APPENDIX C

Data Quality Control Summary Report

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ACRONYMS AND ABBREVIATIONS

ADR	Automated Data Review
AOC	Area of Concern
DoD	U.S. Department of Defense
DQA	Data Quality Assessment
DQO	Data Quality Objective
FWCUG	Facility-wide Cleanup Goal
FWQAPP	Facility-wide Quality Assurance Project Plan
LCS	Laboratory Control Standard
MDL	Method Detection Level
MPR	Monthly Progress Report
MS	Matrix Spike
MSD	Matrix Spike Duplicate
Ohio EPA	Ohio Environmental Protection Agency
PBA08	Performance-Based Acquisition 2008
PBA08 SAP	Performance-Based Acquisition 2008 Supplemental Sampling and Analysis Plan Addendum No. 1
PCB	Polychlorinated Biphenyl
QA	Quality Assurance
QAPP	Quality Assurance Project Plan
QC	Quality Control
QSM	Quality Systems Manual
REIMS	Ravenna Environmental Information Management System
RI	Remedial Investigation
RPD	Relative Percent Difference
RVAAP	Ravenna Army Ammunition Plant
SVOC	Semi-volatile Organic Compound
TestAmerica	TestAmerica Laboratories, Inc.
USACE	U.S. Army Corps of Engineers
USEPA	U.S. Environmental Protection Agency
VOC	Volatile Organic Compound

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C.0 PROJECT QUALITY ASSURANCE SUMMARY

C.1 PURPOSE

Environmental data must always be interpreted relative to its known limitations and its intended use. As can be expected in environmental media, there are areas and data points where the user needs to be cautioned relative to the quality of the project information presented. The data verification process and this data quality assessment (DQA) are performed to assist current and future data users in interpreting these data.

The purpose of this DQA report is to describe:

1. The quality control (QC) procedures followed to ensure data generated by Leidos, formerly Science Applications International Corporation, during remedial investigations (RIs) at the Ravenna Army Ammunition Plant (RVAAP) meet project requirements;
2. The quality of the data collected; and
3. The problems encountered during the course of the study and their solutions.

A separate Chemical Data Usability Assessment has been completed by the U.S. Army Corps of Engineers (USACE) quality assurance (QA) representative (Attachment 1). This assessment discusses the overall data quality and usability of project data based on a review of this DQA and the findings of the third-party validator contracted by USACE. While there were some differences in the qualifiers assigned by Leidos and the third-party reviewer, the findings were deemed to be compatible.

This DQA report assesses the analytical information gathered during the implementation of the RI at Load Line 12. It documents the quality of the data utilized for the RI Report and assesses if QA/QC objectives were met. Evaluation of field and laboratory QC measures will constitute the majority of this assessment; however, references will also be directed toward those QA procedures that establish data credibility. The primary intent of this assessment is to illustrate that, except as noted, data generated for this investigation can withstand scientific scrutiny; are appropriate for their intended purpose; are technically defensible; and are of known and acceptable sensitivity, precision, and accuracy.

Multiple activities were performed to achieve the desired data quality for this project. As discussed in the RI Report, decisions were made during the initial scoping of the RI to define the quality and quantity of data required. Data quality objectives (DQOs) were established to guide the implementation of the field sampling and laboratory analysis [refer to the *Performance Based Acquisition 2008 Supplemental Investigation Sampling and Analysis Plan Addendum No. 1* (USACE 2009), herein referred to as the PBA08 SAP]. A QA program was established to standardize procedures and document activities [refer to the *Facility-wide Quality Assurance Project Plan for Environmental Investigations*, herein referred to as the FWQAPP (USACE 2001), and Part II of the PBA08 SAP]. This program provided a means to detect and correct any deficiencies in the process. Upon receipt by the project team, data were subjected to verification and validation review by an automated data review (ADR) process to identify and qualify

problems related to the analysis. These review steps contributed to this final DQA where data used in the investigation are identified as having met the criteria and are being utilized appropriately.

C.2 QUALITY ASSURANCE PROGRAM

The FWQAPP and Part II of the PBA08 SAP were developed to guide the RI for Load Line 12. These documents enumerated the quantity and type of samples to be taken to inspect the area of concern (AOC) and define the quantity and type of QA/QC samples to be used to evaluate the quality of the data obtained. The FWQAPP established requirements for field and laboratory QC procedures. In general, field QC duplicates and QA split samples were required for each environmental sample matrix collected in the area being investigated; volatile organic compound (VOC) trip blanks were to accompany each cooler containing water samples for VOC determinations; and analytical laboratory QC duplicates, matrix spikes (MSs), laboratory control samples (LCSs), and method blanks were required for each preparation batch of 20 samples or less for each matrix and analyte.

A primary goal of the former RVAAP QA program was to ensure that the quality of results for all environmental measurements were appropriate for their intended use. To this end, the FWQAPP and standardized field procedures were compiled to guide the investigation. Through the process of readiness review, training, equipment calibration, QC implementation, and detailed documentation, the project has successfully accomplished the goals set for the QA program.

C.2.1 Monthly Progress Reports

Monthly progress reports (MPRs) were completed by the Leidos Project Manager for the duration of the project. The MPRs contained information on work completed, problems encountered, corrective actions/solutions, summary of findings, and upcoming work. These reports were issued to the USACE Louisville District Project Manager by e-mail with copies forwarded to the Ohio Environmental Protection Agency (Ohio EPA). Access to these reports can be obtained through the USACE Louisville District Project Manager.

C.2.2 Daily Activity Logs

The Field Team Leader completed daily activity logs that include information such as, but not limited to, on-site sub-tier contractors, on-site equipment, work performed summaries, QC activities, health and safety activities, problems encountered, and corrective actions.

C.2.3 Laboratory "Definitive" Level Data Reporting

The Quality Assurance Project Plan (QAPP) for this project identified requirements for laboratory data reporting and identified TestAmerica Laboratories, Inc. (herein referred to as TestAmerica) of North Canton, Ohio (a subcontractor to White Water Associates Inc., of Amasa, Michigan), as the laboratory for the project. During project execution, the TestAmerica facility in North Canton, Ohio, performed all of the analyses, except for explosives and propellants, which were performed at the TestAmerica

facility in West Sacramento, California. Collected QA split samples were analyzed by USACE's contracted QA laboratory, RTI Laboratories, Inc., of Livonia, Michigan. TestAmerica and RTI Laboratories, Inc. are accredited by the U.S. Department of Defense (DoD). All analytical procedures were completed in accordance with applicable professional standards; U.S. Environmental Protection Agency (USEPA) requirements; government regulations and guidelines; the DoD Quality Systems Manual (QSM), Version 3; USACE Louisville District analytical QA guidelines; and specific project goals and requirements. USEPA "definitive" data have been reported and include the following basic information:

- Laboratory case narratives,
- Sample results (sediment reported per dry weight),
- Laboratory method blank results,
- LCS results,
- Laboratory sample MS recoveries,
- Laboratory duplicate results,
- Surrogate recoveries [VOCs, semi-volatile organic compounds (SVOCs), pesticides, polychlorinated biphenyls (PCBs), and explosives],
- Initial and continuing calibrations,
- Sample preparation dates, and
- Sample analysis dates.

This information from the laboratory, along with field information, provides the basis for subsequent data evaluation relative to sensitivity, precision, accuracy, representativeness, and completeness, which are presented in Section C.4.

C.3 DATA VERIFICATION

The objective when evaluating the project data quality is to determine its usability. The evaluation is based on the interpretation of laboratory QC measures, field QC measures, and project DQOs. This project implemented ADR software to facilitate laboratory data review. The ADR output was reviewed by the project-designated verification staff.

C.3.1 Field Data Verification

Field-generated documents such as sampling logs, boring logs, daily health and safety summaries, daily safety inspections, equipment calibration and maintenance logs, and sample management logs were peer-reviewed on site.

C.3.2 Laboratory Data Verification

Analytical data generated for this project have been subjected to a process of automated data verification and review. The following describes this systematic process and the evaluation activities performed. Several criteria have been established against which the data were compared and from which a judgment was rendered regarding the acceptance and qualification of the data. Because it is beyond the scope of this report to cite those criteria, the reader is directed to the following documents for specific detail:

- PBA08 SAP (USACE 2009).
- DoD – *Quality Systems Manual for Environmental Laboratories*, Version 3, January, 2006.
- USACE Louisville District, *Louisville DoD Quality Systems Manual Supplement*, Version 1, March, 2007.
- USEPA – *Contract Laboratory Program National Functional Guidelines for Organic Data Review*, EPA-540/R-99/008, October, 1999.
- USEPA – *Contract Laboratory Program National Functional Guidelines for Inorganic Data Review*, EPA-540/R-94/013, February, 1994.
- Leidos Technical Support Contractor QA Technical Procedure (TP-DM-300-7), *Data Verification and Validation.*

Upon receiving field and analytical data, verification staff systematically examined the reports, including ADR software, to ensure the content, presentation, and administrative validity of 100% of the data. Discrepancies identified during this process were recorded and documented utilizing the ADR. Any discrepancies were resolved prior to database flag entry. As part of data verification, standardized laboratory electronic data deliverables were subjected to review. This technical evaluation ensured that all contract-specified requirements had been met, and that electronic information conformed to reported hardcopy data. Outlier reports from the ADR software review are included as Attachment 2 to this appendix. QA Program Nonconformance Report and Corrective Action systems were implemented as required.

During the verification phase of the review and evaluation process, data were subjected to a systematic technical review by examining all field and analytical QC results and laboratory documentation following USEPA functional guidelines, DoD QSM criteria, and Leidos internal procedures for laboratory data review. These data review guidelines define the technical review criteria, methods for evaluating the criteria, and actions to be taken resulting from reviewing these criteria. The primary objectives of this phase were to assess and summarize the quality and reliability of the data for the intended use and to document factors that may affect the usability of the data. This process did not include an in-depth review of raw data instrument output or re-calculation of results from the primary instrument output. This data verification and analytical review process included, but was not necessarily limited to, the following parameters:

- Data completeness;
- Analytical holding times and sample preservation;

- Calibration (initial and continuing);
- Method blanks;
- Sample results verification;
- Surrogate recovery;
- LCS analysis;
- Internal standard performance;
- MS recovery;
- Duplicate analysis comparison;
- Reported detection limits;
- Compound, element, and isotope quantification;
- Reported detection levels;
- Method reporting levels; and
- Secondary dilutions.

As an end result of this phase of the review, the data were qualified based on the technical assessment of the verification criteria. Qualifiers were applied by the ADR to each field and analytical result to indicate the usability of the data for its intended purpose.

C.3.3 Definitions of Data Qualifiers (Flags)

During the data verification process, all laboratory data were assigned appropriate data qualification flags and reason codes. Qualification flags are defined as follows:

- "U" Indicates the analyte was analyzed for, but not detected above, the level of the associated value.
- "J" Indicates the analyte was positively identified; however, the associated numerical value is an approximate concentration of the analyte in the sample.
- "UJ" Indicates the analyte was analyzed for, but not detected above, the associated value; however, the reported value is an estimate and demonstrates a decreased knowledge of its accuracy or precision.
- "R" Indicates the analyte value reported is unusable. The integrity of the analyte's identification, accuracy, precision, or sensitivity has raised significant questions as to the reality of the information presented.

C.3.4 Data Acceptability

A total of 18 environmental sediment, surface water, and field QC samples were collected in February 2010 and April 2011 with approximately 2,670 discrete analyses (i.e., analytes) being obtained, reviewed, and integrated into the assessment (these totals do not include field measurements and field descriptions). Under the direction of the PBA08 SAP and USACE Louisville District, the project successfully collected RI samples and produced acceptable results for 99.7% of the sample analyses performed. Data that were rejected are relegated to seven non-detectable concentration PCB results in

surface water sample L12SW-308-5005-SW, non-detectable concentration heptachlor epoxide in sediment sample L12sd-309-5006-SD, and non-detectable concentration antimony in sediment sample L12sd-313-5826-SD.

Table C-1 summarizes the targeted field QC and QA split samples collected during the investigation. Cross-references for duplicate and QA split sample pair numbers are presented on Table C-2 along with the requested parameters for each sample. Table C-3 summarizes results rejected during review, Table C-4 summarizes qualified analyses grouped by media and analyte category, and Table C-5 shows the individual results qualified during review. The majority of the estimated values were based on values observed between the laboratory method detection levels (MDLs) and the project reporting levels. Values determined in this region have an inherently higher variability and need to be considered estimated at best. Also, some data were estimated due to exceeded holding times, continuing calibrations, surrogate recovery deviations, MS/matrix spike duplicate (MSD) deviations, and a few LCS recovery failures.

Table C-1. Number of Samples Taken at Load Line 12

Media	Environmental Samples	Field Duplicates	USACE Split Samples	Trip Blanks	Equipment Rinse Blanks[a]	Source Water Blanks[b]
Sediment	8	1	1	0	2	0
Surface Water	8	1	1	2	1	

[a] Equipment rinse blanks were collected at a frequency of two per field cycle for the entire Performance-based Acquisition 2008 Remedial Investigation (PBA08 RI) for the 17 areas of concern (AOCs) as presented in Section 4.6 of the Performance-based Acquisition 2008 Supplemental Investigation Sampling and Analysis Plan Addendum No. 1 (PBA08 SAP).

[b] Source water blanks for deionized and potable water used during equipment decontamination were evaluated for the entire PBA08 RI for the 17 AOCs as presented in Section 4.6 of the PBA08 SAP.

USACE = U.S. Army Corps of Engineers.

Table C-2. Identification of Regular and QC Samples Taken at Load Line 12

Environmental Samples	Laboratory Sample Delivery Group	Field Duplicates	USACE Split Samples	Trip Blanks[a]	Metals	Explosives	SVOCs	Propellants[b]	VOCs	Pesticides	PCBs	Nitrate
Sediment												
L12SD-306-5000-SD	A0B160474	NS	NS	NS	X	X	X				X	X
L12SD-307-5002-SD	A0B160474	NS	NS	NS	X	X	X				X	X
L12SD-308-5004-SD	A0B160474	NS	NS	NS	X	X	X				X	X
L12SD-309-5006-SD	A0B160474	L12SD-309-6035-FD	L12SD-309-6034-QA	NS	X	X	X	X	X	X	X	X
L12sd-310-5820-SD	A1D210402	NS	NS	NS	X	X	X				X	X
L12sd-311-5822-SD	A1D210402	NS	NS	NS	X	X	X				X	X
L12sd-312-5824-SD	A1D210402	NS	NS	NS	X	X	X				X	X
L12sd-313-5826-SD	A1D210402	NS	NS	NS	X	X	X				X	X
Surface Water												
L12SW-306-5001-SW	A0B160474	NS	NS	PBA08-QC-6007-TB	X	X	X	X	X	X	X	X
L12SW-307-5003-SW	A0B160474	L12SW-307-6033-FD	L12SW-307-6032-QA	PBA08-QC-6007-TB	X	X	X	X	X	X	X	X
L12SW-308-5005-SW	A0B160474	NS	NS	PBA08-QC-6007-TB	X	X	X	X	X	X	X	X
L12SW-309-5007-SW	A0B160474	NS	NS	PBA08-QC-6007-TB	X	X	X	X	X	X	X	X
L12sw-310-5819-SW	A1D210402	NS	NS	PBA08-QC-6242-TB	X	X	X	X	X	X	X	X
L12sw-311-5821-SW	A1D210402	NS	NS	PBA08-QC-6242-TB	X	X	X	X	X	X	X	X
L12sw-312-5823-SW	A1D210402	NS	NS	PBA08-QC-6242-TB	X	X	X	X	X	X	X	X
L12sw-313-5825-SW	A1D210402	NS	NS	PBA08-QC-6242-TB	X	X	X	X	X	X	X	X

[a] Trip blanks only accompany samples for VOCs in water.
[b] Propellants include nitrocellulose and nitroguanidine.
NS = Not sampled.
PCB = Polychlorinated biphenyl.
QC = Quality control.
SVOC = Semi-volatile organic compound.
USACE = U.S. Army Corps of Engineers.
VOC = Volatile organic compound.

Table C-3. Results Rejected in Validation for Samples from Load Line 12

Sample Delivery Group	Sample ID	Location	Chemical	Results	Reporting Limit	Laboratory Qualifier[a]	Validation Qualifier[b]	Validation Code[c]
PCBs								
Surface Water (µg/L)								
A0B160474	L12SW-308-5005-SW	L12sw-308	Aroclor 1016	0.50	0.50	U	R	Surr-R
A0B160474	L12SW-308-5005-SW	L12sw-308	Aroclor 1221	0.50	0.50	U	R	Surr-R
A0B160474	L12SW-308-5005-SW	L12sw-308	Aroclor 1232	0.50	0.50	U	R	Surr-R
A0B160474	L12SW-308-5005-SW	L12sw-308	Aroclor 1242	0.50	0.50	U	R	Surr-R
A0B160474	L12SW-308-5005-SW	L12sw-308	Aroclor 1248	0.50	0.50	U	R	Surr-R
A0B160474	L12SW-308-5005-SW	L12sw-308	Aroclor 1254	0.50	0.50	U	R	Surr-R
A0B160474	L12SW-308-5005-SW	L12sw-308	Aroclor 1260	0.50	0.50	U	R	Surr-R
Metals								
Sediment (mg/kg)								
A1D210402	L12sd-313-5826-SD	L12sd-313	Antimony	2.6	2.6	U	R	MS-R
A0B160474	L12sd-309-5006-SD	LL12sd-309	Heptachlor epoxide	18	18	U	R	MS-R

[a] Laboratory Qualifier: U = not detected.
[b] Validation Qualifier: R = rejected.
[c] Validation Reason Code: MS = Matrix Spike; Surr = Surrogate Recovery.
ID = Identification.
µg/L = Micrograms per liter.
mg/kg = Milligrams per kilogram.
PCB = Polychlorinated biphenyl.

Table C-4. Summary of Qualified Results for Samples from Load Line 12

Analysis Group	Validation Qualifier[a]	Validation Reason Code[b]	Number Qualified	Total Number of Analyses	Percent Qualified
Sediment					
All Analyses	R	--	2	1133	0.09
	J	--	175	1133	15
	UJ	--	49	1133	4.3
	U	--	2	1133	0.18
	None	--	906	1133	80
Metals	R	MS-R	1	207	0.48
	J	LabDup-J	10	207	4.8
	J	MS-J	28	207	14
	J	MS-J, RepLimit-J	12	207	5.8
	J	RepLimit-J	28	207	14
	J	RepLimit-J, LabDup-J	1	207	0.48
	UJ	MB-U, RepLimit-J	2	207	0.97
	UJ	MS-UJ	2	207	0.97
	UJ	RepLimit-J, LabDup-J, CalBlk-U	1	207	0.48
	None	None	122	207	59
Explosives	J	RepLimit-J	7	144	4.9
	UJ	CCV-UJ	5	144	3.5
	None	None	132	144	92
Propellants	UJ	MB-U, MS-J, RepLimit-J	1	4	25
	UJ	MS-UJ	1	4	25
	None	None	2	4	50
SVOCs	J	MS-J, RepLimit-J	2	594	0.34
	J	MS-J	1	594	0.17
	J	RepLimit-J	85	594	14
	UJ	LCS-UJ	3	594	0.51
	UJ	MS-UJ	9	594	1.5
	UJ	MS-UJ, LCS-UJ	1	594	0.17
	None	None	493	594	83
Pesticides	UJ	CCV-UJ	15	42	36
	R	MS-R	1	42	2.4
	None	None	26	42	62
PCBs	J	RepLimit-J	1	63	1.6
	UJ	MS-UJ	1	63	1.6
	None	None	61	63	97
VOCs	UJ	CCV-UJ	2	70	2.9
	UJ	MB-U, RepLimit-J	4	70	5.7
	UJ	MS-UJ	1	70	1.4
	U	MB-U	2	70	2.9
	None	None	61	70	87
Nitrate	None	None	9	9	100

Table C-4. Summary of Qualified Results for Samples from Load Line 12 (continued)

Analysis Group	Validation Qualifier[a]	Validation Reason Code[b]	Number Qualified	Total Number of Analyses	Percent Qualified
Surface Water					
All Analyses	R	--	7	1539	0.45
	J	--	99	1539	6.4
	UJ	--	214	1539	14
	None	--	1219	1539	79
Metals	J	MS-J	5	207	2.4
	J	RepLimit-J	76	207	37
	UJ	RepLimit-J, CalBlk-U	4	207	1.9
	None	None	122	207	59
Explosives	J	RepLimit-J	3	144	2.1
	UJ	CCV-UJ	3	144	2.1
	UJ	HT-UJ	31	144	22
	UJ	HT-UJ, CCV-UJ	1	144	0.69
	None	None	106	144	74
Propellants	J	RepLimit-J	1	14	7.1
	None	None	13	14	93
SVOCs	J	RepLimit-J	9	594	1.5
	UJ	HT-J, MB-U, RepLimit-J	1	594	0.17
	UJ	HT-UJ	65	594	11
	UJ	LCS-UJ	4	594	0.67
	UJ	MB-U, RepLimit-J	1	594	0.17
	UJ	MS-UJ	1	594	0.17
	None	None	513	594	86
Pesticides	J	RepLimit-J	1	189	0.53
	J	Surr-J, RepLimit-J	1	189	0.53
	UJ	CCV-UJ	3	189	1.6
	UJ	MS-UJ	1	189	0.53
	UJ	Surr-UJ	39	189	21
	UJ	Surr-UJ, MS-UJ	2	189	1.1
	None	None	142	189	75
PCBs	R	Surr-R	7	63	11
	UJ	Surr-UJ	49	63	78
	None	None	7	63	11
VOCs	J	RepLimit-J	1	315	0.32
	UJ	LCS-UJ	5	315	1.6
	UJ	RepLimit-J, FldQC-U	4	315	1.3
	None	None	305	315	97
Nitrate	J	RepLimit-J	2	9	22
	None	None	7	9	78
WS-WC-0050	None	None	4	4	100

[a] Validation Qualifiers: J = estimated, U = not detected, UJ = not detected and reporting limit estimated, and R = rejected.

[b] Validation Reason Codes: CalBlk = calibration blank, CCV = continuing calibration verification, FldQC = field quality control, HT = holding time, IC=initial calibration, ICV=initial calibration verification, IntStd=internal standard, IPC=instrument performance check, LabDup=lab duplicate, LCS = laboratory control standard, MB = method blank, MS = matrix spike, ProJudge = professional judgment, RptLimit = reporting limit, and Surr = surrogate recovery.

PCB = Polychlorinated biphenyl.

SVOC = Semi-volatile organic compound.

VOC = Volatile organic compound.

Table C-5. Detailed Listing of Qualified Results for Samples from Load Line 12

Chemical	Laboratory SDG	Sample ID	Results	Reporting Limit	Laboratory Qualifier[a]	Validation Qualifier[b]	Validation Code[c]
Metals							
Sediment (mg/kg)							
Aluminum	A0B160474	L12SD-306-5000-SD	7570	21.1	--	J	MS-J
Aluminum	A0B160474	L12SD-307-5002-SD	17200	25.0	--	J	MS-J
Aluminum	A0B160474	L12SD-308-5004-SD	13000	22.1	--	J	MS-J
Aluminum	A0B160474	L12SD-309-5006-SD	8200	14.4	--	J	MS-J
Aluminum	A0B160474	L12SD-309-6035-FD	8310	14.1	--	J	MS-J
Antimony	A0B160474	L12SD-306-5000-SD	0.22	1.1	J	J	MS-J, RepLimit-J
Antimony	A0B160474	L12SD-307-5002-SD	0.21	1.2	J	J	MS-J, RepLimit-J
Antimony	A0B160474	L12SD-308-5004-SD	1.1	1.1	U	UJ	MS-UJ
Antimony	A0B160474	L12SD-309-5006-SD	0.10	0.72	J	J	MS-J, RepLimit-J
Antimony	A0B160474	L12SD-309-6035-FD	0.70	0.70	U	UJ	MS-UJ
Antimony	A1D210402	L12sd-310-5820-SD	0.15	0.72	J	J	MS-J, RepLimit-J
Antimony	A1D210402	L12sd-311-5822-SD	0.35	1.7	J	J	MS-J, RepLimit-J
Antimony	A1D210402	L12sd-312-5824-SD	0.15	0.55	J	J	MS-J, RepLimit-J
Antimony	A1D210402	L12sd-313-5826-SD	2.6	2.6	U	R	MS-R
Barium	A0B160474	L12SD-306-5000-SD	46.1	2.1	--	J	MS-J
Barium	A0B160474	L12SD-307-5002-SD	104	2.5	--	J	MS-J
Barium	A0B160474	L12SD-308-5004-SD	95.3	2.2	--	J	MS-J
Barium	A0B160474	L12SD-309-5006-SD	65.5	1.4	--	J	MS-J
Barium	A0B160474	L12SD-309-6035-FD	72.0	1.4	--	J	MS-J
Beryllium	A0B160474	L12SD-309-5006-SD	0.58	0.72	J G	J	RepLimit-J
Beryllium	A0B160474	L12SD-309-6035-FD	0.53	3.5	J G	J	RepLimit-J
Cadmium	A0B160474	L12SD-307-5002-SD	0.31	0.50	J	J	RepLimit-J
Cadmium	A1D210402	L12sd-310-5820-SD	0.27	0.29	J	J	RepLimit-J
Cadmium	A1D210402	L12sd-312-5824-SD	0.21	0.22	J	J	RepLimit-J
Calcium	A0B160474	L12SD-306-5000-SD	4850	423	--	J	MS-J
Calcium	A0B160474	L12SD-307-5002-SD	3990	2500	--	J	MS-J
Calcium	A0B160474	L12SD-308-5004-SD	3580	441	--	J	MS-J

Table C-5. Detailed Listing of Qualified Results for Samples from Load Line 12 (continued)

Chemical	Laboratory SDG	Sample ID	Results	Reporting Limit	Laboratory Qualifier[a]	Validation Qualifier[b]	Validation Code[c]
Calcium	A0B160474	L12SD-309-5006-SD	1160	1440	J G	J	MS-J, RepLimit-J
Calcium	A0B160474	L12SD-309-6035-FD	1120	1410	J G	J	MS-J, RepLimit-J
Calcium	A1D210402	L12sd-310-5820-SD	20400	289	--	J	LabDup-J
Calcium	A1D210402	L12sd-311-5822-SD	11300	684	--	J	LabDup-J
Calcium	A1D210402	L12sd-312-5824-SD	2120	220	--	J	LabDup-J
Calcium	A1D210402	L12sd-313-5826-SD	8830	1040	--	J	LabDup-J
Lead	A0B160474	L12SD-306-5000-SD	24.3	0.63	--	J	MS-J
Lead	A0B160474	L12SD-307-5002-SD	18.9	0.75	--	J	MS-J
Lead	A0B160474	L12SD-308-5004-SD	20.6	0.66	--	J	MS-J
Lead	A0B160474	L12SD-309-5006-SD	14.2	0.43	--	J	MS-J
Lead	A0B160474	L12SD-309-6035-FD	13.6	0.42	--	J	MS-J
Manganese	A1D210402	L12sd-310-5820-SD	749	1.4	--	J	LabDup-J
Manganese	A1D210402	L12sd-311-5822-SD	1220	3.4	--	J	LabDup-J
Manganese	A1D210402	L12sd-312-5824-SD	162	1.1	--	J	LabDup-J
Manganese	A1D210402	L12sd-313-5826-SD	615	5.2	--	J	LabDup-J
Mercury	A0B160474	L12SD-306-5000-SD	0.17	0.21	J	J	RepLimit-J
Mercury	A0B160474	L12SD-307-5002-SD	0.065	0.25	J	J	RepLimit-J
Mercury	A0B160474	L12SD-308-5004-SD	0.062	0.22	J	J	RepLimit-J
Mercury	A0B160474	L12SD-309-5006-SD	0.032	0.14	J	J	RepLimit-J
Mercury	A0B160474	L12SD-309-6035-FD	0.046	0.14	J	J	RepLimit-J
Mercury	A1D210402	L12sd-310-5820-SD	0.042	0.14	J B	UJ	MB-U, RepLimit-J
Mercury	A1D210402	L12sd-311-5822-SD	0.10	0.39	J B	J	RepLimit-J
Mercury	A1D210402	L12sd-312-5824-SD	0.062	0.12	J B	UJ	MB-U, RepLimit-J
Mercury	A1D210402	L12sd-313-5826-SD	0.092	0.37	J B	J	RepLimit-J
Potassium	A0B160474	L12SD-309-5006-SD	586	721	J G	J	RepLimit-J
Potassium	A0B160474	L12SD-309-6035-FD	597	703	J G	J	RepLimit-J
Potassium	A1D210402	L12sd-310-5820-SD	1520	144	B	J	MS-J
Potassium	A1D210402	L12sd-311-5822-SD	2390	342	B	J	MS-J
Potassium	A1D210402	L12sd-312-5824-SD	979	110	B	J	MS-J
Potassium	A1D210402	L12sd-313-5826-SD	1620	521	B	J	MS-J
Selenium	A0B160474	L12SD-306-5000-SD	1.1	1.1	--	J	MS-J
Selenium	A0B160474	L12SD-307-5002-SD	2.1	1.2	--	J	MS-J
Selenium	A0B160474	L12SD-308-5004-SD	1.5	1.1	--	J	MS-J
Selenium	A0B160474	L12SD-309-5006-SD	1.0	0.72	--	J	MS-J
Selenium	A0B160474	L12SD-309-6035-FD	1.1	0.70	--	J	MS-J

Table C-5. Detailed Listing of Qualified Results for Samples from Load Line 12 (continued)

Chemical	Laboratory SDG	Sample ID	Results	Reporting Limit	Laboratory Qualifier[a]	Validation Qualifier[b]	Validation Code[c]
Silver	A0B160474	L12SD-306-5000-SD	41.6	1.1	--	J	MS-J
Silver	A0B160474	L12SD-307-5002-SD	0.12	1.2	J	J	MS-J, RepLimit-J
Silver	A0B160474	L12SD-308-5004-SD	0.078	1.1	J	J	MS-J, RepLimit-J
Silver	A0B160474	L12SD-309-5006-SD	0.096	0.72	J	J	MS-J, RepLimit-J
Silver	A0B160474	L12SD-309-6035-FD	0.092	0.70	J	J	MS-J, RepLimit-J
Silver	A1D210402	L12sd-310-5820-SD	70.5	0.72	E	J	LabDup-J
Silver	A1D210402	L12sd-311-5822-SD	0.28	1.7	J	J	RepLimit-J, LabDup-J
Silver	A1D210402	L12sd-312-5824-SD	2.8	0.55	--	J	LabDup-J
Silver	A1D210402	L12sd-313-5826-SD	0.12	2.6	J	UJ	RepLimit-J, LabDup-J, CalBlk-U
Sodium	A0B160474	L12SD-306-5000-SD	82.2	211	J	J	RepLimit-J
Sodium	A0B160474	L12SD-307-5002-SD	196	250	J	J	RepLimit-J
Sodium	A0B160474	L12SD-309-5006-SD	69.8	144	J	J	RepLimit-J
Sodium	A1D210402	L12sd-310-5820-SD	102	144	J	J	RepLimit-J
Sodium	A1D210402	L12sd-313-5826-SD	82.1	521	J	J	RepLimit-J
Thallium	A0B160474	L12SD-306-5000-SD	0.14	0.42	J	J	RepLimit-J
Thallium	A0B160474	L12SD-307-5002-SD	0.27	0.50	J	J	RepLimit-J
Thallium	A0B160474	L12SD-308-5004-SD	0.19	0.44	J	J	RepLimit-J
Thallium	A0B160474	L12SD-309-5006-SD	0.13	0.29	J	J	RepLimit-J
Thallium	A0B160474	L12SD-309-6035-FD	0.12	0.28	J	J	RepLimit-J
Thallium	A1D210402	L12sd-310-5820-SD	0.19	0.29	J	J	RepLimit-J
Thallium	A1D210402	L12sd-311-5822-SD	0.44	0.68	J	J	RepLimit-J
Thallium	A1D210402	L12sd-312-5824-SD	0.17	0.22	J	J	RepLimit-J
Thallium	A1D210402	L12sd-313-5826-SD	0.30	1.0	J	J	RepLimit-J
Surface Water (µg/L)							
Aluminum	A0B160474	L12SW-306-5001-SW	1170	100	--	J	MS-J
Aluminum	A0B160474	L12SW-307-5003-SW	432	100	--	J	MS-J
Aluminum	A0B160474	L12SW-307-6033-FD	4160	100	--	J	MS-J
Aluminum	A0B160474	L12SW-308-5005-SW	21300	100	--	J	MS-J
Aluminum	A0B160474	L12SW-309-5007-SW	10500	100	--	J	MS-J
Antimony	A0B160474	L12SW-306-5001-SW	0.40	5.0	J	J	RepLimit-J
Antimony	A0B160474	L12SW-307-5003-SW	0.66	5.0	J	J	RepLimit-J
Antimony	A0B160474	L12SW-307-6033-FD	1.2	5.0	J	J	RepLimit-J
Antimony	A0B160474	L12SW-308-5005-SW	0.51	5.0	J	J	RepLimit-J
Antimony	A0B160474	L12SW-309-5007-SW	0.94	5.0	J	J	RepLimit-J

Table C-5. Detailed Listing of Qualified Results for Samples from Load Line 12 (continued)

Chemical	Laboratory SDG	Sample ID	Results	Reporting Limit	Laboratory Qualifier[a]	Validation Qualifier[b]	Validation Code[c]
Antimony	A1D210402	L12sw-310-5819-SW	0.44	5.0	J	J	RepLimit-J
Arsenic	A0B160474	L12SW-306-5001-SW	2.4	5.0	J	J	RepLimit-J
Arsenic	A0B160474	L12SW-307-5003-SW	0.46	5.0	J	J	RepLimit-J
Arsenic	A0B160474	L12SW-307-6033-FD	2.4	5.0	J	J	RepLimit-J
Arsenic	A1D210402	L12sw-310-5819-SW	0.87	5.0	J	J	RepLimit-J
Arsenic	A1D210402	L12sw-311-5821-SW	1.0	5.0	J	J	RepLimit-J
Arsenic	A1D210402	L12sw-312-5823-SW	1.0	5.0	J	J	RepLimit-J
Arsenic	A1D210402	L12sw-313-5825-SW	0.91	5.0	J	J	RepLimit-J
Beryllium	A0B160474	L12SW-306-5001-SW	0.099	1.0	J	J	RepLimit-J
Beryllium	A0B160474	L12SW-307-5003-SW	0.035	1.0	J	J	RepLimit-J
Beryllium	A0B160474	L12SW-307-6033-FD	0.19	1.0	J	J	RepLimit-J
Beryllium	A0B160474	L12SW-309-5007-SW	0.55	1.0	J	J	RepLimit-J
Cadmium	A0B160474	L12SW-306-5001-SW	0.36	2.0	J	J	RepLimit-J
Cadmium	A0B160474	L12SW-307-5003-SW	0.038	2.0	J	J	RepLimit-J
Cadmium	A0B160474	L12SW-307-6033-FD	0.21	2.0	J	J	RepLimit-J
Cadmium	A0B160474	L12SW-308-5005-SW	1.2	2.0	J	J	RepLimit-J
Cadmium	A0B160474	L12SW-309-5007-SW	1.7	2.0	J	J	RepLimit-J
Chromium	A0B160474	L12SW-306-5001-SW	1.8	5.0	J	J	RepLimit-J
Chromium	A0B160474	L12SW-307-5003-SW	0.60	5.0	J	J	RepLimit-J
Chromium	A0B160474	L12SW-307-6033-FD	4.8	5.0	J	J	RepLimit-J
Chromium	A1D210402	L12sw-310-5819-SW	0.86	5.0	J	J	RepLimit-J
Chromium	A1D210402	L12sw-311-5821-SW	1.1	5.0	J	J	RepLimit-J
Chromium	A1D210402	L12sw-312-5823-SW	1.2	5.0	J	J	RepLimit-J
Chromium	A1D210402	L12sw-313-5825-SW	1.0	5.0	J	J	RepLimit-J
Cobalt	A0B160474	L12SW-306-5001-SW	2.7	5.0	J	J	RepLimit-J
Cobalt	A0B160474	L12SW-307-5003-SW	0.24	5.0	J	J	RepLimit-J
Cobalt	A0B160474	L12SW-307-6033-FD	2.0	5.0	J	J	RepLimit-J
Cobalt	A1D210402	L12sw-310-5819-SW	0.24	5.0	J	J	RepLimit-J
Cobalt	A1D210402	L12sw-311-5821-SW	0.27	5.0	J	J	RepLimit-J
Cobalt	A1D210402	L12sw-312-5823-SW	0.28	5.0	J	J	RepLimit-J
Cobalt	A1D210402	L12sw-313-5825-SW	0.19	5.0	J	J	RepLimit-J
Copper	A0B160474	L12SW-307-5003-SW	1.4	5.0	J	J	RepLimit-J
Copper	A1D210402	L12sw-310-5819-SW	2.4	5.0	J	J	RepLimit-J
Copper	A1D210402	L12sw-311-5821-SW	2.5	5.0	J	J	RepLimit-J
Copper	A1D210402	L12sw-312-5823-SW	2.6	5.0	J	J	RepLimit-J

Table C-5. Detailed Listing of Qualified Results for Samples from Load Line 12 (continued)

Chemical	Laboratory SDG	Sample ID	Results	Reporting Limit	Laboratory Qualifier[a]	Validation Qualifier[b]	Validation Code[c]
Copper	A1D210402	L12sw-313-5825-SW	2.5	5.0	J	J	RepLimit-J
Lead	A0B160474	L12SW-307-5003-SW	0.30	3.0	J	J	RepLimit-J
Lead	A1D210402	L12sw-310-5819-SW	0.46	3.0	J	J	RepLimit-J
Lead	A1D210402	L12sw-311-5821-SW	0.59	3.0	J	J	RepLimit-J
Lead	A1D210402	L12sw-312-5823-SW	0.51	3.0	J	J	RepLimit-J
Lead	A1D210402	L12sw-313-5825-SW	0.65	3.0	J	J	RepLimit-J
Nickel	A0B160474	L12SW-306-5001-SW	3.9	10.0	J	J	RepLimit-J
Nickel	A0B160474	L12SW-307-5003-SW	1.7	10.0	J	J	RepLimit-J
Nickel	A0B160474	L12SW-307-6033-FD	5.6	10.0	J	J	RepLimit-J
Nickel	A1D210402	L12sw-310-5819-SW	2.0	10.0	J	J	RepLimit-J
Nickel	A1D210402	L12sw-311-5821-SW	2.2	10.0	J	J	RepLimit-J
Nickel	A1D210402	L12sw-312-5823-SW	2.1	10.0	J	J	RepLimit-J
Nickel	A1D210402	L12sw-313-5825-SW	1.8	10.0	J	J	RepLimit-J
Selenium	A0B160474	L12SW-306-5001-SW	0.49	5.0	J	J	RepLimit-J
Selenium	A0B160474	L12SW-307-5003-SW	0.29	5.0	J	J	RepLimit-J
Selenium	A0B160474	L12SW-307-6033-FD	0.56	5.0	J	J	RepLimit-J
Selenium	A0B160474	L12SW-308-5005-SW	1.9	5.0	J	J	RepLimit-J
Selenium	A0B160474	L12SW-309-5007-SW	2.8	5.0	J	J	RepLimit-J
Selenium	A1D210402	L12sw-310-5819-SW	0.35	5.0	J	J	RepLimit-J
Selenium	A1D210402	L12sw-311-5821-SW	0.29	5.0	J	J	RepLimit-J
Selenium	A1D210402	L12sw-312-5823-SW	0.30	5.0	J	J	RepLimit-J
Selenium	A1D210402	L12sw-313-5825-SW	0.44	5.0	J	J	RepLimit-J
Silver	A0B160474	L12SW-306-5001-SW	0.13	5.0	J	UJ	RepLimit-J, CalBlk-U
Silver	A0B160474	L12SW-307-5003-SW	0.12	5.0	J	UJ	RepLimit-J, CalBlk-U
Silver	A0B160474	L12SW-307-6033-FD	0.29	5.0	J	J	RepLimit-J
Silver	A0B160474	L12SW-308-5005-SW	0.090	5.0	J	UJ	RepLimit-J, CalBlk-U
Silver	A0B160474	L12SW-309-5007-SW	0.16	5.0	J	UJ	RepLimit-J, CalBlk-U
Sodium	A1D210402	L12sw-313-5825-SW	940	1000	J	J	RepLimit-J
Vanadium	A0B160474	L12SW-306-5001-SW	2.5	10.0	J	J	RepLimit-J
Vanadium	A0B160474	L12SW-307-5003-SW	0.75	10.0	J	J	RepLimit-J
Vanadium	A0B160474	L12SW-307-6033-FD	7.3	10.0	J	J	RepLimit-J
Vanadium	A1D210402	L12sw-310-5819-SW	0.83	10.0	J	J	RepLimit-J
Vanadium	A1D210402	L12sw-311-5821-SW	1.1	10.0	J	J	RepLimit-J
Vanadium	A1D210402	L12sw-312-5823-SW	1.1	10.0	J	J	RepLimit-J
Vanadium	A1D210402	L12sw-313-5825-SW	1.2	10.0	J	J	RepLimit-J

Table C-5. Detailed Listing of Qualified Results for Samples from Load Line 12 (continued)

Chemical	Laboratory SDG	Sample ID	Results	Reporting Limit	Laboratory Qualifier[a]	Validation Qualifier[b]	Validation Code[c]
Zinc	A0B160474	L12SW-307-5003-SW	10.2	40.0	J	J	RepLimit-J
Zinc	A1D210402	L12sw-310-5819-SW	10.6	40.0	J	J	RepLimit-J
Zinc	A1D210402	L12sw-311-5821-SW	11.5	40.0	J	J	RepLimit-J
Zinc	A1D210402	L12sw-312-5823-SW	14.1	40.0	J	J	RepLimit-J
Zinc	A1D210402	L12sw-313-5825-SW	15.9	40.0	J	J	RepLimit-J
Explosives							
Sediment (mg/kg)							
2,4,6-Trinitrotoluene (TNT)	A0B160474	L12SD-306-5000-SD	0.11	0.25	J	J	RepLimit-J
2,4,6-Trinitrotoluene (TNT)	A1D210402	L12sd-310-5820-SD	0.15	0.25	J	J	RepLimit-J
2,4,6-Trinitrotoluene (TNT)	A1D210402	L12sd-311-5822-SD	0.18	0.25	J PG	J	RepLimit-J
2,4,6-Trinitrotoluene (TNT)	A1D210402	L12sd-312-5824-SD	0.035	0.25	J PG	J	RepLimit-J
Methyl-2,4,6-Trinitrophenylnitramine (Tetryl)	A0B160474	L12SD-306-5000-SD	0.25	0.25	U	UJ	CCV-UJ
Methyl-2,4,6-Trinitrophenylnitramine (Tetryl)	A0B160474	L12SD-307-5002-SD	0.24	0.24	U	UJ	CCV-UJ
Methyl-2,4,6-Trinitrophenylnitramine (Tetryl)	A0B160474	L12SD-308-5004-SD	0.25	0.25	U	UJ	CCV-UJ
Methyl-2,4,6-Trinitrophenylnitramine (Tetryl)	A0B160474	L12SD-309-5006-SD	0.24	0.24	U	UJ	CCV-UJ
Methyl-2,4,6-Trinitrophenylnitramine (Tetryl)	A0B160474	L12SD-309-6035-FD	0.24	0.24	U	UJ	CCV-UJ
Octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine (HMX)	A1D210402	L12sd-311-5822-SD	0.069	0.25	J	J	RepLimit-J
Octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine (HMX)	A1D210402	L12sd-312-5824-SD	0.019	0.25	J	J	RepLimit-J
Octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine (HMX)	A1D210402	L12sd-313-5826-SD	0.11	0.25	J	J	RepLimit-J
Surface Water (µg/L)							
1,3,5-Trinitrobenzene	A0B160474	L12SW-308-5005-SW	0.11	0.11	U	UJ	HT-UJ
1,3,5-Trinitrobenzene	A0B160474	L12SW-309-5007-SW	0.11	0.11	U	UJ	HT-UJ
1,3-Dinitrobenzene	A0B160474	L12SW-308-5005-SW	0.16	0.16	U	UJ	HT-UJ
1,3-Dinitrobenzene	A0B160474	L12SW-309-5007-SW	0.16	0.16	U	UJ	HT-UJ
2,4,6-Trinitrotoluene (TNT)	A0B160474	L12SW-308-5005-SW	0.16	0.16	U	UJ	HT-UJ
2,4,6-Trinitrotoluene (TNT)	A0B160474	L12SW-309-5007-SW	0.16	0.16	U	UJ	HT-UJ
2,4-Dinitrotoluene	A0B160474	L12SW-308-5005-SW	0.16	0.16	U	UJ	HT-UJ

Table C-5. Detailed Listing of Qualified Results for Samples from Load Line 12 (continued)

Chemical	Laboratory SDG	Sample ID	Results	Reporting Limit	Laboratory Qualifier[a]	Validation Qualifier[b]	Validation Code[c]
2,4-Dinitrotoluene	A0B160474	L12SW-309-5007-SW	0.16	0.16	U	UJ	HT-UJ
2,6-Dinitrotoluene	A0B160474	L12SW-308-5005-SW	0.16	0.16	U	UJ	HT-UJ
2,6-Dinitrotoluene	A0B160474	L12SW-309-5007-SW	0.16	0.16	U	UJ	HT-UJ
2-Amino-4,6-dinitrotoluene	A0B160474	L12SW-308-5005-SW	0.33	0.33	U	UJ	HT-UJ
2-Amino-4,6-dinitrotoluene	A0B160474	L12SW-309-5007-SW	0.32	0.32	U	UJ	HT-UJ
2-Nitrotoluene	A0B160474	L12SW-308-5005-SW	0.16	0.16	U	UJ	HT-UJ
2-Nitrotoluene	A0B160474	L12SW-309-5007-SW	0.16	0.16	U	UJ	HT-UJ
3-Nitrotoluene	A0B160474	L12SW-308-5005-SW	0.55	0.55	U	UJ	HT-UJ
3-Nitrotoluene	A0B160474	L12SW-309-5007-SW	0.53	0.53	U	UJ	HT-UJ
4-Amino-2,6-Dinitrotoluene	A0B160474	L12SW-308-5005-SW	0.16	0.16	U	UJ	HT-UJ
4-Amino-2,6-Dinitrotoluene	A0B160474	L12SW-309-5007-SW	0.16	0.16	U	UJ	HT-UJ
4-Amino-2,6-Dinitrotoluene	A1D210402	L12sw-311-5821-SW	0.054	0.15	J	J	RepLimit-J
4-Nitrotoluene	A0B160474	L12SW-308-5005-SW	1.1	1.1	U	UJ	HT-UJ
4-Nitrotoluene	A0B160474	L12SW-309-5007-SW	1.1	1.1	U	UJ	HT-UJ
Hexahydro-1,3,5-Trinitro-1,3,5-Triazine (RDX)	A0B160474	L12SW-307-6033-FD	0.070	0.26	J	J	RepLimit-J
Hexahydro-1,3,5-Trinitro-1,3,5-Triazine (RDX)	A0B160474	L12SW-308-5005-SW	0.28	0.28	U	UJ	HT-UJ
Hexahydro-1,3,5-Trinitro-1,3,5-Triazine (RDX)	A0B160474	L12SW-309-5007-SW	0.26	0.26	U	UJ	HT-UJ
Methyl-2,4,6-Trinitrophenylnitramine (Tetryl)	A0B160474	L12SW-306-5001-SW	0.16	0.16	U	UJ	CCV-UJ
Methyl-2,4,6-Trinitrophenylnitramine (Tetryl)	A0B160474	L12SW-307-5003-SW	0.16	0.16	U	UJ	CCV-UJ
Methyl-2,4,6-Trinitrophenylnitramine (Tetryl)	A0B160474	L12SW-307-6033-FD	0.16	0.16	U	UJ	CCV-UJ
Methyl-2,4,6-Trinitrophenylnitramine (Tetryl)	A0B160474	L12SW-308-5005-SW	0.16	0.16	U	UJ	HT-UJ
Methyl-2,4,6-Trinitrophenylnitramine (Tetryl)	A0B160474	L12SW-309-5007-SW	0.16	0.16	U	UJ	HT-UJ, CCV-UJ
Nitrobenzene	A0B160474	L12SW-308-5005-SW	0.16	0.16	U	UJ	HT-UJ
Nitrobenzene	A0B160474	L12SW-309-5007-SW	0.16	0.16	U	UJ	HT-UJ
Nitroglycerin	A0B160474	L12SW-308-5005-SW	1.1	1.1	U	UJ	HT-UJ
Nitroglycerin	A0B160474	L12SW-309-5007-SW	1.1	1.1	U	UJ	HT-UJ

Table C-5. Detailed Listing of Qualified Results for Samples from Load Line 12 (continued)

Chemical	Laboratory SDG	Sample ID	Results	Reporting Limit	Laboratory Qualifier[a]	Validation Qualifier[b]	Validation Code[c]
Octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine (HMX)	A0B160474	L12SW-308-5005-SW	0.16	0.16	U	UJ	HT-UJ
Octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine (HMX)	A0B160474	L12SW-309-5007-SW	0.16	0.16	U	UJ	HT-UJ
PETN	A0B160474	L12SW-306-5001-SW	1.0	1.1	J PG	J	RepLimit-J
PETN	A0B160474	L12SW-308-5005-SW	1.1	1.1	U	UJ	HT-UJ
PETN	A0B160474	L12SW-309-5007-SW	1.1	1.1	U	UJ	HT-UJ
Propellants							
Sediment (mg/kg)							
Nitrocellulose	A0B160474	L12SD-309-5006-SD	1.2	7.2	B J	UJ	MB-U, MS-J, RepLimit-J
Nitrocellulose	A0B160474	L12SD-309-6035-FD	7.0	7.0	U	UJ	MS-UJ
Surface Water (µg/L)							
Nitrocellulose	A0B160474	L12SW-307-5003-SW	0.15	0.50	B	J	RepLimit-J
PAHs							
Sediment (µg/kg)							
Anthracene	A1D210402	L12sd-310-5820-SD	72	72	U	UJ	MS-UJ
Benz(a)anthracene	A1D210402	L12sd-310-5820-SD	17	72	J	J	RepLimit-J
Benz(a)anthracene	A1D210402	L12sd-312-5824-SD	24	71	J	J	RepLimit-J
Benz(a)anthracene	A1D210402	L12sd-313-5826-SD	44	260	J	J	RepLimit-J
Benzo(a)pyrene	A1D210402	L12sd-310-5820-SD	20	72	J	J	MS-J, RepLimit-J
Benzo(a)pyrene	A1D210402	L12sd-312-5824-SD	27	71	J	J	RepLimit-J
Benzo(a)pyrene	A1D210402	L12sd-313-5826-SD	55	260	J	J	RepLimit-J
Benzo(b)fluoranthene	A1D210402	L12sd-310-5820-SD	31	72	J	J	RepLimit-J
Benzo(b)fluoranthene	A1D210402	L12sd-311-5822-SD	38	220	J	J	RepLimit-J
Benzo(b)fluoranthene	A1D210402	L12sd-312-5824-SD	46	71	J	J	RepLimit-J
Benzo(b)fluoranthene	A1D210402	L12sd-313-5826-SD	60	260	J	J	RepLimit-J
Benzo(ghi)perylene	A1D210402	L12sd-310-5820-SD	18	72	J	J	RepLimit-J
Benzo(ghi)perylene	A1D210402	L12sd-312-5824-SD	21	71	J	J	RepLimit-J
Benzo(ghi)perylene	A1D210402	L12sd-313-5826-SD	46	260	J	J	RepLimit-J
Benzo(k)fluoranthene	A1D210402	L12sd-310-5820-SD	15	72	J	J	RepLimit-J
Benzo(k)fluoranthene	A1D210402	L12sd-312-5824-SD	22	71	J	J	RepLimit-J
Benzo(k)fluoranthene	A1D210402	L12sd-313-5826-SD	58	260	J	J	RepLimit-J
Chrysene	A1D210402	L12sd-310-5820-SD	24	72	J	J	MS-J, RepLimit-J
Chrysene	A1D210402	L12sd-312-5824-SD	34	71	J	J	RepLimit-J
Chrysene	A1D210402	L12sd-313-5826-SD	54	260	J	J	RepLimit-J

Table C-5. Detailed Listing of Qualified Results for Samples from Load Line 12 (continued)

Chemical	Laboratory SDG	Sample ID	Results	Reporting Limit	Laboratory Qualifier[a]	Validation Qualifier[b]	Validation Code[c]
Fluoranthene	A1D210402	L12sd-310-5820-SD	37	72	J	J	RepLimit-J
Fluoranthene	A1D210402	L12sd-311-5822-SD	48	220	J	J	RepLimit-J
Fluoranthene	A1D210402	L12sd-312-5824-SD	50	71	J	J	RepLimit-J
Fluoranthene	A1D210402	L12sd-313-5826-SD	94	260	J	J	RepLimit-J
Indeno(1,2,3-cd)pyrene	A1D210402	L12sd-310-5820-SD	15	72	J	J	RepLimit-J
Indeno(1,2,3-cd)pyrene	A1D210402	L12sd-312-5824-SD	21	71	J	J	RepLimit-J
Indeno(1,2,3-cd)pyrene	A1D210402	L12sd-313-5826-SD	43	260	J	J	RepLimit-J
Naphthalene	A1D210402	L12sd-312-5824-SD	30	71	J	J	RepLimit-J
Phenanthrene	A1D210402	L12sd-310-5820-SD	15	72	J	J	RepLimit-J
Phenanthrene	A1D210402	L12sd-312-5824-SD	29	71	J	J	RepLimit-J
Pyrene	A1D210402	L12sd-310-5820-SD	28	72	J	J	RepLimit-J
Pyrene	A1D210402	L12sd-311-5822-SD	35	220	J	J	RepLimit-J
Pyrene	A1D210402	L12sd-312-5824-SD	41	71	J	J	RepLimit-J
Pyrene	A1D210402	L12sd-313-5826-SD	73	260	J	J	RepLimit-J
Surface Water (µg/L)							
Fluoranthene	A1D210402	L12sw-313-5825-SW	0.33	10	J	J	RepLimit-J
Pyrene	A1D210402	L12sw-313-5825-SW	0.30	10	J	J	RepLimit-J
SVOCs							
Sediment (µg/kg)							
2-Methylnaphthalene	A0B160474	L12SD-306-5000-SD	57	700	J	J	RepLimit-J
2-Methylnaphthalene	A0B160474	L12SD-307-5002-SD	700	820	J	J	RepLimit-J
2-Methylnaphthalene	A0B160474	L12SD-308-5004-SD	41	730	J	J	RepLimit-J
2-Methylnaphthalene	A0B160474	L12SD-309-5006-SD	10	480	J	J	RepLimit-J
2-Methylnaphthalene	A0B160474	L12SD-309-6035-FD	11	460	J	J	RepLimit-J
2-Methylnaphthalene	A1D210402	L12sd-312-5824-SD	54	470	J	J	RepLimit-J
3,3'-Dichlorobenzidine	A0B160474	L12SD-306-5000-SD	700	700	U	UJ	MS-UJ
3,3'-Dichlorobenzidine	A1D210402	L12sd-310-5820-SD	480	480	U	UJ	MS-UJ
3-Nitroaniline	A1D210402	L12sd-310-5820-SD	1200	1200	U	UJ	MS-UJ
3-methylphenol/4-methylphenol	A0B160474	L12SD-307-5002-SD	73	820	J	J	RepLimit-J
4-Chloroaniline	A1D210402	L12sd-310-5820-SD	480	480	U	UJ	MS-UJ
4-Chlorophenyl phenyl ether	A1D210402	L12sd-310-5820-SD	480	480	U	UJ	MS-UJ, LCS-UJ
4-Chlorophenyl phenyl ether	A1D210402	L12sd-311-5822-SD	1400	1400	U	UJ	LCS-UJ
4-Chlorophenyl phenyl ether	A1D210402	L12sd-312-5824-SD	470	470	U	UJ	LCS-UJ
4-Chlorophenyl phenyl ether	A1D210402	L12sd-313-5826-SD	1700	1700	U	UJ	LCS-UJ
4-Nitroaniline	A1D210402	L12sd-310-5820-SD	1200	1200	U	UJ	MS-UJ

Table C-5. Detailed Listing of Qualified Results for Samples from Load Line 12 (continued)

Chemical	Laboratory SDG	Sample ID	Results	Reporting Limit	Laboratory Qualifier[a]	Validation Qualifier[b]	Validation Code[c]
Acenaphthene	A0B160474	L12SD-306-5000-SD	22	110	J	J	RepLimit-J
Acenaphthene	A0B160474	L12SD-308-5004-SD	30	110	J	J	RepLimit-J
Acenaphthylene	A0B160474	L12SD-306-5000-SD	35	110	J	J	RepLimit-J
Acenaphthylene	A0B160474	L12SD-308-5004-SD	61	110	J	J	RepLimit-J
Anthracene	A0B160474	L12SD-306-5000-SD	52	110	J	J	RepLimit-J
Anthracene	A0B160474	L12SD-308-5004-SD	78	110	J	J	RepLimit-J
Anthracene	A0B160474	L12SD-309-6035-FD	9.6	70	J	J	RepLimit-J
Benz(a)anthracene	A0B160474	L12SD-307-5002-SD	26	120	J	J	RepLimit-J
Benz(a)anthracene	A0B160474	L12SD-309-5006-SD	44	72	J	J	RepLimit-J
Benz(a)anthracene	A0B160474	L12SD-309-6035-FD	34	70	J	J	RepLimit-J
Benzo(a)pyrene	A0B160474	L12SD-307-5002-SD	21	120	J	J	RepLimit-J
Benzo(a)pyrene	A0B160474	L12SD-309-5006-SD	60	72	J	J	RepLimit-J
Benzo(a)pyrene	A0B160474	L12SD-309-6035-FD	42	70	J	J	RepLimit-J
Benzo(b)fluoranthene	A0B160474	L12SD-307-5002-SD	30	120	J	J	RepLimit-J
Benzo(ghi)perylene	A0B160474	L12SD-309-5006-SD	57	72	J	J	RepLimit-J
Benzo(ghi)perylene	A0B160474	L12SD-309-6035-FD	38	70	J	J	RepLimit-J
Benzo(k)fluoranthene	A0B160474	L12SD-309-5006-SD	42	72	J	J	RepLimit-J
Benzo(k)fluoranthene	A0B160474	L12SD-309-6035-FD	25	70	J	J	RepLimit-J
Butyl benzyl phthalate	A0B160474	L12SD-309-5006-SD	23	480	J	J	RepLimit-J
Chrysene	A0B160474	L12SD-307-5002-SD	30	120	J	J	RepLimit-J
Chrysene	A0B160474	L12SD-309-5006-SD	63	72	J	J	RepLimit-J
Chrysene	A0B160474	L12SD-309-6035-FD	43	70	J	J	RepLimit-J
Dibenzofuran	A0B160474	L12SD-306-5000-SD	46	700	J	J	RepLimit-J
Dibenzofuran	A0B160474	L12SD-307-5002-SD	130	820	J	J	RepLimit-J
Dibenzofuran	A1D210402	L12sd-312-5824-SD	12	470	J	J	RepLimit-J
Fluoranthene	A0B160474	L12SD-306-5000-SD	380	110	--	J	MS-J
Fluoranthene	A0B160474	L12SD-307-5002-SD	36	120	J	J	RepLimit-J
Fluoranthene	A0B160474	L12SD-309-6035-FD	62	70	J	J	RepLimit-J
Fluorene	A0B160474	L12SD-306-5000-SD	17	110	J	J	RepLimit-J
Fluorene	A0B160474	L12SD-308-5004-SD	24	110	J	J	RepLimit-J
Hexachlorocyclopentadiene	A0B160474	L12SD-306-5000-SD	700	700	U	UJ	MS-UJ
Hexachloroethane	A0B160474	L12SD-306-5000-SD	700	700	U	UJ	MS-UJ
Indeno(1,2,3-cd)pyrene	A0B160474	L12SD-309-5006-SD	49	72	J	J	RepLimit-J
Indeno(1,2,3-cd)pyrene	A0B160474	L12SD-309-6035-FD	33	70	J	J	RepLimit-J
N-Nitrosodiphenylamine	A1D210402	L12sd-310-5820-SD	480	480	U	UJ	MS-UJ

Table C-5. Detailed Listing of Qualified Results for Samples from Load Line 12 (continued)

Chemical	Laboratory SDG	Sample ID	Results	Reporting Limit	Laboratory Qualifier[a]	Validation Qualifier[b]	Validation Code[c]
Naphthalene	A0B160474	L12SD-306-5000-SD	44	110	J	J	RepLimit-J
Naphthalene	A0B160474	L12SD-308-5004-SD	33	110	J	J	RepLimit-J
Phenanthrene	A0B160474	L12SD-309-5006-SD	30	72	J	J	RepLimit-J
Phenanthrene	A0B160474	L12SD-309-6035-FD	26	70	J	J	RepLimit-J
Pyrene	A0B160474	L12SD-307-5002-SD	35	120	J	J	RepLimit-J
Pyrene	A0B160474	L12SD-309-5006-SD	68	72	J	J	RepLimit-J
Pyrene	A0B160474	L12SD-309-6035-FD	49	70	J	J	RepLimit-J
bis(2-Ethylhexyl) phthalate	A0B160474	L12SD-306-5000-SD	43	700	J	J	RepLimit-J
bis(2-Ethylhexyl) phthalate	A0B160474	L12SD-307-5002-SD	63	820	J	J	RepLimit-J
bis(2-Ethylhexyl) phthalate	A1D210402	L12sd-310-5820-SD	28	480	J	J	RepLimit-J
bis(2-Ethylhexyl) phthalate	A1D210402	L12sd-311-5822-SD	200	1400	J	J	RepLimit-J
bis(2-Ethylhexyl) phthalate	A1D210402	L12sd-312-5824-SD	75	470	J	J	RepLimit-J
bis(2-Ethylhexyl) phthalate	A1D210402	L12sd-313-5826-SD	220	1700	J	J	RepLimit-J
Dibenz(a,h)anthracene	A0B160474	L12SD-306-5000-SD	42	110	J	J	RepLimit-J
Dibenz(a,h)anthracene	A0B160474	L12SD-308-5004-SD	85	110	J	J	RepLimit-J
Dibenz(a,h)anthracene	A0B160474	L12SD-309-5006-SD	12	72	J	J	RepLimit-J
Surface Water (µg/L)							
1,2,4-Trichlorobenzene	A0B160474	L12SW-309-5007-SW	10	10	U	UJ	HT-UJ
1,2-Dichlorobenzene	A0B160474	L12SW-309-5007-SW	10	10	U	UJ	HT-UJ
1,3-Dichlorobenzene	A0B160474	L12SW-309-5007-SW	10	10	U	UJ	HT-UJ
1,4-Dichlorobenzene	A0B160474	L12SW-309-5007-SW	10	10	U	UJ	HT-UJ
2,4,5-Trichlorophenol	A0B160474	L12SW-309-5007-SW	10	10	U	UJ	HT-UJ
2,4,6-Trichlorophenol	A0B160474	L12SW-309-5007-SW	10	10	U	UJ	HT-UJ
2,4-Dichlorophenol	A0B160474	L12SW-309-5007-SW	10	10	U	UJ	HT-UJ
2,4-Dimethylphenol	A0B160474	L12SW-309-5007-SW	10	10	U	UJ	HT-UJ
2,4-Dinitrophenol	A0B160474	L12SW-309-5007-SW	25	25	U	UJ	HT-UJ
2,4-Dinitrotoluene	A0B160474	L12SW-309-5007-SW	10	10	U	UJ	HT-UJ
2,6-Dinitrotoluene	A0B160474	L12SW-309-5007-SW	10	10	U	UJ	HT-UJ
2-Chloronaphthalene	A0B160474	L12SW-309-5007-SW	10	10	U	UJ	HT-UJ
2-Chlorophenol	A0B160474	L12SW-309-5007-SW	10	10	U	UJ	HT-UJ
2-Methylnaphthalene	A0B160474	L12SW-309-5007-SW	10	10	U	UJ	HT-UJ
2-Methylphenol	A0B160474	L12SW-309-5007-SW	10	10	U	UJ	HT-UJ
2-Nitroaniline	A0B160474	L12SW-309-5007-SW	25	25	U	UJ	HT-UJ
2-Nitrophenol	A0B160474	L12SW-309-5007-SW	10	10	U	UJ	HT-UJ
3,3'-Dichlorobenzidine	A0B160474	L12SW-308-5005-SW	10	10	U	UJ	MS-UJ

Table C-5. Detailed Listing of Qualified Results for Samples from Load Line 12 (continued)

Chemical	Laboratory SDG	Sample ID	Results	Reporting Limit	Laboratory Qualifier[a]	Validation Qualifier[b]	Validation Code[c]
3,3'-Dichlorobenzidine	A0B160474	L12SW-309-5007-SW	10	10	U	UJ	HT-UJ
3-Nitroaniline	A0B160474	L12SW-309-5007-SW	25	25	U	UJ	HT-UJ
3-methylphenol/4-methylphenol	A0B160474	L12SW-309-5007-SW	10	10	U	UJ	HT-UJ
4,6-Dinitro-2-methylphenol	A0B160474	L12SW-309-5007-SW	25	25	U	UJ	HT-UJ
4-Bromophenyl phenyl ether	A0B160474	L12SW-309-5007-SW	10	10	U	UJ	HT-UJ
4-Chloro-3-methylphenol	A0B160474	L12SW-309-5007-SW	10	10	U	UJ	HT-UJ
4-Chloroaniline	A0B160474	L12SW-309-5007-SW	10	10	U	UJ	HT-UJ
4-Chlorophenyl phenyl ether	A0B160474	L12SW-309-5007-SW	10	10	U	UJ	HT-UJ
4-Chlorophenyl phenyl ether	A1D210402	L12sw-310-5819-SW	10	10	U	UJ	LCS-UJ
4-Chlorophenyl phenyl ether	A1D210402	L12sw-311-5821-SW	10	10	U	UJ	LCS-UJ
4-Chlorophenyl phenyl ether	A1D210402	L12sw-312-5823-SW	10	10	U	UJ	LCS-UJ
4-Chlorophenyl phenyl ether	A1D210402	L12sw-313-5825-SW	10	10	U	UJ	LCS-UJ
4-Nitroaniline	A0B160474	L12SW-309-5007-SW	25	25	U	UJ	HT-UJ
4-Nitrophenol	A0B160474	L12SW-309-5007-SW	25	25	U	UJ	HT-UJ
Acenaphthene	A0B160474	L12SW-309-5007-SW	10	10	U	UJ	HT-UJ
Acenaphthylene	A0B160474	L12SW-309-5007-SW	10	10	U	UJ	HT-UJ
Anthracene	A0B160474	L12SW-309-5007-SW	10	10	U	UJ	HT-UJ
Benz(a)anthracene	A0B160474	L12SW-308-5005-SW	0.24	10	J	J	RepLimit-J
Benz(a)anthracene	A0B160474	L12SW-309-5007-SW	10	10	U	UJ	HT-UJ
Benzo(a)pyrene	A0B160474	L12SW-308-5005-SW	0.22	10	J	J	RepLimit-J
Benzo(a)pyrene	A0B160474	L12SW-309-5007-SW	10	10	U	UJ	HT-UJ
Benzo(b)fluoranthene	A0B160474	L12SW-308-5005-SW	0.32	10	J	J	RepLimit-J
Benzo(b)fluoranthene	A0B160474	L12SW-309-5007-SW	10	10	U	UJ	HT-UJ
Benzo(ghi)perylene	A0B160474	L12SW-309-5007-SW	10	10	U	UJ	HT-UJ
Benzo(k)fluoranthene	A0B160474	L12SW-309-5007-SW	10	10	U	UJ	HT-UJ
Benzoic acid	A0B160474	L12SW-309-5007-SW	25	25	U	UJ	HT-UJ
Benzyl alcohol	A0B160474	L12SW-308-5005-SW	10	10	J B	UJ	MB-U, RepLimit-J
Benzyl alcohol	A0B160474	L12SW-309-5007-SW	10	10	U	UJ	HT-UJ
Bis(2-chloroisopropyl) ether	A0B160474	L12SW-309-5007-SW	10	10	U	UJ	HT-UJ
Butyl benzyl phthalate	A0B160474	L12SW-309-5007-SW	10	10	U	UJ	HT-UJ
Carbazole	A0B160474	L12SW-309-5007-SW	10	10	U	UJ	HT-UJ
Chrysene	A0B160474	L12SW-308-5005-SW	0.22	10	J	J	RepLimit-J
Chrysene	A0B160474	L12SW-309-5007-SW	10	10	U	UJ	HT-UJ
Di-n-butyl phthalate	A0B160474	L12SW-309-5007-SW	10	10	U	UJ	HT-UJ
Di-n-octyl phthalate	A0B160474	L12SW-309-5007-SW	10	10	U	UJ	HT-UJ

Table C-5. Detailed Listing of Qualified Results for Samples from Load Line 12 (continued)

Chemical	Laboratory SDG	Sample ID	Results	Reporting Limit	Laboratory Qualifier[a]	Validation Qualifier[b]	Validation Code[c]
Dibenzofuran	A0B160474	L12SW-309-5007-SW	10	10	U	UJ	HT-UJ
Diethyl phthalate	A0B160474	L12SW-309-5007-SW	10	10	U	UJ	HT-UJ
Dimethyl phthalate	A0B160474	L12SW-309-5007-SW	10	10	U	UJ	HT-UJ
Fluoranthene	A0B160474	L12SW-308-5005-SW	0.46	10	J	J	RepLimit-J
Fluoranthene	A0B160474	L12SW-309-5007-SW	10	10	U	UJ	HT-UJ
Fluorene	A0B160474	L12SW-309-5007-SW	10	10	U	UJ	HT-UJ
Hexachlorocyclopentadiene	A0B160474	L12SW-309-5007-SW	10	10	U	UJ	HT-UJ
Hexachlorobenzene	A0B160474	L12SW-309-5007-SW	10	10	U	UJ	HT-UJ
Hexachlorobutadiene	A0B160474	L12SW-309-5007-SW	10	10	U	UJ	HT-UJ
Hexachloroethane	A0B160474	L12SW-309-5007-SW	10	10	U	UJ	HT-UJ
Indeno(1,2,3-cd)pyrene	A0B160474	L12SW-309-5007-SW	10	10	U	UJ	HT-UJ
Isophorone	A0B160474	L12SW-309-5007-SW	10	10	U	UJ	HT-UJ
N-Nitrosodi-n-propylamine	A0B160474	L12SW-309-5007-SW	10	10	U	UJ	HT-UJ
N-Nitrosodiphenylamine	A0B160474	L12SW-309-5007-SW	10	10	U	UJ	HT-UJ
Naphthalene	A0B160474	L12SW-309-5007-SW	10	10	U	UJ	HT-UJ
Nitrobenzene	A0B160474	L12SW-309-5007-SW	10	10	U	UJ	HT-UJ
Pentachlorophenol	A0B160474	L12SW-309-5007-SW	10	10	U	UJ	HT-UJ
Phenanthrene	A0B160474	L12SW-309-5007-SW	10	10	U	UJ	HT-UJ
Phenol	A0B160474	L12SW-309-5007-SW	10	10	U	UJ	HT-UJ
Pyrene	A0B160474	L12SW-308-5005-SW	0.33	10	J	J	RepLimit-J
Pyrene	A0B160474	L12SW-309-5007-SW	10	10	U	UJ	HT-UJ
bis(2-Chloroethoxy)methane	A0B160474	L12SW-309-5007-SW	10	10	U	UJ	HT-UJ
bis(2-Chloroethyl) ether	A0B160474	L12SW-309-5007-SW	10	10	U	UJ	HT-UJ
bis(2-Ethylhexyl) phthalate	A0B160474	L12SW-308-5005-SW	1.1	10	J	J	RepLimit-J
bis(2-Ethylhexyl) phthalate	A0B160474	L12SW-309-5007-SW	10	10	J B	UJ	HT-J, MB-U, RepLimit-J
Dibenz(a,h)anthracene	A0B160474	L12SW-309-5007-SW	10	10	U	UJ	HT-UJ
Pesticides							
Sediment (µg/kg)							
4,4'-DDD	A0B160474	L12SD-309-5006-SD	14	14	U	UJ	CCV-UJ
4,4'-DDD	A0B160474	L12SD-309-6035-FD	14	14	U	UJ	CCV-UJ
4,4'-DDE	A0B160474	L12SD-309-5006-SD	12	12	U	UJ	CCV-UJ
4,4'-DDE	A0B160474	L12SD-309-6035-FD	12	12	U	UJ	CCV-UJ
Dieldrin	A0B160474	L12SD-309-5006-SD	12	12	U	UJ	CCV-UJ
Dieldrin	A0B160474	L12SD-309-6035-FD	12	12	U	UJ	CCV-UJ
Endosulfan I	A0B160474	L12SD-309-5006-SD	12	12	U	UJ	CCV-UJ

Table C-5. Detailed Listing of Qualified Results for Samples from Load Line 12 (continued)

Chemical	Laboratory SDG	Sample ID	Results	Reporting Limit	Laboratory Qualifier[a]	Validation Qualifier[b]	Validation Code[c]
Endosulfan I	A0B160474	L12SD-309-6035-FD	12	12	U	UJ	CCV-UJ
Endosulfan II	A0B160474	L12SD-309-5006-SD	18	18	U	UJ	CCV-UJ
Endosulfan II	A0B160474	L12SD-309-6035-FD	18	18	U	UJ	CCV-UJ
Endrin	A0B160474	L12SD-309-5006-SD	12	12	U	UJ	CCV-UJ
Endrin	A0B160474	L12SD-309-6035-FD	12	12	U	UJ	CCV-UJ
Heptachlor	A0B160474	L12SD-309-5006-SD	25	25	U	UJ	CCV-UJ
Heptachlor	A0B160474	L12SD-309-6035-FD	25	25	U	UJ	CCV-UJ
Heptachlor epoxide	A0B160474	L12SD-309-5006-SD	18	18	U	UJ	MS-UJ
Heptachlor epoxide	A0B160474	L12SD-309-6035-FD	18	18	U	UJ	CCV-UJ
Surface Water (µg/L)							
4,4'-DDD	A0B160474	L12SW-308-5005-SW	0.050	0.050	U	UJ	Surr-UJ
4,4'-DDD	A0B160474	L12SW-309-5007-SW	0.050	0.050	U	UJ	Surr-UJ
4,4'-DDE	A0B160474	L12SW-308-5005-SW	0.050	0.050	U	UJ	Surr-UJ
4,4'-DDE	A0B160474	L12SW-309-5007-SW	0.050	0.050	U	UJ	Surr-UJ
4,4'-DDT	A0B160474	L12SW-308-5005-SW	0.050	0.050	U	UJ	Surr-UJ, MS-UJ
4,4'-DDT	A0B160474	L12SW-309-5007-SW	0.050	0.050	U	UJ	Surr-UJ
Aldrin	A0B160474	L12SW-308-5005-SW	0.050	0.050	U	UJ	Surr-UJ
Aldrin	A0B160474	L12SW-309-5007-SW	0.050	0.050	U	UJ	Surr-UJ
Dieldrin	A0B160474	L12SW-308-5005-SW	0.050	0.050	U	UJ	Surr-UJ
Dieldrin	A0B160474	L12SW-309-5007-SW	0.050	0.050	U	UJ	Surr-UJ
Endosulfan I	A0B160474	L12SW-308-5005-SW	0.050	0.050	U	UJ	Surr-UJ
Endosulfan I	A0B160474	L12SW-309-5007-SW	0.050	0.050	U	UJ	Surr-UJ
Endosulfan II	A0B160474	L12SW-308-5005-SW	0.050	0.050	U	UJ	Surr-UJ
Endosulfan II	A0B160474	L12SW-309-5007-SW	0.050	0.050	U	UJ	Surr-UJ
Endosulfan sulfate	A0B160474	L12SW-308-5005-SW	0.050	0.050	U	UJ	Surr-UJ
Endosulfan sulfate	A0B160474	L12SW-309-5007-SW	0.050	0.050	U	UJ	Surr-UJ
Endrin	A0B160474	L12SW-308-5005-SW	0.050	0.050	U	UJ	Surr-UJ
Endrin	A0B160474	L12SW-309-5007-SW	0.050	0.050	U	UJ	Surr-UJ
Endrin aldehyde	A0B160474	L12SW-308-5005-SW	0.050	0.050	U	UJ	Surr-UJ
Endrin aldehyde	A0B160474	L12SW-309-5007-SW	0.050	0.050	U	UJ	Surr-UJ
Endrin ketone	A0B160474	L12SW-308-5005-SW	0.050	0.050	U	UJ	Surr-UJ
Endrin ketone	A0B160474	L12SW-309-5007-SW	0.050	0.050	U	UJ	Surr-UJ
Heptachlor	A0B160474	L12SW-308-5005-SW	0.050	0.050	U	UJ	Surr-UJ
Heptachlor	A0B160474	L12SW-309-5007-SW	0.050	0.050	U	UJ	Surr-UJ
Heptachlor epoxide	A0B160474	L12SW-308-5005-SW	0.050	0.050	U	UJ	Surr-UJ

Table C-5. Detailed Listing of Qualified Results for Samples from Load Line 12 (continued)

Chemical	Laboratory SDG	Sample ID	Results	Reporting Limit	Laboratory Qualifier[a]	Validation Qualifier[b]	Validation Code[c]
Heptachlor epoxide	A0B160474	L12SW-309-5007-SW	0.050	0.050	U	UJ	Surr-UJ
Methoxychlor	A0B160474	L12SW-308-5005-SW	0.10	0.10	U	UJ	Surr-UJ
Methoxychlor	A0B160474	L12SW-309-5007-SW	0.10	0.10	U	UJ	Surr-UJ
Methoxychlor	A1D210402	L12sw-310-5819-SW	0.10	0.10	U	UJ	CCV-UJ, CCV-U
Methoxychlor	A1D210402	L12sw-311-5821-SW	0.10	0.10	U	UJ	CCV-UJ, CCV-U
Methoxychlor	A1D210402	L12sw-312-5823-SW	0.10	0.10	U	UJ	CCV-UJ, CCV-U
Toxaphene	A0B160474	L12SW-308-5005-SW	2.0	2.0	U	UJ	Surr-UJ
Toxaphene	A0B160474	L12SW-309-5007-SW	2.0	2.0	U	UJ	Surr-UJ
alpha-BHC	A0B160474	L12SW-308-5005-SW	0.050	0.050	U	UJ	Surr-UJ
alpha-BHC	A0B160474	L12SW-309-5007-SW	0.050	0.050	U	UJ	Surr-UJ
alpha-Chordane	A0B160474	L12SW-308-5005-SW	0.050	0.050	U	UJ	Surr-UJ, MS-UJ
alpha-Chordane	A0B160474	L12SW-309-5007-SW	0.050	0.050	U	UJ	Surr-UJ
beta-BHC	A0B160474	L12SW-308-5005-SW	0.050	0.050	U	UJ	Surr-UJ
beta-BHC	A0B160474	L12SW-309-5007-SW	0.050	0.050	U	UJ	Surr-UJ
beta-BHC	A1D210402	L12sw-310-5819-SW	0.050	0.050	U	UJ	MS-UJ
delta-BHC	A0B160474	L12SW-307-5003-SW	0.067	0.10	J	J	RepLimit-J
delta-BHC	A0B160474	L12SW-308-5005-SW	0.014	0.050	J	J	Surr-J, RepLimit-J
delta-BHC	A0B160474	L12SW-309-5007-SW	0.050	0.050	U	UJ	Surr-UJ
gamma-BHC (Lindane)	A0B160474	L12SW-308-5005-SW	0.050	0.050	U	UJ	Surr-UJ
gamma-BHC (Lindane)	A0B160474	L12SW-309-5007-SW	0.050	0.050	U	UJ	Surr-UJ
gamma-Chlordane	A0B160474	L12SW-308-5005-SW	0.050	0.050	U	UJ	Surr-UJ
gamma-Chlordane	A0B160474	L12SW-309-5007-SW	0.050	0.050	U	UJ	Surr-UJ
PCBs							
Sediment (µg/kg)							
Aroclor 1254	A1D210402	L12sd-310-5820-SD	27	48	J	J	RepLimit-J
Aroclor 1260	A0B160474	L12SD-306-5000-SD	70	70	U	UJ	MS-UJ
Surface Water (µg/L)							
Aroclor 1016	A0B160474	L12SW-306-5001-SW	0.50	0.50	U	UJ	Surr-UJ
Aroclor 1016	A0B160474	L12SW-307-5003-SW	0.50	0.50	U	UJ	Surr-UJ
Aroclor 1016	A0B160474	L12SW-308-5005-SW	0.50	0.50	U	R	Surr-R
Aroclor 1016	A0B160474	L12SW-309-5007-SW	0.50	0.50	U	UJ	Surr-UJ
Aroclor 1016	A1D210402	L12sw-310-5819-SW	0.50	0.50	U	UJ	Surr-UJ
Aroclor 1016	A1D210402	L12sw-311-5821-SW	0.50	0.50	U	UJ	Surr-UJ
Aroclor 1016	A1D210402	L12sw-312-5823-SW	0.50	0.50	U	UJ	Surr-UJ
Aroclor 1016	A1D210402	L12sw-313-5825-SW	0.50	0.50	U	UJ	Surr-UJ

Table C-5. Detailed Listing of Qualified Results for Samples from Load Line 12 (continued)

Chemical	Laboratory SDG	Sample ID	Results	Reporting Limit	Laboratory Qualifier[a]	Validation Qualifier[b]	Validation Code[c]
Aroclor 1221	A0B160474	L12SW-306-5001-SW	0.50	0.50	U	UJ	Surr-UJ
Aroclor 1221	A0B160474	L12SW-307-5003-SW	0.50	0.50	U	UJ	Surr-UJ
Aroclor 1221	A0B160474	L12SW-308-5005-SW	0.50	0.50	U	R	Surr-R
Aroclor 1221	A0B160474	L12SW-309-5007-SW	0.50	0.50	U	UJ	Surr-UJ
Aroclor 1221	A1D210402	L12sw-310-5819-SW	0.50	0.50	U	UJ	Surr-UJ
Aroclor 1221	A1D210402	L12sw-311-5821-SW	0.50	0.50	U	UJ	Surr-UJ
Aroclor 1221	A1D210402	L12sw-312-5823-SW	0.50	0.50	U	UJ	Surr-UJ
Aroclor 1221	A1D210402	L12sw-313-5825-SW	0.50	0.50	U	UJ	Surr-UJ
Aroclor 1232	A0B160474	L12SW-306-5001-SW	0.50	0.50	U	UJ	Surr-UJ
Aroclor 1232	A0B160474	L12SW-307-5003-SW	0.50	0.50	U	UJ	Surr-UJ
Aroclor 1232	A0B160474	L12SW-308-5005-SW	0.50	0.50	U	R	Surr-R
Aroclor 1232	A0B160474	L12SW-309-5007-SW	0.50	0.50	U	UJ	Surr-UJ
Aroclor 1232	A1D210402	L12sw-310-5819-SW	0.50	0.50	U	UJ	Surr-UJ
Aroclor 1232	A1D210402	L12sw-311-5821-SW	0.50	0.50	U	UJ	Surr-UJ
Aroclor 1232	A1D210402	L12sw-312-5823-SW	0.50	0.50	U	UJ	Surr-UJ
Aroclor 1232	A1D210402	L12sw-313-5825-SW	0.50	0.50	U	UJ	Surr-UJ
Aroclor 1242	A0B160474	L12SW-306-5001-SW	0.50	0.50	U	UJ	Surr-UJ
Aroclor 1242	A0B160474	L12SW-307-5003-SW	0.50	0.50	U	UJ	Surr-UJ
Aroclor 1242	A0B160474	L12SW-308-5005-SW	0.50	0.50	U	R	Surr-R
Aroclor 1242	A0B160474	L12SW-309-5007-SW	0.50	0.50	U	UJ	Surr-UJ
Aroclor 1242	A1D210402	L12sw-310-5819-SW	0.50	0.50	U	UJ	Surr-UJ
Aroclor 1242	A1D210402	L12sw-311-5821-SW	0.50	0.50	U	UJ	Surr-UJ
Aroclor 1242	A1D210402	L12sw-312-5823-SW	0.50	0.50	U	UJ	Surr-UJ
Aroclor 1242	A1D210402	L12sw-313-5825-SW	0.50	0.50	U	UJ	Surr-UJ
Aroclor 1248	A0B160474	L12SW-306-5001-SW	0.50	0.50	U	UJ	Surr-UJ
Aroclor 1248	A0B160474	L12SW-307-5003-SW	0.50	0.50	U	UJ	Surr-UJ
Aroclor 1248	A0B160474	L12SW-308-5005-SW	0.50	0.50	U	R	Surr-R
Aroclor 1248	A0B160474	L12SW-309-5007-SW	0.50	0.50	U	UJ	Surr-UJ
Aroclor 1248	A1D210402	L12sw-310-5819-SW	0.50	0.50	U	UJ	Surr-UJ
Aroclor 1248	A1D210402	L12sw-311-5821-SW	0.50	0.50	U	UJ	Surr-UJ
Aroclor 1248	A1D210402	L12sw-312-5823-SW	0.50	0.50	U	UJ	Surr-UJ
Aroclor 1248	A1D210402	L12sw-313-5825-SW	0.50	0.50	U	UJ	Surr-UJ
Aroclor 1254	A0B160474	L12SW-306-5001-SW	0.50	0.50	U	UJ	Surr-UJ
Aroclor 1254	A0B160474	L12SW-307-5003-SW	0.50	0.50	U	UJ	Surr-UJ
Aroclor 1254	A0B160474	L12SW-308-5005-SW	0.50	0.50	U	R	Surr-R

Table C-5. Detailed Listing of Qualified Results for Samples from Load Line 12 (continued)

Chemical	Laboratory SDG	Sample ID	Results	Reporting Limit	Laboratory Qualifier[a]	Validation Qualifier[b]	Validation Code[c]
Aroclor 1254	A0B160474	L12SW-309-5007-SW	0.50	0.50	U	UJ	Surr-UJ
Aroclor 1254	A1D210402	L12sw-310-5819-SW	0.50	0.50	U	UJ	Surr-UJ
Aroclor 1254	A1D210402	L12sw-311-5821-SW	0.50	0.50	U	UJ	Surr-UJ
Aroclor 1254	A1D210402	L12sw-312-5823-SW	0.50	0.50	U	UJ	Surr-UJ
Aroclor 1254	A1D210402	L12sw-313-5825-SW	0.50	0.50	U	UJ	Surr-UJ
Aroclor 1260	A0B160474	L12SW-306-5001-SW	0.50	0.50	U	UJ	Surr-UJ
Aroclor 1260	A0B160474	L12SW-307-5003-SW	0.50	0.50	U	UJ	Surr-UJ
Aroclor 1260	A0B160474	L12SW-308-5005-SW	0.50	0.50	U	R	Surr-R
Aroclor 1260	A0B160474	L12SW-309-5007-SW	0.50	0.50	U	UJ	Surr-UJ
Aroclor 1260	A1D210402	L12sw-310-5819-SW	0.50	0.50	U	UJ	Surr-UJ
Aroclor 1260	A1D210402	L12sw-311-5821-SW	0.50	0.50	U	UJ	Surr-UJ
Aroclor 1260	A1D210402	L12sw-312-5823-SW	0.50	0.50	U	UJ	Surr-UJ
Aroclor 1260	A1D210402	L12sw-313-5825-SW	0.50	0.50	U	UJ	Surr-UJ
VOCs							
Sediment (µg/kg)							
2-Butanone (MEK)	A0B160474	L12SD-309-5006-SD	29	29	J B	UJ	MB-U, RepLimit-J
2-Butanone (MEK)	A0B160474	L12SD-309-6035-FD	28	28	J B	UJ	MB-U, RepLimit-J
Acetone	A0B160474	L12SD-309-5006-SD	37	29	B	U	MB-U, FldQC-U
Acetone	A0B160474	L12SD-309-6035-FD	49	28	B	U	MB-U, FldQC-U
Carbon tetrachloride	A0B160474	L12SD-309-5006-SD	7.2	7.2	U	UJ	CCV-UJ
Carbon tetrachloride	A0B160474	L12SD-309-6035-FD	7.0	7.0	U	UJ	CCV-UJ
Toluene	A0B160474	L12SD-309-5006-SD	7.2	7.2	J B	UJ	MB-U, RepLimit-J
Toluene	A0B160474	L12SD-309-6035-FD	7.0	7.0	J B	UJ	MB-U, RepLimit-J
cis-1,3-Dichloropropene	A0B160474	L12SD-309-6035-FD	7.0	7.0	U	UJ	MS-UJ
Surface Water (µg/L)							
Acetone	A1D210402	L12sw-310-5819-SW	10	10	J	UJ	RepLimit-J, FldQC-U
Acetone	A1D210402	L12sw-311-5821-SW	10	10	J	UJ	RepLimit-J, FldQC-U
Acetone	A1D210402	L12sw-312-5823-SW	10	10	J	UJ	RepLimit-J, FldQC-U
Acetone	A1D210402	L12sw-313-5825-SW	10	10	J	UJ	RepLimit-J, FldQC-U
Carbon disulfide	A0B160474	L12SW-309-5007-SW	0.53	1.0	J	J	RepLimit-J
Chloroethane	A0B160474	L12SW-306-5001-SW	1.0	1.0	U	UJ	LCS-UJ
Chloroethane	A0B160474	L12SW-307-5003-SW	1.0	1.0	U	UJ	LCS-UJ
Chloroethane	A0B160474	L12SW-307-6033-FD	1.0	1.0	U	UJ	LCS-UJ
Chloroethane	A0B160474	L12SW-308-5005-SW	1.0	1.0	U	UJ	LCS-UJ
Chloroethane	A0B160474	L12SW-309-5007-SW	1.0	1.0	U	UJ	LCS-UJ

Table C-5. Detailed Listing of Qualified Results for Samples from Load Line 12 (continued)

Chemical	Laboratory SDG	Sample ID	Results	Reporting Limit	Laboratory Qualifier[a]	Validation Qualifier[b]	Validation Code[c]
Nitrate							
Surface Water (mg/L)							
Nitrate	A1D210402	L12sw-310-5819-SW	0.084	0.10	J	J	RepLimit-J
Nitrate	A1D210402	L12sw-312-5823-SW	0.033	0.10	J	J	RepLimit-J

[a] Laboratory Qualifiers: B=analyte was detected in the associated blank as well as the sample, J=estimated because result is between the method detection limit and the reporting limit, U=not detected, G=elevated reporting limit due to matrix interference, E=inorganic result estimated because of the presence of interference, PG=more than 40% difference between primary and confirmation analysis.

[b] Validation Qualifiers: J=estimated, U=not detected, UJ=not detected and reporting limit estimated, R=rejected.

[c] Validation Reason Codes: CalBlk=Calibration Blank, CCV=Continuing Calibration Verification, FldQC=Field Quality Control, HT=Holding Time, IC=Initial Calibration, ICV=Initial Calibration Verification, IPC=Instrument Performance Check, LCS=Lab Control Standard, MB=Method Blank, MS=Matrix Spike, RptLimit=Reporting Limit,Surr=Surrogate Recovery.

BHC = Hexachlorocyclohexane.
DDD = Dichlorodiphenyldichloroethane.
DDE = Dichlorodiphenyldichloroethylene.
DDT = Dichlorodiphenyltrichloroethane.
ID = Identification.
µg/kg = Micrograms per kilogram.
µg/L = Micrograms per liter.
mg/kg = Milligrams per kilogram.
mg/L = Milligrams per liter.
PAH = Polycyclic aromatic hydrocarbon.
PCB = Polychlorinated biphenyl.
PETN = Pentaerythritol tetranitrate.
SDG = Sample delivery group.
SVOC = Semi-volatile organic compound.
VOC = Volatile organic compound.

For this RVAAP study, two field duplicates were analyzed for one sediment and one surface water media. Two trip blanks for VOC determinations were analyzed for this sample set. Two equipment rinsates and one deionized source water blank were collected for the entire field cycle. An additional rinsate sample was collected in April 2011. The potable water source was previously tested for use by Ohio EPA and USACE. Approval documentation is referenced under the Performance-Based Acquisition 2008 (PBA08) Sharon Conglomerate Well Installation task. The project goal for blanks is to achieve concentrations less than the reporting levels. Table C-6 summarizes analytes that were detected in blanks associated with the entire field cycle. The potable water blank (SCFqc-001-0001) showed detected concentrations for 12 metals and 8 miscellaneous general chemistry analytes. Of these, barium, calcium, iron, magnesium, manganese, nickel, potassium, sodium, and the general chemistry analytes exceeded their reporting limits. As noted, the results have been previously reviewed and accepted by Ohio EPA and USACE.

Toluene was the only analyte detected in the PBA08 field blank (PBA08-QC-6000-FB) and it was well below the laboratory reporting limit. The PBA08 equipment rinsate blanks (PBA08-QC-6001-ER and PBA08-QC-6002-ER) showed detections for eight metals, five SVOCs, and three VOCs. Of the metals, only manganese and nickel in one rinsate and zinc in both rinsates exceeded the reporting limit, but all except nickel were below two times the reporting limit. Only one VOC and one SVOC were detected slightly above the reporting limit. These analytes [acetone and bis(2-ethylhexyl)phthalate] are common laboratory contaminants. Equipment rinsate PBA08-QC-6243-ER was collected during the April 2011 sampling event. Detects for two explosives, one metal, three VOCs, and three SVOCs were reported. Of these, only the explosives were above the reporting limit; however, data were not impacted because these analytes were not detected in the associated groundwater samples. In general, the field blank and rinsate blank results indicate that the equipment decontamination procedure was effective and the potential for sample contamination due to ambient field conditions is very low.

Table C-6. Results for Analytes Detected in Field Blanks or Equipment Rinsate Samples

Sample Identification			SCFqc-001-0001-FB	PBA08-QC-6000-FB	PBA08-QC-6001-ER	PBA08-QC-6002-ER
Date		Project Reporting Level	02/06/09	02/18/10	02/18/10	04/01/10
Sample Type			Potable Water Blank	Deionized Water Blank	Equipment Rinse Blank	Equipment Rinse Blank
Analyte (mg/L)	CAS Number					
Metals						
Antimony	7440-36-0	0.005	0.00019J	<0.005U	<0.005U	<0.005U
Arsenic	7440-38-2	0.005	0.0012J	<0.005U	<0.005U	<0.005U
Barium	7440-39-3	0.01	0.0472	<0.01U	<0.01U	<0.01U
Calcium	7440-70-2	0.1	65.6	<2U	<2U	<2U
Chromium	7440-47-3	0.005	<0.005U	<0.005U	<0.005U	0.0012J
Cobalt	7440-48-4	0.005	<0.005U	<0.005U	<0.005U	0.00006J
Copper	7440-50-8	0.005	0.00057J	<0.005U	<0.005U	<0.005U
Iron	7439-89-6	0.1	0.78	<0.15U	<0.15U	0.0957J
Magnesium	7439-95-4	0.1	28.3	<1U	<1U	<1U
Manganese	7439-96-5	0.01	0.0919	<0.01U	<0.01U	0.0155
Nickel	7440-02-0	0.0002	0.00035J	<0.01U	<0.01U	0.0012J
Potassium	7440-09-7	0.2	2.86	<1U	<1U	<1U
Sodium	7440-23-5	0.2	40.1	<1U	<1U	<1U
Thallium	7440-28-0	0.002	0.00036J	<0.002U	<0.002U	<0.002U
Vanadium	7440-62-2	0.01	<0.01U	<0.01U	0.00053J	<0.01U
Zinc	7440-66-6	0.01	<0.0049UJ	<0.04U	0.0104J	0.0104J
Semi-volatile Organic Compounds						
Benzenemethanol	100-51-6	0.01	<0.01U	<0.01U	<0.01U	0.00078J
Bis(2-ethylhexyl)phthalate	117-81-7	0.01	<0.01U	<0.01UJ	<0.01UJ	0.014
Di-n-butyl phthalate	84-74-2	0.01	<0.01U	<0.01U	<0.01U	0.00068J
Volatile Organic Compounds						
2-Butanone	78-93-3	0.01	<0.01U	<0.01U	0.00072J	<0.01U
Acetone	67-64-1	0.01	<0.01U	<0.01U	0.004J	0.017
Toluene	108-88-3	0.001	<0.001U	0.00053J	0.00042J	0.00034J

Table C-6. Results for Analytes Detected in Field Blanks or Equipment Rinsate Samples (continued)

Sample Identification			SCFqc-001-0001-FB	PBA08-QC-6000-FB	PBA08-QC-6001-ER	PBA08-QC-6002-ER
Date		Project Reporting Level	02/06/09	02/18/10	02/18/10	04/01/10
Sample Type			Potable Water Blank	Deionized Water Blank	Equipment Rinse Blank	Equipment Rinse Blank
Analyte (mg/L)	CAS Number					
Miscellaneous						
Alkalinity	NA	1.0	250 J	NA	NA	NA
Bicarbonate	NA	1.0	250 J	NA	NA	NA
Bromide	24959-67-9	0.2	0.3	NA	NA	NA
Chloride	16887-00-6	0.2	85.9	NA	NA	NA
Fluoride	16984-48-8	0.1	0.1	NA	NA	NA
Orthophosphate	14265-44-2	0.1	0.2	NA	NA	NA
Phosphorous, Total	NA	0.1	0.11	NA	NA	NA
Sulfate	14808-79-8	1.0	51.6	NA	NA	NA

Notes: Explosives, propellants, pesticides, and polychlorinated biphenyls were analyzed for and not detected.
Data Qualifiers: J = estimated, U = not detected, and UJ = not detected and reporting limit estimated.
Sample Type: FB = source water blank and ER = equipment rinse blank.
CAS = Chemical Abstract Service.
mg/L = Milligrams per liter.
NA = Not applicable.

C.4 DATA QUALITY EVALUATION

C.4.1 Metals Analysis

C.4.1.1 Sediment

Analytical holding times were met for all samples. Initial calibration and continuing calibration criteria were achieved for all elements analyzed. Two results (0.97% of metals sediment data) were qualified as undetected "UJ" based on the method blank results, while one result (0.48% of metals sediment data) was qualified as undetected "UJ" based on the instrument blank. All LCS recovery criteria were met throughout the data set. One non-detectable concentration antimony result (0.48% of metals sediment data) was qualified as rejected "R" due to a very low MS recovery. There were 42 results (21% of metals sediment data) qualified as estimated "J" or "UJ" due to MS/MSD recoveries or relative percent differences (RPDs) being outside criteria. Other metals exhibited acceptable recoveries and were not qualified. Twelve results (5.8% of metals sediment data) were qualified as estimated "J" or "UJ" because the lab duplicate RPD did not meet criteria. Reporting levels are considered acceptable relative to QAPP goals. Due to elevated target levels, three samples required dilutions. For analyses qualified as estimated, the deviations observed should not have a primary influence on the results and the values are considered technically sound and defensible. Rejected metal sediment results were limited to one non-detectable concentration antimony result. Complete data summary tables, with associated qualifiers, are provided in Appendix D of the RI Report and can be found in the Ravenna Environmental Information Management System (REIMS).

C.4.1.2 Surface Water

Analytical holding times were met for all samples. Initial and continuing calibration criteria were achieved for all elements analyzed. Method blanks were acceptable and did not impact the data; however, instrument blank contamination resulted in four results (1.9% of metals surface water data) being qualified as estimated non-detectable concentration "UJ." Five results (2.4% of metals surface water data) were qualified as estimated "J" because of MS recoveries outside of control limits. All other MS recoveries and MS/MSD RPDs were satisfactory. Serial dilution and duplicate comparisons were acceptable within the data set. LCS determinations were considered acceptable. No samples required dilution or reanalysis. Reporting levels are considered consistent with QAPP goals. Some data were qualified as estimated; however, none of the deviations were considered severe enough to reject any of the data. Although some analyses were qualified as estimated, the deviations observed should not have a primary influence on the results and the values are considered technically sound and defensible. Complete data summary tables, with associated qualifiers, are provided in Appendix D of the RI Report and can be found in REIMS.

C.4.2 Volatile Organic Analysis

C.4.2.1 Sediment

Analytical holding times were met for all samples. Internal standard area counts and compound retention times were acceptable throughout the data analyses. Initial calibration criteria were achieved for all analytes. Surrogate recoveries were acceptable in all analyses. Two results (2.9% of VOC sediment data) were qualified as estimated "UJ" because continuing calibration criteria was not met. All other initial and continuing calibration criteria were met. Method blanks contained low levels of 2-butanone, acetone, or toluene. Six results (8.6% of sediment VOC data) for these analytes were qualified as non-detectable concentration "U" or estimated non-detectable concentration "UJ" as required in two samples. All LCS recoveries were within criteria. One result (1.4% of VOC sediment data) was qualified as estimated "UJ" because of an MS recovery outside of control limits. All other MS/MSD recoveries and RPD values were acceptable. No samples required dilution or reanalysis. Reporting levels are considered consistent with QAPP goals. Although some analyses were qualified as estimated, the deviations observed should not have a primary influence on the results and the values are considered technically sound and defensible. Complete data summary tables, with associated qualifiers, are provided in Appendix D of the RI Report and can be found in REIMS.

C.4.2.2 Surface Water

Analytical holding times were met for all samples. All surrogate recoveries and internal standard areas were acceptable. Initial calibration criteria and continuing calibration criteria were met for all target analytes. Method blanks were free of contamination and had no impact on the sample data. Acetone was detected in the trip blank resulting in the qualification of this analyte as undetected "UJ" in four associated samples (1.3% of VOC surface water data). MS/MSD recoveries and RPDs were acceptable. Five results (1.6% of VOC surface water data) were qualified as estimated "UJ" because of LCS recoveries outside of control limits. All other LCS recoveries were within acceptance criteria. No samples required dilution or reanalysis. Reporting levels are considered consistent with QAPP goals. Although some analyses were qualified as estimated, the deviations observed should not have a primary influence on the results and the values are considered technically sound and defensible. Complete data summary tables, with associated qualifiers, are provided in Appendix D of the RI Report and can be found in REIMS.

C.4.3 Semi-volatile Organic Analysis

C.4.3.1 Sediment

Analytical holding times were met for all samples. Surrogate recovery criteria were acceptable. Internal standard area counts and compound retention times were acceptable throughout the analyses. Initial and continuing calibration criteria were met for all compounds. The method blank was free of contamination and had no impact on the sample data. Four results (0.67% of SVOC sediment data) were qualified as estimated "UJ" because of LCS recoveries outside acceptance criteria. Thirteen results

(2.2% of SVOC sediment data) were qualified as estimated "J" or "UJ" because of MS/MSD deviations. All other MS/MSD recoveries and RPD values were acceptable. No samples required dilution or reanalysis. Reporting levels are considered consistent with QAPP goals. Although some analyses were qualified as estimated, the deviations observed should not have a primary influence on the results and the values are considered technically sound and defensible. Complete data summary tables, with associated qualifiers, are provided in Appendix D of the RI Report and can be found in REIMS.

C.4.3.2 Surface Water

Analytical holding times were met for most samples except for one sample which was re-extracted three days outside the seven day water extraction holding time due to surrogate recovery failures in the original analysis. Therefore, based on this discrepancy, all results in this sample (11% of SVOC surface water data) were appropriately qualified as estimated non-detectable concentrations "UJ." All surrogate recoveries and internal standard areas were acceptable. Initial and continuing calibration criteria were met for all analytes. Method blanks were free of contamination except for measurable levels of benzenemethanol and bis(2-ethylhexyl)phthalate. Based on blank levels, two results (0.34% of SVOC surface water data) were qualified as estimated non-detected "UJ." Four results (0.67% of SVOC surface water data) were qualified as estimated "UJ" because of LCS recoveries outside acceptance criteria. One result (0.17% of SVOC surface water data) was qualified as estimated "UJ" because of an MS recovery outside control limits. All other MS/MSD recoveries and RPD values were acceptable. One surface water sample was analyzed as a dilution. For this sample, all non-detectable concentration values were below facility-wide cleanup goals (FWCUGs) except for 11 analytes. Of these, the MDLs were below FWCUGs for all but six analytes. All other reporting levels are considered consistent with QAPP goals. Although some analyses were qualified as estimated, the deviations observed should not have a primary influence on the results and the values are considered technically sound and defensible. Complete data summary tables, with associated qualifiers, are provided in Appendix D of the RI Report and can be found in REIMS.

C.4.4 Pesticides

C.4.4.1 Sediment

Analytical holding times were met for all samples. Surrogate recoveries were within acceptance criteria. Initial calibrations were acceptable for all compounds. Continuing calibration percent difference values exceeding 15% resulted in the qualification of 15 results (36% of sediment pesticide data) as estimated non-detectable concentration "UJ." All method blanks were free of contamination and had no impact on the sample data. All LCS recoveries were within acceptance criteria. One result (2.4% of sediment pesticide data) was qualified as estimated "R" because of an MS recovery outside of control limits. All other MS/MSD recoveries and RPD values were acceptable. Results for two samples are reported from dilutions. All non-detectable concentration results for these samples remained below FWCUGs. Reporting levels are considered consistent with QAPP goals. Although some analyses were qualified as estimated, the deviations observed should not have a primary influence on the results and the values are considered technically sound and defensible. Rejected pesticide sediment results were limited to

one non-detectable concentration heptachlor epoxide result. Complete data summary tables, with associated qualifiers, are provided in Appendix D of the RI Report and can be found in REIMS.

C.4.4.2 Surface Water

Analytical holding times were met for all samples. Three results were qualified as estimated "UJ" due to continuing calibration outside of acceptance criteria. All other initial and continuing calibration criteria were met for all analytes. All method blanks were free of contamination and had no impact on the data. Surrogate recoveries were low, causing 42 results (23% of pesticide surface water data) to be qualified estimated "J" or "UJ." All LCS recoveries were within criteria. MS recoveries outside control limits caused three results (1.6% of pesticide surface water data) to be qualified as estimated "UJ." All other MS/MSD recoveries and RPD values were acceptable. One sample required analysis at dilution. All non-detectable concentration results for this sample remained below FWCUGs except for aldrin. The MDL for aldrin remained below the FWCUG. A concentration detected between the MDL and the reporting limit would have been reported as an estimated value. Reporting levels are considered consistent with QAPP goals. Although some analyses were qualified as estimated, the deviations observed should not have a primary influence on the results and the values are considered technically sound and defensible. Complete data summary tables, with associated qualifiers, are provided in Appendix D of the RI Report and can be found in REIMS.

C.4.5 Polychlorinated Biphenyl Analysis

C.4.5.1 Sediment

Analytical holding times were met for all samples. Surrogate recoveries were within acceptance criteria. Initial and continuing calibration criteria were met. All method blanks were free of contamination and had no impact on the sample data. All LCS recoveries were within acceptance criteria. One result (1.6% of PCB sediment data) was qualified as estimated "UJ" because of an MS recovery outside of control limits. All other MS/MSD recoveries and RPD values were acceptable. No samples required dilution or reanalysis. Reporting levels are considered consistent with QAPP goals. Although some analyses were qualified as estimated, the deviations observed should not have a primary influence on the results and the values are considered technically sound and defensible. Complete data summary tables, with associated qualifiers, are provided in Appendix D of the RI Report and can be found in REIMS.

C.4.5.2 Surface Water

Analytical holding times were met for all samples. All initial and continuing calibration criteria were met for all analytes. All method blanks were free of contamination and had no impact on the data. All LCS recoveries were within criteria. MS/MSD recoveries and RPD values were acceptable. Surrogate recoveries were low or less than 10% for eight samples. Therefore, 49 results (78% of PCB surface water data) were qualified as estimated "UJ" and seven results (11% of PCB surface water data) were rejected "R." No samples required dilution or reanalysis. Reporting levels are considered consistent with QAPP goals. For analyses that were qualified as estimated, the deviations observed should not

have a primary influence on the results and the values are considered technically sound and defensible. Complete data summary tables, with associated qualifiers, are provided in Appendix D of the RI Report and can be found in REIMS.

C.4.6 Explosives and Nitroglycerin Analysis

C.4.6.1 Sediment

Analytical holding times were met for all samples. Surrogate recoveries were within acceptance criteria. Initial calibration criteria were acceptable. Continuing calibration deviation caused five results (3.5% of explosives sediment data) to be qualified as estimated "UJ." All other initial and continuing calibration criteria were met. The method blank was free of contamination and had no impact on the sample data. All LCS recoveries were within criteria. MS/MSD recoveries and RPD values were also acceptable. Reporting levels are considered consistent with QAPP goals. Although some analyses were qualified as estimated, the deviations observed should not have a primary influence on the results and the values are considered technically sound and defensible. Complete data summary tables, with associated qualifiers, are provided in Appendix D of the RI Report and can be found in REIMS.

C.4.6.2 Surface Water

Two samples were re-extracted four days outside the seven day holding time due to surrogate recovery failure in the original analysis. All results for these two samples (23% of explosives surface water data) were qualified as estimated "UJ." All other holding times were met. Initial calibration criteria were acceptable for all explosives analytes. Four results (2.8% of explosives surface water data) were qualified as estimated due to continuing calibration deviations. All other initial and continuing calibration criteria were met. All method blanks were free of contamination and had no impact on the sample data. Surrogate recoveries were acceptable for all samples. All LCS recoveries and MS/MSD recoveries and RPD values were within acceptance criteria. Reporting levels are considered consistent with QAPP goals. Although some analyses were qualified as estimated, the deviations observed should not have a primary influence on the results and the values are considered technically sound and defensible. Complete data summary tables, with associated qualifiers, are provided in Appendix D of the RI Report and can be found in REIMS.

C.4.7 Nitroguanidine, Nitrocellulose, and Nitrate Analyses

C.4.7.1 Sediment

Analytical holding times were met for all samples. Initial and continuing calibration criteria were met for all compounds. Method blanks were free of contamination except for low level nitrocellulose. As a result, one result (25% of sediment propellant data) for this analyte was qualified non-detectable concentration "U" as required. All LCS recoveries were within criteria. MS/MSD recoveries and RPD values were acceptable except for nitrocellulose, which caused two results (50% of sediment propellant data) for this analyte to be qualified as estimated "J" or estimated non-detectable concentration "UJ." Reporting levels are considered consistent with QAPP goals. Although some analyses were qualified as estimated, the deviations observed should not have a primary influence on the results and the values are considered technically sound and defensible. Complete data summary tables, with associated qualifiers, are provided in Appendix D of the RI Report and can be found in REIMS.

C.4.7.2 Surface Water

Analytical holding times were met for all samples. Initial calibration criteria and continuing calibration criteria were met for all analytes. Method blanks were free of contamination and had no impact on the sample data. All LCS recoveries were within criteria. MS/MSD recoveries and duplicate RPD values that applied were within acceptance criteria. Reporting levels are considered consistent with QAPP goals. Although some analyses were qualified as estimated, the deviations observed should not have a primary influence on the results and the values are considered technically sound and defensible. Complete data summary tables, with associated qualifiers, are provided in Appendix D of the RI Report and can be found in REIMS.

C.4.8 Precision

Field duplicate samples were collected to ascertain the contribution to variability (i.e., precision) due to the combination of environmental media, sampling consistency, and analytical precision. Field duplicate samples were collected from the same spatial and temporal conditions as the primary environmental sample. Sediment samples were collected after homogenization for all analytes except VOCs.

Field duplicate comparison information is presented in Table C-7. If a given analyte was not detected in both the regular and field duplicate sample, precision was considered acceptable and results were not included in the table. The RPD was calculated only when both samples were less than five times the reporting level. When one or both sample values were between the reporting level and five times the reporting level, the absolute difference was evaluated. Tables 3-1 and 3-2 of the FWQAPP set the RPD criteria at 50% for soil and sediment and at 30% for waters while the absolute difference is set at one times the reporting limit for all matrices. Field duplicate comparisons for the AOC are considered good, with all results below an absolute difference of one or an RPD of 50% except for sodium, aluminum, barium, iron, lead, and manganese which exceed the specified criteria for the surface water duplicate.

C.4.9 Sensitivity

Determining minimum detectable values allows the investigation to assess the relative confidence that can be placed in a value relative to the magnitude or level of analyte concentration observed. The closer a measured value comes to the minimum detectable concentration, the less confidence and more variation the measurement will have. Project sensitivity goals were expressed as quantitation level goals in the QAPP. These levels were achieved or exceeded throughout the analytical process except for few SVOC and pesticide compounds. With the exception of aldrin in one surface water sample and 11 SVOCs in another surface water sample, the non-detectable concentration results for samples analyzed at dilution remained below FWCUGs. Of these, all but six of the SVOCs had MDLs below FWCUGs. Concentrations detected between the MDL and reporting limit would have been reported as estimated values. Individual analyte reporting levels varied due to matrix differences and contaminant analyte concentrations. Reporting levels were elevated in sediment due to inherent moisture content variability and results being reported in the standard dry weight format. Reporting level variations were considered during data interpretation and statistical applications.

Table C-7. Field Duplicate Pair Comparisons for Analytes Detected in Samples from Load Line 12

Sample ID	Chemical	Regular Result	Duplicate Result	RPD % or Absolute Difference[a]	Test[b]
Metals					
Sediment (mg/kg)					
L12SD-309-5006-SD/ L12SD-309-6035-FD	Aluminum	8200J	8310J	1%	RPD
L12SD-309-5006-SD/ L12SD-309-6035-FD	Antimony	0.1J	0.7UJ	(0.85)	D
L12SD-309-5006-SD/ L12SD-309-6035-FD	Arsenic	5.3	5	6%	RPD
L12SD-309-5006-SD/ L12SD-309-6035-FD	Barium	65.5J	72J	10%	RPD
L12SD-309-5006-SD/ L12SD-309-6035-FD	Beryllium	0.58J	0.53J	(0.02)	D
L12SD-309-5006-SD/ L12SD-309-6035-FD	Cadmium	0.39	0.3	(0.32)	D
L12SD-309-5006-SD/ L12SD-309-6035-FD	Calcium	1160J	1120J	(0.03)	D
L12SD-309-5006-SD/ L12SD-309-6035-FD	Chromium	10.9	10.7	2%	RPD
L12SD-309-5006-SD/ L12SD-309-6035-FD	Cobalt	12.2	9.9	21%	RPD
L12SD-309-5006-SD/ L12SD-309-6035-FD	Copper	13.8	14.2	3%	RPD
L12SD-309-5006-SD/ L12SD-309-6035-FD	Iron	19900	17200	15%	RPD
L12SD-309-5006-SD/ L12SD-309-6035-FD	Lead	14.2J	13.6J	4%	RPD
L12SD-309-5006-SD/ L12SD-309-6035-FD	Magnesium	1300	1130	14%	RPD
L12SD-309-5006-SD/ L12SD-309-6035-FD	Manganese	226	244	8%	RPD
L12SD-309-5006-SD/ L12SD-309-6035-FD	Mercury	0.032J	0.046J	(0.10)	D
L12SD-309-5006-SD/ L12SD-309-6035-FD	Nickel	12.5	10.7	16%	RPD
L12SD-309-5006-SD/ L12SD-309-6035-FD	Potassium	586J	597J	(0.02)	D
L12SD-309-5006-SD/ L12SD-309-6035-FD	Selenium	1J	1.1J	(0.14)	D
L12SD-309-5006-SD/ L12SD-309-6035-FD	Silver	0.096J	0.092J	(0.01)	D
L12SD-309-5006-SD/ L12SD-309-6035-FD	Sodium	69.8J	336	(1.90)	D*
L12SD-309-5006-SD/ L12SD-309-6035-FD	Thallium	0.13J	0.12J	(0.04)	D
L12SD-309-5006-SD/ L12SD-309-6035-FD	Vanadium	15.9	15.3	4%	RPD
L12SD-309-5006-SD/ L12SD-309-6035-FD	Zinc	67.6	69.2	2%	RPD
Semi-volatile Organic Compounds					
Sediment (mg/kg)					
L12SD-309-5006-SD/ L12SD-309-6035-FD	2-Methylnaphthalene	0.01J	0.011J	(0.00)	D
L12SD-309-5006-SD/ L12SD-309-6035-FD	Anthracene	0.072U	0.0096J	(0.88)	D
L12SD-309-5006-SD/ L12SD-309-6035-FD	Benz(a)anthracene	0.044J	0.034J	(0.14)	D

Table C-7. Field Duplicate Pair Comparisons for Analytes Detected in Samples from Load Line 12 (continued)

Sample ID	Chemical	Regular Result	Duplicate Result	RPD % or Absolute Difference[a]	Test[b]
L12SD-309-5006-SD/ L12SD-309-6035-FD	Benzo(a)pyrene	0.06J	0.042J	(0.25)	D
L12SD-309-5006-SD/ L12SD-309-6035-FD	Benzo(b)fluoranthene	0.1	0.073	(0.38)	D
L12SD-309-5006-SD/ L12SD-309-6035-FD	Benzo(ghi)perylene	0.057J	0.038J	(0.27)	D
L12SD-309-5006-SD/ L12SD-309-6035-FD	Benzo(k)fluoranthene	0.042J	0.025J	(0.24)	D
L12SD-309-5006-SD/ L12SD-309-6035-FD	Butyl benzyl phthalate	0.023J	0.46U	(0.93)	D
L12SD-309-5006-SD/ L12SD-309-6035-FD	Chrysene	0.063J	0.043J	(0.28)	D
L12SD-309-5006-SD/ L12SD-309-6035-FD	Fluoranthene	0.085	0.062J	(0.32)	D
L12SD-309-5006-SD/ L12SD-309-6035-FD	Indeno(1,2,3-cd)pyrene	0.049J	0.033J	(0.23)	D
L12SD-309-5006-SD/ L12SD-309-6035-FD	Phenanthrene	0.03J	0.026J	(0.06)	D
L12SD-309-5006-SD/ L12SD-309-6035-FD	Pyrene	0.068J	0.049J	(0.27)	D
L12SD-309-5006-SD/ L12SD-309-6035-FD	dibenz(a,h)anthracene	0.012J	0.07U	(0.82)	D
Metals					
Surface Water (mg/L)					
L12SW-307-5003-SW/ L12SW-307-6033-FD	Aluminum	0.432J	4.16J	(37.0)	D*
L12SW-307-5003-SW/ L12SW-307-6033-FD	Antimony	0.00066J	0.0012J	(0.11)	D
L12SW-307-5003-SW/ L12SW-307-6033-FD	Arsenic	0.00046J	0.0024J	(0.39)	D
L12SW-307-5003-SW/ L12SW-307-6033-FD	Barium	0.023	0.0452	(2.20)	D*
L12SW-307-5003-SW/ L12SW-307-6033-FD	Beryllium	0.000035J	0.00019J	(0.16)	D
L12SW-307-5003-SW/ L12SW-307-6033-FD	Cadmium	0.000038J	0.00021J	(0.09)	D
L12SW-307-5003-SW/ L12SW-307-6033-FD	Calcium	27.8	28	1%	RPD
L12SW-307-5003-SW/ L12SW-307-6033-FD	Chromium	0.0006J	0.0048J	(0.84)	D
L12SW-307-5003-SW/ L12SW-307-6033-FD	Cobalt	0.00024J	0.002J	(0.35)	D
L12SW-307-5003-SW/ L12SW-307-6033-FD	Copper	0.0014J	0.0057	(0.86)	D
L12SW-307-5003-SW/ L12SW-307-6033-FD	Iron	0.502	6.35	(39.0)	D*
L12SW-307-5003-SW/ L12SW-307-6033-FD	Lead	0.0003J	0.004	(1.20)	D*
L12SW-307-5003-SW/ L12SW-307-6033-FD	Magnesium	5.85	6.51	11%	RPD
L12SW-307-5003-SW/ L12SW-307-6033-FD	Manganese	0.127	0.437	110%	RPD*
L12SW-307-5003-SW/ L12SW-307-6033-FD	Nickel	0.0017J	0.0056J	(0.39)	D
L12SW-307-5003-SW/ L12SW-307-6033-FD	Potassium	1.25	2.03	(0.78)	D
L12SW-307-5003-SW/ L12SW-307-6033-FD	Selenium	0.00029J	0.00056J	(0.05)	D
L12SW-307-5003-SW/ L12SW-307-6033-FD	Silver	0.00012UJ	0.00029J	(0.03)	D
L12SW-307-5003-SW/ L12SW-307-6033-FD	Sodium	2.63	2.77	(0.14)	D
L12SW-307-5003-SW/ L12SW-307-6033-FD	Vanadium	0.00075J	0.0073J	(0.66)	D
L12SW-307-5003-SW/ L12SW-307-6033-FD	Zinc	0.0102J	0.0482	(0.95)	D

Table C-7. Field Duplicate Pair Comparisons for Analytes Detected in Samples from Load Line 12 (continued)

Sample ID	Chemical	Regular Result	Duplicate Result	RPD % or Absolute Difference[a]	Test[b]
Explosives					
Surface Water (mg/L)					
L12SW-307-5003-SW/ L12SW-307-6033-FD	4-Amino-2,6-Dinitrotoluene	0.00021	0.00022	(0.06)	D
L12SW-307-5003-SW/ L12SW-307-6033-FD	Hexahydro-1,3,5-Trinitro-1,3,5-Triazine (RDX)	0.00026U	0.00007J	(0.73)	D
Propellants					
Surface Water (mg/L)					
L12SW-307-5003-SW/ L12SW-307-6033-FD	Nitrocellulose	0.15J	0.5U	(0.70)	D
Pesticides					
Surface Water (mg/L)					
L12SW-307-5003-SW/ L12SW-307-6033-FD	delta-BHC	0.000067J	0.00005U	(0.23)	D
Nitrate					
Surface Water (mg/L)					
L12SW-307-5003-SW/ L12SW-307-6033-FD	Nitrate	0.5	0.4	(1.00)	D

[a] Relative Percent Difference (RPD) is calculated as 100x |R-D|/(R-D)/2, where R is the concentration of the regular sample and D is the concentration of the duplicate. The absolute difference is calculated as |R-D|/L where L is the average reporting limit of the two samples. Values followed by a "%" are RPD values. Values in parentheses are absolute difference values.

[b] The test used to evaluate the duplicate comparison is the RPD if both sample results were more than five times the reporting limit or the absolute difference (D) if any result was less than five times the reporting limit.

*RPD or D outside criteria.
BHC = Hexachlorocyclohexane.
ID = Identification.
mg/kg = Milligrams per kilogram.
mg/L = Milligrams per liter.
J = Estimated.
RPD = Relative percent difference.
U = Not detected.
UJ = Not detected and reporting limit estimated.

Method blank determinations were performed with each analytical sample batch for each analyte under investigation. These blanks were evaluated during data review to determine their potential impact on individual data points, if any. Review action levels are set at 5 times the detected blank concentration for all analytes, except those designated as common laboratory contaminants (i.e., methylene chloride, acetone, toluene, 2-butanone, and phthalate compounds) with action levels set at 10 times the detected blank concentration. During data review, reported sample concentrations are assessed against method blank action levels, and the following qualifications are made when reportable quantities of analytes were observed in the associated method blank.

- When the analyte sample concentration is above 5 or 10 times the action level, the data are not qualified and it is considered a positive value.
- When inorganic analyte sample concentrations are determined to be below 5 or 10 times the action level, the data are considered impacted by the method blank and the value reported is qualified as a non-detectable concentration at the analyte value reported. These data are then qualified as "U."
- When organic analyte sample concentrations are determined to be below 5 or 10 times the action level, the data are considered impacted by the method blank and the value reported is qualified as a non-detectable concentration. If the reported value is below the reporting level, the result is qualified as a non-detectable concentration at the reporting level. If the result is above the reporting limit, it is qualified as a non-detectable concentration at the analyte value reported. These data are then qualified as "U."

No data were rejected as a result of method blank contamination; however, various analytes were qualified as non-detectable concentration "U" according to the validation in Table C-4.

The common VOC laboratory contaminant acetone was detected in the trip blank. The concentration observed was below the reporting level. This analyte was detected below the reporting limit in four associated surface water samples and qualified as undetected "U." It is, therefore, determined that VOC analyses were not affected through the transportation and storage process, and that the procedures and precautions employed were effective in preserving the integrity of the sample analysis.

C.4.10 Representativeness and Comparability

Representativeness expresses the degree to which data accurately reflect the analyte or parameter of interest for the environmental AOC and is the qualitative term most concerned with the proper design of the sampling program. Factors that affect the representativeness of analytical data include proper preservation, holding times, using standard sampling and analytical methods, and determining matrix or analyte interferences. Samples were hand-delivered to the laboratory by the TestAmerica courier and were received within temperature specifications and in good condition. One SVOC analysis and two explosives surface water analyses were conducted outside the holding time because of the need for re-extraction due to surrogate recovery failures. These re-extractions were performed within two times the holding time and the data were qualified accordingly as estimated "UJ." No other holding time deviations were observed.

Comparability, like representativeness, is a qualitative term relative to an individual project data set. The RI employed appropriate sampling methodologies, sample containers and preservation, and site surveillance; used standard sampling devices and uniform training; documented sampling, standard analytical protocols/procedures, QC checks with standard control limits, and universally accepted data reporting units to ensure comparability to other data sets. By properly implementing and documenting these standard practices, the project has established the confidence that the data will be comparable to other project and programmatic information. Tables C-8 and C-9 present the standardized parameter groups, sample containers, preservation techniques, and associated holding times for environmental media.

C.4.11 Completeness

Usable data are defined as those data that pass individual scrutiny during the verification and validation process and are accepted for unrestricted application to the human health risk assessment evaluation or equivalent-type applications. Estimated data have been determined to be acceptable for RVAAP project objectives.

The completeness goal for analytical data is 90% as defined in Tables 3-1 and 3-2 of the FWQAPP. The project achieved this goal by collecting all samples presented in the PBA08 SAP and producing usable results for 99.7% of all sample analyses performed.

C.5 DATA QUALITY ASSESSMENT SUMMARY

In concurrence with the USACE Chemical Data Quality Assessment presented in Attachment 1, the overall quality of the RI Report data and information meets or exceeds the established project objectives. Through proper implementation of the project data verification and assessment process, project information has been determined to be acceptable for use.

Data, as presented, have been qualified as usable or estimated "J"/"UJ" or rejected "R." Data that have been estimated indicate accuracy, precision, or sensitivity being less than desired but adequate for interpretation. Data that are not acceptable for use have been rejected. The only rejected data for this AOC are seven non-detectable concentration PCB results for one surface water sample due to low surrogate recovery and one sediment non-detectable concentration antimony result due to a low MS recoveries**.** Qualifiers have been applied to data when necessary.

Except as noted, data produced for this project demonstrate they can withstand scientific scrutiny; are appropriate for its intended purpose; are technically defensible; and are of known and acceptable sensitivity, precision, and accuracy. Data integrity has been documented through proper implementation of QA and QC measures. The environmental information presented has an established confidence that allows utilization for the project objectives and provides data for future needs.

Table C-8. Container Requirements for Sediment Samples

Analyte Group	Container	Minimum Sample Size	Preservative	Holding Time
Volatile Organic Compounds	One 2-oz glass jar with septum cap (no headspace)	20 g	Cool, 4°C	14 days
Semi-volatile Organic Compounds	4-oz glass	30 g	Cool, 4°C	14 days (extraction) 40 days (analysis)
Pesticide Compounds	4-oz glass	30 g	Cool, 4°C	14 days (extraction) 40 days (analysis)
Polychlorinated Biphenyls	4-oz glass	30 g	Cool, 4°C	14 days (extraction) 40 days (analysis)
Polycyclic Aromatic Hydrocarbon Compounds	4-oz glass	30 g	Cool, 4°C	14 days (extraction) 40 days (analysis)
Explosive Compounds	4-oz glass	10 g	Cool, 4°C	14 days (extraction) 40 days (analysis)
Nitroguanidine	4-oz glass	10 g	Cool, 4°C	14 days (extraction) 40 days (analysis)
Nitrocellulose	4-oz glass	10 g	Cool, 4°C	14 days (extraction) 40 days (analysis)
Metals (TAL)	4-oz glass or plastic	20 g	Cool, 4°C	180 days; Hg at 28 days
Geotechnical Parameters	Moisture/density/porosity/K – Shelby tube TOC – no special container Grain Size Fraction - no special container	Various 100 g 5,000 g	Air tight, cool Cool NA	NA

g = Gram.
Hg = Mercury.
K= Permeability.
NA = Not applicable.
oz = Ounce.
TAL = Target analyte list.
TOC= Total organic carbon.

Table C-9. Container Requirements for Surface Water Samples

Analyte Group	Container	Minimum Sample Size	Preservative	Holding Time
Volatile Organic Compounds	Three 40-mL glass vial	Two 40 mL	HCl to pH <2 Cool, 4°C	14 days
Semi-volatile Organic Compounds	Two 1-L amber glass	1 L	Cool, 4°C	7 days (extraction) 40 days (analysis)
Pesticide Compounds	Two 1-L amber glass	1 L	Cool, 4°C	7 days (extraction) 40 days (analysis)
Polychlorinated Biphenyls	Two 1-L amber glass	1 L	Cool, 4°C	7 days (extraction) 40 days (analysis)
Polycyclic Aromatic Hydrocarbon Compounds	Two 1-L amber glass	1 L	Cool, 4°C	7 days (extraction) 40 days (analysis)
Explosive Compounds	Two 1-L amber glass	1 L	Cool, 4°C	7 days (extraction) 40 days (analysis)
Nitroguanidine	500-mL amber glass	10 mL	Cool, 4°C	7 days (extraction) 40 days (analysis)
Nitrocellulose	500-mL amber glass	100 mL	Cool, 4°C	7 days (extraction) 40 days (analysis)
Nitrate	250-mL poly	50 mL	Cool, 4°C	48 hr
Metals (TAL)	1-L HNO_3 poly	300 mL	HNO_3 to pH <2 Cool, 4°C	180 days; Hg at 28 days

HCl = Hydrochloric acid.
Hg = Mercury.
HNO_3 = Nitric acid.
hr = Hours.
L = Liter.
mL = Milliliter.
Poly = Polyvinyl.
TAL = Target analyte list.

C.6 REFERENCES

DoD (U.S. Department of Defense) 2006. *Quality Systems Manual for Environmental Laboratories.* Environmental Data Quality Workgroup. Version 3. January 2006.

USACE (U.S. Army Corps of Engineers) 2001. *Facility-wide Sampling and Analysis Plan for Environmental Investigations at the Ravenna Army Ammunition Plant, Ravenna, Ohio*. March 2001.

USACE 2007. *Louisville DoD Quality Systems Manual Supplement*. Version 1. March 2007.

USACE 2009. *PBA 2008 Supplemental Investigation Sampling Analysis Plan Addendum No. 1 Ravenna Army Ammunition Plant, Ravenna, Ohio*. December 2009.

USEPA (U.S. Environmental Protection Agency) 1994. *Contract Laboratory Program National Functional Guidelines for Inorganic Data Review*. EPA-540/R-94/013. February 1994.

USEPA 1999. *Contract Laboratory Program National Functional Guidelines for Organic Data Review*. EPA-540/R-99/008. Final. October 1999.

ATTACHMENT 1

Chemical Data Usability Report

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MEMORANDUM FOR RECORD 6 November 2013

SUBJECT: FINAL CHEMICAL DATA USABILITY ASSESSMENT

PROJECT: Ravenna Army Ammunition Plant, Ravenna, Ohio
18 Areas of Concern (PBA08)
Load Line 12 Remedial Investigation

1. Purpose:

   This memorandum represents and documents the evaluation of the quality and usability of the analytical data obtained during the Phase III Remedial Investigation (RI) of Load Line 12 (RVAAP-12). This includes determination of contract compliance, data usability, and data quality objective attainment in accordance with EM 200-1-6, Chapter 5 (October 2006).

2. References:

   2.1 Data Quality Control Summary Report, Appendix C of the *Draft Phase III Remedial Investigation Report for Wet Sediment and Surface Water at RVAAP-12 Load Line 12*, prepared by SAIC, February 3, 2012.

   2.2 *Final Data Validation Report, Ravenna Army Ammunition Plant 18 Areas of Concern 2010 Sampling, Ravenna, Ohio*, prepared by MEC^{x}, LP, March 2013.

   2.3 *PBA 2008 Supplemental Investigation Sampling and Analysis Plan Addendum No. 1* (PBA08 SAP) prepared by SAIC, December 2009.

   2.4 *Facility-Wide Quality Assurance Project Plan for Environmental Investigations at the Ravenna Army Ammunition Plant, Appendix , Ravenna, Ohio* (FWQAPP), prepared by SAIC, March 2001.

   2.5 *DoD Quality Systems Manual for Environmental Laboratories*, Department of Defense (DoD QSM), Environmental Data Quality Workgroup, Version 3, January 2006.

   2.6 *Louisville DoD Quality Systems Manual Supplement, Version 1*, prepared by USACE –Louisville District, March 2007.

   2.7 EM 200-1-6, Chapter 5, Chemical Quality Assurance for Hazardous, Toxic and Radioactive Waste (HTRW) Projects, October 1997.

3. Project Description:

   The purpose of the PBA08 RI at Load Line 12 was to supplement the data from previous sampling events to delineate the nature and extent of contamination, evaluate contaminant fate and transport, and complete a human health risk assessment (HHRA) and ecological risk assessment (ERA) to support remedial decisions. Depending on the results of the RI, a recommendation would be provided for either no further action (NFA) or a Feasibility Study (FS) that would evaluate potential remedies and future actions.

   Sampling was conducted in February 2010 and April 2011 by Science Application International Corporation (SAIC). Sixteen environmental sediment and surface water samples were collected and analyzed for one or more of the following parameters: metals, explosives, propellants (nitrocellulose and nitroguanidine), pesticides, polychlorinated biphenyls (PCBs), semivolatile organic compounds

(SVOCs), volatiles (VOCs), and nitrate. Analytical services were provided by TestAmerica (TA-North Canton, OH and TA-West Sacramento, CA).

4. Analytical Program Overview:
Below are excerpts from Section 4.5 of the PBA08 SAP.

4.1 Data Quality Objectives

Data quality objective (DQO) summaries for this investigation will follow Tables 3-1 and 3-2 in the Facility-Wide QAPP. All QC parameters stated in the specific U.S. Environmental Protection Agency (USEPA) SW-846 methods will be adhered to for each chemical listed. The SW-846 method references found in the Facility-Wide QAPP have been revised to the Update III methods, as appropriate. Laboratories are required to comply with all methods as written; recommendations are considered requirements. Concurrence with the DoD QSM for Environmental Laboratories (DoD, 2006), and the Louisville QSM Supplement is expected.

4.2 Level of Quality Control Effort

QC efforts will follow Section 3.2 of the Facility-Wide QAPP. Field QC measurements will include field source water blanks, trip blanks, field duplicates, surrogates, and equipment rinsate blanks. Laboratory QC measurements will include method blanks, laboratory control samples (LCSs), laboratory duplicates, and matrix spike/matrix spike duplicate (MS/MSD) samples. LCS measurements will include the standard mid-level analyte concentration, plus a QC/method reporting level (MRL) low-level concentration. It is recognized that the laboratory will routinely perform and monitor the QC/MRL; however, guidance check limits will be utilized, as advisory and corrective action will not be required for individual analyte variances. The QC/MRL will be successfully analyzed at the beginning of the analytical sequences as required by the QSM. Additionally, the lab will analyze the QC/MRL sample at the close of the analytical sequence.

4.3 Accuracy, Precision, and Sensitivity of Analysis

Accuracy, precision, and sensitivity goals identified in Section 3.3 and Tables 3-1 through 3-9 of the Facility-Wide QAPP will be imposed for this investigation. As stated above, some of the analytical methods numbers have been updated (refer to Table 2-1 of this QAPP). Quality objectives related to individual method QC protocol will also follow requirements given in the DoD QSM for Environmental Laboratories and the Louisville QSM Supplement. Laboratories will make all reasonable attempts to meet the program and project reporting levels in Tables 3-1 through 3-9 of the Facility-Wide QAPP for each individual sample analysis.

4.4 Completeness, Representativeness, and Comparability

Completeness, representativeness, and comparability goals identified in Section 3.4 and Tables 3-1 and 3-2 of the Facility-Wide QAPP will be imposed for this investigation. The completeness goal for analytical data is 90%, as defined in Tables 3-1 and 3-2 of the FWQAPP.

5. Chemical Data Quality and Usability Assessment:
This assessment of the overall quality and usability of project data is based upon a thorough review of the associated Data Quality Control Summary Report as presented in Appendix C of the *Draft Phase III Remedial Investigation Report for Wet Sediment and Surface Water at RVAAP-12 Load Line 12*

(SAIC, 2012) and Section 17 of the *Final Data Validation Report, Ravenna Army Ammunition Plant 18 Areas of Concern 2010 Sampling* (MEC^x, 2013).

The Data Quality Control Summary Report represents the findings of the Level III data review of 100% of the primary data as performed by the contractor, SAIC. As a result of this review process, the data are qualified based on the technical assessment of the verification criteria. Qualifiers indicate the usability of the data.

Data validation was performed by MEC^x, a USACE-Louisville District contracted third-party. The Data Validation Report details their findings from the Level IV validation of 10% of the primary sample data, analysis of field duplicate results, and the determination of data. This evaluation includes review of the same QC elements as the primary contractor's review in addition to an in-depth look into the verification of sample results, target compound identification, and raw data. The intent is to verify the quality and the reliability of the primary data for its intended use.

The data were evaluated in the context of the data quality objective (DQOs) and measurement quality objectives (MQOs) as specified in the PBA08 SAP and FWQAPP referenced in items 2 and 4 above.

The subsections below present the U.S. Army Corps of Engineers – Louisville District's assessment of the chemical data quality for Load Line 12, including determination of contract compliance, data usability, and data quality objective attainment.

5.1 Contract Compliance

Samples were collected and analyzed in accordance with the procedures specified in the project QAPPs. With minor exceptions, data met the QC specifications outlined in the DoD QSM and project QAPPs. Specific non-conformances and their impact on data usability are noted and described in the associated data evaluation reports.

Some analytes had method detection levels (MDLs) and/or reporting limits (RLs) that exceeded the criteria in Table 3-1 of the SAP or in Table 3-3 of the FWQAPP, if no criteria were listed in the SAP. The failure to achieve reporting limits (RLs) less than applicable criteria for some analytes was anticipated due to analytical limitations. Results with RLs/MDLs exceeding project criteria may still be usable during risk assessment; however, it is incumbent upon the final data user to make this determination on a case by case basis.

5.2 Data Quality Attainment

The quality of data generated for the Load Line 12 RI met the project DQOs. Usable definitive data of known and documented quality was produced for 99.6 % of the sample analyses performed. This includes data qualified as estimated (J) due to QC outliers. The J qualifier indicates that accuracy, precision, or sensitivity is less than desired; however, the results are of sufficient quality to be considered usable.

During the contractor's 100% Level III evaluation, rejected data were relegated to 1antimony and 7 PCB results. Two additional results, nitrate and heptachlor epoxide, were rejected during the 10% Level IV data validation performed by MEC^x. All rejected data were nondetects.

Load Line 12

Rejected Data

Sample	SDG	Analyte	Reason	Review
L12SW-308-5005-SW	A0B160474	Aroclor 1016	Surrogate Recovery (<10%)	Level III (100%)
		Aroclor 1221		
		Aroclor 1232		
		Aroclor 1242		
		Aroclor 1248		
		Aroclor 1254		
		Aroclor 1260		
L12SD-313-5826-SD	A0B210402	Antimony	MS Recovery (<30%)	
L12SD-309-5006-SD	A0B160474	Nitrate	Holding Time	Level IV (10%)
		Heptachlor Epoxide	MS/MSD Recovery (0%)	

5.3 Data Usability

Data were consistently reviewed and qualified by both the primary contractor and the third-party validator. Overall findings were compatible. Although differences in professional opinion may have resulted in some data being qualified as estimated (J) by one reviewer and not the other, this rarely adversely impacted the usability of the data. This occurred primarily in regards to qualification of data due to MRL recovery outliers. Section 3.2 of the FWQAPP considers the QC limits "guidance". As such, SAIC notes the outliers but doesn't qualify based upon them. Based upon professional opinion, MECx qualifies data associated with missing MRL standards or those with recovery outliers.

6.0 Conclusion:

Through the proper implementation of the project data review, verification, and validation process that is outlined in the FWQAPP, the data for the Load Line 12 RI are deemed acceptable for use with some exceptions. Rejected and unusable data are relegated to 10 sample results (all nondetects) out of approximately 2,670 results. Based upon this assessment, 99.6% of the analytical results are usable as qualified to meet the project DQOs; can withstand scientific scrutiny; are technically defensible; and are of known and acceptable quality in terms of sensitivity, precision, and accuracy.

Kathy Krantz
Project Chemist
USACE – Louisville District

ATTACHMENT 2

Automated Data Review Outlier Reports

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QC Outlier Report: Temperature (Non-qualified Outliers)

Lab Report Batch: A0B160474 **Lab ID:** TALCAN

Client Sample ID	Lab Sample ID	Analysis Method	Matrix	Sample Temperature (C)	Criteria	
					Lower Limit	Upper Limit
L12SW-306-5001-SW	A0B160474006	353.2 Modified	AQ	1.3	2.0	6.0
L12SW-307-6033-FD	A0B160474008	353.2 Modified	AQ	0.7	2.0	6.0
L12SW-306-5001-SW	A0B160474006	8081A	AQ	1.3	2.0	
L12SW-307-6033-FD	A0B160474008	8081A	AQ	0.7	2.0	
L12SW-306-5001-SW	A0B160474006	8082	AQ	1.3	2.0	
L12SW-307-6033-FD	A0B160474008	8082	AQ	0.7	2.0	
L12SW-306-5001-SW	A0B160474006	8260B	AQ	1.3	2.0	
L12SW-307-6033-FD	A0B160474008	8260B	AQ	0.7	2.0	
L12SW-306-5001-SW	A0B160474006	8270C	AQ	1.3	2.0	
L12SW-307-6033-FD	A0B160474008	8270C	AQ	0.7	2.0	
L12SW-306-5001-SW	A0B160474006	8330B	AQ	1.3	2.0	
L12SW-307-6033-FD	A0B160474008	8330B	AQ	0.7	2.0	
L12SW-306-5001-SW	A0B160474006	8330M	AQ	1.3	2.0	
L12SW-307-6033-FD	A0B160474008	8330M	AQ	0.7	2.0	
L12SW-306-5001-SW	A0B160474006	9056	AQ	1.3	2.0	6.0
L12SW-307-6033-FD	A0B160474008	9056	AQ	0.7	2.0	6.0

Temperature Outlier Report

Lab Report Batch: **Lab ID:**

Client Sample ID	Lab Sample ID	Analysis Method	Matrix	Sample Temp (C)	Temperature Criteria (C)			Between High and Gross Exceedence			Above Gross Exceedence		
								Detect Quals		Non-Detect Qual(s)	Detect Quals		Non-Detect Qual(s)
					Low	High	Gross Exceed	Non-Biased	Biased		Non-Biased	Biased	

QC Outlier Report: Holding Times

Lab Report Batch: A0B160474 **Lab ID:** TALCAN

					Actual Holding Time			Criteria				Reported Dates (and Times)		
Client Sample ID	Lab Sample ID	Analysis Method	Matrix	Prep Method	Coll To Prep	Prep To Ana	Coll To Ana	Coll To Prep	Prep To Ana	Coll To Ana	Unit of Meas	Collection Date	Preparation Date	Analysis Date
L12SW-308-5005-SW	A0B160474009	8330B	AQ	3535	11.0	4.0		7	40		Days	02/15/2010	02/26/2010	03/02/2010
L12SW-308-5005-SW	A0B160474009S	8330B	AQ	3535	11.0	4.0		7	40		Days	02/15/2010	02/26/2010	03/02/2010
L12SW-308-5005-SW	A0B160474009D	8330B	AQ	3535	11.0	4.0		7	40		Days	02/15/2010	02/26/2010	03/02/2010
L12SW-309-5007-SW	A0B160474010	8270C	AQ	3520C	10.0	5.0		7	40		Days	02/15/2010	02/25/2010	03/02/2010
		8330B	AQ	3535	3.0	6.0		7	40		Days	02/15/2010	02/18/2010	02/24/2010

Matrix Spike / Matrix Spike Duplicate Recovery and RPD Outlier Report

Method Batch : 0048021 **Analysis Method :** 8081A **Analysis Date :** 03/08/2010

Preparation Batch : 0048021 **Preparation Type :** 3520C **Preparation Date :** 02/17/2010

Lab Reporting Batch : A0B160474 **Lab ID:** TALCAN

Client Sample ID	Lab Sample ID	Matrix	Analyte Name	Reported *		Project Limits (Percent)			
				Percent Recovery	RPD	Rejection Point**	Lower Limit	Upper Limit	RPD
L12SW-308-5005-SWMS	A0B160474009D	AQ	4,4'-DDT	42		0.00	45.00	140.00	50.00
			alpha-Chordane	60		0.00	65.00	125.00	50.00

Associated Samples: Parent sample only

Client Sample ID	Lab Sample ID
L12SW-308-5005-SW	A0B160474009

* Only those Percent Recovery and/or RPD values outside project limits are listed in this report.
** Metal are also assessed against an upper rejection point of 150 percent for waters and 200 percent for soils and sediments

Project Number and Name: 172819.00.09456.00.9200.02.200 - RVAAP PBA2008 17 AOCs RI

Matrix Spike / Matrix Spike Duplicate Recovery and RPD Outlier Report

Method Batch : 0048025 **Analysis Method :** 8082 **Analysis Date :** 02/22/2010

Preparation Batch : 0048025 **Preparation Type :** 3540C **Preparation Date :** 02/17/2010

Lab Reporting Batch : A0B160474 **Lab ID:** TALCAN

Client Sample ID	Lab Sample ID	Matrix	Analyte Name	Reported *		Project Limits (Percent)			
				Percent Recovery	RPD	Rejection Point**	Lower Limit	Upper Limit	RPD
L12SD-306-5000-SDMS	A0B160474001D	SO	Aroclor 1260	58		0.00	60.00	130.00	33.00

Associated Samples: Parent sample only

Client Sample ID	Lab Sample ID
L12SD-306-5000-SD	A0B160474001

* Only those Percent Recovery and/or RPD values outside project limits are listed in this report.
** Metal are also assessed against an upper rejection point of 150 percent for waters and 200 percent for soils and sediments

Project Number and Name: 172819.00.09456.00.9200.02.200 - RVAAP PBA2008 17 AOCs RI

Matrix Spike / Matrix Spike Duplicate Recovery and RPD Outlier Report

Method Batch : 0048026 **Analysis Method :** 8081A **Analysis Date :** 03/05/2010

Preparation Batch : 0048026 **Preparation Type :** 3540C **Preparation Date :** 02/17/2010

Lab Reporting Batch : A0B160474 **Lab ID:** TALCAN

Client Sample ID	Lab Sample ID	Matrix	Analyte Name	Reported *		Project Limits (Percent)			
				Percent Recovery	RPD	Rejection Point**	Lower Limit	Upper Limit	RPD
L12SD-309-5006-SDMS	A0B160474004S	SO	Heptachlor epoxide	0.0		0.00	65.00	130.00	43.00
L12SD-309-5006-SDMS	A0B160474004D		Heptachlor epoxide	0.0		0.00	65.00	130.00	43.00

Associated Samples: Parent sample only

Client Sample ID	Lab Sample ID
L12SD-309-5006-SD	A0B160474004

* Only those Percent Recovery and/or RPD values outside project limits are listed in this report.
** Metal are also assessed against an upper rejection point of 150 percent for waters and 200 percent for soils and sediments

Project Number and Name: 172819.00.09456.00.9200.02.200 - RVAAP PBA2008 17 AOCs RI

Matrix Spike / Matrix Spike Duplicate Recovery and RPD Outlier Report

Method Batch : 0048028 **Analysis Method :** 8270C **Analysis Date :** 03/03/2010

Preparation Batch : 0048028 **Preparation Type :** 3540C **Preparation Date :** 02/17/2010

Lab Reporting Batch : A0B160474 **Lab ID:** TALCAN

Client Sample ID	Lab Sample ID	Matrix	Analyte Name	Reported *		Project Limits (Percent)			
				Percent Recovery	RPD	Rejection Point**	Lower Limit	Upper Limit	RPD
L12SD-306-5000-SDMS	A0B160474001S	SO	3,3'-Dichlorobenzidine	2.9		0.00	10.00	130.00	56.00
L12SD-306-5000-SDMS	A0B160474001D		3,3'-Dichlorobenzidine	4.8		0.00	10.00	130.00	56.00
			Hexachloroethane	20	62	0.00	35.00	110.00	29.00

Associated Samples: Parent sample only

Client Sample ID	Lab Sample ID
L12SD-306-5000-SD	A0B160474001

* Only those Percent Recovery and/or RPD values outside project limits are listed in this report.
** Metal are also assessed against an upper rejection point of 150 percent for waters and 200 percent for soils and sediments

Project Number and Name: 172819.00.09456.00.9200.02.200 - RVAAP PBA2008 17 AOCs RI

Matrix Spike / Matrix Spike Duplicate Recovery and RPD Outlier Report

Method Batch : 0048029 **Analysis Method :** 8270C **Analysis Date :** 02/24/2010

Preparation Batch : 0048029 **Preparation Type :** 3520C **Preparation Date :** 02/17/2010

Lab Reporting Batch : A0B160474 **Lab ID:** TALCAN

Client Sample ID	Lab Sample ID	Matrix	Analyte Name	Reported *		Project Limits (Percent)			
				Percent Recovery	RPD	Rejection Point**	Lower Limit	Upper Limit	RPD
L12SW-308-5005-SWMS	A0B160474009S	AQ	3,3'-Dichlorobenzidine	9.3		0.00	20.00	110.00	56.00
L12SW-308-5005-SWMS	A0B160474009D		3,3'-Dichlorobenzidine	7.9		0.00	20.00	110.00	56.00

Associated Samples: Parent sample only

Client Sample ID	Lab Sample ID
L12SW-308-5005-SW	A0B160474009

* Only those Percent Recovery and/or RPD values outside project limits are listed in this report.
** Metal are also assessed against an upper rejection point of 150 percent for waters and 200 percent for soils and sediments

Project Number and Name: 172819.00.09456.00.9200.02.200 - RVAAP PBA2008 17 AOCs RI

Matrix Spike / Matrix Spike Duplicate Recovery and RPD Outlier Report

Method Batch : 0053020 **Analysis Method :** 6020 **Analysis Date :** 02/24/2010

Preparation Batch : 0053020 **Preparation Type :** 3005A **Preparation Date :** 02/22/2010

Lab Reporting Batch : A0B160474 **Lab ID:** TALCAN

Client Sample ID	Lab Sample ID	Matrix	Analyte Name	Reported *		Project Limits (Percent)			
				Percent Recovery	RPD	Rejection Point**	Lower Limit	Upper Limit	RPD
L12SW-308-5005-SWMS	A0B160474009S	AQ	Aluminum	150		30.00	63.00	128.00	20.00
L12SW-308-5005-SWMS	A0B160474009D		Aluminum	153		30.00	63.00	128.00	20.00

Associated Samples: All samples in Method Batch

Client Sample ID	Lab Sample ID
L12SW-306-5001-SW	A0B160474006
L12SW-307-5003-SW	A0B160474007
L12SW-307-6033-FD	A0B160474008
L12SW-308-5005-SW	A0B160474009
L12SW-309-5007-SW	A0B160474010

* Only those Percent Recovery and/or RPD values outside project limits are listed in this report.
** Metal are also assessed against an upper rejection point of 150 percent for waters and 200 percent for soils and sediments

Project Number and Name: 172819.00.09456.00.9200.02.200 - RVAAP PBA2008 17 AOCs RI

Matrix Spike / Matrix Spike Duplicate Recovery and RPD Outlier Report

Method Batch : 0053028 **Analysis Method :** 6020 **Analysis Date :** 02/24/2010

Preparation Batch : 0053028 **Preparation Type :** 3050B **Preparation Date :** 02/22/2010

Lab Reporting Batch : A0B160474 **Lab ID:** TALCAN

Client Sample ID	Lab Sample ID	Matrix	Analyte Name	Reported *		Project Limits (Percent)			
				Percent Recovery	RPD	Rejection Point**	Lower Limit	Upper Limit	RPD
L12SD-306-5000-SDMS	A0B160474001S	SO	Antimony	34		30.00	75.00	125.00	20.00
			Calcium	53		30.00	70.00	130.00	20.00
			Silver	74		30.00	75.00	125.00	20.00
L12SD-306-5000-SDMS	A0B160474001D		Aluminum	175		30.00	70.00	130.00	20.00
			Antimony	32		30.00	75.00	125.00	20.00
			Barium		21	30.00	10.00	199.00	20.00
			Silver	36		30.00	75.00	125.00	20.00

Associated Samples: All samples in Method Batch

Client Sample ID	Lab Sample ID
L12SD-306-5000-SD	A0B160474001
L12SD-307-5002-SD	A0B160474002
L12SD-308-5004-SD	A0B160474003
L12SD-309-5006-SD	A0B160474004
L12SD-309-6035-FD	A0B160474005

* Only those Percent Recovery and/or RPD values outside project limits are listed in this report.
** Metal are also assessed against an upper rejection point of 150 percent for waters and 200 percent for soils and sediments

Project Number and Name: 172819.00.09456.00.9200.02.200 - RVAAP PBA2008 17 AOCs RI

Matrix Spike / Matrix Spike Duplicate Recovery and RPD Outlier Report

Method Batch : 0056149 **Analysis Method :** 353.2 Modified **Analysis Date :** 03/01/2010

Preparation Batch : 0056149 **Preparation Type :** Gen Prep **Preparation Date :** 02/25/2010

Lab Reporting Batch : A0B160474 **Lab ID:** TALCAN

Client Sample ID	Lab Sample ID	Matrix	Analyte Name	Reported *		Project Limits (Percent)			
				Percent Recovery	RPD	Rejection Point**	Lower Limit	Upper Limit	RPD
L12SD-309-5006-SDMS	A0B160474004D	SO	Nitrocellulose	32		10.00	34.00	115.00	71.00

Associated Samples: All samples in Method Batch

Client Sample ID	Lab Sample ID
L12SD-309-5006-SD	A0B160474004
L12SD-309-6035-FD	A0B160474005

* Only those Percent Recovery and/or RPD values outside project limits are listed in this report.
** Metal are also assessed against an upper rejection point of 150 percent for waters and 200 percent for soils and sediments

Project Number and Name: 172819.00.09456.00.9200.02.200 - RVAAP PBA2008 17 AOCs RI

Matrix Spike / Matrix Spike Duplicate Recovery and RPD Outlier Report

Method Batch : 0057113 **Analysis Method :** 8260B **Analysis Date :** 02/25/2010

Preparation Batch : 0057113 **Preparation Type :** 5030B **Preparation Date :** 02/25/2010

Lab Reporting Batch : A0B160474 **Lab ID:** TALCAN

Client Sample ID	Lab Sample ID	Matrix	Analyte Name	Reported *		Project Limits (Percent)			
				Percent Recovery	RPD	Rejection Point**	Lower Limit	Upper Limit	RPD
L12SD-309-6035-FDMS	A0B160474005S	SO	cis-1,3-Dichloropropene	69		0.00	70.00	125.00	40.00

Associated Samples: Parent sample only

Client Sample ID	Lab Sample ID
L12SD-309-6035-FD	A0B160474005

* Only those Percent Recovery and/or RPD values outside project limits are listed in this report.
** Metal are also assessed against an upper rejection point of 150 percent for waters and 200 percent for soils and sediments

Project Number and Name: 172819.00.09456.00.9200.02.200 - RVAAP PBA2008 17 AOCs RI

Laboratory Control Sample / Laboratory Control Sample Duplicate Outlier Report

Method Batch : 0054246 **Analysis Method :** 8260B **Analysis Date :** 02/23/2010

Preparation Batch : 0054246 **Preparation Type :** 5030B **Preparation Date :** 02/23/2010

Lab Reporting Batch : A0B160474 **Lab ID:** TALCAN

			Reported Values		Project Limits (Percent)			
LCS Lab Sample ID	**Matrix**	**Analyte Name**	**Percent Recovery**	**RPD**	**Rejection Point**	**Lower Limit**	**Upper Limit**	**RPD**
A0B230000246C	AQ	Chloroethane	52		10.00	60.00	135.00	30.00
A0B230000246L		Chloroethane	51	1.4	10.00	60.00	135.00	30.00

Associated Samples

Client Sample ID	**Lab Sample ID**
L12SW-306-5001-SW	A0B160474006
L12SW-307-5003-SW	A0B160474007
L12SW-307-6033-FD	A0B160474008
L12SW-308-5005-SW	A0B160474009
L12SW-309-5007-SW	A0B160474010
PBA08-QC-6007-TB	A0B160474011

Scope of Data Qualification: The outlier in the LCS qualifies that analyte in all samples with the same Preparation Batch ID as the LCS

Project Number and Name: 172819.00.09456.00.9200.02.200 - RVAAP PBA2008 17 AOCs RI

Laboratory Control Sample / Laboratory Control Sample Duplicate Outlier Report

Method Batch : 0056134 **Analysis Method :** 8270C **Analysis Date :** 03/02/2010

Preparation Batch : 0056134 **Preparation Type :** 3520C **Preparation Date :** 02/25/2010

Lab Reporting Batch : A0B160474 **Lab ID:** TALCAN

			Reported Values		Project Limits (Percent)			
LCS Lab Sample ID	**Matrix**	**Analyte Name**	**Percent Recovery**	**RPD**	**Rejection Point**	**Lower Limit**	**Upper Limit**	**RPD**
A0B250000134C	AQ	2-Methylnaphthalene	110		10.00	45.00	105.00	31.00
A0B250000134L		2-Methylnaphthalene	110	0.53	10.00	45.00	105.00	31.00

Associated Samples

Client Sample ID	**Lab Sample ID**
L12SW-309-5007-SW	A0B160474010

Scope of Data Qualification: The outlier in the LCS qualifies that analyte in all samples with the same Preparation Batch ID as the LCS

Project Number and Name: 172819.00.09456.00.9200.02.200 - RVAAP PBA2008 17 AOCs RI

QC Outlier Report: Non-Qualified Outliers for Reporting Limits
(Sample is non-detect but reported result exceeds project requirements for reporting limit)

Lab Report Batch: A0B160474 **Lab ID:** TALCAN

Client Sample ID	Lab Sample ID	Analysis Method	Matrix	Analyte Name	Lab Qualifier	Result	Reporting Limit Criteria*	Units
L12SD-306-5000-SD	A0B160474001	8270C	SO	Carbazole	U	110	106.382979	ug/kg
		8330B		1,3,5-Trinitrobenzene	U	0.25	0.52659574	mg/kg
				1,3-Dinitrobenzene	U	0.25	0.52659574	mg/kg
				2,4-Dinitrotoluene	U	0.25	0.52659574	mg/kg
				2,6-Dinitrotoluene	U	0.25	0.52659574	mg/kg
				2-Amino-4,6-dinitrotoluene	U	0.25	0.52659574	mg/kg
				2-Nitrotoluene	U	0.25	0.52659574	mg/kg
				3-Nitrotoluene	U	0.25	0.52659574	mg/kg
				4-Amino-2,6-Dinitrotoluene	U	0.25	0.52659574	mg/kg
				4-Nitrotoluene	U	0.50	1.05319149	mg/kg
				Nitrobenzene	U	0.25	0.52659574	mg/kg
L12SD-308-5004-SD	A0B160474003	8270C	SO	2,4-Dinitrophenol	U	1800	1777.77778	ug/kg
				2-Nitroaniline	U	1800	1777.77778	ug/kg
				3-Nitroaniline	U	1800	1777.77778	ug/kg
				4,6-Dinitro-2-methylphenol	U	1800	1777.77778	ug/kg
				4-Nitroaniline	U	1800	1777.77778	ug/kg
				4-Nitrophenol	U	1800	1777.77778	ug/kg
				Benzoic acid	U	1800	1777.77778	ug/kg
		8330B		1,3,5-Trinitrobenzene	U	0.25	0.55	mg/kg
				1,3-Dinitrobenzene	U	0.25	0.55	mg/kg
				2,4,6-Trinitrotoluene (TNT)	U	0.25	0.55	mg/kg
				2,4-Dinitrotoluene	U	0.25	0.55	mg/kg
				2,6-Dinitrotoluene	U	0.25	0.55	mg/kg
				2-Amino-4,6-dinitrotoluene	U	0.25	0.55	mg/kg
				2-Nitrotoluene	U	0.25	0.55	mg/kg
				3-Nitrotoluene	U	0.25	0.55	mg/kg
				4-Amino-2,6-Dinitrotoluene	U	0.25	0.55	mg/kg
				4-Nitrotoluene	U	0.50	1.1	mg/kg
				Nitrobenzene	U	0.25	0.55	mg/kg
L12SD-309-5006-SD	A0B160474004	8081A	SO	Aldrin	U	29	28.9855072	ug/kg
				alpha-Chordane	U	22	21.7391304	ug/kg

* Reporting Limit Criteria = (Dilution Factor) * (Reporting Limit from the reference project library) * (Percent Moisture Correction)
Percent Moisture Correction:
Soil: 100 / (100 - Percent Moisture)
Water: 1

Project Number and Name: **172819.00.09456.00.9200.02.200 - RVAAP PBA2008 17 AOCs RI**

QC Outlier Report: Non-Qualified Outliers for Reporting Limits
(Sample is non-detect but reported result exceeds project requirements for reporting limit)

Lab Report Batch: A0B160474 **Lab ID:** TALCAN

Client Sample ID	Lab Sample ID	Analysis Method	Matrix	Analyte Name	Lab Qualifier	Result	Reporting Limit Criteria*	Units
L12SD-309-5006-SD	A0B160474004	8081A	SO	delta-BHC	U	29	28.9855072	ug/kg
				Endosulfan sulfate	U	22	21.7391304	ug/kg
				Endrin aldehyde	U	22	21.7391304	ug/kg
		8082		Aroclor 1016	U	48	47.826087	ug/kg
				Aroclor 1221	U	48	47.826087	ug/kg
				Aroclor 1232	U	48	47.826087	ug/kg
				Aroclor 1242	U	48	47.826087	ug/kg
				Aroclor 1248	U	48	47.826087	ug/kg
				Aroclor 1254	U	48	47.826087	ug/kg
				Aroclor 1260	U	48	47.826087	ug/kg
		8260B		2-Hexanone	U	29	28.9855072	ug/kg
				4-methyl-2-pentanone (MIBK)	U	29	28.9855072	ug/kg
		8270C		1,2,4-Trichlorobenzene	U	480	478.26087	ug/kg
				1,2-Dichlorobenzene	U	480	478.26087	ug/kg
				1,3-Dichlorobenzene	U	480	478.26087	ug/kg
				1,4-Dichlorobenzene	U	480	478.26087	ug/kg
				2,4,5-Trichlorophenol	U	480	478.26087	ug/kg
				2,4,6-Trichlorophenol	U	480	478.26087	ug/kg
				2,4-Dichlorophenol	U	480	478.26087	ug/kg
				2,4-Dimethylphenol	U	480	478.26087	ug/kg
				2,4-Dinitrophenol	U	1200	1159.42029	ug/kg
				2,4-Dinitrotoluene	U	480	478.26087	ug/kg
				2,6-Dinitrotoluene	U	480	478.26087	ug/kg
				2-Chloronaphthalene	U	480	478.26087	ug/kg
				2-Chlorophenol	U	480	478.26087	ug/kg
				2-Methylphenol	U	480	478.26087	ug/kg
				2-Nitroaniline	U	1200	1159.42029	ug/kg
				2-Nitrophenol	U	480	478.26087	ug/kg
				3,3'-Dichlorobenzidine	U	480	478.26087	ug/kg
				3-methylphenol/4-methylphenol	U	480	478.26087	ug/kg
				3-Nitroaniline	U	1200	1159.42029	ug/kg
				4,6-Dinitro-2-methylphenol	U	1200	1159.42029	ug/kg
				4-Bromophenyl phenyl ether	U	480	478.26087	ug/kg

* Reporting Limit Criteria = (Dilution Factor) * (Reporting Limit from the reference project library) * (Percent Moisture Correction)
Percent Moisture Correction:
Soil: 100 / (100 - Percent Moisture)
Water: 1

Project Number and Name: **172819.00.09456.00.9200.02.200 - RVAAP PBA2008 17 AOCs RI**

QC Outlier Report: Non-Qualified Outliers for Reporting Limits
(Sample is non-detect but reported result exceeds project requirements for reporting limit)

Lab Report Batch: A0B160474 **Lab ID:** TALCAN

Client Sample ID	Lab Sample ID	Analysis Method	Matrix	Analyte Name	Lab Qualifier	Result	Reporting Limit Criteria*	Units
L12SD-309-5006-SD	A0B160474004	8270C	SO	4-Chloro-3-methylphenol	U	480	478.26087	ug/kg
				4-Chloroaniline	U	480	478.26087	ug/kg
				4-Chlorophenyl phenyl ether	U	480	478.26087	ug/kg
				4-Nitroaniline	U	1200	1159.42029	ug/kg
				4-Nitrophenol	U	1200	1159.42029	ug/kg
				Benzoic acid	U	1200	1159.42029	ug/kg
				Benzyl alcohol	U	480	478.26087	ug/kg
				bis(2-Chloroethoxy)methane	U	480	478.26087	ug/kg
				bis(2-Chloroethyl) ether	U	480	478.26087	ug/kg
				Bis(2-chloroisopropyl) ether	U	480	478.26087	ug/kg
				bis(2-Ethylhexyl) phthalate	U	480	478.26087	ug/kg
				Dibenzofuran	U	480	478.26087	ug/kg
				Diethyl phthalate	U	480	478.26087	ug/kg
				Dimethyl phthalate	U	480	478.26087	ug/kg
				Di-n-butyl phthalate	U	480	478.26087	ug/kg
				Di-n-octyl phthalate	U	480	478.26087	ug/kg
				Hexachlorobenzene	U	480	478.26087	ug/kg
				Hexachlorobutadiene	U	480	478.26087	ug/kg
				HEXACHLOROCYCLOPENTADIE	U	480	478.26087	ug/kg
				Hexachloroethane	U	480	478.26087	ug/kg
				Isophorone	U	480	478.26087	ug/kg
				Nitrobenzene	U	480	478.26087	ug/kg
				N-Nitrosodi-n-propylamine	U	480	478.26087	ug/kg
				N-Nitrosodiphenylamine	U	480	478.26087	ug/kg
				Pentachlorophenol	U	480	478.26087	ug/kg
				Phenol	U	480	478.26087	ug/kg
L12SD-309-6035-FD	A0B160474005	8081A	SO	4,4'-DDE	U	12	11.971831	ug/kg
				alpha-BHC	U	18	17.6056338	ug/kg
				beta-BHC	U	25	24.6478873	ug/kg
				Dieldrin	U	12	11.971831	ug/kg
				Endosulfan I	U	12	11.971831	ug/kg
				Endosulfan II	U	18	17.6056338	ug/kg

* Reporting Limit Criteria = (Dilution Factor) * (Reporting Limit from the reference project library) * (Percent Moisture Correction)
Percent Moisture Correction:
Soil: 100 / (100 - Percent Moisture)
Water: 1

Project Number and Name: **172819.00.09456.00.9200.02.200 - RVAAP PBA2008 17 AOCs RI**

QC Outlier Report: Non-Qualified Outliers for Reporting Limits
(Sample is non-detect but reported result exceeds project requirements for reporting limit)

Lab Report Batch: A0B160474 **Lab ID:** TALCAN

Client Sample ID	Lab Sample ID	Analysis Method	Matrix	Analyte Name	Lab Qualifier	Result	Reporting Limit Criteria*	Units
L12SD-309-6035-FD	A0B160474005	8081A	SO	Endrin	U	12	11.971831	ug/kg
				gamma-BHC (Lindane)	U	18	17.6056338	ug/kg
				gamma-Chlordane	U	12	11.971831	ug/kg
				Heptachlor	U	25	24.6478873	ug/kg
				Heptachlor epoxide	U	18	17.6056338	ug/kg
L12SW-306-5001-SW	A0B160474006	8330B	AQ	1,3,5-Trinitrobenzene	U	0.11	0.108	ug/L
				4-Nitrotoluene	U	1.1	1.08	ug/L
				Nitroglycerin	U	1.1	1.08	ug/L
L12SW-307-5003-SW	A0B160474007	8330B	AQ	1,3-Dinitrobenzene	U	0.16	0.156	ug/L
				2,4,6-Trinitrotoluene (TNT)	U	0.16	0.156	ug/L
				2,4-Dinitrotoluene	U	0.16	0.156	ug/L
				2,6-Dinitrotoluene	U	0.16	0.156	ug/L
				2-Nitrotoluene	U	0.16	0.156	ug/L
				Methyl-2,4,6-Trinitrophenylnitramin	U	0.16	0.156	ug/L
				Nitrobenzene	U	0.16	0.156	ug/L
				Octahydro-1,3,5,7-tetranitro-1,3,5,7	U	0.16	0.156	ug/L
L12SW-307-6033-FD	A0B160474008	8330B	AQ	1,3-Dinitrobenzene	U	0.16	0.1575	ug/L
				2,4,6-Trinitrotoluene (TNT)	U	0.16	0.1575	ug/L
				2,4-Dinitrotoluene	U	0.16	0.1575	ug/L
				2,6-Dinitrotoluene	U	0.16	0.1575	ug/L
				2-Amino-4,6-dinitrotoluene	U	0.32	0.315	ug/L
				2-Nitrotoluene	U	0.16	0.1575	ug/L
				Methyl-2,4,6-Trinitrophenylnitramin	U	0.16	0.1575	ug/L
				Nitrobenzene	U	0.16	0.1575	ug/L
				Octahydro-1,3,5,7-tetranitro-1,3,5,7	U	0.16	0.1575	ug/L
L12SW-308-5005-SW	A0B160474009	8330B	AQ	1,3,5-Trinitrobenzene	U	0.11	0.108	ug/L
				4-Nitrotoluene	U	1.1	1.08	ug/L
				Hexahydro-1,3,5-Trinitro-1,3,5-Triaz	U	0.28	0.275	ug/L
				Nitroglycerin	U	1.1	1.08	ug/L
				PETN	U	1.1	1.08	ug/L

* Reporting Limit Criteria = (Dilution Factor) * (Reporting Limit from the reference project library) * (Percent Moisture Correction)
Percent Moisture Correction:
Soil: 100 / (100 - Percent Moisture)
Water: 1

Project Number and Name: **172819.00.09456.00.9200.02.200 - RVAAP PBA2008 17 AOCs RI**

QC Outlier Report: Non-Qualified Outliers for Reporting Limits
(Sample is non-detect but reported result exceeds project requirements for reporting limit)

Lab Report Batch: A0B160474 **Lab ID:** TALCAN

Client Sample ID	Lab Sample ID	Analysis Method	Matrix	Analyte Name	Lab Qualifier	Result	Reporting Limit Criteria*	Units
L12SW-309-5007-SW	A0B160474010	8330B	AQ	1,3,5-Trinitrobenzene	U	0.11	0.106	ug/L
				1,3-Dinitrobenzene	U	0.16	0.159	ug/L
				2,4,6-Trinitrotoluene (TNT)	U	0.16	0.159	ug/L
				2,4-Dinitrotoluene	U	0.16	0.159	ug/L
				2,6-Dinitrotoluene	U	0.16	0.159	ug/L
				2-Amino-4,6-dinitrotoluene	U	0.32	0.318	ug/L
				2-Nitrotoluene	U	0.16	0.159	ug/L
				4-Amino-2,6-Dinitrotoluene	U	0.16	0.159	ug/L
				4-Nitrotoluene	U	1.1	1.06	ug/L
				Methyl-2,4,6-Trinitrophenylnitramin	U	0.16	0.159	ug/L
				Nitrobenzene	U	0.16	0.159	ug/L
				Nitroglycerin	U	1.1	1.06	ug/L
				Octahydro-1,3,5,7-tetranitro-1,3,5,7	U	0.16	0.159	ug/L
				PETN	U	1.1	1.06	ug/L

* Reporting Limit Criteria = (Dilution Factor) * (Reporting Limit from the reference project library) * (Percent Moisture Correction)
Percent Moisture Correction:
Soil: 100 / (100 - Percent Moisture)
Water: 1

Project Number and Name: **172819.00.09456.00.9200.02.200 - RVAAP PBA2008 17 AOCs RI**

QC Outlier Report: Trip Blank

Lab Reporting Batch :
Lab ID:
Method/Preparation Batch :
Analysis Date :
Client Sample ID :
Preparation Date :
Lab Sample ID :
Preparation Type :

Analysis Method :

No contamination was found.

Continuing Calibration (CCV) Outlier Report (Organics)

There are no Organic Continuing Calibrations with outliers

Continuing Calibration (CCAL) Outlier Report (Inorganics)

There are no Inorganic Continuing Calibrations with outliers

Reporting Limits Outlier Report (detected results reported below the reporting limit)

Lab Report Batch: A0B160474 **Lab ID:** TALCAN

Client Sample ID	Lab Sample ID	Analysis Method	Matrix	Analyte Name	Lab Qualifier	Result	EDD Reporting Limit	Units
L12SD-306-5000-SD	A0B160474001	6020	SO	Antimony	J	0.22	1.1	mg/kg
				Sodium	J	82.2	211	mg/kg
				Thallium	J	0.14	0.42	mg/kg
		7471A		Mercury	J	0.17	0.21	mg/kg
		8270C		2-Methylnaphthalene	J	57	700	ug/kg
				bis(2-Ethylhexyl) phthalate	J	43	700	ug/kg
				Dibenzofuran	J	46	700	ug/kg
		8330B		2,4,6-Trinitrotoluene (TNT)	J	0.11	0.25	mg/kg
L12SD-307-5002-SD	A0B160474002	6020		Antimony	J	0.21	1.2	mg/kg
				Cadmium	J	0.31	0.50	mg/kg
				Silver	J	0.12	1.2	mg/kg
				Sodium	J	196	250	mg/kg
				Thallium	J	0.27	0.50	mg/kg
		7471A		Mercury	J	0.065	0.25	mg/kg
		8270C		2-Methylnaphthalene	J	700	820	ug/kg
				3-methylphenol/4-methylphenol	J	73	820	ug/kg
				bis(2-Ethylhexyl) phthalate	J	63	820	ug/kg
				Dibenzofuran	J	130	820	ug/kg
L12SD-308-5004-SD	A0B160474003	6020		Silver	J	0.078	1.1	mg/kg
				Thallium	J	0.19	0.44	mg/kg
		7471A		Mercury	J	0.062	0.22	mg/kg
		8270C		2-Methylnaphthalene	J	41	730	ug/kg
L12SD-309-5006-SD	A0B160474004	353.2 Modified		Nitrocellulose	B J	1.2	7.2	mg/kg
		6020		Antimony	J	0.10	0.72	mg/kg
				Beryllium	J G	0.58	0.72	mg/kg
				Calcium	J G	1160	1440	mg/kg
				Potassium	J G	586	721	mg/kg
				Silver	J	0.096	0.72	mg/kg
				Sodium	J	69.8	144	mg/kg
				Thallium	J	0.13	0.29	mg/kg
		7471A		Mercury	J	0.032	0.14	mg/kg
		8260B		2-Butanone (MEK)	J B	5.7	29	ug/kg
				Toluene	J B	1.7	7.2	ug/kg
		8270C		2-Methylnaphthalene	J	10	480	ug/kg
				Butyl benzyl phthalate	J	23	480	ug/kg
L12SD-309-6035-FD	A0B160474005	6020		Beryllium	J G	0.53	3.5	mg/kg

Reporting Limits Outlier Report (detected results reported below the reporting limit)

Lab Report Batch: A0B160474 **Lab ID:** TALCAN

Client Sample ID	Lab Sample ID	Analysis Method	Matrix	Analyte Name	Lab Qualifier	Result	EDD Reporting Limit	Units
L12SD-309-6035-FD	A0B160474005	6020	SO	Calcium	J G	1120	1410	mg/kg
				Potassium	J G	597	703	mg/kg
				Silver	J	0.092	0.70	mg/kg
				Thallium	J	0.12	0.28	mg/kg
		7471A		Mercury	J	0.046	0.14	mg/kg
		8260B		2-Butanone (MEK)	J B	6.5	28	ug/kg
				Toluene	J B	0.80	7.0	ug/kg
		8270C		2-Methylnaphthalene	J	11	460	ug/kg
L12SW-306-5001-SW	A0B160474006	6020	AQ	Antimony	J	0.40	5.0	ug/L
				Arsenic	J	2.4	5.0	ug/L
				Beryllium	J	0.099	1.0	ug/L
				Cadmium	J	0.36	2.0	ug/L
				Chromium	J	1.8	5.0	ug/L
				Cobalt	J	2.7	5.0	ug/L
				Nickel	J	3.9	10.0	ug/L
				Selenium	J	0.49	5.0	ug/L
				Silver	J	0.13	5.0	ug/L
				Vanadium	J	2.5	10.0	ug/L
		8330B		PETN	J PG	1.0	1.1	ug/L
L12SW-307-5003-SW	A0B160474007	353.2 Modified		Nitrocellulose	B	0.15	0.50	mg/L
		6020		Antimony	J	0.66	5.0	ug/L
				Arsenic	J	0.46	5.0	ug/L
				Beryllium	J	0.035	1.0	ug/L
				Cadmium	J	0.038	2.0	ug/L
				Chromium	J	0.60	5.0	ug/L
				Cobalt	J	0.24	5.0	ug/L
				Copper	J	1.4	5.0	ug/L
				Lead	J	0.30	3.0	ug/L
				Nickel	J	1.7	10.0	ug/L
				Selenium	J	0.29	5.0	ug/L
				Silver	J	0.12	5.0	ug/L
				Vanadium	J	0.75	10.0	ug/L
				Zinc	J	10.2	40.0	ug/L
		8081A		delta-BHC	J	0.067	0.10	ug/L
L12SW-307-6033-FD	A0B160474008	6020		Antimony	J	1.2	5.0	ug/L
				Arsenic	J	2.4	5.0	ug/L

Reporting Limits Outlier Report (detected results reported below the reporting limit)

Lab Report Batch: A0B160474 **Lab ID:** TALCAN

Client Sample ID	Lab Sample ID	Analysis Method	Matrix	Analyte Name	Lab Qualifier	Result	EDD Reporting Limit	Units
L12SW-307-6033-FD	A0B160474008	6020	AQ	Beryllium	J	0.19	1.0	ug/L
				Cadmium	J	0.21	2.0	ug/L
				Chromium	J	4.8	5.0	ug/L
				Cobalt	J	2.0	5.0	ug/L
				Nickel	J	5.6	10.0	ug/L
				Selenium	J	0.56	5.0	ug/L
				Silver	J	0.29	5.0	ug/L
				Vanadium	J	7.3	10.0	ug/L
		8330B		Hexahydro-1,3,5-Trinitro-1,3,5-Triazine	J	0.070	0.26	ug/L
L12SW-308-5005-SW	A0B160474009	6020		Antimony	J	0.51	5.0	ug/L
				Cadmium	J	1.2	2.0	ug/L
				Selenium	J	1.9	5.0	ug/L
				Silver	J	0.090	5.0	ug/L
		8081A		delta-BHC	J	0.014	0.050	ug/L
		8270C		Benzyl alcohol	J B	0.45	10	ug/L
				bis(2-Ethylhexyl) phthalate	J	1.1	10	ug/L
L12SW-309-5007-SW	A0B160474010	6020		Antimony	J	0.94	5.0	ug/L
				Beryllium	J	0.55	1.0	ug/L
				Cadmium	J	1.7	2.0	ug/L
				Selenium	J	2.8	5.0	ug/L
				Silver	J	0.16	5.0	ug/L
		8260B		Carbon disulfide	J	0.53	1.0	ug/L
		8270C		bis(2-Ethylhexyl) phthalate	J B	8.2	10	ug/L
PBA08-QC-6007-TB	A0B160474011	8260B		Acetone	J	5.0	10	ug/L

Method Blank Outlier Report

Lab Reporting Batch : A0B160474
Lab ID: TALCAN
Analysis Method : 8270C
Analysis Date : 02/24/2010
Preparation Type : 3520C
Preparation Date : 02/17/2010
Method Blank Lab Sample ID : A0B170000029B
Preparation Batch : 0048029

Benzyl alcohol	Result	Reporting Limit	Units	Lab Qual	Comments
Method Blank Result:	**0.98**	**10**	**ug/L**	**J**	

Benzyl alcohol was qualified due to method blank contamination in the following associated samples:

Client Sample ID	Lab Sample ID	Dilution	Result	Lab Qual	Result Units
L12SW-308-5005-SW	A0B160474009	1	0.45	J B	ug/L

Method Blank Outlier Report

Lab Reporting Batch : A0B160474
Lab ID: TALCAN
Analysis Method : 6020
Analysis Date : 02/24/2010
Preparation Type : 3050B
Preparation Date : 02/22/2010
Method Blank Lab Sample ID : A0B220000028B
Preparation Batch : 0053028

Vanadium	Result	Reporting Limit	Units	Lab Qual	Comments
Method Blank Result:	**0.043**	**1.0**	**mg/kg**	**J**	

Vanadium contamination found in the method blank did not qualify any samples.

Method Blank Outlier Report

Lab Reporting Batch : A0B160474 **Lab ID:** TALCAN

Analysis Method : 6020 **Analysis Date :** 02/26/2010

Preparation Type : 3050B **Preparation Date :** 02/25/2010

Method Blank Lab Sample ID : A0B250000051B **Preparation Batch :** 0056051

Copper	Result	Reporting Limit	Units	Lab Qual	Comments
Method Blank Result:	**0.12**	**0.50**	**mg/kg**	**J**	

Copper contamination found in the method blank did not qualify any samples.

Method Blank Outlier Report

Lab Reporting Batch : A0B160474
Lab ID: TALCAN
Analysis Method : 8270C
Analysis Date : 03/02/2010
Preparation Type : 3520C
Preparation Date : 02/25/2010
Method Blank Lab Sample ID : A0B250000134B
Preparation Batch : 0056134

bis(2-Ethylhexyl) phthalate	Result	Reporting Limit	Units	Lab Qual	Comments
Method Blank Result:	**0.83**	**10**	**ug/L**	**J**	**Common Contaminant**

bis(2-Ethylhexyl) phthalate was qualified due to method blank contamination in the following associated samples:

Client Sample ID	Lab Sample ID	Dilution	Result	Lab Qual	Result Units
L12SW-309-5007-SW	A0B160474010	1	8.2	J B	ug/L

Method Blank Outlier Report

Lab Reporting Batch : A0B160474 **Lab ID:** TALCAN

Analysis Method : 353.2 Modified **Analysis Date :** 03/01/2010

Preparation Type : Gen Prep **Preparation Date :** 02/25/2010

Method Blank Lab Sample ID : G0B250000149B **Preparation Batch :** 0056149

Nitrocellulose	Result	Reporting Limit	Units	Lab Qual	Comments
Method Blank Result:	**0.80**	**5.0**	**mg/kg**	**B**	

Nitrocellulose was qualified due to method blank contamination in the following associated samples:

Client Sample ID	Lab Sample ID	Dilution	Result	Lab Qual	Result Units
L12SD-309-5006-SD	A0B160474004	1	1.2	B J	mg/kg

Method Blank Outlier Report

Lab Reporting Batch : A0B160474 **Lab ID:** TALCAN

Analysis Method : 8260B **Analysis Date :** 02/25/2010

Preparation Type : 5030B **Preparation Date :** 02/25/2010

Method Blank Lab Sample ID : A0B260000113B **Preparation Batch :** 0057113

2-Butanone (MEK)	Result	Reporting Limit	Units	Lab Qual	Comments
Method Blank Result:	**3.8**	**20**	**ug/kg**	**J**	**Common Contaminant**

2-Butanone (MEK) was qualified due to method blank contamination in the following associated samples:

Client Sample ID	Lab Sample ID	Dilution	Result	Lab Qual	Result Units
L12SD-309-5006-SD	A0B160474004	1	5.7	J B	ug/kg
L12SD-309-6035-FD	A0B160474005	1	6.5	J B	ug/kg

2-Hexanone	Result	Reporting Limit	Units	Lab Qual	Comments
Method Blank Result:	**1.6**	**20**	**ug/kg**	**J**	

2-Hexanone contamination found in the method blank did not qualify any samples.

Acetone	Result	Reporting Limit	Units	Lab Qual	Comments
Method Blank Result:	**15**	**20**	**ug/kg**	**J**	**Common Contaminant**

Acetone was qualified due to method blank contamination in the following associated samples:

Client Sample ID	Lab Sample ID	Dilution	Result	Lab Qual	Result Units
L12SD-309-5006-SD	A0B160474004	1	37	B	ug/kg
L12SD-309-6035-FD	A0B160474005	1	49	B	ug/kg

Toluene	Result	Reporting Limit	Units	Lab Qual	Comments
Method Blank Result:	**0.39**	**5.0**	**ug/kg**	**J**	

Toluene was qualified due to method blank contamination in the following associated samples:

Client Sample ID	Lab Sample ID	Dilution	Result	Lab Qual	Result Units
L12SD-309-5006-SD	A0B160474004	1	1.7	J B	ug/kg
L12SD-309-6035-FD	A0B160474005	1	0.80	J B	ug/kg

Surrogate Recovery Outlier Report

Lab Report Batch: A0B160474 **Lab ID:** TALCAN

Client Sample ID	Lab Sample ID	Analysis Method	Dilution	Matrix	Surrogate	Percent Recovery	Criteria (percent) Lower Limit	Upper Limit	Reject Point	Associated Target Analytes
L12SD-309-5006-SDMS	A0B160474004S	8081A	5	SO	TETRACHLORO-M-XYLENE	155	55.0	130.0	10.0	All Target
L12SW-306-5001-SW	A0B160474006	8082	1	AQ	Decachlorobiphenyl	33	40.0	135.0	10.0	All Target
L12SW-307-5003-SW	A0B160474007	8082	1	AQ	Decachlorobiphenyl	33	40.0	135.0	10.0	All Target
L12SW-308-5005-SW	A0B160474009	8081A	1	AQ	Decachlorobiphenyl	26	30.0	135.0	10.0	All Target
		8082			Decachlorobiphenyl	4.4	40.0	135.0	10.0	All Target
L12SW-309-5007-SW	A0B160474010	8081A	1	AQ	Decachlorobiphenyl	27	30.0	135.0	10.0	All Target
		8082			Decachlorobiphenyl	19	40.0	135.0	10.0	All Target

QC Outlier Report: Field Duplicates (Non-qualified Outliers)

Lab Report Batch: **Lab ID:**

			Field Sample				Field Sample Duplicate						
Analysis Method	Matrix	Analyte Name	Client Sample ID	Ana Type	Result	Lab Qualifier	Client Sample Duplicate ID	Ana Type	Result	Lab Qualifiers	RPD Dup* (%)	RPD Criteria (%)	Result Units

Note: Outlier report also includes analytes detected in one sample but not in the related sample, i.e., analyte was detected in the field sample but not in the field duplicate sample, or vice versa. In this case, RPD value assigned to the field duplicate sample is 200.

QC Outlier Report: Temperature (Non-qualified Outliers)

Lab Report Batch: A1D210402 **Lab ID:** TALCAN

Client Sample ID	Lab Sample ID	Analysis Method	Matrix	Sample Temperature (C)	Criteria	
					Lower Limit	Upper Limit
L12sw-313-5825-SW	A1D210402009	8081A	AQ	1.8	2.0	
PBA08-QC-6243-ER	A1D210402001	8081A	AQ	1.2	2.0	
L12sd-310-5820-SD	A1D210402004	8082	SO	1.2	2.0	
L12sd-310-5820-SDMS	A1D210402004S	8082	SO	1.2	2.0	
L12sd-310-5820-SDMSD	A1D210402004D	8082	SO	1.2	2.0	
L12sd-311-5822-SD	A1D210402006	8082	SO	1.2	2.0	
L12sd-312-5824-SD	A1D210402008	8082	SO	1.2	2.0	
L12sd-313-5826-SD	A1D210402010	8082	SO	1.2	2.0	
L12sw-313-5825-SW	A1D210402009	8082	AQ	1.8	2.0	
PBA08-QC-6243-ER	A1D210402001	8082	AQ	1.2	2.0	
L12sw-313-5825-SW	A1D210402009	8260B	AQ	1.8	2.0	
PBA08-QC-6242-TB	A1D210402002	8260B	AQ	1.2	2.0	
PBA08-QC-6243-ER	A1D210402001	8260B	AQ	1.2	2.0	
L12sd-310-5820-SD	A1D210402004	8270C	SO	1.2	2.0	
L12sd-310-5820-SDMS	A1D210402004S	8270C	SO	1.2	2.0	
L12sd-310-5820-SDMSD	A1D210402004D	8270C	SO	1.2	2.0	
L12sd-311-5822-SD	A1D210402006	8270C	SO	1.2	2.0	
L12sd-312-5824-SD	A1D210402008	8270C	SO	1.2	2.0	
L12sd-313-5826-SD	A1D210402010	8270C	SO	1.2	2.0	
L12sw-313-5825-SW	A1D210402009	8270C	AQ	1.8	2.0	
PBA08-QC-6243-ER	A1D210402001	8270C	AQ	1.2	2.0	
L12sd-310-5820-SD	A1D210402004	8270C PAH	SO	1.2	2.0	
L12sd-310-5820-SDMS	A1D210402004S	8270C PAH	SO	1.2	2.0	
L12sd-310-5820-SDMSD	A1D210402004D	8270C PAH	SO	1.2	2.0	
L12sd-311-5822-SD	A1D210402006	8270C PAH	SO	1.2	2.0	
L12sd-312-5824-SD	A1D210402008	8270C PAH	SO	1.2	2.0	
L12sd-313-5826-SD	A1D210402010	8270C PAH	SO	1.2	2.0	
L12sw-313-5825-SW	A1D210402009	8270C PAH	AQ	1.8	2.0	
PBA08-QC-6243-ER	A1D210402001	8270C PAH	AQ	1.2	2.0	
L12sd-310-5820-SD	A1D210402004	8330B	SO	1.2	2.0	
L12sd-310-5820-SDMS	A1D210402004S	8330B	SO	1.2	2.0	

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QC Outlier Report: Temperature (Non-qualified Outliers)

Lab Report Batch: A1D210402 **Lab ID:** TALCAN

Client Sample ID	Lab Sample ID	Analysis Method	Matrix	Sample Temperature (C)	Criteria	
					Lower Limit	Upper Limit
L12sd-310-5820-SDMSD	A1D210402004D	8330B	SO	1.2	2.0	
L12sd-311-5822-SD	A1D210402006	8330B	SO	1.2	2.0	
L12sd-312-5824-SD	A1D210402008	8330B	SO	1.2	2.0	
L12sd-313-5826-SD	A1D210402010	8330B	SO	1.2	2.0	
L12sw-313-5825-SW	A1D210402009	8330B	AQ	1.8	2.0	
PBA08-QC-6243-ER	A1D210402001	8330B	AQ	1.2	2.0	
L12sw-313-5825-SW	A1D210402009	8330M	AQ	1.8	2.0	
PBA08-QC-6243-ER	A1D210402001	8330M	AQ	1.2	2.0	
L12sd-310-5820-SD	A1D210402004	9056	SO	1.2	2.0	6.0
L12sd-311-5822-SD	A1D210402006	9056	SO	1.2	2.0	6.0
L12sd-311-5822-SDMS	A1D210402006S	9056	SO	1.2	2.0	6.0
L12sd-311-5822-SDMSD	A1D210402006D	9056	SO	1.2	2.0	6.0
L12sd-312-5824-SD	A1D210402008	9056	SO	1.2	2.0	6.0
L12sd-313-5826-SD	A1D210402010	9056	SO	1.2	2.0	6.0
L12sw-313-5825-SW	A1D210402009	9056	AQ	1.8	2.0	6.0
PBA08-QC-6243-ER	A1D210402001	9056	AQ	1.2	2.0	6.0

Temperature Outlier Report

Lab Report Batch: **Lab ID:**

Client Sample ID	Lab Sample ID	Analysis Method	Matrix	Sample Temp (C)	Temperature Criteria (C)			Between High and Gross Exceedence			Above Gross Exceedence		
								Detect Quals		Non-Detect Qual(s)	Detect Quals		Non-Detect Qual(s)
					Low	High	Gross Exceed	Non-Biased	Biased		Non-Biased	Biased	

Matrix Spike / Matrix Spike Duplicate Recovery and RPD Outlier Report

Method Batch : 1114020 **Analysis Method :** 8081A **Analysis Date :** 05/03/2011

Preparation Batch : 1114020 **Preparation Type :** 3520C **Preparation Date :** 04/25/2011

Lab Reporting Batch : A1D210402 **Lab ID:** TALCAN

Client Sample ID	Lab Sample ID	Matrix	Analyte Name	Reported *		Project Limits (Percent)			
				Percent Recovery	RPD	Rejection Point**	Lower Limit	Upper Limit	RPD
L12sw-310-5819-SWMS	A1D210402003D	AQ	beta-BHC	59		0.00	65.00	125.00	50.00

Associated Samples: Parent sample only

Client Sample ID	Lab Sample ID
L12sw-310-5819-SW	A1D210402003

* Only those Percent Recovery and/or RPD values outside project limits are listed in this report.
** Metal are also assessed against an upper rejection point of 150 percent for waters and 200 percent for soils and sediments

Project Number and Name: 172819.00.09456.00.9200.02.200 - RVAAP PBA2008 17 AOCs RI

Matrix Spike / Matrix Spike Duplicate Recovery and RPD Outlier Report

Method Batch : 1118021 **Analysis Method :** 6020 **Analysis Date :** 05/13/2011

Preparation Batch : 1118021 **Preparation Type :** 3050B **Preparation Date :** 04/28/2011

Lab Reporting Batch : A1D210402 **Lab ID:** TALCAN

Client Sample ID	Lab Sample ID	Matrix	Analyte Name	Reported *		Project Limits (Percent)			
				Percent Recovery	RPD	Rejection Point**	Lower Limit	Upper Limit	RPD
L12sd-310-5820-SDMS	A1D210402004S	SO	Antimony	24		30.00	75.00	125.00	20.00
			Potassium	134		30.00	70.00	130.00	20.00

Associated Samples: All samples in Method Batch

Client Sample ID	Lab Sample ID
L12sd-310-5820-SD	A1D210402004
L12sd-311-5822-SD	A1D210402006
L12sd-312-5824-SD	A1D210402008
L12sd-313-5826-SD	A1D210402010

* Only those Percent Recovery and/or RPD values outside project limits are listed in this report.
** Metal are also assessed against an upper rejection point of 150 percent for waters and 200 percent for soils and sediments

Project Number and Name: 172819.00.09456.00.9200.02.200 - RVAAP PBA2008 17 AOCs RI

Matrix Spike / Matrix Spike Duplicate Recovery and RPD Outlier Report

Method Batch : 1119036 **Analysis Method :** 8270C **Analysis Date :** 05/17/2011

Preparation Batch : 1119036 **Preparation Type :** 3540C **Preparation Date :** 04/29/2011

Lab Reporting Batch : A1D210402 **Lab ID:** TALCAN

Client Sample ID	Lab Sample ID	Matrix	Analyte Name	Reported *		Project Limits (Percent)			
				Percent Recovery	RPD	Rejection Point**	Lower Limit	Upper Limit	RPD
L12sd-310-5820-SDMS	A1D210402004S	SO	3,3'-Dichlorobenzidine	4.5		0.00	10.00	130.00	56.00
			3-Nitroaniline	12		0.00	25.00	110.00	45.00
			4-Chloroaniline	6.5		0.00	10.00	95.00	30.00
			4-Chlorophenyl phenyl ether	29		0.00	45.00	110.00	29.00
			4-Nitroaniline	18		0.00	35.00	115.00	30.00
			N-Nitrosodiphenylamine	48		0.00	50.00	115.00	68.00
L12sd-310-5820-SDMSD	A1D210402004D		3,3'-Dichlorobenzidine	4.2		0.00	10.00	130.00	56.00
			3-Nitroaniline		87	0.00	25.00	110.00	45.00
			4-Chloroaniline		104	0.00	10.00	95.00	30.00
			4-Chlorophenyl phenyl ether	27		0.00	45.00	110.00	29.00
			4-Nitroaniline	31	54	0.00	35.00	115.00	30.00

Associated Samples: Parent sample only

Client Sample ID	Lab Sample ID
L12sd-310-5820-SD	A1D210402004

* Only those Percent Recovery and/or RPD values outside project limits are listed in this report.
** Metal are also assessed against an upper rejection point of 150 percent for waters and 200 percent for soils and sediments

Project Number and Name: 172819.00.09456.00.9200.02.200 - RVAAP PBA2008 17 AOCs RI

Matrix Spike / Matrix Spike Duplicate Recovery and RPD Outlier Report

Method Batch : 1119036 **Analysis Method :** 8270C PAH **Analysis Date :** 05/17/2011

Preparation Batch : 1119036 **Preparation Type :** 3540C **Preparation Date :** 04/29/2011

Lab Reporting Batch : A1D210402 **Lab ID:** TALCAN

Client Sample ID	Lab Sample ID	Matrix	Analyte Name	Reported *		Project Limits (Percent)			
				Percent Recovery	RPD	Rejection Point**	Lower Limit	Upper Limit	RPD
L12sd-310-5820-SDMS	A1D210402004S	SO	Benzo[a]pyrene	48		0.00	50.00	110.00	30.00
			Chrysene	54		0.00	55.00	110.00	30.00
L12sd-310-5820-SDMSD	A1D210402004D		Anthracene	54		0.00	55.00	105.00	30.00
			Benzo[a]pyrene	47		0.00	50.00	110.00	30.00
			Chrysene	51		0.00	55.00	110.00	30.00

Associated Samples: Parent sample only

Client Sample ID	Lab Sample ID
L12sd-310-5820-SD	A1D210402004

* Only those Percent Recovery and/or RPD values outside project limits are listed in this report.
** Metal are also assessed against an upper rejection point of 150 percent for waters and 200 percent for soils and sediments

Project Number and Name: 172819.00.09456.00.9200.02.200 - RVAAP PBA2008 17 AOCs RI

Laboratory Control Sample / Laboratory Control Sample Duplicate Outlier Report

Method Batch : 1114022 **Analysis Method :** 8270C **Analysis Date :** 05/09/2011

Preparation Batch : 1114022 **Preparation Type :** 3520C **Preparation Date :** 04/25/2011

Lab Reporting Batch : A1D210402 **Lab ID:** TALCAN

			Reported Values		Project Limits (Percent)			
LCS Lab Sample ID	**Matrix**	**Analyte Name**	**Percent Recovery**	**RPD**	**Rejection Point**	**Lower Limit**	**Upper Limit**	**RPD**
A1D240000022C	AQ	4-Chlorophenyl phenyl ether	34		10.00	50.00	110.00	33.00

Associated Samples

Client Sample ID	Lab Sample ID
L12sw-310-5819-SW	A1D210402003
L12sw-311-5821-SW	A1D210402005
L12sw-312-5823-SW	A1D210402007
L12sw-313-5825-SW	A1D210402009
PBA08-QC-6243-ER	A1D210402001

Scope of Data Qualification: The outlier in the LCS qualifies that analyte in all samples with the same Preparation Batch ID as the LCS

Project Number and Name: 172819.00.09456.00.9200.02.200 - RVAAP PBA2008 17 AOCs RI

Laboratory Control Sample / Laboratory Control Sample Duplicate Outlier Report

Method Batch : 1119036 **Analysis Method :** 8270C **Analysis Date :** 05/17/2011

Preparation Batch : 1119036 **Preparation Type :** 3540C **Preparation Date :** 04/29/2011

Lab Reporting Batch : A1D210402 **Lab ID:** TALCAN

			Reported Values		Project Limits (Percent)			
LCS Lab Sample ID	**Matrix**	**Analyte Name**	**Percent Recovery**	**RPD**	**Rejection Point**	**Lower Limit**	**Upper Limit**	**RPD**
A1D290000036C	SO	4-Chlorophenyl phenyl ether	31		10.00	45.00	110.00	29.00

Associated Samples

Client Sample ID	Lab Sample ID
L12sd-310-5820-SD	A1D210402004
L12sd-311-5822-SD	A1D210402006
L12sd-312-5824-SD	A1D210402008
L12sd-313-5826-SD	A1D210402010

Scope of Data Qualification: The outlier in the LCS qualifies that analyte in all samples with the same Preparation Batch ID as the LCS

Project Number and Name: 172819.00.09456.00.9200.02.200 - RVAAP PBA2008 17 AOCs RI

QC Outlier Report: Non-Qualified Outliers for Reporting Limits
(Sample is non-detect but reported result exceeds project requirements for reporting limit)

Lab Report Batch: A1D210402 **Lab ID:** TALCAN

Client Sample ID	Lab Sample ID	Analysis Method	Matrix	Analyte Name	Lab Qualifier	Result	Reporting Limit Criteria*	Units
L12sd-310-5820-SD	A1D210402004	8082	SO	Aroclor 1016	U	48	47.826087	ug/kg
				Aroclor 1221	U	48	47.826087	ug/kg
				Aroclor 1232	U	48	47.826087	ug/kg
				Aroclor 1242	U	48	47.826087	ug/kg
				Aroclor 1248	U	48	47.826087	ug/kg
				Aroclor 1260	U	48	47.826087	ug/kg
		8270C		1,2,4-Trichlorobenzene	U	480	478.26087	ug/kg
				1,2-Dichlorobenzene	U	480	478.26087	ug/kg
				1,3-Dichlorobenzene	U	480	478.26087	ug/kg
				1,4-Dichlorobenzene	U	480	478.26087	ug/kg
				2,4,5-Trichlorophenol	U	480	478.26087	ug/kg
				2,4,6-Trichlorophenol	U	480	478.26087	ug/kg
				2,4-Dichlorophenol	U	480	478.26087	ug/kg
				2,4-Dimethylphenol	U	480	478.26087	ug/kg
				2,4-Dinitrophenol	U	1200	1159.42029	ug/kg
				2,4-Dinitrotoluene	U	480	478.26087	ug/kg
				2,6-Dinitrotoluene	U	480	478.26087	ug/kg
				2-Chloronaphthalene	U	480	478.26087	ug/kg
				2-Chlorophenol	U	480	478.26087	ug/kg
				2-Methylnaphthalene	U	480	478.26087	ug/kg
				2-Methylphenol	U	480	478.26087	ug/kg
				2-Nitroaniline	U	1200	1159.42029	ug/kg
				2-Nitrophenol	U	480	478.26087	ug/kg
				3,3'-Dichlorobenzidine	U	480	478.26087	ug/kg
				3-methylphenol/4-methylphenol	U	480	478.26087	ug/kg
				3-Nitroaniline	U	1200	1159.42029	ug/kg
				4,6-Dinitro-2-methylphenol	U	1200	1159.42029	ug/kg
				4-Bromophenyl phenyl ether	U	480	478.26087	ug/kg
				4-Chloro-3-methylphenol	U	480	478.26087	ug/kg
				4-Chloroaniline	U	480	478.26087	ug/kg
				4-Chlorophenyl phenyl ether	U	480	478.26087	ug/kg
				4-Nitroaniline	U	1200	1159.42029	ug/kg

* Reporting Limit Criteria = (Dilution Factor) * (Reporting Limit from the reference project library) * (Percent Moisture Correction)
Percent Moisture Correction:
Soil: 100 / (100 - Percent Moisture)
Water: 1

Project Number and Name: **172819.00.09456.00.9200.02.200 - RVAAP PBA2008 17 AOCs RI**

QC Outlier Report: Non-Qualified Outliers for Reporting Limits
(Sample is non-detect but reported result exceeds project requirements for reporting limit)

Lab Report Batch: A1D210402 **Lab ID:** TALCAN

Client Sample ID	Lab Sample ID	Analysis Method	Matrix	Analyte Name	Lab Qualifier	Result	Reporting Limit Criteria*	Units
L12sd-310-5820-SD	A1D210402004	8270C	SO	4-Nitrophenol	U	1200	1159.42029	ug/kg
				Benzoic acid	U	1200	1159.42029	ug/kg
				Benzyl alcohol	U	480	478.26087	ug/kg
				bis(2-Chloroethoxy)methane	U	480	478.26087	ug/kg
				bis(2-Chloroethyl) ether	U	480	478.26087	ug/kg
				Bis(2-chloroisopropyl) ether	U	480	478.26087	ug/kg
				Butyl benzyl phthalate	U	480	478.26087	ug/kg
				Dibenzofuran	U	480	478.26087	ug/kg
				Diethyl phthalate	U	480	478.26087	ug/kg
				Dimethyl phthalate	U	480	478.26087	ug/kg
				Di-n-butyl phthalate	U	480	478.26087	ug/kg
				Di-n-octyl phthalate	U	480	478.26087	ug/kg
				Hexachlorobenzene	U	480	478.26087	ug/kg
				Hexachlorobutadiene	U	480	478.26087	ug/kg
				HEXACHLOROCYCLOPENTADIE	U	480	478.26087	ug/kg
				Hexachloroethane	U	480	478.26087	ug/kg
				Isophorone	U	480	478.26087	ug/kg
				Nitrobenzene	U	480	478.26087	ug/kg
				N-Nitrosodi-n-propylamine	U	480	478.26087	ug/kg
				N-Nitrosodiphenylamine	U	480	478.26087	ug/kg
				Pentachlorophenol	U	480	478.26087	ug/kg
				Phenol	U	480	478.26087	ug/kg
		8270C PAH		Acenaphthene	U	72	9.66666667	ug/kg
				Acenaphthylene	U	72	9.66666667	ug/kg
				Anthracene	U	72	9.66666667	ug/kg
				dibenz[a,h]anthracene	U	72	9.66666667	ug/kg
				Fluorene	U	72	9.66666667	ug/kg
				Naphthalene	U	72	9.66666667	ug/kg
		8330B		1,3,5-Trinitrobenzene	U	0.25	0.35869565	mg/kg
				1,3-Dinitrobenzene	U	0.25	0.35869565	mg/kg
				2,4-Dinitrotoluene	U	0.25	0.35869565	mg/kg
				2,6-Dinitrotoluene	U	0.25	0.35869565	mg/kg
				2-Amino-4,6-dinitrotoluene	U	0.25	0.35869565	mg/kg

* Reporting Limit Criteria = (Dilution Factor) * (Reporting Limit from the reference project library) * (Percent Moisture Correction)
Percent Moisture Correction:
Soil: 100 / (100 - Percent Moisture)
Water: 1

Project Number and Name: **172819.00.09456.00.9200.02.200 - RVAAP PBA2008 17 AOCs RI**

QC Outlier Report: Non-Qualified Outliers for Reporting Limits
(Sample is non-detect but reported result exceeds project requirements for reporting limit)

Lab Report Batch: A1D210402 **Lab ID:** TALCAN

Client Sample ID	Lab Sample ID	Analysis Method	Matrix	Analyte Name	Lab Qualifier	Result	Reporting Limit Criteria*	Units
L12sd-310-5820-SD	A1D210402004	8330B	SO	2-Nitrotoluene	U	0.25	0.35869565	mg/kg
				3-Nitrotoluene	U	0.25	0.35869565	mg/kg
				4-Amino-2,6-Dinitrotoluene	U	0.25	0.35869565	mg/kg
				4-Nitrotoluene	U	0.50	0.71739130	mg/kg
				Nitrobenzene	U	0.25	0.35869565	mg/kg
L12sd-311-5822-SD	A1D210402006	8270C	SO	2,4-Dinitrophenol	U	3500	3478.26087	ug/kg
				2-Nitroaniline	U	3500	3478.26087	ug/kg
				3-Nitroaniline	U	3500	3478.26087	ug/kg
				4,6-Dinitro-2-methylphenol	U	3500	3478.26087	ug/kg
				4-Nitroaniline	U	3500	3478.26087	ug/kg
				4-Nitrophenol	U	3500	3478.26087	ug/kg
				Benzoic acid	U	3500	3478.26087	ug/kg
				Carbazole	U	220	217.391304	ug/kg
		8270C PAH		Acenaphthene	U	220	29	ug/kg
				Acenaphthylene	U	220	29	ug/kg
				Anthracene	U	220	29	ug/kg
				Benz[a]anthracene	U	220	29	ug/kg
				Benzo[a]pyrene	U	220	29	ug/kg
				Benzo[g,h,i]perylene	U	220	29	ug/kg
				Benzo[k]fluoranthene	U	220	29	ug/kg
				Chrysene	U	220	29	ug/kg
				dibenz[a,h]anthracene	U	220	29	ug/kg
				Fluorene	U	220	29	ug/kg
				Indeno[1,2,3-cd]pyrene	U	220	29	ug/kg
				Naphthalene	U	220	29	ug/kg
				Phenanthrene	U	220	29	ug/kg
		8330B		1,3,5-Trinitrobenzene	U	0.25	1.07608696	mg/kg
				1,3-Dinitrobenzene	U	0.25	1.07608696	mg/kg
				2,4-Dinitrotoluene	U	0.25	1.07608696	mg/kg
				2,6-Dinitrotoluene	U	0.25	1.07608696	mg/kg
				2-Amino-4,6-dinitrotoluene	U	0.25	1.07608696	mg/kg
				2-Nitrotoluene	U	0.25	1.07608696	mg/kg

* Reporting Limit Criteria = (Dilution Factor) * (Reporting Limit from the reference project library) * (Percent Moisture Correction)
Percent Moisture Correction:
Soil: 100 / (100 - Percent Moisture)
Water: 1

Project Number and Name: **172819.00.09456.00.9200.02.200 - RVAAP PBA2008 17 AOCs RI**

QC Outlier Report: Non-Qualified Outliers for Reporting Limits
(Sample is non-detect but reported result exceeds project requirements for reporting limit)

Lab Report Batch: A1D210402 **Lab ID:** TALCAN

Client Sample ID	Lab Sample ID	Analysis Method	Matrix	Analyte Name	Lab Qualifier	Result	Reporting Limit Criteria*	Units
L12sd-311-5822-SD	A1D210402006	8330B	SO	3-Nitrotoluene	U	0.25	1.07608696	mg/kg
				4-Amino-2,6-Dinitrotoluene	U	0.25	1.07608696	mg/kg
				4-Nitrotoluene	U	0.50	2.15217391	mg/kg
				Nitrobenzene	U	0.25	1.07608696	mg/kg
		9056		NITRATE	U	21.9	21.7391304	mg/kg
L12sd-312-5824-SD	A1D210402008	8082	SO	Aroclor 1016	U	47	46.4788732	ug/kg
				Aroclor 1221	U	47	46.4788732	ug/kg
				Aroclor 1232	U	47	46.4788732	ug/kg
				Aroclor 1242	U	47	46.4788732	ug/kg
				Aroclor 1248	U	47	46.4788732	ug/kg
				Aroclor 1254	U	47	46.4788732	ug/kg
				Aroclor 1260	U	47	46.4788732	ug/kg
		8270C		1,2,4-Trichlorobenzene	U	470	464.788732	ug/kg
				1,2-Dichlorobenzene	U	470	464.788732	ug/kg
				1,3-Dichlorobenzene	U	470	464.788732	ug/kg
				1,4-Dichlorobenzene	U	470	464.788732	ug/kg
				2,4,5-Trichlorophenol	U	470	464.788732	ug/kg
				2,4,6-Trichlorophenol	U	470	464.788732	ug/kg
				2,4-Dichlorophenol	U	470	464.788732	ug/kg
				2,4-Dimethylphenol	U	470	464.788732	ug/kg
				2,4-Dinitrotoluene	U	470	464.788732	ug/kg
				2,6-Dinitrotoluene	U	470	464.788732	ug/kg
				2-Chloronaphthalene	U	470	464.788732	ug/kg
				2-Chlorophenol	U	470	464.788732	ug/kg
				2-Methylphenol	U	470	464.788732	ug/kg
				2-Nitrophenol	U	470	464.788732	ug/kg
				3,3'-Dichlorobenzidine	U	470	464.788732	ug/kg
				3-methylphenol/4-methylphenol	U	470	464.788732	ug/kg
				4-Bromophenyl phenyl ether	U	470	464.788732	ug/kg
				4-Chloro-3-methylphenol	U	470	464.788732	ug/kg
				4-Chloroaniline	U	470	464.788732	ug/kg
				4-Chlorophenyl phenyl ether	U	470	464.788732	ug/kg

* Reporting Limit Criteria = (Dilution Factor) * (Reporting Limit from the reference project library) * (Percent Moisture Correction)
Percent Moisture Correction:
Soil: 100 / (100 - Percent Moisture)
Water: 1

Project Number and Name: **172819.00.09456.00.9200.02.200 - RVAAP PBA2008 17 AOCs RI**

QC Outlier Report: Non-Qualified Outliers for Reporting Limits
(Sample is non-detect but reported result exceeds project requirements for reporting limit)

Lab Report Batch: A1D210402 **Lab ID:** TALCAN

Client Sample ID	Lab Sample ID	Analysis Method	Matrix	Analyte Name	Lab Qualifier	Result	Reporting Limit Criteria*	Units
L12sd-312-5824-SD	A1D210402008	8270C	SO	Benzyl alcohol	U	470	464.788732	ug/kg
				bis(2-Chloroethoxy)methane	U	470	464.788732	ug/kg
				bis(2-Chloroethyl) ether	U	470	464.788732	ug/kg
				Bis(2-chloroisopropyl) ether	U	470	464.788732	ug/kg
				Butyl benzyl phthalate	U	470	464.788732	ug/kg
				Carbazole	U	71	70.4225352	ug/kg
				Diethyl phthalate	U	470	464.788732	ug/kg
				Dimethyl phthalate	U	470	464.788732	ug/kg
				Di-n-butyl phthalate	U	470	464.788732	ug/kg
				Di-n-octyl phthalate	U	470	464.788732	ug/kg
				Hexachlorobenzene	U	470	464.788732	ug/kg
				Hexachlorobutadiene	U	470	464.788732	ug/kg
				HEXACHLOROCYCLOPENTADIE	U	470	464.788732	ug/kg
				Hexachloroethane	U	470	464.788732	ug/kg
				Isophorone	U	470	464.788732	ug/kg
				Nitrobenzene	U	470	464.788732	ug/kg
				N-Nitrosodi-n-propylamine	U	470	464.788732	ug/kg
				N-Nitrosodiphenylamine	U	470	464.788732	ug/kg
				Pentachlorophenol	U	470	464.788732	ug/kg
				Phenol	U	470	464.788732	ug/kg
		8270C PAH		Acenaphthene	U	71	9.3943662	ug/kg
				Acenaphthylene	U	71	9.3943662	ug/kg
				Anthracene	U	71	9.3943662	ug/kg
				dibenz[a,h]anthracene	U	71	9.3943662	ug/kg
				Fluorene	U	71	9.3943662	ug/kg
		9056		NITRATE	U	7.1	7.04225352	mg/kg
L12sd-313-5826-SD	A1D210402010	8270C PAH	SO	Acenaphthene	U	260	35.1052632	ug/kg
				Acenaphthylene	U	260	35.1052632	ug/kg
				Anthracene	U	260	35.1052632	ug/kg
				dibenz[a,h]anthracene	U	260	35.1052632	ug/kg
				Fluorene	U	260	35.1052632	ug/kg
				Naphthalene	U	260	35.1052632	ug/kg

* Reporting Limit Criteria = (Dilution Factor) * (Reporting Limit from the reference project library) * (Percent Moisture Correction)
Percent Moisture Correction:
Soil: 100 / (100 - Percent Moisture)
Water: 1

Project Number and Name: **172819.00.09456.00.9200.02.200 - RVAAP PBA2008 17 AOCs RI**

QC Outlier Report: Non-Qualified Outliers for Reporting Limits
(Sample is non-detect but reported result exceeds project requirements for reporting limit)

Lab Report Batch: A1D210402 **Lab ID:** TALCAN

Client Sample ID	Lab Sample ID	Analysis Method	Matrix	Analyte Name	Lab Qualifier	Result	Reporting Limit Criteria*	Units
L12sd-313-5826-SD	A1D210402010	8270C PAH	SO	Phenanthrene	U	260	35.1052632	ug/kg
		8330B		1,3,5-Trinitrobenzene	U	0.25	1.30263158	mg/kg
				1,3-Dinitrobenzene	U	0.25	1.30263158	mg/kg
				2,4,6-Trinitrotoluene (TNT)	U	0.25	1.30263158	mg/kg
				2,4-Dinitrotoluene	U	0.25	1.30263158	mg/kg
				2,6-Dinitrotoluene	U	0.25	1.30263158	mg/kg
				2-Amino-4,6-dinitrotoluene	U	0.25	1.30263158	mg/kg
				2-Nitrotoluene	U	0.25	1.30263158	mg/kg
				3-Nitrotoluene	U	0.25	1.30263158	mg/kg
				4-Amino-2,6-Dinitrotoluene	U	0.25	1.30263158	mg/kg
				4-Nitrotoluene	U	0.50	2.60526316	mg/kg
				Nitrobenzene	U	0.25	1.30263158	mg/kg
L12sw-310-5819-SW	A1D210402003	8270C PAH	AQ	Acenaphthene	U	10	0.2	ug/L
				Acenaphthylene	U	10	0.2	ug/L
				Anthracene	U	10	0.2	ug/L
				Benz[a]anthracene	U	10	0.2	ug/L
				Benzo[a]pyrene	U	10	0.2	ug/L
				Benzo[b]fluoranthene	U	10	0.2	ug/L
				Benzo[g,h,i]perylene	U	10	0.2	ug/L
				Benzo[k]fluoranthene	U	10	0.2	ug/L
				Chrysene	U	10	0.2	ug/L
				dibenz[a,h]anthracene	U	10	0.2	ug/L
				Fluoranthene	U	10	0.2	ug/L
				Fluorene	U	10	0.2	ug/L
				Indeno[1,2,3-cd]pyrene	U	10	0.2	ug/L
				Naphthalene	U	10	0.2	ug/L
				Phenanthrene	U	10	0.2	ug/L
				Pyrene	U	10	0.2	ug/L
		8330B		2-Amino-4,6-dinitrotoluene	U	0.29	0.288	ug/L
		WS-WC-0050		Nitrocellulose	U	2.0	0.5	mg/L
L12sw-311-5821-SW	A1D210402005	8270C PAH	AQ	Acenaphthene	U	10	0.2	ug/L

* Reporting Limit Criteria = (Dilution Factor) * (Reporting Limit from the reference project library) * (Percent Moisture Correction)
Percent Moisture Correction:
Soil: 100 / (100 - Percent Moisture)
Water: 1

Project Number and Name: **172819.00.09456.00.9200.02.200 - RVAAP PBA2008 17 AOCs RI**

QC Outlier Report: Non-Qualified Outliers for Reporting Limits
(Sample is non-detect but reported result exceeds project requirements for reporting limit)

Lab Report Batch: A1D210402 **Lab ID:** TALCAN

Client Sample ID	Lab Sample ID	Analysis Method	Matrix	Analyte Name	Lab Qualifier	Result	Reporting Limit Criteria*	Units
L12sw-311-5821-SW	A1D210402005	8270C PAH	AQ	Acenaphthylene	U	10	0.2	ug/L
				Anthracene	U	10	0.2	ug/L
				Benz[a]anthracene	U	10	0.2	ug/L
				Benzo[a]pyrene	U	10	0.2	ug/L
				Benzo[b]fluoranthene	U	10	0.2	ug/L
				Benzo[g,h,i]perylene	U	10	0.2	ug/L
				Benzo[k]fluoranthene	U	10	0.2	ug/L
				Chrysene	U	10	0.2	ug/L
				dibenz[a,h]anthracene	U	10	0.2	ug/L
				Fluoranthene	U	10	0.2	ug/L
				Fluorene	U	10	0.2	ug/L
				Indeno[1,2,3-cd]pyrene	U	10	0.2	ug/L
				Naphthalene	U	10	0.2	ug/L
				Phenanthrene	U	10	0.2	ug/L
				Pyrene	U	10	0.2	ug/L
		8330B		1,3-Dinitrobenzene	U	0.15	0.1455	ug/L
				2,4,6-Trinitrotoluene (TNT)	U	0.15	0.1455	ug/L
				2,4-Dinitrotoluene	U	0.15	0.1455	ug/L
				2,6-Dinitrotoluene	U	0.15	0.1455	ug/L
				2-Nitrotoluene	U	0.15	0.1455	ug/L
				Methyl-2,4,6-Trinitrophenylnitramin	U	0.15	0.1455	ug/L
				Nitrobenzene	U	0.15	0.1455	ug/L
				Octahydro-1,3,5,7-tetranitro-1,3,5,7	U	0.15	0.1455	ug/L
		WS-WC-0050		Nitrocellulose	U	2.0	0.5	mg/L
L12sw-312-5823-SW	A1D210402007	8270C PAH	AQ	Acenaphthene	U	10	0.2	ug/L
				Acenaphthylene	U	10	0.2	ug/L
				Anthracene	U	10	0.2	ug/L
				Benz[a]anthracene	U	10	0.2	ug/L
				Benzo[a]pyrene	U	10	0.2	ug/L
				Benzo[b]fluoranthene	U	10	0.2	ug/L
				Benzo[g,h,i]perylene	U	10	0.2	ug/L
				Benzo[k]fluoranthene	U	10	0.2	ug/L

* Reporting Limit Criteria = (Dilution Factor) * (Reporting Limit from the reference project library) * (Percent Moisture Correction)
Percent Moisture Correction:
Soil: 100 / (100 - Percent Moisture)
Water: 1

Project Number and Name: **172819.00.09456.00.9200.02.200 - RVAAP PBA2008 17 AOCs RI**

QC Outlier Report: Non-Qualified Outliers for Reporting Limits
(Sample is non-detect but reported result exceeds project requirements for reporting limit)

Lab Report Batch: A1D210402 **Lab ID:** TALCAN

Client Sample ID	Lab Sample ID	Analysis Method	Matrix	Analyte Name	Lab Qualifier	Result	Reporting Limit Criteria*	Units
L12sw-312-5823-SW	A1D210402007	8270C PAH	AQ	Chrysene	U	10	0.2	ug/L
				dibenz[a,h]anthracene	U	10	0.2	ug/L
				Fluoranthene	U	10	0.2	ug/L
				Fluorene	U	10	0.2	ug/L
				Indeno[1,2,3-cd]pyrene	U	10	0.2	ug/L
				Naphthalene	U	10	0.2	ug/L
				Phenanthrene	U	10	0.2	ug/L
				Pyrene	U	10	0.2	ug/L
		8330B		1,3-Dinitrobenzene	U	0.17	0.1665	ug/L
				2,4,6-Trinitrotoluene (TNT)	U	0.17	0.1665	ug/L
				2,4-Dinitrotoluene	U	0.17	0.1665	ug/L
				2,6-Dinitrotoluene	U	0.17	0.1665	ug/L
				2-Nitrotoluene	U	0.17	0.1665	ug/L
				3-Nitrotoluene	U	0.56	0.555	ug/L
				4-Amino-2,6-Dinitrotoluene	U	0.17	0.1665	ug/L
				Hexahydro-1,3,5-Trinitro-1,3,5-Triaz	U	0.28	0.2775	ug/L
				Methyl-2,4,6-Trinitrophenylnitramin	U	0.17	0.1665	ug/L
				Nitrobenzene	U	0.17	0.1665	ug/L
				Octahydro-1,3,5,7-tetranitro-1,3,5,7	U	0.17	0.1665	ug/L
		WS-WC-0050		Nitrocellulose	U	2.0	0.5	mg/L
L12sw-313-5825-SW	A1D210402009	8270C PAH	AQ	Acenaphthene	U	10	0.2	ug/L
				Acenaphthylene	U	10	0.2	ug/L
				Anthracene	U	10	0.2	ug/L
				Benz[a]anthracene	U	10	0.2	ug/L
				Benzo[a]pyrene	U	10	0.2	ug/L
				Benzo[b]fluoranthene	U	10	0.2	ug/L
				Benzo[g,h,i]perylene	U	10	0.2	ug/L
				Benzo[k]fluoranthene	U	10	0.2	ug/L
				Chrysene	U	10	0.2	ug/L
				dibenz[a,h]anthracene	U	10	0.2	ug/L
				Fluorene	U	10	0.2	ug/L
				Indeno[1,2,3-cd]pyrene	U	10	0.2	ug/L

* Reporting Limit Criteria = (Dilution Factor) * (Reporting Limit from the reference project library) * (Percent Moisture Correction)
Percent Moisture Correction:
Soil: 100 / (100 - Percent Moisture)
Water: 1

Project Number and Name: **172819.00.09456.00.9200.02.200 - RVAAP PBA2008 17 AOCs RI**

QC Outlier Report: Non-Qualified Outliers for Reporting Limits
(Sample is non-detect but reported result exceeds project requirements for reporting limit)

Lab Report Batch: A1D210402 **Lab ID:** TALCAN

Client Sample ID	Lab Sample ID	Analysis Method	Matrix	Analyte Name	Lab Qualifier	Result	Reporting Limit Criteria*	Units
L12sw-313-5825-SW	A1D210402009	8270C PAH	AQ	Naphthalene	U	10	0.2	ug/L
				Phenanthrene	U	10	0.2	ug/L
		8330B		1,3-Dinitrobenzene	U	0.15	0.1485	ug/L
				2,4,6-Trinitrotoluene (TNT)	U	0.15	0.1485	ug/L
				2,4-Dinitrotoluene	U	0.15	0.1485	ug/L
				2,6-Dinitrotoluene	U	0.15	0.1485	ug/L
				2-Amino-4,6-dinitrotoluene	U	0.30	0.297	ug/L
				2-Nitrotoluene	U	0.15	0.1485	ug/L
				3-Nitrotoluene	U	0.50	0.495	ug/L
				4-Amino-2,6-Dinitrotoluene	U	0.15	0.1485	ug/L
				Hexahydro-1,3,5-Trinitro-1,3,5-Triaz	U	0.25	0.2475	ug/L
				Methyl-2,4,6-Trinitrophenylnitramin	U	0.15	0.1485	ug/L
				Nitrobenzene	U	0.15	0.1485	ug/L
				Octahydro-1,3,5,7-tetranitro-1,3,5,7	U	0.15	0.1485	ug/L
		WS-WC-0050		Nitrocellulose	U	2.0	0.5	mg/L
PBA08-QC-6243-ER	A1D210402001	8270C PAH	AQ	Acenaphthene	U	10	0.2	ug/L
				Acenaphthylene	U	10	0.2	ug/L
				Anthracene	U	10	0.2	ug/L
				Benz[a]anthracene	U	10	0.2	ug/L
				Benzo[a]pyrene	U	10	0.2	ug/L
				Benzo[b]fluoranthene	U	10	0.2	ug/L
				Benzo[g,h,i]perylene	U	10	0.2	ug/L
				Benzo[k]fluoranthene	U	10	0.2	ug/L
				Chrysene	U	10	0.2	ug/L
				dibenz[a,h]anthracene	U	10	0.2	ug/L
				Fluoranthene	U	10	0.2	ug/L
				Fluorene	U	10	0.2	ug/L
				Indeno[1,2,3-cd]pyrene	U	10	0.2	ug/L
				Naphthalene	U	10	0.2	ug/L
				Phenanthrene	U	10	0.2	ug/L
				Pyrene	U	10	0.2	ug/L
		WS-WC-0050		Nitrocellulose	U	2.0	0.5	mg/L

* Reporting Limit Criteria = (Dilution Factor) * (Reporting Limit from the reference project library) * (Percent Moisture Correction)
Percent Moisture Correction:
Soil: 100 / (100 - Percent Moisture)
Water: 1

Project Number and Name: **172819.00.09456.00.9200.02.200 - RVAAP PBA2008 17 AOCs RI**

QC Outlier Report: Trip Blank

Lab Reporting Batch : A1D210402
Lab ID: TALCAN
Method/Preparation Batch : 1122143 / 1122143
Analysis Date : 05/02/2011
Client Sample ID : PBA08-QC-6242-TB
Preparation Date : 05/02/2011
Lab Sample ID : A1D210402002
Preparation Type : 5030B

Analysis Method : 8260B

Acetone	Result	Reporting Limit	Units	Lab Qual	Comments
Trip Blank Result:	**6.7**	**10**	**ug/L**	**J**	**Common Contaminant**

Acetone was qualified due to trip blank contamination in the following associated samples:

Client Sample ID	Lab Sample ID	Dilution	Result	Lab Qual	Result Unit
L12sw-310-5819-SW	A1D210402003	1	5.0	J	ug/L
L12sw-311-5821-SW	A1D210402005	1	4.6	J	ug/L
L12sw-312-5823-SW	A1D210402007	1	5.6	J	ug/L
L12sw-313-5825-SW	A1D210402009	1	4.9	J	ug/L

Continuing Calibration (CCV) Outlier Report (Organics)

There are no Organic Continuing Calibrations with outliers

Continuing Calibration (CCAL) Outlier Report (Inorganics)

There are no Inorganic Continuing Calibrations with outliers

Laboratory Duplicate RPD Outlier Report

Method Batch : 1118021 **Analysis Method :** 6020 **Analysis Date :** 05/13/2011

Lab Reporting Batch : A1D210402 **Lab ID:** TALCAN

Client Sample ID	Lab Sample ID	Matrix	Analyte Name	Reported RPD	Project Limit RPD
L12sd-310-5820-SDDUP	A1D210402004X	SO	Calcium	25	20.00
			Manganese	68	20.00
			Silver	21	20.00

Associated Samples: All samples in Method Batch

Client Sample ID	Lab Sample ID
L12sd-310-5820-SD	A1D210402004
L12sd-311-5822-SD	A1D210402006
L12sd-312-5824-SD	A1D210402008
L12sd-313-5826-SD	A1D210402010

Reporting Limits Outlier Report (detected results reported below the reporting limit)

Lab Report Batch: A1D210402 **Lab ID:** TALCAN

Client Sample ID	Lab Sample ID	Analysis Method	Matrix	Analyte Name	Lab Qualifier	Result	EDD Reporting Limit	Units
L12sd-310-5820-SD	A1D210402004	6020	SO	Antimony	J	0.15	0.72	mg/kg
				Cadmium	J	0.27	0.29	mg/kg
				Sodium	J	102	144	mg/kg
				Thallium	J	0.19	0.29	mg/kg
		7471A		Mercury	J B	0.042	0.14	mg/kg
		8082		Aroclor 1254	J	27	48	ug/kg
		8270C		bis(2-Ethylhexyl) phthalate	J	28	480	ug/kg
		8270C PAH		Benz[a]anthracene	J	17	72	ug/kg
				Benzo[a]pyrene	J	20	72	ug/kg
				Benzo[b]fluoranthene	J	31	72	ug/kg
				Benzo[g,h,i]perylene	J	18	72	ug/kg
				Benzo[k]fluoranthene	J	15	72	ug/kg
				Chrysene	J	24	72	ug/kg
				Fluoranthene	J	37	72	ug/kg
				Indeno[1,2,3-cd]pyrene	J	15	72	ug/kg
				Phenanthrene	J	15	72	ug/kg
				Pyrene	J	28	72	ug/kg
		8330B		2,4,6-Trinitrotoluene (TNT)	J	0.15	0.25	mg/kg
L12sd-311-5822-SD	A1D210402006	6020		Antimony	J	0.35	1.7	mg/kg
				Silver	J	0.28	1.7	mg/kg
				Thallium	J	0.44	0.68	mg/kg
		7471A		Mercury	J B	0.10	0.39	mg/kg
		8270C		bis(2-Ethylhexyl) phthalate	J	200	1400	ug/kg
		8270C PAH		Benzo[b]fluoranthene	J	38	220	ug/kg
				Fluoranthene	J	48	220	ug/kg
				Pyrene	J	35	220	ug/kg
		8330B		2,4,6-Trinitrotoluene (TNT)	J PG	0.18	0.25	mg/kg
				Octahydro-1,3,5,7-tetranitro-1,3,5,7-tetr	J	0.069	0.25	mg/kg
L12sd-312-5824-SD	A1D210402008	6020		Antimony	J	0.15	0.55	mg/kg
				Cadmium	J	0.21	0.22	mg/kg
				Thallium	J	0.17	0.22	mg/kg
		7471A		Mercury	J B	0.062	0.12	mg/kg
		8270C		2-Methylnaphthalene	J	54	470	ug/kg
				bis(2-Ethylhexyl) phthalate	J	75	470	ug/kg
				Dibenzofuran	J	12	470	ug/kg
		8270C PAH		Benz[a]anthracene	J	24	71	ug/kg

Reporting Limits Outlier Report (detected results reported below the reporting limit)

Lab Report Batch: A1D210402 **Lab ID:** TALCAN

Client Sample ID	Lab Sample ID	Analysis Method	Matrix	Analyte Name	Lab Qualifier	Result	EDD Reporting Limit	Units
L12sd-312-5824-SD	A1D210402008	8270C PAH	SO	Benzo[a]pyrene	J	27	71	ug/kg
				Benzo[b]fluoranthene	J	46	71	ug/kg
				Benzo[g,h,i]perylene	J	21	71	ug/kg
				Benzo[k]fluoranthene	J	22	71	ug/kg
				Chrysene	J	34	71	ug/kg
				Fluoranthene	J	50	71	ug/kg
				Indeno[1,2,3-cd]pyrene	J	21	71	ug/kg
				Naphthalene	J	30	71	ug/kg
				Phenanthrene	J	29	71	ug/kg
				Pyrene	J	41	71	ug/kg
		8330B		2,4,6-Trinitrotoluene (TNT)	J PG	0.035	0.25	mg/kg
				Octahydro-1,3,5,7-tetranitro-1,3,5,7-tetr	J	0.019	0.25	mg/kg
L12sd-313-5826-SD	A1D210402010	6020		Silver	J	0.12	2.6	mg/kg
				Sodium	J	82.1	521	mg/kg
				Thallium	J	0.30	1.0	mg/kg
		7471A		Mercury	J B	0.092	0.37	mg/kg
		8270C		bis(2-Ethylhexyl) phthalate	J	220	1700	ug/kg
		8270C PAH		Benz[a]anthracene	J	44	260	ug/kg
				Benzo[a]pyrene	J	55	260	ug/kg
				Benzo[b]fluoranthene	J	60	260	ug/kg
				Benzo[g,h,i]perylene	J	46	260	ug/kg
				Benzo[k]fluoranthene	J	58	260	ug/kg
				Chrysene	J	54	260	ug/kg
				Fluoranthene	J	94	260	ug/kg
				Indeno[1,2,3-cd]pyrene	J	43	260	ug/kg
				Pyrene	J	73	260	ug/kg
		8330B		Octahydro-1,3,5,7-tetranitro-1,3,5,7-tetr	J	0.11	0.25	mg/kg
L12sw-310-5819-SW	A1D210402003	6020	AQ	Antimony	J	0.44	5.0	ug/L
				Arsenic	J	0.87	5.0	ug/L
				Chromium	J	0.86	5.0	ug/L
				Cobalt	J	0.24	5.0	ug/L
				Copper	J	2.4	5.0	ug/L
				Lead	J	0.46	3.0	ug/L
				Nickel	J	2.0	10.0	ug/L
				Selenium	J	0.35	5.0	ug/L
				Vanadium	J	0.83	10.0	ug/L

Reporting Limits Outlier Report (detected results reported below the reporting limit)

Lab Report Batch: A1D210402 **Lab ID:** TALCAN

Client Sample ID	Lab Sample ID	Analysis Method	Matrix	Analyte Name	Lab Qualifier	Result	EDD Reporting Limit	Units
L12sw-310-5819-SW	A1D210402003	6020	AQ	Zinc	J	10.6	40.0	ug/L
		8260B		Acetone	J	5.0	10	ug/L
		9056		NITRATE	J	0.084	0.10	mg/L
L12sw-311-5821-SW	A1D210402005	6020		Arsenic	J	1.0	5.0	ug/L
				Chromium	J	1.1	5.0	ug/L
				Cobalt	J	0.27	5.0	ug/L
				Copper	J	2.5	5.0	ug/L
				Lead	J	0.59	3.0	ug/L
				Nickel	J	2.2	10.0	ug/L
				Selenium	J	0.29	5.0	ug/L
				Vanadium	J	1.1	10.0	ug/L
				Zinc	J	11.5	40.0	ug/L
		8260B		Acetone	J	4.6	10	ug/L
		8330B		4-Amino-2,6-Dinitrotoluene	J	0.054	0.15	ug/L
L12sw-312-5823-SW	A1D210402007	6020		Arsenic	J	1.0	5.0	ug/L
				Chromium	J	1.2	5.0	ug/L
				Cobalt	J	0.28	5.0	ug/L
				Copper	J	2.6	5.0	ug/L
				Lead	J	0.51	3.0	ug/L
				Nickel	J	2.1	10.0	ug/L
				Selenium	J	0.30	5.0	ug/L
				Vanadium	J	1.1	10.0	ug/L
				Zinc	J	14.1	40.0	ug/L
		8260B		Acetone	J	5.6	10	ug/L
		9056		NITRATE	J	0.033	0.10	mg/L
L12sw-313-5825-SW	A1D210402009	6020		Arsenic	J	0.91	5.0	ug/L
				Chromium	J	1.0	5.0	ug/L
				Cobalt	J	0.19	5.0	ug/L
				Copper	J	2.5	5.0	ug/L
				Lead	J	0.65	3.0	ug/L
				Nickel	J	1.8	10.0	ug/L
				Selenium	J	0.44	5.0	ug/L
				Sodium	J	940	1000	ug/L
				Vanadium	J	1.2	10.0	ug/L
				Zinc	J	15.9	40.0	ug/L
		8260B		Acetone	J	4.9	10	ug/L

Reporting Limits Outlier Report (detected results reported below the reporting limit)

Lab Report Batch: A1D210402 **Lab ID:** TALCAN

Client Sample ID	Lab Sample ID	Analysis Method	Matrix	Analyte Name	Lab Qualifier	Result	EDD Reporting Limit	Units
L12sw-313-5825-SW	A1D210402009	8270C PAH	AQ	Fluoranthene	J	0.33	10	ug/L
				Pyrene	J	0.30	10	ug/L
PBA08-QC-6242-TB	A1D210402002	8260B		Acetone	J	6.7	10	ug/L
PBA08-QC-6243-ER	A1D210402001	6020		Manganese	J	2.5	10.0	ug/L
		8260B		2-Butanone (MEK)	J	0.84	10	ug/L
				Acetone	J	8.0	10	ug/L
				Carbon disulfide	J	0.31	1.0	ug/L
				Methylene chloride	J B	0.37	1.0	ug/L
		8270C		Benzyl alcohol	J	1.7	10	ug/L
				Diethyl phthalate	J	1.1	10	ug/L
				Di-n-butyl phthalate	J	0.85	10	ug/L

Method Blank Outlier Report

Lab Reporting Batch : A1D210402
Lab ID: TALCAN
Analysis Method : 8270C
Analysis Date : 05/09/2011
Preparation Type : 3520C
Preparation Date : 04/25/2011
Method Blank Lab Sample ID : A1D240000022B
Preparation Batch : 1114022

bis(2-Ethylhexyl) phthalate	Result	Reporting Limit	Units	Lab Qual	Comments
Method Blank Result:	**1.1**	**10**	**ug/L**	**J**	**Common Contaminant**

bis(2-Ethylhexyl) phthalate contamination found in the method blank did not qualify any samples.

Method Blank Outlier Report

Lab Reporting Batch : A1D210402
Lab ID: TALCAN
Analysis Method : 6020
Analysis Date : 05/13/2011
Preparation Type : 3050B
Preparation Date : 04/28/2011
Method Blank Lab Sample ID : A1D280000021B
Preparation Batch : 1118021

Potassium	Result	Reporting Limit	Units	Lab Qual	Comments
Method Blank Result:	**4.8**	**100**	**mg/kg**	**J**	

Potassium contamination found in the method blank did not qualify any samples.

Mercury	Result	Reporting Limit	Units	Lab Qual	Comments
Method Blank Result:	**0.015**	**0.10**	**mg/kg**	**J**	

Mercury was qualified due to method blank contamination in the following associated samples:

Client Sample ID	Lab Sample ID	Dilution	Result	Lab Qual	Result Units
L12sd-310-5820-SD	A1D210402004	1	0.042	J B	mg/kg
L12sd-312-5824-SD	A1D210402008	0.86	0.062	J B	mg/kg

Method Blank Outlier Report

Lab Reporting Batch : A1D210402
Lab ID: TALCAN
Analysis Method : 8260B
Analysis Date : 05/02/2011
Preparation Type : 5030B
Preparation Date : 05/02/2011
Method Blank Lab Sample ID : A1E020000143B
Preparation Batch : 1122143

Methylene chloride	Result	Reporting Limit	Units	Lab Qual	Comments
Method Blank Result:	**0.68**	**1.0**	**ug/L**	**J**	**Common Contaminant**

Methylene chloride was qualified due to method blank contamination in the following associated samples:

Client Sample ID	Lab Sample ID	Dilution	Result	Lab Qual	Result Units
PBA08-QC-6243-ER	A1D210402001	1	0.37	J B	ug/L

Surrogate Recovery Outlier Report

Lab Report Batch: A1D210402 **Lab ID:** TALCAN

Client Sample ID	Lab Sample ID	Analysis Method	Dilution	Matrix	Surrogate	Percent Recovery	Criteria (percent) Lower Limit	Upper Limit	Reject Point	Associated Target Analytes
L12sw-310-5819-SW	A1D210402003	8082	1	AQ	Decachlorobiphenyl	29	40.0	135.0	10.0	All Target
L12sw-311-5821-SW	A1D210402005	8082	1	AQ	Decachlorobiphenyl	28	40.0	135.0	10.0	All Target
L12sw-312-5823-SW	A1D210402007	8082	1	AQ	Decachlorobiphenyl	29	40.0	135.0	10.0	All Target
L12sw-313-5825-SW	A1D210402009	8082	1	AQ	Decachlorobiphenyl	31	40.0	135.0	10.0	All Target