP21,FP427,AR211.31570,ZE95.33470,SD130.220,--RAN
SS,OP21,FP428,AR211.31300,ZE94.30440,SD161.300,--RAN
SS,OP21,FP429,AR195.47280,ZE89.58290,SD161.165,--TOP
SS,OP21,FP430,AR189.06530,ZE89.45380,SD161.205,--TOP
SS,OP21,FP431,AR181.48570,ZE89.44010,SD139.860,--TOP
SS,OP21,FP432,AR168.56540,ZE88.51500,SD141.560,--TOP
SS,OP21,FP433,AR160.04570,ZE89.49030,SD122.540,--TOP
SS,OP21,FP434,AR152.57200,ZE90.14070,SD101.340,--TOP
SS,OP21,FP435,AR148.51270,ZE90.19190,SD72.790,--TOP
SS,OP21,FP436,AR159.18160,ZE90.45210,SD43.065,--TOP
SS,OP21,FP437,AR178.17370,ZE90.13380,SD14.615,--TOP
SS,OP21,FP438,AR310.41320,ZE94.04260,SD16.675,--TOP
SS,OP21,FP439,AR318.20040,ZE95.13420,SD50.470,--TOP
SS,OP21,FP440,AR313.16280,ZE96.13180,SD81.235,--TOP
SS,OP21,FP441,AR309.59560,ZE96.33570,SD114.715,--TOP
SS,OP21,FP442,AR308.14260,ZE96.32010,SD152.160,--TOP
SS,OP21,FP443,AR170.30490,ZE91.13400,SD34.365,--BRK
SS,OP21,FP444,AR203.18010,ZE97.51020,SD27.600,--BRK
SS,OP21,FP445,AR236.38090,ZE105.26540,SD27.330,--BRK
SS,OP21,FP446,AR258.45220,ZE109.44170,SD41.730,--BRK
SS,OP21,FP447,AR164.43320,ZE88.26430,SD153.240,--BRK
SS,OP21,FP448,AR156.19590,ZE89.23460,SD128.870,--BRK
SS,OP21,FP449,AR146.10080,ZE89.57190,SD103.475,--BRK
SS,OP21,FP450,AR139.36500,ZE89.25530,SD70.775,--BRK
SS,OP21,FP451,AR133.27490,ZE87.48280,SD45.165,--BRK
SS,OP21,FP452,AR96.38390,ZE84.06010,SD36.480,--BRK
SS,OP21,FP453,AR52.01530,ZE85.10490,SD38.260,--BRK
RD,BD 1:0.00000
RD,FD 1:308.41490
RD,ZD 1:95.41550
MD,SD 1:272.020
RD,BV 1:179.59410
RD,FV 1:128.41380
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RD,ZV 1:264.18100
MD,SD 1:272.010
LS,HI5.400,HR6.170
TR,OP21,FP22,AR308.41530,ZE95.41525,SD272.015,--RDM-02B SPK
OC,OP22,N 9816.9018,E 9643.8392,EL505.397,--RDM-02B SPK
BK,OP22,BP21,BS159.3916,BC0.0000
RD,BD 1:226.46290
LS,HI5.200,HR5.660
SS,OP22,FP203,AR226.46290,ZE92.56220,SD297.800,--MW03
SS,OP22,FP223,AR226.29080,ZE93.27480,SD295.615,--RAN
LS,HI5.200,HR21.930
SS,OP22,FP327,AR200.17050,ZE89.38410,SD487.725,--RDV27SL
SP,PN328,N 10304.6171,E 9643.3213,EL491.6962,--RDV28SL
SP,PN328,N 10304.6171,E 9643.3213,EL491.6962,--RDV28SL
LS,HI5.200,HR5.660
SS,OP22,FP205,AR187.55490,ZE90.32010,SD395.545,--B-5
SS,OP22,FP204,AR171.29190,ZE91.19560,SD168.715,--MW04
SS,OP22,FP224,AR171.01440,ZE92.08550,SD167.665,--RAN
SS,OP22,FP326,AR153.48480,ZE92.21070,SD139.775,--RDV26SL
RD,BD 1:359.59590
RD,FD 1:157.06480
RD,ZD 1:91.06410
MD,SD 1:176.015
RD,BV 1:179.59100
RD,FV 1:337.06090
RD,ZV 1:268.53120
MD,SD 1:176.005
LS,HI5.200,HR6.170
SS,OP22,FP13,AR157.06540,ZE91.06445,SD176.010,--RDM-03 CAP2
LS,HI5.200,HR5.660
SS,OP22,FP206,AR212.35330,ZE93.05480,SD530.370,--MW06
LS,HI5.200,HR8.980
SS,OP22,FP226,AR212.44210,ZE93.01080,SD529.700,--RAN
LS,HI5.200,HR5.660
SS,OP22,FP454,AR239.07530,ZE92.57300,SD339.880,--TOP
SS,OP22,FP455,AR234.34220,ZE93.00480,SD332.670,--TOP
SS,OP22,FP456,AR230.36110,ZE93.08240,SD318.540,--TOP
SS,OP22,FP457,AR227.34150,ZE93.16030,SD308.440,--TOP
SS,OP22,FP458,AR223.08460,ZE93.50500,SD267.100,--TOP
SS,OP22,FP459,AR219.31440,ZE94.36370,SD222.905,--TOP
SS,OP22,FP460,AR218.05130,ZE94.59170,SD197.740,--TOP
SS,OP22,FP461,AR222.26590,ZE95.33410,SD175.015,--TOP
SS,OP22,FP462,AR230.42020,ZE95.46340,SD160.960,--TOP
SS,OP22,FP463,AR238.03220,ZE94.36430,SD134.680,--TOP
SS,OP22,FP464,AR240.42220,ZE95.16100,SD103.285,--TOP
SS,OP22,FP465,AR243.43140,ZE96.04570,SD81.920,--ER
SS,OP22,FP466,AR229.50380,ZE97.54460,SD101.435,--ER
SS,OP22,FP467,AR220.39350,ZE98.47450,SD123.525,--ER
LS,HI5.200,HR12.210
SS,OP22,FP468,AR213.47500,ZE97.01460,SD143.445,--ER
LS,HI5.200,HR15.480
SS,OP22,FP469,AR210.06410,ZE97.00550,SD158.780,--ER
SS,OP22,FP470,AR207.26410,ZE97.07210,SD185.950,--ER
SS,OP22,FP471,AR207.05130,ZE97.50530,SD187.550,--ER
SS,OP22,FP472,AR209.46180,ZE97.29140,SD155.650,--ER
SS,OP22,FP473,AR216.04550,ZE96.18260,SD126.920,--ER
SS,OP22,FP474,AR224.21590,ZE94.34590,SD106.345,--ER
SS,OP22,FP475,AR235.05210,ZE91.56560,SD87.730,--ER
SS,OP22,FP476,AR245.54490,ZE89.02260,SD74.785,--ER
SS,OP22,FP477,AR245.36350,ZE86.00060,SD52.730,--ER
SS,OP22,FP478,AR233.39490,ZE90.43290,SD76.310,--ER
SS,OP22,FP479,AR226.12240,ZE93.12480,SD86.940,--ER
SS,OP22,FP480,AR216.20360,ZE95.54430,SD108.670,--ER
SS,OP22,FP481,AR208.25460,ZE97.21400,SD131.010,--ER
LS,HI5.200,HR21.930
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SS,OP22,FP482,AR205.47260,ZE95.27350,SD157.285,--ER
SS,OP22,FP483,AR205.12090,ZE95.57540,SD178.210,--ER/TOE
SS,OP22,FP484,AR179.33550,ZE95.29350,SD117.655,--TOE
LS,HI5.200,HR15.480
SS,OP22,FP485,AR177.48130,ZE98.45510,SD87.330,--TOE
SS,OP22,FP486,AR155.39290,ZE95.32370,SD89.470,--TOE
SS,OP22,FP487,AR136.08310,ZE97.36540,SD69.230,--TOE
LS,HI5.200,HR5.660
SS,OP22,FP488,AR243.30360,ZE96.28160,SD50.980,--TOP
SS,OP22,FP489,AR233.06140,ZE95.47320,SD68.305,--TOP
SS,OP22,FP490,AR220.41490,ZE95.36330,SD63.190,--TOP
SS,OP22,FP491,AR210.04500,ZE94.31370,SD89.330,--TOP
SS,OP22,FP492,AR197.58060,ZE93.40570,SD101.295,--TOP
SS,OP22,FP493,AR183.09070,ZE95.32510,SD92.045,--TOP
SS,OP22,FP494,AR185.03090,ZE96.41550,SD79.050,--TOP
SS,OP22,FP495,AR169.33060,ZE93.55380,SD64.630,--TOP
SS,OP22,FP496,AR153.58070,ZE94.07130,SD72.800,--TOP
SS,OP22,FP497,AR141.09560,ZE93.49230,SD36.255,--TOP
SS,OP22,FP498,AR93.03060,ZE92.47580,SD40.725,--TOP
SS,OP22,FP499,AR69.31480,ZE91.32420,SD67.065,--TOP
SS,OP22,FP500,AR56.51530,ZE89.52420,SD97.730,--TOP
SS,OP22,FP501,AR48.11100,ZE87.04250,SD116.055,--TOP
SS,OP22,FP502,AR47.24530,ZE88.25040,SD155.440,--TOP
SS,OP22,FP503,AR43.06060,ZE87.53160,SD179.385,--TOP
LS,HI5.200,HR8.980
SS,OP22,FP504,AR38.33130,ZE86.48380,SD197.135,--TOP
SS,OP22,FP505,AR31.57210,ZE86.34180,SD210.305,--TOP
LS,HI5.200,HR15.480
SS,OP22,FP506,AR26.21220,ZE84.31470,SD212.800,--TOP
SS,OP22,FP507,AR20.36100,ZE84.35570,SD197.975,--TOP
SS,OP22,FP508,AR17.43200,ZE83.24130,SD164.305,--TOP
LS,HI5.200,HR5.660
SS,OP22,FP509,AR11.03250,ZE86.34190,SD131.065,--TOP
SS,OP22,FP510,AR179.38420,ZE93.58420,SD40.695,--BRK
SS,OP22,FP511,AR217.40080,ZE91.35410,SD10.955,--BRK
SS,OP22,FP512,AR333.16000,ZE86.27040,SD28.010,--BRK
SS,OP22,FP513,AR345.17590,ZE85.23190,SD64.015,--BRK
SS,OP22,FP514,AR348.46360,ZE84.58250,SD102.710,--BRK
SS,OP22,FP515,AR351.47200,ZE84.47470,SD140.625,--BRK
SS,OP22,FP516,AR353.30410,ZE84.22270,SD176.485,--BRK
SS,OP22,FP517,AR353.18040,ZE83.57450,SD215.585,--BRK
SS,OP22,FP518,AR351.19280,ZE83.37230,SD241.955,--BRK
SS,OP22,FP519,AR346.13240,ZE82.29520,SD209.400,--TOP
SS,OP22,FP520,AR337.57310,ZE81.30400,SD183.315,--TOP
SS,OP22,FP521,AR326.51040,ZE80.56410,SD170.185,--TOP
SS,OP22,FP522,AR313.36230,ZE80.34440,SD167.320,--TOP
SS,OP22,FP523,AR302.15180,ZE81.05010,SD176.375,--TOP
SS,OP22,FP524,AR290.37550,ZE81.47090,SD192.265,--TOP
SS,OP22,FP525,AR287.01010,ZE82.36070,SD201.380,--TOP
SS,OP22,FP526,AR350.16170,ZE84.11370,SD208.235,--BRK
SS,OP22,FP527,AR349.24110,ZE85.53420,SD179.575,--BRK
SS,OP22,FP528,AR345.55570,ZE87.36520,SD154.330,--BRK
SS,OP22,FP529,AR340.31130,ZE89.24550,SD124.210,--BRK
SS,OP22,FP530,AR332.32540,ZE90.48530,SD97.390,--BRK
SS,OP22,FP531,AR317.06220,ZE93.17450,SD70.195,--BRK
SS,OP22,FP532,AR297.42330,ZE94.40050,SD58.210,--BRK
SS,OP22,FP533,AR270.07100,ZE95.33480,SD59.470,--BRK
SS,OP22,FP534,AR339.32200,ZE88.22370,SD144.080,--BRK
SS,OP22,FP535,AR328.21050,ZE88.31510,SD126.500,--BRK
SS,OP22,FP536,AR319.52230,ZE87.34150,SD121.110,--BRK
SS,OP22,FP537,AR302.24440,ZE86.21340,SD126.425,--BRK
SS,OP22,FP538,AR285.40260,ZE87.18530,SD141.360,--BRK
SS,OP22,FP539,AR277.40550,ZE88.50100,SD160.025,--BRK
LS,HI5.200,HR12.210
SS,OP22,FP540,AR265.56100,ZE88.26310,SD173.220,--BRK
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SS,OP22,FP541,AR258.00060,ZE90.00180,SD183.915,--BRK
SS,OP22,FP542,AR249.44550,ZE92.15240,SD204.165,--BRK
SS,OP22,FP543,AR243.00560,ZE93.16250,SD186.060,--BRK
SS,OP22,FP544,AR236.52300,ZE93.24500,SD171.580,--BRK
SS,OP22,FP545,AR242.49090,ZE92.17090,SD146.635,--BRK
SS,OP22,FP546,AR251.13280,ZE91.33380,SD122.260,--BRK
SS,OP22,FP547,AR263.27340,ZE91.07310,SD98.790,--BRK
SS,OP22,FP548,AR281.49210,ZE89.20000,SD75.035,--BRK
SS,OP22,FP549,AR308.44380,ZE88.17340,SD82.610,--BRK
SS,OP22,FP550,AR324.20460,ZE87.07070,SD99.565,--BRK
SS,OP22,FP551,AR316.42010,ZE87.39490,SD111.400,--TOP
SS,OP22,FP552,AR299.02050,ZE86.25050,SD99.430,--TOP
SS,OP22,FP553,AR276.34100,ZE86.59040,SD103.045,--TOP
SS,OP22,FP554,AR260.47460,ZE87.44110,SD136.800,--TOP
LS,HI5.200,HR5.660
SS,OP22,FP555,AR262.39130,ZE87.46360,SD154.980,--TOP
SS,OP22,FP556,AR264.55330,ZE87.59220,SD163.985,--TOP
SS,OP22,FP557,AR275.26140,ZE87.46020,SD153.485,--TOP
SS,OP22,FP558,AR271.46070,ZE87.34480,SD137.965,--RAN
SS,OP22,FP559,AR284.39140,ZE87.31070,SD124.260,--RAN
SS,OP22,FP560,AR234.11120,ZE95.29250,SD167.290,--TOP
SS,OP22,FP561,AR224.39260,ZE95.14350,SD184.600,--TOP
SS,OP22,FP562,AR221.32500,ZE94.59100,SD202.935,--TOP
SS,OP22,FP563,AR223.55540,ZE94.17330,SD242.875,--TOP
SS,OP22,FP564,AR226.45230,ZE93.39040,SD285.130,--TOP
SS,OP22,FP565,AR246.04080,ZE93.42470,SD235.555,--TOE
SS,OP22,FP566,AR243.09160,ZE93.35580,SD271.815,--TOE
SS,OP22,FP567,AR240.57100,ZE93.36290,SD307.755,--TOE
SS,OP22,FP568,AR238.53530,ZE93.45250,SD327.830,--TOE
SS,OP22,FP569,AR233.24580,ZE94.01560,SD312.725,--TOE
SS,OP22,FP570,AR228.45280,ZE94.22250,SD291.825,--TOE
SS,OP22,FP571,AR226.14030,ZE94.29450,SD263.585,--TOE
SS,OP22,FP572,AR224.41380,ZE94.53560,SD242.075,--TOE
SS,OP22,FP573,AR222.48350,ZE95.13280,SD214.640,--TOE
SS,OP22,FP574,AR222.43540,ZE95.28190,SD203.810,--TOE
SS,OP22,FP575,AR225.06320,ZE95.48150,SD189.510,--TOE
SS,OP22,FP576,AR233.55240,ZE95.40040,SD172.425,--TOE
SS,OP22,FP577,AR230.07320,ZE95.07000,SD219.185,--RAN
SS,OP22,FP578,AR231.27480,ZE94.54430,SD266.735,--RAN
SS,OP22,FP579,AR236.16000,ZE94.23180,SD292.180,--RAN
SS,OP22,FP580,AR238.38060,ZE94.37170,SD243.485,--RAN
RD,BD 1:359.59590
RD,FD 1:205.17210
RD,ZD 1:92.25360
MD,SD 1:498.720
RD,BV 1:179.59340
RD,FV 1:25.16540
RD,ZV 1:267.34100
MD,SD 1:498.720
LS,HI5.200,HR0.370
SS,OP22,FP11,AR205.17210,ZE92.25430,SD498.720,--RDM-01 CAP2
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raw data

1,	10313.3795,	9686.6205,	489.1064,	RDM-01 CAP
2,	10000.0000,	10000.0000,	552.2200,	RDM-02 CAP
3,	9945.0463,	9523.2477,	501.0150,	RDM-03 CAP
11,	10313.3207,	9686.7779,	489.0991,	RDM-01 CAP2
13,	9945.1191,	9523.3063,	501.0108,	RDM-03 CAP2
21,	9563.1169,	9737.9465,	533.1722,	RDM-02A SPK
22,	9816.9018,	9643.8392,	505.3971,	RDM-02B SPK
31,	10232.2383,	10166.7633,	553.0988,	RDM-02Z SPK
32,	10326.1040,	10229.7173,	549.7684,	RDM-02Y SPK
33,	10401.9683,	10377.2399,	549.4509,	RDM-02X SPK
100,	9999.9127,	9999.9476,	552.4519,	BS CHK RDM-02
101,	9768.6153,	9864.5403,	535.9574,	FS01
102,	9765.1667,	9875.9062,	536.0667,	FS02
103,	9763.7169,	9883.1345,	536.1636,	FS03
104,	9759.8402,	9892.1511,	536.5732,	FS04
105,	9776.6635,	9896.3508,	536.2211,	FS05
106,	9781.3430,	9886.0148,	536.0219,	FS06
107,	9784.7067,	9875.9814,	536.1298,	FS07
108,	9798.9661,	9889.6482,	536.3560,	FS08
109,	9786.2071,	9898.0351,	536.5061,	FS09
110,	9809.3851,	9867.9585,	535.5023,	FS10
111,	9813.0495,	9846.0689,	534.0327,	FS11
112,	9793.2165,	9856.1876,	535.1998,	FS12
113,	9793.6375,	9835.6134,	534.0952,	FS13
114,	9775.4489,	9847.5197,	535.5045,	FS14
115,	9826.5427,	9844.9305,	531.4368,	FS15
116,	9759.3965,	9860.1673,	536.2197,	FS16
117,	9750.1093,	9857.5268,	536.3554,	FS17
118,	9740.9690,	9852.5546,	536.4322,	FS18
119,	9732.8654,	9848.3171,	536.6306,	FS19
120,	9738.0893,	9831.2162,	535.1398,	FS20
121,	9758.2625,	9839.9686,	535.5795,	FS21
122,	9740.1183,	9807.0475,	533.9713,	FS22
123,	9713.7923,	9839.9199,	536.9458,	FS23
124,	9704.2589,	9835.3795,	536.5132,	FS24
125,	9696.7477,	9830.9243,	536.4695,	FS25
126,	9688.9397,	9826.8830,	537.0499,	FS26
127,	9678.1832,	9821.8432,	536.7876,	FS27
128,	9668.8784,	9818.0309,	536.5682,	FS28
129,	9659.3575,	9813.3094,	536.3975,	FS29
130,	9651.7642,	9808.4072,	536.3400,	FS30
131,	9644.4224,	9806.2338,	536.2555,	FS31
132,	9630.9572,	9799.8282,	536.2324,	FS32
133,	9623.5454,	9798.4419,	535.9292,	FS33
134,	9605.3671,	9788.2285,	536.2274,	FS34
135,	9720.9801,	9821.9703,	535.5085,	FS35
136,	9703.9694,	9813.0486,	536.0221,	FS36
137,	9684.8165,	9804.9083,	535.9446,	FS37
138,	9667.1678,	9796.3591,	535.6829,	FS38
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140,	9630.5200,	9778.1353,	535.4248,	FS40
141,	9613.2422,	9770.2102,	534.1219,	FS41
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143,	9703.7189,	9789.6029,	533.9601,	FS43
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146,	9648.8722,	9767.1688,	533.7802,	FS46
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148,	9619.3496,	9811.8405,	537.5931,	FS48
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150,	9634.7215,	9821.5604,	537.3379,	FS50
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152,	9656.3607,	9830.5560,	537.0951,	FS52
153,	9665.3998,	9833.8465,	537.6706,	FS53
154,	9660.0749,	9852.5455,	538.6861,	FS54
155,	9664.4455,	9861.6333,	538.1792,	FS55
156,	9673.5792,	9865.7842,	538.1110,	FS56
157,	9647.1803,	9847.2651,	538.7735,	FS57
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159,	9610.6561,	9829.6068,	539.1317,	FS59
160,	9776.7875,	9825.7075,	534.0986,	FS60
161,	9759.6792,	9817.1623,	534.4190,	FS61
162,	9620.6532,	9805.2970,	536.6026,	FS62
163,	9723.2456,	9843.5231,	536.4890,	FS63
164,	9743.2163,	9891.7433,	537.5664,	FS64
165,	9732.1132,	9887.8011,	537.2788,	FS65
166,	9725.2390,	9886.9109,	537.7462,	FS66
167,	9715.5472,	9882.7943,	537.3576,	FS67
168,	9706.2078,	9879.6305,	537.2363,	FS68
169,	9697.5461,	9876.0839,	537.7582,	FS69
170,	9688.1531,	9872.0654,	537.7660,	FS70
171,	9679.0192,	9868.3134,	537.6104,	FS71
172,	9612.3354,	9801.2388,	537.0620,	FS72
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174,	9600.1712,	9813.0283,	538.2292,	FS74
175,	9587.8946,	9779.0197,	535.7499,	FS75
176,	9595.5452,	9761.5636,	533.1272,	FS76
177,	9677.8046,	9764.6833,	532.1622,	FS77
178,	9706.3697,	9775.7517,	531.9763,	FS78
179,	9734.3234,	9785.5202,	532.0810,	FS79
180,	9760.4557,	9798.3847,	530.9789,	FS80
181,	9784.8800,	9816.6948,	532.6491,	FS81
182,	9812.5359,	9830.5477,	532.1881,	FS82
200,	10000.0446,	9999.9490,	552.1294,	BS
201,	9667.7115,	9614.2120,	516.3432,	MW01

202,	9749.6574,	9806.0077,	532.2504,	B-2
203,	10083.2266,	9776.2130,	489.6676,	MW03
204,	9964.6271,	9562.4352,	501.0151,	MW04
205,	10203.1803,	9558.8024,	501.2565,	B-5
206,	10334.4457,	9756.1801,	476.2919,	MW06
207,	9413.4799,	9668.5050,	539.5472,	MW07
211,	9426.7112,	9699.4626,	535.9709,	GT01
212,	9447.4030,	9728.1281,	532.9017,	GT02
213,	9478.4131,	9743.8572,	532.8409,	GT03
214,	9515.1012,	9739.9746,	532.2427,	GT04
221,	9668.7092,	9616.9950,	513.2736,	RAN
223,	10081.7969,	9773.8393,	487.0808,	RAN
224,	9962.9907,	9561.8020,	498.6516,	RAN
226,	10333.5404,	9757.3692,	473.7261,	RAN
227,	9414.8735,	9665.3905,	536.8085,	RAN
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303,	10138.9206,	10112.8359,	555.2551,	RDV03SL
304,	10118.3224,	10118.1038,	554.9958,	RDV04SL
305,	10118.3176,	10118.1024,	554.9959,	RDV05SL
307,	10188.8903,	10176.6131,	555.3789,	RDV07SL
308,	10188.7346,	10176.6487,	555.3890,	RDV08SL
309,	10225.5319,	10173.6718,	553.5202,	RDV09SL
310,	10225.5146,	10173.6897,	553.5224,	RDV10SL
311,	10252.0755,	10210.5711,	552.6304,	RDV11SL
312,	10252.1003,	10210.6258,	552.6303,	RDV12SL
313,	10287.4829,	10245.8103,	552.1507,	RDV13SL
314,	10351.2182,	10332.1923,	550.0887,	RDV14SL
315,	10351.2087,	10332.1534,	550.0894,	RDV15SL
316,	10342.9429,	10352.9440,	550.2555,	RDV16SL
317,	10333.9840,	10375.0915,	556.2206,	RDV17SL
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319,	10552.3430,	10351.1643,	468.0074,	RDV19SL
320,	10616.7283,	10348.2138,	435.7524,	RDV20SL
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325,	9845.8980,	9624.7594,	502.6826,	RDV025SL
326,	9912.9785,	9542.4813,	499.2014,	RDV26SL
327,	10304.6171,	9643.3213,	491.6962,	RDV27SL
328,	10304.6171,	9643.3213,	491.6962,	RDV28SL
329,	10270.5650,	10507.7088,	577.8964,	RDV29SL
330,	10222.8307,	10229.7186,	567.0886,	RDV30SL
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402,	9474.4128,	9631.1389,	524.5607,	TOE
403,	9456.3193,	9654.8044,	527.5850,	TOE
404,	9460.9636,	9677.9716,	525.7370,	TOE
405,	9448.0302,	9695.5281,	529.0758,	TOE
406,	9456.3489,	9715.6118,	529.2664,	TOE
407,	9480.4356,	9722.5138,	526.4770,	TOE
408,	9505.6183,	9725.6662,	525.5860,	TOE
409,	9531.8251,	9707.6189,	523.3202,	TOE
410,	9555.0122,	9700.2620,	519.6313,	TOE
411,	9580.9804,	9698.2379,	517.3030,	TOE
412,	9610.1706,	9694.7647,	514.5759,	TOE
413,	9637.1079,	9690.5059,	515.7418,	TOE
414,	9667.8467,	9684.4118,	514.5756,	TOE
415,	9698.3091,	9676.1672,	513.2802,	TOE
416,	9611.9553,	9667.9860,	512.5804,	TOE
417,	9595.4266,	9648.4085,	513.5671,	TOE
418,	9572.4481,	9636.5039,	511.5331,	TOE
419,	9583.8226,	9613.7367,	507.7403,	TOE
420,	9593.0241,	9590.0045,	503.4145,	TOE
421,	9578.3410,	9666.9979,	514.7791,	RAN
422,	9549.6799,	9668.7653,	516.7436,	RAN
423,	9519.4495,	9672.7786,	519.7624,	RAN
424,	9494.6923,	9684.0894,	522.3568,	RAN
425,	9480.8764,	9700.3975,	524.2607,	RAN
426,	9491.4493,	9658.8982,	522.4159,	RAN
427,	9503.2488,	9622.9955,	520.2889,	RAN
428,	9488.8213,	9595.3392,	520.2230,	RAN
429,	9452.6842,	9620.5634,	532.9838,	TOP
430,	9439.7565,	9634.1737,	533.5864,	TOP
431,	9445.5198,	9662.2410,	533.5629,	TOP
432,	9430.0398,	9689.7609,	535.7194,	TOP
433,	9442.8448,	9714.4833,	533.3028,	TOP
434,	9462.0138,	9731.0328,	532.4963,	TOP
435,	9490.3284,	9738.1830,	532.5033,	TOP
436,	9520.7443,	9730.2760,	532.3442,	TOP
437,	9550.3654,	9730.8054,	532.8542,	TOP
438,	9578.9039,	9732.7098,	531.7276,	TOP
439,	9612.5015,	9728.6070,	528.3132,	TOP
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447,	9415.6353,	9696.5415,	537.0703,	BRK
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450,	9493.3017,	9749.5416,	533.6147,	BRK
451,	9519.6432,	9750.0682,	534.6399,	BRK

452,	9540.9764,	9766.6959,	536.6619,	BRK
453,	9567.7712,	9775.7861,	536.1269,	BRK
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455,	10091.5777,	9830.6996,	487.4514,	TOP
456,	10091.6341,	9804.1065,	487.4908,	TOP
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458,	10062.5758,	9747.1138,	487.0171,	TOP
459,	10026.7483,	9716.8470,	487.0215,	TOP
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461,	9978.2903,	9709.3859,	487.9766,	TOP
462,	9955.0908,	9724.7684,	488.7384,	TOP
463,	9923.1037,	9725.9526,	494.1083,	TOP
464,	9895.2708,	9710.4434,	495.4517,	TOP
465,	9876.1121,	9699.7827,	496.2569,	ER
466,	9904.3472,	9693.3101,	490.9732,	ER
467,	9931.3817,	9686.2187,	486.0487,	ER
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470,	10000.0025,	9666.6429,	472.0616,	ER
471,	10001.4108,	9665.6491,	469.5085,	ER
472,	9969.1411,	9669.1135,	474.8356,	ER
473,	9938.3254,	9678.0530,	481.1740,	ER
474,	9913.7265,	9686.9905,	486.6199,	ER
475,	9888.9488,	9693.8080,	492.1337,	ER
476,	9869.2486,	9697.2343,	496.3694,	ER
477,	9853.9249,	9681.2052,	498.7939,	ER
478,	9880.6640,	9685.7518,	494.1520,	ER
479,	9895.0121,	9681.7020,	490.2439,	ER
480,	9920.8077,	9673.6294,	483.9243,	ER
481,	9945.5411,	9662.1103,	478.3321,	ER
482,	9972.7669,	9658.6963,	473.7025,	ER
483,	9993.5106,	9658.8462,	470.1480,	ER/TOE
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485,	9896.6180,	9610.7513,	481.8110,	TOE
486,	9880.2133,	9581.2146,	486.4741,	TOE
487,	9846.7632,	9582.0579,	485.9431,	TOE
488,	9853.8494,	9678.4921,	499.1916,	TOP
489,	9874.0503,	9680.6101,	498.0438,	TOP
490,	9875.8636,	9665.7100,	498.7608,	TOP
491,	9904.6708,	9658.8970,	497.8866,	TOP
492,	9917.9007,	9639.6463,	498.4314,	TOP
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494,	9892.6321,	9623.1316,	495.7163,	TOP
495,	9872.2895,	9610.8294,	500.5107,	TOP
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502,	9678.5418,	9573.1307,	509.2295,	TOP
503,	9651.5926,	9574.4985,	511.5493,	TOP
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505,	9611.2686,	9601.5903,	514.1942,	TOP
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508,	9653.8557,	9651.3096,	513.9921,	TOP
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513,	9764.6628,	9680.4796,	510.0838,	BRK
514,	9729.7283,	9697.4035,	513.9362,	BRK
515,	9693.8937,	9710.7847,	517.6915,	BRK
516,	9660.1799,	9723.1224,	522.2388,	BRK
517,	9625.9554,	9741.3179,	527.6131,	BRK
518,	9606.6358,	9760.4928,	531.8120,	BRK
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521,	9716.9205,	9778.9287,	531.7226,	TOP
522,	9751.7155,	9795.4853,	532.3262,	TOP
523,	9780.9440,	9814.3320,	532.2746,	TOP
524,	9815.9506,	9834.1291,	532.4074,	TOP
525,	9828.4971,	9843.2056,	530.8680,	TOP
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529,	9721.5134,	9723.3851,	506.2050,	BRK
530,	9751.4860,	9715.9757,	503.5525,	BRK
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537,	9790.5260,	9767.2213,	512.9650,	BRK
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539,	9851.9763,	9799.9392,	508.1881,	BRK
540,	9888.4593,	9801.5176,	503.0975,	BRK
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542,	9949.6559,	9798.7427,	490.3487,	BRK
543,	9953.4829,	9769.7402,	487.7630,	BRK
544,	9954.5305,	9745.7885,	488.1704,	BRK
545,	9924.9720,	9742.7758,	492.5390,	BRK
546,	9894.0146,	9738.6550,	495.0578,	BRK

547,	9861.5678,	9731.9337,	496.4472,	BRK
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552,	9801.9099,	9741.9359,	504.5993,	TOP
553,	9841.4058,	9743.7813,	503.8082,	TOP
554,	9884.3154,	9762.7528,	503.7907,	TOP
555,	9888.8695,	9780.9643,	510.9500,	TOP
556,	9887.2484,	9791.8572,	510.6908,	TOP
557,	9856.3594,	9792.0450,	510.9173,	TOP
558,	9860.8152,	9774.4991,	510.7630,	RAN
559,	9829.2137,	9767.3706,	510.3172,	RAN
560,	9955.2130,	9736.5743,	488.9319,	TOP
561,	9984.4276,	9719.5211,	488.0689,	TOP
562,	10005.3850,	9716.9533,	487.3000,	TOP
563,	10038.8628,	9740.7475,	486.7595,	TOP
564,	10071.7540,	9770.4090,	486.7814,	TOP
565,	9981.0033,	9812.1373,	489.6837,	TOE
566,	10015.9187,	9828.1882,	487.8738,	TOE
567,	10050.0832,	9843.7508,	485.5717,	TOE
568,	10072.7264,	9847.7143,	483.4585,	TOE
569,	10078.3167,	9814.0620,	482.9490,	TOE
570,	10072.8284,	9782.2888,	482.6843,	TOE
571,	10053.3052,	9758.5724,	484.2770,	TOE
572,	10036.6402,	9743.2781,	484.2657,	TOE
573,	10014.4308,	9725.5137,	485.3934,	TOE
574,	10004.4937,	9721.1058,	485.5029,	TOE
575,	9988.1035,	9722.8125,	485.7729,	TOE
576,	9959.8531,	9738.7359,	487.9090,	TOE
577,	10006.3831,	9752.2683,	485.3903,	RAN
578,	10044.4170,	9781.1814,	482.0994,	RAN
579,	10052.8232,	9814.7503,	482.5824,	RAN
580,	10007.3897,	9794.2205,	485.3205,	RAN

Project: red_devil_gps
Processed: Tuesday, October 24, 2000 12:12 WAVE 2.35Page 1 raw

Station	Latitude	Longitude	Ellipsoid Height (m)	Position Error (m)
bay2	55° 11' 25.51006" N	162° 42' 24.33988" W	49.671	0.216
ken1	60° 40' 30.28361" N	151° 21' 00.70745" W	54.443	0.171
rdm-01	61° 45' 37.95242" N	157° 18' 51.83563" W	79.588	0.302
rdm-02	61° 45' 34.05240" N	157° 18' 47.58321" W	101.531	0.278
rdm-03	61° 45' 34.93867" N	157° 18' 57.45131" W	82.970	0.239

proc

OBSERVATION ADJUSTMENT SUMMARY
NETWORK = red_devil_g
TIME = Tue Oct 24 13:08:22 2000

OBSERVATION ADJUSTMENT (Tau = 1.96)

GPS Parameter Group 1 GPS Observations

Azimuth rotation = -0.0465 seconds	1.00å = 0.0226 seconds	
Deflection in latitude = -0.5235 seconds	1.00å = 0.2542 seconds	
Deflection in longitude = -0.3993 seconds	1.00å = 0.1939 seconds	
Network scale = 1.000000000000	1.00å = 0.000000000000	

SUB-NET 1

OBSERVATION ADJUSTMENT (Tau = 1.72)

OBS#	BLK#/ REF#	TYPE	BACKSIGHT/ INSTRUMENT/ FORESIGHT	UDVC/ UDPG/ SBNT	OBSERVED/ ADJUSTED/ RESIDUAL	1.00å/ 1.00å/ 1.00å	TAU
1	1	gpsaz	-**-	-**-	232ø41'19.6954"	0.0026"	0.01
	1		ken1	-**-	232ø41'19.6954"	0.0024"	
			bay2	1	+0.000013"	0.0009"	
2	1	gpsht	-**-	-**-	-5.4447m	0.0361m	0.07
	1		ken1	-**-	-5.4458m	0.0346m	
			bay2	1	-0.001187m	0.0105m	
3	1	gpsds	-**-	-**-	906511.8372m	0.0130m	0.00
	1		ken1	-**-	906511.8373m	0.0024m	
			bay2	1	+0.000073m	0.0127m	
7	3	gpsaz	-**-	-**-	293ø15'26.4770"	0.0064"	OPEN
	1		ken1	-**-	293ø15'26.4770"	0.0064"	
			rdm-02	1	+0.000000"	0.0000"	
8	3	gpsht	-**-	-**-	+44.5163m	0.0479m	OPEN
	1		ken1	-**-	+44.5163m	0.0479m	
			rdm-02	1	+0.000000m	0.0000m	
9	3	gpsds	-**-	-**-	342312.1500m	0.0183m	OPEN
	1		ken1	-**-	342312.1500m	0.0183m	
			rdm-02	1	+0.000000m	0.0000m	
10	4	gpsaz	-**-	-**-	293ø15'15.5285"	0.0135"	0.57
	1		ken1	-**-	293ø15'15.5362"	0.0110"	
			rdm-03	1	+0.007661"	0.0078"	
11	4	gpsht	-**-	-**-	+28.8585m	0.0449m	0.16
	1		ken1	-**-	+28.8506m	0.0349m	
			rdm-03	1	-0.007934m	0.0282m	
12	4	gpsds	-**-	-**-	342457.3482m	0.0225m	0.83
	1		ken1	-**-	342457.3381m	0.0214m	
			rdm-03	1	-0.010032m	0.0070m	
13	5	gpsaz	-**-	-**-	108ø01'27.3785"	0.0154"	0.83
	1		rdm-03	-**-	108ø01'27.3642"	0.0116"	

```
                                  ken1     1        -0.014383"   0.0100"

  14      5 gpsht                  -**-  -**-        -28.8817m   0.0352m    0.64
          1                      rdm-03  -**-        -28.9034m   0.0291m
                                  ken1     1       -0.021762m   0.0198m

  15      5 gpsds                  -**-  -**-     342457.2271m   0.0467m    0.98
          1                      rdm-03  -**-     342457.2886m   0.0292m
                                  ken1     1        +0.061468m   0.0365m

  16      6 gpsaz                  -**-  -**-  293ø16'23.4613"   0.0054"    OPEN
          1                       ken1  -**-  293ø16'23.4613"   0.0054"
                                 rdm-01     1       +0.000000"   0.0000"

  17      6 gpsht                  -**-  -**-        +25.3064m   0.0328m    OPEN
          1                       ken1  -**-        +25.3064m   0.0328m
                                 rdm-01     1       +0.000000m   0.0000m

  18      6 gpsds                  -**-  -**-     342408.5981m   0.0138m    OPEN
          1                       ken1  -**-     342408.5981m   0.0138m
                                 rdm-01     1        +0.000000m   0.0000m


                    SUB-NET 2


      OBSERVATION ADJUSTMENT (Tau = 1.00)


OBS#  BLK#/  TYPE      BACKSIGHT/       UDVC/     OBSERVED/     1.00å/     TAU
      REF#             INSTRUMENT/      UDPG/     ADJUSTED/     1.00å/
                       FORESIGHT        SBNT      RESIDUAL      1.00å

-----------------------------------------------------------------------------
    4     2 gpsaz                   -**-  -**-  0ø43'29.9348"   0.0335"    1.39
          1                       bay2d1  -**-  0ø43'29.8883"   0.0004"
                                  bay2d2     2     -0.046452"   0.0335"

-----------------------------------------------------------------------------
-----------------------------------------------------------------------------
    5     2 gpsht                   -**-  -**-       +0.0000m   0.0000m    1.19
          1                       bay2d1  -**-       +0.0000m   0.0000m
                                  bay2d2     2     +0.000000m   0.0000m

-----------------------------------------------------------------------------
    6     2 gpsds                   -**-  -**-        0.0000m   0.0000m    OPEN
          1                       bay2d1  -**-        0.0000m   0.0000m
                                  bay2d2     2     +0.000000m   0.0000m
```

```
Project:                                red_devil_gps
Supervisor:                             kwoods
Date Created:                           10/24/00 17:56
Date Last Accessed:                     10/24/00 17:56
Project Directory:                      C:\GPSURVEY\projects\red_devi
Antenna Type:                           Compact L1/L2
Antenna Measurement Method:             Measured to bottom of antenna
Antenna Group:                          GPSurvey
Receiver Type:                          4000SSE
Coordinate System:                      Geographic
Zone:                                   WGS84
Linear Unit:                            Meter
Timezone:                               Greenwich Mean Time :  0:00
Number of Stations:                     5
Number of Baselines:                    6
No. of Continuous Kinematic Solns:      0

                                         **** Reference Coordinates ****
 Station          Station                Latitude            Longitude            Height        Station
Short Name          ID                                                                           Quality
ken1             ken1            60°40'30.28465" N    151°21'00.71512" W      54.43572  Processor Estimated Position
bay2             xxx             55°11'25.49327" N    162°42'24.40162" W      49.08202  Processor Estimated Position
rdm-02           rdm-02          61°45'34.01042" N    157°18'47.69171" W      99.01228  Processor Estimated Position
rdm-03           rdm-03          61°45'34.90375" N    157°18'57.48666" W      83.35760  Processor Estimated Position
rdm-01           rdm-01          61°45'37.87979" N    157°18'51.95634" W      79.80328  Processor Estimated Position


Project Name:                                   red_devil_gps
Processed:                                      Tuesday, October 24, 2000  12:41
                                                WAVE 2.35
Solution Output File (SSF):                     00001369.SSF

From Station:                                   bay2
Data file:                                      BAY22860.RNX
Antenna Height (meters):                        0.063  True Vertical          0.000  Uncorrected
Position Quality:                               Point Positioning

WGS 84 Position:                                55° 11' 25.485570" N                        X     -3484277.581
                                                162° 42' 24.353482" W                       Y     -1084780.340
                                                50.653                                      Z      5213554.762

To Station:                                     bay2
Data file:                                      BAY22850.RNX
Antenna Height (meters):                        0.063  True Vertical          0.000  Uncorrected

WGS 84 Position:                                55° 11' 25.485570" N                        X     -3484277.581
                                                162° 42' 24.353482" W                       Y     -1084780.340
                                                50.653                                      Z      5213554.762

Start Time:                                     10/12/00 12:00:00.00 GPS       (1083 388800.00)
Stop Time:                                      10/12/00 23:59:30.00 GPS       (1083 431970.00)
Occupation Time      Meas. Interval (seconds):  11:59:30.00                    15.00

Solution Type:                                  L1 fixed double difference
Solution Acceptability:                         Passed ratio test

Ephemeris:                                      Broadcast
Met Data:                                       Standard
Baseline Slope Distance      Std. Dev. (meters): 0.000008                      0.000000

                                                              Forward                          Backward
Normal Section Azimuth:                                  0° 47' 49.616494"              180° 47' 49.616494"
Vertical Angle:                                        -88° 12' 16.807836"               88° 12' 16.807836"

Baseline Components (meters):                   dx        0.000005    dy        0.000001    dz       -0.000007
Standard Deviations (meters):                             0.000000              0.000000               0.000000

                                                dn        0.000000    de        0.000000    du       -0.000008
                                                          0.000000              0.000000               0.000000

                                                                                              dh       -0.000008
                                                                                                        0.000000

Aposteriori Covariance Matrix:                       1.331052E-024
                                                     4.024253E-025         6.302788E-025
                                                    -9.788322E-025        -2.923065E-025          2.391005E-024

Variance Ratio       Cutoff:                    545536832.0            1.5
Reference Variance:                             0.000

Observable       Count/Rejected       RMS:      L1 phase                        15559/17                0.000016

Processor Controls:

[General]
Process start time:                             10/11/00 12:00:00 GPS          (1083 302400)
Process stop time:                              10/13/00 00:00:00 GPS          (1083 432000)
Elevation mask:                                 15 degrees
Maximum iterations:                             10
Maximum fixable cycle slip:                     600 seconds
Ephemeris:                                      Broadcast
Residuals:                                      Disabled
Antenna phase correction:                       Enabled

[Observables]
```

L1 phase	Enabled
L2 phase	Enabled
Squared L2 phase	Enabled
L2 P code	Enabled
L1 C/A code	Enabled
L2 code (encrypted)	Enabled

[Static Network]

Baseline generation:	Independent
Min baseline observation time	120 seconds

[Quality]

Observation editing:	Edit multiplier	3.5
Ratio test:	Cutoff	1.5
Reference variance test:	Disabled	

[Tropo Correction]

Model:	Hopfield
Estimated zenith delay interval:	2 hours
Use observed mets:	Enabled

[Iono Correction]

Correction:	Ambiguity Pass	Final Pass
Applied to:	Iono free	Iono free
Application threshold:	Static, Kinematic	Static, Kinematic
	10 kilometers	5 kilometers

[Final Solution]

Final solution type:	L1 Fixed

[Satellites]

Disabled:	

Project Name:	red_devil_gps
Processed:	Tuesday, October 24, 2000 12:41
	WAVE 2.35
Solution Output File (SSF):	00001366.SSF
From Station:	ken1
Data file:	KEN12860.RNX
Antenna Height (meters):	0.063 True Vertical 0.000 Uncorrected
Position Quality:	Point Positioning
WGS 84 Position:	60° 40' 30.265739" N X -2748339.465
	151° 21' 00.669609" W Y -1501544.543
	56.098 Z 5537749.119
To Station:	bay2
Data file:	BAY22860.RNX
Antenna Height (meters):	0.063 True Vertical 0.000 Uncorrected
WGS 84 Position:	55° 11' 25.485570" N X -3484277.581
	162° 42' 24.353482" W Y -1084780.340
	50.653 Z 5213554.762
Start Time:	10/12/00 00:00:30.00 GPS (1083 345630.00)
Stop Time:	10/12/00 23:59:30.00 GPS (1083 431970.00)
Occupation Time Meas. Interval (seconds):	23:59:00.00 15.00
Solution Type:	Iono free float double difference
Solution Acceptability:	Acceptable
Ephemeris:	Broadcast
Met Data:	Standard
Baseline Slope Distance Std. Dev. (meters):	905758.959 0.002719

	Forward	Backward
Normal Section Azimuth:	232° 41' 19.693846"	43° 02' 42.285727"
Vertical Angle:	-4° 03' 54.516291"	-4° 03' 56.283289"

Baseline Components (meters):	dx	-735938.116	dy	416764.203	dz -324194.356
Standard Deviations (meters):		0.004174		0.003368	0.006498
	dn	-547638.924	de	-718587.504	du -64209.820

0.001995	0.003036	0.007602

dh -5.445
0.007575

Aposteriori Covariance Matrix:

1.742150E-005		
4.183746E-006	1.134030E-005	
-2.168493E-005	-1.160887E-005	4.222032E-005

Reference Variance: 12.092

Observable	Count/Rejected	RMS:	Iono free phase	26203/123	0.043

Ambiguity Summary (cycles):

Iono free

SV	Ambiguity	Error
01	2158482.294	± 1.013
02	-9873444.350	± 0.560
02	-9873444.402	± 0.578
02	-2372220.519	± 1.062
02	3867580.877	± 1.560
03	-2730259.208	± 0.386
03	-2730256.292	± 0.522
04	-9393860.035	± 0.461
04	-403068.395	± 1.110
05	-9097169.785	± 0.450
05	-9097170.187	± 0.427
05	-9097170.789	± 0.300
07	-8252915.071	± 0.499
07	-193924.205	± 1.024
08	21.942	± 0.616
08	2386342.520	± 1.128
09	-8744090.543	± 0.363
10	-18284446.439	± 0.575
10	-18284446.596	± 0.766
10	-7523189.621	± 0.439
10	3118065.852	± 1.171
13	1593158.631	± 1.048
15	-4068221.192	± 0.490
15	-4068218.690	± 0.433
17	-11347880.383	± 0.684
17	-4679940.583	± 0.338
17	-4679940.663	± 0.257
17	-5840233.538	± 0.577
17	-5840230.840	± 0.652
19	-11904771.188	± 0.985
19	-4499118.432	± 0.702
19	1057034.034	± 1.622
19	1057033.597	± 1.051
20	-1882961.802	± 0.840
20	-1882962.048	± 1.024
20	-1882961.345	± 1.038
20	-1882961.445	± 1.044
21	-9534577.964	± 0.622
21	-6020558.598	± 0.450
21	-6020555.845	± 0.486
21	-4553201.618	± 0.902
22	-5807691.660	± 0.302
22	-798882.902	± 1.089
23	-9429233.461	± 0.468
23	-9429233.636	± 0.549
23	-3108359.967	± 0.277
23	-3108357.709	± 0.490
24	-6723431.339	± 0.852
24	-6723430.708	± 0.505
24	-6723431.518	± 0.421
24	-6723431.395	± 0.405
24	-6723431.476	± 0.909
24	2616094.400	± 1.151
25	-6886354.058	± 0.267
25	-1260876.022	± 0.990
25	-1260875.156	± 1.058
26	-9862829.252	± 0.439
26	-5482426.227	± 0.709
26	-5482423.956	± 0.851
27	-12501576.030	± 0.734
27	212729.563	± 1.085
28	-2920211.213	± 0.371
28	-2920208.866	± 0.692
28	1909321.540	± 1.049
29	-8768950.483	± 0.603
29	-8768950.866	± 0.307
29	-2088379.644	± 0.576
29	-2088379.616	± 0.552
29	-2088379.394	± 0.805
29	-2088379.130	± 1.084
30	-8020986.957	± 0.215
31	-12357028.044	± 1.093
31	-12357028.102	± 0.997
31	-8541517.937	± 0.663
31	-8541515.343	± 0.567

Processor Controls:

[General]

Process start time:	10/11/00 12:00:00 GPS	(1083 302400)
Process stop time:	10/13/00 00:00:00 GPS	(1083 432000)
Elevation mask:	15 degrees	
Maximum iterations:	10	
Maximum fixable cycle slip:	600 seconds	
Ephemeris:	Broadcast	
Residuals:	Disabled	
Antenna phase correction:	Enabled	
[Observables]		
L1 phase	Enabled	
L2 phase	Enabled	
Squared L2 phase	Enabled	
L2 P code	Enabled	
L1 C/A code	Enabled	
L2 code (encrypted)	Enabled	
[Static Network]		
Baseline generation:	Independent	
Min baseline observation time	120 seconds	
[Quality]		
Observation editing:	Edit multiplier	3.5
Ratio test:	Cutoff	1.5
Reference variance test:	Disabled	
[Tropo Correction]		
Model:	Hopfield	
Estimated zenith delay interval:	2 hours	
Use observed mets:	Enabled	
[Iono Correction]	Ambiguity Pass	Final Pass
Correction:	Iono free	Iono free
Applied to:	Static, Kinematic	Static, Kinematic
Application threshold:	10 kilometers	5 kilometers
[Final Solution]		
Final solution type:	L1 Fixed	
[Satellites]		
Disabled:		

Project Name:	red_devil_gps			
Processed:	Tuesday, October 24, 2000 12:41			
	WAVE 2.35			
Solution Output File (SSF):	00001382.SSF			
From Station:	ken1			
Data file:	KEN12850.RNX			
Antenna Height (meters):	0.063 True Vertical	0.000 Uncorrected		
Position Quality:	Point Positioning			
WGS 84 Position:	60° 40' 30.266951" N		X	-2748339.482
	151° 21' 00.677225" W		Y	-1501544.420
	56.075		Z	5537749.117
To Station:	rdm-01			
Data file:	89112850.DAT			
Antenna Height (meters):	1.475 True Vertical	1.413 Uncorrected		
WGS 84 Position:	61° 45' 37.862837" N		X	-2791686.781
	157° 18' 51.906007" W		Y	-1166962.515
	81.388		Z	5596008.087
Start Time:	10/11/00 17:30:15.00 GPS	(1083 322215.00)		
Stop Time:	10/11/00 21:28:30.00 GPS	(1083 336510.00)		
Occupation Time Meas. Interval (seconds):	03:58:15.00	15.00		
Solution Type:	Iono free float double difference			
Solution Acceptability:	Acceptable			

```
Ephemeris:                                          Broadcast
Met Data:                                           Standard
Baseline Slope Distance      Std. Dev. (meters):    342371.359                    0.002918

                                                          Forward                          Backward
Normal Section Azimuth:                          293° 16' 23.456049"              108° 02' 40.080566"
Vertical Angle:                                   -1° 31' 48.363273"               -1° 32' 18.555193"

Baseline Components (meters):                    dx      -43347.299    dy      334581.906    dz       58258.970
Standard Deviations (meters):                              0.003833                0.003375                0.005777

                                                 dn      135228.021    de     -314400.943    du       -9142.043
                                                           0.001957                0.002847                0.006893

                                                                                              dh          25.313
                                                                                                        0.006871

Aposteriori Covariance Matrix:                       1.468942E-005
                                                     4.806383E-006        1.139101E-005
                                                    -1.858056E-005       -9.559940E-006        3.337412E-005

Reference Variance:                              1.975

Observable       Count/Rejected      RMS:        Iono free phase                4879/0                  0.015

Ambiguity Summary (cycles):                      SV                            Ambiguity                Error

Iono free                                        04                          9893369.859              ± 0.092
                                                 07                           392124.752              ± 0.105
                                                 11                              -23.861              ± 0.078
                                                 13                          6044475.262              ± 0.060
                                                 19                         14941393.422              ± 0.063
                                                 20                          5282568.747              ± 0.106
                                                 20                          5282568.634              ± 0.054
                                                 22                         14376016.085              ± 0.114
                                                 24                         17005674.810              ± 0.122
                                                 25                         -2677907.406              ± 0.108
                                                 27                         19238878.603              ± 0.098
                                                 28                         20871902.913              ± 0.135
                                                 29                        -11931999.938              ± 0.158

Processor Controls:

[General]
Process start time:                              10/11/00 12:00:00 GPS        (1083 302400)
Process stop time:                               10/13/00 00:00:00 GPS        (1083 432000)
Elevation mask:                                  15 degrees
Maximum iterations:                              10
Maximum fixable cycle slip:                      600 seconds
Ephemeris:                                       Broadcast
Residuals:                                       Disabled
Antenna phase correction:                        Enabled

[Observables]
L1 phase                                         Enabled
L2 phase                                         Enabled
Squared L2 phase                                 Enabled
L2 P code                                        Enabled
L1 C/A code                                      Enabled
L2 code (encrypted)                              Enabled

[Static Network]
Baseline generation:                             Independent
Min baseline observation time                    120 seconds

[Quality]
Observation editing:                             Edit multiplier              3.5
Ratio test:                                      Cutoff                       1.5
Reference variance test:                         Disabled

[Tropo Correction]
Model:                                           Hopfield
Estimated zenith delay interval:                 2 hours
Use observed mets:                               Enabled

[Iono Correction]                                Ambiguity Pass               Final Pass
Correction:                                      Iono free                    Iono free
Applied to:                                      Static, Kinematic            Static, Kinematic
Application threshold:                           10 kilometers                5 kilometers

[Final Solution]
Final solution type:                             L1 Fixed

[Satellites]
Disabled:
```

Project Name:	red_devil_gps
Processed:	Tuesday, October 24, 2000 12:41
	WAVE 2.35
Solution Output File (SSF):	00001373.SSF
From Station:	ken1
Data file:	KEN12860.RNX
Antenna Height (meters):	0.063 True Vertical 0.000 Uncorrected
Position Quality:	Point Positioning
WGS 84 Position:	60° 40' 30.265739" N X -2748339.465
	151° 21' 00.669609" W Y -1501544.543
	56.098 Z 5537749.119
To Station:	rdm-02
Data file:	89112860.DAT
Antenna Height (meters):	1.538 True Vertical 1.475 Uncorrected
WGS 84 Position:	61° 45' 33.993391" N X -2791768.410
	157° 18' 47.641645" W Y -1167064.440
	100.614 Z 5595968.347
Start Time:	10/12/00 19:09:45.00 GPS (1083 414585.00)
Stop Time:	10/12/00 23:24:15.00 GPS (1083 429855.00)
Occupation Time Meas. Interval (seconds):	04:14:30.00 15.00
Solution Type:	Iono free float double difference
Solution Acceptability:	Acceptable
Ephemeris:	Broadcast
Met Data:	Standard
Baseline Slope Distance Std. Dev. (meters):	342275.461 0.003906

	Forward	Backward
Normal Section Azimuth:	293° 15' 26.478719"	108° 01' 46.934816"
Vertical Angle:	-1° 31' 35.233284"	-1° 32' 28.570816"

Baseline Components (meters):	dx	-43428.945	dy	334480.103	dz 58219.228
Standard Deviations (meters):		0.005077		0.004788	0.008525
	dn	135103.544	de	-314350.745	du -9117.702
		0.002755		0.003506	0.010075
					dh 44.516
					0.010026

Aposteriori Covariance Matrix:

2.577246E-005		
1.341602E-005	2.292917E-005	
-3.780514E-005	-2.243595E-005	7.268337E-005

Reference Variance: 3.345

Observable	Count/Rejected	RMS:
Iono free phase	5939/33	0.021

Ambiguity Summary (cycles):

SV	Ambiguity	Error
Iono free		
01	3493191.079	± 0.076
04	-1156886.777	± 0.112
08	16300711.063	± 0.117
10	11664995.628	± 0.180
19	939871.812	± 0.059
20	-2.142	± 0.149
20	-2.330	± 0.140
22	3004548.163	± 0.154
22	-4638923.388	± 0.171
24	-1682270.706	± 0.159
25	-4822938.367	± 0.171
27	4387726.676	± 0.074
28	10009974.445	± 0.096

Processor Controls:

[General]	
Process start time:	10/11/00 12:00:00 GPS (1083 302400)
Process stop time:	10/13/00 00:00:00 GPS (1083 432000)
Elevation mask:	15 degrees
Maximum iterations:	10
Maximum fixable cycle slip:	600 seconds
Ephemeris:	Broadcast
Residuals:	Disabled
Antenna phase correction:	Enabled
[Observables]	
L1 phase	Enabled
L2 phase	Enabled
Squared L2 phase	Enabled
L2 P code	Enabled
L1 C/A code	Enabled

L2 code (encrypted)	Enabled
[Static Network]	
Baseline generation:	Independent
Min baseline observation time	120 seconds
[Quality]	
Observation editing:	Edit multiplier 3.5
Ratio test:	Cutoff 1.5
Reference variance test:	Disabled
[Tropo Correction]	
Model:	Hopfield
Estimated zenith delay interval:	2 hours
Use observed mets:	Enabled
[Iono Correction]	
Correction:	Ambiguity Pass / Final Pass
Applied to:	Iono free / Iono free
Application threshold:	Static, Kinematic / Static, Kinematic; 10 kilometers / 5 kilometers
[Final Solution]	
Final solution type:	L1 Fixed
[Satellites]	
Disabled:	

Project Name: red_devil_gps
Processed: Tuesday, October 24, 2000 12:41
WAVE 2.35
Solution Output File (SSF): 00001376.SSF

From Station: ken1
Data file: KEN12860.RNX
Antenna Height (meters): 0.063 True Vertical 0.000 Uncorrected
Position Quality: Point Positioning

WGS 84 Position:
60° 40' 30.265739" N X -2748339.465
151° 21' 00.669609" W Y -1501544.543
56.098 Z 5537749.119

To Station: rdm-03
Data file: 89112851.DAT
Antenna Height (meters): 1.513 True Vertical 1.451 Uncorrected

WGS 84 Position:
61° 45' 34.886931" N X -2791794.510
157° 18' 57.436837" W Y -1166919.607
84.956 Z 5595967.641

Start Time: 10/12/00 00:00:30.00 GPS (1083 345630.00)
Stop Time: 10/12/00 02:12:00.00 GPS (1083 353520.00)
Occupation Time 02:11:30.00 Meas. Interval (seconds): 15.00

Solution Type: Iono free float double difference
Solution Acceptability: Acceptable

Ephemeris: Broadcast
Met Data: Standard
Baseline Slope Distance 342420.188 Std. Dev. (meters): 0.004839

	Forward	Backward
Normal Section Azimuth:	293° 15' 15.529920"	108° 01' 27.372732"
Vertical Angle:	-1° 31' 47.014954"	-1° 32' 21.472660"

Baseline Components (meters):
Standard Deviations (meters):

dx	-43455.045	dy	334624.936	dz	58218.523
	0.005507		0.005800		0.008350
dn	135143.771	de	-314490.360	du	-9141.109
	0.004695		0.004753		0.009437
				dh	28.858
					0.009333

Aposteriori Covariance Matrix:

3.032494E-005		
1.223267E-005	3.364314E-005	
-2.000714E-005	-2.721936E-005	6.972447E-005

Reference Variance: 1.744

Observable	Count/Rejected	RMS:
Iono free phase	2898/0	0.016

Ambiguity Summary (cycles):

SV	Ambiguity	Error

Iono free	02	-4103900.867	± 0.120
	03	-9019790.722	± 0.195
	10	-8326524.106	± 0.166
	10	-8326524.075	± 0.220
	17	-7096796.788	± 0.172
	19	-4255339.520	± 0.138
	23	3796177.604	± 0.187
	26	22016.454	± 0.171
	27	131030.045	± 0.081
	28	-8492855.612	± 0.276
	31	-2971011.233	± 0.141

Processor Controls:

[General]		
Process start time:	10/11/00 12:00:00 GPS	(1083 302400)
Process stop time:	10/13/00 00:00:00 GPS	(1083 432000)
Elevation mask:	15 degrees	
Maximum iterations:	10	
Maximum fixable cycle slip:	600 seconds	
Ephemeris:	Broadcast	
Residuals:	Disabled	
Antenna phase correction:	Enabled	
[Observables]		
L1 phase	Enabled	
L2 phase	Enabled	
Squared L2 phase	Enabled	
L2 P code	Enabled	
L1 C/A code	Enabled	
L2 code (encrypted)	Enabled	
[Static Network]		
Baseline generation:	Independent	
Min baseline observation time	120 seconds	
[Quality]		
Observation editing:	Edit multiplier	3.5
Ratio test:	Cutoff	1.5
Reference variance test:	Disabled	
[Tropo Correction]		
Model:	Hopfield	
Estimated zenith delay interval:	2 hours	
Use observed mets:	Enabled	
[Iono Correction]	Ambiguity Pass	Final Pass
Correction:	Iono free	Iono free
Applied to:	Static, Kinematic	Static, Kinematic
Application threshold:	10 kilometers	5 kilometers
[Final Solution]		
Final solution type:	L1 Fixed	
[Satellites]		
Disabled:		

Project Name:	red_devil_gps			
Processed:	Tuesday, October 24, 2000 12:41			
	WAVE 2.35			
Solution Output File (SSF):	00001379.SSF			
From Station:	rdm-03			
Data file:	89112851.DAT			
Antenna Height (meters):	1.513 True Vertical	1.451 Uncorrected		
Position Quality:	Point Positioning			
WGS 84 Position:	61° 45' 34.886931" N		X	-2791794.510
	157° 18' 57.436837" W		Y	-1166919.607
	84.956		Z	5595967.641
To Station:	ken1			
Data file:	KEN12850.RNX			
Antenna Height (meters):	0.063 True Vertical	0.000 Uncorrected		
WGS 84 Position:	60° 40' 30.266951" N		X	-2748339.482
	151° 21' 00.677225" W		Y	-1501544.420
	56.075		Z	5537749.117

Start Time:	10/11/00 22:56:15.00 GPS	(1083 341775.00)
Stop Time:	10/11/00 23:59:30.00 GPS	(1083 345570.00)
Occupation Time Meas. Interval (seconds):	01:03:15.00	15.00
Solution Type:	Iono free float double difference	
Solution Acceptability:	Acceptable	
Ephemeris:	Broadcast	
Met Data:	Standard	
Baseline Slope Distance Std. Dev. (meters):	342420.066	0.009848

	Forward	Backward
Normal Section Azimuth:	108° 01' 27.379472"	293° 15' 15.530010"
Vertical Angle:	-1° 32' 21.484671"	-1° 31' 46.999038"

Baseline Components (meters):
Standard Deviations (meters):

dx	43455.028	dy	-334624.813	dz	-58218.524
	0.006541		0.009506		0.006851
dn	-105913.335	de	325498.477	du	-9198.308
	0.005382		0.009808		0.007412
				dh	-28.882
					0.007341

Aposteriori Covariance Matrix:

4.278695E-005		
-1.813701E-005	9.036317E-005	
-1.756547E-005	1.021330E-005	4.694288E-005

Reference Variance: 1.104

Observable	Count/Rejected	RMS:
Iono free phase	1371/0	0.013

Ambiguity Summary (cycles):

Iono free

SV	Ambiguity	Error
03	9150820.850	± 0.220
08	131030.358	± 0.148
10	8457554.766	± 0.261
13	14640240.997	± 0.198
17	7227827.225	± 0.321
19	4386369.441	± 0.134
24	19214641.876	± 0.348
28	8623885.696	± 0.188

Processor Controls:

[General]		
Process start time:	10/11/00 12:00:00 GPS	(1083 302400)
Process stop time:	10/13/00 00:00:00 GPS	(1083 432000)
Elevation mask:	15 degrees	
Maximum iterations:	10	
Maximum fixable cycle slip:	600 seconds	
Ephemeris:	Broadcast	
Residuals:	Disabled	
Antenna phase correction:	Enabled	
[Observables]		
L1 phase	Enabled	
L2 phase	Enabled	
Squared L2 phase	Enabled	
L2 P code	Enabled	
L1 C/A code	Enabled	
L2 code (encrypted)	Enabled	
[Static Network]		
Baseline generation:	Independent	
Min baseline observation time	120 seconds	
[Quality]		
Observation editing:	Edit multiplier	3.5
Ratio test:	Cutoff	1.5
Reference variance test:	Disabled	
[Tropo Correction]		
Model:	Hopfield	
Estimated zenith delay interval:	2 hours	
Use observed mets:	Enabled	
[Iono Correction]	Ambiguity Pass	Final Pass
Correction:	Iono free	Iono free
Applied to:	Static, Kinematic	Static, Kinematic
Application threshold:	10 kilometers	5 kilometers
[Final Solution]		
Final solution type:	L1 Fixed	
[Satellites]		
Disabled:		

CLOSURES LOG
NETWORK = red_devil_g
TIME = Tue Oct 24 13:08:22 2000

OBS#	TYPE	BACKSIGHT	INSTRUMENT	FORESIGHT	CLOSURE	TRANSFORM
1	gpsaz		ken1	bay2	0.000013"	-0.000010"
2	gpsht		ken1	bay2	-0.001187m	0.001183m
3	gpsds		ken1	bay2	0.000073m	-0.000084m
4	gpsaz		bay2d1	bay2d2	-0.046452"	0.046452"
5	gpsht		bay2d1	bay2d2	0.000000m	0.000000m
6	gpsds		bay2d1	bay2d2	0.000000m	0.000000m
7	gpsaz		ken1	rdm-02	0.000000"	0.037802"
8	gpsht		ken1	rdm-02	0.000000m	0.951412m
9	gpsds		ken1	rdm-02	0.000000m	-0.025466m
10	gpsaz		ken1	rdm-03	0.007661"	0.037798"
11	gpsht		ken1	rdm-03	-0.007934m	0.951784m
12	gpsds		ken1	rdm-03	-0.010032m	-0.025487m
13	gpsaz		rdm-03	ken1	-0.014383"	0.056467"
14	gpsht		rdm-03	ken1	-0.021762m	-0.898909m
15	gpsds		rdm-03	ken1	0.061468m	0.024067m
16	gpsaz		ken1	rdm-01	0.000000"	0.037804"
17	gpsht		ken1	rdm-01	0.000000m	0.951825m
18	gpsds		ken1	rdm-01	0.000000m	-0.025484m

OBS#	BLK#/ REF#	TYPE	BACKSIGHT/ INSTRUMENT/ FORESIGHT	UDVC/ UDPG/ SBNT	OBSERVED/ ADJUSTED/ RESIDUAL	1.00å/ 1.00å/ 1.00å	TAU
4	2	gpsaz	-**-	-**-	0ø43'29.9348"	0.0335"	1.39
	1		bay2d1	-**-	0ø43'29.8883"	0.0004"	
			bay2d2	2	-0.046452"	0.0335"	
5	2	gpsht	-**-	-**-	+0.0000m	0.0000m	1.19
	1		bay2d1	-**-	+0.0000m	0.0000m	
			bay2d2	2	+0.000000m	0.0000m	
15	5	gpsds	-**-	-**-	342457.2271m	0.0467m	0.98
	1		rdm-03	-**-	342457.2886m	0.0292m	
			ken1	1	+0.061468m	0.0365m	
13	5	gpsaz	-**-	-**-	108ø01'27.3785"	0.0154"	0.83
	1		rdm-03	-**-	108ø01'27.3642"	0.0116"	
			ken1	1	-0.014383"	0.0100"	
12	4	gpsds	-**-	-**-	342457.3482m	0.0225m	0.83
	1		ken1	-**-	342457.3381m	0.0214m	
			rdm-03	1	-0.010032m	0.0070m	
14	5	gpsht	-**-	-**-	-28.8817m	0.0352m	0.64
	1		rdm-03	-**-	-28.9034m	0.0291m	
			ken1	1	-0.021762m	0.0198m	
10	4	gpsaz	-**-	-**-	293ø15'15.5285"	0.0135"	0.57
	1		ken1	-**-	293ø15'15.5362"	0.0110"	
			rdm-03	1	+0.007661"	0.0078"	
11	4	gpsht	-**-	-**-	+28.8585m	0.0449m	0.16
	1		ken1	-**-	+28.8506m	0.0349m	
			rdm-03	1	-0.007934m	0.0282m	
2	1	gpsht	-**-	-**-	-5.4447m	0.0361m	0.07
	1		ken1	-**-	-5.4458m	0.0346m	
			bay2	1	-0.001187m	0.0105m	
1	1	gpsaz	-**-	-**-	232ø41'19.6954"	0.0026"	0.01
	1		ken1	-**-	232ø41'19.6954"	0.0024"	
			bay2	1	+0.000013"	0.0009"	
6	2	gpsds	-**-	-**-	0.0000m	0.0000m	OPEN
	1		bay2d1	-**-	0.0000m	0.0000m	
			bay2d2	2	+0.000000m	0.0000m	
18	6	gpsds	-**-	-**-	342408.5981m	0.0138m	OPEN
	1		ken1	-**-	342408.5981m	0.0138m	
			rdm-01	1	+0.000000m	0.0000m	
17	6	gpsht	-**-	-**-	+25.3064m	0.0328m	OPEN
	1		ken1	-**-	+25.3064m	0.0328m	
			rdm-01	1	+0.000000m	0.0000m	
16	6	gpsaz	-**-	-**-	293ø16'23.4613"	0.0054"	OPEN
	1		ken1	-**-	293ø16'23.4613"	0.0054"	
			rdm-01	1	+0.000000"	0.0000"	
9	3	gpsds	-**-	-**-	342312.1500m	0.0183m	OPEN
	1		ken1	-**-	342312.1500m	0.0183m	
			rdm-02	1	+0.000000m	0.0000m	
8	3	gpsht	-**-	-**-	+44.5163m	0.0479m	OPEN
	1		ken1	-**-	+44.5163m	0.0479m	
			rdm-02	1	+0.000000m	0.0000m	
7	3	gpsaz	-**-	-**-	293ø15'26.4770"	0.0064"	OPEN
	1		ken1	-**-	293ø15'26.4770"	0.0064"	
			rdm-02	1	+0.000000"	0.0000"	
3	1	gpsds	-**-	-**-	906511.8372m	0.0130m	0.00
	1		ken1	-**-	906511.8373m	0.0024m	
			bay2	1	+0.000073m	0.0127m	

SUMMARY OF COVARIANCES
NETWORK = red_devil_g
TIME = Tue Oct 24 13:08:22 2000

Definition of precision (E x S)ý = Cý + Pý:
Horizontal:
Precision (P) expressed as: ratio
Propagated linear error (E): U.S.
(standard error of adjusted horizontal distance)
Scalar (S) on propagated linear error: 1.0000
Constant error term (C): 0.0000
3-Dimensional:
Precision (P) expressed as: ratio
Propagated linear error (E): U.S.
(standard error of adjusted slope distance)
Scalar (S) on propagated linear error: 1.0000
Constant error term (C): 0.0000
Using orthometric height errors

FROM/ TO	AZIMUTH/ DELTA H	1.00å 1.00å	DISTANCE/ DELTA h	1.00å 1.00å	HOR PREC/ 3-D PREC
bay2	-**-	-**-	-**-	-**-	-**-
bay2d1	-**-	-**-	-**-	-**-	-**-
bay2	-**-	-**-	-**-	-**-	-**-
bay2d2	-**-	-**-	-**-	-**-	-**-
bay2	-**-	-**-	-**-	-**-	-**-
ken1	-**-	-**-	-**-	-**-	-**-
bay2	20ø59'17"	0.00"	795935.800m	0.0423m	1:18830550
rdm-01	+31.7029m	0.5974m	-**-	-**-	1:18830550
bay2	20ø59'45"	0.01"	795854.773m	0.0425m	1:18708417
rdm-02	+50.9124m	0.5982m	-**-	-**-	1:18708417
bay2	20ø59'08"	0.01"	795817.656m	0.0507m	1:15690582
rdm-03	+35.2470m	0.5750m	-**-	-**-	1:15690582
bay2d1	-**-	-**-	-**-	-**-	-**-
bay2d2	-**-	-**-	-**-	-**-	-**-
bay2d1	-**-	-**-	-**-	-**-	-**-
ken1	-**-	-**-	-**-	-**-	-**-
bay2d1	20ø59'17"	0.00"	795935.800m	0.0423m	1:18830550
rdm-01	+31.7029m	0.5974m	-**-	-**-	1:18830550
bay2d1	20ø59'45"	0.01"	795854.773m	0.0425m	1:18708417
rdm-02	+50.9124m	0.5982m	-**-	-**-	1:18708417
bay2d1	20ø59'08"	0.01"	795817.656m	0.0507m	1:15690582
rdm-03	+35.2470m	0.5750m	-**-	-**-	1:15690582
bay2d2	-**-	-**-	-**-	-**-	-**-
ken1	-**-	-**-	-**-	-**-	-**-
bay2d2	20ø59'17"	0.00"	795935.800m	0.0423m	1:18830550
rdm-01	+31.7029m	0.5974m	-**-	-**-	1:18830550
bay2d2	20ø59'45"	0.01"	795854.773m	0.0425m	1:18708417
rdm-02	+50.9124m	0.5982m	-**-	-**-	1:18708417

bay2d2	20ø59'08"	0.01"	795817.656m	0.0507m	1:15690582
rdm-03	+35.2470m	0.5750m	-**-	-**-	1:15690582
ken1	293ø16'23"	0.02"	342408.573m	0.0211m	1:16235859
rdm-01	+26.2583m	0.5974m	-**-	-**-	1:16235859
ken1	293ø15'27"	0.02"	342312.125m	0.0243m	1:14091369
rdm-02	+45.4677m	0.5982m	-**-	-**-	1:14091369
ken1	293ø15'16"	0.03"	342457.313m	0.0205m	1:16709870
rdm-03	+29.8023m	0.5750m	-**-	-**-	1:16709870
rdm-01	152ø27'49"	28.14"	135.054m	0.0195m	1: 6929
rdm-02	+19.2095m	0.0580m	-**-	-**-	1: 6929
rdm-01	221ø25'12"	43.13"	122.800m	0.0201m	1: 6113
rdm-03	+3.5441m	0.0479m	-**-	-**-	1: 6113
rdm-02	280ø54'06"	30.89"	146.318m	0.0276m	1: 5300
rdm-03	-15.6654m	0.0592m	-**-	-**-	1: 5300

```
                COORDINATE ADJUSTMENT SUMMARY
                NETWORK = red_devil_g
                TIME = Tue Oct 24 13:08:22 2000


Datum = WGS-84
Coordinate System = Geographic
Zone = Global

                    SUB-NETWORK 1
Network Adjustment Constraints:
  2 fixed coordinates in y
  2 fixed coordinates in x
  2 fixed coordinates in H


POINT   NAME      OLD COORDS        ADJUST      NEW COORDS          1.00å

   1 bay2
         LAT=  55ø 11' 25.485570" +0.000000"  55ø 11' 25.485570"        FIXED
         LON= 162ø 42' 24.353482" +0.000000" 162ø 42' 24.353482"        FIXED
      ELL HT=             50.6533m   +0.0000m             50.6533m        FIXED
    ORTHO HT=              0.0000m   +0.0000m              0.0000m    NOT KNOWN

   4 ken1
         LAT=  60ø 40' 30.265739" +0.000000"  60ø 40' 30.265739"        FIXED
         LON= 151ø 21' 00.669609" +0.000000" 151ø 21' 00.669609"        FIXED
      ELL HT=             56.0980m   +0.0000m             56.0980m        FIXED
    ORTHO HT=              0.0000m   +0.0000m              0.0000m    NOT KNOWN

   5 rdm-01
         LAT=  61ø 45' 37.861960" +0.001672"  61ø 45' 37.863631"    0.033867m
         LON= 157ø 18' 51.897854" +0.002976" 157ø 18' 51.894878"    0.030623m
      ELL HT=             81.4044m   +0.9518m             82.3562m    0.597433m
    ORTHO HT=              0.0000m   +0.0000m              0.0000m    NOT KNOWN

   6 rdm-02
         LAT=  61ø 45' 33.993391" +0.001672"  61ø 45' 33.995062"    0.034912m
         LON= 157ø 18' 47.641645" +0.002974" 157ø 18' 47.638671"    0.032314m
      ELL HT=            100.6143m   +0.9514m            101.5657m    0.598195m
    ORTHO HT=              0.0000m   +0.0000m              0.0000m    NOT KNOWN

   7 rdm-03
         LAT=  61ø 45' 34.886931" +0.001962"  61ø 45' 34.888893"    0.046260m
         LON= 157ø 18' 57.436837" +0.003894" 157ø 18' 57.432943"    0.028405m
      ELL HT=             84.9565m   +0.9438m             85.9003m    0.574996m
    ORTHO HT=              0.0000m   +0.0000m              0.0000m    NOT KNOWN

                    SUB-NETWORK 2
Network Adjustment Constraints:
  2 fixed coordinates in y
  2 fixed coordinates in x
  2 fixed coordinates in H


POINT   NAME      OLD COORDS        ADJUST      NEW COORDS          1.00å

   2 bay2d1
         LAT=  55ø 11' 25.485570" +0.000000"  55ø 11' 25.485570"        FIXED
         LON= 162ø 42' 24.353482" +0.000000" 162ø 42' 24.353482"        FIXED
      ELL HT=             50.6533m   +0.0000m             50.6533m        FIXED
    ORTHO HT=              0.0000m   +0.0000m              0.0000m    NOT KNOWN

   3 bay2d2
         LAT=  55ø 11' 25.485570" +0.000000"  55ø 11' 25.485570"        FIXED
```

LON=	162º 42' 24.353482"	+0.000000"	162º 42' 24.353482"	FIXED
ELL HT=	50.6533m	+0.0000m	50.6533m	FIXED
ORTHO HT=	0.0000m	+0.0000m	0.0000m	NOT KNOWN

```
AC6587 ************************************************************************
AC6587  CORS         -  This is a GPS Continuously Operating Reference Station.
AC6587  DESIGNATION -  COLD BAY 2 CORS L1 PHASE CENTER
AC6587  CORS_ID      -  BAY2
AC6587  PID          -  AC6587
AC6587  STATE/COUNTY-  AK/ALEUTIANS EAST BOROUGH
AC6587  USGS QUAD    -  COLD BAY A-3
AC6587
AC6587                          *CURRENT SURVEY CONTROL
AC6587
AC6587* NAD 83(CORS)-  55 11 25.51099(N)    162 42 24.27817(W)     ADJUSTED
AC6587* NAVD 88      -
AC6587
AC6587  EPOCH DATE   -        1997.00
AC6587  X            -  -3,484,276.180 (meters)                    COMP
AC6587  Y            -  -1,084,781.300 (meters)                    COMP
AC6587  Z            -   5,213,554.625 (meters)                    COMP
AC6587  ELLIP HEIGHT-           49.94  (meters)                    GPS OBS
AC6587  GEOID HEIGHT-           16.82  (meters)                    GEOID99
AC6587
AC6587  HORZ ORDER   -  SPECIAL (CORS)
AC6587  ELLP ORDER   -  SPECIAL (CORS)
AC6587
AC6587.ITRF positions are available for this station.
AC6587.The coordinates were established by GPS observations
AC6587.and adjusted by the National Geodetic Survey in July 2000.
AC6587.The coordinates are valid at the epoch date displayed above.
AC6587.The epoch date for horizontal control is a decimal equivalence
AC6587.of Year/Month/Day.
AC6587
AC6587
AC6587.The XYZ, and position/ellipsoidal ht. are equivalent.
AC6587
AC6587.The ellipsoidal height was determined by GPS observations
AC6587.and is referenced to NAD 83.
AC6587
AC6587.The geoid height was determined by GEOID99.
AC6587
AC6587                            SUPERSEDED SURVEY CONTROL
AC6587
AC6587  NAD 83(CORS)-  55 11 25.51103(N)    162 42 24.27768(W) AD(1996.00) c
AC6587  NAD 83(CORS)-  55 11 25.51091(N)    162 42 24.27734(W) AD(1997.00) c
AC6587  ELLIP HT     -          49.96  (m)                      GP(1997.00) c c
AC6587  ELLIP HT     -          49.96  (m)                      GP(1996.00) c c
AC6587
AC6587.Superseded values are not recommended for survey control.
AC6587.NGS no longer adjusts projects to the NAD 27 or NGVD 29 datums.
AC6587.See file dsdata.txt to determine how the superseded data were derived.
AC6587
AC6587_STATION IS THE L1 PHASE CENTER OF THE GPS ANTENNA
AC6587
AC6587                            STATION DESCRIPTION
AC6587
AC6587'DESCRIBED BY NATIONAL GEODETIC SURVEY
AC6587'STATION IS A GPS CORS.  LATEST INFORMATION INCLUDING POSITIONS AND
AC6587'VELOCITIES ARE AVAILABLE IN THE COORDINATE AND LOG FILES ACCESSIBLE
AC6587'BY ANONYMOUS FTP OR THE WORLDWIDE WEB.
AC6587'   FTP CORS.NGS.NOAA.GOV: CORS/COORD  AND  CORS/STATION_LOG
AC6587'   HTTP://WWW.NGS.NOAA.GOV  UNDER PRODUCTS AND SERVICES.
AF9584 ************************************************************************
AF9584  CORS         -  This is a GPS Continuously Operating Reference Station.
AF9584  DESIGNATION -  COLD BAY 2 CORS ARP
AF9584  CORS_ID      -  BAY2
AF9584  PID          -  AF9584
AF9584  STATE/COUNTY-  AK/ALEUTIANS EAST BOROUGH
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AF9584  USGS QUAD    -  COLD BAY A-3
AF9584
AF9584                          *CURRENT SURVEY CONTROL
AF9584
AF9584* NAD 83(CORS)-  55 11 25.51101(N)    162 42 24.27819(W)     ADJUSTED
AF9584* NAVD 88     -
AF9584
AF9584  EPOCH DATE  -        1997.00
AF9584  X           -  -3,484,276.125 (meters)                     COMP
AF9584  Y           -  -1,084,781.282 (meters)                     COMP
AF9584  Z           -   5,213,554.543 (meters)                     COMP
AF9584  ELLIP HEIGHT-          49.84  (meters)                     GPS OBS
AF9584  GEOID HEIGHT-          16.82  (meters)                     GEOID99
AF9584
AF9584  HORZ ORDER  -  SPECIAL (CORS)
AF9584  ELLP ORDER  -  SPECIAL (CORS)
AF9584
AF9584.ITRF positions are available for this station.
AF9584.The coordinates were established by GPS observations
AF9584.and adjusted by the National Geodetic Survey in July 2000.
AF9584.The coordinates are valid at the epoch date displayed above.
AF9584.The epoch date for horizontal control is a decimal equivalence
AF9584.of Year/Month/Day.
AF9584
AF9584
AF9584.The XYZ, and position/ellipsoidal ht. are equivalent.
AF9584
AF9584.The ellipsoidal height was determined by GPS observations
AF9584.and is referenced to NAD 83.
AF9584
AF9584.The geoid height was determined by GEOID99.
AF9584
AF9584                          SUPERSEDED SURVEY CONTROL
AF9584
AF9584  NAD 83(CORS)-  55 11 25.51093(N)    162 42 24.27736(W) AD(1997.00) c
AF9584  NAD 83(CORS)-  55 11 25.51105(N)    162 42 24.27771(W) AD(1996.00) c
AF9584  ELLIP HT    -          49.87  (m)                      GP(1997.00) c c
AF9584  ELLIP HT    -          49.87  (m)                      GP(1996.00) c c
AF9584
AF9584.Superseded values are not recommended for survey control.
AF9584.NGS no longer adjusts projects to the NAD 27 or NGVD 29 datums.
AF9584.See file dsdata.txt to determine how the superseded data were derived.
AF9584
AF9584_STATION IS THE ANTENNA REFERENCE POINT OF THE GPS ANTENNA
AF9584
AF9584                          STATION DESCRIPTION
AF9584
AF9584'DESCRIBED BY NATIONAL GEODETIC SURVEY 2000
AF9584'STATION IS A GPS CORS.  LATEST INFORMATION INCLUDING POSITIONS AND
AF9584'VELOCITIES ARE AVAILABLE IN THE COORDINATE AND LOG FILES ACCESSIBLE
AF9584'BY ANONYMOUS FTP OR THE WORLDWIDE WEB.
AF9584'   FTP CORS.NGS.NOAA.GOV: CORS/COORD  AND  CORS/STATION_LOG
AF9584'   HTTP://WWW.NGS.NOAA.GOV  UNDER PRODUCTS AND SERVICES.
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AB6390 ***********************************************************************
AB6390  CORS         -  This is a GPS Continuously Operating Reference Station.
AB6390  DESIGNATION -  KENAI 1 CORS L1 PHASE CENTER
AB6390  CORS_ID      -  KEN1
AB6390  PID          -  AB6390
AB6390  STATE/COUNTY-  AK/KENAI PENINSULA BOROUGH
AB6390  USGS QUAD    -  KENAI C-4
AB6390
AB6390                          *CURRENT SURVEY CONTROL
AB6390
AB6390* NAD 83(CORS)-  60 40 30.28634(N)    151 21 00.57209(W)     ADJUSTED
AB6390* NAVD 88      -        50.85   (meters)     166.8    (feet)  GPS OBS
AB6390
AB6390  EPOCH DATE   -        1997.00
AB6390  X            -  -2,748,338.083 (meters)                     COMP
AB6390  Y            -  -1,501,545.475 (meters)                     COMP
AB6390  Z            -   5,537,749.058 (meters)                     COMP
AB6390  ELLIP HEIGHT-          55.67  (meters)                     GPS OBS
AB6390  GEOID HEIGHT-           7.09  (meters)                     GEOID99
AB6390
AB6390  HORZ ORDER   -  SPECIAL (CORS)
AB6390  ELLP ORDER   -  SPECIAL (CORS)
AB6390
AB6390.ITRF positions are available for this station.
AB6390.The coordinates were established by GPS observations
AB6390.and adjusted by the National Geodetic Survey in July 2000.
AB6390.The coordinates are valid at the epoch date displayed above.
AB6390.The epoch date for horizontal control is a decimal equivalence
AB6390.of Year/Month/Day.
AB6390
AB6390.The orthometric height was determined by GPS observations and a
AB6390.high-resolution geoid model using precise GPS observation and
AB6390.processing techniques.
AB6390
AB6390.The XYZ, and position/ellipsoidal ht. are equivalent.
AB6390
AB6390.The ellipsoidal height was determined by GPS observations
AB6390.and is referenced to NAD 83.
AB6390
AB6390.The geoid height was determined by GEOID99.
AB6390
AB6390;                    North         East     Units   Scale      Converg.
AB6390;SPC AK 4      -   744,056.503   426,212.228   MT  0.99996669 -1 10 37.9
AB6390
AB6390                          SUPERSEDED SURVEY CONTROL
AB6390
AB6390  NAD 83(CORS)-  60 40 30.28642(N)    151 21 00.57281(W) AD(1996.00) c
AB6390  NAD 83(CORS)-  60 40 30.28572(N)    151 21 00.57192(W) AD(1997.00) c
AB6390  ELLIP HT     -          55.66  (m)                     GP(1997.00) c c
AB6390  ELLIP HT     -          55.66  (m)                     GP(1996.00) c c
AB6390
AB6390.Superseded values are not recommended for survey control.
AB6390.NGS no longer adjusts projects to the NAD 27 or NGVD 29 datums.
AB6390.See file dsdata.txt to determine how the superseded data were derived.
AB6390
AB6390_STATION IS THE L1 PHASE CENTER OF THE GPS ANTENNA
AB6390
AB6390                          STATION DESCRIPTION
AB6390
AB6390'DESCRIBED BY NATIONAL GEODETIC SURVEY
AB6390'STATION IS A GPS CORS.  LATEST INFORMATION INCLUDING POSITIONS AND
AB6390'VELOCITIES ARE AVAILABLE IN THE COORDINATE AND LOG FILES ACCESSIBLE
AB6390'BY ANONYMOUS FTP OR THE WORLDWIDE WEB.
AB6390'   FTP CORS.NGS.NOAA.GOV: CORS/COORD  AND  CORS/STATION_LOG
AB6390'   HTTP://WWW.NGS.NOAA.GOV  UNDER PRODUCTS AND SERVICES.
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AB7155 ***********************************************************************
AB7155  FBN          -  This is a Federal Base Network Control Station.
AB7155  DESIGNATION -  NIKI USCG B
AB7155  PID          -  AB7155
AB7155  STATE/COUNTY-  AK/ANCHORAGE BOROUGH
AB7155  USGS QUAD    -  KENAI C-4
AB7155
AB7155                          *CURRENT SURVEY CONTROL
AB7155
AB7155* NAD 83(1992)-  60 40 30.52477(N)    151 21 01.64386(W)     ADJUSTED
AB7155* NAVD 88      -        40.717  (meters)     133.59   (feet)  ADJUSTED
AB7155
AB7155  X            -  -2,748,335.881 (meters)                     COMP
AB7155  Y            -  -1,501,525.729 (meters)                     COMP
AB7155  Z            -   5,537,743.831 (meters)                     COMP
AB7155  LAPLACE CORR-          -14.70  (seconds)                    DEFLEC99
AB7155  ELLIP HEIGHT-           45.53  (meters)                     GPS OBS
AB7155  GEOID HEIGHT-            7.09  (meters)                     GEOID99
AB7155  DYNAMIC HT  -           40.767 (meters)     133.75   (feet)  COMP
AB7155  MODELED GRAV-      981,812.2   (mgal)                       NAVD 88
AB7155
AB7155  HORZ ORDER  -  A
AB7155  VERT ORDER  -  FIRST     CLASS II
AB7155  ELLP ORDER  -  FIRST     CLASS I
AB7155
AB7155.This is a reference station for the KENAI 1
AB7155.National Continuously Operating Reference Station (KEN1).
AB7155
AB7155.ITRF positions are available for this station.
AB7155.The horizontal coordinates were established by GPS observations
AB7155.and adjusted by the National Geodetic Survey in June 1997.
AB7155.This is a SPECIAL STATUS position.  See SPECIAL STATUS under the
AB7155.DATUM ITEM on the data sheet items page.
AB7155
AB7155.The orthometric height was determined by differential leveling
AB7155.and adjusted by the National Geodetic Survey in October 2000.
AB7155
AB7155.The X, Y, and Z were computed from the position and the ellipsoidal ht.
AB7155
AB7155.The Laplace correction was computed from DEFLEC99 derived deflections.
AB7155
AB7155.The ellipsoidal height was determined by GPS observations
AB7155.and is referenced to NAD 83.
AB7155
AB7155.The geoid height was determined by GEOID99.
AB7155
AB7155.The dynamic height is computed by dividing the NAVD 88
AB7155.geopotential number by the normal gravity value computed on the
AB7155.Geodetic Reference System of 1980 (GRS 80) ellipsoid at 45
AB7155.degrees latitude (g = 980.6199 gals.).
AB7155
AB7155.The modeled gravity was interpolated from observed gravity values.
AB7155
AB7155;                     North         East     Units   Scale      Converg.
AB7155;SPC AK 4      -   744,064.215   426,196.111   MT  0.99996672 -1 10 38.8
AB7155;UTM  05       - 6,727,735.647   590,120.115   MT  0.99969952 +1 26 17.7
AB7155
AB7155                          SUPERSEDED SURVEY CONTROL
AB7155
AB7155.No superseded survey control is available for this station.
AB7155
AB7155_MARKER: I = METAL ROD
AB7155_SETTING: 49 = STAINLESS STEEL ROD W/O SLEEVE (10 FT.+)
AB7155_STAMPING: NIKI USCG B 1996
AB7155_PROJECTION: FLUSH
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AB7155_MAGNETIC: N = NO MAGNETIC MATERIAL
AB7155_STABILITY: A = MOST RELIABLE AND EXPECTED TO HOLD
AB7155+STABILITY: POSITION/ELEVATION WELL
AB7155_SATELLITE: THE SITE LOCATION WAS REPORTED AS SUITABLE FOR
AB7155+SATELLITE: SATELLITE OBSERVATIONS - 1996
AB7155_ROD/PIPE-DEPTH: 12.2 meters
AB7155
AB7155  HISTORY     - Date     Condition        Recov. By
AB7155  HISTORY     - 1996     MONUMENTED       NOS
AB7155  HISTORY     - 19960518 GOOD             NGS
AB7155
AB7155                          STATION DESCRIPTION
AB7155
AB7155'DESCRIBED BY NATIONAL OCEAN SERVICE 1996 (JGF)
AB7155'THE STATION IS LOCATED AT THE USCG DGPS CORS SITE WHICH IS LOCATED 1
AB7155'MILE (1.6 KM) EAST OF THE UNOCAL REFINERY AT NIKISKI.  TO REACH THE
AB7155'STATION FROM THE INTERSECTION OF MILLER LOOP ROAD NORTH AND THE KENAI
AB7155'SPUR NORTH HIGHWAY AT THE UNOCAL REFINERY GO EAST ON MILLER LOOP ROAD
AB7155'FOR 0.8 MILE (1.3 KM) TO A GRAVEL SIDEROAD, TURN RIGHT, SOUTH AND GO
AB7155'APPROXIMATELY 40 METERS (131.2 FT) TO PARKING ON THE LEFT AT THE DGPS
AB7155'HUTS AND STATION OF THE SOUTH SIDE OF THE PARKING AREA.  THE STATION
AB7155'IS A STAINLESS BOLT IN THE TOP OF STAINLESS ROD DRIVEN TO REFUSAL AND
AB7155'ENCASED IN 5 INCH PVC CEMENTED IN THE GROUND WITH ALUMINUM ACCESS
AB7155'COVER.  IT IS 10.3 METERS (33.8 FT) EAST OF THE ENTRANCE LANE CENTER
AB7155'LINE, 18.3 METERS (60.0 FT) WEST OF THE NORTHERLY OF TWO 30 FT (9.1 M)
AB7155'STEEL TOWERS, 1.6 METERS (5.2 FT) SOUTH OF THE PARKING AREA AND 0.7
AB7155'METERS (2.3 FT) NORTH OF PINK PLASTIC WITNESS POST.
AB7155
AB7155                          STATION RECOVERY (1996)
AB7155
AB7155'RECOVERY NOTE BY NATIONAL GEODETIC SURVEY 1996 (JGF)
AB7155'RECOVERED AS DESCRIBED.
AB7156 ***********************************************************************
AB7156  FBN          -  This is a Federal Base Network Control Station.
AB7156  DESIGNATION -  NIKI USCG A
AB7156  PID          -  AB7156
AB7156  STATE/COUNTY-  AK/ANCHORAGE BOROUGH
AB7156  USGS QUAD    -  KENAI C-4
AB7156
AB7156                          *CURRENT SURVEY CONTROL
AB7156
AB7156* NAD 83(1992)-  60 40 26.18701(N)    151 20 53.60919(W)     ADJUSTED
AB7156* NAVD 88      -        41.290  (meters)     135.47   (feet)  ADJUSTED
AB7156
AB7156  X            -  -2,748,380.351 (meters)                     COMP
AB7156  Y            -  -1,501,689.041 (meters)                     COMP
AB7156  Z            -   5,537,678.564 (meters)                     COMP
AB7156  LAPLACE CORR-          -14.73  (seconds)                    DEFLEC99
AB7156  ELLIP HEIGHT-           46.09  (meters)                     GPS OBS
AB7156  GEOID HEIGHT-            7.08  (meters)                     GEOID99
AB7156  DYNAMIC HT  -           41.340 (meters)     135.63   (feet)  COMP
AB7156  MODELED GRAV-      981,812.1   (mgal)                       NAVD 88
AB7156
AB7156  HORZ ORDER  -  A
AB7156  VERT ORDER  -  FIRST     CLASS II
AB7156  ELLP ORDER  -  FIRST     CLASS I
AB7156
AB7156.This is a reference station for the KENAI 1
AB7156.National Continuously Operating Reference Station (KEN1).
AB7156
AB7156.ITRF positions are available for this station.
AB7156.The horizontal coordinates were established by GPS observations
AB7156.and adjusted by the National Geodetic Survey in June 1997.
AB7156.This is a SPECIAL STATUS position.  See SPECIAL STATUS under the
AB7156.DATUM ITEM on the data sheet items page.
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AB7156
AB7156.The orthometric height was determined by differential leveling
AB7156.and adjusted by the National Geodetic Survey in October 2000.
AB7156
AB7156.Photographs are available for this station.
AB7156
AB7156.The X, Y, and Z were computed from the position and the ellipsoidal ht.
AB7156
AB7156.The Laplace correction was computed from DEFLEC99 derived deflections.
AB7156
AB7156.The ellipsoidal height was determined by GPS observations
AB7156.and is referenced to NAD 83.
AB7156
AB7156.The geoid height was determined by GEOID99.
AB7156
AB7156.The dynamic height is computed by dividing the NAVD 88
AB7156.geopotential number by the normal gravity value computed on the
AB7156.Geodetic Reference System of 1980 (GRS 80) ellipsoid at 45
AB7156.degrees latitude (g = 980.6199 gals.).
AB7156
AB7156.The modeled gravity was interpolated from observed gravity values.
AB7156
AB7156;                      North         East     Units   Scale      Converg.
AB7156;SPC AK 4      -   743,927.485   426,315.318   MT  0.99996651 -1 10 31.8
AB7156;UTM  05       - 6,727,604.535   590,245.404   MT  0.99969979 +1 26 24.7
AB7156
AB7156                            SUPERSEDED SURVEY CONTROL
AB7156
AB7156.No superseded survey control is available for this station.
AB7156
AB7156_MARKER: I = METAL ROD
AB7156_SETTING: 49 = STAINLESS STEEL ROD W/O SLEEVE (10 FT.+)
AB7156_STAMPING: NIKI USCG A 1996
AB7156_PROJECTION: FLUSH
AB7156_MAGNETIC: N = NO MAGNETIC MATERIAL
AB7156_STABILITY: A = MOST RELIABLE AND EXPECTED TO HOLD
AB7156+STABILITY: POSITION/ELEVATION WELL
AB7156_SATELLITE: THE SITE LOCATION WAS REPORTED AS SUITABLE FOR
AB7156+SATELLITE: SATELLITE OBSERVATIONS - 1996
AB7156_ROD/PIPE-DEPTH: 6.50 meters
AB7156
AB7156  HISTORY     - Date     Condition        Recov. By
AB7156  HISTORY     - 1996     MONUMENTED       NOS
AB7156  HISTORY     - 19960518 GOOD             NGS
AB7156
AB7156                            STATION DESCRIPTION
AB7156
AB7156'DESCRIBED BY NATIONAL OCEAN SERVICE 1996 (JGF)
AB7156'THE STATION IS LOCATED AT THE USCG DGPS CORS SITE WHICH IS LOCATED 1
AB7156'MILE (1.6 KM) EAST OF THE UNOCAL REFINERY AT NIKISKI.  TO REACH THE
AB7156'STATION FROM THE INTERSECTION OF MILLER LOOP ROAD NORTH AND THE KENAI
AB7156'SPUR NORTH HIGHWAY AT THE UNOCAL REFINERY GO EAST ON MILLER LOOP ROAD
AB7156'FOR 0.8 MILE (1.3 KM) TO A GRAVEL SIDEROAD, TURN RIGHT, AND GO SOUTH
AB7156'THEN EAST FOR 0.1 MILE (0.2 KM) TO THE STATION ON THE RIGHT IN THE
AB7156'CLEARING FOR THE GROUND PLANE OF THE DGPS BROADCAST TOWER.  THE
AB7156'STATION IS A STAINLESS BOLT IN THE TOP OF STAINLESS ROD DRIVEN TO
AB7156'REFUSAL AND ENCASED IN 5 INCH PVC CEMENTED IN THE GROUND WITH ALUMINUM
AB7156'ACCESS COVER.  IT IS 88 METERS (288.7 FT) WEST OF THE WOODEN FENCE
AB7156'SURROUNDING THE TOWER, 6 METERS (19.7 FT) SOUTH OF THE GRAVEL ROAD TO
AB7156'THE THE TOWER AND 1.2 METERS (3.9 FT) NORTH OF A PINK PLASTIC WITNESS
AB7156'POST.
AB7156
AB7156                            STATION RECOVERY (1996)
AB7156
AB7156'RECOVERY NOTE BY NATIONAL GEODETIC SURVEY 1996 (JGF)
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AB7156'RECOVERED AS DESCRIBED.
AF9548 ***********************************************************************
AF9548  CORS         -  This is a GPS Continuously Operating Reference Station.
AF9548  DESIGNATION -  KENAI 1 CORS ARP
AF9548  CORS_ID      -  KEN1
AF9548  PID          -  AF9548
AF9548  STATE/COUNTY-  AK/KENAI PENINSULA BOROUGH
AF9548  USGS QUAD    -  KENAI C-4
AF9548
AF9548                          *CURRENT SURVEY CONTROL
AF9548
AF9548* NAD 83(CORS)-  60 40 30.28636(N)     151 21 00.57211(W)      ADJUSTED
AF9548* NAVD 88      -        50.76   (meters)      166.5     (feet)  GPS OBS
AF9548
AF9548  EPOCH DATE   -        1997.00
AF9548  X            -  -2,748,338.044 (meters)                      COMP
AF9548  Y            -  -1,501,545.454 (meters)                      COMP
AF9548  Z            -   5,537,748.980 (meters)                      COMP
AF9548  ELLIP HEIGHT-           55.58  (meters)                      GPS OBS
AF9548  GEOID HEIGHT-            7.09  (meters)                      GEOID99
AF9548
AF9548  HORZ ORDER   -  SPECIAL (CORS)
AF9548  ELLP ORDER   -  SPECIAL (CORS)
AF9548
AF9548.ITRF positions are available for this station.
AF9548.The coordinates were established by GPS observations
AF9548.and adjusted by the National Geodetic Survey in July 2000.
AF9548.The coordinates are valid at the epoch date displayed above.
AF9548.The epoch date for horizontal control is a decimal equivalence
AF9548.of Year/Month/Day.
AF9548
AF9548.The orthometric height was determined by GPS observations and a
AF9548.high-resolution geoid model using precise GPS observation and
AF9548.processing techniques.
AF9548
AF9548.The XYZ, and position/ellipsoidal ht. are equivalent.
AF9548
AF9548.The ellipsoidal height was determined by GPS observations
AF9548.and is referenced to NAD 83.
AF9548
AF9548.The geoid height was determined by GEOID99.
AF9548
AF9548                          SUPERSEDED SURVEY CONTROL
AF9548
AF9548  NAD 83(CORS)-  60 40 30.28574(N)     151 21 00.57194(W) AD(1997.00) c
AF9548  NAD 83(CORS)-  60 40 30.28644(N)     151 21 00.57283(W) AD(1996.00) c
AF9548  ELLIP HT     -          55.57  (m)                       GP(1997.00) c c
AF9548  ELLIP HT     -          55.57  (m)                       GP(1996.00) c c
AF9548
AF9548.Superseded values are not recommended for survey control.
AF9548.NGS no longer adjusts projects to the NAD 27 or NGVD 29 datums.
AF9548.See file dsdata.txt to determine how the superseded data were derived.
AF9548
AF9548_STATION IS THE ANTENNA REFERENCE POINT OF THE GPS ANTENNA
AF9548
AF9548                          STATION DESCRIPTION
AF9548
AF9548'DESCRIBED BY NATIONAL GEODETIC SURVEY 2000
AF9548'STATION IS A GPS CORS.  LATEST INFORMATION INCLUDING POSITIONS AND
AF9548'VELOCITIES ARE AVAILABLE IN THE COORDINATE AND LOG FILES ACCESSIBLE
AF9548'BY ANONYMOUS FTP OR THE WORLDWIDE WEB.
AF9548'   FTP CORS.NGS.NOAA.GOV: CORS/COORD  AND  CORS/STATION_LOG
AF9548'   HTTP://WWW.NGS.NOAA.GOV  UNDER PRODUCTS AND SERVICES.
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DISTRIBUTION

Retort Building Demolition and Limited Site Investigation
Red Devil Mine
Red Devil, Alaska

March 30, 2001

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