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UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION IX
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MCAS EL TORO
SSIC # 5090.3

26 August 1993

Andy Piszkin
Remedial Project Manager
Naval Facilities Engineering Command
Southwest Division
Code 1811
1220 Pacific Highway
San Diego, California 92132-5181

Subject: Comments on Jacobs Engineering Group, Inc. Position Papers dated August 6, 11, and 12, 1993 for Draft Phase II Work Plan for OUs 2 and 3

Dear Mr. Piszkin:

This letter transmits EPA's comments on Jacobs Engineering Group, Inc. Position Papers for Draft Phase II Work Plan. Also included for your information, is EPA's most current (9/93) Data Quality Objectives Process Guidance for Superfund: Fact Sheet. We hope you find these comments useful.

If you have any questions regarding this subject or if you wish to discuss other matters related to the RI/FS, please contact me at (415) 744-2391.

Sincerely,

John Hamill
Remedial Project Manager

Attachment

cc: Lt. Commander Larry Serafini, USMCAS El Toro
Joe Zarnoch, DTSC
John Broderick, RWQCB
John Dolegowski, CH2MHILL

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Marine Corps Air Station El Toro (MCAS El Toro) Submittal of Draft Technical Review Comments Pertaining to the MCAS El Toro Position Papers by Jacobs Engineering Group, Inc.

Comments on "Chemicals to be Investigated During Phase II (Surface Soils)" by Jacobs Engineering Group, Inc.

JEG Document Control #CLE-C01-01F245-G2-0161

The process used to drive the RBCs is not part of this review.

The first step for the identification of chemicals for Phase II investigation involves the comparison to background for naturally occurring constituents. This would be appropriate only if the spatial variability of the constituents in the area has been characterized.

COPCs that are not identified for investigation at a particular site or stratum by the process described in the memo may still be investigated during Phase II. The memo says that a separate method will be used to select COPC that may pose an environmental risk. It does not mention what methods or criteria will be used to select COPC posing environmental risks.

Comments on "OU-1 Regional Groundwater VOC Contamination Ability to Proceed with the OU-1 FS Based on the Phase I RI Data" by Jacobs Engineering Group, Inc.

JEG Document Control #CLE-C01-01F145-G2-0162

Since high TCE concentrations in shallow groundwater have been observed, it appears that the site is a potential source area. Therefore, hydraulic containment and extraction of the shallow on-Station TCE plume is appropriate to minimize the areal extent between the source area and the Desalter extraction wells that could be further contaminated with higher levels of TCE.

Comments on "Establishment of Cutpoints for Inorganics in Groundwater, Sediments, and Surface Water" by Jacobs Engineering Group, Inc.

JEG Document Control #CLE-C01-01F245-G2-0163

The memo uses the term "inorganics" for naturally occurring constituents. As long as a constituent (inorganic or organic) can be naturally occurring, determination of its background level becomes an issue. For example, some phenol compounds can be naturally occurring and they are commonly seen in groundwater impacted by leachate from landfills. Characterization of background levels for phenols becomes necessary when determining if phenols are derived from site-related activities.

The memo discusses the problems of establishing background values for naturally occurring constituents in groundwater due to the complexity of the geochemistry and the high variability of the data. We agree that it may be difficult to establish cutpoints for the naturally occurring constituents.

It is proposed that data for naturally occurring constituents in sediment in the washes be compared to the background concentrations developed for surface soil. This would be appropriate only if the spatial variability of naturally occurring constituents in surface soil in the area has been characterized.

Comments on "Establishment of Cutpoints During the Data Quality Objectives Process" by Jacobs Engineering Group, Inc.

JEG Document Control #CLE-C01-01F245-G2-0165

The memo proposes that individual cutpoints not be established, instead, baseline risk assessment and feasibility study be employed to evaluate the remediation of sites. Because of the limited detection of VOCs in the vadose zone soil samples collected during Phase I of the RI, the current contaminant data of the vadose zone may not be sufficient for risk baseline assessment or feasibility study if the hot spots in the vadose zone have been missed.

Comments on "Phase II: Ecological Issues" by Jacobs Engineering Group, Inc.

JEG Document Control #CLE-C01-01F145-G2-0164

No fatal flaws in the approach used to identify COPCs for the assessment of ecological risk were found. However, the following three items may require action: 1) Why weren't birds included? 2) How was dose calculated for mammalian species? and 3) How were sediment criteria developed? Perhaps memos addressing the last two questions are in order.

EL TORO NAVAL BASE
COMMENTS ON STATISTICAL DESIGN FOR THE PHASE II SAMPLING PLAN

The following summarizes comments on Bruce Peterson's August 11 1993 memorandum.

•The proposed sampling approach seems to be sound but further clarifications are needed on specific aspects of the methodology presented in the position paper.

•The two objectives of Phase II (base line risk assessment and delineation of patterns of contamination) could be addressed together by using a sampling approach that satisfies both objectives where possible, and in cases that cleaning the entire stratum is not consider a viable economic alternative.

•The final version of this document should be expanded to include discussion of the use of the Phase I findings that support the Phase II approach.

•In particular, uncertainties in the Phase I data should be presented and well understood before these data are used to draw any conclusions about theoretical distributions, real means, and standard deviations (and consequently CV's). Summary statistics for the Phase I data should be presented and discussed by stratum, and should include number of samples, mean, error estimates, and variability estimates for the COC's.

•The memorandum (page 1) states that "based on the sample values from a stratum, a distribution of values of the entire population of potential samples from a stratum is hypothesized. Since the number of samples collected from a stratum is relatively small there is uncertainty associated with this estimate. In fact an alternate population distribution of values could have yielded a similar set of sample values". Uncertainty is associated with both large and small samples. The point here should be that the Phase I samples are so small that the uncertainty in the data is very large. Also, what is meant by "similar"?

•More background information is needed on how the hypothesized and alternative distributions in Figures 1, 2, and 3 were constructed. Are these hypothetical cases based on hypothetical data given here just to clarify the concepts, or are they based on actual data? Are Figures 1, 2, and 3 based on the same data set? It appears there are some inconsistencies between these Figures. The discussion of the method is based on the assumption of lognormal distributions. It is not made clear whether the analytical results from the Phase I data support the assumption of lognormality or not. Also, it would be helpful to expand the discussion of Figure 3 to provide further clarification.

•The memorandum should state clearly where the discussion refers to the sample mean, the population mean, or the mean of the logarithms.

•The discussion based on the analysis of the Phase I data is not very clear. In particular, it is not clear how the sample specific risks were calculated. Clarification is needed on what contaminants and what concentrations are represented. Also, further discussion on Figure 4 is needed. The probability plot clearly shows that the assumption of lognormality for the risk distribution could be challenged. Several distributions are present in different ranges of the data. Analysis of variance is an excellent approach for assessing variability. Additional discussion of the implementation of the analysis of variance approach would be helpful.

•It is not clear why an MDRD of 5 was selected.

•It is not clear what degrees of freedom were used , and why, to select $t_{_(1)}$ and $t_{\beta(1)}$, The values of these parameters and consequently the number of samples can vary considerably for the same probability depending on the degrees of freedom used to select these parameters.

•Including an example of the approach using data from Phase I would be helpful.

Comments on "Chemicals to be Investigated During Phase II
Summary of Selection Procedures
Dated: 11 August 1993

JEG Document Control #: CLE-C01-01F145-G2-0167

Previously approved RI/FS project planning documents have specified that all non-detected chemicals would be investigated in Phase II (Final Work Plan, 2/91; Final FSP 2/91, FSP Amendment 8/92). Further, the statistical approach proposed is based on the assumption of homogeneity of contaminants within AOC's and/or strata. Documentation for the basis of the assumption has not been presented to date; rather, oral arguments were presented to the effect that the industrial processes related to each AOC, as well as waste disposal practices, were such that contaminants could be expected to be dispersed and detected in a homogeneous fashion.

What is needed from MCAS El Toro is documentation to provide confidence in these assumptions:

A.

1. What were the operations/industrial processes and disposal practices at each AOC/stratum?

2. Provide documentation.

3. What factors lead one to conclude that these processes and practices would result in contaminant homogeneity?

What is the uncertainty (in qualitative terms) in the above 3 items?

B.

1. What were the expected waste disposal practices at each AOC/stratum?

2. Provide documentation.

3. What factors lead one to conclude that these processes and practices would result in contaminant homogeneity?

4. What is the uncertainty associated in qualitative terms?

C.

1. What products were used, stored, released at each AOC/stratum?

2. What were the chemical constituents of these products and what were their total volumes?

3. Documentation.

4. What is the uncertainty associated in qualitative terms?

D.

1. What are the environmental fate and transport characteristics of the chemicals potentially released at each AOC/strata?

2. Documentation.

3. What factors leads one to conclude that the environmental fate and transport of contaminants over time will result in homogeneity?

4. What is the uncertainty associated in qualitative terms?

E.

1. What are the physical and chemical characteristics of each AOC/stratum? e.g., geology, topography, soil composition, pH, etc.

2. Documentation.

3. What factors would lead one to conclude that, over time, contamination at each AOC/stratum would be homogeneous.

4. What is the uncertainty associated in qualitative terms?

The statistical sampling approach is only valid under the assumption of contaminant homogeneity within each AOC/stratum. Therefore, strong documented evidence is necessary to support such an approach. Uncertainty caused by lack of documentation cannot be easily overcome.

If the assumption of homogeneity cannot be supported with documentation at any AOC/stratum all chemicals which the historical information shows were used, stored, and/or potentially released at that AOC/stratum should be retained in the RI Phase II investigation. Analytical laboratories should be instructed also to report all chemicals within the class for each analysis.

Technical Review: MCAS El Toro DQO Proposal for AOC 12, August, 1993

The DQO package for AOC 12 does not meet the intent of the EPA DQO process. The DQO process, regardless of what format is followed, should be designed to measure performance:

Did we do what we set out to do?

Of course, success depends on asking the right question in the first place.

It is not clear to the reviewer exactly what the problem is, what decision(s) will be made that addresses that problem, what will be done to measure success in making the decision(s).

While other formats are possible, the seven step EPA DQO process as shown in Figure 1 designs a scientific method for an investigation with a stated hypotheses, a means of testing that hypotheses, and a method of measuring success. The DQO's for AOC 12 do not in our opinion satisfy this objective.

The DQO's for AOC 12:

- do not contain a true performance measure of success;

- do not state what will be done;

- do not state exactly how to do it;

- the loose criteria given do not provide a valid way to measure success;

It is unclear which of the various sections in the document are equivalent to each of the seven steps in the EPA DQO process. However, much of the information provided is useful and the above mentioned criticisms can be readily addressed.

Specific Comments:

1. Page 1, 2nd paragraph

The physical features discussed as not identified in Figure A12.1.

2.Page 1, 3rd bullet

The large, dark stain is not shown in Figure A12.1.

3. Page 1, 3rd paragraph

The history should include the information resulting from the recent records search by representatives of DTSC and MCAS El Toro regarding AOC 12. How will that information alter DQO's at AOC 12?

4. Page 1, 4th paragraph

What criteria were used to divide the AOC into 3 strata?

5. Page 2, 1st bullet

Define near-surface soil samples.
Previously, 3 strata were identified. Here, sampling is said to have occurred in those strata and a "catch basin", which is not identified or located on a figure nor been discussed previously. Is this a 4th stratum?

6. Page 2, bullets

RI Phase 1 report lists "collecting sediment samples" as an activity. However, it is not listed here.

7. Page 2-3, Sampling results

The sampling regime differs from that presented previously at the top of page 2.
The sampling results differ from the results presented in the RI Phase 1 report. For example, some COPC do not appear: eg., 2-butanone is missing now from the stratum 1 results as are others in each strata.
Sediment sample results are missing.
Several chemical classes are shown as not having had any analyses performed, eg., SVOC's, pesticides, herbicides. Why not? Also, earlier discussion of suspected contamination at this AOC included only metals and not organics. Why were analyses done for organics?

8. Page 4, 1st sentence

How many sampling events have occurred to date? Results for Chloromethane are absent here.

9. Page 4, 2nd sentence

Why haven't concentrations been presented for these compounds while data is shown above for VOC's in groundwater?

10. Page 4, COPC

Criteria for background determinations should be presented or discussed here.
Background soil concentrations should be shown in tables.
No figures have been labeled A12.2, A12.3, A12.4, A12.5.

11. Page 4, Section A12.4

Does the discovery by DTSC/MCAS El Toro of information regarding AOC 12 cause a need to review the historic aerial photographs?

12. Page 5, Sections A12.5 and A12.6

No figures are labeled A12.6, A12.7 or A12.8.

13. Page 5, Section A12.7

What were the values used for each COPC to evaluate the "potential to leach" for each?
Which ARAR's were used, and for which COPC? What were the values used for each COPC?

14. Page 6, Problem Definition

This section appears to be analogous to Steps 2 and 5 in the EPA DQO process. What is missing is a logic statement: if....then....(action).

15. Page 7, 2nd paragraph

It appears that the DQO approach proposed leans heavily towards the Observational Approach method of investigation. Rather than proposing specifics performance measurement standards up front, collecting data, and then determining if the performance measurements have or have not been met, this proposal defers all until a later stage. That is, performance measurements are put off until the ROD and Remedial Design stages. Given that MCAS El Toro is slated for closure and parcels may be slated for sale, this long range observational approach may not be appropriate.

16. Page 8, Section A12.10

No comments since the design has not yet been submitted for review.

Note that a section corresponding to EPA DQO process Step six, Specify Limits on Uncertainty which was submitted by MCAS El Toro in a separate position paper has been reviewed by EPA and comments are attached.

FIGURE 1

United States Environmental Protection Agency

Office of Solid Waste And Emergency Response

Publication 9355.9-01FS
EPA/540/F-93-043
September 1993

EPA

DATA QUALITY OBJECTIVES PROCESS GUIDANCE FOR SUPERFUND: FACT SHEET

EPA Order 5360.1, entitled, *Policy and Program Requirements to Implement the Mandatory Quality Assurance Program,* establishes mandatory QA requirements for Agency environmental data collection activities. The National Oil and Hazardous Substances Pollution Contingency Plan (NCP) mandates specific Superfund QA requirements. Both documents emphasize two requirements. The first is that Superfund environmental data must be of known quality. Second, QA plans based on generic or site-specific procedures are required to obtain the first objective. The Office of Emergency and Remedial Response (OERR) has developed this fact sheet to promote the Data Quality Objective (DQO) Process Guidance Document for Superfund. The focus here is the development and implementation of a mandatory quality system which requires all Superfund activities to develop and operate management processes and structures for assuring that the data collected are of known quality. The DQO process is an effective means by which managers and technical staff may plan and design a more efficient QA plan and a more timely sampling and analysis program that is consistent with the integrated site assessment and accelerated response activities of the Superfund Accelerated Cleanup Model (SACM). Conforming to this guidance will help ensure that site managers generate data of known quality.

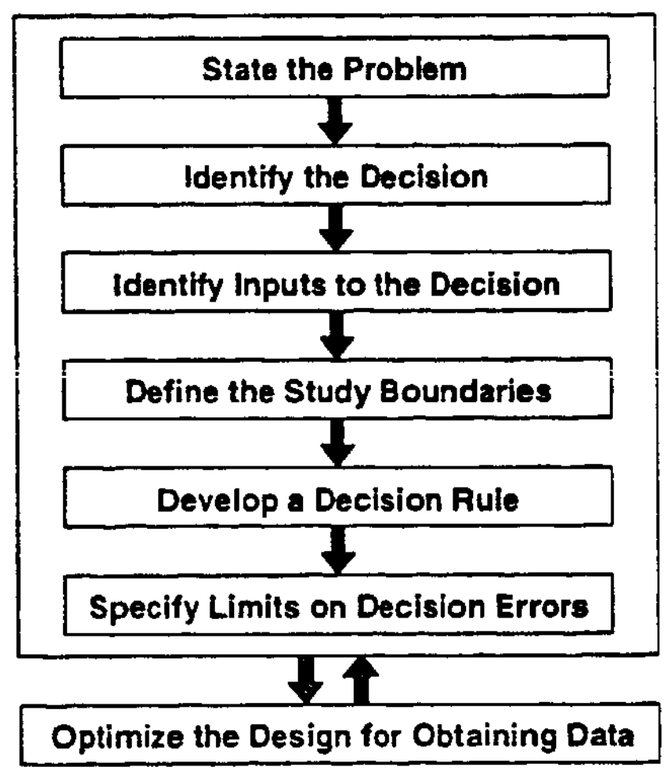


Figure 1. The DQO Process

This fact sheet describes the Interim Final "The Data Quality Objectives Process for Superfund (September 1993). This new guidance supersedes previous Superfund guidance on Data Quality Objectives (DQOs)[1]. This fact sheet also introduces the guidance for managing and conducting a data quality assessment and the DQO Decision Error Feasibility Trials software.

[1]Environmental Protection Agency (EPA). 1987. *Data Quality Objectives for Remedial Response Activities: Development Process* EPA/540/G-87/003.

What are DQOs? DQOs are qualitative and quantitative statements derived from the outputs of each step of the DQO Process that:

1) Clarify the study objective;
2) Define the most appropriate type of data to collect;
3) Determine the most appropriate conditions from which to collect the data; and
4) Specify acceptable levels of decision errors that will be used as the basis for establishing the quantity and quality of data needed to support the decision.

The DQOs are then used to develop a scientific and resource-effective sampling design.

What is the Data Quality Objective Process?

The DQO Process (presented in Figure 1) is a scientific and legally defensible data collection planning process to help users decide what **type, quality,** and **quantity** of data will be **sufficient** for environmental decision making.

What are the products of the DQO Process?

The products (outputs) of the DQO process are statements that define data quality criteria and sampling design performance specifications. The key data quality criteria state "how good" the data should be and are expressed as acceptable probabilities of decision errors. Other data quality criteria include the spatial and temporal boundaries of the study, and a precise statement of the environmental conditions that will be studied to determine the need for remedial or removal actions. Sampling design performance specification outputs include the sampling design method, the numbers and locations of samples and the sample collection method. More information on DQO outputs is presented in Figure 2.

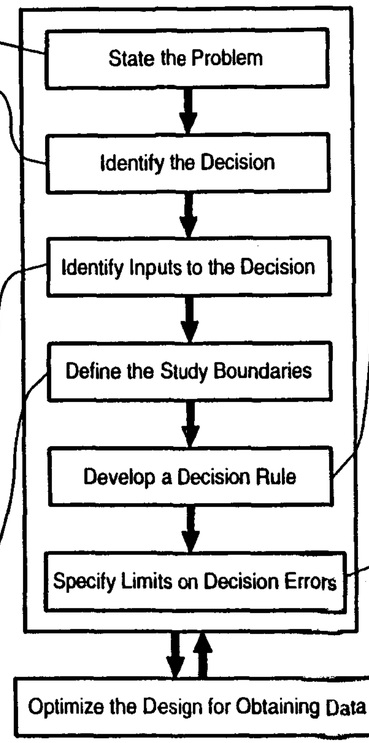
What are the benefits of using the DQO process to plan Superfund studies?

The DQO Process offers site managers a way to plan field investigations so that the quality of data collected can be evaluated with respect to the data's intended use. This is a timely benefit that responds to the recent declaration by the General Accounting Office (GAO) and the Office of the Inspector General (OIG) that EPA monitoring programs are **not** adequately using statistical data collection design procedures, and therefore are unable to evaluate data quality submitted for decision making and cannot state the quality of decisions based on the data. The DQO process is responsive to the GAO and OIG concerns because it provides a method by which site managers can estimate how data quality contributes to the quality of their decisions.

Specifically, the DQO process:

- helps site managers decide **how many samples and analyses are required** to support defensible decision making;
- helps site managers **define where and when samples are to be collected;**
- helps site managers develop a **statistical sampling design** that allows the uncertainty in data to be quantified;
- helps field personnel **identify resource-efficient sample collection methods;**
- helps laboratory analysts **identify resource-efficient analytical methods;**
- can drastically **reduce overall project costs;**
- provides the QA community with a **scientific basis** for defining the **right type and number of quality control and assessment samples and associated analytical precision and recovery requirements;**
- provides a structure for **clarifying multiple study objectives** into specific decisions;
- encourages the **participation and communication** of data users and relevant technical experts in planning, implementation and assessment.

THE DATA QUALITY OBJECTIVES PROCESS



1. STATE THE PROBLEM

Purpose

Summarize the contamination problem that will require new environmental data, and identify the resources available to resolve the problem.

Activities

- Identify members of the scoping team.
- Develop/refine the conceptual site model.
- Define the exposure scenarios.
- Specify available resources.
- Write a brief summary of the contamination problem.

2. IDENTIFY THE DECISION

Purpose

Identify the decision that requires new environmental data to address the contamination problem.

Activities

- Identify the key decision for the current phase or stage of the project.
- Identify alternative actions that may be taken based on the findings of the field investigation.
- Identify relationships between this decision and any other current or subsequent decisions.

3. IDENTIFY INPUTS

Purpose

Identify the information needed to support the decision, and specify which inputs require new environmental measurements.

Activities

- Identify the informational inputs needed to resolve the decision.
- Identify sources for each informational input, and list those inputs that are obtained through environmental measurements.
- Define the basis for establishing contaminant-specific action levels.
- Identify potential sampling approaches and appropriate analytical methods.

4. DEFINE BOUNDARIES

Purpose

Specify the spatial and temporal aspects of the environmental media that the data must represent to support the decision.

Activities

- Define the geographic areas of the field investigation.
- Define each environmental medium of concern.
- Divide each medium into strata having relatively homogeneous characteristics.
- Define the scale of decision making.
- Determine when to take samples.
- Determine the time frame to which the decision applies.
- Identify practical constraints that may hinder sample collection (reconsider previous steps as necessary).

5. DEVELOP A DECISION RULE

Purpose

Develop a logical "if...then..." statement that defines the conditions that would cause the decision maker to choose among alternative actions.

Activities

- Specify the parameter of interest (such as mean, median, or proportion).
- Specify the action level for the decision.
- Combine the outputs of the previous DQO steps into an "if...then..." decision rule that includes the parameter of interest, the action level, and the alternative actions.

6. SPECIFY LIMITS ON DECISION ERRORS

Purpose

Specify the decision maker's acceptable limits on decision errors, which are used to establish appropriate performance goals for limiting uncertainty in the data.

Activities

- Determine the range of contaminant levels that may be encountered at the site.
- Define both types of decision errors and identify the potential consequences of each.
- Specify a range of contaminant levels over which the consequences of decision errors are relatively minor (the gray region).
- Assign acceptable limits on decision errors above and below the gray region.
- Check for consistency.

7. OPTIMIZE THE DESIGN

Purpose

Identify the most resource-effective sampling and analysis design for generating data that are expected to satisfy the DQOs.

Activities

- Review the DQO outputs and existing environmental data.
- Develop general sampling and analysis design alternatives.
- For each design alternative, verify that the DQOs are satisfied.
- Select the most resource-effective design that satisfies all of the DQOs.
- Document the operational details and theoretical assumptions of the selected design in the Sampling and Analysis Plan.

What role does Statistics play in the DQO Process?

The statistical procedures used in the DQO Process provide:

- a scientific basis for making inferences about areas of a site based on information contained in environmental samples;
- a basis for defining data quality criteria and assessing the achieved data quality for supporting integrated site assessment decisions;
- a foundation for defining meaningful quality control procedures that are based on the intended use of the data;
- quantitative criteria for knowing when site managers can stop sampling (i.e., when the site has been adequately characterized); and
- a solid foundation for planning subsequent data collection activities.

How does the DQO process fit into integrated site assessment (SACM)?

The DQO process provides a logical framework for planning multiple field investigations, thereby fulfilling the integrated site assessment goal of cross-program response planning and allowing optimal cross-program data useability. By emphasizing the need to place limits on the probability of taking incorrect actions, the DQO Process complements the integrated site assessment objective of evaluating the need for action. The DQO Process places a worthwhile investment in planning, which results in timely and efficient cleanups.

How do I acquire statistical support for field investigation planning and data quality assessment?

Site managers can access statistical support through the alternative remedial contracting strategy (ARCS) or the long-term contracting strategy.

EPA has also developed the following software and guidance to provide additional support.

PC Software for DQO Decision Error Feasibility Trials

In order to provide real-time evaluation of the impact of DQOs on field investigation resources, EPA has developed an interactive PC-based software package "DQO Decision Error Feasibility Trials" to help site managers develop feasible and affordable DQOs. Site managers can use this statistical tool to quickly vary their DQOs, such as limits on decision errors, then see how these changes affect the number of samples and resources required. The program incorporates several different statistical design options that can be refined in collaboration with a statistical design team.

Data Quality Assessment

EPA has developed a Data Quality Assessment (DQA) guidance document (EPA QA/G-9) that explains how a site manager can evaluate whether the data satisfies the pre-specified DQOs. In general, DQA consists of the following five steps:

1. Define the statistical hypothesis;
2. Determine acceptable decision error rates;
3. Identify the statistical test and assumptions;
4. Assess the validity of the statistical test; and
5. Perform the statistical test and assess the adequacy of the design.

What is the link between quality control and DQO development?

DQOs define complete data collection design specifications. DQOs are the driving component of quality assurance project plans (QAPPs), which are required for each data collection operation. Quality control (QC) programs are a required element of QAPPs and are defined based on DQOs. QC programs provide real-time measurements and monitoring of data collection operations to facilitate corrective action and support subsequent data validation and assessments. QC programs can also be used to evaluate whether expected decision error rates will be met.

Where do I find out more about the Superfund DQO guidance, the DQO process, and QA training?

For more information on Superfund DQO guidance

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