

**NSWC CRANE
CRANE, INDIANA**

**QUALITY ASSURANCE PROJECT PLAN FOR FULL-SCALE OPERATIONS
AT THE BIOREMEDIATION FACILITY
REV. 0, February 9, 1998**

COMMENT- RESOLUTION

Commentor: Allen E. Debus, EPA Region 5:

A. Major Issues

Comment 1:

I am aware that the RCRA staff is busily preparing detection limit based goals for this project, which will represent some of the important objectives for this project. However the completed tables are not available for review. It is presumed that Crane shall take responsibility for adding information to the analytical reporting limit column. Also, Crane must understand that if reporting limits associated with methods cited in the table are unachievable it may be necessary to propose alternate methods.

Response 1:

Residential, industrial and ecological goals were established for target compounds of concern by EPA. The analytical methods will be reviewed to ensure these limits can be achieved. Alternative methods will be evaluated for those compounds that don't meet the objectives. Final tables with analytical reporting limits will be submitted for EPA review and approval. Changes to the laboratory SOPs will be provided to EPA for review and approval.

Comment 2:

An objective decision tree is also in preparation for this project. I have seen your handwritten version, which will relate a decision-making process to respective field and laboratory data results. This item is an essential addition to the plan, especially if it will replace or supplement information provided in Section 1.4.2 to some degree.

Response 2:

Decision-making flowcharts for excavation site soil, treated soil, and rock decontamination are included in the Final Full-Scale Operations Plan as Figures 1-2, 1-3, and 1-4 respectively. These figures are referenced in the QAPP Section 1.1.2.

Comment 3:

The field methods proposed for analysis of RDX and TNT cannot be used to analyze compost confidently until after the technique has been reliably demonstrated for the Crane site compost. Presently, there is no audit demonstration plan in the proposed QAPP outlining how the feasibility of these methods shall be demonstrated. In a conference call held on February 18, 1998, we discussed how this could be done using compost sampled from the 30% pilot scale mixture. Also, splitting of compost using the Wiley Mill/riffle splitter should be performed. A total of 36 samples will be taken from Days 0, 5 and 10 to obtain data from high concentrations, concentrations from the "hump" of the curve, and near the end of the process when RDX and TNT concentrations are expected to be low.

Response 3:

The Navy plans to use the field test kits for RDX and TNT testing to estimate the end of cycle of the compost piles. The field test kits provide semi-quantitative results required to make an assessment if the

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compost pile is degrading as planned. At the end of the cycle (expected to be around Day 28 based on pilot-scale results), samples of the compost will be sent to the off-site laboratory for confirmation analysis. If this laboratory results indicate that the compost pile does not meet the cleanup goals, the pile will be treated (per one of the three options provided in Figure 1-3 of the Final Full-Scale Operations Plan) further. Again, confirmation samples will be collected at the end of that cycle to verify that the pile meets the cleanup goals.

The Navy plans to analyze samples from one pilot-scale size pile during full-scale operations by both field test kits and off-site analysis on days 0, 5, and 10 to ensure the results of both techniques on the compost matrix are sufficient to meet the data quality objectives of the project. This audit demonstration will be outlined in subsequent QAPP revision and results submitted to EPA upon conclusion of the analysis and data review.

In the interim, the full-scale operations will continue as specified in the Full-Scale Operations Plan and the QAPP.

Comment 4:

In December, 1997, the Division Director announced Regional policy directing QA staff to only approve methods for VOCs analysis in soils that are anticipated to report accurate data. Because there evidently is a need for VOCs in soil (as well as compost) data to be proposed, the sampling/analytical strategy for performing this task must be revised. During the cited conference call, we discussed the possibility of using an onsite mobile field GC unit, equipped to handle carefully tared vials, appropriately prepared for the anticipated concentration range of VOCs.

Response 4:

In order to maintain a high level of data quality in a cost effective manner a field GC will not be used for this limited number of samples. All volatile sample analyses will be performed by off-site laboratory following the analytical procedures in Appendix C of the QAPP. As provided in the latest SW846 update, samples will be collected using EnCore sampler to maintain sample integrity. Field SOP QAPP-1.0 will be revised to include reference to this sampling protocol.

Comment 5:

TCLP data is needed for the completion of certain tasks, yet the explosive compound, 2,4 - dinitrotoluene was not mentioned, precluding one's ability to assess the hazardous characteristic - D030.

Response 5:

2,4-DNT and Nitrobenzene are TCLP compounds under SVOC analysis and are part of Method 8330 - Explosives. TCLP SVOC will be performed under Task 1 to assess the hazardous characteristic only for sites where semi-volatiles are target compounds of concern. For sites where semi-volatiles are not of concern, these compounds will be evaluated based upon the total results obtained from Method 8330. The QAPP will be revised accordingly.

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B. Specific Comments:

Comment 1:

Table 1-8: Task number 1 makes no distinction as to whether explosives will be reported on the basis of field testing. A need for TCLP data is also not reflected. In the third column for task 1, use of the term, "present" should be defined. What is meant analytically by this term? In the fourth column for all tasks, note that NEESA level C doesn't address 8330 procedures. Will field test kit data also be evaluated per NEESA Level C? An explanation of the specific "data quality level" protocol to be followed for field and laboratory generated explosives data should be added to this QAPP. For task 4, any toxicity testing that will be done should be mentioned. For task 5, the statement in the second column implies that only method 8330 testing will be performed.

Response 1:

- 1.a. Results of Task 1 will be reported based on the results of off-site laboratory analysis only. Methods of analysis are provided in Appendix C.
- 1.b. TCLP analysis of metals and VOCs will be performed under Task 1 as specified in Table 1-11. Table 1-8 will be revised to reflect this.
- 1.c. The term "present" is being used to mean any target compound in the soil at levels above the cleanup goals (i.e, Table 1-2) for excavated soil.
- 1.d. NEESA Level C requires that the "methods used must be EPA methods or be equivalent to EPA methods." EPA SW846 Method 8330 is incorporated by reference under section 7 of the QAPP. QA/QC samples required under this QAPP meets the requirements of the NEESA document.
- 1.e. Since field test kit data will only be used for qualitative and semi-quantitative purposes, it will not be evaluated per NEESA Level C. Results of the field test kits will be used to identify when it is appropriate to send final conformation samples to the off-site laboratory, therefore, no validation of the field test kit results will be performed.
- 1.f. Data Quality Objectives are outlined in Section 1.4.4 of this QAPP. The term "NEESA Level C" will be added as a definition in the next revision.
- 1.g. Toxicity testing procedure will be provided as an Addendum to this QAPP for EPA review and approval as specified in Section 1.4.2.3. The procedure will provide details of the laboratory performing the test including SOPs. Additionally, an Addendum to the Full-Scale Operational Plan will be developed to discuss the actual details of the required toxicity testing.
- 1.h. All SWMU-specific contaminants listed in Section 1.4.2.1 will be analyzed under Task 5 as indicated in Table 1-8 and Table 1-11.

Comment 2:

Section 1, page 29 of 41: Near the bottom of the page, in the first enumerated point, note that "entry concentration" values must be estimated based on the mixture ratios of soil and all amendments, meaning that the calculation used to define the % degradation of toxicity and mobility shall be 4 times the amount measured in compost because the contaminated soil will be 25% by weight for all mixtures. The calculation used to adjust the measured values to "entry concentration" values should be defined in an appropriate portion of this QAPP.

Response 2:

The "entry" concentration will be determined based on the results obtained from the Pre-excavation Site

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Characterization samples.

Comment 3:

Section 1, Page 30 of 41: It should be stated that the "hazardous" nature of the soil will be defined on the basis of the TCLP test. Also, the actual concentration based criteria for acceptance into the Biofacility should be stated.

Response 3:

Toxicity Characteristic Levels for the target compound volatiles, semivolatiles, and metals will be incorporated into the QAPP in subsequent revision.

Comment 4:

Section 1, Page 31 of 41: Under the narrative description of Task 1, will the TCLP criteria apply if storm water retention pond water is added to compost piles?

Response 4:

The retention pond water will be non-hazardous with respect to TCLP limits for the target compounds because only non-hazardous soil is treated at the Biofacility. Therefore, the TCLP criteria will not apply to the compost piles with retention pond water added for moisture.

Comment 5:

Section 1, page 31 of 41: Under the description of Data Collection Task 4 it should be stated whether the "other SWMU specific constituents", will be calculated on the basis of "initial soil characterization sample results", or on the basis of (approximately) four times the Day 0 compost values. (I think it will be the former, but this should be pinned down.) Also, all samples tested for explosives, whether by field or laboratory methods or in the case of a sample split, should be prepared using Wiley Mill and riffle splitter devices.

Response 5:

- 5.a Initial soil concentrations will be based on the results of the Pre-excavation Site Characterization samples (Task 1).
- 5.b Final confirmation sample analysis for explosives (and other SWMU-specific compounds if required) will only be performed by an off-site analytical laboratory. Samples will be submitted to the laboratory where they will be homogenized per laboratory standard operating procedures.

Comment 6

Section 1, Page 31 of 41: Under the description of Data Collection Task 5, note that a splitting procedure must be followed whenever samples are selected for both laboratory and field testing. (This statement does not apply to VOCs analysis.)

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Response 6:

There is no intent to analyze samples in the field for VOCs. Field test kits for explosive analysis will only be used to determine when it is appropriate to submit samples for off-site confirmation analysis.

Comment 7:

Section 1.4.2.1, page 32 of 42: It is recommended that the title of this section be changed from "Target Constituents" to "SWMU-Specific Constituents". There should be a statement that these constituents are not intended to be "TCLP parameters", and that the degree of soil 'hazardousness' shall not be defined on the basis of field data.

Response 7:

- 7.a Title will be revised in subsequent revision to the QAPP.
- 7.b Target constituent were based upon previous site investigations. Concentrations for the purpose of defining hazardous nature with respect to TCLP will be determined through off-site laboratory analysis.

Comment 8:

Section 1.4.2: As noted in comment A.4 above, the strategy proposed by Crane for analysis of VOCs in soil is insufficient. One alternative discussed was the possible use of a field GC, equipped to handle sample vials collected in a manner such that atmospheric losses of VOCs would be minimized during analysis. This would be in lieu of "confirmation" fixed lab derived results for VOCs in soil, provided that the field SOP has been approved by the U.S. EPA Region 5. Even so, use of a field GC would present complications with compound resolution of VOC gases such as vinyl chloride. Review of a sample data package from the field GC team would help to identify potential difficulties prior to field implementation. Also, it should be noted that the SVOC parameter, N-nitroso-diphenylamine, will not actually be measured. Therefore, all data reported for diphenylamine and N-nitroso-diphenylamine should be regarded as N-nitroso-diphenylamine for data assessment purposes. Note that some metals proposed for reporting such as aluminum iron and magnesium are not hazardous constituents. Is this a problem?

Response 8:

Currently there is no intent to analyze samples in the field for VOCs. All VOC sample analyses will be performed at an off-site laboratory following the methods in Appendix C of the QAPP. The samples will be collected using the EnCore sampling technique. The Field SOP QAPP-1.0 will be revised to reflect this sampling technique. Since no field GC will be used, the comment pertaining to N-nitroso-diphenylamine does not apply. Aluminum, iron, and magnesium are identified as chemicals of concern at the SWMU sites. Therefore, the excavation confirmation sample results will be reviewed to ensure that cleanup goals are met for these parameters. Also, site background data for metals will be used (if available).

Comment 9:

Section 1.4.2.3, Page 34 of 41: It should be stated how the general performance goal of 90% to 99% reduction will be defined on the basis of environmental chemical measurements to be performed for this

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specific project. (See comment B.2.)

Response 9:

The 90% to 99% reduction will be based on the "entry" concentration determined on the results obtained from the Pre-excavation Site Characterization samples. Additional details of this decision-making process are presented in Figure 1-3 of the Full-Scale Operational Plan.

Comment 10:

Section 1.4.4, Page 36 of 41: In the first paragraph under this section, the level of QC effort for planned field measurements should be stated. Will it be NEESA level C as implied by this description?

Response 10:

Field operational measurements will not follow NEESA Level C. Quality control levels for these tests will be incorporated in subsequent revision to the QAPP.

Comment 11:

Section 1.4.4, page 36 of 41: In the 3rd line from the bottom of this page, the phrase, "...the accuracy of the measurement is not critical..." should be deleted. The U.S. EPA disagrees with this statement.

Response 11:

Comment is noted, however, field test kits are being used to approximate the concentrations to determine when to collect samples for final confirmation analysis (to be performed by an off-site laboratory). Field test kit results are not used for any critical measurements as the results of off-site analytical testing will be used to determine if compost treatment and soil excavation meets the clean-up levels.

Comment 12:

Table 1-11: The matrices of interest should be added to the table for each respective task and subtask. For the dioxin parameter, should the data be reported in terms of 2,3,7,8 TCDD equivalence, or should data be reported for each chlorinated dioxin and dibenzo furan congener? Under Task 4, replace or supplement the "Method 8330" reference with field test in the 2nd column (top box), and add TNT & RDX as field parameters to the 3rd column. In the 2nd column, bottom box, explosives by method 8330 isn't indicated.

Response 12:

- 12.a Matrices of interest will be added in subsequent QAPP revision.
- 12.b Each individual chlorinated dioxin and dibenzo furan congener will be analyzed and reported. Data will also be calculated as a 2,3,7,8-TCDD TEF.
- 12.c Field test kits will be added to the table to reflect the compost operational sampling on days 7, 14 and 21.
- 12.d Explosives are included in the Task 5 box as the third bulleted item in column 2.

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Comment 13:

Table 1-11, page 40 of 41: In the 2nd column, the reference to method 8240 should be changed to method 8260.

Response 13:

Method reference will be changed to 8260 in subsequent revision to the QAPP.

Comment 14:

Table 1-12: References to the TNT and RDX test kits should be added here (if it is decided not to add them to Table 1-11).

Response 14:

Method references will be added in subsequent revision to the QAPP.

Comment 15:

Section 2.4, Page 3 of 9: Referring to the final bullet on the page, who performs data validation independent of the laboratory?

Response 15:

Data validation of off-site analytical laboratory data will be performed by the Navy's Contractor -- Morrison Knudsen, who are independent of the laboratory.

Comment 16:

Section 2.6.1, Page 7 of 9: At the very end of the first paragraph, insert the phrase, "...for this project only." In the second paragraph, who is the "PQCM"? Does this term refer to a "Project QC manager"? If so, please identify this individual's QC responsibilities in this QAPP.

Response 16:

16.a The phrase will be incorporated in subsequent revision to the QAPP.

16.b The PQCM abbreviation means Program Quality Control Manager. Role is defined in Section 2.3.

Comment 17:

Section 2.6.2, Page 8 of 9: This section apparently has little to do with Project Organization. Can this discussion be inserted into a more appropriate portion of the QAPP? Also, please identify the "testing laboratory representative" here. Is this person the "PQCM"?

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Response 17:

- 17.a Format of the QAPP was derived from EPA Region 5 Model QAPP. Section 2.6 deals with laboratory qualifications and not project organization. The QAPP will be reviewed to see if there is a more suitable place for this section.
- 17.b The term "laboratory representative" in Section 2.6.2 will be revised to the "laboratory project manager or designee" to reflect the personnel listed in Section 2.4 Laboratory Responsibilities.

Comment 18:

Section 3.1.2, Page 1 of 12: Either the term "data verification" should be defined specifically, or a reference can be made to another portion of this QAPP where it is defined.

Response 18:

Data Verification is defined in Section 9.2.2. Subsequent QAPP revision will include a reference to this section.

Comment 19:

Section 3.2.2, Page 2 of 12: Under Field Accuracy Objectives, special protocol used to achieve high accuracy for VOCs in soil, if measured using a field GC, should be addressed.

Response 19:

All volatile sample analyses will be performed at an off-site laboratory following the procedures listed in Appendix C of this QAPP. Refer to Comment B.8 for additional explanation.

Comment 20:

Sections 3.4.2 and 3.5, Page 3 of 12: More information should be provided describing how soil and compost homogenization techniques will be employed to adequately ensure that samples will be reliably homogenized in order to meet comparability and representativeness objectives. Also, at the end of the stated definition for "comparability", add the phrase, "...as in the comparison of data from differing time intervals and to the Pilot Scale Study." These objectives should be explored more fully for both field and laboratory measurement activities. The discussions provided offer little useful information for the special case of bioremediation.

Response 20:

- 20.a Sample homogenization techniques are outlined in Section 4 of the QAPP and in the individual soil collection and analytical standard operating procedures. Comparability is a qualitative measure that is achieved by following these procedures. Representativeness will also be assured by following these procedures, the QAPP, and Full-Scale Operational Plan. The QAPP will be revised to specifically reference these sections of the document.
- 20.b Comment noted and will be incorporated into subsequent revision to the QAPP. It should be noted that changes in sampling techniques or analysis will no longer allow it to be comparable to

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the Pilot-Scale Study.

Comment 21:

Section 3.6, page 4 of 12: Note that the VOCs sample volume will differ in consequence to the new Directive.

Response 21:

Comment is noted and additional soil fractions will be collected as appropriate for MS/MSD samples.

Comment 22:

Section 3.6, page 5 of 12: In the first line, change the term "regular" to "investigative".

Response 22:

Term will be changed in subsequent revision to the QAPP.

Comment 23:

Table 3-1, page 6 of 12: In the 5th column, some of the QC limit references either do not match the information which is called for in the appendices, or refer to other documents that are not included. For instance, what is the "QC Blue Book", and how does that document's directives pertain to QC intended for this project? Please check all these cited references to determine whether they fully explain what is called for in this section of the QAPP.

Response 23:

The "QC Blue Book" contains the acceptable precision and accuracy criteria for Southwest laboratories analytical methods. Quality Control limits will be updated in subsequent revision to the QAPP to reflect the current limits established in the "Blue Book".

Comment 24:

Table 3-2, Page 7 of 12: The QC Limits for Completeness should be 95% for all critical measurements.

Response 24:

The Completeness acceptance criterion was set at 90% during the pilot-scale operations. Therefore, for consistency it is proposed not to increase the criteria.

Comment 25:

Table 3-3, Page 8 of 12: For metals analysis, instead of an MSD, a sample duplicate can be used instead.

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Change the QC Limit Completeness criterion to 95%.

Response 25:

- 25.a Comment noted and agreed with.
25.b The Completeness acceptance criterion was set at 90% during the pilot-scale operations. Therefore, for consistency it is proposed not to increase the criteria.

Comment 26:

Table 3-4, Page 9 of 12: Note that all Section 1.4.2.1 SVOC target analytes should be represented in the MS and LCS spiking solutions for informational purposes. This provision should be prescribed by U.S. Navy for the laboratory. Change the Completeness acceptance criterion to 95%.

Response 26:

- 26.a Compounds to be spiked will be as outlined in the laboratory SOP.
26.b The Completeness acceptance criterion was set at 90% during the pilot-scale operations. Therefore, for consistency it is proposed not to increase the criteria.

Comment 27:

Table 3-5, page 10 of 12: The sections cited in the fifth column provide little indication of what the current "red book limits" might be.

Response 27:

The "QC Red Book" contains the laboratory derived reporting limits for Southwest Laboratories analytical methods. Quality Control limits will be updated in subsequent revision to the QAPP to reflect the current limits established in the "Red Book".

Comment 28:

Table 3-6, Page 11 of 12: Note that Southwest - Oklahoma's analytical capability for dioxin was not a parameter audited sufficiently by the U.S. EPA RCRA Region 5. In the fifth column, for precision, apparently a reference to page C2-173 was not included.

Response 28:

EPA can audit the laboratory at any time during the course of the project as specified in Section 10.3.2 of the QAPP. Reference to Page C2-173 will be made as suggested in subsequent revision to the QAPP.

Comment 29:

Tables 3-1 through 3-8: If the references to water acceptance criteria in these tables are only intended to apply to analysis of storm water retention pond water, rock wash water, and various blanks, then it should

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be so stated in this QAPP.

Response 29:

Comment is noted. These tables will be updated as suggested in subsequent revision to the QAPP.

Comment 30:

Section 3 Another DQO table should be prepared to reflect the outcome of field TNT and RDX explosives data, as there will be a battery of QC samples routinely analyzed in conjunction with these measurements, as well as acceptance criteria applied to these sample results.

Response 30:

The QAPP will be revised to include a table which summarizes the objectives of the field test kits.

Comment 31:

Section 4.1, Page 1 of 18: Under "Objective 1", the "entry" level concentration should be defined per previous comments. Under "Objective 2", what is meant by the term, SWMU-specific "waste product"? Under "Objective 3", the compound, 2,4 - DNT should be included as part of the TC definition.

Response 31:

- 31.a The "entry" concentration will be determined based on the results obtained from the Pre-excavation Site Characterization samples.
- 31.b The QAPP will be revised to clarify this objective to "determine if SWMU specific chemicals are present in the soil"
- 31.c 2,4-DNT and nitrobenzene will be included in the review of determining hazardous characteristics by using the total results obtained from the explosives analysis. The QAPP will be revised to reflect this.

Comment 32:

Section 4.1, Page 2 of 18: At the top of the page, note that the number of samples to be collected for analysis of VOCs in soil may change depending on the sample strategy chosen.

Response 32:

Comment is noted. VOC samples will be collected using the EnCore sampling device and at least three fractions will be collected to ensure adequate sample volume for analysis.

Comment 33:

Section 4.1, Page 2 of 18: Apply comment B.342 to the section in the second half of this page, addressing "Volatiles Organics Sampling".

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Response 33:

Comment is noted. VOC samples will be collected using the EnCore sampling device and at least three fractions will be collected for each sample to ensure adequate sample volume for analysis.

Comment 34:

Section 4.1, Page 3 of 18: Under Marking Grid Blocks for Excavation, the rationale for an initial 3 foot excavation should be explained.

Response 34:

The Navy plans to excavate only to a maximum of two feet based on results of the pre-characterization samples. If contamination is found to extent beyond two feet, the Navy will propose alternate remediation at a later date. Refer to Figure 1-2 of the Full-Scale Operational Plan for additional details of the decision-making process for excavation site soil.

Comment 35:

Section 4.5.2, page 7 of 18: In the ~~second~~ first paragraph, the phrase, "...for all constituents listed in Table....." should be inserted after the end of the existing second sentence.

Response 35:

Comment is noted and the phrase will be inserted in subsequent QAPP revision.

Comment 36:

Section 4.5, Page 8 of 18: The portion of the plan dealing with "site-specific VOCs" should be revised per the new Directive policy.

Response 36:

Comment is noted. VOC samples will be collected using the EnCore sampling device and analyzed per the volatile method in Appendix C of the QAPP. Sufficient volume will be collected for the analysis.

Comment 37:

Section 4.6.2, Page 8 of 18: Referring to the first paragraph, the phrase, "...with respect to analysis type." should be inserted at the end of the third sentence.

Response 37:

Comment noted and will be incorporated in subsequent QAPP revision.

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Comment 38:

Table 4-3: For trip blanks, there should be one VOC trip blank set per shipping cooler. Also, a temperature blank should be included with each cooler to be read and recorded by the Sample Custodian immediately upon arrival of the coolers at Southwest. In the column for MS/MSD, there should be a sample duplicate taken for assessing precision for metals in both soil and compost.

Response 38:

- 38.a One VOC trip blank set will be sent for each cooler containing VOC samples. The term "1 per VOA" will be corrected to "1 per VOA sample cooler" in subsequent QAPP revision.
- 38.b Comment noted and agreed with. Temperature blanks will be collected as stated in Section 4.8 of the QAPP.
- 38.c In addition to MS/MSD, sample duplicates will be collected as noted in Table 4-3.

Comment 39:

Table 4-4, Page 14 of 17: The VOCs in soil Directive should be followed. Preservation methods and bottles could differ for VOCs.

Response 39:

Comment noted. Table 4-4 will be updated to reflect the use of the EnCore samplers to be used.

Comment 40:

Section 4.9.1, Page 17 of 17: Referring to the 3rd paragraph, what is the corrective action for excessive RPD?

Response 40:

Corrective action for RPD exceeding the criteria listed in Section 4.9.1 will be to take a third measurement for the given parameter. If the percent difference for this third measurement varies from both of the other two measurements, the measuring device will be re-calibrated per the manufacturers guidelines and the procedure reviewed to ensure compliance with established techniques. These remarks will be incorporated in subsequent revision to the QAPP.

Comment 41:

Section 5.1.2.2, Page 5 of 9: Matrix spike and matrix spike duplicate samples should also be mentioned in the last paragraph. Also, note that immediately after the end of section 5.1.2.2, a new section 5.1.2.2 appears on this page.

Response 41:

- 41.a Comment is noted. MS/MSD samples will have the same sample identifier as the corresponding sample.

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41.b The second 5.1.2.2 will be changed to 5.1.2.3 in subsequent QAPP revision.

Comment 42:

Section 5.3, Page 8 of 9: The U.S. Navy should take custody of the final evidence file, including all laboratory data deliverables. This file should be maintained for a minimum of ten years following the termination of the project. Afterward, prior to disposal, the U.S. EPA should be notified in writing.

Response 42:

The Navy contractually requires that all its contractors maintain this documentation during the performance period. The Navy will take possession of final evidence files at the conclusion of the contract or as required by the Navy. The Navy will maintain the files as suggested and provide written notification as suggested. These remarks will be incorporated into subsequent revision to the QAPP.

Comment 43:

Section 7.1, Page 1 of 2: The brief description is silent on the use of EnSys test kits.

Response 43:

Comment noted and subsequent QAPP revision will include reference to the field test kits and the respective procedures.

Comment 44:

Section 7.2.2, Page 1 of 2: In the last line on the page, insert the phrase, "...specified in section 1.4.2.1." After the phrase, "compounds of interest".

Response 44:

Phrase will be added in subsequent QAPP revision.

Comment 45:

Table 7-1, Page 2 of 2: In the third column, referring to Dioxins, change the method reference from "2890" to "8290".

Response 45:

Comment noted and method reference will be changed in subsequent QAPP revision.

Comment 46:

Section 9.2.2, Page 2 of 7: Does NEESA Level C address explosives compounds testing? SW-846 QC

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**QUALITY ASSURANCE PROJECT PLAN FOR FULL-SCALE OPERATIONS
AT THE BIOREMEDIATION FACILITY
REV. 0, February 9, 1998**

COMMENT- RESOLUTION

elements should be followed, not just NEESA Level C. In the case of organics analyses, this includes provisions for a 5 point initial calibration curve (plus blank), MS/MSD, LCS, etc... In the last paragraph on the page, note that a 10% validation is insufficient in the case of critical measurement parameters such as explosives data. A higher percentage level should be proposed for explosives confirmation data.

Response 46:

- 46.a NEESA Level C incorporates SW846 methods by reference.
- 46.b Comment is noted. QC to be followed will be per SW846 and the methods outlined in Appendix C.
- 46.c Comment is noted, however, a 10% validation will be adequate considering overall objective of the project. Note that all analytical lots/batches will also be verified.

Comment 47:

Section 9.3, page 3 of 7: To the extent necessary, procedures for correlating field and laboratory explosives data should be discussed.

Response 47:

Comment noted, however, off-site analytical testing will be performed on days 0 and at the end of the composting period (approximately 28 days). Field test kit demonstration will be performed on days 0, 5, and 10, on a pilot-scale size pile as discussed in response to Comment A.3. No simultaneous laboratory and field testing will be performed after the initial audit demonstration.

Comment 48:

Table 9-1, page 5 of 7: In the middle column, 3rd row, there is a phrase which reads, "For volatiles by GC, the names of surrogates should be changed to reflect the surrogate used." What does this mean?

Response 48:

Since there will be no GC analysis of VOCs, this phrase will be removed in subsequent QAPP revision.

Comment 49:

Section 10.2.1, Page 1 of 4: The individual audit plan should be appended to this plan. (Is it "individual" or "internal" audit plan?)

Response 49:

The comment is noted. The text will be revised in subsequent revision to the QAPP. The internal audit plan is further discussed in Section 8.0 of the Full-Scale Operations Plan.

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Comment 50:

Section 10.2.1, Page 2 of 4: Please indicate that the audit checklists mentioned in the last paragraph of this section should include auditing of the field colorimetry kits.

Response 50:

Audits include all aspects of field operations, including the field test kits. Note that the QAPP also allows for auditing by the Navy and EPA under Section 4.9.3.

Comment 51:

Table 11-1, Page 2 of 2: Use of field colorimetry kits should be included in this table.

Response 51:

Comment noted and instrumentation used for this analysis will be included in subsequent QAPP revision.

Comment 52:

Section 12, Page 1 of 2: This discussion, although reiterating what is contained in the model QAPP, is faulty. (The difficulty stems from the Model itself, which is under revision presently.) The references to a sample being randomly selected for spiking purposes represents only a special case, and may not represent an appropriate procedure for this project. Please edit all the subsection of Section 12 such that the selection of QC samples intended to represent accuracy and precision is consistent with discussion previously presented in this QAPP. For instance, in some cases it may be necessary to collect additional sample volume for spiking purposes. In the case of inorganics analyses, it is not necessary to collect a sample matrix spike duplicate. Also, the use of these calculations should be referred to different QC programmatic elements such as surrogates, field duplicates, matrix spike samples & duplicates. The use of control charts should be explained as they may pertain to these QC sample types (or parameters as in the case of surrogates). To what extent will these determinations divulge sources of variance in field and laboratory investigational samples? Note that, for reasons of clarity, this section could be effectively integrated with the DQO discussion.

Response 52:

This section will be updated in subsequent QAPP revision to reflect the specific section of the QAPP.

Comment 53:

Section 13.3, Page 2 of 3: This is only a summary. Relevant sections from SOPs should be referenced.

Response 53:

Comment is noted and the QAPP will be revised to include the laboratory corrective action procedure.

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Comment 54:

Section 13.4, page 3 of 3: The U.S. EPA must also be consulted prior to sampling events described here.

Response 54:

EPA will be consulted prior to any re-sampling if the data quality objectives as outlined in this QAPP cannot be met.

Comment 55:

Section 14, Page 1 of 1: Are "post-audit" QA Reports the only kind that will be prepared?

Response 55:

Post audit reports are the only reports that will be issued as a result of internal audits. Additional reports will be submitted as outlined in Section 12 of the Full-Scale Operational Plan.

Comment 56:

Appendix A, Field SOP QAPP-1.0: Modify per the VOCs in soil directive.

Response 56:

The field sampling SOP will be revised to reflect the use of EnCore sampling devices.

Comment 57:

Appendix A, Field SOP QAPP- 3.0: The use of the Wiley Mill & riffle splitter for composting all samples prior to field analyses of explosives or splitting of compost prior to collection of confirmation samples for explosives analyses should be described.

Response 57:

Samples will be composited in the field and at the laboratory as outlined in the QAPP Section 4 and laboratory SOPs. Since samples will be analyzed by either the field test kits or by an off-site laboratory, no splitting is necessary. Due to the moisture contents and the nature of the constituents of interest, it is felt that the sample integrity and field operations will be better maintained by having the laboratory homogenize the samples.

Comment 58:

Appendix A, Field SOP QAPP - 5.0: If the method has been modified by SDI, then only the new procedures and specific sections from the Users' Guide which have been superseded, should be described here. The wavelength setting of analysis should be recorded prior to each set of analyses, because it is intended to be changed in between runs of RDX and TNT. On page 2 of 6, last sentence in

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section 5.1, it should be explained to what extent cross reactivity factors will have to be considered for this project. Section 7.0 does not sufficiently address the Quality Assurance that must be adhered to when using the field test kits. QC elements apparently missing or not emphatically stated as being performed include the following:

RDX:

- a. Phase 4 step 5-h, result. The QAPP is relatively silent on this important result.
- b. Control QA/QC check sample, page 8 of 13 in Users' Guide. The QAPP is relatively silent on this important result.
- c. Page 10 of 13 in Users' Guide, places QC limitations on the kits themselves. There should be records added to the field operating log as to whether or not analyses have been performed within these constraints.
- d. Page 11 of 13 of the RDX users' Guide, "QA/QC" section, recommends additional QC sample types not otherwise indicated in the QAPP. It should be explained in appropriate sections of the QAPP how these guidelines and additional QC protocol will be adhered to.

TNT:

- a. Phase 1, page 4 of 12 - The grade of acetone utilized for the field audit demonstration soil study should also be used for the RDX field test. In 2h, this important QC item is not acknowledged in other portions of the QAPP.
- b. Referring to Phase 3, is DNT an issue or not? Will there be a 3 ~~second~~-minute or 10 minute development period?
- c. Page 9 of 12 in Users' Guide, places QC limitations on the kits themselves. There should be records added to the field operating log as to whether or not analyses have been performed within these constraints.
- d. Page 10 of 12 of the TNT users' Guide, "QA/QC" section, recommends additional QC sample types otherwise not indicated in the QAPP. It should be explained in appropriate sections of the QAPP how these guidelines and additional QC protocol will be adhered to.

Response 58:

Presently the field test kits used were obtained from Ensys. When kits are obtained from SDI they will be reviewed for consistency to the procedures and modifications made as appropriate. Both field test kit procedures will be reviewed to ensure that the proper QC is being performed and will be submitted with subsequent revision to the QAPP.

Comment 59

RDX users' Guide: Based on the recent Region 10 Black & Veatch Jan. 1998 report, for the Crane study,

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it should be considered and concluded whether or not the nitrate removal step Phase 3, should be eliminated. (See pp. 3-4 and 3-7 of this report, and Page 9 of 13 in the RDX users' guide.)

Response 59:

Comment is noted, however, the Navy requests that a copy of this report be provided so that they may evaluate the impacts.