Appendices
To
A Study of the Implementation of the RCRA Corrective Action Program

Table of Contents

APPENDIX A: RCRA Corrective Action Questionnaire (OMB Clearance Number: 2050-0136) A-1

APPENDIX B: Quality Assurance/Quality Control Procedures B-1

APPENDIX C: Estimates and Confidence Intervals C-1

Appendix A

RCRA Corrective Action Questionnaire (OMB Clearance Number: 2050-0136)

GENERAL INSTRUCTIONS

The purpose of this questionnaire is to collect information **from EPA and State project managers** that will help EPA assess how the RCRA corrective action program has been implemented at the site-specific level. Based on a pilot exercise conducted in June 1996 and the additions made to the questionnaire based on changes requested by the Office of Management and Budget, EPA Headquarters estimates that this questionnaire may take between four and six hours to complete and may require a review of some facility files. ***EPA wants to thank you in advance for your cooperation.***

If you have any questions regarding the questionnaire, please contact Mr. Guy Tomassoni of the Office of Solid Waste (OSW), Permits and State Programs Division (PSPD), at (703) 308-8622. **Please return the completed questionnaire by March 3, 1997** with any comments and/or explanations to:

Mr. Guy Tomassoni (mail code 5303W)
U.S. EPA
Office of Solid Waste
Corrective Action Programs Branch
401 M Street S.W.
Washington, D.C. 20460

The questionnaire is divided into three sections. Section I solicits the name, phone number, and other information on the individual responsible for completing the questionnaire. Section II is structured to obtain general information on the facility's background, status of implementation, sources and types of contamination, general factors that lead to remedial decisions. Section III is structured to obtain information on the specific remedial actions (i.e., final remedies and/or stabilization activities) that have been selected at the four units or areas at the site that, in the judgment of the project manager, represented or represent the greatest actual or potential threat to human health or the environment.

Several different types of questions are included in this questionnaire:

Some questions ask you to provide information (e.g., Question 2 -- commercial name of facility); some questions ask you to select only **one** answer from the multiple answers provided (e.g., Question 33 -- formal risk assessment conducted: yes, no, or unknown); some questions ask you to select **all that apply** (e.g., Question 13 -- corrective action events currently underway at the facility: RFI, CMS, CMI, etc.); and a few questions ask you to provide narrative to a broad question (e.g., Question 52B -- a brief description of any voluntary remedial activities conducted by the facility).

In addition, some questions solicit stand-alone responses, while other questions are "nested" with identified skip patterns.

Please pay careful attention to the directions for each question to ensure the highest quality data. To improve consistency in the interpretation of the questions, definitions of selected terms are provided in alphabetized order at the end of the questionnaire. These selected terms are identified with an asterisk (*****) the first time they appear in the questionnaire.

Note that in order to obtain the maximum level of clarity, we are distinguishing between "no" and "unknown" responses. "No" means that the answer to the specific question is definitively no (e.g., contamination has <u>not</u> migrated off-site). "Unknown" means that you are not sure of the answer. If there is a better answer to the question than those provided, please select "other" as the answer, and describe the better answer in the space provided.

This questionnaire has been reviewed and approved as an Information Collection Request (ICR) by the Office of Management and Budget (OMB) under the Paperwork Reduction Act of 1995 (5 CFR 1320). The collection is approved under OMB Control Number 2050-0136 entitled "Generic RCRA 1641.01", through xx/xx/199x.

This ICR seeks information from survey respondents who are in all instances EPA or State project managers for corrective action activities at specific facilities subject to RCRA Corrective Action. It is the responsibility of respondent EPA or State project managers to complete this questionnaire using their best professional judgement. **The terms of this ICR approval do not permit the EPA or State project manager survey respondent to require or request that the facility owner/operator complete this questionnaire.**

However, this ICR approval authorizes and directs respondent EPA and State project managers to contact a facility owner/operator to answer select questions that seek to obtain the latter's best professional estimate of the costs associated with RCRA Corrective Action activities. These questions to be directed to the owner/operator include numbers 47, 69, 87, 108 and 123. The EPA or State project manager may contact the owner/operator regarding these specific questions in any reasonable manner, e.g., in person, via telephone or through mailed or faxed memorandum. In whichever manner the owner/operator is contacted, the terms of this ICR approval require the EPA or State project manager to provide verbatim the information in the following message to the owner/operator before asking the specific questions:

Message for Project Manager to Convey to Owner/Operator

"EPA is conducting a survey of EPA and State project managers to gather information about how the RCRA Corrective Action program has been implemented at the site-specific level. EPA intends to use this information to help in future Headquarters-initiated activities, which could include rulemaking, guidance and training development.

"Your site is among approximately 75 chosen for this survey, and I would like to ask you for your help in answering a few specific questions."

"First, I am required by law to inform you that this survey has been reviewed and approved as an Information Collection Request under the Paperwork Reduction Act of 1995 by the Office of Management and Budget. OMB approved the collection under Information Collection Request Control Number 2xxx-xxxx, entitled "generic RCRA yyy yyy", which is approved through xx/x/199x. If you have any comments on the information I am going to ask from you or regarding the survey in general, you may direct them too send them to EPA and OMB at the following addresses:"

Guy Tomassoni
EPA-HQ
Office of Solid Waste
401 M. St., S.W.
Washington, DC 20460

Office of Management and Budget
Desk Officer for RCRA Programs
725 17th Street, N.W.
Room 10202
Washington, DC 20503

"The terms of the information collection as approved by OMB require me, the EPA or State project manager, to complete this questionnaire using my best professional judgment. I am not permitted to require or request that you complete this questionnaire for me. However, this information collection approval does authorize and direct me to contact facility owner/operators to answer a select few questions which seek to obtain your best professional estimates of the costs of corrective action activities. The first of these questions pertain to facility-wide cost estimates. The next four questions and the subquestions pertain to the four units or areas of concern that I have identified as being the most significant threat, in relative terms, to human health or the environment. Your help in providing these answers is requested but is not mandatory."

"Under the terms of this information collection approval I am authorized to provide you with a draft copy of my completed questionnaire for your facility if you desire to receive one. The purpose of providing you this draft is to allow you an opportunity to verify the factual accuracy of my responses before I submit the completed questionnaire to EPA Headquarters. You have no obligation to request or obtain a draft copy of the completed questionnaire. If you do request a copy, you have no obligation to provide any feedback or additional information. However, any comments you might choose to provide would be welcome and should be delivered to me within 5 working days so that I can return the completed questionnaire back to EPA Headquarters by March 3, 1997." Do you want me to send you copy of the draft questionnaire after I have completed it (yes / no)?

"Finally, under the term of clearance for this information collection, the identity of each facility or unit of a facility included in this survey will be kept anonymous in any analysis or reports that EPA makes public. Now allow me to proceed directly to the relevant questions:"

(Note: The following five questions are to be directed to the owner/operator. These questions are provided here to help facilitate delivery to the owner/operator should you desire to send them in written form rather than asking the questions via telephone. If you send the specific questions to the owner/operator, please transfer their answers to the same questions that are also found in the full questionnaire.)

47. What is the owner/operator's best professional judgment regarding their total costs for complying with RCRA Corrective Action requirements at this facility (including costs for investigations, and both the cost spent to date as well as future costs)?

a. Less than 1 million dollars
b. 1 to 5 million dollars
c. 5 to 10 million dollars
d. 10 to 25 million dollars
e. 25-50 million dollars
f. Over 50 million dollars
g. Owner/operator was not willing to provide an estimate

For the first unit or area: _____ (insert name that will be familiar to the owner/operator)

69. A. What is the owner/operator's expected timeframe for the own/operator to incur **capital costs**?

a. Capital costs were incurred over the past 5 years
b. Capital costs are expected to be incurred within 3 years
c. Capital costs are expected to be incurred between 3 to 10 years
d. Capital costs are expected to be incurred greater than 10 years from now
e. Owner/operator did not provide this information

B. What is the owner/operator's best professional judgment of the **total capital costs** for remediating this unit?

a. Less than 250 thousand dollars
b. 250 thousand to 750 thousand dollars
c. 750 thousand to 1 million dollars
d. 1 to 3 million dollars
e. 3 to 5 million dollars
f. 5 to 10 million dollars
g. Over 10 million dollars
h. Owner/operator did not provide this information

C. What is the owner/operator's best professional judgment of the timeframe for **O&M costs**? *[Please circle only **one** answer.]*

a 1 year
b. 2 to 5 years
c. 6 to 10 years
d. 11 to 30 years
e. Over 30 years
f. Owner/operator did not provide this information

D. What is **owner/operator's** best professional judgment of the annual **O&M costs** from the beginning of the remedial action to the anticipated end of the action: *[Please circle only **one** answer.]*

a. Less than 50,000 dollars
b. 50,000 to 250,000 dollars

c. 250,000 to 500,000 dollars
d. 500,000 to 750,000 dollars
e. Greater than 750,000 dollars
f. Owner/operator did not provide this information

E. What is the **owner/operator's** best professional judgment regarding the **total costs** for remediating this unit?

a. Less than 250 thousand dollars
b. 250 thousand to 1 million dollars
c. 1 to 5 million dollars
d. 5 to 10 million dollars
e. 10 to 25 million dollars
f. 25 to 50 million dollars
g. Over 50 million dollars
h. Owner/operator did not provide this information

For the second unit or area: _____ (insert name that will be familiar to the owner/operator)

87. A. What is the owner/operator's expected timeframe for the own/operator to incur **capital costs**?

a. Capital costs were incurred over the past 5 years
b. Capital costs are expected to be incurred within 3 years
c. Capital costs are expected to be incurred between 3 to 10 years
d. Capital costs are expected to be incurred greater than 10 years from now
e. Owner/operator did not provide this information

B. What is the owner/operator's best professional judgment of the **total capital costs** for remediating this unit?

a. Less than 250 thousand dollars
b. 250 thousand to 750 thousand dollars
c. 750 thousand to 1 million dollars
d. 1 to 3 million dollars
e. 3 to 5 million dollars
f. 5 to 10 million dollars
g. Over 10 million dollars
h. Owner/operator did not provide this information

C. What is the owner/operator's best professional judgment of the timeframe for **O&M costs**? *[Please circle only **one** answer.]*

a 1 year
b. 2 to 5 years
c. 6 to 10 years
d. 11 to 30 years
e. Over 30 years
f. Owner/operator did not provide this information

D. What is **owner/operator's** best professional judgment of the annual **O&M costs** from the beginning of the remedial action to the anticipated end of the action: *[Please circle only **one** answer.]*

a. Less than 50,000 dollars
b. 50,000 to 250,000 dollars
c. 250,000 to 500,000 dollars
d. 500,000 to 750,000 dollars
e. Greater than 750,000 dollars
f. Owner/operator did not provide this information

E. What is the **owner/operator's** best professional judgment regarding the **total costs** for remediating this unit?

a. Less than 250 thousand dollars
b. 250 thousand to 1 million dollars
c. 1 to 5 million dollars
d. 5 to 10 million dollars
e. 10 to 25 million dollars
f. 25 to 50 million dollars
g. Over 50 million dollars
h. Owner/operator did not provide this information

For the third unit or area: _____ (insert name that will be familiar to the owner/operator)

105. A. What is the owner/operator's expected timeframe for the own/operator to incur **capital costs**?

a. Capital costs were incurred over the past 5 years
b. Capital costs are expected to be incurred within 3 years
c. Capital costs are expected to be incurred between 3 to 10 years
d. Capital costs are expected to be incurred greater than 10 years from now
e. Owner/operator did not provide this information

B. What is the owner/operator's best professional judgment of the **total capital costs** for remediating this unit?

a. Less than 250 thousand dollars
b. 250 thousand to 750 thousand dollars
c. 750 thousand to 1 million dollars
d. 1 to 3 million dollars
e. 3 to 5 million dollars
f. 5 to 10 million dollars
g. Over 10 million dollars
h. Owner/operator did not provide this information

C. What is the owner/operator's best professional judgment of the timeframe for **O&M costs**? *[Please circle only **one** answer.]*

a 1 year
b. 2 to 5 years

c. 6 to 10 years
d. 11 to 30 years
e. Over 30 years
f. Owner/operator did not provide this information

D. What is **owner/operator's** best professional judgment of the annual **O&M costs** from the beginning of the remedial action to the anticipated end of the action: *[Please circle only **one** answer.]*

a. Less than 50,000 dollars
b. 50,000 to 250,000 dollars
c. 250,000 to 500,000 dollars
d. 500,000 to 750,000 dollars
e. Greater than 750,000 dollars
f. Owner/operator did not provide this information

E. What is the **owner/operator's** best professional judgment regarding the **total costs** for remediating this unit?

a. Less than 250 thousand dollars
b. 250 thousand to 1 million dollars
c. 1 to 5 million dollars
d. 5 to 10 million dollars
e. 10 to 25 million dollars
f. 25 to 50 million dollars
g. Over 50 million dollars
h. Owner/operator did not provide this information

For the fourth unit or area: _____ (insert name that will be familiar to the owner/operator)

123. A. What is the owner/operator's expected timeframe for the own/operator to incur **capital costs**?

a. Capital costs were incurred over the past 5 years
b. Capital costs are expected to be incurred within 3 years
c. Capital costs are expected to be incurred between 3 to 10 years
d. Capital costs are expected to be incurred greater than 10 years from now
e. Owner/operator did not provide this information

B. What is the owner/operator's best professional judgment of the **total capital costs** for remediating this unit?

a. Less than 250 thousand dollars
b. 250 thousand to 750 thousand dollars
c. 750 thousand to 1 million dollars
d. 1 to 3 million dollars
e. 3 to 5 million dollars
f. 5 to 10 million dollars
g. Over 10 million dollars
h. Owner/operator did not provide this information

C. What is the owner/operator's best professional judgment of the timeframe for **O&M costs**? *[Please circle only **one** answer.]*

a 1 year
b. 2 to 5 years
c. 6 to 10 years
d. 11 to 30 years
e. Over 30 years
f. Owner/operator did not provide this information

D. What is **owner/operator's** best professional judgment of the annual **O&M costs** from the beginning of the remedial action to the anticipated end of the action: *[Please circle only **one** answer.]*

a. Less than 50,000 dollars
b. 50,000 to 250,000 dollars
c. 250,000 to 500,000 dollars
d. 500,000 to 750,000 dollars
e. Greater than 750,000 dollars
f. Owner/operator did not provide this information

E. What is the **owner/operator's** best professional judgment regarding the **total costs** for remediating this unit?

a. Less than 250 thousand dollars
b. 250 thousand to 1 million dollars
c. 1 to 5 million dollars
d. 5 to 10 million dollars
e. 10 to 25 million dollars
f. 25 to 50 million dollars
g. Over 50 million dollars
h. Owner/operator did not provide this information

SECTION I: RESPONDENT INFORMATION

1. Please print the following information:

   a. Name of EPA or State individual completing questionnaire:

      _____

   b. For EPA Regional respondents:

      Region number: _____

      Office name: _____

      For State respondents:

      State abbreviation: _____

      Office name: _____

   c. Direct telephone number: (__ __ __) __ __ __ - __ __ __ __

   d. Fax number: (__ __ __) __ __ __ - __ __ __ __

   e. Name and phone number of the representative of the owner/operator that was contacted to supply cost-related information addressed in questions _____.

      Name: _____

      Direct telephone number: (__ __ __) __ __ __ - __ __ __ __

SECTION II: FACILITY-SPECIFIC QUESTIONS

Facility Background

2. What is the commercial name of the facility?

   _____

3. What is the facility's location?

   a. Street address: _____

   b. City: _____

   c. State: _____

   d. Zip code: _____

   e. Latitude and longitude (if known): _____

4. A. Is the facility's mailing address different from its location?

      a. Yes
      b. No **[Skip to Question 5]**

   B. What is the facility's mailing address?

      a. Street address: _____

      b. City: _____

      c. State: _____

      d. Zip code: _____

5. What is the facility's 12-digit EPA identification number?

   __ __ __ __ __ __ __ __ __ __ __ __

6. Identify the primary 4-digit Standard Industrial Classification (SIC) code for the facility, based on facility type (e.g., "3444" for sheet metal work, "9711" for national security (i.e., U.S. Department of Defense installations)). *[See attached list of SIC codes to determine primary SIC code for the facility. If the 4-digit SIC code is unknown, please enter the most appropriate 2-digit SIC code.]*

   __ __ __ __

7. Provide a brief background description of the facility.

   a. Approximate year in which operations began: _____

   b. Approximate size of facility (in acres): _____

c. Approximate location of nearby waterways (if any) *[e.g. "adjacent to the ABC River"]*:

_____

d. Primary products that have been, as well as those that are generated presently at the facility:

_____

e. Primary wastes that have been, as well as those that are generated presently at the facility:

_____

f. Other narrative comments on the facility (if any) *[e.g., "Acme Fleet Maintenance provides logistical and maintenance support for Acme Trucking operations in the Midwest. The facility rebuilds, repairs, stores, and distributes fleet equipment. The facility is located in the Green Sands physiographic district. Acme Fleet purchased the facility in 1978 from XYZ Corporation, which previously used the facility to produce and store petrochemicals."]*:

_____

_____

_____

_____

_____

8. What is the implementing authority (-ies) being used at the facility to conduct RCRA Corrective Action* (note: see definition for RCRA Corrective Action)? *[Please circle **all that apply**.]*

a. Enforcement order
b. EPA-issued permit
c. State-issued permit
d. Voluntary corrective action

9. A. Are other EPA or State cleanup authorities being used at this facility to impose **other** than remediation imposed pursuant to RCRA Correction Action authorities?

a. Yes
b. No **[Skip to Question 10]**

B. Identify these other authorities. *[Please circle **all that apply**.]*

a. State Underground Storage Tank (UST) program
b. State Underground Injection Control (UIC) program
c. State Superfund program
d. EPA Superfund program
e. State Toxic Substances Control Act (TSCA) program
f. EPA TSCA program
g. Other: _____

10. Which is the lead agency for implementing RCRA corrective action? *[Please circle only **one** answer.]*

a. EPA
b. State
c. Joint EPA and State

Status of Corrective Action

11. Has a final remedy (-ies) been selected at this facility? *[Please circle only **one** answer.]*

a. Yes
b. No

12. Have interim measures* been implemented at this facility? *[Please circle only **one** answer.]*

a. Yes
b. No

13. What corrective action event(s) have been completed at the facility? *[Please circle **all that are currently being conducted at the facility**.]*

a. RCRA Facility Assessment (RFA) (or equivalent)
b. RCRA Facility Investigation (RFI) (or equivalent)
c. Corrective Measures Study (CMS) (or equivalent)
d. Corrective Measures Implementation (CMI) (or equivalent)
e. Stabilization*
f. Other: _____

14. A. Two "environmental indicators" are currently used to measure environmental status for facilities subject to RCRA corrective action: (1) the Human Exposures Controlled Determination* and (2) the Groundwater Releases Controlled Determination.* Have these two environmental indicators been evaluated for this facility? *[Note: These indicators are facility-wide measures.]*

a. Yes
b. No **[Skip to Question 15]**

B. Identify the status code for the Human Exposures Controlled Determination . *[Please circle only **one** answer.]*

a. YE (Yes; Remedial measures including treatment and or exposure controls have been implemented with the result that humans are no longer exposed to contaminant concentrations in excess of specified cleanup levels.)
b. NC (No Control; No control measures (i.e., remedial actions) were necessary to ensure that humans are not exposed to contaminant concentrations in excess of specified cleanup levels.)
c. Insufficient data is available currently to identify a YE or NC determination.

C. Identify the status code for the Groundwater Releases Controlled Determination *[Please circle only **one** answer.]*

a. YE (Yes; A remedial action has been implemented which is designed and operating (including performance monitoring) to effectively control the further migration of contaminated ground water beyond a designated boundary. Examples of a designated boundary include the engineered system itself (e.g., cut-off wall), the facility boundary, a line upgradient of receptors, or the current leading edge of the plume as defined by levels established by the overseeing regulatory authority). Note that a remedial action in this context could include natural attenuation as a component.
b. NR (No Release; Data is sufficient to document that there are no releases to ground water above regulatory concerns.
c. Insufficient data is available to identify either a YE or NR determination.

15. What is the facility's National Corrective Action Priority System (NCAPS)* ranking? *[Please circle only **one** answer.]*

a. High
b. Medium
c. Low
d. Not ranked
e. Unknown

Sources of Contamination/Contaminants of Concern

16. Approximately how many units or areas are potentially subject to remedial action under RCRA authorities? *[Note: This number should include all regulated units* , areas of concern (AOCs)*, and all other solid waste management units (SWMUs)*. Please circle only **one** answer.]*

a. Actual number, if known:_____
b. Less than 10
c. 10 to 25
d. 26 or more
e. Unknown and estimate cannot be made

17. A. Approximately how many of the total number of units subject to RCRA corrective action are regulated units? *[Please circle only **one** answer.]*

a. Actual number, if known:_____
b. Less than 10
c. 10 or more
d. Unknown and estimate cannot be made **[Skip to Question 18]**
e. None **[Skip to Question 18]**

B. If the number of regulated units is known or can be approximately estimated, identify the number of units in each regulatory status.

a. Operating Number of units: ____
b. Closing Number of units: ____
c. Clean closed Number of units: ____
d. Post-closure Number of units: ____
e. Unknown Number of units: ____

18. What types of units or AOCs are contributing (or have contributed) most significantly to the contamination at the facility? *[Please circle only **one or two** answers.]*

a. Landfill
b. Waste pile
c. Aboveground tank
d. Underground tank
e. Container/container storage area
f. Spill area
g. Surface impoundment
h. Land treatment unit
i. Industrial sewers used for collecting waste
j. Other: _____

19. What media are contaminated (e.g., above background, above levels of concern or action levels*) at the facility? *[Please circle **all that apply**.]*

a. Soil
b. Groundwater
c. Surface water
d. Sediments
e. Air

20. A. Has contamination migrated beyond the facility boundary?

a. Yes
b. No **[Skip to Question 21]**
c. Unknown **[Skip to Question 21]**

B. In which medium (-a) have the contaminants migrated beyond the facility boundary? *[Please circle **all that apply**.]*

a. Soil
b. Groundwater
c. Surface water
d. Sediments
e. Air

21. What are the primary classes of contaminants being addressed by remedial actions at the site? *[Please circle **all that apply**.]*

a. Volatile organic compounds (VOCs)
b. Semi-volatile organic compounds
c. Polychlorinated biphenyls (PCBs)
d. Metals
e. Pesticides
f. Other: _____

22. A. Does the site have known or suspected dense non-aqueous phase liquids (DNAPLs*)?

a. Yes
b. No, DNAPLs are not likely **[Skip to 22 C]**
c. Unknown **[Skip to 22 C]**

B. What was the basis for confirmation or suspicion of the DNAPLs? *[Please circle **all that apply**.]*

a. Past waste management practices
b. High concentrations of contaminants or dissolved contamination
c. Actual observed DNAPLs in the groundwater
d. Actual observed DNAPLs in the soil
e. Other: _____

C. Does the site have known or suspected light non-aqueous phase liquids (LNAPLs*)?

a. Yes
b. No, LNAPLs are not likely **[Skip to Question 23]**
c. Unknown **[Skip to Question 23]**

D. What was the basis for confirmation or suspicion of the LNAPLs? *[Please circle **all that apply**.]*

a. Past waste management practices
b. High concentrations of contaminants or dissolved contamination
c. Actual observed LNAPLs in the groundwater
d. Actual observed LNAPLs in the soil
e. Other: _____

23. A. Were innovative characterization approaches used during the investigation of the facility.

a. Yes
b. No **[Skip to question 24]**

B. Identify the type of innovative characterization approaches that were used during the investigation. ***[Please circle all that apply]***

a. Direct-push sampling techniques (e.g., Geoprobe™, cone penetrometer, etc.)
b. On-site GC/MS analytical techniques
c. Assay kits
d. X-ray fluorescence
e. Other: _____

Media-Specific Contamination - Groundwater

24. A. Is the facility located above an aquifer that is an actual or potential source of **on-site** drinking water?

a. Yes
b. No **[Skip to 25]**
c. Unknown **[Skip to 25]**

B. Is the facility located above a source of **on-site** drinking water that is **currently** being used as such?

a. Yes
b. No
c. Unknown

C. Has contamination **from the facility** been detected in an aquifer that is either an actual or potential source of **on-site** drinking water? *[Please circle only **one** answer.]*

a. Yes, actual public supply
b. Yes, actual private supply
c. Yes, potential supply
d. No, contamination has not been detected in an aquifer that is either an on-site actual or potential supply
e. Unknown

25. A. Is **off-site** ground water an actual or potential source of drinking water (within approximately two miles **from the facility** boundary in the pathway of anticipated contaminant migration)?

a. Yes
b. No **[Skip to 26]**
c. Unknown **[Skip to 26]**

B. Is **off-site** ground water **currently** being used as a source of drinking water (within approximately two miles **from the facility** boundary in the pathway of anticipated contaminant migration)?

a. Yes
b. No **[Skip to Question 25F]**
c. Unknown **[Skip to Question 25F]**

C. If the answer to 25B is "a", is the **off-site** well(s) a public or private water supply?

a. Public only **[Skip to 25E]**
b. Private only
c. There are both public and private wells present
d. Potable well(s) exist, but unknown as to whether it is a public or private water supply.

D. What is the approximate distance between the facility boundary and the nearest potable **private** well, in the direction of anticipated contaminant migration? *[Please circle only **one** answer.]*

a. Less than ½ mile
b. ½ to 1 mile
c. 1 to 2 miles
d. Unknown

E. What is the approximate distance between the facility boundary and the nearest potable **public** well, in the direction of anticipated contaminant migration? *[Please circle only **one** answer.]*

a. Less than ½ mile
b. ½ to 1 mile
c. 1 to 2 miles
d. Unknown

F. Has contamination **from the facility** been detected off-site in an aquifer that is either an actual or potential source of **off-site** drinking water? *[Please circle only **one** answer.]*

a. Yes, actual public supply
b. Yes, actual private supply
c. Yes, potential supply
d. No, contamination has not been detected off-site in an aquifer that is either an off-site actual or potential supply
e. Contamination has not migrated passed the facility boundary
f. Unknown

G. Has contamination **from the facility** been detected in the potable well(s) identified in 25B?

a. Yes
b. No **[Skip to question 26]**
c. Unknown **[Skip to question 26]**

H. In the following blanks, please write the name of the primary contaminant(s) of concern that have been detected in the potable well(s) identified in 25B. If the Answer to 25C is "c" (i.e., both public and private wells are contaminated), then please indicate next to the contaminant name(s) whether it is present in either the public well, private well or both.

_____
_____
_____

26. What is the basis for the aquifer use determination (on-site as well as off-site)? *[Please circle only **one** answer.]*

a. EPA aquifer classification system
b. State aquifer classification system
c. Other: _____

Media-Specific Contamination - Surface Water

27. How would you describe the surface water bodies that are located within approximately two miles of the facility in the direction of anticipated contaminant migration. *[Please circle **all that apply**.]*

a. Wetland
b. Creek*
c. River*
d. Lake
e. Pond
f. Estuary*
g. Ocean
h. None
i. Unknown
j. Other _____

28. How would you describe the surface water body nearest to the facility boundary in the direction of anticipated contaminant migration? *[Please circle only **one** answer.]*

a. Wetland
b. Creek
c. River
d. Lake
e. Pond
f. Estuary
g. Ocean
h. None
i. Unknown
j. Other _____

29. A. What is the approximate distance from the facility boundary to the nearest surface water body, in the direction of anticipated contaminant migration? *[Please circle only **one** answer.]*

a. Adjacent to the facility boundary
b. Less than ¼ mile
c. ¼ to 1 mile
d. 1 to 2 miles **[Skip to Question 30]**
e. Over 2 miles **[Skip to Question 30]**
f. Unknown **[Skip to Question 30]**

B. If you selected "a", "b", or "c" under Question 29A, is the surface water body downstream of the facility used as a source of drinking water?

a. Yes
b. No **[Skip to Question 29D]**
c. Unknown **[Skip to Question 29D]**

C. If you selected "a" under Question 29B, what is the approximate distance, in the downstream direction, from the actual or projected point at which contamination **from the facility** has or could enter into the surface water body to the drinking water intake? *[Please circle only **one** answer.]*

a. Less than 1 mile
b. 1 to 5 miles
c. Over 5 miles
d. Unknown

D. If you selected "a", "b", or "c" under Question 29A, has contamination **from the facility** been detected in media associated with the surface water body? *[Please circle only **one** answer]*

a. Contaminants detected in the water column of the surface water body
b. Contaminants detected in the sediments associated with the surface water body
c. Contaminants detected in both surface water and sediments
d. Contaminants not detected in media associated with surface water body **[Skip to Question 30]**

E. If you selected "a", "b", or "c" under Question 29D, please write the name of the primary contaminant(s) of concern that have been detected in media associated with the surface water body.

_____
_____
_____

F. If you selected "a" for 29B, have contaminants **from the facility** been detected in the downstream potable water intake?

a. Yes
b. No
c. Unknown

G. If you selected "a" for 29F, please write the name of the primary contaminant(s) of concern that have been detected in the downstream potable water intake.

_____
_____

30. Does the facility have a National Pollution Discharge Elimination System (NPDES)* permit for discharge to the nearest surface water body?

a. Yes
b. No

c. Unknown

Risk Assessment, Action Levels

31. A. What is the primary land use **within** the boundary of the facility (i.e., onsite)? *[Please circle only **one** answer]*

a. Industrial
b. Commercial
c. Residential
d. Recreational
e. Agricultural

B. What other land use(s) exist **within** the facility boundary?*[Please circle **all that apply**.]*

a. Industrial
b. Commercial
c. Residential
d. Recreational
e. Agricultural
f. Answer to 31A is the only land use within the facility boundary.

C. How did an on-site land use designation other than residential affect the selected remedy? *[Please circle **all that apply**]*

a. The remedy was based on a non-residential land use designation.
b. Non-residential land use used to justify extension of remedy implementation schedule.
c. Non-residential land use did not influence remedial decision; i.e., cleanup still based on residential land use exposure scenario.
d. Unknown

32. A. What are the predominant land uses within an approximate ½ mile radius of the facility boundary in the direction of possible contaminant migration? *[Please circle **all that apply**.]*

a. Industrial
b. Commercial
c. Residential
d. Recreational
e. Agricultural

B. Independent of comments/concerns raised by stakeholders, how did the off-site land use(s) identified in 32A affect the remedial alternative? *[Please circle **all that apply**.]*

a. Off-site residential land use was used as justification to support using residential based exposure in determining on-site cleanup numbers.
b. Off-site non-residential land use was used as justification to support a decision to base cleanup numbers on non-residential exposure.
c. Off-site land use did not influence on-site remedial decisions
d. Off-site land use was used as justification to support using different technology in remedial decision.

33. A. Was a formal, site-specific, **human** health risk assessment(s) performed at the facility? *[Note that Question 34 below is directed toward ecological risk assessments.]*

a. Yes
b. No **[Skip to Question 34]**
c. Unknown **[Skip to Question 34]**

B. If yes, was the risk assessment performed by the owner/operator or by the lead agency implementing RCRA corrective action (as identified under Question 10)? *[Please circle only **one** answer.]*

a. Owner/operator
b. Lead agency

C. What guidance was used to conduct the risk assessment? *[Please circle **all that apply**.]*

a. Risk Assessment Guidance for Superfund (RAGs)
b. State guidance
c. Regional guidance
d. Other: _____
e. Unknown

34. A. Was a formal, site-specific, **ecological** risk assessment(s) performed at the facility? *[Please circle only **one** answer.]*

a. Yes
b. No **[Skip to Question 35]**
c. Unknown **[Skip to Question 35]**

B. If yes, what type of ecological risk assessment(s) was performed for the facility? *[Please circle only **one** answer.]*

a. Qualitative
b. Semi-quantitative
c. Quantitative
d. Unknown

C. What guidance was used to conduct the ecological risk assessment(s)? *[Please circle **all that apply**.]*

a. EPA guidance
b. State guidance
c. Other: _____
d. Unknown

35. A. Were action levels* used at the facility? *[Please circle only **one** answer.]*

a. Yes
b. No **[Skip to Question 36]**
c. Unknown **[Skip to Question 36]**

B. If yes, what action levels were used? *[Please circle **all that apply**.]*

a. Proposed Subpart S action levels
b. State action levels
c. Regional action levels (e.g., Region III Screening Levels)
d. Site-specific action levels
e. Other: _____

C. For which medium(a) were the action levels used? *[Please circle **all that apply**.]*

a. Soil
b. Groundwater
c. Surface water
d. Sediments
e. Air

General Remedy Selection Questions

36. Is/was a phased approach* to RCRA corrective action used at the facility? *[Please circle **all that apply**.]*

a. Yes, a phased RFI was conducted
b. Yes, a phased CMS was conducted
c. Yes, a phased approach was used to select and implement the remedial alternatives
d. No, a phased approach was not used
e. Unknown

37. A. Was Superfund's presumptive remedy guidance* used to streamline the remedy selection process at the facility?

a. Yes **[Skip to Question 38]**
b. No
c. Unknown

B. Please indicate why either 37 "b" or "c" was selected. *[Please circle only **one** answer.]*

a. Was not aware of the Superfund presumptive remedy guidances
b. Did not know that Superfund presumptive remedy guidances could be used for RCRA Corrective Action
c. Considered using, but available presumptive remedy guidances were not applicable to the facility in question.
d. Other: _____

38. A. Was natural attenuation* selected in a permit, order or other formal agreement for any remedial alternative or component of a remedial alternative at the facility?

a. Yes
b. No **[Skip to Question 39]**
c. Unknown **[Skip to Question 39]**

B. If yes, for what aspects of the site was natural attenuation selected? *[Please circle **all that apply**.]*

a. Selected for on-site contamination
b. Selected for off-site contamination
c. Selected for groundwater as the sole remedy
d. Selected for soils as the sole remedy
e. Selected for groundwater as one component of the remedy
f. Selected for soils as one component of the remedy
g. Other: _____

39. Was a corrective action management unit* (CAMU) used to facilitate the remedial action?

a. Yes
b. No
c. Unknown

40. Was the Superfund concept of the Area of Contamination* (not synonymous with the RCRA Area of Concern) used to facilitate the remedial action?

a. Yes
b. No
c. Unknown

41. A. Has a technical impracticability* determination been made for the contaminated ground water or soil at the facility? *[Please circle only **one** answer]*

a. Yes for contaminated ground water
b. Yes for contaminated soil
c. Yes for both contaminated groundwater and soil
d. No **[Skip to Question 41C]**
e. Unknown **[Skip to Question 41C]**

B. What was the basis for the technical impracticability determination? *[Please circle **all that apply; then skip to Question 42.**]*

a. Presence of LNAPL
b. Presence of DNAPL
c. Complex geology *(e.g., karst terrain, fractured bedrock)*
d. Inaccessibility
e. Achieving otherwise applicable remedial goals were determined to be Infeasible from an engineering perspective
f. Other: _____

C. Please indicate why "d" was selected for 41A. *[Please circle only **one** answer.]*

a. Was not aware of the 1993 Technical Impracticability guidance, or provision in RCRA Corrective Action that allows for recognizing technical impracticability
b. Remedial objectives were determined to be "technically practicable"
c. Sufficient information on which to base a technical impracticability determination was not available.
d. Other: _____

42. Was the conditional remedy* approach, as described in the July 1990 Subpart S proposal, used?

a. Yes
b. No
c. Unknown

43. Has a final remedy(-ies) been **implemented** at this facility? *[Note that Question 11 solicits information on whether a final remedy(-ies) has been **selected** at the facility.]*

a. Yes
b. No
c. Unknown

44. Approximately what percent of contaminated media identified at the facility do you anticipate will be treated **on**-site? *[Please circle only **one** answer.]*

a. None
b. Less than 50 percent
c. 50 to 75 percent
d. 76 to 99 percent
e. 100 percent

45. Approximately how long do you anticipate it will take to complete all RCRA Corrective Action remedial activities at the facility? *[Please circle only **one** answer.]*

a. Less than 5 years
b. 5 to 10 years
c. 11 to 30 years
d. Over 30 years

46. Based on your professional judgment, what are the total costs for complying with RCRA Corrective Action requirements at this facility (including costs for investigations, and both the cost spent to date as well as future costs)?

a. Less than 1 million dollars
b. 1 to 5 million dollars
c. 5 to 10 million dollars
d. 10 to 25 million dollars
e. 25-50 million dollars
f. Over 50 million dollars

47. What is the owner/operator's best professional judgment regarding their total costs for complying with RCRA Corrective Action requirements at this facility (including costs for investigations, and both the cost spent to date as well as future costs)?

a. Less than 1 million dollars
b. 1 to 5 million dollars
c. 5 to 10 million dollars
d. 10 to 25 million dollars
e. 25-50 million dollars
f. Over 50 million dollars
g. Owner/operator was not willing to provide an estimate

Institutional Controls

48. A. Were institutional controls required as part of the remedy?

a. Yes
b. No **[Skip to Question 49]**
c. Unknown **[Skip to Question 49]**

B. What institutional controls were required? *[Please circle **all that apply**.]*

a. Restrictive covenants *(sometimes referred to as deed restrictions)*
b. On-site use restrictions *(including well restriction areas)*
c. Off-site use restrictions *(including well restriction areas)*
d. Access restrictions
e. Compliance monitoring
f. Notices *(e.g., deed notices, notices to potential buyers, notice to governmental authorities)*
g. Other: _____

Public Participation

49. What public participation techniques were used during the remedy selection process at the facility? *[Please circle **all that apply**.]*

a. Informal public meetings
b. Announcements in newspapers, magazines, journals
c. Formal public hearings
d. Fact sheets
e. Mailings to the facility's mailing list
f. Information repository
g. Multilingual communications
h. Door-to-door contact with affected off-site residents
i. Other: _____

50. Did public participation influence the selection of the remedial action at the facility? *[Please circle only **one** answer.]*

a. Yes, the remedial alternative was more stringent due to public comments
b. Yes, the remedial alternative was less stringent due to public comments (e.g., public did not want off-site disposal due to risks associated with truck traffic)
c. No, selection of the remedial alternative did not change due to public comments.
d. No, no public comments were received
e. Other: _____

51. Who took the responsibility for the public participation at the facility? *[Please circle only **one** answer.]*

a. The facility voluntarily conducted all of the public involvement activities
b. The lead agency handled all of the public participation
c. The facility and the lead agency shared responsibility for public participation

Voluntary Remedial Actions

52. A. Have **any** remedial actions been conducted voluntarily (i.e., not specifically required in a permit or order) by the facility? *[Note that Question 8 also inquired whether RCRA Corrective Action activities were being implemented on a voluntary basis.]*

a. Yes
b. No **[Skip to Question 53]**
c. Unknown **[Skip to Question 53]**

B. Please identify several voluntary remedial actions that have been conducted by the facility.

a. _____
b. _____
c. _____
d. _____

C. What form of oversight was conducted for the voluntary action? *[Please circle **all that apply**.]*

a. Occasional field visits
b. Review of proposed work
c. Review of completed work
d. Routine communication between facility and regulator
e. No oversight
f. Other: _____

D. Did you provide any assurances to the facility that the work conducted should satisfy regulatory requirements?

a. Yes
b. No **[Skip to Question 53]**
c. Unknown **[Skip to Question 53]**

E. If yes, what mechanism did you use to provide these assurances to the facility? *[Please circle **all that apply**.]*

a. "Comfort" Letter
b. Approval of proposed work plans
c. Other: _____
d. Unknown

Financial Assurance

53. A. Was financial assurance required for corrective action?

a. Yes
b. No **[Skip to Question 54]**
c. Unknown **[Skip to Question 54]**

B. During what stage in the corrective action process were financial assurance mechanisms required? *[Please circle only **one** answer.]*

a. RFA
b. RFI
c. Stabilization
d. CMS
e. Remedy selection
f. CMI
g. Other: _____
h. Unknown

C. What financial assurance mechanism was used or will be used by the facility? *[Please circle only **one** answer.]*

a. Surety bond guaranteeing performance
b. Trust fund
c. Letter of credit
d. Financial test and corporate guarantee
e. Other: _____
f. Unknown

D. If the answer to 53C is "a", "b", or "c", then what was the dollar amount associated with the mechanism used to establish financial assurance?

a. Less than 1 million dollars
b. 1 to 5 million dollars
c. 5 to 10 million dollars
d. 10 to 25 million dollars
e. 25 to 50 million dollars
f. Over 50 million dollars

SECTION III: REMEDY-SPECIFIC QUESTIONS

EPA Headquarters recognizes that some facilities have numerous units and/or areas of concern that are addressed by corrective action, and that remediation may often involve a variety of different remedial strategies. Describing selected remedies for all of the different units could be burdensome; therefore, we ask that you complete the following questions on the **four** units or areas of concern (e.g., for the purposes of this questionnaire, a plume of contaminated groundwater could be considered as a discrete unit or area of concern) that represent the most significant threat to human health or the environment.

First Unit

54. A. Identify type of unit or area of concern. *[Please circle only **one** answer.]*

a.	Landfill	i.	Surface impoundment
b.	Waste pile	j.	Land treatment unit
c.	Above ground tank	k.	Industrial sewers
d.	Below ground tank	l.	Container storage area
e.	Loading area	m.	Containment building
f.	Other spill area	n.	Surface water contamination
g.	Groundwater plume		
h.	Other: _____		

B. Identify unit area. *[Please circle only **one** answer.]*

a. Less than 1 acre
b. 1 to 5 acres
c. 6 to 25 acres
d. Over 25 acres

55. Identify all media that are contaminated from this unit (above background, above levels of concern or action levels) at the facility? *[Please circle **all that apply**.]*

a. Soil
b. Groundwater
c. Surface water
d. Sediments
e. Air

56. A. In the following blanks, please write the name of the primary contaminant(s) of concern associated with the unit, and the reason(s) for the concern using the following terms: toxicity, mobility, volume, persistence, propensity to bioaccumulate, public perception.

Contaminant Name	Reason for Concern
_____	_____
_____	_____
_____	_____
_____	_____

57. Identify whether the contaminants are present or suspected to be present in the form of light non-aqueous phase liquids (LNAPLs) or dense non-aqueous phase liquids (DNAPLs).

a. LNAPLs
b. DNAPLs
c. Neither LNAPLs or DNAPLs present or suspected to be present
d. Unknown

58. A. Was a human health risk assessment conducted for this unit?

a. Yes
b. No **[Skip to Question 60]**
c. Unknown **[Skip to Question 60]**

59. A. In the top half of the table below, please identify the name of the contaminant which drives on-site human health risk. For this contaminant, identify the medium, exposure route, receptor, and modeled scenario which leads to this risk. **(only one answer per cell.)**

B. In the bottom half of the table below, please identify the name of the contaminant which drives off-site human health risk. For this contaminant, identify the medium, exposure route, receptor, and modeled scenario which leads to this risk. **(only one answer per cell.)**

	Contaminant note: fill in blank	**Medium**	**Exposure Route**	**Receptor**	**Scenario Modeled**
On-site (A.)		a. Soil b. Ground water c. Surface water d. Sediments e. Air f. Food chain	a. Inhalation b. Ingestion c. Dermal d. Other	a. Adult worker b. Adult c. Child d. Other	a. Actual receptor b. Potential receptor
Off-site (B.)		a. Soil b. Ground water c. Surface water d. Sediments e. Air f. Food chain	a. Inhalation b. Ingestion c. Dermal d. Other	a. Adult b. Child c. Other	a. Actual receptor b. Potential receptor

C. What conclusions were made from the on-site human health risk assessment(s)? *[Please circle **all that apply**.]*

a. On-site contamination represented an actual risk to human health
b. On-site contamination represented a potential risk to human health
c. On-site contamination represented no apparent unacceptable risk to human health
d. On-site contamination risk unknown

D. What conclusions were made from the off-site human health risk assessment(s)? *[Please circle **all that apply**.]*

a. Off-site contamination represented an actual risk to human health
b. Off-site contamination represented a potential risk to human health
c. Off-site contamination represented no apparent unacceptable risk to human health
d. Off-site contamination risk unknown

E. What was the high-end human health risk* associated with releases from the unit, to the nearest order of magnitude? *[Please circle only **one** answer.]*

a. Less than or equal to 10^{-7}
b. 10^{-6}
c. 10^{-5}
d. 10^{-4}
e. 10^{-3}
f. 10^{-2}
g. Unknown

F. What was the central tendency human health risk* associated with releases from the unit, to the nearest order of magnitude? *[Please circle only **one** answer.]*

a. Less than or equal to 10^{-7}
b. 10^{-6}
c. 10^{-5}
d. 10^{-4}
e. 10^{-3}
f. 10^{-2}
g. Unknown

G. How did the results of the human health risk assessment influence the selection of the remedial alternative?*[Please circle only **one** answer.]*

a. The remedial alternative was more stringent due to risk assessment
b. The remedial alternative was less stringent due to risk assessment
c. The remedial alternative did not change due to the risk assessment
d. Other:_____

60. A. Was a formal, site-specific, **ecological** risk assessment(s) performed for releases associated with the unit? *[Please circle only **one** answer.]*

a. Yes
b. No **[Skip to Question 61]**
c. Unknown **[Skip to Question 61]**

B. How did the results of the eco risk assessment influence the selection of the remedial alternative?*[Please circle only **one** answer.]*

a. The remedial alternative was more stringent due to risk assessment
b. The remedial alternative was less stringent due to risk assessment
c. The remedial alternative did not change due to the risk assessment
d. Other: _____

61. What is the implementing authority (-ies) being used to fulfill RCRA Corrective Action requirements at this unit? *[Please circle **one** only.]*

a. Enforcement order
b. EPA-issued permit
c. State-issued permit
d. Voluntary corrective action

62. Identify the type of remedy alternative. *[Please circle only **one** answer.]*

a. Final remedy
b. Stabilization **[Skip to Question 64]**

63. If a final remedy has been selected for this unit, what are/were the three primary objectives of the final remedy? ***[Please circle no more than three answers]*** *[Note that Question 11 solicits information on whether a final remedy(-ies) has been selected at the facility.]*

a. Prevent exposures to human populations
b. Prevent exposures to the environment
c. Stop off-site migration of the contaminants
d. Prevent off-site migration of the contaminants
e. Prevent further on-site migration of the contaminants
f. Return media to maximum beneficial uses
g. Other: _____
h. Unknown

64. If a stabilization measure(s) has been chosen for this unit, what are/were the three primary objectives of the stabilization measure(s)? ***[Please circle no more than three answers]*** *[Note that Questions 12 and 13 solicit information on interim measures and current stabilization activities at the facility.]*

a. Prevent exposures to human populations
b. Prevent exposures to the environment
c. Stop off-site migration of the contaminants
d. Prevent off-site migration of the contaminants
e. Prevent further on-site migration of the contaminants
f. Return media to maximum beneficial uses
g. Other: _____
h. Unknown

65. Describe remedial alternative. *[Please circle **all that apply**.]*

a.	Excavation with off-site incineration	o.	Ex-situ solidification/stabilization
b.	Excavation with on-site incineration	p.	In-situ solidification/stabilization
c.	Soil washing	q.	Solvent extraction
d.	Ex-situ bioremediation	r.	Soil vapor extraction
e.	In-situ bioremediation	s.	Vitrification
f.	Soil flushing	t.	Cap/cover
g.	Dechlorination	u.	Barrier wall
h.	Thermal desorption	v.	French drain
i.	Pump and treat	w.	Air sparging
j.	Geosynthetic wall	x.	Natural attenuation
k.	Bioventing	y.	Run-on/run-off control
l.	Free product recovery	z.	Other:_____
m.	Ex-situ solidification		
n.	Alternative water supply		

66. A. Were final cleanup levels* established?

a. Yes
b. No **[Skip to Question 67]**
c. Unknown **[Skip to Question 67]**

B. If yes, what were the final cleanup levels based on? *[Please circle **all that apply**.]*

a. Background contaminant concentrations
b. Proposed Subpart S action levels
c. Maximum contaminant levels (MCLs)
d. Minimum detection limits (MDLs)
e. Practical quantitation limits (PQLs)
f. Regional or State generic cleanup levels
g. Risk-based, site-specific levels
h. Other: _____

67. A. Did the remedy for the site involve establishing a groundwater point of compliance*?

a. Yes
b. No **[Skip to Question 68]**
c. Unknown **[Skip to Question 68]**

B. If yes, where was the groundwater point of compliance set? *[Please circle only **one** answer.]*

a. Throughout the plume
b. Unit boundary (i.e., when waste is left in place, throughout the plume up to the boundary of a waste management area encompassing the original source(s) of release)
c. Existing plume boundary
d. Buffer zone boundary (i.e., some prescribed distance from the facility boundary)
e. Facility boundary
f. Other: _____

C. What was the basis for setting the ground water point of compliance as identified in Question 67B?

a. Federal guidance or policy (i.e., proposed Subpart S regulations)
b. State regulatory requirement or policy
c. Site-specific risk-based decision
d. Other: _____

68. A. What is the expected timeframe for the owner/operator to incur **capital costs**[*]?

a. Capital costs were incurred over the past 5 years
b. Capital costs are expected to be incurred within 3 years
c. Capital costs are expected to be incurred between 3 to 10 years
d. Capital costs are expected to be incurred greater than 10 years from now

B. Based on your professional judgment, what are the **total capital costs** for remediating this unit (note: can be based on estimates conveyed from owner/operator in Corrective Measures Study (CMS) report)? *[Please circle only **one** answer.]*

a. Less than 250 thousand dollars
b. 250 thousand to 750 thousand dollars
c. 750 thousand to 1 million dollars
d. 1 to 3 million dollars
e. 3 to 5 million dollars
f. 5 to 10 million dollars
g. Over 10 million dollars

C. What is the timeframe for **O&M costs**? *[Please circle only **one** answer.]*

a 1 year
b. 2 to 5 years
c. 6 to 10 years
d. 11 to 30 years
e. Over 30 years
f. Unknown

D. What is the expected **annual O&M costs** from the beginning of the remedial action to the anticipated end of the action: *[Please circle only **one** answer.]*

a. Less than 50,000 dollars
b. 50,000 to 250,000 dollars
c. 250,000 to 500,000 dollars
d. 500,000 to 750,000 dollars
e. Greater than 750,000 dollars

E. Based upon **your** professional judgment, what are the **total costs** of remediating this unit (note: can be based on estimates conveyed from owner/operator in Corrective Measures Study (CMS) report)?

a. Less than 250 thousand dollars
b. 250 thousand to 1 million dollars
c. 1 to 5 million dollars
d. 5 to 10 million dollars
e. 10 to 25 million dollars
f. 25 to 50 million dollars
g. Over 50 million dollars

69. A. What is the owner/operator's expected timeframe for the own/operator to incur **capital costs**?

a. Capital costs were incurred over the past 5 years
b. Capital costs are expected to be incurred within 3 years
c. Capital costs are expected to be incurred between 3 to 10 years
d. Capital costs are expected to be incurred greater than 10 years from now
e. Owner/operator did not provide this information

B. What is the owner/operator's best professional judgment of the **total capital costs** for remediating this unit?

a. Less than 250 thousand dollars
b. 250 thousand to 750 thousand dollars
c. 750 thousand to 1 million dollars
d. 1 to 3 million dollars
e. 3 to 5 million dollars
f. 5 to 10 million dollars
g. Over 10 million dollars
h. Owner/operator did not provide this information

C. What is the owner/operator's best professional judgment of the timeframe for **O&M costs**? *[Please circle only **one** answer.]*

a 1 year
b. 2 to 5 years
c. 6 to 10 years
d. 11 to 30 years
e. Over 30 years
f. Owner/operator did not provide this information

D. What is **owner/operator's** best professional judgment of the annual **O&M costs** from the beginning of the remedial action to the anticipated end of the action: *[Please circle only **one** answer.]*

a. Less than 50,000 dollars
b. 50,000 to 250,000 dollars
c. 250,000 to 500,000 dollars
d. 500,000 to 750,000 dollars
e. Greater than 750,000 dollars
f. Owner/operator did not provide this information

E. What is the **owner/operator's** best professional judgment regarding the **total costs** for remediating this unit?

a. Less than 250 thousand dollars
b. 250 thousand to 1 million dollars
c. 1 to 5 million dollars
d. 5 to 10 million dollars
e. 10 to 25 million dollars
f. 25 to 50 million dollars
g. Over 50 million dollars
h. Owner/operator did not provide this information

70. Identify the status of the remedial alternative. *[Please circle only **one** answer.]*

a. Completed
b. Being implemented
c. Not yet implemented **[Skip to Question 72]**

71. Identify the results of the remedial alternative. *[Please circle **all that apply**.]*

a. Cleanup standards met
b. Source of contamination controlled
c. Migration of contamination controlled
d. Risk to human health and the environment controlled
e. Mass of contamination reduced
f. Other: _____
g. Unknown pending implementation of the remedial alternative

Second Unit

72. A. Identify type of unit or area of concern. *[Please circle only **one** answer.]*

a.	Landfill	i.	Surface impoundment
b.	Waste pile	j.	Land treatment unit
c.	Above ground tank	k.	Industrial sewers
d.	Below ground tank	l.	Container storage area
e.	Loading area	m.	Containment building
f.	Other spill area	n.	Surface water contamination
g.	Groundwater plume		
h.	Other: _____		

B. Identify unit area. *[Please circle only **one** answer.]*

a. Less than 1 acre
b. 1 to 5 acres
c. 6 to 25 acres
d. Over 25 acres

73. Identify all media that are contaminated from this unit (above background, above levels of concern or action levels) at the facility? *[Please circle **all that apply**.]*

a. Soil
b. Groundwater
c. Surface water
d. Sediments
e. Air

74. A. In the following blanks, please write the name of the primary contaminant(s) of concern associated with the unit, and the reason(s) for the concern using the following terms: toxicity, mobility, volume, persistence, propensity to bioaccumulate, public perception.

Contaminant Name	Reason for Concern
_____	_____
_____	_____
_____	_____
_____	_____

75. Identify whether the contaminants are present or suspected to be present in the form of light non-aqueous phase liquids (LNAPLs) or dense non-aqueous phase liquids (DNAPLs).

a. LNAPLs
b. DNAPLs
c. Neither LNAPLs or DNAPLs present or suspected to be present
d. Unknown

76. A. Was a human health risk assessment conducted for this unit?

a. Yes
b. No **[Skip to Question 78]**
c. Unknown **[Skip to Question 78]**

77. A. In the top half of the table below, please identify the name of the contaminant which drives on-site human health risk. For this contaminant, identify the medium, exposure route, receptor, and modeled scenario which leads to this risk. **(only one answer per cell.)**

B. In the bottom half of the table below, please identify the name of the contaminant which drives off-site human health risk. For this contaminant, identify the medium, exposure route, receptor, and modeled scenario which leads to this risk. **(only one answer per cell.)**

	Contaminant note: fill in blank	**Medium**	**Exposure Route**	**Receptor**	**Scenario Modeled**
On-site (A.)		a. Soil b. Ground water c. Surface water d. Sediments e. Air f. Food chain	a. Inhalation b. Ingestion c. Dermal d. Other	a. Adult worker b. Adult c. Child d. Other	a. Actual receptor b. Potential receptor
Off-site (B.)		a. Soil b. Ground water c. Surface water d. Sediments e. Air f. Food chain	a. Inhalation b. Ingestion c. Dermal d. Other	a. Adult b. Child c. Other	a. Actual receptor b. Potential receptor

C. What conclusions were made from the on-site human health risk assessment(s)? *[Please circle **all that apply**.]*

a. On-site contamination represented an actual risk to human health
b. On-site contamination represented a potential risk to human health
c. On-site contamination represented no apparent unacceptable risk to human health
d. On-site contamination risk unknown

D. What conclusions were made from the off-site human health risk assessment(s)? *[Please circle **all that apply**.]*

a. Off-site contamination represented an actual risk to human health
b. Off-site contamination represented a potential risk to human health
c. Off-site contamination represented no apparent unacceptable risk to human health
d. Off-site contamination risk unknown

E. What was the high-end human health risk associated with releases from the unit, to the nearest order of magnitude? *[Please circle only **one** answer.]*

a. Less than or equal to 10^{-7}
b. 10^{-6}
c. 10^{-5}
d. 10^{-4}
e. 10^{-3}
f. 10^{-2}
g. Unknown

F. What was the central tendency human health risk associated with releases from the unit, to the nearest order of magnitude? *[Please circle only **one** answer.]*

a. Less than or equal to 10^{-7}
b. 10^{-6}
c. 10^{-5}
d. 10^{-4}
e. 10^{-3}
f. 10^{-2}
g. Unknown

G. How did the results of the human health risk assessment influence the selection of the remedial alternative?*[Please circle only **one** answer.]*

a. The remedial alternative was more stringent due to risk assessment
b. The remedial alternative was less stringent due to risk assessment
c. The remedial alternative did not change due to the risk assessment
d. Other:_____

78. A. Was a formal, site-specific, **ecological** risk assessment(s) performed for releases associated with the unit? *[Please circle only **one** answer.]*

a. Yes
b. No **[Skip to Question 79]**
c. Unknown **[Skip to Question 79]**

B. How did the results of the eco risk assessment influence the selection of the remedial alternative?*[Please circle only **one** answer.]*

a. The remedial alternative was more stringent due to risk assessment
b. The remedial alternative was less stringent due to risk assessment
c. The remedial alternative did not change due to the risk assessment
d. Other:_____

79. What is the implementing authority (-ies) being used to fulfill RCRA Corrective Action requirements at this unit? *[Please circle **one** only.]*

a. Enforcement order
b. EPA-issued permit
c. State-issued permit
d. Voluntary corrective action

80. Identify the type of remedy alternative. *[Please circle only **one** answer.]*

a. Final remedy
b. Stabilization **[Skip to Question 82]**

81. If a final remedy has been selected for this unit, what are/were the three primary objectives of the final remedy? ***[Please circle no more than three answers]*** *[Note that Question 11 solicits information on whether a final remedy(-ies) has been selected at the facility.]*

a. Prevent exposures to human populations
b. Prevent exposures to the environment
c. Stop off-site migration of the contaminants
d. Prevent off-site migration of the contaminants
e. Prevent further on-site migration of the contaminants
f. Return media to maximum beneficial uses
g. Other: _____
h. Unknown

82. If a stabilization measure(s) has been chosen for this unit, what are/were the three primary objectives of the stabilization measure(s)? ***[Please circle no more than three answers]*** *[Note that Questions 12 and 13 solicit information on interim measures and current stabilization activities at the facility.]*

a. Prevent exposures to human populations
b. Prevent exposures to the environment
c. Stop off-site migration of the contaminants
d. Prevent off-site migration of the contaminants
e. Prevent further on-site migration of the contaminants
f. Return media to maximum beneficial uses
g. Other: _____
h. Unknown

83. Describe remedial alternative. *[Please circle **all that apply**.]*

a. Excavation with off-site incineration
b. Excavation with on-site incineration
c. Soil washing
d. Ex-situ bioremediation
e. In-situ bioremediation
f. Soil flushing
g. Dechlorination
h. Thermal desorption
o. Ex-situ solidification/stabilization
p. In-situ solidification/stabilization
q. Solvent extraction
r. Soil vapor extraction
s. Vitrification
t. Cap/cover

i.	Pump and treat	u.	Barrier wall
j.	Geosynthetic wall	v.	French drain
k.	Bioventing	w.	Air sparging
l.	Free product recovery	x.	Natural attenuation
m.	Ex-situ solidification	y.	Run-on/run-off control
n.	Alternative water supply	z.	Other: _____

84. A. Were final cleanup levels* established?

a. Yes
b. No **[Skip to Question 85]**
c. Unknown **[Skip to Question 85]**

B. If yes, what were the final cleanup levels based on? *[Please circle **all that apply**.]*

a. Background contaminant concentrations
b. Proposed Subpart S action levels
c. Maximum contaminant levels (MCLs)
d. Minimum detection limits (MDLs)
e. Practical quantitation limits (PQLs)
f. Regional or State generic cleanup levels
g. Risk-based, site-specific levels
h. Other: _____

85. A. Did the remedy for the site involve establishing a groundwater point of compliance*?

a. Yes
b. No **[Skip to Question 86]**
c. Unknown **[Skip to Question 86]**

B. If yes, where was the groundwater point of compliance set? *[Please circle only **one** answer.]*

a. Throughout the plume
b. Unit boundary (i.e., when waste is left in place, throughout the plume up to the boundary of a waste management area encompassing the original source(s) of release)
c. Existing plume boundary
d. Buffer zone boundary (i.e., some prescribed distance from the facility boundary)
e. Facility boundary
f. Other: _____

C. What was the basis for setting the ground water point of compliance as identified in Question 85B?

a. Federal guidance or policy (i.e., proposed Subpart S regulations)
b. State regulatory requirement or policy
c. Site-specific risk-based decision
d. Other: _____

86. A. What is the expected timeframe for the owner/operator to incur **capital costs**?

a. Capital costs were incurred over the past 5 years
b. Capital costs are expected to be incurred within 3 years
c. Capital costs are expected to be incurred between 3 to 10 years
d. Capital costs are expected to be incurred greater than 10 years from now

B. Based on your professional judgment, what are the **total capital costs** for remediating this unit (note: can be based on estimates conveyed from owner/operator in Corrective Measures Study (CMS) report)?

a. Less than 250 thousand dollars
b. 250 thousand to 750 thousand dollars
c. 750 thousand to 1 million dollars
d. 1 to 3 million dollars
e. 3 to 5 million dollars
f. 5 to 10 million dollars
g. Over 10 million dollars

C. What is the timeframe for **O&M costs**? *[Please circle only **one** answer.]*

a 1 year
b. 2 to 5 years
c. 6 to 10 years
d. 11 to 30 years
e. Over 30 years
f. Unknown

D. What is the expected **annual O&M costs** from the beginning of the remedial action to the anticipated end of the action: *[Please circle only **one** answer.]*

a. Less than 50,000 dollars
b. 50,000 to 250,000 dollars
c. 250,000 to 500,000 dollars
d. 500,000 to 750,000 dollars
e. Greater than 750,000 dollars

E. Based upon **your** professional judgment, what are the **total costs** of remediating this unit (note: can be based on estimates conveyed from owner/operator in Corrective Measures Study (CMS) report)?

a. Less than 250 thousand dollars
b. 250 thousand to 1 million dollars
c. 1 to 5 million dollars
d. 5 to 10 million dollars
e. 10 to 25 million dollars
f. 25 to 50 million dollars
g. Over 50 million dollars

87. A. What is the owner/operator's expected timeframe for the own/operator to incur **capital costs**?

a. Capital costs were incurred over the past 5 years
b. Capital costs are expected to be incurred within 3 years
c. Capital costs are expected to be incurred between 3 to 10 years
d. Capital costs are expected to be incurred greater than 10 years from now
e. Owner/operator did not provide this information

B. What is the owner/operator's best professional judgment of the **total capital costs** for remediating this unit?

a. Less than 250 thousand dollars
b. 250 thousand to 750 thousand dollars
c. 750 thousand to 1 million dollars
d. 1 to 3 million dollars
e. 3 to 5 million dollars
f. 5 to 10 million dollars
g. Over 10 million dollars
h. Owner/operator did not provide this information

C. What is the owner/operator's best professional judgment of the timeframe for **O&M costs**? *[Please circle only **one** answer.]*

a 1 year
b. 2 to 5 years
c. 6 to 10 years
d. 11 to 30 years
e. Over 30 years
f. Owner/operator did not provide this information

D. What is **owner/operator's** best professional judgment of the annual **O&M costs** from the beginning of the remedial action to the anticipated end of the action: *[Please circle only **one** answer.]*

a. Less than 50,000 dollars
b. 50,000 to 250,000 dollars
c. 250,000 to 500,000 dollars
d. 500,000 to 750,000 dollars
e. Greater than 750,000 dollars
f. Owner/operator did not provide this information

E. What is the **owner/operator's** best professional judgment regarding the **total costs** for remediating this unit?

a. Less than 250 thousand dollars
b. 250 thousand to 1 million dollars
c. 1 to 5 million dollars
d. 5 to 10 million dollars
e. 10 to 25 million dollars

f. 25 to 50 million dollars
g. Over 50 million dollars
h. Owner/operator did not provide this information

88. Identify the status of the remedial alternative. *[Please circle only **one** answer.]*

a. Completed
b. Being implemented
c. Not yet implemented **[Skip to Question 90]**

89. Identify the results of the remedial alternative. *[Please circle **all that apply**.]*

a. Cleanup standards met
b. Source of contamination controlled
c. Migration of contamination controlled
d. Risk to human health and the environment controlled
e. Mass of contamination reduced
f. Other: _____
g. Unknown pending implementation of the remedial alternative

Third Unit

90. A. Identify type of unit or area of concern. *[Please circle only **one** answer.]*

a. Landfill
b. Waste pile
c. Above ground tank
d. Below ground tank
e. Loading area
f. Other spill area
g. Groundwater plume
h. Other: _____
i. Surface impoundment
j. Land treatment unit
k. Industrial sewers
l. Container storage area
m. Containment building
n. Surface water contamination

B. Identify unit area. *[Please circle only **one** answer.]*

a. Less than 1 acre
b. 1 to 5 acres
c. 6 to 25 acres
d. Over 25 acres

91. Identify all media that are contaminated from this unit (above background, above levels of concern or action levels) at the facility? *[Please circle **all that apply**.]*

a. Soil
b. Groundwater
c. Surface water
d. Sediments
e. Air

92. A. In the following blanks, please write the name of the primary contaminant(s) of concern associated with the unit, and the reason(s) for the concern using the following terms: toxicity, mobility, volume, persistence, propensity to bioaccumulate, public perception.

Contaminant Name	Reason for Concern
_____	_____
_____	_____
_____	_____
_____	_____

93. Identify whether the contaminants are present or suspected to be present in the form of light non-aqueous phase liquids (LNAPLs) or dense non-aqueous phase liquids (DNAPLs).

a. LNAPLs
b. DNAPLs
c. Neither LNAPLs or DNAPLs present or suspected to be present
d. Unknown

94. A. Was a human health risk assessment conducted for this unit?

a. Yes
b. No **[Skip to Question 96]**
c. Unknown **[Skip to Question 96]**

95. A. In the top half of the table below, please identify the name of the contaminant which drives on-site human health risk. For this contaminant, identify the medium, exposure route, receptor, and modeled scenario which leads to this risk. **(only one answer per cell.)**

B. In the bottom half of the table below, please identify the name of the contaminant which drives off-site human health risk. For this contaminant, identify the medium, exposure route, receptor, and modeled scenario which leads to this risk. **(only one answer per cell.)**

	Contaminant note: fill in blank	**Medium**	**Exposure Route**	**Receptor**	**Scenario Modeled**
On-site (A.)		a. Soil b. Ground water c. Surface water d. Sediments e. Air f. Food chain	a. Inhalation b. Ingestion c. Dermal d. Other	a. Adult worker b. Adult c. Child d. Other	a. Actual receptor b. Potential receptor
Off-site (B.)		a. Soil b. Ground water c. Surface water d. Sediments e. Air f. Food chain	a. Inhalation b. Ingestion c. Dermal d. Other	a. Adult b. Child c. Other	a. Actual receptor b. Potential receptor

C. What conclusions were made from the on-site human health risk assessment(s)? *[Please circle **all that apply**.]*

a. On-site contamination represented an actual risk to human health
b. On-site contamination represented a potential risk to human health
c. On-site contamination represented no apparent unacceptable risk to human health
d. On-site contamination risk unknown

D. What conclusions were made from the off-site human health risk assessment(s)? *[Please circle **all that apply**.]*

a. Off-site contamination represented an actual risk to human health
b. Off-site contamination represented a potential risk to human health
c. Off-site contamination represented no apparent unacceptable risk to human health
d. Off-site contamination risk unknown

E. What was the high-end human health risk associated with releases from the unit, to the nearest order of magnitude? *[Please circle only **one** answer.]*

a. Less than or equal to 10^{-7}
b. 10^{-6}
c. 10^{-5}
d. 10^{-4}
e. 10^{-3}
f. 10^{-2}
g. Unknown

F. What was the central tendency human health risk associated with releases from the unit, to the nearest order of magnitude? *[Please circle only **one** answer.]*

a. Less than or equal to 10^{-7}
b. 10^{-6}
c. 10^{-5}
d. 10^{-4}
e. 10^{-3}
f. 10^{-2}
g. Unknown

G. How did the results of the human health risk assessment influence the selection of the remedial alternative?*[Please circle only **one** answer.]*

a. The remedial alternative was more stringent due to risk assessment
b. The remedial alternative was less stringent due to risk assessment
c. The remedial alternative did not change due to the risk assessment
d. Other:_____

96. A. Was a formal, site-specific, **ecological** risk assessment(s) performed for releases associated with the unit? *[Please circle only **one** answer.]*

a. Yes
b. No **[Skip to Question 97]**
c. Unknown **[Skip to Question 97]**

B. How did the results of the eco risk assessment influence the selection of the remedial alternative? *[Please circle only **one** answer.]*

a. The remedial alternative was more stringent due to risk assessment
b. The remedial alternative was less stringent due to risk assessment
c. The remedial alternative did not change due to the risk assessment
d. Other:_____

97. What is the implementing authority (-ies) being used to fulfill RCRA Corrective Action requirements at this unit? *[Please circle **one** only.]*

a. Enforcement order
b. EPA-issued permit
c. State-issued permit
d. Voluntary corrective action

98. Identify the type of remedy alternative. *[Please circle only **one** answer.]*

a. Final remedy
b. Stabilization **[Skip to Question 100]**

99. If a final remedy has been selected for this unit, what are/were the three primary objectives of the final remedy? ***[Please circle no more than three answers]*** *[Note that Question 11 solicits information on whether a final remedy(-ies) has been selected at the facility.]*

a. Prevent exposures to human populations
b. Prevent exposures to the environment
c. Stop off-site migration of the contaminants
d. Prevent off-site migration of the contaminants
e. Prevent further on-site migration of the contaminants
f. Return media to maximum beneficial uses
g. Other: _____
h. Unknown

100. If a stabilization measure(s) has been chosen for this unit, what are/were the three primary objectives of the stabilization measure(s)? ***[Please circle no more than three answers]*** *[Note that Questions 12 and 13 solicit information on interim measures and current stabilization activities at the facility.]*

a. Prevent exposures to human populations
b. Prevent exposures to the environment
c. Stop off-site migration of the contaminants
d. Prevent off-site migration of the contaminants

e. Prevent further on-site migration of the contaminants
f. Return media to maximum beneficial uses
g. Other: _____
h. Unknown

101. Describe remedial alternative. *[Please circle **all that apply**.]*

a. Excavation with off-site incineration
b. Excavation with on-site incineration
c. Soil washing
d. Ex-situ bioremediation
e. In-situ bioremediation
f. Soil flushing
g. Dechlorination
h. Thermal desorption
i. Pump and treat
j. Geosynthetic wall
k. Bioventing
l. Free product recovery
m. Ex-situ solidification
n. Alternative water supply
o. Ex-situ solidification/stabilization
p. In-situ solidification/stabilization
q. Solvent extraction
r. Soil vapor extraction
s. Vitrification
t. Cap/cover
u. Barrier wall
v. French drain
w. Air sparging
x. Natural attenuation
y. Run-on/run-off control
z. Other: _____

102. A. Were final cleanup levels* established?

a. Yes
b. No **[Skip to Question 103]**
c. Unknown **[Skip to Question 103]**

B. If yes, what were the final cleanup levels based on? *[Please circle **all that apply**.]*

a. Background contaminant concentrations
b. Proposed Subpart S action levels
c. Maximum contaminant levels (MCLs)
d. Minimum detection limits (MDLs)
e. Practical quantitation limits (PQLs)
f. Regional or State generic cleanup levels
g. Risk-based, site-specific levels
h. Other: _____

103. A. Did the remedy for the site involve establishing a groundwater point of compliance*?

a. Yes
b. No **[Skip to Question 104]**
c. Unknown **[Skip to Question 104]**

B. If yes, where was the groundwater point of compliance set? *[Please circle only **one** answer.]*

a. Throughout the plume
b. Unit boundary (i.e., when waste is left in place, throughout the plume up to the boundary of a waste management area encompassing the original source(s) of release)
c. Existing plume boundary
d. Buffer zone boundary (i.e., some prescribed distance from the facility boundary)
e. Facility boundary
f. Other: _____

C. What was the basis for setting the ground water point of compliance as identified in Question 103B?

a. Federal guidance or policy (i.e., proposed Subpart S regulations)
b. State regulatory requirement or policy
c. Site-specific risk-based decision
d. Other: _____

104. A. What is the expected timeframe for the owner/operator to incur **capital costs**?

a. Capital costs were incurred over the past 5 years
b. Capital costs are expected to be incurred within 3 years
c. Capital costs are expected to be incurred between 3 to 10 years
d. Capital costs are expected to be incurred greater than 10 years from now

B. Based on your professional judgment, what are the **total capital costs** for remediating this unit (note: can be based on estimates conveyed from owner/operator in Corrective Measures Study (CMS) report)?

a. Less than 250 thousand dollars
b. 250 thousand to 750 thousand dollars
c. 750 thousand to 1 million dollars
d. 1 to 3 million dollars
d. 3 to 5 million dollars
e. 5 to 10 million dollars
f. Over 10 million dollars

C. What is the timeframe for **O&M costs**? *[Please circle only **one** answer.]*

a 1 year
b. 2 to 5 years
c. 6 to 10 years
d. 11 to 30 years
e. Over 30 years
f. Unknown

D. What is the expected **annual O&M costs** from the beginning of the remedial action to the anticipated end of the action: *[Please circle only **one** answer.]*

a. Less than 50,000 dollars
b. 50,000 to 250,000 dollars
c. 250,000 to 500,000 dollars
d. 500,000 to 750,000 dollars
e. Greater than 750,000 dollars

E. Based upon **your** professional judgment, what are the **total costs** of remediating this unit (note: can be based on estimates conveyed from owner/operator in Corrective Measures Study (CMS) report)?

a. Less than 250 thousand dollars
b. 250 thousand to 1 million dollars
c. 1 to 5 million dollars
d. 5 to 10 million dollars
e. 10 to 25 million dollars
f. 25 to 50 million dollars
g. Over 50 million dollars

105. A. What is the owner/operator's expected timeframe for the own/operator to incur **capital costs**?

a. Capital costs were incurred over the past 5 years
b. Capital costs are expected to be incurred within 3 years
c. Capital costs are expected to be incurred between 3 to 10 years
d. Capital costs are expected to be incurred greater than 10 years from now
e. Owner/operator did not provide this information

B. What is the owner/operator's best professional judgment of the **total capital costs** for remediating this unit?

a. Less than 250 thousand dollars
b. 250 thousand to 750 thousand dollars
c. 750 thousand to 1 million dollars
d. 1 to 3 million dollars
e. 3 to 5 million dollars
f. 5 to 10 million dollars
g. Over 10 million dollars
h. Owner/operator did not provide this information

C. What is the owner/operator's best professional judgment of the timeframe for **O&M costs**? *[Please circle only **one** answer.]*

a 1 year
b. 2 to 5 years
c. 6 to 10 years
d. 11 to 30 years
e. Over 30 years
f. Owner/operator did not provide this information

D. What is **owner/operator's** best professional judgment of the annual **O&M costs** from the beginning of the remedial action to the anticipated end of the action: *[Please circle only **one** answer.]*

a. Less than 50,000 dollars
b. 50,000 to 250,000 dollars
c. 250,000 to 500,000 dollars
d. 500,000 to 750,000 dollars
e. Greater than 750,000 dollars
f. Owner/operator did not provide this information

E. What is the **owner/operator's** best professional judgment regarding the **total costs** for remediating this unit?

a. Less than 250 thousand dollars
b. 250 thousand to 1 million dollars
c. 1 to 5 million dollars
d. 5 to 10 million dollars
e. 10 to 25 million dollars
f. 25 to 50 million dollars
g. Over 50 million dollars
h. Owner/operator did not provide this information

106. Identify the status of the remedial alternative. *[Please circle only **one** answer.]*

a. Completed
b. Being implemented
c. Not yet implemented **[Skip to Question 108]**

107. Identify the results of the remedial alternative. *[Please circle **all that apply**.]*

a. Cleanup standards met
b. Source of contamination controlled
c. Migration of contamination controlled
d. Risk to human health and the environment controlled
e. Mass of contamination reduced
f. Other: _____
g. Unknown pending implementation of the remedial alternative

<u>Fourth Unit</u>

108. A. Identify type of unit or area of concern. *[Please circle only **one** answer.]*

a. Landfill
b. Waste pile
c. Above ground tank
d. Below ground tank
e. Loading area
f. Other spill area
g. Groundwater plume
h. Other: _____
i. Surface impoundment
j. Land treatment unit
k. Industrial sewers
l. Container storage area
m. Containment building
n. Surface water contamination

B. Identify unit area. *[Please circle only **one** answer.]*

a. Less than 1 acre
b. 1 to 5 acres
c. 6 to 25 acres
d. Over 25 acres

109. Identify all media that are contaminated from this unit (above background, above levels of concern or action levels) at the facility? *[Please circle **all that apply**.]*

a. Soil
b. Groundwater
c. Surface water
d. Sediments
e. Air

110. A. In the following blanks, please write the name of the primary contaminant(s) of concern associated with the unit, and the reason(s) for the concern using the following terms: toxicity, mobility, volume, persistence, propensity to bioaccumulate, public perception.

Contaminant Name	Reason for Concern
_____	_____
_____	_____
_____	_____
_____	_____

111. Identify whether the contaminants are present or suspected to be present in the form of light non-aqueous phase liquids (LNAPLs) or dense non-aqueous phase liquids (DNAPLs).

a. LNAPLs
b. DNAPLs
c. Neither LNAPLs or DNAPLs present or suspected to be present
d. Unknown

112. A. Was a human health risk assessment conducted for this unit?

a. Yes
b. No **[Skip to Question 114]**
c. Unknown **[Skip to Question 114]**

113. A. In the top half of the table below, please identify the name of the contaminant which drives on-site human health risk. For this contaminant, identify the medium, exposure route, receptor, and modeled scenario which leads to this risk. **(only one answer per cell.)**

B. In the bottom half of the table below, please identify the name of the contaminant which drives off-site human health risk. For this contaminant, identify the medium, exposure route, receptor, and modeled scenario which leads to this risk. **(only one answer per cell.)**

	Contaminant note: fill in blank	**Medium**	**Exposure Route**	**Receptor**	**Scenario Modeled**
On-site (A.)		a. Soil b. Ground water c. Surface water d. Sediments e. Air f. Food chain	a. Inhalation b. Ingestion c. Dermal d. Other	a. Adult worker b. Adult c. Child d. Other	a. Actual receptor b. Potential receptor
Off-site (B.)		a. Soil b. Ground water c. Surface water d. Sediments e. Air f. Food chain	a. Inhalation b. Ingestion c. Dermal d. Other	a. Adult b. Child c. Other	a. Actual receptor b. Potential receptor

C. What conclusions were made from the on-site human health risk assessment(s)? *[Please circle **all that apply**.]*

a. On-site contamination represented an actual risk to human health
b. On-site contamination represented a potential risk to human health
c. On-site contamination represented no apparent unacceptable risk to human health
d. On-site contamination risk unknown

D. What conclusions were made from the off-site human health risk assessment(s)? *[Please circle **all that apply**.]*

a. Off-site contamination represented an actual risk to human health
b. Off-site contamination represented a potential risk to human health
c. Off-site contamination represented no apparent unacceptable risk to human health
d. Off-site contamination risk unknown

E. What was the high-end human health risk associated with releases from the unit, to the nearest order of magnitude? *[Please circle only **one** answer.]*

a. Less than or equal to 10^{-7}
b. 10^{-6}
c. 10^{-5}
d. 10^{-4}
e. 10^{-3}
f. 10^{-2}
g. Unknown

F. What was the central tendency human health risk associated with releases from the unit, to the nearest order of magnitude? *[Please circle only **one** answer.]*

a. Less than or equal to 10^{-7}
b. 10^{-6}
c. 10^{-5}
d. 10^{-4}
e. 10^{-3}
f. 10^{-2}
g. Unknown

G. How did the results of the human health risk assessment influence the selection of the remedial alternative?*[Please circle only **one** answer.]*

a. The remedial alternative was more stringent due to risk assessment
b. The remedial alternative was less stringent due to risk assessment
c. The remedial alternative did not change due to the risk assessment
d. Other:_____

114. A. Was a formal, site-specific, **ecological** risk assessment(s) performed for releases associated with the unit? *[Please circle only **one** answer.]*

a. Yes
b. No **[Skip to Question 115]**
c. Unknown **[Skip to Question 115]**

B. How did the results of the eco risk assessment influence the selection of the remedial alternative?*[Please circle only **one** answer.]*

a. The remedial alternative was more stringent due to risk assessment
b. The remedial alternative was less stringent due to risk assessment
c. The remedial alternative did not change due to the risk assessment
d. Other:_____

115. What is the implementing authority (-ies) being used to fulfill RCRA Corrective Action requirements at this unit? *[Please circle **one** only.]*

a. Enforcement order
b. EPA-issued permit
c. State-issued permit
d. Voluntary corrective action

116. Identify the type of remedy alternative. *[Please circle only **one** answer.]*

a. Final remedy
b. Stabilization **[Skip to Question 118]**

117. If a final remedy has been selected for this unit, what are/were the three primary objectives of the final remedy? ***[Please circle no more than three answers]*** *[Note that Question 11 solicits information on whether a final remedy(-ies) has been selected at the facility.]*

a. Prevent exposures to human populations
b. Prevent exposures to the environment
c. Stop off-site migration of the contaminants
d. Prevent off-site migration of the contaminants
e. Prevent further on-site migration of the contaminants
f. Return media to maximum beneficial uses
g. Other: _____
h. Unknown

118. If a stabilization measure(s) has been chosen for this unit, what are/were the three primary objectives of the stabilization measure(s)? ***[Please circle no more than three answers]*** *[Note that Questions 12 and 13 solicit information on interim measures and current stabilization activities at the facility.]*

a. Prevent exposures to human populations
b. Prevent exposures to the environment
c. Stop off-site migration of the contaminants
d. Prevent off-site migration of the contaminants
e. Prevent further on-site migration of the contaminants
f. Return media to maximum beneficial uses
g. Other: _____
h. Unknown

119. Describe remedial alternative. *[Please circle **all that apply**.]*

a. Excavation with off-site incineration
b. Excavation with on-site incineration
c. Soil washing
d. Ex-situ bioremediation
e. In-situ bioremediation
f. Soil flushing
g. Dechlorination
h. Thermal desorption
i. Pump and treat
j. Geosynthetic wall
k. Bioventing
l. Free product recovery
m. Ex-situ solidification
n. Alternative water supply
o. Ex-situ solidification/stabilization
p. In-situ solidification/stabilization
q. Solvent extraction
r. Soil vapor extraction
s. Vitrification
t. Cap/cover
u. Barrier wall
v. French drain
w. Air sparging
x. Natural attenuation
y. Run-on/run-off control
z. Other: _____

120. A. Were final cleanup levels* established?

a. Yes
b. No **[Skip to Question 121]**
c. Unknown **[Skip to Question 121]**

B. If yes, what were the final cleanup levels based on? *[Please circle **all that apply**.]*

a. Background contaminant concentrations
b. Proposed Subpart S action levels
c. Maximum contaminant levels (MCLs)
d. Minimum detection limits (MDLs)
e. Practical quantitation limits (PQLs)
f. Regional or State generic cleanup levels
g. Risk-based, site-specific levels
h. Other: _____

121. A. Did the remedy for the site involve establishing a groundwater point of compliance*?

a. Yes
b. No **[Skip to Question 122]**
c. Unknown **[Skip to Question 122]**

B. If yes, where was the groundwater point of compliance set? *[Please circle only **one** answer.]*

a. Throughout the plume
b. Unit boundary (i.e., when waste is left in place, throughout the plume up to the boundary of a waste management area encompassing the original source(s) of release)
c. Existing plume boundary
d. Buffer zone boundary (i.e., some prescribed distance from the facility boundary)
e. Facility boundary
f. Other: _____

C. What was the basis for setting the ground water point of compliance as identified in Question 121B?

a. Federal regulatory requirement (i.e., proposed Subpart S regulations)
b. State regulatory requirement
c. Site-specific risk-based decision
d. Other: _____

122. A. What is the expected timeframe for the owner/operator to incur **capital costs**?

a. Capital costs were incurred over the past 5 years
b. Capital costs are expected to be incurred within 3 years
c. Capital costs are expected to be incurred between 3 to 10 years
d. Capital costs are expected to be incurred greater than 10 years from now

B. Based on your professional judgment, what are the **total capital costs** for remediating this unit (note: can be based on estimates conveyed from owner/operator in Corrective Measures Study (CMS) report)?

a. Less than 250 thousand dollars
b. 250 thousand to 750 thousand dollars

c. 750 thousand to 1 million dollars
d. 1 to 3 million dollars
e. 3 to 5 million dollars
f. 5 to 10 million dollars
g. Over 10 million dollars

C. What is the timeframe for **O&M costs**? *[Please circle only **one** answer.]*

a 1 year
b. 2 to 5 years
c. 6 to 10 years
d. 11 to 30 years
e. Over 30 years
f. Unknown

D. What is the expected **annual O&M costs** from the beginning of the remedial action to the anticipated end of the action: *[Please circle only **one** answer.]*

a. Less than 50,000 dollars
b. 50,000 to 250,000 dollars
c. 250,000 to 500,000 dollars
d. 500,000 to 750,000 dollars
e. Greater than 750,000 dollars

E. Based upon **your** professional judgment, what are the **total costs** of remediating this unit (note: can be based on estimates conveyed from owner/operator in Corrective Measures Study (CMS) report)?

a. Less than 250 thousand dollars
b. 250 thousand to 1 million dollars
c. 1 to 5 million dollars
d. 5 to 10 million dollars
e. 10 to 25 million dollars
f. 25 to 50 million dollars
g. Over 50 million dollars

123. A. What is the owner/operator's expected timeframe for the own/operator to incur **capital costs**?

a. Capital costs were incurred over the past 5 years
b. Capital costs are expected to be incurred within 3 years
c. Capital costs are expected to be incurred between 3 to 10 years
d. Capital costs are expected to be incurred greater than 10 years from now
e. Owner/operator did not provide this information

B. What is the owner/operator's best professional judgment of the **total capital costs** for remediating this unit?

a. Less than 250 thousand dollars
b. 250 thousand to 750 thousand dollars
c. 750 thousand to 1 million dollars
d. 1 to 3 million dollars
e. 3 to 5 million dollars
f. 5 to 10 million dollars
g. Over 10 million dollars
h. Owner/operator did not provide this information

C. What is the owner/operator's best professional judgment of the timeframe for **O&M costs**? *[Please circle only **one** answer.]*

a 1 year
b. 2 to 5 years
c. 6 to 10 years
d. 11 to 30 years
e. Over 30 years
f. Owner/operator did not provide this information

D. What is **owner/operator's** best professional judgment of the annual **O&M costs** from the beginning of the remedial action to the anticipated end of the action: *[Please circle only **one** answer.]*

a. Less than 50,000 dollars
b. 50,000 to 250,000 dollars
c. 250,000 to 500,000 dollars
d. 500,000 to 750,000 dollars
e. Greater than 750,000 dollars
f. Owner/operator did not provide this information

E. What is the **owner/operator's** best professional judgment regarding the **total costs** for remediating this unit?

a. Less than 250 thousand dollars
b. 250 thousand to 1 million dollars
c. 1 to 5 million dollars
d. 5 to 10 million dollars
e. 10 to 25 million dollars
f. 25 to 50 million dollars
g. Over 50 million dollars
h. Owner/operator did not provide this information

124. Identify the status of the remedial alternative. *[Please circle only **one** answer.]*

a. Completed
b. Being implemented
c. Not yet implemented

125. Identify the results of the remedial alternative. *[Please circle **all that apply**.]*

a. Cleanup standards met
b. Source of contamination controlled
c. Migration of contamination controlled
d. Risk to human health and the environment controlled
e. Mass of contamination reduced
f. Other: _____
g. Unknown pending implementation of the remedial alternative

DEFINITIONS

Action Level	Constituent-specific and medium-specific contaminant level that, if found in the environment, will typically trigger further evaluation. Action levels are health- and environment-based levels determined by the Agency to be indicators for protection of human health and the environment.
Area of Concern (AOC)	Releases that warrant investigation or remediation regardless of whether they are associated with a specific Solid Waste Management Unit (SWMU) as currently used and defined below. For example, when an overseeing agency believes one-time spills of hazardous waste or hazardous constituents have not been adequately cleaned up, these releases are often addressed as areas of concern. Area of concern should not be confused with the Superfund concept of "area of contamination" as described below.
Area of Contamination	Certain discrete areas of generally dispersed contamination. Allows for consolidation of contaminated media without triggering RCRA Subtitle C requirements. *[See National Contingency Plan, 55 FR 8758-8760, March 8, 1990.]*. Direction on the use of the Area of Contamination Concept During RCRA Cleanups was conveyed in a March 13, 1996 memo from Michael Shapiro (Office of Solid Waste), Steve Luftig (Office of Emergency and Remedial Response), and Jerry Cliffort (Office of Site Remediation Enforcement).
Capital Cost	One-time costs which include expenditures for remedial equipment, installation of equipment, and initial remedial activities (e.g., soil excavation).
Central Tendency Human Health Risk	The "central tendency" of the risk distribution is, conceptually, at the 50th percentile of the actual (either measured or estimated) distribution.
Corrective Action Management Unit (CAMU)	An area within a facility that is designated by the Regional Administrator for the purpose of implementing Corrective Action requirements, which is contaminated by hazardous wastes (including hazardous constituents), and which may contain discrete, engineered, land-based sub-units. *[See final CAMU/TU rule, 58 FR 8658, February 16, 1993.]*
Conditional Remedy	A remedy that is sufficient to stabilize the site in the short term, while the final remedy can be deferred to some time

	in the future -- perhaps when the facility ceases operations.
Creek	A natural stream of water normally smaller than and often tributary to a river.
Dense Nonaqueous Phase Liquids (DNAPLs)	DNAPLs are nonaqueous-phase liquids that do not dissolve readily in water. These liquids are more dense than water and include common solvents such as trichloroethylene.
Estuary	The wide lower course of river where its current is met by tides; or, an arm of the sea that extends inland to meet the mouth of a river.
Final Cleanup Level	Constituent-specific and medium-specific cleanup level that the chosen final remedy should meet for a given contaminant.
Groundwater Releases Controlled Determination	Appropriate when the migration of groundwater contamination at or from the facility across designated boundaries is controlled; these boundaries may be facility boundaries or specified boundaries within a facility.
High-End Human Health Risk	The "high-end" of the risk distribution is, conceptually, above the 90th percentile of the actual (either measured or estimated) distribution.
Human Exposures Controlled Determination	Appropriate when there are no unacceptable risks to humans due to releases of contaminants at or from the facility.
Interim Measures	Short term measures requiring the owner/operator to abate, minimize, stabilize, mitigate, or eliminate release(s) or threat of release(s).
Light Nonaqueous Phase Liquids	LNAPLs are light nonaqueous-phase liquids that do not readily dissolve in water **(LNAPLs)**. These liquids are less dense than water and include substances such as gasoline.
National Corrective Action Prioritization System (NCAPS)	A computer-based system designed to help the Regions prioritize the RCRA TSDF universe for corrective action activities.
National Pollution Discharge Elimination System (NPDES)	The system for controlling discharges to surface water under the Clean Water Act.

Natural Attenuation	Involves natural processes such as biodegradation, dispersion, dilution, and adsorption to reduce contaminant mass and/or concentration.
Operation & Maintenance Cost (O&M)	Operation and maintenance costs include ongoing maintenance activities such as electricity for running groundwater extraction pumps.
Phased Approach	Allows the owner/operator to complete Corrective Action requirements in pre-determined stages.
Point of Compliance (POC)	The physical location at a facility where compliance with the media cleanup standard is determined.
Presumptive Remedy Guidance	Guidance developed by the Superfund program that relies on past experiences to streamline cleanups. Presumptive remedies are preferred technologies for common categories of sites, based on historical patterns of remedy selection and EPA's evaluation of performance. As of May 1996, presumptive remedy guidance address: municipal landfills, volatile organic contamination in soil, and wood treating sites.
Regulated Unit	Surface impoundments, waste piles, land treatment units, and landfills that received hazardous waste after July 26, 1982. Often referred to as "Subpart F" units.
RCRA Corrective Action	Also referred to as HSWA Corrective Action. The statutory requirements for addressing releases from solid waste management units (SWMUs), as enacted by Congress through the Hazardous and Solid Waste Amendments (HSWA) of 1984 [3004(u) and (v) -- 42 U.S.C 9624 (u) and (v); and 3008(h) -- 42 U.S.C. 6928(h)]. Activities associated with RCRA Corrective Action generally include, but are not limited to, initial site assessment, detailed site investigations, remedy selection and implementation, and remedy completion. In this context, RCRA Corrective Action is distinct from Corrective Action for Regulated Units pursuant to 40 CFR 264.90 through 264.100.
Risk Assessment	Use of the factual base to define the health effects of exposure of individuals or populations to hazardous materials and situations. Risk assessments generally consist of four parts: hazard identification, dose-response assessment, exposure assessment, and risk characterization. Risk assessments also include characterization of the uncertainties inherent in the process of inferring risk.

River	A natural stream of water of considerable volume.
Solid Waste Management Unit (SWMU)	Any discernible unit at which solid wastes have been placed at any time, irrespective of whether the unit was intended for the management of solid or hazardous waste. Such units include any area at a facility at which solid wastes have been routinely and systematically released.
Stabilization	An initiative that emphasizes the importance and value of taking early actions to control releases, prevent the further spread of contaminants, and reduce current risks to human health and the environment to acceptable levels.
Technical Impracticability	Determination that remediation of a release to a media cleanup standard is not required when remediation is technically impracticable or when the scale of operations required might be of such a magnitude and complexity that the alternative would be impracticable. The determination involves a consideration of both engineering feasibility and reliability.

Appendix B

Quality Assurance/Quality Control Procedures

EPA designed and implemented a quality assurance/quality control procedure to ensure the consistency and quality of RCAID data. For each section of the questionnaire, EPA performed the following steps:

A. Section I: Respondent Information

- Check that Region numbers are valid and correct those that are not.
- Check that state abbreviations are valid and correct those that are not.
- Check to see that either Region or state information is complete, but that both are not filled out. Remove any "NA" in these fields (in at least one case, "NA" was entered in the state information because the respondent was from the region).
- Eliminate titles from respondent name fields. Put all affiliations in parentheses after the respondent name.
- Format respondent phone and fax numbers consistently (i.e., ###-###-#### with extensions listed as x####).
- Standardize format for "Owner/Operator Question." Fill in question numbers where respondent left question blank but Owner/Operator did supply information. Leave blank (i.e., no "NA") if Owner/Operator did not supply information.

B. Section II: Facility-Specific Questions

<u>Facility Background</u>

- Add CARIA ID number to RCAID system.
- Correct EPA ID numbers of facilities. (A few facilities had invalid EPA ID numbers. Identify the correct numbers through RCRIS.)
- Look up SIC code where respondent provided description instead of number.
- Change any state names to abbreviations.
- Format Latitude/Longitude consistently (i.e. N ##.##'##" W ##.##'##").
- Correct all "Year operation began" entries to be one year with no parentheticals. If more than one year provided (e.g., 1963-64) use earliest date provided. For indeterminate dates (e.g., mid 1960s) use best judgment and document.
- Format acres consistently. Do not include the term "acres" in the entry. If two acreages are provided (e.g., facility and property) use best judgment and document.
- Eliminate unnecessary verbiage in primary products and primary waste fields so that the fields contain only lists. For example the entry "The facility was at various times engaged in rolling/fabricating steel, fabricating uranium fuel elements, metal finishing, metal fabrication" would be changed to "rolling/fabricating steel, fabricating uranium fuel elements, metal finishing, metal fabrication."

Status of Corrective Action

- Check for consistency between question 11 (final remedy selection) and question 43 (final remedy implementation).[1]

- Check for consistency between parts A, B, and C of question 14 (evaluation of environmental indicators). If respondent answers B and C, then A should be "Yes". Delete invalid answers for B and C (e.g., a respondent indicated that it had not evaluated either indicator in part A, but rather than skipping B and C as instructed, the facility added the answer "Not Yet" as a new option).[2]

- For NCAPS ranking, add "Not Answered" for facilities where this question was not answered.

Sources of Contamination/Contaminants of Concern

- For Number of Units questions (16 and 17), add "Not Answered" where question was not answered. For respondents who circled "Actual" but did not provide a number, change to "Not Answered." Check for internal consistency between number counts (i.e., more regulated units than total units, more units in part B of 17 than in part A). Use best judgment to correct and document.[3]

- Check for internal consistency between parts A and B of question 20 (migration beyond facility boundary). For example, selecting a medium in part B is not consistent with answering "No" or "Unknown" to part A. Use answer to 25 F and G (contamination of off-site aquifer), 29 D and F (contamination of surface water body), and best judgment to correct. Document all changes.

- Check for internal consistency between parts A and B of question 22 (presence of DNAPLs) and between parts C and D (presence of LNAPLs). Check for consistency with question 41.B (technical impracticability) and unit-specific questions on DNAPLs and LNAPLs (57, 75, 93, and 111).[4]

- Check for internal consistency between parts A and B of question 23 (innovative characterization approaches). For example, selecting a technique in part B is not consistent with answering "No" to part A.

[1] Respondents for two facilities had inconsistent answers (i.e., "No" to selection and "Yes" to implementation): facility 2 had implemented a final remedy but not formalized via a modification; facility 63 had completed the closure of the "pre-RCRA" basin. Answers for Q.11 for both facilities were changed to "Yes".

[2] One inconsistency (facility 86) due to entry error. Corrected from "No" to "Yes".

[3] Respondent for facility 65 answered 1 for 16 and 2 for 17; however, the facility entered 1 for 16 as the entire site. Changed to "Unknown".

[4] Respondent for facility 92 indicated no presence of LNAPLs and then cited LNAPLS as contaminants of unit 3. Changed Q.22C to "Yes".

Media-Specific Contamination - Groundwater

- Check for internal consistency between parts A, B, and C of question 24 (on-site drinking water sources).[5]

- Check for internal consistency between parts A through H of question 25 (off-site drinking water sources). Check for consistency with question 20 (migration beyond facility boundary).[6]

Media-Specific Contamination - Surface Water

- Check for internal consistency between parts A through G of question 29 (nearest surface water body).[7]

Risk Assessment, Action Levels

- For Primary Land Use within Boundary, add "Not Answered" for facilities where this question was not answered.

- Check for internal consistency between parts A and B of question 33 (human health risk assessment). Check for consistency with unit-specific questions on human health risk assessment (questions 58, 59, 76, 77, 94, 95, 112, and 113).[8]

- Check for internal consistency between parts A and B of question 34 (ecological risk assessment). Check for consistency with unit-specific questions on ecological risk assessment (questions 60, 78, 96, and 114).[9]

- Check for internal consistency between parts A and B of question 35 (action levels).

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[5] Respondent for facility 6 indicated the facility was not located above a potential source of on-site drinking waster but it was located above a current source of on-site drinking water. Changed Q.24A to "Yes". Respondents for facilities 75 and 82 indicated the facility was not located above a potential source of on-site drinking waster but that contamination from the facility had been detected in an aquifer that was an actual/potential source of on-site drinking water -- changed Q.24A to "Yes".

[6] One inconsistency (facility 6) due to entry error. Changed Q.25A to "Yes". Respondents for four facilities (59, 62, 94, 95) did not comply with skip pattern for public/private wells and distances. Deleted extraneous answers.

[7] Respondent for facility 82 did not comply with skip pattern. Deleted extraneous answers.

[8] Respondent for facilities 52 and 90 indicated that no human health risk assessment was performed at the facility but then indicated one was performed for a specific unit. Changed Q.33A to "Yes".

[9] Respondent for facility 92 indicated that an ecorisk assessment had not been conducted but then listed "Ongoing" as the guidance used. Deleted this because the assessment is ongoing. Respondent for facility 52 indicated that no ecorisk assessment was performed at the facility but then indicated one was performed for a specific unit. Changed Q.34A to "Yes".

General Remedy Selection

- Check for internal consistency between parts A and B of question 37 (use of Superfund presumptive remedy guidance).[10]
- Check for internal consistency between parts A and B of question 38 (use of natural attenuation).[11]
- Check for internal consistency between parts A, B, and C of question 39 (technical impracticability).[12]
- Check for consistency between question 11 (final remedy selection) and question 43 (final remedy implementation).
- For Percent Treated On-Site, add "Not Answered" for facilities where this question was not answered.
- For Time to Complete, add "Not Answered" for facilities where this question was not answered.
- For Respondent Total Cost Estimate, check that it is less than or equal to the cost estimate for all four units (questions 68E, 86E, 104E, and 122E).[13] Document any changes.
- For Owner/Operator Total Cost Estimate, add "Not Answered" for facilities where this question was not answered by the EPA respondent (as opposed to the respondent selecting "Owner/operator was not willing to provide an estimate").

Institutional Controls

- Check for internal consistency between parts A and B of question 48 (institutional controls).[14]

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[10] One inconsistency (facility 85) due to entry error. Corrected from "Yes" to "No".

[11] Respondent for facility 73 did not comply with skip pattern. Deleted extraneous answer

[12] Respondents for three facilities (50, 77, and 94) had inconsistencies due to an entry error (77), and not complying with skip pattern and providing extraneous comments (50 and 94). Made appropriate changes. Skip pattern not clear for facilities answering "Unknown". Deleted extraneous information for facilities 6, 44, 45, and 61.

[13] All blanks for total cost were changed to "Not Answered". Respondents for facilities 4 and 88 had extraneous answers for total cost for unit 1. These were removed. Respondents for facilities 46, 49, 57, 58, 87, and 95 had total facility cost less than the sum of the total costs for the four units. Changed to be at least as much as the sum of the four units. Facility 50's total cost was not entered. It was added. Respondent for facility 86 had selected two cost ranges for the fourth unit. Kept only the highest range.

[14] Respondent for facility 2 misunderstood question and answered "No" to institution controls because a final remedy had not been selected although controls had been used as interim measures. Changed to "Yes". Respondent for facility 62 answered "No", but then did not obey skip pattern and provided information on controls that would be likely. Deleted this extraneous information.

Voluntary Remedial Actions

- Check for internal consistency between parts A through E of question 52 (voluntary remedial actions).[15]

Financial Assurance

- Check for internal consistency between parts A through D of question 53 (financial assurances).[16]

C. Section III: Remedy-Specific Questions

The following QA/QC procedures was be performed for all four units.

- Check that unit area is less than the facility area provided in question 7.[17]
- Check that the media contaminated in this unit are consistent with the media selected in question 19 (media contaminated at the facility).[18]
- Check for consistency between question 58 (human health risk assessment conducted) and question 59 (results of human health risk assessment).[19] Document all changes.
- Check for internal consistency between parts A and B of question 60 (ecological risk assessment).[20]

[15] Respondent for facility 75 indicated that the facility conducted a quasi-voluntary cleanup. Changed "No" to "Yes".

[16] Respondents for facilities 44, 67, 69, 78, 84, 89, 93, and 98 did not comply with skip pattern. Deleted extraneous answers.

[17] Only time unit area can exceed facility area (given an answer to the facility size question) is when the "unit" is a groundwater plume.

[18] Respondent for facility 92 did not select air as a facility-wide contaminated medium, but did select it for one of the units. Changed Q.19 to include air. Facilities 2, 43, 45, 63, 70, and 76 did not select sediments as a facility-wide contaminated media, but did select it for one of the units. Changed Q.19 to include sediments. The respondent for facility 78 did not select soil as a facility-wide contaminated media, but did select it for one of the units. Changed Q.19 to include soil. Respondents for facilities 4, 63, 70, 89, and 90 did not select sediments as a facility-wide contaminated media, but did select it for one of the units. Changed Q.19 to include sediments.

[19] Facilities 45, 46, 62, and 84 indicated that they did not do a unit-specific risk assessment, but they did do a facility wide one and provided unit-specific information. Changed Q.58 to "Yes". Facilities 52, 75, and 82 indicated that they did not do a unit specific risk assessment but did not comply with the skip pattern. Deleted extraneous information.

[20] Facility 63 indicated that they did not conduct a unit-specific risk assessment, but they did conduct a facility-wide one and provided unit-specific information. Changed Q.60 to "Yes". Facility 75 indicated that they did not do a unit specific risk assessment but did not comply with the skip pattern. Deleted extraneous information.

- Check for consistency between question 63 (primary objectives of final remedy) and question 11 (final remedy selection).[21]

- Check for consistency between question 64 (primary objectives of stabilization) and question 12 (interim measures).[22]

- Check for internal consistency between parts A and B of question 66 (final cleanup levels). Document all changes.

- Check for internal consistency between parts A, B, and C of question 67 (groundwater point of compliance).[23]

- Check for internal consistency between parts B, C, D, and E of question 68 (respondent cost estimates).[24]

- Check for internal consistency between parts B, C, D, and E of question 69 (Owner/Operator cost estimates). Add "Not Answered" for facilities where this question was not answered by the EPA respondent.

[21] It appears that many survey respondents did not follow the directions of Q.63 (i.e., answer only if a final remedy had been implemented). Rather than lose the information provided by facilities, we will assume that if no final remedy has been selected (Q.11) the answers to Q.63 are what the objectives will be. Respondents answers for the objectives of stabilization at facilities 6, 46 and 62 were mistakenly entered as objectives for the final remedy. The appropriate changes have been made. The answer for Q.62 for facility 58 was not entered -- the appropriate entry was made. Respondents for facilities 68, 74, 84, and 95 did not comply with the skip pattern. Deleted extraneous information.

[22] It appears that many respondents did not follow the directions of Q.64 (i.e., answer only if a stabilization remedy had been implemented). Rather than lose the information provided, we will assume that if no stabiliation remedy has been selected (Q.12) the answers to Q.63 are what the objectives will be. Respondents for facilities 47 and 52 did not comply with the skip pattern. Deleted extraneous information. The respondent for facility 45 selected both final remedy and stabilization as the answer to Q.62. Deleted stabilization answers.

[23] Respondents for facilities 52 and 86 did not comply with the skip pattern. Deleted extraneous information

[24] Respondents for facilities 3, 45, 46, and 61 indicated total costs less than capital costs and O&M. Changed total costs to be at least as much as capital costs

Appendix C

Estimates and Confidence Intervals

Section A of this appendix presents confidence intervals for many of the exhibits and selected text in the main report. Section B presents statistics on selected logistic regressions presented in the main report.

A. Confidence Intervals for Exhibits and Selected Text

This appendix presents extrapolation results and 95 percent confidence intervals for selected aspects of the revised RCAID database. All confidence intervals provided are approximately 95 percent confidence intervals. In some cases the confidence interval computed included a lower bound below 0 percent or an upper bound above 100 percent. In these cases, the confidence intervals have been truncated at 0 percent and 100 percent, respectively.

This appendix is organized according to the exhibits in Chapters 2 through 5. Confidence intervals are not presented for Exhibits 2-5, 2-6, 2-8, 4-6, 4-7, 5-1, 5-3, 5-8, and 5-11. These exhibits do not have confidence intervals because of the nature of the data presented, such as a graph rather than a few point estimates, or because the data are unextrapolated (e.g., unit data). Also, many tables of confidence intervals present data for more point estimates than are in parallel exhibits. For example, several confidence interval tables present data both including and excluding "no responses" whereas most exhibits in the main report are based on data excluding such responses. In many cases, the confidence intervals are quite large due to calculations of the percentages based on the entire RCAID universe.

95 Percent Confidence Intervals for RCAID Extrapolations in Exhibit 2-1: NCAPS Ranking of Corrective Action Universe, GPRA Universe, and RCAID Universe[a]

NCAPS Rank	Lower Bound	RCAID Point Estimate	Upper Bound
High	52%	77%	100%
Medium	0%	6%	15%
Low	0%	4%	10%
Not Ranked	0%	13%	29%

[a] Point estimates and confidence intervals were adjusted to exclude facilities for which the NCAPS status was not reported. Since only 89% of facilities had reported NCAPS status, the percentages reported in the table were calculated as follows: 77% = (68.8%/89%), 6% = (5.3%/89%), 4% = (3.4%/89%), and 13% = (12%/89%) for High, Medium, Low, and Not Ranked, respectively.

95 Percent Confidence Intervals for Exhibit 2-2: Status of Interim Measure Implementation and Final Remedy Selection

Corrective Action Status	Lower Bound	Point Estimate	Upper Bound
Interim Measures Implemented	60%	77%	94%
Final Remedy Selected	39%	57%	76%
Final Remedy Only, No Interim Measures	4%	20%	36%
Interim Measures Only, No Final Remedy	20%	40%	59%
Both Interim Measure and Final Remedy	22%	37%	53%
Neither Interim Measure or Final Remedy	0%	3%	8%

95 Percent Confidence Intervals for Exhibit 2-3: Implementation of Voluntary Corrective Action by Lead Agency

		Lower Bound	Point Estimate	Upper Bound
As Percent of Total Universe				
Voluntary Corrective Action	EPA Lead	12%	32%	53%
	State Lead	6%	22%	37%
	Joint Lead	0%	2%	4%
No Voluntary Corrective Action	EPA Lead	0%	16%	32%
	State Lead	4%	21%	38%
	Joint Lead	0%	0%	1%
Voluntary Corrective Action - Unknown	EPA Lead	0%	4%	11%
	State Lead	0%	1%	1%
	Joint Lead	0%	2%	6%
As Percent of "Lead Universe"				
Voluntary Corrective Action	EPA Lead	23%	62%	100%
	State Lead	14%	50%	86%
	Joint Lead	0%	41%	92%
No Voluntary Corrective Action	EPA Lead	0%	31%	61%
	State Lead	9%	49%	89%
	Joint Lead	0%	9%	22%
Voluntary Corrective Action - Unknown	EPA Lead	0%	7%	21%
	State Lead	0%	1%	2%
	Joint Lead	0%	50%	149%

95 Percent Confidence Intervals for Exhibit 2-4: Number of Units Per Facility

Units	As a Percent of Total Universe			As a Percent of Universe Reporting Unit Number		
	Lower Bound	Point Estimate	Upper Bound	Lower Bound	Point Estimate	Upper Bound
Less than 5	5%	26%	48%	6%	29%	52%
5 to 9	13%	31%	49%	14%	33%	53%
10 - 25	2%	24%	45%	2%	26%	49%
More than 25	6%	12%	18%	6%	13%	19%

95 Percent Confidence Intervals for Exhibit 2-7: RCAID Facilities by Region, State, and Lead Agency[a]

Lead Agency	Lower Bound	Point Estimate	Upper Bound
EPA	30%	52%	75%
State	21%	43%	66%
Joint	0%	4%	9%

[a] Exhibit 2-8 presents the results by state and Region. This exhibit reports overall confidence intervals.

95 Percent Confidence Intervals for Exhibit 2-9: Land Use at RCAID Facilities

Category		Lower Bound	Point Estimate	Upper Bound
Primary On-Site Land Use	**Industrial**	**72%**	**87%**	**100%**
	Commercial	**0%**	**11%**	**27%**
	Unknown/No Data	**0%**	**1%**	**4%**
Other On-Site Land Use	**Industrial [a]**	**0%**	**15%**	**30%**
	Commercial	**0%**	**14%**	**29%**
	Residential	**2%**	**6%**	**11%**
	Recreational	**3%**	**7%**	**11%**
	Agricultural	**0%**	**1%**	**3%**
Primary Land Use Only[b]		**63%**	**79%**	**95%**
All On-Site Land Use	**Industrial**	**73%**	**88%**	**100%**
	Commercial	**3%**	**25%**	**47%**
	Residential	**2%**	**6%**	**11%**
	Recreational	**3%**	**7%**	**11%**
	Agricultural	**0%**	**1%**	**3%**
½ Mile Radius Land Use	**Industrial**	**35%**	**52%**	**68%**
	Commercial	**54%**	**71%**	**89%**
	Residential	**37%**	**60%**	**82%**
	Recreational	**9%**	**31%**	**52%**
	Agricultural	**5%**	**12%**	**19%**

[a] Includes 121 facilities (14%) with Industrial selected as Primary Use and Other Use.

[b] Includes facility (with weight of 8.67) whose respondent did not answer the Primary Land Use question.

95 Percent Confidence Intervals for Exhibit 3-1: Primary Areas of Concern for Extrapolated RCAID Facilities

Area of Concern	Lower Bound	Point Estimate	Upper Bound
Spill Area	31%	54%	77%
Landfill	12%	35%	58%
Surface Impoundment	11%	27%	43%
Underground Tank	4%	26%	48%
Aboveground Tank	0%	11%	26%
Waste Pile	0%	5%	11%
Sewer	0%	3%	7%
Container/Container Storage Area	0%	3%	6%
Land Treatment Unit	0%	0%	1%
Other	8%	19%	29%

95 Percent Confidence Intervals for Exhibit 3-2: Media Contaminated at RCAID, GPRA, and NPL Sites

Media	Lower Bound	RCAID Point Estimate	Upper Bound
Soil	98%	99%	100%
Ground Water	77%	91%	100%
Sediment	9%	31%	53%
Surface Water	1%	22%	42%
Air	0%	5%	13%

95 Percent Confidence Intervals for Exhibit 3-3: Media Contaminated and Migration of Contamination Beyond the Facility Boundary

Media	Facilities with Off-site Migration via Specific Media					
	Lower Bound		Point Estimate [a]		Upper Bound	
	Number	Percent	Number	Percent	Number	Percent
Surface Water	0	0%	158	81%	337	174%
Air	0	0%	34	76%	79	178%
Ground Water	191	24%	392	49%	592	73%
Sediment	0	0%	130	48%	269	99%
Soil	0	0%	60	7%	126	14%

[a] Point estimate is for facilities with off-site contamination reported via specified media.

95 Percent Confidence Intervals for Exhibit 3-4: Migration of Contamination Beyond the Facility Boundary and Land Use Within One-half Mile

Land Use	Migration Beyond Facility Boundary	Percent of Total Universe			Number in Total Universe		
		Lower Bound	Point Estimate	Upper Bound	Point Estimate	Lower Bound	Upper Bound
Industrial	Migration	15%	33%	50%	291	135	447
	No Migration	3%	13%	24%	119	27	212
	Unknown	0%	5%	13%	48	0	116
Commercial	Migration	19%	42%	64%	372	171	573
	No Migration	3%	24%	46%	216	22	409
	Unknown	0%	5%	13%	47	0	116
Residential	Migration	10%	26%	42%	233	90	376
	No Migration	2%	23%	45%	207	15	399
	Unknown	0%	10%	24%	89	0	215
Recreational	Migration	0%	15%	31%	136	0	272
	No Migration	0%	9%	24%	84	0	210
	Unknown	0%	6%	14%	54	0	124
Agricultural	Migration	0%	8%	15%	70	9	131
	No Migration	0%	3%	7%	28	0	66
	Unknown	0%	1%	3%	9	0	26

95 Percent Confidence Intervals for Exhibit 3-5 and Preceding Text: Number of Types of Contaminants at RCAID Facilities

Contaminant Type	Lower Bound	Point Estimate	Upper Bound
VOCs	77%	84%	90%
SVOCs	19%	41%	63%
Metals	7%	23%	39%
PCBs	0%	10%	24%
Pesticides	0%	5%	11%
Other	6%	22%	37%
No Classes	0%	0%	1%
1 Class	30%	51%	72%
2 Classes	3%	17%	31%
3 Classes	5%	25%	44%
4 Classes	0%	5%	10%
5 Classes	0%	1%	3%

95 Percent Confidence Intervals for Exhibit 3-6: Comparison of Contaminant Groups for All Contaminated Media at RCAID and Superfund NPL Sites

Contaminant Group	Lower Bound	RCAID Point Estimate	Upper Bound
VOCs Only	15%	36%	58%
VOCs/SVOCs	7%	29%	51%
VOCs/Metals/SVOCs	3%	10%	16%
VOCs/Metals	0%	8%	22%
SVOCs Only	4%	6%	7%
Other	0%	6%	12%
Metals Only	4%	5%	5%
Metals/SVOCs	0%	0%	1%

95 Percent Confidence Intervals for DNAPLs and LNAPLs (text following Exhibit 3-6)[a]

	Lower Bound	Point Estimate	Upper Bound
DNAPLs	15%	39%	53%
LNAPLs	12%	37%	62%
Both	5%	24%	43%

[a] Data exclude facilities for which the answer was unknown.

95 Percent Confidence Interval for Exhibit 3-7: Distance to Surface Water from Facility Boundary

Distance of Surface Water From Facility Boundary	Lower Bound	Point Estimate	Upper Bound
Adjacent	19%	38%	57%
Within 1/4 mile	3%	20%	36%
1/4 mile to 1 mile	3%	23%	43%
1 to 2 miles	0%	14%	33%
Over 2 miles	0%	3%	7%
Non-Response	0%	3%	8%
Readjusted Percents to Exclude Non-Responses			
Adjacent	19%	39%	58%
Within 1/4 mile	4%	21%	38%
1/4 mile to 1 mile	3%	24%	44%
1 to 2 miles	0%	14%	34%
Over 2 miles	0%	3%	7%

95 Percent Confidence Interval for Text Following Exhibit 3-7

Closest Surface Water Body	Lower Bound	Point Estimate	Upper Bound
Source of Drinking Water	0%	14%	30%

95 Percent Confidence Intervals for Exhibit 4-1: Innovative Site Characterization

Technique Used	Lower Bound	Point Estimate	Upper Bound
Use Innovative	12%	28%	43%
Direct Push Sampling	9%	15%	21%
On-Site GC/MS	3%	9%	15%
X-ray Flourescence	0%	6%	12%
Assay Kits	0%	4%	9%

95 Percent Confidence Intervals for Phased Corrective Action Text in Section 4.A.2

	Lower Bound	Point Estimate	Upper Bound			
Any Phased Approach	48%	70%	92%			
Phased RFI	38%	60%	82%			
Phased CMS	0%	13%	28%			
Phased Implementation	9%	30%	50%			
		As Percent of Total		**Percent of Specified Group**		
	Lower Bound	**Point Estimate**	**Upper Bound**	**Lower Bound**	**Point Estimate**	**Upper Bound**
Used Phased/Low Priority	0%	3%	9%	0%	100%	100%
Used Phased/Medium Priority	0%	4%	12%	0%	82%	100%
Used Phased/High Priority	21%	45%	68%	31%	65%	99%
Used Phased/State Lead	14%	36%	59%	32%	84%	100%
Used Phased/Joint Lead	0%	4%	8%	0%	94%	100%
Used Phased/EPA Lead	8%	30%	52%	15%	57%	100%

95 Percent Confidence Intervals for Text in Section 4.A.3

	Lower Bound	Point Estimate	Upper Bound
Facilities Completing CMS	37%	55%	74%
Facilities Using Superfund Presumptive Remedy Guidance	0%	14%	34%
Facilities Considered Using Superfund Presumptive Remedy Guidance, but Found it Inapplicable	0%	8%	17%
Facilities Unaware of or Did Not Know that Superfund Presumptive Remedy Guidance Could Be Used	3%	19%	35%

95 Percent Confidence Intervals for Text Prior to Exhibit 4-2

Type of Action Level	Lower Bound	Point Estimate	Upper Bound
State	8%	29%	50%
Regional	1%	18%	35%
Subpart S	0%	17%	34%
Site-Specific	0%	14%	28%
Other	1%	7%	13%
Total Use of Action Levels	34%	58%	82%

95 Percent Confidence Intervals for Exhibit 4-2: Use of Action Levels Across Media Types

Media	Lower Bound	Point Estimate	Upper Bound
Soil	30%	54%	78%
Ground Water	20%	38%	56%
Surface Water	0%	13%	29%
Sediments	1%	12%	23%
Air	0%	1%	2%

95 Percent Confidence Intervals for Exhibit 4-3: Methods of Public Participation at RCAID Facilities[a]

Mechanism	As Percent of Total Universe			As Percent of Universe Using Public Participation		
	Lower Bound	Point Estimate	Upper Bound	Lower Bound	Point Estimate	Upper Bound
Meetings	4%	21%	38%	5%	25%	45%
Announcements	27%	45%	63%	32%	53%	75%
Hearings	5%	15%	25%	6%	18%	30%
Fact Sheets	17%	33%	50%	20%	40%	59%
Mailings	15%	33%	50%	18%	39%	59%
Repository	11%	33%	55%	13%	40%	66%
Multilingual	0%	2%	7%	0%	3%	8%
Door to Door	0%	3%	7%	0%	3%	8%
Other	13%	36%	59%	16%	43%	71%

[a] These data include facilities without a final remedy selected. Exhibit 4-3, in contrast, includes only facilities with a final remedy selected.

95 Percent Confidence Intervals for Exhibit 4-4: Institutional Controls at RCAID Facilities

Mechanism	Lower Bound	Point Estimate	Upper Bound
Monitoring	15%	40%	65%
Restrictive Covenants	14%	39%	64%
On-Site Use Restrictions	7%	32%	57%
Access Restrictions	7%	28%	49%
Notices	7%	25%	43%
Off-Site Use Restrictions	0%	9%	26%

95 Percent Confidence Intervals for Exhibit 5-2: Estimated Cleanup Costs at RCAID Facilities

Total Cost	Lower Bound	Point Estimate	Upper Bound
Less than $1 million	10%	32%	53%
$1 million to $5 million	0%	24%	49%
$5 million to $10 million	0%	13%	31%
$10 million to $25 million	1%	20%	39%
$25 million to $50 million	0%	2%	5%
Over $50 million	2%	9%	16%

95 Percent Confidence Intervals for Exhibit 5-4: Corrective Action Costs and Number of Contaminant Types

Number of Contaminant Types	Cost of Corrective Action	As Percent of Total Universe			As Percent of Contaminant Group		
		Lower Bound	Point Estimate	Upper Bound	Lower Bound	Point Estimate	Upper Bound
0	NA/NR	0%	0%	1%			
1	Less than $1M	8%	25%	43%	20%	67%	100%
	$1-5M	0%	5%	11%	0%	14%	30%
	$5-10M	0%	2%	5%	0%	4%	12%
	$10-25M	0%	5%	11%	0%	12%	29%
	Over $50M	0%	1%	3%	0%	3%	8%
	NA/NR	0%	14%	30%			
2	Less than $1M	0%	2%	5%	0%	11%	28%
	$1-5M	0%	0%	0%	0%	1%	2%
	$5-10M	0%	4%	9%	0%	26%	55%
	$10-25M	0%	1%	1%	0%	4%	8%
	$25-50M	0%	2%	5%	0%	11%	28%
	Over $50M	0%	8%	22%	0%	49%	100%
3	$1-5M	0%	7%	21%	0%	28%	84%
	$5-10M	0%	9%	23%	0%	35%	92%
	$10-25M	0%	7%	20%	0%	28%	81%
	Over $50M	0%	2%	6%	0%	9%	25%
4	$5-10M	0%	0%	0%	0%	2%	7%
	$10-25M	0%	0%	1%	0%	7%	17%
	$25-50M	0%	2%	5%	0%	36%	100%
	Over $50M	0%	3%	7%	0%	55%	100%
5	$10-25M	0%	1%	3%	0%	85%	100%
	Over $50M	0%	0%	1%	0%	15%	44%
	NA/NR	0%	0%	0%			

95 Percent Confidence Intervals for Exhibit 5-5: Higher Cost Cleanups Are More Likely to Have Off-Site Contamination

Cleanup Costs	Lower Bound	Point Estimate	Upper Bound
Facilities with Off-Site Contamination as a Percent of Total Universe			
Less than $1M	0%	8%	17%
$1-5M	0%	12%	27%
$5-10M	0%	8%	22%
$10-25M	0%	12%	27%
$25-50M	0%	2%	5%
Over $50M	0%	4%	9%
NA/NR	0%	4%	9%
Facilities with Off-Site Contamination as a Percent of Relevant Cost Group			
Less than $1M	0%	29%	62%
$1-5M	0%	57%	100%
$5-10M	0%	71%	100%
$10-25M	0%	70%	100%
$25-50M	0%	100%	100%
Over $50M	0%	49%	100%
NA/NR	0%	26%	60%

95 Percent Confidence Intervals for Exhibit 5-6: Corrective Action Costs for Facilities with Various On-Site Land Uses

	As a Percent of Total Universe			As a Percent of Land Use Universe That Reported Cost		
	Lower Bound	Point Estimate	Upper Bound	Lower Bound	Point Estimate	Upper Bound
Industrial Land Use						
Less than $1M	0%	17%	34%	0%	23%	45%
$1-5M	0%	20%	41%	0%	27%	55%
$5-10M	0%	11%	26%	0%	15%	34%
$10-25M	0%	17%	33%	0%	23%	44%
$25-50M	0%	2%	5%	0%	2%	7%
Over $50M	0%	8%	14%	0%	10%	19%
NA/N	0%	13%	30%			
Commercial Land Use						
Less than $1M	0%	10%	25%	0%	41%	100%
$1-5M	0%	0%	1%	0%	2%	6%
$5-10M	0%	7%	21%	0%	29%	85%
$10-25M	0%	3%	8%	0%	14%	32%
$25-50M	0%	12%	5%	0%	6%	18%
Over $50M	0%	2%	6%	0%	9%	25%
NA/NR	0%	0%	0%			
Residential Land Use						
Less than $1M	0%	0%	0%	0%	0%	0%
$1-5M	0%	0%	0%	0%	0%	0%
$5-10M	0%	0%	0%	0%	0%	0%
$10-25M	0%	2%	6%	0%	35%	100%
$25-50M	0%	0%	0%	0%	0%	0%
Over $50M	0%	4%	9%	0%	65%	100%
NA/NR	0%	0%	0%			
Recreational Land Use						
Less than $1M	0%	0%	0%	0%	0%	0%
$1-5M	0%	0%	0%	0%	0%	0%
$5-10M	0%	0%	0%	0%	0%	0%
$10-25M	0%	2%	6%	0%	33%	95%
$25-50M	0%	0%	0%	0%	0%	0%
Over $50M	0%	5%	9%	0%	67%	100%
NA/NR	0%	0%	0%			
Agricultural						
Less than $1M	0%	0%	0%	0%	0%	0%
$1-5M	0%	0%	0%	0%	0%	0%
$5-10M	0%	0%	0%	0%	0%	0%
$10-25M	0%	0%	0%	0%	0%	0%
$25-50M	0%	0%	0%	0%	0%	0%
Over $50M	0%	1%	3%	0%	100%	100%
NA/NR	0%	0%	0%			

95 Percent Confidence Intervals for Exhibit 5-7: Cost and Time Required to Complete Corrective Action[a]

Cost	Time to Complete (in Years)	Lower Bound	Point Estimate	Upper Bound	Lower Bound	Point Estimate	Upper Bound
		As Percent of All Responses			As Percent of Cost Category		
Less than $1M	Less than 5 years	3%	20%	37%	9%	73%	100%
	5 to 10 yrs	0%	4%	11%	0%	13%	44%
	11 to 30 years	0%	0%	1%	0%	1%	3%
	NA/NR	0%	3%	8%	0%	13%	35%
$1 to 5M	Less than 5 years	0%	2%	5%	0%	10%	25%
	5 to 10 yrs	0%	9%	23%	0%	46%	100%
	11 to 30 years	0%	9%	23%	0%	44%	100%
$5 to 10M	5 to 10 yrs	0%	2%	5%	0%	17%	45%
	11 to 30 years	0%	9%	23%	0%	80%	100%
	More than 30 years	0%	0%	1%	0%	3%	8%
$10 to 25M	Less than 5 years	0%	2%	6%	0%	12%	36%
	5 to 10 yrs	0%	3%	7%	0%	15%	39%
	11 to 30 years	0%	3%	6%	0%	15%	35%
	More than 30 years	0%	10%	24%	0%	58%	100%
$25 to 50M	5 to 10 yrs	0%	0%	0%	0%	6%	19%
	More than 30 years	0%	2%	5%	0%	94%	100%
More than $50M	5 to 10 yrs	0%	2%	6%	0%	28%	79%
	11 to 30 years	0%	4%	9%	0%	49%	100%
	More than 30 years	0%	2%	4%	0%	23%	49%
NA/NR	5 to 10 yrs	0%	7%	21%	0%	47%	100%
	11 to 30 years	0%	0%	0%	0%	1%	3%
	More than 30 years	0%	4%	11%	0%	25%	72%
	NA/NR	0%	4%	9%	0%	27%	60%

[a] Unlike Exhibit 5-7, this exhibit includes non-responses and unknown responses.

95 Percent Confidence Intervals for Exhibit 5-8: Time to Complete Corrective Action by Media Contaminated

Media Contaminated	Time to Complete (Years)	As Percent of Total Universe			As Percent of Media Group		
		Lower Bound	Point Estimate	Upper Bound	Lower Bound	Point Estimate	Upper Bound
Soil	Less than 5	5%	24%	42%	6%	26%	45%
	5 to 10	5%	27%	48%	5%	29%	52%
	11 to 30	9%	24%	40%	10%	27%	43%
	More than 30	1%	17%	34%	1%	19%	37%
	NA/UK	0%	7%	14%			
Ground Water	Less than 5	1%	17%	34%	1%	20%	39%
	5 to 10	5%	27%	48%	6%	31%	56%
	11 to 30	9%	24%	40%	11%	29%	46%
	More than 30	1%	17%	34%	1%	20%	39%
	NA/UK	0%	5%	11%			
Surface Water	5 to 10	0%	3%	8%	0%	13%	36%
	11 to 30	0%	10%	25%	0%	48%	115%
	More than 30	0%	8%	22%	0%	38%	100%
	NA/UK	0%	0%	0%			
Sediment	Less than 5	0%	2%	7%	0%	8%	23%
	5 to 10	0%	5%	11%	0%	16%	37%
	11 to 30	0%	14%	30%	0%	46%	96%
	More than 30	0%	9%	23%	0%	30%	74%
	NA/UK	0%	0%	0%			
Air	11 to 30	0%	0%	1%	0%	9%	21%
	More than 30	0%	4%	11%	0%	91%	265%
	NA/UK	0%	1%	3%			

95 Percent Confidence Intervals for Exhibit 5-9: Time to Complete Corrective Action by Number of Contaminant Types

Number of Contaminants	Time to Complete (Years)	As Percent of Total Universe			As Percent of Contaminant Group		
		Lower Bound	Point Estimate	Upper Bound	Lower Bound	Point Estimate	Upper Bound
5	11 to 30	0%	1%	3%	0%	91%	100%
	More than 30	0%	0%	0%	0%	9%	27%
4	5 to 10	0%	2%	6%	0%	48%	100%
	11 to 30	0%	0%	1%	0%	9%	20%
	More than 30	0%	2%	5%	0%	42%	100%
3	5 to 10	0%	0%	1%	0%	2%	4%
	11 to 30	3%	17%	32%	11%	71%	100%
	More than 30	0%	7%	20%	0%	27%	81%
2	Less than 5	0%	2%	5%	0%	12%	32%
	5 to 10	0%	9%	23%	0%	59%	100%
	11 to 30	0%	3%	6%	0%	20%	41%
	More than 30	0%	1%	3%	1%	9%	17%
	NA/UK	0%	1%	4%			
1	Less than 5	13%	22%	31%	29%	47%	66%
	5 to 10	0%	15%	31%	0%	32%	67%
	11 to 30	0%	2%	6%	0%	5%	14%
	More than 30	0%	7%	16%	0%	16%	34%
	NA/UK	0%	5%	12%			
Non-Response	NA/UK	0%	0%	1%			

95 Percent Confidence Intervals for Exhibit 5-10: Relationship Between Off-Site Contamination and Time to Complete Remedy

Time (in Years)	Off-Site Contamination	As Percent of Total Universe			As Percent of Time Group, Excluding Unknown Responses		
		Lower Bound	Point Estimate	Upper Bound	Lower Bound	Point Estimate	Upper Bound
Less than 5	Migration	1%	3%	5%	6%	22%	38%
	No Migration	0%	10%	24%	0%	77%	100%
	Unknown	0%	12%	27%			
5 to 10	Migration	0%	9%	18%	0%	33%	68%
	No Migration	0%	18%	38%	0%	67%	100%
11 to 30	Migration	4%	19%	34%	19%	92%	100%
	No Migration	0%	2%	5%	0%	8%	22%
	Unknown	0%	4%	8%			
More than 30	Migration	0%	13%	28%	0%	77%	100%
	No Migration	0%	4%	11%	0%	23%	63%
	Unknown	0%	0%	1%			
NR/UK	Migration	0%	5%	11%	0%	71%	100%
	No Migration	0%	2%	6%	0%	29%	87%

B. Statistics on Selected Correlations

This section presents the results of five statistical analyses of the RCAID data. The results of some of these analyses were not presented in the main report because of the inaccuracy of the problems with the data on whether the facility had selected a final remedy versus only implemented corrective measures.

1. Logistic regression to predict final remedy selection as a function of NCAPS ranking, risk assessments conducted, media contamination, migration of contamination off-site, and drinking water threats

```
pweight:  weight                                  Number of obs    =        65
Strata:   strata                                  Number of strata =        18
PSU:      <observations>                          Number of PSUs   =        65
                                                  Population size  =    888.89
                                                  F(  10,     38)  =      4.84
                                                  Prob > F         =    0.0002

------------------------------------------------------------------------------
       final |      Coef.    Std. Err.       t     P>|t|      [95% Conf. Interval]
-------------+----------------------------------------------------------------
        high |  -.1724466    1.323476     -0.130   0.897     -2.834936    2.490043
      medium |  -2.253288    1.564637     -1.440   0.156     -5.400932     .894356
         low |   3.322215    2.370827      1.401   0.168     -1.447273    8.091703
    mediasoi |   2.377857     3.54077      0.672   0.505     -4.745253    9.500967
    mediagro |  -2.596987    1.333773     -1.947   0.058     -5.280192    .0862175
    mediasur |   6.075184    1.826851      3.325   0.002      2.400034    9.750334
    mediased |  -4.302337    1.833824     -2.346   0.023     -7.991515   -.6131587
     migrate |  -2.542119    1.024937     -2.480   0.017     -4.604026   -.4802107
       dwact |  -.5418642    1.161439     -0.467   0.643     -2.878377    1.794649
       dwpot |   2.558742    .6734158      3.800   0.000      1.204004     3.91348
       _cons |   .8641719    3.290446      0.263   0.794     -5.755352    7.483696
------------------------------------------------------------------------------
```

2. Logistic regression to predict interim remedies as a function of NCAPS ranking, risk assessments conducted, media contamination, migration of contamination off-site, and drinking water threats

```
pweight:  weight                                  Number of obs    =        65
Strata:   strata                                  Number of strata =        18
PSU:      <observations>                          Number of PSUs   =        65
                                                  Population size  =    888.89
                                                  F(   9,     39)  =      1.32
                                                  Prob > F         =    0.2578

------------------------------------------------------------------------------
      interim |      Coef.    Std. Err.       t     P>|t|      [95% Conf. Interval]
--------------+----------------------------------------------------------------
         high |    .454192    1.293625      0.351   0.727     -2.148245    3.056629
       medium |   1.522372      1.9451      0.783   0.438     -2.390665    5.435409
          low |  -2.949556    1.811119     -1.629   0.110     -6.593057    .6939457
     mediagro |    2.31666    1.564134      1.481   0.145     -.8299714    5.463291
     mediasur |  -2.444618     1.95981     -1.247   0.218     -6.387247     1.49801
     mediased |    2.21844    1.342372      1.653   0.105     -.4820638    4.918944
      migrate |   1.082799    1.677337      0.646   0.522     -2.291567    4.457166
        dwact |   1.017687    1.823373      0.558   0.579     -2.650466    4.685839
        dwpot |  -.8763499    1.049153     -0.835   0.408     -2.986973    1.234274
        _cons |  -1.379185    1.235438     -1.116   0.270     -3.864566    1.106196
------------------------------------------------------------------------------
```

3. Logistic regression to predict final remedies as a function of unit type, media contamination, and results of unit-specific risk assessments

```
                                                  Number of obs   =        144
                                                  LR chi2(12)     =      28.48
                                                  Prob > chi2     =     0.0047
Log likelihood = -85.075018                       Pseudo R2       =     0.1434

------------------------------------------------------------------------------
       final |      Coef.   Std. Err.       z     P>|z|       [95% Conf. Interval]
-------------+----------------------------------------------------------------
    landfill |   .1233124   .4922455      0.251   0.802       -.841471    1.088096
     gwplume |   .3333772   .6204771      0.537   0.591      -.8827356     1.54949
          si |   .3202997   .7061848      0.454   0.650      -1.063797    1.704397
        soil |   .6826962   .4993296      1.367   0.172      -.2959717    1.661364
          gw |  -.3227442   .4614282     -0.699   0.484      -1.227127    .5816385
          sw |  -.2722762   .7318916     -0.372   0.710      -1.706757    1.162205
    sediment |  -.2737721   .6832943     -0.401   0.689      -1.613004     1.06546
    lordnapl |  -1.424613   .4370073     -3.260   0.001      -2.281132   -.5680943
    onactual |   18.88888   1.133257     16.668   0.000       16.66774    21.11002
    onpotent |   .1811314   .5341305      0.339   0.735      -.8657452    1.228008
    offactua |  -19.40771          .          .       .              .           .
    offpoten |  -.6588305    .774837     -0.850   0.395      -2.177483     .859822
       _cons |   .2959715   .5537268      0.535   0.593      -.7893131    1.381256
------------------------------------------------------------------------------
```

4. Logistic regression to predict interim remedies as a function of unit type, media contamination, and results of unit-specific risk assessments

```
Logit estimates                                   Number of obs   =        144
                                                  LR chi2(9)      =      28.07
                                                  Prob > chi2     =     0.0009
Log likelihood = -85.276956                       Pseudo R2       =     0.1413

------------------------------------------------------------------------------
       final |      Coef.   Std. Err.       z     P>|z|       [95% Conf. Interval]
-------------+----------------------------------------------------------------
        soil |   .5699355   .4405577      1.294   0.196      -.2935417    1.433413
          gw |  -.2217478   .4160629     -0.533   0.594      -1.037216    .5937205
          sw |  -.3083693   .7174689     -0.430   0.667      -1.714582    1.097844
    sediment |   -.280111   .6592704     -0.425   0.671      -1.572257    1.012035
    lordnapl |  -1.420118   .4314527     -3.291   0.001      -2.265749   -.5744858
    onactual |   18.91017   1.093184     17.298   0.000       16.76757    21.05277
    onpotent |   .1757163   .5225478      0.336   0.737      -.8484586    1.199891
    offactua |  -19.31944          .          .       .              .           .
    offpoten |  -.5919204   .7639986     -0.775   0.438       -2.08933    .9054894
       _cons |   .4368815   .5004941      0.873   0.383       -.544069    1.417832
------------------------------------------------------------------------------
```

5. Logistic regression to predict use of institutional controls as a function of lead agency and NCAPS ranking

```
pweight:  weight                                  Number of obs    =        65
Strata:   strata                                  Number of strata =        18
PSU:      <observations>                          Number of PSUs   =        65
                                                  Population size  =    888.89
                                                  F(   5,     43)  =      2.17
                                                  Prob > F         =    0.0751

------------------------------------------------------------------------------
controls |      Coef.    Std. Err.       t     P>|t|      [95% Conf. Interval]
---------+--------------------------------------------------------------------
 epalead |   3.801586    2.012852      1.889   0.065     -.2477493    7.850922
statelea |   3.171903    1.702944      1.863   0.069     -.2539793    6.597785
    high |  -.5361298    1.143192     -0.469   0.641     -2.835936    1.763676
  medium |  -3.940132    1.550097     -2.542   0.014     -7.058526   -.8217389
     low |   1.270705    1.513688      0.839   0.405     -1.774442    4.315852
   _cons |  -3.052824    1.888291     -1.617   0.113     -6.851575    .7459265
------------------------------------------------------------------------------
```