TX1

FILE COPY
Project Name GreenPark
Category EA
Sub-Category Phase I

QST ENVIRONMENTAL

February 5, 1999

Ms. Marina Robertson
GreenPark Ventures, LLC
3030 Old Ranch Parkway, Suite 450
Seal Beach, California 90740-2750

COPY

Subject: Results of Preliminary Soil Sampling at Runkle Ranch in Simi Valley, California

Dear Ms. Robertson:

QST Environmental, Inc. (QST) is presenting the results of a preliminary soil sampling investigation performed at Runkle Ranch. The site is approximately 550 acres and is located at N ½ of Section 26, E ½ of Section 23, SE 1/4 of Section 14, NW 1/4 of Section 24, SE 1/4 of Section 13, Township 2 N, Range 18 W in Simi Valley, Ventura County, California (Figure 1).

The purpose of the investigation was to determine if operations conducted at the adjacent "Rocketdyne" facility had impacted on-site soils, based on surface run-off carrying radionuclides to the site. Results of the investigation would determine if further site investigation is necessary for the subject site.

Site Investigation Field Activities

On December 23, 1998, a representative of QST and GreenPark Ventures, LLC (GreenPark) arrived at the site to collect four soil samples at three locations identified as S-1, S-2, and S-3 in Figure 2. In addition, one composite sample was collected from a white powdery material found on-site within the area identified as "Powder" in Figure 2.

Two soil samples, S1-0 and S1-1, were collected at location S-1 at 0 and 1 foot depths, respectively. One soil sample, S2-0, was collected at the surface of location S-2. These two sample locations were selected within a natural drainage channel flowing into the site from the Rocketdyne. Location S-1 was selected as close as possible to the Rocketdyne facility and S-2 was selected further down stream. Consequently, these sample locations would potentially represent the worse case on-site impact of radionuclides in surface water run-off from Rocketdyne. One soil sample, S3-0, was collected at the surface of location S-3. Location S-3 was chosen within wall of a natural canyon not impacted by surface water run-off from Rocketdyne. Consequently, this location would serve as the potential on-site background concentration of naturally occurring radionuclides.

Based on the July 1995, EPA Update entitled "The US EPA Announces Results of Rocketdyne's Off-Site Sampling Program for the Santa Susana Field Laboratory", the four soil samples were analyzed for Strontium, Cesium, and Tritium. These three compounds were identified in EPA's report as the radionuclide constituents of concern.

426 N. 44th Street, Ste. 110, Phoenix, AZ 85008, Phone 602•244•1192, FAX 602•244•9280
Formerly Environmental Science & Engineering, Inc.

Mar 08 05 10:54a Heriberto Robles Ph.D. 949-387-0900 p.1

The composite sample of powder material was collected in the area depicted in Figure 2. The composite sample "Powder" was formed by collecting grab surface samples of the powdery material at four location within the sample area. In order to determine the nature of the powdery material, the composite sample was analyzed for 23 metals ranging from Aluminum to Zinc, total Cyanide, Phosphate, and pH.

Soil Sample Results

The analytical results of the soil samples (Table 1) indicated the presence of Strontium in all samples collected from S-1 and S-2 (ranging from 0.25 to 0.86 pCi/g) that exceeded the EPA average local background concentration of 0.052 pCi/g, referenced in the EPA report. When comparing these same results to the potential on-site background concentration taken from S3-0 (0.41 pCi/g), all of the samples collected at the surface of S-1 and S-2 exceeded this value. However, the sample collected one below grade from S-1 was below the potential on-site background level.

Cesium-137 was detected in Sample S1-1 (0.11 pCi/g) that exceeded the EPA average local background concentration of 0.087 pCi/g. All of the other samples, including the potential on-site background sample (S3-0) were below the EPA background concentration.

Tritium was detected in all soil samples collected at the surface (including the potential on-site background) but was below the EPA average local background concentration of 140 pCi/l. However, due to laboratory (see Attachment A) error in conducting the analysis, the concentrations of Tritium found in the soil samples may not be representative.

When comparing EPA's average local background concentrations of the radionuclides to the potential on-site background (i.e., S3-0), the concentration of Strontium was higher on-site than what was determined by EPA. The on-site background results of the other two constituents were less than the EPA background levels.

The analytical results of the composite powder sample (Table 1) indicated the presence of Aluminum, Calcium, Chromium, Cobalt, Copper, Iron, Lead, Magnesium, Manganese, Nickel, Potassium, Sodium, Vanadium, and Zinc. Of these detected metals, Aluminum, Calcium, Iron, Magnesium, and Potassium were detected in orders of magnitude higher than the other detected metals. When comparing the metals results with EPA Region IX's Residential Preliminary Remediation Goals (PRGs), the results showed that all of the detected metals that had a corresponding PRG, were below the residential limit. No PRGs were available for Calcium, Iron, Magnesium, Potassium, and Sodium. Total Cyanide and Phosphate results for the powder were below laboratory detection limits. The pH of the powder was determined to be 4.0, which is lower than the average pH value of soil.

The laboratory report and QA/QC data pertaining to the analysis of the soil and powder samples are presented in Attachment A.

Mar 08 05 10:54a Heriberto Robles Ph.D. 949-387-0900 p.2

Conclusions and Recommendations

Based on the analytical results of the soil samples, it would appear that there may have been some impact of radionuclides to the site from the Rocketdyne facility. Consequently, a more extensive site investigation appears to be necessary to the determine the lateral and vertical impact of radionuclides in the soil. In addition, based on the results of the potential on-site background sample (S3-0), the site investigation should include background sampling to determine naturally occurring conditions of the radionuclide constituents of concern at Runkle Ranch.

In terms of the powdery material, analytical results indicates that the material consists mainly of metals and inorganics that are normally non-toxic. However, because no residential PRGs have been established for these compounds and the pH appears to lower than average soil values, further limited investigation is recommended.

QST is currently preparing a scope of work to conduct the next phase of the investigation at Runkle Ranch, which will be provided to GreenPark in the near future.

Thank you for allow QST to service your environmental needs. If you should have any questions, please contact the undersigned at (602) 244-1192, ext. 113.

Sincerely,
QST ENVIRONMENTAL, INC.

John S. Kim
Chief Engineer

Mar 08 05 10:54a Heriberto Robles Ph.D. 949-387-0900 p.3

FIGURES

TABLES

TABLE 1. RESULTS OF SOIL SAMPLES COLLECTED AT RUNKLE RANCH; 12/23/98

SOIL SAMPLES RADIONUCLIDE RESULTS

SAMPLE ID	SAMPLE DATE	SAMPLE DEPTH	PARAMETERS (pCi/g)		
			Strontium	Cesium	Tritium
S1-0	12/23/98	0'	**0.86**	**0.11**	0.4
S1-1	"	1'	**0.25**	0.036	-0.001
S2-0	"	0'	**0.83**	-0.002	0.056
S3-0*	"	0'	**0.41**	0.011	0.008
EPA LOCAL BACKGROUND (pCi/g)			0.052	0.087	140

* NOTE: Sample location my potentially serve as site specific background.

POWDER SAMPLE INORGANIC RESULTS

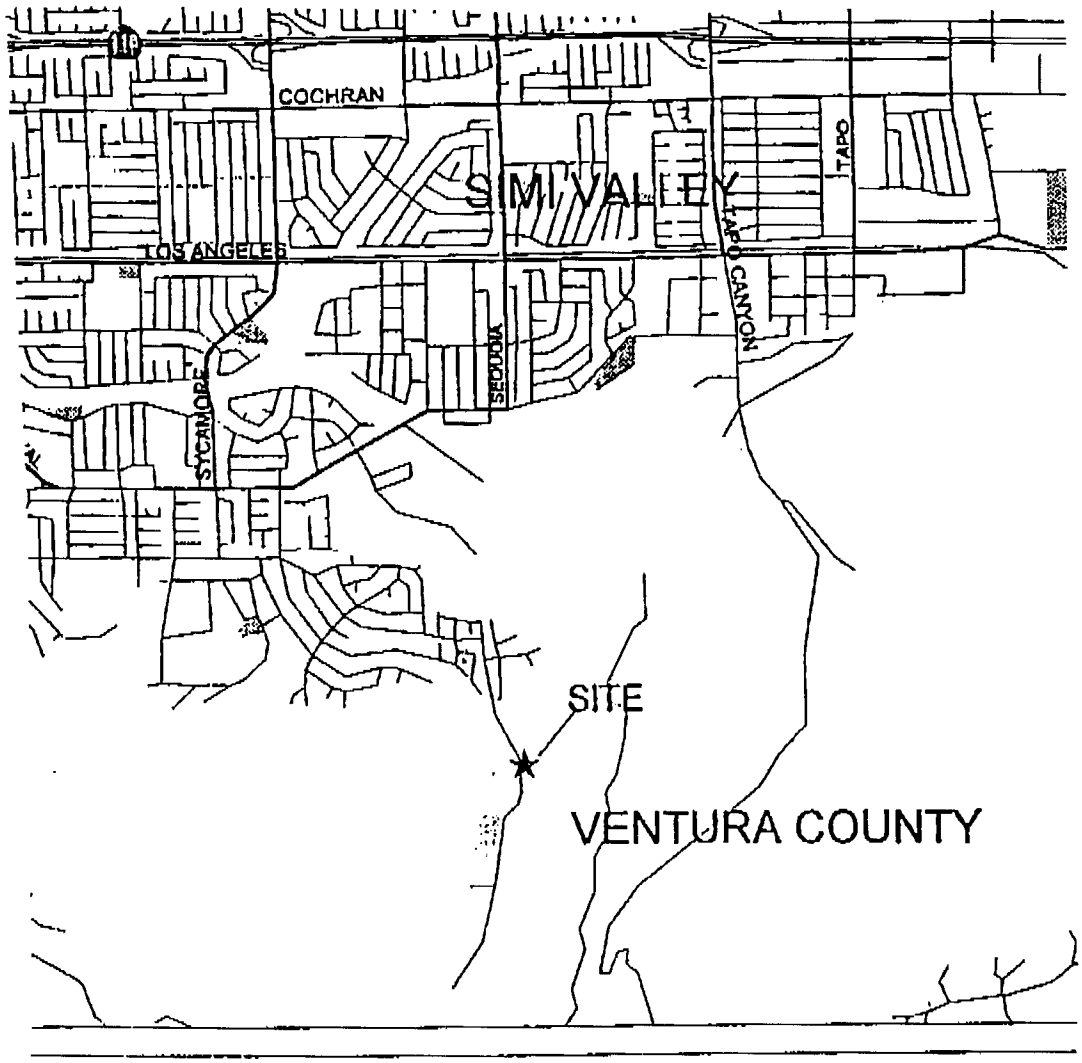
ANALYTICAL PARAMETERS	SAMPLE ID	SAMPLE DATE	SAMPLE DEPTH	RESULTS (MG/KG)	EPA PRGS (MG/KG)
Aluminum	POWDER	12/23/98	0'	6300	77000
Calcium	"	"	"	3900	NA
Chromium	"	"	"	8	210
Cobalt	"	"	"	8	4600
Copper	"	"	"	12	2800
Iron	"	"	"	16000	NA
Lead	"	"	"	6	130
Magnesium	"	"	"	6600	NA
Manganese	"	"	"	230	3200
Nickel	"	"	"	9	150
Potassium	"	"	"	1800	NA
Sodium	"	"	"	340	NA
Vanadium	"	"	"	27	540
Zinc	"	"	"	30	23000
pH	"	"	"	4 (UNITS)	NA

ATTACHMENT A

LABORATORY REPORTS AND QA/QC DATA OF COLLECTED SAMPLES

FIGURES

CADD FILE: ACAD\FILES\KIM\RUNKLE RANCH\SIT-LOC.dwg



N

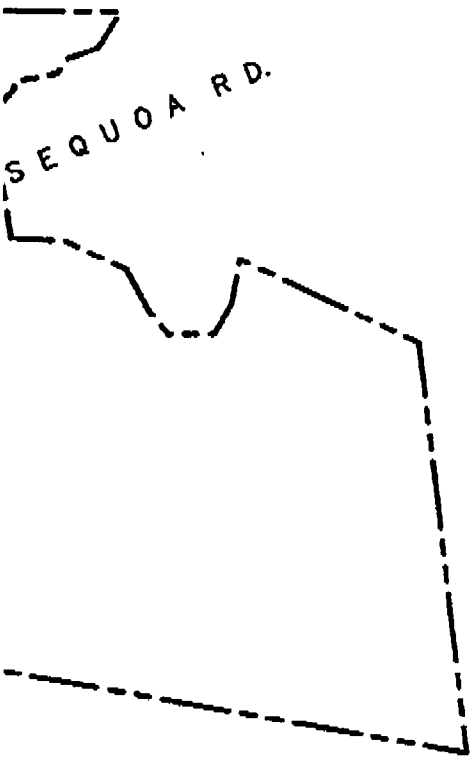
QST ENVIRONMENTAL

GREEN PARK VENTURES
3030 SEAL BEACH PARKWAY, STE
SEAL BEACH, CA 90740-2750

SITE LOCATION MAP
RUNKLE RANCH
SIMI VALLEY, CA

PROJECT MANAGER: J. KIM	PROJECT DESIGNER:	
DRAWN BY:	APPROVED BY: J. KIM	SCALE
PROJECT No.	DATE: 2-4-99	FIGURE: 1

WITH



LEGEND

S-1 SOIL SAMPLING LOCATIONS

PROPERTY BOUNDARY

DIRT ROAD

INTERMITTENT STREAM

N

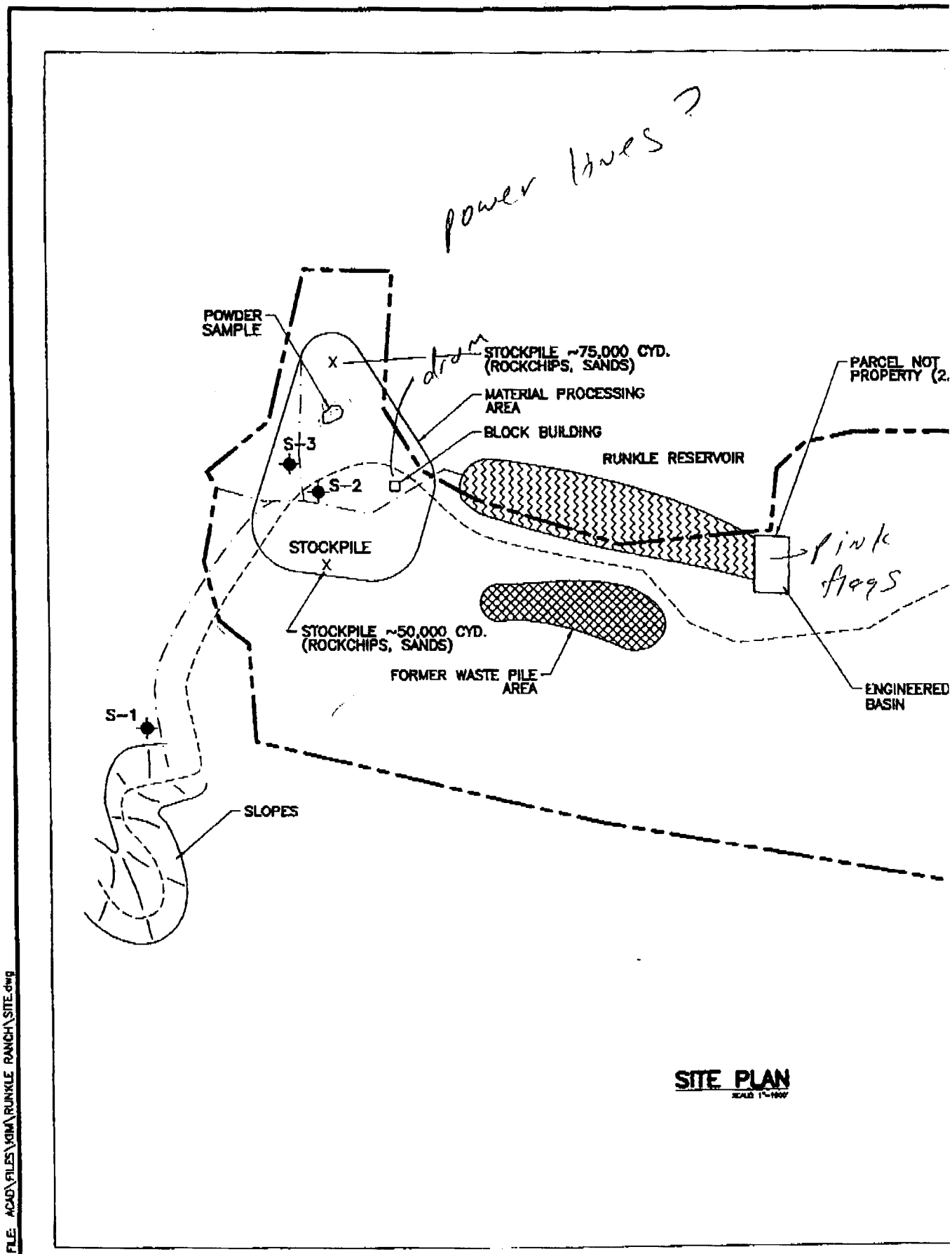
0 1000

QST ENVIRONMENTAL

GREEN PARK VENTURES
3030 SEAL BEACH PARKWAY, STE. 450
SEAL BEACH, CA 90740-2750

SITE PLAN
SOIL SAMPLING LOCATION
RUNKLE RANCH

PROJECT MANAGER: J. KIM	PROJECT DESIGNER:	
DRAWN BY: R. CURTIS	APPROVED BY: J. KIM	SCALE 1"=1000'
PROJECT No. 8698112 0003	DATE 2-4-99	FIGURE 2



SITE PLAN

3D FILE: ACAD\FILES\KBM\RUNKLE RANCH\SITE.dwg

ATTACHMENT A

LABORATORY REPORTS AND QA/QC DATA OF COLLECTED SAMPLES

Quanterra

CERTIFICATE OF ANALYSIS

QST Environmental
425 N. 44th Street, Suite 110
Phoenix, AZ 85008

January 28, 1999

Attention: Mr. John Kim

Quanterra, St. Louis Project Number	: 833.01
Date Received	: December 24, 1998
Number of Samples	: Four (4)
Sample type	: Solid

INTRODUCTION

Four solid samples in SDG 20233 were received at Quanterra, St. Louis for radiological analyses.

The samples were labeled as follows:

CLIENT ID	LAB ID	MATRIX
S1-0	20233-001	Solid
S1-1	20233-002	Solid
S2-0	20233-003	Solid
S3-0	20233-004	Solid

Reviewed and Approved

Martha Cahill
Quanterra Project Manager

ANALYTICAL RESULTS/METHODOLOGY

The analytical results are presented in the enclosed Certificate of Analysis. This report includes information on client identification number, lab identification number, preparation date, analysis date, results, units, and results for quality control samples.

The following table is a list of the analyses requested and the methods used for the above samples:

Analysis	Method
Strontium	SM-7500 Sr
Cesium-137	HASL 300
Tritium, Azeotropic	EERF H-01

QUALITY CONTROL

A method blank and laboratory control sample were analyzed with the above samples for all the parameters.

NONCONFORMANCES

The Tritium analysis was not performed according to the method. Soils analyzed for Tritium are not to be dried prior to analysis because Tritium is azeotropic. The samples in this SDG were dried prior to analysis. The amount of Tritium in the samples only represents what was organically bound to the soil. It does not take into account any Tritium that may have been in the moisture of the soil.

COMMENTS

There were no problems associated with the Cesium or Strontium analyses.

Receipt

No variances were noted during sample receipt.

QUALIFIERS/DEFINITIONS

NA	= Not applicable
ND	= Non - detect
MG/L	= Milligrams per liter
UG/L	= Micrograms per liter
%REC	= Percent Recovery
QCBLK	= Method Blank
QCLCS	= Laboratory Control Sample
CRDL	= Customer Required Detection Limit
RPD	= Relative Percent Difference
IDL	= Instrument detection limit
DL	= PQL
J	= Estimated Value (Organics only)
D	= Diluted
U	= Non - Detect
B	= Value greater than IDL but less than CRDL (Metals only)

949-387-0900 Heriberto Robles Ph.D.

Quanterra
28 January 1999

QST
3010 OLD RANCH PARKWAY
SUITE 450
Seal Beach, CA 90740

Project: QST Environmental

Category: Total Strontium
Method: STD METHOD

Client ID	Laboratory ID	Matrix	Date Sampled	Date Received	Prep Date	Date Analyzed	Parameter	Result	Sigma Error (+/-)	MDA	Units
S1-0	20233-001	Soil	12/23/98	12/24/98	01/27/99	01/27/98	Strontium	0.86	0.23	0.22	PCI/G
S1-1	20233-002	Soil	12/23/98	12/24/98	01/27/99	01/27/99	Strontium	0.25	0.14	0.22	PCI/G
S2-0	20233-003	Soil	12/23/98	12/24/98	01/27/99	01/27/97	Strontium	0.83	0.21	0.19	PCI/G
S3-0	20233-004	Soil	12/23/98	12/24/98	01/27/99	01/27/99	Strontium	0.41	0.16	0.21	PCI/G
NA	QCBLK189899-1	Soil	NA	NA	01/27/99	01/27/99	Strontium	0.11	0.14	0.22	PCI/G
NA	QCLCS189899-1	Soil	NA	NA	01/27/99	01/27/99	Strontium	93	---	---	%REC

Quanterra
28 January 1999

OST
3030 OLD RANCH PARKWAY
SUITE 450
Seal Beach, CA 90740

Project: OST Environmental

Category: Gamma Spec.
Method: HASL 300

Client ID	Lab Sample ID	Matrix	Date Sampled	Date Received	Prep Date	Date Analyzed	Parameter	Result	Sigma Error (+/-)	MDA	Units
S1-0	20233-001	Soil	12/23/98	12/24/98	01/21/99	01/21/99	Cesium-137	0.11	0.097	0.22	PCI/G
							Potassium-40	24.7	5.7	3.1	PCI/G
							Lead-212	1.2	0.23	0.26	PCI/G
							Lead-214	0.61	0.24	0.29	PCI/G
S1-1	20233-002	Soil	12/23/98	12/24/98	01/21/99	01/21/99	Cesium-137	0.036	0.083	0.17	PCI/G
							Potassium-40	25.6	4.8	1.6	PCI/G
							Lead-212	0.88	0.21	0.30	PCI/G
							Lead-214	0.66	0.20	0.29	PCI/G
S2-0	20233-003	Soil	12/23/98	12/24/98	01/21/99	01/21/99	Cesium-137	-0.002	0.08	0.16	PCI/G
							Potassium-40	19.9	4.8	1.7	PCI/G
							Lead-212	0.78	0.18	0.26	PCI/G
							Lead-214	0.46	0.20	0.25	PCI/G
S3-0	20233-004	Soil	12/23/98	12/24/98	01/21/99	01/21/99	Cesium-137	0.011	0.13	0.25	PCI/G
							Potassium-40	20.2	4.6	3.1	PCI/G
							Lead-212	1.5	0.27	3.7	PCI/G
							Lead-214	1.0	0.29	0.35	PCI/G
NA	QCBLK189894-1	Soil	NA	NA	01/21/99	01/21/99	Cesium-137	-0.031	0.075	0.14	PCI/G
NA	QCLCS189894-1	Soil	NA	NA	01/21/99	01/22/99	Americium-241	95	---	---	%REC
							Cesium-137	99	---	---	%REC
							Cobalt-60	96	---	---	%REC

Mar 08 05 11:03a Heriberto Robles Ph.D. 949-387-0900 p.11

Quanterra
28 January 1999

QST
3030 OLD RANCH PARKWAY
SUITE 450
Seal Beach, CA 90740

Project: QST Environmental

Category: Tritium
Method: EERF H.01

Client ID	Laboratory ID	Matrix	Date Sampled	Date Received	Prep Date	Date Analyzed	Parameter	Result	Sigma Error (+/-)	MDA	Units
S1-0	20233-001	Soil	12/23/98	12/24/98	01/25/99	01/25/99	Tritium	0.40	0.078	0.094	PCI/G
S1-1	20233-002	Soil	12/23/98	12/24/98	01/25/99	01/25/99	Tritium	-0.001	0.054	0.093	PCI/G
S2-0	20233-003	Soil	12/23/98	12/24/98	01/25/99	01/25/99	Tritium	0.056	0.055	0.091	PCI/G
S3-0	20233-004	Soil	12/23/98	12/24/98	01/25/99	01/25/99	Tritium	0.008	0.052	0.090	PCI/G
NA	QCBLK190425-1	Solid	NA	NA	01/25/99	01/25/99	Tritium	0.003	0.012	0.020	PCI/G
NA	QCLCS190425-1	Solid	NA	NA	01/25/99	01/25/99	Tritium	91	---	---	%REC

Quanterra December 31, 1998 03:06 pm
Account: 11396 Project: 033.01 QST Environmental QAS No. 033.01 Rev. 0
Master Sample Login: 20233

Project Manager: A. Field

Reviewed by and Date: Ray Scroll for Martha Cahill

Sample Header Template: DH Final

Data:

Sample No.	Client ID	C-Matrix	Date: Collected	Received	Due	Shipper	Rad Category	Rad Sample No.
20233-001	S1-0	Soil	23-DEC-98 10:25	24-DEC-98 10:30	21-JAN-99	FEDEX	3*	R8047-004
20233-002	S1-1	Soil	23-DEC-98 10:40	24-DEC-98 10:30	21-JAN-99	FEDEX	3*	R8047-003
20233-003	S2-0	Soil	23-DEC-98 11:10	24-DEC-98 10:30	21-JAN-99	FEDEX	3*	R8047-002
20233-004	S3-0	Soil	23-DEC-98 11:30	24-DEC-98 10:30	21-JAN-99	FEDEX	3*	R8047-001

Sample No.	#	Container Type	Analysis	Class	Preservative	Anal. Due Date	Hold Date	Site	(Container Numbers:% Filled)
20233-001	2	GW - Glass Jar-8oz	RAD/3HH.01/Q4	S	NONE	18-JAN-99	22-JUN-99	S3C	(415667:100 415668:99)
	2		RAD/GAMMA/Q4	S	NONE	18-JAN-99	23-JUN-99	S3C	(415667:100 415668:99)
	1		RAD/SCREEN/Q4	S	NONE	18-JAN-99	22-JUN-99	S3C	(415667:100)
	2		RAD/SRTOTAL/Q4	S	NONE	18-JAN-99	23-JUN-99	S3C	(415667:100 415668:99)
20233-002	2	GW - Glass Jar-8oz	RAD/3HH.01/Q4	S	NONE	18-JAN-99	22-JUN-99	S3C	(415678:100 415679:99)
	2		RAD/GAMMA/Q4	S	NONE	18-JAN-99	23-JUN-99	S3C	(415678:100 415679:99)
	1		RAD/SCREEN/Q4	S	NONE	18-JAN-99	22-JUN-99	S3C	(415678:100)
	2		RAD/SRTOTAL/Q4	S	NONE	18-JAN-99	23-JUN-99	S3C	(415678:100 415679:99)
20233-003	2	GW - Glass Jar-8oz	RAD/3HH.01/Q4	S	NONE	18-JAN-99	22-JUN-99	S3C	(415681:100 415682:99)
	2		RAD/GAMMA/Q4	S	NONE	18-JAN-99	23-JUN-99	S3C	(415681:100 415682:99)
	1		RAD/SCREEN/Q4	S	NONE	18-JAN-99	22-JUN-99	S3C	(415681:100)
	2		RAD/SRTOTAL/Q4	S	NONE	18-JAN-99	23-JUN-99	S3C	(415681:100 415682:99)
20233-004	2	GW - Glass Jar-8oz	RAD/3HH.01/Q4	S	NONE	18-JAN-99	22-JUN-99	S3C	(415683:100 415684:99)
	2		RAD/GAMMA/Q4	S	NONE	18-JAN-99	23-JUN-99	S3C	(415683:100 415684:99)
	1		RAD/SCREEN/Q4	S	NONE	18-JAN-99	22-JUN-99	S3C	(415683:100)
	2		RAD/SRTOTAL/Q4	S	NONE	18-JAN-99	23-JUN-99	S3C	(415683:100 415684:99)

3*=Sample has not been rad screened.

P.13
949-387-0900
Heriberto Robles Ph.D.
Mar 08 05 11:03a

Chain of Custody Record

temp NOICE CUL # 017457

Quanterra

Client	Project Manager	Date	Chain Of Custody Number
QST ENVIRONMENTAL	JOHN KIM	12/23/98	45509
Address	**Telephone Number (Area Code)/Fax Number**	**Lab Number**	**Page** 1 of 1
426 N. 44TH ST. SUITE 110	(602)244-1192 / (602)244-9280		
City PHOENIX	**State** AZ	**Zip Code** 85008	**Site Contact**
Project Name RUALKLE RANCH			**Carrier/Waybill Number**
Contract/Purchase Order/Quote No.			

Sample I.D. No. and Description	Date	Time	Sample Type	Total Volume	Containers Type	Containers No.	Preservative	Condition on Receipt	Analysis: Strontium-90	Analysis: Cesium-137	Analysis: Tritium (Azeo)
S1-0	12/23/98	10:25	Soil	~~2 liter~~ 16oz	8-oz	2		100% X 2	X	X	X
S1-1	12/23/98	10:40	"	16oz	"	2			X	X	X
S2-0	12/23/98	11:10	"	16oz	"	2			X	X	X
S3-0	12/23/98	11:30	"	16oz	"	2			X	X	X

Special Instructions

Possible Hazard Identification: ☐ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☒ Unknown

Sample Disposal: ☐ Return To Client ☒ Disposal By Lab ☒ Archive For 2 Months

Turn Around Time Required: ☒ Normal ☐ Rush

QC Level: ☐ I. ☐ II. ☐ III.

Project Specific (Specify)

Relinquished By	Date	Time	1. Received By	Date	Time
QST	12/23/98	2:00 PM.	Mario Robles	12/23/98	2:00
Relinquished By: Mario Robles	12/23/98	8:00	2. Received By: Joe Flemin	12-24-98	1030
Relinquished By	Date	Time	3. Received By	Date	Time

Comments: 3-WEEK TURNAROUND TIME.

DISTRIBUTION: WHITE - Stays with Sample; CANARY - Returned to Client with Report; PINK - Field Copy

Quanterra
Environmental Services

017457

Login No.: 20233

Condition Upon Receipt Variance Report
St. Louis Laboratory

Client: EST

Project No: 833 01

Shipper/No: UPS / Fedex / 808768313658

Date: 12-24-98 Time: 1030

Initiated by: Joe Tiemann

RFA/COC Numbers: 45509

Condition/Variance (Check all that apply):

1. ☐ Sample received broken/leaking.
2. ☐ Sample received without proper preservative.
   - ☐ Cooler temperature not within 4°C ± 2°C
     Record temperature: _____
   - ☐ pH _____
   - ☐ other: _____
3. ☐ Sample received in improper container.
4. ☐ Sample received without proper paperwork. Explain: _____
5. ☐ Paperwork received without sample.
6. ☐ No sample ID on sample container.
7. ☐ Custody tape disturbed/broken/missing.
8. ☐ Sample ID on container does not match sample ID on paperwork. Explain: _____
9. ☐ All coolers on airbill not received with shipment.
10. ☐ Other (explain below): _____

☒ No variances were noted during sample receipt. Cooler Temperature Upon Receipt: NO ICE

Notes: _____

Corrective Action:

☐ Client's Name: _____ Informed verbally on: _____ By: _____

☐ Client's Name: _____ Informed in writing on: _____ By: _____

☐ Sample(s) processed "as is". _____

☐ Sample(s) on hold until: _____ If released, notify: _____

Sample Control Supervisor Review: (or designate) Joe Tiemann Date: 12-24-98

Project Management Review: Ron Scott for Martha Cahill Date: 12/31/98

SIGNED ORIGINAL MUST BE RETAINED IN THE PROJECT FILE

SL-ADMIN-0004, Revised 11/24/95

Mar 08 05 11:03a Heriberto Robles Ph.D. 949-387-0900 p.14

Columbia Analytical Services INC.
An Employee-Owned Company

January 5, 1999

John Kim
QST Environmental
426 N. 44th Street
Suite 100
Phoenix, AZ 85008

Re: Runkle Ranch/Project #6698112

Dear John :

Enclosed are the results of the sample submitted to our laboratory on December 23, 1998. For your reference, these analyses have been assigned our service request number L9804461.

All analyses were performed in accordance with our laboratory's quality assurance program. Results are intended to be considered in their entirety and apply only to the sample analyzed. Columbia Analytical Services is not responsible for use of less than the complete report.

Columbia Analytical Services is certified for environmental analyses by the Arizona Department of Environmental Quality (certificate number: 0136).

Please call if you have any questions.

Respectfully submitted,

Columbia Analytical Services, Inc.

Roy Martinez
Project Chemist

RM/kh

Mar 08 05 11:04a Heriberto Robles Ph.D. 949-387-0900 p.15

Columbia Analytical Services, Inc.

Acronyms

8015M	California DHS LUFT Method
A2LA	American Association for Laboratory Accreditation
ASTM	American Society for Testing and Materials
BOD	Biochemical Oxygen Demand
BTEX	Benzene/Toluene/Ethylbenzene/Xylenes
CAM	California Assessment Metals
CARB	California Air Resources Board
CAS Number	Chemical Abstract Service Registry Number
CFC	Chlorofluorocarbon
CFU	Colony-Forming Unit
COD	Chemical Oxygen Demand
CRDL	Contract Required Detection Limit
DEC	Department of Environmental Conservation
DEQ	Department of Environmental Quality
DLCS	Duplicate Laboratory Control Sample
DMS	Duplicate Matrix Spike
DOE	Department of Ecology
DOH or DHS	Department of Health Services
ELAP	Environmental Laboratory Accreditation Program
EPA	U.S. Environmental Protection Agency
GC	Gas Chromatography
GC/MS	Gas Chromatography/Mass Spectrometry
IC	Ion Chromatography
ICB	Initial Calibration Blank sample
ICP	Inductively Coupled Plasma atomic emission spectrometry
ICV	Initial Calibration Verification sample
J	Estimated concentration. The value is less than the MRL, but greater than or equal to the MDL. If the value is equal to the MRL, the result is actually <MRL before rounding.
LCS	Laboratory Control Sample
LUFT	Leaking Underground Fuel Tank
M	Modified
MBAS	Methylene Blue Active Substances
MCL	Maximum Contaminant Level. The highest permissible concentration of a substance allowed in drinking water as established by the U.S. EPA.
MDL	Method Detection Limit
MPN	Most Probable Number
MRL	Method Reporting Limit
MS	Matrix Spike
MTBE	Methyl-*tert*-Butyl Ether
NA	Not Applicable
NAN	Not Analyzed
NC	Not Calculated
NCASI	National Council of the paper industry for Air and Stream Improvement
ND	None Detected at or above the Method Reporting/Detection Limit (MRL/MDL)
NIOSH	National Institute for Occupational Safety and Health
NTU	Nephelometric Turbidity Units
ppb	Parts Per Billion
ppm	Parts Per Million
PQL	Practical Quantitation Limit
QA/QC	Quality Assurance/Quality Control
RCRA	Resource Conservation and Recovery Act
RPD	Relative Percent Difference
SIM	Selected Ion Monitoring
SM	*Standard Methods for the Examination of Water and Wastewater*, 18th Ed., 1992.
STLC	Solubility Threshold Limit Concentration
SW	*Test Methods for Evaluating Solid Waste, Physical/Chemical Methods*, SW-846, Third Edition, 1986 and as amended by Updates I, II, IIA, and IIB.
TCLP	Toxicity Characteristics Leaching Procedure
TDS	Total Dissolved Solids
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. If the value is equal to the PQL, the result is actually <PQL before rounding.
TRPH	Total Recoverable Petroleum Hydrocarbons
TSS	Total Suspended Solids
TTLC	Total Threshold Limit Concentration
VOA	Volatile Organic Analyte(s)

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: QST Environmental
Project: Runkle Ranch/6698112
Sample Matrix: Soil

Service Request: L9804461
Date Collected: NA
Date Received: NA

Metals

Sample Name: Method Blank
Lab Code: L981229-MB1
Test Notes:

Units: mg/Kg (ppm)
Basis: Wet

Analyte	Prep Method	Analysis Method	MRL	Dilution Factor	Date Digested	Date Analyzed	Result	Result Notes
Aluminum, Total	EPA 3050B	6010B	10	1	12/29/98	12/30/98	ND	
Antimony, Total	EPA 3050B	6010B	10	1	12/29/98	12/30/98	ND	
Arsenic, Total	EPA 3050B	7060A	5	1	12/28/98	12/28/98	ND	
Beryllium, Total	EPA 3050B	6010B	0.5	1	12/29/98	12/30/98	ND	
Cadmium, Total	EPA 3050B	6010B	1	1	12/29/98	12/30/98	ND	
Calcium, Total	EPA 3050B	6010B	10	1	12/29/98	12/30/98	ND	
Chromium, Total	EPA 3050B	6010B	2	1	12/29/98	12/30/98	ND	
Cobalt, Total	EPA 3050B	6010B	2	1	12/29/98	12/30/98	ND	
Copper, Total	EPA 3050B	6010B	2	1	12/29/98	12/30/98	ND	
Iron, Total	EPA 3050B	6010B	5	1	12/29/98	12/30/98	ND	
Lead, Total	EPA 3050B	6010B	5	1	12/29/98	12/30/98	ND	
Magnesium, Total	EPA 3050B	6010B	10	1	12/29/98	12/30/98	ND	
Manganese, Total	EPA 3050B	6010B	1	1	12/29/98	12/30/98	ND	
Mercury, Total	METHOD	7471A	0.1	1	12/24/98	12/24/98	ND	
Molybdenum, Total	EPA 3050B	6010B	10	1	12/29/98	12/30/98	ND	
Nickel, Total	EPA 3050B	6010B	5	1	12/29/98	12/30/98	ND	
Potassium, Total	EPA 3050B	7610	5	1	12/29/98	1/3/99	ND	
Selenium, Total	EPA 3050B	7740	5	1	12/28/98	12/28/98	ND	
Silver, Total	EPA 3050B	6010B	1	1	12/29/98	12/30/98	ND	
Sodium, Total	EPA 3050B	6010B	50	1	12/29/98	12/30/98	ND	
Thallium, Total	EPA 3050B	6010B	20	1	12/29/98	12/30/98	ND	
Vanadium, Total	EPA 3050B	6010B	2	1	12/29/98	12/30/98	ND	
Zinc, Total	EPA 3050B	6010B	1	1	12/29/98	12/30/98	ND	

Approved By: _____ Date: 1/4/99

Mar 08 05 11:04a Heriberto Robles Ph.D. 949-387-0900 p.17

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client:	QST Environmental	**Service Request:**	L9804461
Project:	Runkle Ranch/6698112	**Date Collected:**	NA
Sample Matrix:	Soil	**Date Received:**	NA

Inorganic Parameters

Sample Name: Method Blank
Lab Code: L981222-MB
Test Notes:

Basis: NA

Analyte	Units	Analysis Method	MRL	Dilution Factor	Date Extracted	Date Analyzed	Result	Result Notes
Cyanide, Total	mg/Kg (ppm)	9010B/9014	0.5	1	NA	12/22-23/98	ND	
Orthophosphate as Phosphate	mg/Kg (ppm)	300.0	10	1	12/24/98	12/24/98	ND	

Approved By: _____ Date: 1/4/99

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Mar 08 05 11:05a Heriberto Robles Ph.D. 949-387-0900 p.18

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: QST Environmental
Project: Runkle Ranch/6698112
Sample Matrix: Soil

Service Request: L9804461
Date Collected: 12/23/98
Date Received: 12/23/98

Metals

Sample Name: POWDER
Lab Code: L9804461-001
Test Notes:

Units: mg/Kg (ppm)
Basis: Wet

Analyte	Prep Method	Analysis Method	MRL	Dilution Factor	Date Digested	Date Analyzed	Result	Result Notes
Aluminum, Total	EPA 3050B	6010B	10	1	12/29/98	12/30/98	6300	
Antimony, Total	EPA 3050B	6010B	10	1	12/29/98	12/30/98	ND	
Arsenic, Total	EPA 3050B	7060A	5	1	12/28/98	12/28/98	ND	
Beryllium, Total	EPA 3050B	6010B	0.5	1	12/29/98	12/30/98	ND	
Cadmium, Total	EPA 3050B	6010B	1	1	12/29/98	12/30/98	ND	
Calcium, Total	EPA 3050B	6010B	10	1	12/29/98	12/30/98	3900	
Chromium, Total	EPA 3050B	6010B	2	1	12/29/98	12/30/98	8	
Cobalt, Total	EPA 3050B	6010B	2	1	12/29/98	12/30/98	8	
Copper, Total	EPA 3050B	6010B	2	1	12/29/98	12/30/98	12	
Iron, Total	EPA 3050B	6010B	5	1	12/29/98	12/30/98	16000	
Lead, Total	EPA 3050B	6010B	5	1	12/29/98	12/30/98	6	
Magnesium, Total	EPA 3050B	6010B	10	1	12/29/98	12/30/98	6600	
Manganese, Total	EPA 3050B	6010B	1	1	12/29/98	12/30/98	230	
Mercury, Total	METHOD	7471A	0.1	1	12/24/98	12/24/98	ND	
Molybdenum, Total	EPA 3050B	6010B	10	1	12/29/98	12/30/98	ND	
Nickel, Total	EPA 3050B	6010B	5	1	12/29/98	12/30/98	9	
Potassium, Total	EPA 3050B	7610	5	20	12/29/98	1/3/99	1800	
Selenium, Total	EPA 3050B	7740	5	1	12/28/98	12/28/98	ND	
Silver, Total	EPA 3050B	6010B	1	1	12/29/98	12/30/98	ND	
Sodium, Total	EPA 3050B	6010B	50	1	12/29/98	12/30/98	340	
Thallium, Total	EPA 3050B	6010B	20	1	12/29/98	12/30/98	ND	
Vanadium, Total	EPA 3050B	6010B	2	1	12/29/98	12/30/98	27	
Zinc, Total	EPA 3050B	6010B	1	1	12/29/98	12/30/98	30	

Approved By: _____ Date: 1/4/99

IS-4/021397p

Mar 08 05 11:05a Heriberto Robles Ph.D. 949-387-0900 p.19

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client:	QST Environmental	**Service Request:**	L9804461
Project:	Runkle Ranch/6698112	**Date Collected:**	12/23/98
Sample Matrix:	Soil	**Date Received:**	12/23/98

Inorganic Parameters

Sample Name:	POWDER
Lab Code:	L9804461-001
Test Notes:	

Basis: Wet

Analyte	Units	Analysis Method	MRL	Dilution Factor	Date Extracted	Date Analyzed	Result	Result Notes
Cyanide, Total	mg/Kg (ppm)	9010B/9014	0.5	1	NA	12/23/98	ND	
Orthophosphate as Phosphate	mg/Kg (ppm)	300.0	10	5	12/24/98	12/24/98	<50	I1, C2A
pH	pH UNITS	9045C	--	1	12/23/98	12/23/98	4.0	

I1 Sample preparation: 1:10 (weight:volume) deionized water extraction.

C2A MRL is elevated because of matrix interferences and because the sample required diluting.

Approved By: _____ Date: 1/4/99

154/021397p

Mar 08 05 11:05a Heriberto Robles Ph.D. 949-387-0900 p.20

Mar 08 05 11:05a Heriberto Robles Ph.D. 949-387-0900 p.21

Columbia Analytical Services INC.

CHAIN OF CUSTODY/LABORATORY ANALYSIS REQUEST FORM

6925 Canoga Avenue • Canoga Park, CA 91303 • (818) 587-5550 • Fax (818) 587-5555

DATE 12/23/98 PAGE 1 OF 1

PROJECT NAME RUNKLE RANCH # 6698112

PROJECT MANAGER JOHN KIM

COMPANY/ADDRESS QST ENVIRONMENTAL

426 N. 44TH ST. SUITE 110

PHOENIX, AZ 85008 PHONE (602) 244-1192

SAMPLERS SIGNATURE

L9804461

ANALYSIS REQUESTED

SAMPLE I.D.	DATE	TIME	LAB I.D.	SAMPLE MATRIX	NUMBER OF CONTAINERS	TPH Gas/BTEX 8015/8020/602	TPH/8015 Modified Diesel ☐ FC ☐ Gasoline ☐	BTEX 602/8020	Total Petroleum Hydrocarbons EPA 418.1	Halogenated Volatiles 601/8010	Volatile Organics GC/MS 624/8240/8260	Base Neutral Acid Organic GC/MS 625/8270	CAM Metals 6010/7000	SEE ATTACHED LIST	REMARKS
POWDER	12/23/98	11:50	1	SOIL	3									X	

RELINQUISHED BY:

Signature

JOHN KIM

Printed Name

QST

Firm

12/23/98 12:40

Date/Time

RECEIVED BY:

Sharon Malone

Signature

Sharon Malone

Printed Name

CAS

Firm

12/23/98 12:40

Date/Time

TURNAROUND REQUIREMENTS

___ 24 hr ___ 48 hr. ___ 5 day

X Standard

___ Other (Specify)

___ Provide Verbal Preliminary Results

Requested Report Date _____

REPORT REQUIREMENTS

X I. Routine Report

___ II. Report (includes DUP.MS. MSD, as required, may be charged as samples)

___ III. Data Validation Report (includes All Raw Data)

___ RWQCB

INVOICE INFORMATION:

P.O.# _____

Bill To _____

SAMPLE RECEIPT:

Shipping VIA: _____

Shipping #: _____

Condition: _____

Lab No: _____

RELINQUISHED BY:

Signature

Printed Name

Firm

Date/Time

RECEIVED BY:

Signature

Printed Name

Firm

Date/Time

SPECIAL INSTRUCTIONS/COMMENTS: