Quality Assurance Project Plan
Ephrata Landfill Drum Area Exploration
Ephrata, Washington

Prepared for

Grant County Department of Public Works

and

City of Ephrata

Prepared by

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ACRONYMS

CW	Containerized Waste
FW	Free Flowing Waste
Ecology	Washington State Department of Ecology
EPA	Environmental Protection Agency
ERRG	Engineering/Remediation Resources Group
HAZWOPER	Hazardous Waste Operation
ID	inside diameter
IRAP	Interim Remedial Action Plan Ephrata Landfill Corrective Action
PCBs	Polychlorinated Biphenyls
PDF	portable document format
PQL	Practical Quantitation Limit
QA	Quality Assurance
QAPP	Quality Assurance Project Plan
QC	Quality Control
RCRA	Resource Conservation Recovery Act
STL	Severn Trent Laboratory
SVOCs	Semi-volatile Organic Compounds
TCLP	Toxicity Characteristics Leaching Procedure
VOA	Volatile Organic Analysis
VOC	Volatile Organic Compound

1. INTRODUCTION

This Quality Assurance Project Plan (QAPP) supports surveying and sampling of buried drums located at the Ephrata Landfill in Ephrata, Washington (Figure 1-1). These activities comprise one of several interim actions described in the Interim Remedial Action Plan Ephrata Landfill Corrective Action (IRAP) (Parametrix 2006), which is Exhibit C of Agreed Order No. DE 3810 between Washington State Department of Ecology (Ecology) and Grant County and the City of Ephrata (Ecology 2006) (Agreed Order). Grant County has requested Parametrix and Engineering/Remediation Resources Group (ERRG) to survey and sample drums to obtain data needed to complete drum removal project planning and refine drum removal specifications. Drum removal will be accomplished as a separate interim action.

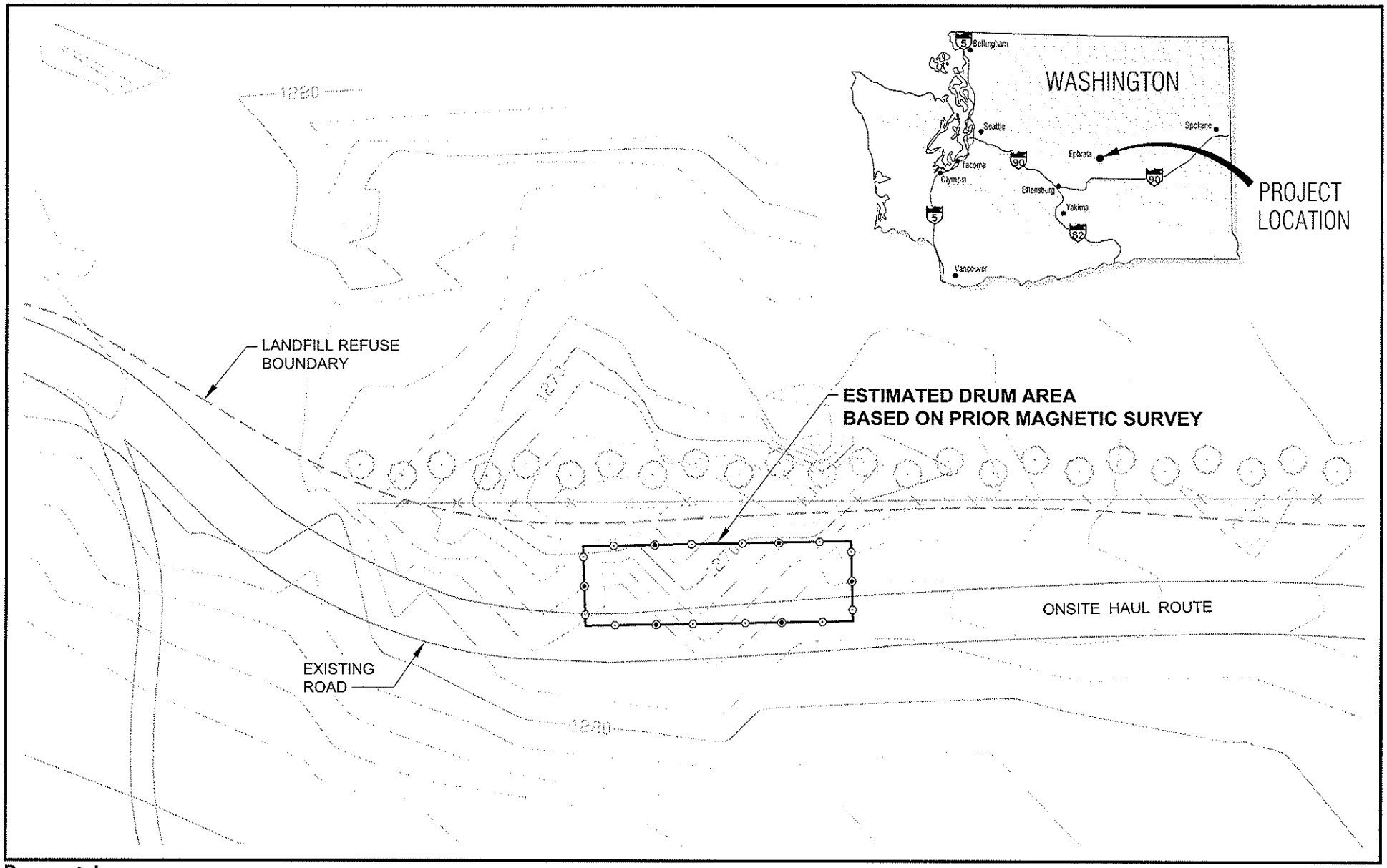
Parametrix and ERRG prepared this QAPP consistent with Ecology and U.S. Environmental Protection Agency (EPA) requirements found in the following documents:

- Ecology Model Toxics Control Act (Ecology 2001).
- EPA QA/R-5, EPA Requirements for Quality Assurance Project Plans, Final, March 2001.
- EPA QA/G-5, EPA Guidance for Quality Assurance Project Plans, December 2002.

This QAPP reflects a level of detail and completeness appropriate for waste sampling and analysis consistent with the graded approach described in the above EPA documents.

1.1 PROJECT BACKGROUND

Grant County, with concurrence from Ecology and the City of Ephrata, solicited bids in August 2006 for buried drum removal. The parties anticipated, at that time, that the Agreed Order would be finalized and the public comment period closed prior to the start of drum removal site activities. For various reasons, all bids were rejected and drum removal did not proceed. Bidders had submitted an unusually large number of questions during drum removal advertisement. Bidder questions focused on uncertainties about the drum contents and attendant worker health and safety issues, analytical costs, and disposal requirements. Surveying and sampling drums will provide data needed to complete drum removal planning and refine drum removal specifications to more clearly allocate drum removal project risks and responsibilities.



Parametrix DATE: Jan 15, 2007 FILE: BR1860011P03T05-F-01

N

0 60'

SCALE IN FEET

LEGEND

- ◉ DRUM SAMPLE AND SURVEY LOCATION
- ⊙ DRUM SURVEY LOCATION

Figure 1-1
Ephrata Landfill Drum Removal
Drum Exploration and
Sampling Locations

2. PROJECT ORGANIZATION AND MANAGEMENT

This section describes project organization and management including a project description, background of the site, project roles and responsibilities, documentation, and reporting requirements.

2.1 PROJECT ORGANIZATION

Drum area exploration project roles are summarized in Table 2-1.

Table 2-1. Project Roles and Responsibilities

Person	Function	Organization	Phone	Key Project Role
Cole Carter	Site Manager, Project Coordinator	Ecology	(509) 329-3609	Regulatory oversight and approvals
Derek Pohle	Project Coordinator	Grant County	(509) 754-6082	Owner's representative, point of contact for approvals
Wes Crago	Project Coordinator	City of Ephrata	(509) 754-4601	Point of contact for approvals
Brian Pippin	Project Manager	Parametrix	(425) 458-6370	Technical and administrative lead
Jeremy Krohn	Field Lead	Parametrix	(425) 458-6283	Field coordination, ambient air monitoring, project documentation
Sheila McConnell	Certified Industrial Hygienist	Parametrix	(425) 452-8655 (425) 681-7516	Off-site health and safety support for Parametrix & ERRG
John Hicks	Subconsultant Project Manager	ERRG	(206) 423-7784	Subconsultant technical and administrative lead
Tracy Smith	Field Lead	ERRG	(253) 606-5489	Field coordination, sample collection and handling, project documentation
Kathy Kreps	Analytical Laboratory	Severn-Trent Laboratory (STL)	(253) 922-2310	Laboratory analyses and reporting

2.2 PROBLEM DEFINITION/BACKGROUND

The purpose of the drum area exploration interim action is to survey and sample drums to obtain data needed to complete drum removal planning and refine drum removal specifications. This action is not anticipated to substantively affect the decision to remove the drums.

Documentation of the drum placement is limited. The drums are thought to have been placed in the mid 1970's, stacked in three layers on top of bedrock (basalt). The exact number, contents, and condition of the drums are unknown (Ecology 1987). The approximate location of drums has been identified through geophysical exploration (Pacific Groundwater Group 2004). There have been no other investigations or sampling of the drums.

2.3 TASK DESCRIPTION

Excavate test pits or trenches (18 planned) to corroborate geophysical exploration findings, by surveying drum coordinates and depths, and analyze drum content samples (6 planned). Surveying, sampling, and analysis will be conducted as described in Section 3.0.

2.4 SPECIAL TRAINING AND CERTIFICATION

All personnel conducting sampling activities on the project site must be 40-hour Hazardous Waste Operation (HAZWOPER) trained per 29CFR 1910.120 and be current with their annual 8-hour refresher course.

Staff sampling the drums will have appropriate training and equipment for Level B consistent with the health and safety plan entitled Health and Safety Plan for Ephrata Landfill Drum Exploration Investigation (ERRG/Parametrix 2007).

2.5 SAMPLING DOCUMENTATION AND RECORDS

Sample handling will be documented through the use of daily field logs, photographs, and other documents as appropriate.

2.5.1 Field Logs and Forms

A bound field notebook will be maintained to provide daily records of field activities and observations. Entries will be made in waterproof ink, signed, and dated. Notebook pages will not be removed or destroyed. Corrections will be made by drawing a single line through the original entry (so that the original entry can still be read) and writing the corrected entry alongside. Corrections will be initialed and dated. Explanatory footnotes will be included as appropriate. To the extent feasible errors will be corrected or corrections initialed by the person who made the original entry. Upon completion of the exploration, field logs and forms will be retained in the project files.

2.5.2 Photographs

Photographs will be noted and cross-referenced in the field notebook. Digital photographs will be reviewed in the field to assess quality and need to re-shoot the photograph. Non-digital photographs will be reviewed once developed. Photographs will be matched and reconciled with notebook entries.

2.6 REPORTING

Following completion of sampling and analysis, Parametrix will prepare a short technical report including the following:

- Summary of field activities completed
- Figures showing sampling locations
- Survey data
- Summary of laboratory analytical results and comparison to relevant regulatory criteria
- Boring/test pit logs and sampling forms
- Laboratory data sheets and the results of data review

A draft report will be submitted to Ecology electronically in portable document format (PDF) and in Microsoft Word format. Two hard copies, electronic and compact disc instances of the final report reflecting response to Ecology comments will be submitted.

3. DATA GENERATION AND ACQUISITION

This section discusses the specific rationale used to develop sampling and analysis strategies.

3.1 SAMPLING PROCESS DESIGN

The subsurface investigation will include a drum area perimeter evaluation and waste characterization from selected locations in the drum area.

The objective of the drum area perimeter evaluation is to obtain the coordinates and depths of several perimeter drums. The data will be used to complete drum removal plans and specifications. Material above the drums (overburden) is expected to be municipal solid waste and crushed rock/gravel. It is unlikely that any leakage from drums would have contaminated overburden; therefore, overburden will not be sampled. Since the overburden is not considered to be contaminated it will be disposed of as refuse in the active landfill. The excavations will be backfilled with onsite borrow.

The objective of the drum sampling is to obtain waste characterization data to facilitate disposal options. Samples of drum contents will be collected, and the chemical nature of the collected material will be evaluated using the laboratory methods described in Section 3.4 of this QAPP. Proposed sampling includes:

- Collecting 6 drum samples from the 18 test pits (see Figure 1-1). The pits will be completed to the top of the drums to obtain representative samples of the drum contents.
- Additional sampling based on field observations of drum stability.

Test pits for drum sampling will be located at the east and west boundaries of the geophysical anomaly and at appropriate distances between (see Figure 1-1). Specific test pit locations will be determined in the field and surveyed. A description of the proposed sampling methods is presented in Section 3.2.

3.2 SAMPLING METHODS AND PROCEDURES

This section presents the sampling methods and procedures to be used to collect data necessary to adequately characterize representative drum contents at the site. The contents of the drums are unknown but should fit within the categories of liquid (aqueous or organic), sludge or solid. For the purposes of this study, a sample is defined as an aliquot or representative grab from the entire depth of the drum.

3.2.1 Drum Content Sampling

Drums will be accessed using tools such as a bung wrench. In the case of corrosion or poor access to the open top or bung of the drum, a cold cut will be made with an oversized drill bit or saw blade. If solids are encountered during sampling, a larger hole will be cut to allow sub-sampling of the solid material. Drum cuts, where needed, will be made using non-sparking, intrinsically safe tools.

Representative samples will be collected from the drum contents at six locations using disposable drum samplers consisting of pre-cleaned, ½-inch inside diameter (ID), glass tubes. The drum sampling tube will be inserted into the drum, to the full depth. The top of the tube will be sealed and removed from the drum. Observations of the percentage of liquid and sludge, and other physical characteristics will be collected. The samples will then be placed

directly into labeled sampling containers provided by the analytical laboratory, as described in the following paragraphs.

After sampling, the drum entry point will be sealed with an expandable rubber stopper seal or similar, to prevent the contents from leaking, since the sampled drums will remain in place.

If the sample appears to be mostly liquid, a minimum of four 500 mL jars/sample (2 liters) and two 40mL Volatile Organic Analysis (VOA) vials (for Volatile Organic Compound (VOC) analysis) will be collected and submitted to the laboratory in sampling kits marked "aqueous samples." In the case that the material appears to be an oil or thick liquid, only two 500 mL jars/sample (1 liter) and two 40mL VOA vials of drum material will be collected (see Table 3-1).

If the drum contains mostly solids or heavy sludges, and the material is unable to be withdrawn using the glass tube, a pre-cleaned stainless steel spatula or corer will be used to remove a sample from the drum. Sufficient solid material to fill two wide-mouth 500 mL jars and two 2 oz. wide mouth glass jars for 8260 VOC analysis will be collected.

Multi-phase material (liquid and solid) may also be encountered in some of the drums. Drum contents of this nature will require a minimum of two liters of sample, plus two 40 mL VOA vials for volatile analysis.

Each test pit will be logged by the Field Leads or designees. Logs will include general material descriptions and photos as appropriate.

Drum coordinates and elevations will be ascertained using conventional land survey methods, with accuracy to the nearest 0.1 foot.

3.2.2 Sampling Containers, Preservation, and Holding Times

A summary of specifications for containers, preservation and holding times for drum samples are shown in Table 3-1.

Table 3-1. Sample Containers, Preparation, Preservatives and Holding Times for Drum Sampling

Sample Matrix	Analyses	Method	Sample Container	Preservation and Handling	Holding Times
Liquid and Multiphase	VOCs	EPA 8260B	(2) 40 ml VOA vials	Zero headspace, cool to 4°C	14 days
	Flashpoint	EPA 1020A	(4) 500 ml glass jars with PTFE lined lids[1]	Cool to 4°C	-
	Reactive Cyanide	EPA 9014			7 days
	Sulfide	EPA 9034			7 days
	pH	EPA 9045C			7 days
	PCBs	EPA 8082			7 days
	SVOCs	EPA 8270C			7 days
	RCRA Metals (8)	EPA 6010/7470A			6 months Hg 28 days
	Pesticides	EPA 8081A			7 days
	Herbicides	EPA 8151A			7 days

Table 3-1. Sample Containers, Preparation, Preservatives and Holding Times for Drum Sampling (continued)

Sample Matrix	Analyses	Method	Sample Container	Preservation and Handling	Holding Times
Sludge and Solids	VOCs	EPA 8260B	(2) 2 oz. Wide Mouth glass jars with PTFE lined lids	Zero headspace, cool to 4°C	14 days
	Flashpoint	EPA 1020A	(4) 500 ml glass jars with PTFE lined lids	Cool to 4°C	-
	Reactive Cyanide	EPA 9014			7 days
	Sulfide	EPA 9034			7 days
	pH	EPA 9045C			7 days
	PCBs	EPA 8082			7 days
	TCLP RCRA Metals (8)	EPA 1311/ 6010/7470A			7 days
	TCLP Pesticides	EPA 1311/ 8081A			7 days
	TCLP Herbicides	EPA 1311/ 8151A			7 days
	TCLP VOCs	EPA 1311/ 8260B			7 days
	TCLP SVOCs	EPA 1311/ 8270C			7 days

[1] Unless oil or thick liquid then (2) 500 ml glass jars

3.2.3 Decontamination Procedures

Decontamination of all non-disposable tools and equipment will be conducted between each sampling location. The following steps will be taken during decontamination of hand-held equipment and tools used during field investigations:

- Scrub with non-phosphate detergent (i.e., Alconox or similar).
- Rinse with tap water.
- Rinse thoroughly with deionized water.
- Allow to air dry and place in clean Ziploc bag or other clean container.

Larger tools and equipment, such as the excavator bucket, will be brushed off and washed if needed at the end of the project as described in the site health and safety plan (ERRG/Parametrix 2007). Between test pits, loose soil materials will be scraped or brushed off of equipment Further information regarding decontamination procedures can be found in the site health and safety plan.

3.2.4 Investigation-Derived Waste

Investigation-derived waste will be stored in drums labeled with the date, content, location, company, and a unique identification number. Disposable supplies and personal protective equipment (i.e., disposable coveralls, gloves, paper towels) cross-contaminated by drum contents will be placed inside polyethylene bags or other appropriate containers. Cross-contaminated supplies will be designated for disposal. Uncontaminated disposable supplies will be segregated for disposal as ordinary solid waste. Material excavated from the test pits will be placed in the active landfill cell onsite.

3.3 SAMPLE HANDLING AND CUSTODY

This section describes protocols for sample labeling, packaging and transportation, and sample chain-of-custody to be used for this project. These procedures ensure that the quality and integrity of the samples are maintained during their collection, transportation, storage, and analysis.

For ease in completing the chain-of-custody, a list of requested analyses will be included with the sample shipment and attached to the chain-of-custody.

3.3.1 Sample Identification and Labeling

Prior to the field investigation, each sample location will be assigned a unique code. Each sample collected at that location will be pre-assigned an identification code using the sampling site code followed by other specific information describing the sample. The sample numbering protocol is shown in Table 3-2.

Table 3-2. Sample Numbering Protocol

Classification	CW = Containerized Waste FW = Free Flowing Waste
Sampling Station	Sampling location number
Date	MMDDYY

The following example illustrates the sample numbering system:

CW-01-021107, where:

CW	=	Waste encountered is containerized
01	=	Sampling Station Number #1
021107	=	February 11, 2007

3.3.2 Sample Storage, Packing, and Transportation

Samples will be placed in a cooler following collection and chilled to approximately 4ºC using wet ice. Samples will be transported or shipped to the analytical laboratory within a timeframe consistent with the sample holding times shown in Table 3-1.

Samples will be accumulated onsite and delivered to the lab in one batch. If prolonged cooler storage is necessary, additional wet ice will be added to ensure that cooler temperatures remain at approximately 4ºC.

3.3.3 Sample Custody

The chain-of-custody procedures used for this project provide an accurate written or computerized record that can be used to trace the possession of each sample from the time each is collected until the completion of all required analyses. A sample is in custody if it is in any of the following places:

- In someone's physical possession
- In someone's view
- In a secured container
- In a designated secure area

The following information will be provided on the chain-of-custody form:

- Sample identification numbers
- Matrix type for each sample
- Analytical methods to be performed for each sample
- Number of containers for each sample
- Sampling date and time for each sample
- Names of sampling personnel
- Signature and dates indicating the transfer of sample custody

For ease in completing the chain-of-custody, a list of requested analyses will be included with the sample shipment and attached to the chain-of-custody.

All samples will be maintained in custody until formally transferred to the laboratory under a written chain-of-custody. Samples will be kept in sight of the sampling crew or in a secure, locked vehicle at all times. Samples that leave the custody of field personnel will be sealed by placing a signed and dated Custody Seal across the seam of the shipping container.

3.4 ANALYTICAL METHODS

Drum samples will be analyzed for waste characterization purposes. The sample volume and container protocols described in Section 3.2 above were suggested by the laboratory to support the waste analyses described below. The default project laboratory will be Severn Trent Laboratories (STL) in Tacoma, Washington. The laboratory name may change during this project due to a recent merger of the Severn Trent and TestAmerica laboratory divisions, however, the Ecology accreditation will not be affected. The following analyses are planned:

- Flashpoint (Setaflash Closed Cup) using EPA Method 1020A.
- Toxicity Characteristics Leaching Procedure (TCLP) Resource Conservation Recovery Act (RCRA) 8 Metals using EPA Method 1311/6010B/7470A.
- TCLP Organochlorine Pesticides by EPA Method 1311/8081A.
- TCLP Chlorinated Herbicides by EPA Method 1311/8151A.
- TCLP VOCs by EPA Method 1311/ 8260B.
- TCLP Semi-volatile Organic Compounds (SVOCs) by EPA Method 1311/8270C.

- Reactive Cyanide by EPA Method 9014.
- Sulfide by EPA Method 9034.
- pH by EPA Method 9045C.
- Polychlorinated Biphenyls (PCBs) by EPA Method 8082.
- Samples will be tested for full list VOCs by EPA Method 8260B.

A list of analytes for each of the TCLP analyses shown above is included in Appendix A.

If drum samples appear to be single phase aqueous material, the following analyses are planned in lieu of the TCLP analyses:

- VOCs by EPA Method 8260B.
- SVOCs by EPA Method 8270C.
- RCRA 8 Metals using EPA Method 6010B/7470A.
- Organochlorine Pesticides by EPA Method 8081A.
- Chlorinated Herbicides by EPA Method 8151A.

Analytical methods and quantitation limits for the analytes are presented in Appendix B. The reporting limit in most cases is equal to the Practical Quantitation Limit (PQL), or the lowest concentration that can be reliably measured during routine laboratory operating conditions, using Ecology-approved analysis methods. The laboratory will notify the Project Manager of any proposed procedural changes and document these changes in the cover letter with the data reports.

No field quality control samples are planned for this project due to the nature of the material (waste) and the intent of this investigation.

3.4.1 Field Data

Originals of field notes and laboratory reports will be stored in the project files. Field notes will be recorded in bound notebooks or forms substantively like those included in Appendix B.

3.4.2 Laboratory Data

A summary and internal laboratory quality control results will be included in the laboratory data reports and archived in the project files. Electronic data will be in the form of portable document format (PDF) and may be incorporated into spreadsheets and archived on electronic media and placed in the project file.

4. DATA REVIEW

This section describes procedures for assessing project data. The Project Managers or their designees will review the following Quality Control (QC) data results for all samples:

- Chain-of-custody documentation
- Holding times
- Analyses requested were performed
- Laboratory method blank evaluation
- Surrogate and matrix spike recovery evaluation

If, based on this limited review, the QC data results indicate potential data quality problems, further evaluations will be conducted.

5. REFERENCES

Ecology (Washington State Department of Ecology). 1987. Phase I Site Inspection Report, Ephrata Landfill, Ephrata, Grant County, Washington. WAD 98063848. Prepared by Michael J. Spencer, Site Discovery/Investigations Subunit, Hazardous Waste Cleanup Program. February 1987.

Ecology (Washington State Department of Ecology). 2001. Washington Administrative Code 173-340 Model Toxics Control Act, February.

Ecology (Washington State Department of Ecology). 2006. Agreed Order No. DE 3810. December 2006.

EPA (U.S. Environmental Protection Agency). 1984. NEIC procedures manual for the evidence audit of enforcement investigations by contractor evidence audit teams. Technical Report EPA-330/9-81-003-R. U.S. Environmental Protection Agency, Washington, D.C. 1984.

EPA (U.S. Environmental Protection Agency). 1986. Test methods for evaluating solid waste, 3rd edition. U.S. Environmental Protection Agency, Washington, D.C.

EPA (U.S. Environmental Protection Agency). 2001a. EPA Requirements for Quality Assurance Project Plans. EPA QA/R-5, EPA/240/B-01/003, March..

EPA (U.S. Environmental Protection Agency). 2001b. Guidance on Environmental Data Validation and Verification. EPA QA/G-8.

EPA (U.S. Environmental Protection Agency). 2002. Guidance for Quality Assurance Project Plans. EPA QA/G-5. EPA/240/R-02/009, December.

ERRG and Parametrix ERRG. 2007. Health and Safety Plan for Ephrata Landfill Drum Exploration Investigation. January 2007 (in preparation).

Pacific Groundwater Group. 2004. Review of Ephrata Landfill Documentation Technical Memorandum. October 2004.

Parametrix. 2006. Interim Remedial Action Plan, Ephrata Landfill Corrective Action. December 2006.

APPENDIX A

STL Reporting Limits Spreadsheet

SEVERN TRENT STL

Severn Trent Laboratories, Inc.
5755 8th Street East
Tacoma, WA 98424

Prepared for:

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Seattle, WA 98102

Prepared by	Kreps, Kathy E
Date	10/13/2006, Revised 11/3/06
Expiration Date	1/12/2007
Est. Start Date	

Project: Waste Characterization

Quote Number: 58001098

Matrix	Method	Test Description	Analyte	RL	MDL	Units
Waste Characterization						
Waste	1020A	Setaflash Closed-Cup Method of Determining Ignitability	Flashpoint	NONE	NONE	NONE
Waste	6010B (1311 - 3010A)	Inductively Coupled Plasma - Atomic Emission Spectrometry	Lead	0.015	0.00117	mg/L
			Arsenic	0.05	0.0027	mg/L
			Barium	0.005	0.00016	mg/L
			Cadmium	0.005	0.00011	mg/L
			Chromium	0.01	0.00063	mg/L
			Selenium	0.05	0.00442	mg/L
			Silver	0.01	0.00083	mg/L
Waste	7470A (1311 - 7470A)	Mercury in Liquid Waste (Manual Cold Vapor Technique)	Mercury	0.0002	5.5E-05	mg/L
Waste	8081A (1311 - 3510C)	Organochlorine Pesticides by Gas Chromatography	gamma-BHC (Lindane)	0.001	0.00010	mg/L
			Chlordane (technical)	0.01	0.00173	mg/L
			Endrin	0.002	0.00028	mg/L
			Heptachlor	0.001	0.00028	mg/L
			Heptachlor epoxide	0.001	0.00014	mg/L
			Methoxychlor	0.01	0.00132	mg/L
			Toxaphene	0.1	0.00925	mg/L
Waste	8151A (1311 - 8151A)	Chlorinated Herbicides by GC-MS	2,4-D	0.025	0.00115	ug/L
			Silvex (2,4,5-TP)	0.025	0.00208	ug/L
Waste	8260B (1311 - 5030B)	Volatile Organic Compounds by GC/MS	Vinyl chloride	1	0.18	ug/L
			1,1-Dichloroethene	1	0.098	ug/L
			2-Butanone	5	1.2	ug/L
			Chloroform	1	0.067	ug/L
			Carbon tetrachloride	1	0.07	ug/L
			Benzene	1	0.1	ug/L
			1,2-Dichloroethane	1	0.2	ug/L
			Trichloroethene	1	0.074	ug/L
			Tetrachloroethene	1	0.088	ug/L

SEVERN TRENT STL

Severn Trent Laboratories, Inc.
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Tacoma, WA 98424

Prepared for:

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1910 Fairview Ave. East, Suite 103
Seattle, WA 98102

Prepared by: Kreps, Kathy E
Date: 10/13/2006, Revised 11/3/06
Expiration Date: 1/12/2007
Est. Start Date:

Project: Waste Characterization

Quote Number: 58001098

Matrix	Method	Test Description	Analyte	RL	MDL	Units
			Chlorobenzene	1	0.063	ug/L
Waste	8270C (1311 - 3510C)	Semivolatile Compounds by Gas Chromatography/Mass Spectrometry (GC/MS)	1,4-Dichlorobenzene	2	0.12	ug/L
			2-Methylphenol	2	0.38	ug/L
			3 & 4 Methylphenol	4	0.17	ug/L
			Hexachloroethane	3	0.13	ug/L
			Nitrobenzene	2	0.075	ug/L
			Hexachlorobutadiene	3	0.16	ug/L
			2,4,6-Trichlorophenol	3	0.1	ug/L
			2,4,5-Trichlorophenol	2	0.085	ug/L
			2,4-Dinitrotoluene	2	0.12	ug/L
			Hexachlorobenzene	2	0.082	ug/L
			Pentachlorophenol	3.5	0.13	ug/L
			Pyridine	10	1.2	ug/L
Waste	9014 (7.3.3)	Reactive Cyanide Analysis using method 9014	Cyanide, Reactive	20	20	mg/Kg
Waste	9034 (7.3.4)	Titrimetric Procedure for Acid-Soluble and Acid-Insoluble Sulfides	Sulfide	20	20	mg/Kg
			Sulfide, Reactive	20	20	mg/Kg
Waste	9045C	Soil and Waste pH	pH	NONE	NONE	NONE
F-listed Solvents						
Waste	8260B (5035)	Volatile Organic Compounds by GC/MS	Trichlorofluoromethane	40	3.8	ug/Kg
			1,1-Dichloroethene	16	5.3	ug/Kg
			1,1,2-Trichloro-1,2,2-trifluoroethane	40	3	ug/Kg
			Carbon disulfide	40	5	ug/Kg
			Acetone	200	29	ug/Kg
			Methylene Chloride	40	6.1	ug/Kg
			Methyl Ethyl Ketone	200	55	ug/Kg
			1,1,1-Trichloroethane	16	3.9	ug/Kg
			Carbon tetrachloride	16	3	ug/Kg
			Benzene	8	2.8	ug/Kg

Severn Trent Laboratories, Inc.
5755 8th Street East
Tacoma, WA 98424

Prepared for:

John Hicks
ERRG
1910 Fairview Ave. East, Suite 103
Seattle, WA 98102

Prepared by	Kreps, Kathy E
Date	10/13/2006, Revised 11/3/06
Expiration Date	1/12/2007
Est. Start Date	

Project: Waste Characterization

Quote Number: 58001098

Matrix	Method	Test Description	Analyte	RL	MDL	Units
			n-Butyl alcohol	4000	510	ug/Kg
			Trichloroethene	16	3	ug/Kg
			methyl isobutyl ketone	200	12	ug/Kg
			Toluene	40	7.4	ug/Kg
			1,1,2-Trichloroethane	40	3.6	ug/Kg
			Tetrachloroethene	25	7.3	ug/Kg
			Chlorobenzene	40	12	ug/Kg
			Ethylbenzene	40	7.2	ug/Kg
			m-Xylene & p-Xylene	40	15	ug/Kg
			o-Xylene	40	7.2	ug/Kg
			1,2-Dichlorobenzene	40	3.4	ug/Kg
			Ethyl ether	200	12	ug/Kg
			Ethyl acetate	200	21	ug/Kg
Waste	8270C (3580A)	Semivolatile Compounds by Gas Chromatography/Mass Spectrometry (GC/MS)	2-Methylphenol	100	28	ug/Kg
			3 & 4 Methylphenol	200	53	ug/Kg
			Nitrobenzene	100	15	ug/Kg
			Pyridine	1000	250	ug/Kg
			Cyclohexanone	300	100	ug/Kg
PCBs						
Waste	8082 (3580A)	Polychlorinated Biphenyls (PCBs) by Gas Chromatography	PCB-1016	0.01	0.0058	mg/Kg
			PCB-1221	0.01	0.0058	mg/Kg
			PCB-1232	0.01	0.0058	mg/Kg
			PCB-1242	0.01	0.0058	mg/Kg
			PCB-1248	0.01	0.0058	mg/Kg
			PCB-1254	0.01	0.0015	mg/Kg
			PCB-1260	0.01	0.0015	mg/Kg
Table 4						
Water	160.1	Total Dissolved Solids	Total Dissolved Solids	20	20	mg/L
Water	300	Chloride & Sulfate	Chloride	0.4	0.13	mg/L
			Sulfate	0.3	0.036	mg/L

SEVERN TRENT STL

Severn Trent Laboratories, Inc.
5755 8th Street East
Tacoma, WA 98424

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Seattle, WA 98102

Prepared by	Kreps, Kathy E
Date	10/13/2006, Revised 11/3/06
Expiration Date	1/12/2007
Est. Start Date	

Project: Waste Characterization

Quote Number: 58001098

Matrix	Method	Test Description	Analyte	RL	MDL	Units
Water	300	Nitrate	Nitrogen, Nitrate	0.03	0.011	mg/L
Water	6010B (3005A)	Metals (Custom List)	Iron	0.2	0.0148	mg/L
Water	6020 (3005A)	ICP-MS	Arsenic	0.002	0.000367	mg/L
			Manganese	0.002	0.0000477	mg/L
Water	8260B (5030B)	VOC	Chloromethane	1	0.18	ug/L
			Vinyl chloride	1	0.18	ug/L
			Chloroethane	5	0.19	ug/L
			Trichlorofluoromethane	1	0.088	ug/L
			1,1-Dichloroethene	1	0.098	ug/L
			Methylene Chloride	1	0.09	ug/L
			trans-1,2-Dichloroethene	1	0.074	ug/L
			1,1-Dichloroethane	1	0.11	ug/L
			cis-1,2-Dichloroethene	1	0.079	ug/L
			Benzene	1	0.1	ug/L
			1,2-Dichloroethane	1	0.2	ug/L
			Trichloroethene	1	0.074	ug/L
			1,2-Dichloropropane	1	0.092	ug/L
			Toluene	1	0.066	ug/L
			Tetrachloroethene	1	0.088	ug/L
			Ethylbenzene	1	0.085	ug/L
			m-Xylene & p-Xylene	2	0.17	ug/L
			o-Xylene	1	0.068	ug/L
			1,4-Dichlorobenzene	1	0.052	ug/L
			1,2-Dichlorobenzene	1	0.07	ug/L
Water	8270C (3510C)	SVOC	Bis(2-ethylhexyl) phthalate	15	0.32	ug/L

APPENDIX B

Example Field Forms

STL Seattle
5755 8th Street East

Tacoma, WA 98484
phone 253-922-2310 fax 253-922-5047

Chain of Custody Record

SEVERN TRENT STL

Severn Trent Laboratories, Inc.

Client Contact	**Project Manager:**	**Site Contact:**	**Date:**	COC No:
ERRG	**Tel/Fax:**	**Lab Contact:**	**Carrier:**	_____ of _____ COCs
1910 Fairview Ave E Suite 103	**Analysis Turnaround Time**			Job No.
Seattle, WA 98102	Calendar (C) or Work Days (W) _____			
(206) 423-7784 Phone	TAT if different from Below _____			SDG No.
(206) 212-2194 FAX	☐ 2 weeks			
Project Name:Ephrata Landfill Drum Exploration	☐ 1 week			
Site:	☐ 2 days			
P O #	☐ 1 day			

Sample Identification	**Sample Date**	**Sample Time**	**Sample Type**	**Matrix**	**# of Cont.**	Filtered Sample	Sample Specific Notes:

Preservation Used: 1= Ice, 2= HCl; 3= H_2SO_4; 4=HNO_3; 5=NaOH; 6= Other _____

Possible Hazard Identification

☐ *Non-Hazard* ☐ *Flammable* ☐ *Skin Irritant* ☐ *Poison B* ☐ *Unknown*

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)

☐ *Return To Client* ☐ *Disposal By Lab* ☐ *Archive For* _____ *Months*

Special Instructions/QC Requirements & Comments:

Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:

Date:
Time: _____
Weather: _____
Page: _____
Project Number: _____
Project: _____

TRENCHING LOG

PROJECT NAME _____
TRENCHING CONTRACTOR _____
TRENCHING EQUIPMENT _____
SITE / SAMPLE LOCATION _____
SAMPLE MATRIX _____
SAMPLE NUMBER _____
SAMPLE DEPTH _____
DEPTH TO GROUNDWATER _____

CONTAINERS USED	AMOUNT COLLECTED

COMMENTS/OBSERVATIONS: _____

SOIL DESCRIPTION/GROUNDWATER PARAMETERS: _____

TRENCH LOCATION MAP:

PREPARED BY: _____

Date:
Time: _____
Weather: _____
Page: _____
Project Number: _____
Project: _____

TRENCH CROSS-SECTION SKETCH:

ADDITIONAL COMMENTS/OBSERVATIONS _____

_____

_____

PREPARED BY: _____

Engineering/Remediation Resources Group, Inc.
Nonconformance Report

Project Number: _____ Report Number: _____

Project Name: _____

Nonconformance Description:

_____

_____

_____

_____

_____

_____

_____

_____

Prepared By: _____ Date: _____

Corrective Action Taken:

_____

_____

_____

_____

_____

_____

_____

_____

Prepared By: _____ Date: _____

Corrective Action Verification:

_____

_____

_____

_____

_____

_____

_____

_____

Verified By: _____ Date: _____