1317 South 13th Avenue P.O. Box 479 Kelso, Washington 98626 (360) 577-7222 ph (360) 636-1068 fax

Columbia Analytical Services
An Employee - Owned Company

October 21, 2003

Service Request No: K2306730

Howard Jones
Marine Taxonomic Services, Ltd.
5125 NW Crescent Valley Dr.
Corvallis, OR 97330

RE: Kennicott Greens Creek Mine / KGCM2003B

Dear Howard:

Enclosed are the results of the sample(s) submitted to our laboratory on September 3, 2003. For your reference, these analyses have been assigned our service request number K2306730.

All analyses were performed according to our laboratory's quality assurance program. The test results meet requirements of the NELAC standards except as noted in the case narrative report. All results are intended to be considered in their entirety, and Columbia Analytical Services, Inc. (CAS) is not responsible for use of less than the complete report. Results apply only to the items submitted to the laboratory for analysis and individual items (samples) analyzed, as listed in the report.

Please call if you have any questions. My extension is 3281.

Respectfully submitted,

Columbia Analytical Services, Inc.

Abbie Spielman
Project Chemist

AS/jeb

Acronyms

ASTM	American Society for Testing and Materials
A2LA	American Association for Laboratory Accreditation
CARB	California Air Resources Board
CAS Number	Chemical Abstract Service registry Number
CFC	Chlorofluorocarbon
CFU	Colony-Forming Unit
DEC	Department of Environmental Conservation
DEQ	Department of Environmental Quality
DHS	Department of Health Services
DOE	Department of Ecology
DOH	Department of Health
EPA	U. S. Environmental Protection Agency
ELAP	Environmental Laboratory Accreditation Program
GC	Gas Chromatography
GC/MS	Gas Chromatography/Mass Spectrometry
LUFT	Leaking Underground Fuel Tank
M	Modified
MCL	Maximum Contaminant Level is the highest permissible concentration of a substance allowed in drinking water as established by the USEPA.
MDL	Method Detection Limit
MPN	Most Probable Number
MRL	Method Reporting Limit
NA	Not Applicable
NC	Not Calculated
NCASI	National Council of the Paper Industry for Air and Stream Improvement
ND	Not Detected
NIOSH	National Institute for Occupational Safety and Health
PQL	Practical Quantitation Limit
RCRA	Resource Conservation and Recovery Act
SIM	Selected Ion Monitoring
TPH	Total Petroleum Hydrocarbons
tr	Trace level is the concentration of an analyte that is less than the PQL but greater than or equal to the MDL.

Inorganic Data Qualifiers

*	The result is an outlier. See case narrative.
#	The control limit criteria is not applicable. See case narrative.
B	The analyte was found in the associated method blank at a level that is significant relative to the sample result.
E	The result is an estimate amount because the value exceeded the instrument calibration range.
J	The result is an estimated concentration that is less than the MRL but greater than or equal to the MDL.
U	The compound was analyzed for, but was not detected ("Non-detect") at or above the MRL/MDL.
i	The MRL/MDL has been elevated due to a matrix interference.
X	See case narrative.

Metals Data Qualifiers

#	The control limit criteria is not applicable. See case narrative.
B	The result is an estimated concentration that is less than the MRL but greater than or equal to the MDL.
E	The percent difference for the serial dilution was greater than 10%, indicating a possible matrix interference in the sample.
M	The duplicate injection precision was not met.
N	The Matrix Spike sample recovery is not within control limits. See case narrative.
S	The reported value was determined by the Method of Standard Additions (MSA).
U	The compound was analyzed for, but was not detected ("Non-detect") at or above the MRL/MDL.
W	The post-digestion spike for furnace AA analysis is out of control limits, while sample absorbance is less than 50% of spike absorbance.
i	The MRL/MDL has been elevated due to a matrix interference.
X	See case narrative.
*	The duplicate analysis not within control limits. See case narrative.
+	The correlation coefficient for the MSA is less than 0.995.

Organic Data Qualifiers

*	The result is an outlier. See case narrative.
#	The control limit criteria is not applicable. See case narrative.
A	A tentatively identified compound, a suspected aldol-condensation product.
B	The analyte was found in the associated method blank at a level that is significant relative to the sample result.
C	The analyte was qualitatively confirmed using GC/MS techniques, pattern recognition, or by comparing to historical data.
D	The reported result is from a dilution.
E	The result is an estimate amount because the value exceeded the instrument calibration range.
J	The result is an estimated concentration that is less than the MRL but greater than or equal to the MDL.
N	The result is presumptive. The analyte was tentatively identified, but a confirmation analysis was not performed.
P	The GC or HPLC confirmation criteria was exceeded. The relative percent difference is greater than 40% between the two analytical results (25% for CLP Pesticides).
U	The compound was analyzed for, but was not detected ("Non-detect") at or above the MRL/MDL.
i	The MRL/MDL has been elevated due to a chromatographic interference.
X	See case narrative.

Additional Petroleum Hydrocarbon Specific Qualifiers

F	The chromatographic fingerprint of the sample matches the elution pattern of the calibration standard.
L	The chromatographic fingerprint of the sample resembles a petroleum product, but the elution pattern indicates the presence of a greater amount of lighter molecular weight constituents than the calibration standard.
H	The chromatographic fingerprint of the sample resembles a petroleum product, but the elution pattern indicates the presence of a greater amount of heavier molecular weight constituents than the calibration standard.
O	The chromatographic fingerprint of the sample resembles an oil, but does not match the calibration standard.
Y	The chromatographic fingerprint of the sample resembles a petroleum product eluting in approximately the correct carbon range, but the elution pattern does not match the calibration standard.
Z	The chromatographic fingerprint does not resemble a petroleum product.

Case Narrative

COLUMBIA ANALYTICAL SERVICES, INC.

Client:	Marine Taxonomic Services, Ltd.	**Service Request No.:**	K2306730
Project:	Kennicott-Greens Creek Mine	**Date Received:**	9/3/03
Sample Matrix:	Sediment, Tissue		

CASE NARRATIVE

All analyses were performed consistent with the quality assurance program of Columbia Analytical Services, Inc. (CAS). This report contains analytical results for samples designated for Tier II data deliverables. When appropriate to the method, method blank results have been reported with each analytical test. Additional quality control analyses reported herein include: Laboratory Duplicate (DUP), Matrix Spike (MS), and Laboratory Control Sample (LCS).

Sample Receipt

Eleven sediment samples and seventeen tissue samples were received for analysis at Columbia Analytical Services on 9/3/03. The following discrepancies were noted upon initial sample inspection. All samples were received outside of recommended temperature, and one sample container was received broken. Additional details about the exceptions are noted on the cooler receipt and preservation form included in this data package. These issues were resolved via discussion with the client on 9/8/03. All remaining samples were received in good condition and consistent with the accompanying chain of custody. The sediment samples were stored in a refrigerator at 4°C upon receipt at the laboratory. The tissue samples were stored frozen at –20°C upon receipt at the laboratory.

General Chemistry Parameters

No anomalies associated with the analysis of these samples were observed.

Total Metals

No anomalies associated with the analysis of these samples were observed.

Approved by _____ Date 10/21/03

Chain of Custody Documentation

Columbia Analytical Services, Inc.
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CHAIN OF CUSTODY

Sediment and Tissue Chemistry

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SR#: K230 6730

PAGE 1 OF 3 COC #

PROJECT NAME: Kennicott Greens Creek Mine
PROJECT NUMBER: KGCM 2003 B
PROJECT MANAGER: Howard R. Jones
COMPANY/ADDRESS: Marine Taxonomic Services
5125 NW Crescent Valley Dr. Corvallis OR 97330
PHONE #: 541 753 7609
FAX #: 541 753 0715
SAMPLER'S SIGNATURE: Howard R Jones

SAMPLE I.D.	DATE	TIME	LAB I.D.	MATRIX	NUMBER OF CONTAINERS	Metals (list below)	☐ Total Volatile Solids ☐ Total Solids ☐ Lipids	TOC (ASTM D4129M)	Grain size - PSEP / ASTM D422	Sulfide ☐ Total (9030M) ☐ Water Soluble	AVS / SEM	Ammonia ☐ Total (350.1m) ☐ Pore water	Pesticides (8081)	PCBs (8082) ☐ Aroclors ☐ Congeners	Semivolatiles (GC/MS SIM) ☐ PAHs ☐ Phthalates ☐ Phenols ☐ PSEP	Organotin - Sediment ☐ Mono ☐ Di ☐ Tri ☐ Tetra	Organotin - Pore water ☐ Mono ☐ Di ☐ Tri ☐ Tetra	Volatiles (8260)	TRPH 8015 / 418.1	REMARKS
S-1 Sediments	I 8/27	0800	1		1															
S-1 Nephtys	"	"	2		1															
S-1 Cockles	"	"	3		1															
S-1 Sediments	II "	"	4		1															
S-2 Sediments	I 8/28	0900			1															AP
S-2 Sediments	II "	"	5		1															*
S-2 Nephtys	"	"	6		1															
S-2 Cockles	"	"	7		1															
S-2 Littleneck	"	"	8		1															

REPORT REQUIREMENTS

X I. Routine Report: Method Blank, Surrogate, as required
___ II. Report Dup., MS, MSD as required
___ III. Data Validation Report (includes all raw data)
___ IV. CLP Deliverable Report
___ V. EDD

INVOICE INFORMATION

P.O. #
Bill To: KGCM c/o Bill Ockenfels
PO Box 32199
Juneau, AK 99801

TURNAROUND REQUIREMENTS

___ 24 hr. ___ 48 hr.
___ 5 Day
X Standard (10-15 working days)
___ Provide FAX Results

Requested Report Date

Circle which metals are to be analyzed:

SMS Metals: As (Cd) Cr (Cu) (Pb) (Hg) Ag (Zn)
CA Metals: Ag As Cd Cr Cu Hg Ni Pb Se Zn

SPECIAL INSTRUCTIONS/COMMENTS:

All samples that have Sediment II on lid and/or label are to be analysed for sediment grain size

* DID NOT RECEIVE S-1 SEDIMENTS II INTACT, UNABLE TO CONTAIN.

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
H Jones	9/3/03 1000		
Signature	Signature	Signature	Signature
8-31-0730			
Date/Time	Date/Time	Date/Time	Date/Time
H R Jones	MTS		
Printed Name	Firm		

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SR#: K2306730

PAGE 2 OF 3 COC #

PROJECT NAME: Kennicott Greens Creek Mine (KGCM)
PROJECT NUMBER: KGCM 2003B
PROJECT MANAGER: H K Jones
COMPANY/ADDRESS: MTS 5125 NW Crescent Valley Dr
Corvallis OR 97330
PHONE #: 541 753-7609 FAX #
SAMPLER'S SIGNATURE: Howard R Jones

SAMPLE I.D.	DATE	TIME	LAB I.D.	MATRIX	NUMBER OF CONTAINERS	Semivolatile Organics by GC/MS 625 ☐ 8270 ☐	Volatile Organics 624 ☐ 8260 ☐	Hydrocarbons (*see below) Gas ☐ Diesel ☐ Oil ☐	☐ Fuel Fingerprint (FIQ) ☐ NW-HCID Screen	Oil & Grease/TRPH 413.1 ☐ 418.1 ☐ 1664 SGT ☐ 1664 HEM ☐	PCB's Aroclors ☐ Congeners ☐	Pesticides/Herbicides 608 ☐ 8081A ☐ 8141A ☐ 8151A ☐	Chlorophenolics - 8151M Tri ☐ Tetra ☐ PCP ☐	PAHS 8310 ☐ SIM ☐	GC/MS-SIM PAH ☐ Phenol ☐ Phthalates ☐	Metals, Total or Dissolved (See list below)	Cyanide ☐ Hex-Chrom ☐	pH, Cond., Cl, SO4, PO4, F, NO2, NO3, BOD, TSS, TDS (circle)	NH3-N, COD, Total-P, TKN, TOC, DOC (circle)	TOX 9020 ☐ AOX 1650 ☐ 506 ☐					REMARKS
S-3 Sediments	I 8/27	0700	9		1																				
S-3 Sediments	II "	"	10		1																				
S-3 Nephtys	"	"	11		1																				
S-3 Cockles	"	"	12		1																				
S-3 Littleneck	"	"	13		1																				
S-3 Softshell	"	"	14		1																				
S-3 Nereis	"	"	15		1																				
S-3 Aberinicola	"	"	16		1																				
S-5 N Sediments	I 8/30	1500	17		1																				
S-5 N Sediments	II "	"	18		1																				

000008

REPORT REQUIREMENTS

X I. Routine Report: Method Blank, Surrogate, as required
___ II. Report Dup., MS, MSD as required
___ III. Data Validation Report (includes all raw data)
___ IV. CLP Deliverable Report
___ V. EDD

INVOICE INFORMATION

P.O. #
Bill To: KGCM % Bill Odekiw
PO Box 32199
Juneau, AK 99801

TURNAROUND REQUIREMENTS

___ 24 hr. ___ 48 hr.
___ 5 Day
X Standard (10-15 working days)
___ Provide FAX Results

Requested Report Date

Circle which metals are to be analyzed:

Total Metals: Al As Sb Ba Be B Ca Cd Co Cr Cu Fe Pb Mg Mn Mo Ni K Ag Na Se Sr Tl Sn V Zn Hg

Dissolved Metals: Al As Sb Ba Be B Ca Cd Co Cr Cu Fe Pb Mg Mn Mo Ni K Ag Na Se Sr Tl Sn V Zn Hg

*INDICATE STATE HYDROCARBON PROCEDURE: AK CA WI NORHTWEST OTHER:_____ (CIRCLE ONE)

SPECIAL INSTRUCTIONS/COMMENTS:

See page 1 for Sediment II instructions

RELINQUISHED BY:		RECEIVED BY:		RELINQUISHED BY:		RECEIVED BY:	
H Jones	8-31-0730	[signature]	9/3/03 1000				
Signature	Date/Time	Signature	Date/Time	Signature	Date/Time	Signature	Date/Time
H Jones	MTS	[signature]	CAS				
Printed Name	Firm	Printed Name	Firm	Printed Name	Firm	Printed Name	Firm

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SR#: K2306730

PAGE 3 OF 3 COC #

PROJECT NAME

PROJECT NUMBER

PROJECT MANAGER

COMPANY/ADDRESS

see page 1&2

PHONE # FAX #

SAMPLER'S SIGNATURE

SAMPLE I.D.	DATE	TIME	LAB I.D.	MATRIX	NUMBER OF CONTAINERS	☐ Total Volatile Solids ☐ Total Solids	TOC ☐ (ASTM D4129M) ☐ PSEP	Grain size ☐ PSEP ☐ ASTM D422	Sulfide ☐ Total (9030M) ☐ PSEP ☐ Water Soluble	☐ AVS ☐ SEM (metals list below)	Ammonia ☐ Total (350.1m) ☐ Plumb ☐ Pore water	Metals (list below)	Pesticides (8081-L)	PCBs (8082-L) ☐ Aroclors ☐ Congeners	Semivolatiles ☐ GC/MS SIM (PAH) ☐ 8270-L	Organotins ☐ Bulk ☐ Pore Water ☐ TBT only	Volitiles (8260)	Dioxins ☐ 1613 ☐ 8290	TPH ☐ GRO ☐ DRO ☐ RRO	☐ Lipids	Tissue Sample Preparations (Instructions below)				REMARKS
✓ S-4 Sediments I	8/29	0900	19		1																				
✓ S-4 Sediments II	"	"	20		1																				
✓ S-4 Nephtys	"	"	21		1																				
✓ S-4 Cockles	"	"	22		1																				
✓ S-5 S Sediments I	8/30	1500	23		1																				
✓ S-5 S Sediments II	"	"	24		1																				
✓ STN-1 mussels	8/30	1900	25		1																				
✓ STN-2 mussels	"	"	26		1																				
✓ STN-3 mussels	"	"	27		1																				
✓ ESL mussels	8/28	1100	28		1																				

000009

REPORT REQUIREMENTS

X I. Routine Report: Method Blank, Surrogate, as required

___ II. Report Dup., MS, MSD as required

___ III. Data Validation Report (includes all raw data)

___ IV. CLP Deliverable Report

___ V. EDD

INVOICE INFORMATION

P.O. #

Bill To: see page 2/3

TURNAROUND REQUIREMENTS

___ 24 hr. ___ 48 hr.

___ 5 Day

X Standard (10-15 working days)

___ Provide FAX Results

Requested Report Date

Circle which metals are to be analyzed:

SMS Metals: As Cd Cr Cu Pb Hg Ag Zn

CA Metals: Ag As Cd Cr Cu Hg Ni Pb Se Zn

SEM Metals: Cd Cu Pb Hg Ni Zn

SPECIAL INSTRUCTIONS/COMMENTS:

See Page 1 for sediment II instructions

RELINQUISHED BY:		RECEIVED BY:		RELINQUISHED BY:		RECEIVED BY:	
H Jones	8/31 0730	[signature]	9/3/03 1000				
Signature	Date/Time	Signature	Date/Time	Signature	Date/Time	Signature	Date/Time
AR Jones	N-TS	[signature]	CAS				
Printed Name	Firm	Printed Name	Firm	Printed Name	Firm	Printed Name	Firm

Columbia Analytical Services Inc.
Cooler Receipt And Preservation Form

Project/Client Marine Taxonomic Work Order K23 06730

Cooler received on 9/3/03 and opened on 9/3/03 by [illegible]

1. Were custody seals on outside of cooler? Y N
   If yes, how many and where? _____
2. Were seals intact and signature & date correct? Y N
3. Is the shipper's airbill available and filed? If no, record airbill number: [illegible] ~~Y N~~
4. COC #
   Temperature of cooler(s) upon receipt: 24.5
   Temperature Blank: 24.4
5. Were custody papers properly filled out (ink, signed, etc.)? Y N
6. Type of packing material present [illegible]
7. Did all bottles arrive in good condition (unbroken)? Y N
8. Were all bottle labels complete (*i.e.* analysis, preservation, etc.)? Y N
9. Did all bottle labels and tags agree with custody papers? Y N
10. Were the correct types of bottles used for the tests indicated? Y N
11. Were all of the preserved bottles received at the lab with the appropriate pH? ~~Y N~~
12. Were VOA vials checked for absence of air bubbles, and if present, noted below? ~~Y~~ N
13. Did the bottles originate from CAS/K or a branch laboratory? Y N
14. Are CWA Microbiology samples received with > ½ the 24 hr. hold time remaining from collection? ~~Y N~~
15. Was Cl2/Res negative? ~~Y N~~

Explain any discrepancies: S-1 Sediment II rec'd broken & Spilled Out - Could not contain - use volume from S-I, sed I

9/8/03

RESOLUTION: called client to confirm samples rec. out of temp, broken bottle as per H. Jones - additional volume for S-1 sediment II can be taken from S-1 Sediment I

Samples that required preservation or received out of temperature:

Sample ID	Reagent	Volume	Lot Number	Bottle Type	Rec'd out of Temperature	Initials

000010

CRFREV.DOC3/5/2003

Total Solids

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client: Marine Taxonomic Sevices, Ltd.
Project: Kennicott Greens Cre/KGCM2003B
Sample Matrix: Sediment

Service Request: K2306730

Total Solids

Prep Method: NONE
Analysis Method: 160.3M
Test Notes:

Units: PERCENT
Basis: WET

Sample Name	Lab Code	Date Collected	Date Received	Date Analyzed	Result	Result Notes
S-1 Sediments I	K2306730-001	08/27/2003	09/03/2003	09/09/2003	89.9	
S-2 Sediments I	K2306730-004	08/28/2003	09/03/2003	09/09/2003	71.0	
S-2 Sediments II	K2306730-005	08/28/2003	09/03/2003	09/09/2003	71.4	
S-3 Sediments I	K2306730-009	08/27/2003	09/03/2003	09/09/2003	59.4	
S-3 Sediments II	K2306730-010	08/27/2003	09/03/2003	09/09/2003	56.7	
S-5 N Sediments I	K2306730-017	08/30/2003	09/03/2003	09/09/2003	73.3	
S-5 N Sediments II	K2306730-018	08/30/2003	09/03/2003	09/09/2003	77.5	
S-4 N Sediments I	K2306730-019	08/29/2003	09/03/2003	09/09/2003	74.5	
S-4 N Sediments II	K2306730-020	08/29/2003	09/03/2003	09/09/2003	76.6	
S-5 S Sediments I	K2306730-023	08/30/2003	09/03/2003	09/09/2003	72.5	
S-5 S Sediments II	K2306730-024	08/30/2003	09/03/2003	09/09/2003	61.7	

000012

QA/QC Report

Client:	Marine Taxonomic Sevices, Ltd.	**Service Request:**	K2306730
Project:	Kennicott Greens Cre/KGCM2003B	**Date Collected:**	08/27/2003
Sample Matrix:	Sediment	**Date Received:**	09/03/2003
		Date Analyzed:	09/09/2003

Duplicate Sample Summary
Total Solids

Prep Method:	NONE	**Units:**	PERCENT
Analysis Method:	160.3M	**Basis:**	WET
Test Notes:			

Sample Name	Lab Code	Sample Result	Duplicate Sample Result	Average	Relative Percent Difference	Result Notes
S-1 Sediments I	K2306730-001	89.9	88.6	89.3	1	

000013