

MEMORANDUM FOR RECORD**Date:** April 18, 2016**SUBJECT:** Environmental Liabilities for AOC SEAD-001-R-01 Deactivation Furnaces (alias SEAD-16/17)

1. This memorandum serves as formal documentation of the information used to develop the Cost-To-Complete (CTC) estimate for SEAD 001-R-01 for the 2016 data call. Estimators experience is documented on the Estimator Experience Form, per the Financial Accounting Standards Board Handbook (FASB) Technical Release 2 (Enclosure 1). The contract W912DY-09-D-0062 Delivery Order 23 (Enclosure 3) is the basis for cost for the GW monitoring at the site. The Remedial Action Cost Engineering and Requirements (RACER) 11.2 system was used to estimate the cost of well abandonment and site close out and is updated with the 2015 escalation factor per 29 March 2016 Data Call Memorandum for Ground Water sampling FY16. Site Closeout and well decommissioning is expected to take place in FY 21 when GW testing is expected to be terminated. The LUC monitoring cost and the five-year review requirements are based upon contract number W912DS-09-D-0062 Task Order 0023 (enclosed).
2. COE oversight policy for New York District (CENAN) is to manage programs at 10-11% oversight cost; RACER default of 11% is adequate.
3. **Site History:** Formerly known as SEAD-016/017, this site includes former and existing popping plants. The "Abandoned Deactivation Furnace (SEAD-016)", located in the east-central portion of SEDA, consists of 2.6 acres of fenced land with grasslands, a storage area and the building housing the deactivation furnace. The "Existing Deactivation Furnace (SEAD-017)" is located adjacent to and southwest of SEAD-016 and consists of a deactivation furnace building surrounded by a crushed shale road. The RI identified lead in building materials and soil and PAHs in the soil at SEAD-016. Lead concentrations in the soil at SEAD-016 were of concern. Metals in GW were also identified as a contaminant. A ROD was signed by the regulators on Sept. 29, 2006. The RA took place in FY07 which removed contaminated soil to an approved off-site disposal facility and the demolition of all structures on the site. Upon completion of the RA, LTM was initiated and GW sampling began to demonstrate that the removal action did not have any further impacts on GW.
4. **Current Condition:** SEAD 001-R-01 is in LTM phase with the GW being monitored to demonstrate that the RA did not further degrade the GW. LUC monitoring cost and the five-year review requirements are included with Site SEAD 009 as a single installation activity. The concentrations have decreased but have not yet met standards. The five year review has not yet been submitted; EPA has not agreed with discontinuing the groundwater monitoring as of April 18, 2016.

5. **Exit Strategy:** GW monitoring will discontinue when statistical evaluation shows there was no degradation of the GW as a result of the RA. At the end of the GW monitoring in FY 15, 8 rounds will have been collected and analyzed which is sufficient to for the statistics required to discontinue the monitoring program. (See Encl 6). Upon demonstration that GW has met the established cleanup goal, GW sampling will be eliminated and LUC restriction will be eliminated. Monitoring is expected to end in 2016 the Annual Report will document the end of monitoring. EPA will review this status in the Five Year Review Report, to be submitted FY16. Groundwater monitoring can be discontinued only with EPA concurrence.

6. **Enclosure:**

1. Estimator Experience Form
2. Final ROD for SEAD-16 and SEAD-17 March 2006
3. Groundwater Statistics and Monitoring Compliance by ITRC dtd Dec 2013.
4. "Statistical Analysis if Groundwater Monitoring Data at RCRA Facilities", Unified Guidance, EPA 530/R-09-007 dtd March 2009.
5. Estimate Summary Table

7. **RACER Assumptions:**

Well Abandonment /Site Closeout Documentation (LTM phase):

Well Abandonment:

1. Number of wells: 12
2. Depth: 15 feet
3. Diameter: 2"
4. Formation type: Unconsolidated
5. Method: Overdrill/removal

Site Completion Documentation: Well Abandonment:

1. Site Closeout is moderate complexity
2. Kick-off, review and regulatory meetings included
3. Work Plans and reports--all RACER default values
4. Documents will be stored for 30 years

**8. Cost Summary SEAD-001-R-01
 (SEAD-16/17)**

Ground Water sampling FY16 (Encl 4) CLIN 0007a= \$23,146.49 (Rounded to \$23,150)	\$23,150
Cost to Owner for Contract management \$26,050 X .11 = \$2546.50 (Rounded to \$2,547)	\$2,547
Well Abandonment/Site Closeout (RACER) Subtotal = \$98,700	
Escalation factor (2015) =1.0157 Well Abandonment/Site Closeout = 100,249.59 (Rounded \$100,250)	\$100,250
Total Site Cost	\$125,947

Material Change: yes
Reason: Additional year of groundwater monitoring due to EPA concurrence.
Cost basis is a new groundwater monitoring contract.

Prepared by: Randall Battaglia
Cost Estimator

Signature Date

Reviewed by: James E. Briggs
Cost Estimate Reviewer

Signature Date

ENCLOSURE 2
RECORD OF DECISION

FOR

THE ABANDONED DEACTIVATION FURNACE (SEAD-16) AND
THE ACTIVE DEACTIVATION FURNACE (SEAD-17)

SENECA ARMY DEPOT ACTIVITY
ROMULUS, NEW YORK

Prepared for:

SENECA ARMY DEPOT ACTIVITY
ROMULUS, NEW YORK

and

UNITED STATES ARMY CORPS OF ENGINEERS
4820 UNIVERSITY SQUARE
HUNTSVILLE, ALABAMA

Prepared By:

PARSONS
150 Federal St.
4th Floor
Boston, Massachusetts

Contract Number: DACA87-95-D-0031
Delivery Order 003
USEPA Site ID: NY0213820830; NY Site ID: 8-50-006

March 2006

ESCALATION RATES

Constant Year (FY16) Dollars

The CTC estimates shall be reported on a current cost basis (unadjusted for inflation). The following factors should be used to bring previous year costs to the current year.

Base Fiscal Year	Escalation Rate
FY11	1.0666
FY12	1.0568
FY13	1.0421
FY14	1.0288
FY15	1.0157

Estimate Summary Table

Site # SEAD-001-R-01

Site Number	Phase	CTC Subtotal (\$K)	Estimate Type	Assumption	Basis of Assumption	Basis of Assumption Document Name	Location of Basis of Assumption Document
SEAD 001-R-01 (SEAD 16/17)	LTM	23	Contract Price	Contract for GW monitoring	TO 0023, CLIN 0007a	Contract #: W912DY-09-D-0062, D.O. 0023 dated 30 June 2016	HNC
							1600 University Square
							Huntsville Al
	Close out	99	IGE	Engineering Estimate	Engineering Estimate	W912DY-08-D-0008	USACE NY
					FY11 Contract Amounts		5786 State Route 96
					Escalation Factor		Romulus, NY 14541
	LTM	3	IGE	COE Oversight of Contract	Engineering Estimate	Army Management System rates	USACE NY
							5786 State Route 96
							Romulus, NY 14541
Total cost to complete		125					
Does the CTC estimate include work through site closure? (Yes/No)		yes					

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Contract Number: DACA87-95-D-0031

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Delivery Order 003

USEPA Site ID: NY0213820830; NY Site ID: 8-50-006

Site Name and Location

The Abandoned Deactivation Furnace (SEAD-16) and the Active Deactivation Furnace (SEAD-17)
Seneca Army Depot Activity
CERCLIS ID# NY0213820830
Romulus, Seneca County, New York

Statement of Basis and Purpose

This decision document presents the U.S. Army's (Army's) and the U.S. Environmental Protection Agency's (USEPA's) selected remedy for SEAD-16 and SEAD-17, located at the Seneca Army Depot Activity (SEDA or the Depot) near Romulus, New York. The decision was developed in accordance with the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA) as amended, 42 U.S.C. §9601 et seq., and, to the extent practicable, the National Oil and Hazardous Substances Pollution Contingency Plan (NCP), 40 CFR Part 300. The Base Realignment and Closure (BRAC) Environmental Coordinator, the Director of the National Capital Region Field Office, and the USEPA Region II have been delegated the authority to approve this Record of Decision (ROD). The New York State Department of Environmental Conservation (NYSDEC) and the New York State Department of Health (NYSDOH) have concurred with the selected remedy.

Sites

This ROD is based on the Administrative Record that has been developed in accordance with Section 113(k) of CERCLA. The Administrative Record is available for public review at the Seneca Army Depot Activity, 5786 State Route 96, Building 123, Romulus, NY 14541. The Administrative Record Index identifies each of the items considered during the selection of the remedial action. This index is included in Appendix A.

The State of New York, through the NYSDEC and NYSDOH, has concurred with the selected remedy. The NYSDEC Declaration of Concurrence is provided in Appendix B of this ROD.

Site Assessment

The response action selected in this ROD is necessary to protect human health or the environment from actual or threatened releases of hazardous substances into the environment or from actual or threatened releases of pollutants or contaminants from SEAD-16 and SEAD-17, which may present an imminent and substantial endangerment to public health or welfare.

Description of the Selected Remedy

The selected remedy for SEAD-16 and SEAD-17 addresses contaminated soil, building debris, and groundwater. The selected remedy will result in the removal of soil and groundwater as a pathway

The elements that compose this remedy include:

- Conduct additional sampling as part of the pre-design sampling program to further delineate areas of excavation;
- Remove, test, and dispose of the SEAD-16 building debris off-site;
- Excavate approximately 275 cubic yards (cy) of ditch soil to a depth of 1 foot (ft.) with concentrations greater than 1250 mg/Kg until cleanup standards are achieved;
- Excavate approximately 1760 cy of surface soils to a depth of 1 ft. at SEAD-16 with concentrations greater than 1250 mg/Kg, and polycyclic aromatic hydrocarbon (PAH) and n concentrations greater than risk-based derived cleanup standards listed below and in Table 1-1;
- Excavate approximately 67 cy of subsurface soils to a depth of 2 ft. to 3 ft. at SEAD-16 (a around SB16-2, SB16-4, and SB16-5) with lead concentrations greater than 1250 mg/Kg, PAH and metal concentrations greater than risk-based derived cleanup standards listed below in Table 1-1 (Figure 1-1);
- Excavate approximately 2590 cy of surface soils to a depth of 1 ft. at SEAD-17 with concentrations greater than 1250 mg/Kg and metal concentrations greater than risk-based derived cleanup standards listed below (Table 1-1) (Figure 1-2);
- Stabilize excavated soils from SEAD-16 and SEAD-17 and building debris from SEAD-16 exceeding the toxicity characteristic leaching procedure (TCLP) criteria in order to attain Land Disposal Restrictions (LDR);
- Dispose of the excavated material in an off-site landfill;
- Backfill the excavated areas with clean backfill;
- Conduct groundwater monitoring at SEAD-16 and SEAD-17 until concentrations are below the GA criteria; *GW monitoring*
- Remediate material potentially presenting an explosive hazard and munitions and explosives of concern to meet the Department of Defense Explosive Safety Board (DDESB) requirements for unrestricted use or to put into place land use restrictions as may be required by DDESB;
- Submit a Completion Report following the remedial action;
- Establish and maintain land use controls (LUCs) to prevent access to or use of the groundwater and to prevent residential use until cleanup standards are met; and
- Complete a review of the selected remedy every 5 years (at minimum), in accordance with Section 121(c) of the CERCLA. *5 year review*

COMPOUNDS	SOIL CLEANUP GOAL
Polycyclic Aromatic Hydrocarbons (PAHs)	
Benzo(a)anthracene ($\mu\text{g}/\text{Kg}$)	20,417
Benzo(a)pyrene ($\mu\text{g}/\text{Kg}$)	2,042
Benzo(b)fluoranthene ($\mu\text{g}/\text{Kg}$)	20,417
Benzo(k)fluoranthene ($\mu\text{g}/\text{Kg}$)	50,000
Chrysene ($\mu\text{g}/\text{Kg}$)	50,000
Dibenz(a,h)anthracene ($\mu\text{g}/\text{Kg}$)	2,042
Indeno(1,2,3-cd)pyrene ($\mu\text{g}/\text{Kg}$)	20,417
Metals	
Antimony (mg/Kg)	29
Arsenic (mg/Kg)	20
Cadmium (mg/Kg)	14
Copper (mg/Kg)	331
Lead (mg/Kg)	1250
Mercury (mg/Kg)	0.54
Thallium (mg/Kg)	2.6
Zinc (mg/kg)	773

To complete Resource Conservation and Recovery Act (RCRA) closure of the deactivation furnace at SEAD-17, the Army will either further decontaminate or demolish and dispose off-site the structure that failed to meet closure standards during the interim closure (i.e., concrete slabs and block walls).

SEAD-16 AND SEAD-17 Land Use Control (LUC) Performance Objectives

The LUC performance objectives for SEAD-16 and SEAD-17 are to:

- Prevent access to or use of the groundwater until cleanup levels are met; and
- Prevent residential housing, elementary and secondary schools, childcare facilities and playgrounds activities.

The LUCs would be implemented over the area bounded by the boundary at SEAD-16 (Figure 1-1) and SEAD-17 (Figure 1-2). The boundary of SEAD-16 is defined as the fence; SEAD-17 is bounded by the fence to the east and by natural boundaries, such as ditches. It should be noted that land within the Planned Industrial/Office Development (PID) area, which includes SEAD-16 and SEAD-17, is also subject to a separate Proposed Plan and ROD that include institutional controls (ICs) ["Final ROD for Sites Requiring Institutional Controls in the Planned Industrial/Office Development or Warehousing Areas" (Parsons, 2004)]. Groundwater use restrictions will continue until groundwater constituent concentrations have been reduced to levels that allow for unlimited exposure and unrestricted use. With USEPA approval, once groundwater cleanup standards are achieved, the groundwater use restrictions may be eliminated.

for SEAD-16 and SEAD-17 will be prepared which satisfies the applicable requirements Paragraphs (a) and (c) of Environmental Conservation Law (ECL) Article 27, Section 1 Institutional and Engineering Controls. In addition, the Army will prepare an environmental easement for SEAD-16 and SEAD-17, consistent with Section 27-1318(b) and Article 71, Title 3 ECL, in favor of the State of New York and the Army, which will be recorded at the time of property's transfer from federal ownership. A schedule for completion of the draft SEAD-16 SEAD-17 LUC Remedial Design Plan (LUC RD) will be completed within 21 days of the R signature, consistent with Section 14.4 of the Federal Facilities Agreement (FFA).

The Army shall implement, inspect, report, and enforce the LUCs described in this ROD accordance with the approved LUC RD. Although the Army may later transfer these responsibilities to another party by contract, property transfer agreement, or through other means, the Army shall retain ultimate responsibility for remedy integrity.

State Concurrence

NYSDOH forwarded a letter of concurrence regarding the selection of a remedial action to NYSDEC and NYSDEC, in turn, forwarded to USEPA a letter of concurrence regarding the selection of remedial action in the future. This letter of concurrence has been placed in Appendix B.

Declaration

CERCLA and the NCP require each selected remedy to be protective of human health, public welfare, and the environment; be cost effective, comply with other statutory laws; and use permanent solutions, alternative treatment technologies, and resource recovery options to the maximum extent possible. CERCLA and the NCP also state a preference for treatment as a principal element for the reduction of toxicity, mobility, or volume of the hazardous substances.

The selected remedy is consistent with CERCLA and the NCP and is protective of human health and the environment, complies with Federal and State requirements that are applicable or relevant and appropriate to the remedial action, is cost-effective, and utilizes permanent solutions. This remedy also reduces the toxicity, mobility, or volume of hazardous substances, pollutants, or contaminants.

Because this remedy may result in hazardous substances, pollutants, or contaminants remaining on-site above levels that allow for unlimited use and unrestricted exposure for an indeterminate period, a statutory review will be conducted every 5 years after initiation of the remedial action to ensure that the remedy is, or will be, protective of human health and the environment.

unrestricted use. With USEPA approval, once groundwater cleanup standards are achieved groundwater use restrictions may be eliminated.

To implement the Army's remedy, which includes LUCs, a LUC RD for SEAD-16 and SEAD-17 will be prepared which satisfies the applicable requirements of Paragraphs (a) and (c) of ECL Article 27, Section 1318: Institutional and Engineering Controls. In addition, the Army will prepare an environmental easement for SEAD-16 and SEAD-17, consistent with Section 27-1318(b) and Article 71, Title 36 of ECL, in favor of the State of New York and the Army, which will be recorded at the time of SEAD-16's and SEAD-17's transfer from federal ownership. A schedule for completion of the draft SEAD-16 and SEAD-17 LUC RD will be completed within 21 days of the ROD signature consistent with Section 14.4 of the FFA.

The present worth cost of this alternative is \$3,109,400. The capital cost and the present worth O&M cost of Alternative 4 are \$1,699,900 and \$1,409,500, respectively. *chosen*

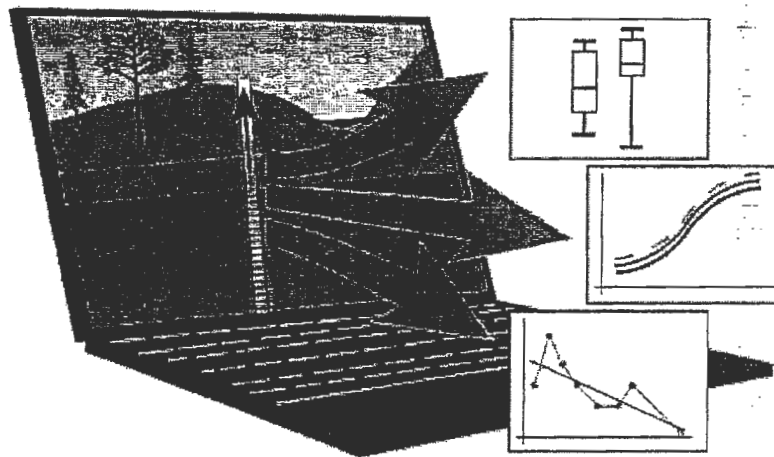
In comparison to other remedies considered in the FS, Alternative 4 has the highest overall ranking. While it does not rank highest for any single evaluation criterion, as Alternatives 2 and 6 do, neither does it rank the lowest for any evaluation criteria considered, which each of the other intrusive alternatives did. Alternative 4 ranks second of all the alternatives for long-term effectiveness and permanence and reduction of mobility of contaminants. It also ranks highest of the three alternatives (2, 4, and 6) for technical feasibility and overall cost. The preferred alternative will eliminate source soils from further impacting SEAD-16 and SEAD-17 by preventing contact with receptors and migration of contaminants to surface water and groundwater. It is a cost-effective, readily available alternative that does not require long-term maintenance aside from groundwater monitoring and maintenance of LUCs, such as groundwater restrictions, and residential/daycare land use restrictions; and, the alternative can be implemented quickly to provide short-term effectiveness. Finally, it is a permanent solution that would significantly reduce the mobility of the contaminants and potential for exposure at SEAD-16 and SEAD-17.



Guidance Document

Groundwater Statistics and Monitoring Compliance

Statistical Tools for the Project Life Cycle



December 2013

Prepared by
The Interstate Technology & Regulatory Council
Groundwater Statistics and Monitoring Compliance Team

- If you suspect outliers, examine the data using a probability plot, Dixon's test, Rosner's test, or another appropriate method.
- See Section 5.7 for information regarding the handling of nondetects.
- Use of 8 to 10 measurements is recommended, a larger data set may be required if the data are skewed or contain nondetects.

Strengths and Weaknesses

- This method is relatively simple to implement and interpret (when assumptions are met).
- Use on lognormal data which are transformed is not recommended.

Further Information

Additional information on the Pooled Variance t-test, including examples of how to perform the test can be found in Chapter 16.1.1, Unified Guidance.

5.11.3 Wilcoxon Rank-sum Test

The Wilcoxon rank-sum test is a nonparametric two-sample test that may be used to compare two populations when the groundwater data are not normally-distributed and cannot be normalized by transformation. The Wilcoxon rank-sum test is equivalent to the Mann-Whitney U-test. Requirements for the Wilcoxon rank-sum test include the assumption of equal variances, the assumption of a common (unknown) distribution, a lack of spatial variability, and temporal stability. The Wilcoxon rank-sum test can handle data sets with a limited number of nondetects (10-15%) with uniform reporting limits.

As the name implies, the Wilcoxon rank-sum test is performed by ordering the combined data from smallest to largest and ranking the values from 1 to N. Tied values receive a midrank which is the average of the ranks they would receive were they not tied. The resulting numerical ranks of the background samples are denoted as B_i and the compliance samples are C_i . The Wilcoxon statistic (W) is computed as the sum of the compliance ranks and the result is standardized to compute a Z-score for comparison to a tabulated critical statistic. Calculations for W, the expected value $E(W)$, standard deviation $SD(W)$, and the test statistic Z, for data with no ties are available in most statistical references and the Unified Guidance.

A computed Z is greater than the tabulated critical Z at the selected significance level, indicates that the compliance well concentrations are statistically different from the background at the significance level.

The Wilcoxon rank-sum test is available in most statistical software packages as a default selection for nonparametrically-distributed data; however, most packages do not automatically evaluate for compliance with the necessary underlying requirements or assumptions.

Applications and Relevant Study Questions

- Study Question 2: Are concentrations greater than background concentrations?

- Study Question 5: Is there a trend in contaminant concentrations?

Assumptions

Although there is no assumption of normality, violations of the requirements listed below may invalidate the results of the test. Always verify that the data comply with the requirements.

Requirements and Tips

- Equal population variances
- Common (shared) distribution between populations
- Absence of naturally-occurring spatial variability
- Samples are spatially and temporally independent
- Temporal stability
- The number of nondetects should be minimal (typically, less than 10 to 15%) and should be treated as tied data.
- Use of 8 to 10 measurements is recommended, a larger data set may be required if the data are skewed or contain nondetects.

SAMPLE
NUMBER

Strengths and Weaknesses

- no requirement for normality
- can accommodate nondetects, but a large number of nondetects may decrease the usefulness of the result.

Further Information

Additional information on the Wilcoxon Rank-Sum test including examples of how to perform the test can be found in Chapter 16.2, Unified Guidance.

5.11.4 Sign or Signed Rank Test

The signed rank test is used to evaluate differences between groups of “paired” data such as analytical results from a group of wells before and after remediation efforts. The signed rank test evaluates whether a statistically significant difference exists between the medians of two groups by evaluating the difference between each pair of observations. The pairs are ranked in ascending order of the absolute value of their difference, and each rank is multiplied by the sign of the paired difference. The sum of those products is the test statistic W , which is compared to a tabulated critical value that is based on the selected statistical significance of the test and the number of sample pairs (differences). A computed test statistic W greater than the tabulated critical W at the selected significance level, indicates that the two groups of data are statistically different at the selected significance level. The signed rank test is available in some statistical software packages and is relatively straightforward to implement in spreadsheet software.

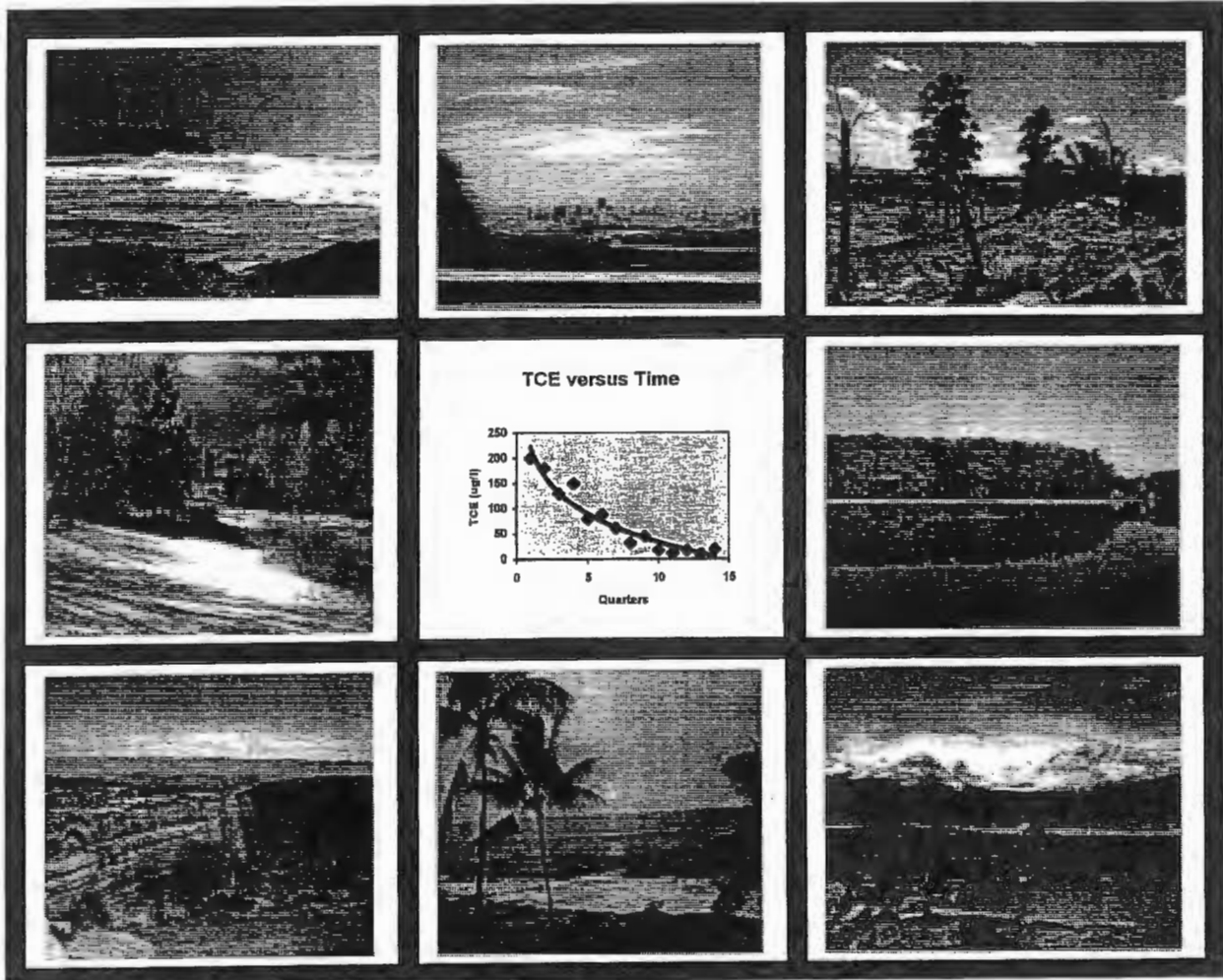
Applications and Relevant Study Questions

Study Question 5: Is there a trend in contaminant concentrations?

STATISTICAL ANALYSIS OF GROUNDWATER MONITORING DATA AT RCRA FACILITIES UNIFIED GUIDANCE

MARCH 2009

EPA 530/R-09-007



**ENVIRONMENTAL PROTECTION AGENCY
OFFICE OF RESOURCE CONSERVATION AND RECOVERY**



encl 4

chosen, and the frequency of background versus compliance well testing. The number of compliance wells and annual frequency of testing also affect overall costs, but are generally site-specific considerations. By limiting the number of constituents and ensuring adequate background sample sizes, it is possible to select certain statistical tests which help minimize future compliance (and total) sample requirements.

Selection of an appropriate number of detection monitoring constituents should be dictated by the knowledge of waste or waste leachate composition and the corresponding groundwater concentrations. When historical background data are available, constituent choices may be influenced by their statistical characteristics. A few representative constituents or analytes may serve to accurately assess the potential for a release. These constituents should stem from the regulated wastes, be sufficiently mobile, stable and occur at high enough concentrations to be readily detected in the groundwater. Depending on the waste composition, some non-hazardous organic or inorganic indicator analytes may serve the same purpose. The guidance suggests that between 10-15 formal detection monitoring constituents should be adequate for most site conditions. Other constituents can still be reported but not directly incorporated into formal detection monitoring, especially when large simultaneously analyzed suites like ICP-trace elements, volatile or semi-volatile organics data are run. The focus of adequate background and future compliance test sample sizes can then be limited to the selected monitoring constituents.

The RCRA regulations do not consistently specify how many observations must be collected in background. Under the Part 265 Interim Status regulations, four quarterly background measurements are required during the first year of monitoring. Recent modifications to Part 264 for Subtitle C facilities require a sequence of at least four observations to be collected in background during an interval approved by the Regional Administrator. On the other hand, at least four measurements must be collected from each background well during the first semi-annual period along with at least one additional observation during each subsequent period, for Subtitle D facilities under Part 258. Although these are minimum requirements in the regulations, are they adequate sample sizes for background definition and use?

Four observations from a population are rarely enough to adequately characterize its statistical features; statisticians generally consider sample sizes of $n \leq 4$ to be insufficient for good statistical analysis. A decent population survey, for example, requires several hundred and often a few to several thousand participants to generate accurate results. Clinical trials of medical treatments are usually conducted on dozens to hundreds of patients. In groundwater tests, such large sample sizes are a rare luxury. However, it is feasible to obtain small sample sets of up to $n = 20$ for individual background wells, and potentially larger sample sizes if the data characteristics allow for pooling of multiple well data.

Sample Number } The Unified Guidance recommends that a minimum of at least 8 to 10 independent background observations be collected before running most statistical tests. Although still a small sample size by statistical standards, these levels allow for minimally acceptable estimates of variability and evaluation of trend and goodness-of fit. However, this recommendation should be considered a temporary minimum until additional background sampling can be conducted and the background sample size enlarged (see further discussions below).

Small sample sizes in background can be particularly troublesome, especially in controlling statistical test false positive and negative rates. False negative rates in detection monitoring, *i.e.*, the

ORDER FOR SUPPLIES OR SERVICES

1. CONTRACT PURCH ORDER/ AGREEMENT NO. W912DY-09-D-0062			2. DELIVERY ORDER/ CALL NO. 0023		3. DATE OF ORDER/ CALL (YYYYMMDD) 2016 Mar 30		4. REQ. PURCH. REQUEST NO. W31RYO0838003		5. PRIORITY		
6. ISSUED BY US ARMY ENGINEERING & SUPPORT CENTER CEHNC-CT 4820 UNIVERSITY SQUARE HUNTSVILLE AL 35816-1822				7. ADMINISTERED BY (if other than 6) DIRECTORATE OF CONTRACTING - HNC ATTN: MICHELLE BLACKMON 256-895-2531 HUNTSVILLE AL 35816		8. DELIVERY FOB <input checked="" type="checkbox"/> DESTINATION <input type="checkbox"/> OTHER (See Schedule if other)					
9. CONTRACTOR PARSONS GOVERNMENT SERVICES INC. MICHELLE SMITH 100 W WALNUT ST ADDRESS PASADENA CA 91124-0001				10. DELIVER TO FOB POINT BY (Date) (YYYYMMDD) SEE SCHEDULE		11. MARK IF BUSINESS IS <input type="checkbox"/> SMALL <input type="checkbox"/> SMALL DISADVANTAGED <input type="checkbox"/> WOMEN-OWNED		12. DISCOUNT TERMS Net 30 Days			
				13. MAIL INVOICES TO THE ADDRESS IN BLOCK See Item 15							
14. SHIP TO SEE SCHEDULE SEE SCHEDULE SEE SCHEDULE SEE SCHEDULE AA				15. PAYMENT WILL BE MADE BY US ARMY ENG & SUP CENTER - FINANCE OFFIC US ARMY CORPS OF ENGRS FINANCE CTR 5722 INTEGRITY DRIVE MILLINGTON TN 38054-5005		16. MARK ALL PACKAGES AND PAPERS WITH IDENTIFICATION NUMBERS IN BLOCKS 1 AND 2.					
16. TYPE OF ORDER		DELIVERY/ CALL <input checked="" type="checkbox"/>		This delivery order call is issued on another Government agency, or in accordance with and subject to terms and conditions of above numbered contract.							
		PURCHASE		Reference your quote dated Furnish the following on terms specified herein. REF:							
ACCEPTANCE. THE CONTRACTOR HEREBY ACCEPTS THE OFFER REPRESENTED BY THE NUMBERED PURCHASE ORDER AS IT MAY PREVIOUSLY HAVE BEEN OR IS NOW MODIFIED, SUBJECT TO ALL OF THE TERMS AND CONDITIONS SET FORTH, AND AGREES TO PERFORM THE SAME.											
Parsons Gov Services				[Signature]				Don Sultrecker, VP		3/30/16	
NAME OF CONTRACTOR				SIGNATURE				TYPED NAME AND TITLE		DATE SIGNED (YYYYMMDD)	
<input checked="" type="checkbox"/> If this box is marked, supplier must sign Acceptance and return the following number of copies: 3/30/16											
17. ACCOUNTING AND APPROPRIATION DATA/ LOCAL USE See Schedule											
18. ITEM NO.		19. SCHEDULE OF SUPPLIES/ SERVICES				20. QUANTITY ORDERED/ ACCEPTED*		21. UNIT	22. UNIT PRICE	23. AMOUNT	
		SEE SCHEDULE									
* If quantity accepted by the Government is being as quantity ordered, indicate by X. If different, enter actual quantity accepted below quantity ordered and encircle.						24. UNITED STATES OF AMERICA TEL: MULLADY.RICHARD.J.1090040282 EMAIL: BY:		25. TOTAL 26. DIFFERENCES		5637,951.83	
27. QUANTITY IN COLUMN 20 HAS BEEN <input type="checkbox"/> INSPECTED <input type="checkbox"/> RECEIVED <input type="checkbox"/> ACCEPTED, AND CONFORMS TO THE CONTRACT EXCEPT AS NOTED											
b. SIGNATURE OF AUTHORIZED GOVERNMENT REPRESENTATIVE						c. DATE (YYYYMMDD)		d. PRINTED NAME AND TITLE OF AUTHORIZED GOVERNMENT REPRESENTATIVE			
e. MAILING ADDRESS OF AUTHORIZED GOVERNMENT REPRESENTATIVE						28. SHIP NO.		29. DO VOUCHER NO.		30. INITIALS	
f. TELEPHONE NUMBER		g. E-MAIL ADDRESS				<input type="checkbox"/> PARTIAL <input type="checkbox"/> FINAL		32. PAID BY		33. AMOUNT VERIFIED CORRECT FOR	
36. I certify this account is correct and proper for payment.						31. PAYMENT <input type="checkbox"/> COMPLETE <input type="checkbox"/> PARTIAL <input type="checkbox"/> FINAL		34. CHECK NUMBER			
a. DATE (YYYYMMDD)		b. SIGNATURE AND TITLE OF CERTIFYING OFFICER						35. BILL OF LADING NO.			
37. RECEIVED AT		38. RECEIVED BY		39. DATE RECEIVED (YYYYMMDD)		40. TOTAL CONTAINERS		41. SR ACCOUNT NO.		42. SR VOUCHER NO	

Section A - Solicitation/Contract Form

AWARD NARRATIVE

Task Order 0023, which contains Firm Fixed-Price (FFP) tasks, is being issued to Parsons Government Services, Inc for Remedial Action at Seneca Army Depot Activity, Romulus, NY, EPA Site ID# NY0213820830, NY Site ID# 8-50-006 in accordance with Performance Work Statement Revision 2, dated March 24, 2016.

The period of performance is date of award through March 30, 2018.

US Department of Labor Wage Determination Number 15-2381, Revision 1, dated March 1, 2016 shall be used with project task order.

The Terms and Conditions of the basic contract, W912DY-09-D-0062 takes precedence in the case of any ambiguity or conflict.

This task order is awarded in the amount of \$1,211,190.20 of which \$637,951.83 is being funded at the time of award.

Task	Description	Type	Amount	Total
1	UFP-QAPP and QASP	FFP	7,063.20	7,063.20
2	GIS	FFP	3,908.96	3,908.96
2a	Optional, Additional GIS per FY	FFP	1,525.90	
3	Long Term Monitoring of The OB Grounds	FFP		
3a	(FY17) First Annual Groundwater Monitoring	FFP	21,453.84	21,453.84
3b	Optional, (FY18) Second Annual Groundwater Monitoring	FFP	21,457.76	
3c	Optional, (FY19) Third Annual Groundwater Monitoring	FFP	21,461.68	
3d	Optional, (FY20) Fourth Annual Groundwater Monitoring	FFP	21,465.59	
3e	Optional, (FY21) Fifth Annual Groundwater Monitoring	FFP	21,469.51	
4	Long Term Monitoring of the Fire Training and Demonstration Pad Area	FFP		
4a	(FY17) First Annual Groundwater Monitoring	FFP	26,049.47	26,049.47
4b	Optional, (FY18) Second Annual Groundwater Monitoring	FFP	26,080.17	
4c	Optional, (FY19) Third Annual Groundwater Monitoring	FFP	26,110.87	
4d	Optional, (FY20) Fourth Annual Groundwater Monitoring	FFP	26,141.57	
4e	Optional, (FY21) Fifth Annual Groundwater Monitoring	FFP	26,172.27	
5	Long Term Monitoring of the Ash Landfill Operable Unit	FFP		
5a	(FY17) First Annual Groundwater Monitoring	FFP	51,594.03	51,594.03
5b	Optional, (FY18) Second Annual Groundwater Monitoring	FFP	51,686.28	
5c	Optional, (FY19) Third Annual Groundwater Monitoring	FFP	51,778.54	
5d	Optional, (FY20) Fourth Annual Groundwater Monitoring	FFP	51,870.79	
5e	Optional, (FY21) Fifth Annual Groundwater Monitoring	FFP	51,963.04	
6	Ash Landfill Operable Unit Biowall Recharge	FFP	440,038.65	440,038.65
7	Long Term Monitoring of the Deactivation Furnaces Operable Unit	FFP		
7a	(FY17) First Annual Groundwater Monitoring	FFP	23,146.49	23,146.49
7b	Optional, (FY18) Second Annual Groundwater Monitoring	FFP	23,178.47	
7c	Optional, (FY19) Third Annual Groundwater Monitoring	FFP	23,210.46	
7d	Optional, (FY20) Fourth Annual Groundwater Monitoring	FFP	23,242.44	
7e	Optional, (FY21) Fifth Annual Groundwater Monitoring	FFP	23,274.43	
8	Monitoring of LUCs at Various Sites	FFP		
8a	(FY17) First Annual Monitoring Event	FFP	17,934.42	17,934.42



8b	Optional, (FY18) Second Annual Monitoring Event	FFP	17,934.42	
8c	Optional, (FY19) Third Annual Monitoring Event	FFP	17,934.42	
8d	Optional, (FY20) Fourth Annual Monitoring Event	FFP	17,934.42	
9	Monitoring of LUCs at Various Munition Sites	FFP		
9a	(FY17) First Annual Monitoring Event	FFP	5,895.00	5,895.00
9b	Optional, (FY18) Second Annual Monitoring Event	FFP	5,895.28	
9c	Optional, (FY19) Third Annual Monitoring Event	FFP	5,895.28	
9d	Optional, (FY20) Fourth Annual Monitoring Event	FFP	5,895.28	
10	Five-year Review	FFP	27,488.41	27,488.41
11	Community Relations Support	FFP	13,379.36	13,379.36
11a	Optional, Additional Meetings	FUP	8,646.02	
12	Optional, Administrative Record	FFP	1,013.48	
	Totals		\$1,211,190.20	\$637,951.83

Seneca Army Depot Cost Estimate
Site Closeout and Well Abandonment
SEAD 001-R-01

TASK	UNITS	UNIT COST (FY11)	NO. WELLS	Amount	ESCALATION FACTOR	FY16 Estimate= Amt x Esc	BASIS/DOCUMENTATION
WELL ABANDONMENT	LS	\$ 5,223.00	12 WELLS	\$ 62,796.00	1.0666	\$ 66,978.00	W912DY-08-D-0003, TASK ORDER 0008, FY11; 6 wells @ \$31,398= \$5,223
Closeout Report	LS	\$ 18,206.00			1.0666	\$ 19,419.00	
Project Management (Contractor)	HRS	200 \$/HR	60 HRS	\$ 12,000.00	1.0666	\$ 12,799.00	
						\$ 99,196.00	

**CONTRACT W912DY-08-D-0003
DELIVERY ORDER 0008
LONG-TERM MONITORING PLAN FOR THE OPEN BURNING GROUNDS AND
FIRE TRAINING AREA, ANNUAL LAND USE CONTROL EVALUATION, AND
ABANDONMENT OF EXISTING MONITORING WELLS
SENECA ARMY DEPOT ACTIVITY
TECHNICAL PROGRESS REPORT NO. 18
OCTOBER 29, 2011 THROUGH NOVEMBER 25, 2011**

Task	Description	CPFF Costs *	Prior Cumulative Costs	Costs this Period	Total Costs to Date	Percent Budget Expended	Physical Percent Complete
Task 1	Long Term Monitoring - OB Grounds	\$88,311	\$45,068	\$1,659	\$46,726	53%	59%
Task 2	Long Term Monitoring - FTA	\$68,453	\$68,222	\$83	\$68,305	100%	91%
Task 3	LUC Annual Inspections	\$121,216	\$77,648	\$853	\$78,501	65%	72%
Task 4	Well Abandonment - S5, 59, 71	\$26,165	\$19,979	\$41	\$20,020	77%	97%
Task 5	Well Abandonment - S12, 48, 63	\$99,428	\$42,700	\$475	\$43,175	43%	96%
Task 6	Well Abandonment - S121C, 122B, 70	\$20,932	\$13,977	\$525	\$14,502	69%	97%
Task 7	Well Abandonment - S25, 26	\$31,398	\$18,354	\$14	\$18,369	59%	97%
Task 8	Well Abandonment - S24, 67	\$10,466	\$8,895	\$0	\$8,895	85%	97%
Task 9	Well Abandonment - Ash Landfill	\$65,423	\$39,988	\$57	\$40,045	61%	97%
Task 10	Well Abandonment - S119B	\$5,233	\$4,079	\$0	\$4,079	78%	97%
Task 11	Well Abandonment - S27	\$2,617	\$2,616	\$0	\$2,616	100%	97%
TOTALS		\$539,643	\$341,526	\$3,707	\$345,233	64%	84%

Notes:

* Does not include fixed fee component of budget.

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CONTRACT W912DY-08-D-0003
DELIVERY ORDER 0012
ASH LANDFILL LONG-TERM MONITORING
SENECA ARMY DEPOT ACTIVITY
TECHNICAL PROGRESS REPORT NO. 05
OCTOBER 29, 2011 THROUGH NOVEMBER 25, 2011

Task	Description	Funded Fixed Price Costs *	Prior Cumulative Costs	Costs this Period	Total Costs to Date	Percent Budget Expended	Physical Percent Complete
Task 1	Field Events, Ltr Reports	\$71,342	\$31,034	\$1,855	\$32,889	46%	46%
Task 2	Prep. of Annual Report	\$18,206	\$0	\$0	\$0	0%	0%
Task 3	Project Management	\$34,521	\$8,699	\$2,486	\$11,185	32%	32%
TOTALS		\$124,069	\$39,733	\$4,340	\$44,073	36%	36%

* Inclusive of Award Fee and Base funding.

CONTRACT W912DY-08-D-0003
DELIVERY ORDER 0013
REMEDIAL INVESTIGATION / FEASIBILITY STUDY
OPEN BURN / OPEN DETONATION GROUND
SENECA ARMY DEPOT ACTIVITY
TECHNICAL PROGRESS REPORT NO. 03
OCTOBER 29, 2011 THROUGH NOVEMBER 25, 2011

Task	Description	Funded Fixed Price Costs*	Prior Cumulative Costs	Costs this Period	Total Costs to Date	Percent Budget Expended	Physical Percent Complete
Task 1	Work Plan, APP, QASP	\$35,933	\$17,607	\$2,587	\$20,194	56%	56%
Task 2d	1000-1500' Reacq	\$1,674,952	\$0	\$0	\$0	0%	0%
Task 2e	1000-1500' Mag & Dig Wooded	\$1,298,475	\$0	\$0	\$0	0%	0%
Task 2f	1500-2000' Mag & Dig Wooded	\$1,013,875	\$0	\$0	\$0	0%	0%
Task 3	FS	\$77,323	\$1,546	\$309	\$1,856	2%	2%
Task 4	Proposed Plan	\$56,077	\$0	\$0	\$0	0%	0%
Task 5	Decision Document	\$43,176	\$0	\$0	\$0	0%	0%
Task 6	Completion report	\$82,469	\$0	\$0	\$0	0%	0%
Task 7	Community Relations Supp	\$47,133	\$0	\$0	\$0	0%	0%
Task 9	PM	\$338,829	\$23,718	\$10,165	\$33,883	10%	10%
TOTALS		\$4,668,242	\$42,872	\$13,061	\$55,933	1%	1%

Notes:

* Inclusive of Award Fee and Base funding.

SEAD

Phase	2016	2017	2018	2019	2020	2021	2022	2023	Out Years
CTM		23							
Other cost		3							
Other cost			101						
		26	101						127

OUT
1
YR

SEAD

Phase	2016	2017	2018	2019	2020	2021	2022	2023	Out Years
LTM		23	23	23	23	23			
Owner Cost		3	3	3	3	3			
Close out							101		
		26	26	26	26	26	101		231

OUT
5
YRS