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LETTER REGARDING REVISED U S NAVY RESPONSES TO REGULATORY COMMENTS
ON THE DRAFT REMEDIAL INVESTIGATION/FEASIBILITY STUDY WORK PLAN FOR
OPERABLE UNIT 2 (OU 2) MCCOY ANNEX LANDFILL NTC ORLANDO FL
1/3/1997
BROWN & ROOT ENVIRONMENTAL



Brown & Root Environmental

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(423) 483-9900

FAX: (423) 483-2014

97-E001

January 3, 1997

Project Number 7457

Commanding Officer
Department of the Navy
SOUTHNAVFACENGCOM
ATTN: Barbara Nwokike (Code 1873)
2155 Eagle Drive
North Charleston, South Carolina 29419

Reference: CLEAN Contract No. N62467-94-D-0888
Contract Task Order No. 0024

Subject: Revised Comment Responses on Draft RI/FS Workplan for OU 2, McCoy Annex Landfill
Naval Training Center, Orlando, Florida

Dear Ms. Nwokike:

Enclosed are revised responses to EPA and FDEP comments on the RI/FS Workplan for OU 2, McCoy Annex Landfill. The revisions have been made as a result of the discussions during the OPT meeting on November 12 and 13, 1996. The revised portions of the responses are identified in the enclosure by underlines (new text) and strike outs (deletions).

Please call Mike Campbell or me at (423) 483-9900 if you have any questions regarding the responses.

Sincerely yours,

Steven B. McCoy, P.E.
Task Order Manager

SBM/smc

- c: Nancy Rodriguez, USEPA Region IV (2 copies)
John Mitchell, FDEP (2 copies)
Wayne Hansel, SOUTHDIV
Lt. Gary Whipple, NTC-Orlando
Mac McNeil, Bechtel
John Kaiser, ABB-ES
Mike Campbell, B&R Environmental
Sam Patterson, B&R Environmental

PROJECT REVIEW COMMENTS

DRAFT REMEDIAL INVESTIGATION AND FEASIBILITY (RI/FS) WORKPLAN OPERABLE UNIT 2 (OU 2) McCOY ANNEX LANDFILL NTC, ORLANDO

David Clowes, Florida Department of Environmental Protection (FDEP)

1. Section 2.6, page 2-14 should be corrected to explain that sample locations based on statistics and a grid pattern are not biased samples, but are random or unbiased samples.

There is confusion in the terminology which was used in the statistical sampling section presented in Section 2.6. Some of that confusion may have resulted from the fact that there is a typographical error in Section 2.6, p. 2-14, bullet item no. 2. In the third line of that bullet, the word "biased" should have read "based". To further clarify this section, the text has been revised as follows. The two bulleted items now read:

- **Hydrologic, gas generation and migration, and groundwater data will be collected on a purposeful basis due to the potential heterogeneity involved. Purposeful sampling is biased sampling; examples include characterizing areas of likely high concentrations or evaluating changes in concentrations with distance from the source. Surface soil data will be collected on a grid basis.**
- **In areas where contamination is considered to be either unlikely or more homogeneously distributed (off-site sediment and surface water), a statistically based sampling methodology will be applied."**

In addition, in the second paragraph on p. 2-15, fifth line, the phrase "...will not exceed..." has been replaced by "...will equal or exceed... ."

2. Section 2.7.1. The ingestion of and direct contact with groundwater by future area residents should be considered a likely pathway, not just a potential deviation from the considered pathways. Florida Water Quality Standards (Chapters 62-520 and 62-550, F.A.C.) were established to protect the quality of Florida's Class G-I and G-II groundwater resources as potential drinking water supplies. Thus, even if the present scenario does not consider consumption and exposure to the groundwater, all future scenarios should consider groundwater consumption and exposure, as well as resource protection/restoration.

The groundwater ingestion/direct contact/inhalation pathway will be included in the Conceptual Site Model as a probable condition rather than a potential deviation. All associated text will be modified to reflect this change.

3. Section 3.4.1, Page 3-9. As decided at the [BCT] meeting [of January 12 and 13, 1995], one soil sample should be collected from each acre (99 samples), with each soil sample composed of five equidistantly spaced sample locations within each acre. Note, discrete soil samples should be collected for VOC analysis: therefore, one VOC sample should be collected from the center location of each acre.

The landfill cover is believed to have been derived from a clean source and to be uniform in nature. As such, it should not be treated as a potentially contaminated medium. The objectives of the sampling and analysis program are to confirm these assumptions and evaluate the quality and competency of the existing soil cover for engineering considerations in the design of the landfill cap.

Accordingly, the first paragraph of Subsection 3.4.1, pp. 3-8 and 3-9 has been replaced with the following two paragraphs:

"The surface soil sampling program will be conducted based on the sampling methodology presented in Section 2.6. Although it is believed that the landfill cover was derived from a clean source and is not considered a contaminated medium, one surface soil sample of the existing cover will be collected for laboratory analysis from each acre (99 samples). The objective of this sampling and analysis activity is to confirm that the existing soil cover is not contaminated. The samples will be collected from a depth range of 0 to ~~2 feet~~ 4-feet. Samples for SVOC and metals analyses will be composited from five equidistantly spaced sample locations within each acre (Figure 3-). Samples for VOC analysis will not be composited, but will be collected from the central node of the composite pattern. Statistical evaluation of the results will be performed and additional sampling will be conducted if outliers are found.

Within the McCoy Annex Landfill, one geotechnical soil sample will be collected per 4 acres (for a total of approximately 25). At each location a Shelby tube sample will be collected for determination of undisturbed vertical permeability (ASTM D5084/EPA 9100), moisture content (ASTM D2216), in-place density (ASTM D2937), and Atterberg Limits (ASTM D4318). A standard proctor test (ASTM D698) will also be performed at each sampling location to determine the degree of compaction of the existing soil cover. Within each 4-acre block, these samples will be collected above landfill trenches if possible."

4. Section 5.1.4. Ranges of Remedial Goal Options (RGOs) for carcinogenic chemicals of concern (COCs) (1E-4 to 1E-6) and hazard quotients (10, 1, and 0.1) for non-carcinogenic COCs are not acceptable. With the inclusion of the inhalation pathway in the calculation of RGOs/Cleanup Levels, FDEP default criteria are 1E-6 for carcinogenic COCs and 1.0 hazard quotient for non-carcinogenic COCs.

FDEP's policy regarding a cancer risk of greater than 1E-6 is understood. In order to achieve project objectives, potential remedial alternatives will be evaluated by comparing their effectiveness in reducing risk within the EPA allowable risk range (1E-4 to 1E-6). This evaluation will permit a comparison of risk reduction versus the associated cost of each alternative so that risk management decisions can be made. The following sentence will be added to the last paragraph of the section:

"The State of Florida does not accept a cancer risk greater than 1×10^{-6} ."

5. Appendix A. The updated 1994 Florida Ground Water Guidance Concentrations booklet contains the Maximum Concentration Levels (MCLs) and numerical interpretations by Departmental toxicologists of the promulgated narrative minimum criteria standard. The Primary and Secondary Drinking Water Standards are established in Chapter 62-550, F.A.C. and promulgated as groundwater standards in Chapter 62-520, F.A.C. For those constituents in the booklet that do not have Primary or Secondary Drinking Water Standards, the Department considers their numerical interpretations as minimum criteria and trigger/screening values for assessment purposes. Furthermore, the Department would consider them cleanup levels unless alternate ones are approved by the Department.

Alternate cleanup levels may be proposed during the RI/FS process.

PROJECT REVIEW COMMENTS

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Greg Brown, Florida Department of Environmental Protection (FDEP)

Bullet No. 1. The EPA's presumptive remedies for municipal landfills may not be completely transferable to the subject mixed industrial landfill. EPA has specific criteria for the use of presumptive remedies at municipal landfills that may not apply to this particular mixed industrial landfill. For example, if there is groundwater contamination, the investigators should consider the need to find source areas, or "hotspots", within the landfill that if removed would make the chosen presumptive remedies more effective and reliable.

It is recognized that there may be some differences between the McCoy Annex Landfill and the generic municipal landfill to which the presumptive remedy will be applied. However, during the BCT meeting of January 12 and 13, it was discussed and agreed upon by the BCT that, consistent with the preamble of the presumptive remedy, any aspect of the CERCLA municipal landfill guidance should be utilized where applicable. Source areas, or "hot spots," will be addressed during the geophysical and passive soil gas field investigations. If potential hot spots are determined, they will be investigated and, if confirmed, will be considered for early removal.

Bullet No. 2. Landfill caps have other design criteria than just prevention of direct contact of source material with receptors. Infiltration, runoff, and erosion control, among others, should also be considered if applicable to the ultimate remedial design objectives.

Cap design will be an essential element of the remedial alternative under the presumptive remedy. Data will be collected to evaluate infiltration rates and the remaining concerns will be addressed during the remedial design phase.

Bullet No. 3. I'm glad to see a statistically biased sampling scheme, but I'm skeptical of the statistically "biased" [sic] approach proposed in the work plan. The proposed nonparametric approach may be robust in assuming independent and uncorrelated data, but that generally doesn't exist in environmental data since it tends to be regionalized (i.e., spatially related). In addition, Region IV has expressed skepticism about statistical techniques such as nonparametric methods that can not estimate the power of the test. Some discussion is in order for this subject.

The use of nonparametrics for statistical evaluation will be limited to the evaluation of off-site sediment and surface water data. For these media, it is assumed that contaminant

distribution will be more homogeneous and thus will not be spatially correlated. A discussion regarding the power of the test will be added to Section 2.6.

Bullet No. 4. Since the Navy is being "cutting edge", they may also wish to use the EPA's recent DQO process. This process defines two DQO categories: (1) screening data, with definitive confirmation, and (2) definitive data. Use of this process may further "streamline" the RI/FS while maintaining protectiveness.

The recent EPA DQO process was used in the proposed sampling program through (1) the identification of populations to be defined, and (2) through identification of acceptable confidence limits to characterize those populations. Thus, this assures the data collected will be focused, streamlined, and supportive of risk and remedial alternative evaluations.

Bullet No. 5. The FS will be an engineering document and the Final FS should be signed, sealed, and dated by the Florida Registered Professional Engineer with responsible charge for its preparation. There are specific criteria for demonstrating engineering responsible charge in F.S. 471 and Rule 61G15, F.A.C. I also refer you to the Remedial Action Plan Guideline, ESS-13, prepared by the Bureau's Engineering Support Section. Although this guideline was prepared specifically for Remedial Action Plans, it contains useful guidance for other engineering documents prepared in the State of Florida and submitted to a public agency for review and approval. In particular, the letter from the Office of Attorney General dated November 5, 1992, and referenced in ESS-13 indicated:

"There are individuals and companies not licensed as engineers or geologists who do "environmental consulting". Some of the individuals or companies have expertise in related areas (i.e., biology, chemistry, etc.). It is possible for some of these individuals and companies to play a role in the preparation of these documents, provided they do so under the direct supervision of a professional engineer or professional geologist."

Section 8.0 will specify that the Final FS will be signed, sealed, and dated by the Florida Registered Professional Engineer with responsible charge for its preparation.

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John Mitchell, Florida Department of Environmental Protection (FDEP)

1. Appendix A should also include the "To be Considered" (TBC) guidelines: Region III Soil RBCs; Florida Soil Cleanup Goals (SCG); Region IV Sediment Screening Values (SSV); and the Florida Sediment Quality Assessment Guidelines (SQAG).

These TBCs will be added to Appendix A as requested.

2. In Section 3.4.1 (Surface Soil Sampling), the last paragraph indicates pesticide levels will be compared to background. This is inappropriate. Organic or anthropogenic constituents are not to be compared to background unless it can be established that elevated concentrations detected at a site are part of an area wide situation that is being addressed as a separate site or under a separate program.

The current sentence regarding this issue - "Pesticide levels will be compared to background values during evaluation." will be replaced with the following text:

"The levels of pesticides and herbicides will be compared to those measured in samples collected from areas of the golf course that are outside the boundaries of the former landfill. This comparison will help to evaluate the contribution of pesticides and herbicides that results from normal golf course maintenance (i.e., not associated with past landfilling activities)."

3. Section 5.1.1 (Hazard Identification) also needs to include Applicable Relevant and Appropriate Requirements (ARARs) for identification of Chemicals of Potential Concern (CPCs).

Applicable Relevant and Appropriate Requirements (ARARs) will be added to the list of factors for selection of CPCs in the last sentence of Section 5.1.1.

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DRAFT REMEDIAL INVESTIGATION AND FEASIBILITY (RI/FS) WORKPLAN OPERABLE UNIT 2 (OU 2) McCOY ANNEX LANDFILL NTC, ORLANDO

Nancy Rodriguez, United States Environmental Protection Agency (EPA)

I. General Comments

1. The data generated should be presented graphically as contour maps, delineating the contaminants of interest and their critical concentrations as determined by PRGs or similar risk-based mechanism. How will the use of Non-Parametric Statistical methods be used? The methods for comparison to background for selection of COPCs was not discussed in detail? Please note that the Region IV Office of Health Assessment prefers the 2X background criterion to statistical methods of comparison.

The field and analytical data generated during the RI will be presented graphically as contour maps whenever appropriate and whenever such data presentation will facilitate a better understanding of potentially complex spatial relationships between various chemical parameters.

The evaluation of investigatory data in the comparison to background will be handled through the use of some of the more widely used statistical approaches (i.e., Mann-Whitney, Student T, and Box and Whisker plots). The Box and Whisker plots will assist in identifying outliers. The 2x background evaluation will be performed in addition to the statistical comparison. This will support the comparison of site data to established background concentrations and/or ranges.

The use of nonparametrics for statistical evaluation will be limited to the evaluation of off-site sediment and surface water data. For these media, it is assumed that contaminant distribution will be more homogeneous and thus will not be spatially correlated.

Section II. Specific Comments

1. Page 2-22, first full paragraph. It says:

"The potential exposure of maintenance workers in direct contact with landfill wastes is avoidable, and risks to human health far outweigh the convenience of maintaining such utilities in the future."

The first full paragraph of Page 2-22 will be rewritten as follows:

"From a regulatory standpoint, the McCoy Annex Landfill will be treated as a closed landfill. However, future reuse scenarios include its continued use as a golf course, with residential areas outside of, but adjacent to the closed landfill. For purposes of

this RI/FS workplan, it is assumed that no utilities pass through the former landfill nor do irrigation lines penetrate through the soil cover into landfill materials. If such utilities exist, therefore, they will be removed from service or replaced with utilities that do not penetrate the soil cover into landfill materials. This will protect maintenance workers from potential exposure to direct contact with landfill wastes."

2. Page 2-24. Ordnance. If ordnance was in fact disposed of in the landfill, how will it be detected?

As previously stated, there are no records which indicate that ordnance was disposed of in the landfill. The primary intent of the geophysical survey which is planned (magnetometer, terrain conductivity [Geonics EM-31D], and ground penetrating radar surveys) is to map the boundaries of the landfill and to locate "hot spots" that might warrant source removal to support the selected remedial alternative. If future information is disclosed that indicates a strong likelihood of UXO, then a time domain metal detector survey (Geonics EM-61) could be added to complement the suite of techniques already in place.

3. Page 5-3, recreational users and inhalation of landfill gases. As well as site maintenance workers, recreational users, presumably golfers, should also be evaluated for exposure to landfill gases.

This exposure route has not been included as a probable condition on the conceptual site model, Figure 2-4 (Page 2-18) because the presumptive remedy, along with a maintenance and monitoring program to be included with the remedy, eliminates the need to consider it. Inhalation is included as a potential deviation, however, and inhalation exposure to landfill gases will be evaluated as part of the human health risk evaluation (Section 5.1.3 Exposure Assessment).

EPA Comments on the Draft RI/FS Work Plan for Operable Unit 1, North Grinder Landfill, were included in the response to comments for Operable Unit 2, McCoy Annex Landfill. Those comments have been reviewed in the context of OU 2, and our response follows.

1. Sect. 1.1, p. 1-1: The second sentence is repeated in the text of the first paragraph.

Comment 1 is not appropriate for OU 2, McCoy Annex Landfill.

2. Sect. 2.2, p. 2-2: A minor discrepancy between Chapter 1 and this section concerning the timing of the Army Air Command's acquisition of the property has been noted. A statement in the first paragraph of this section indicates that landfilling operations started between 1939 and 1947, at a time when the property was under control of the Army Air Command. According to Chapter 1, the Army Air Command acquired the property in August 1940. Is the earlier landfill start date, 1939, simply an observation based on review of aerial photos?

Comment 2 is not appropriate for OU 2, McCoy Annex Landfill.

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3. Sect. 2.3, p. 2-7: In discussing the potential for interaquifer migration of contaminants, the common occurrence of sinkholes in the area should be acknowledged.

The text has been revised as follows: in Section 2.3, p. 2-4, second complete paragraph, after last sentence ending with "...flow rates in the surficial aquifer," the following text will be added: "The prevalence of karst activity and sinkhole development throughout the Greater Orlando area will be considered in the hydrogeologic characterization."

4. Sect. 2.6, pp. 2-17 through 2-19:

- (A) The entire description of the statistical sampling method is unclear, making it difficult to evaluate relative to EPA guidance on the subjects of sampling plan design and data quality objectives (DQOs). For example, on page 2-17 it says:

...two different sampling strategies will be applied to the different media within and surrounding the landfill.

Samples to evaluate gas generation and migration from the landfill will be taken. Hydrologic and groundwater data will be collected on a grid or biased basis due to the heterogeneity involved.

In areas where contamination is considered to be either unlikely or more homogeneously distributed (sediment, surface water, and surface soil), a statistically biased sampling methodology will be applied.

This section was confusing because of the inaccurate use of the terminology.

There are two types of environmental sampling strategies. The first type seeks to sample areas in which contamination is known or suspected. It is called biased, purposive, judgmental, or "hot-spot" sampling. This first type generally seeks information regarding the maximum level of contamination present.

The second type seeks to sample areas in which contamination is not known to be present. It is called random, systematic, statistical, grid-based or unbiased sampling. However, there are some differences between these. This second type generally seeks to 1) determine the areal extent of contamination; and 2) determine if contamination is present in areas hitherto believed to be "clean."

- (B) Further on, the work plan indicates that non-parametric statistics will be used to determine levels of confidence and sample sizes. EPA guidance on the subjects of sampling design and DQOs generally stress the need to establish a decision rule and specify limits on decision errors. Using the surface soil sampling plan (Chapter 3) as an example, what does it mean to say that we are 95 percent confident that the maximum contaminant concentration encountered is greater than the 0.75 quantile, in terms of making a right or wrong decision about whether remedial action is required?

- (C) In determining the number of samples to collect, it is often necessary or desirable to know the identity of the principle contaminants in the medium being sampled, something about data distribution and variability, the screening or cleanup standard site data will be evaluated against, and the analytical detection limits for each contaminant. Again, using surface soil sampling as an example, we know little or nothing about surface soil contamination at the Grinder Landfill that could aid us in developing a statistically based sampling plan. However, there are two pieces of information that need to be obtained from the initial round of soil sampling: (1) standard surface soil samples to determine if landfill contents have impacted the surface; and (2) the depth to the landfill contents.
- (D) Also, in this discussion, there was no consideration of the receptors and the exposure units appropriate for these receptors. Briefly defined, an exposure unit (EU) is the area of an environmental medium a receptor will routinely contact during the course of a day. For example, a recreational user might be a youth baseball/softball player who will move over 1-2 acres (the size of a baseball field) whereas the site worker will probably range over the entire 15 acres of the landfill.

The sampling strategy should consider EU for the two scenarios - recreational user/site worker and off-site resident. How much of a given medium will they contact in a day? Sampling should be designed to estimate the RME concentration of a contaminant within that EU. If sampling within each EU is adequate and the maximum detected concentration of a contaminant is less than the risk-based level or regulatory standard, then a finding of No Further Action would be supported.

- (E) The choice specified in the document is to take fewer samples and use statistical means to support decision. EPA suggests that statistics and consideration of the receptors should be used to develop a sampling plan, the results of which could support decisions without additional recourse to statistics.

Comment 4(A) has been incorporated into the work plan for OU 2, McCoy Annex Landfill in a similar manner to the OU 1 work plan. Specifically, the two bulleted items at the bottom of page 2-14 have been revised to now read:

- "• Hydrologic, gas generation and migration, and groundwater data will be collected on a purposeful basis due to the potential heterogeneity involved. Purposeful sampling is biased sampling; examples include characterizing areas of likely high concentrations or evaluating changes in concentrations with distance from the source. Surface soil data will be collected on a grid basis.**
- In areas where contamination is considered to be either unlikely or more homogeneously distributed (off-site sediment and surface water) a statistically based sampling methodology will be applied."**

In addition, in the second complete paragraph on p. 2-15, fifth line, the phrase "...will not exceed..." has been replaced by "...will equal or exceed... ."

- (B) The workplan is being revised to clarify that most of the sampling locations will be selected purposefully (i.e., at areas more likely to be contaminated or along boundaries) or as part of a grid. Soil sampling will be performed on a grid designed to take one sample per acre; 99 samples will be taken. There is no need for a statistical explanation for the number of these samples. The statistically based plan will be used for sediment and surface water locations off of the base, which will be sampled only if initial results indicate that contaminant migration may have occurred.

The description of the statistically based plan is also being clarified and shortened. It will ~~discuss the number of samples (5) needed~~ indicate that while 5 samples are sufficient to obtain an approximate 95 percent upper confidence limit for the median, 10 samples will be collected to satisfy regulatory requirements. ~~This~~ The 95 percent upper confidence limit means that the true population median has only a five percent chance of being greater than the sample maximum. This is considered an adequate level of confidence for making remediation decisions based on upper bound concentrations in the media. As an upper bound estimate for the median, the upper 95 percent confidence limit is a conservative value for exposure considerations. Therefore, consideration of other quantiles, like the 75th percentile, is unnecessary.

- (C) Section 3.4.1 of the workplan (as modified by the response to David Clowes, FDEP Comment 3) details the surface soil sampling program to determine if landfill contents have impacted the surface. Section 3.1 discusses the geophysical program that will be implemented to determine the depth to the landfill contents (specifically the ground penetrating radar portion of the program).
- (D) It is believed that any detailed discussion of receptors over and adjacent to the landfill and the exposure units (EU) appropriate for these receptors is unnecessary given that the presumptive remedy will be utilized. The sampling approach proposed is sufficient to support the FS and any risk evaluations which may need to be conducted.
- (E) In the absence of indications of heterogeneity, the sampling plan is sufficient to characterize the media.

5. Sect. 2.7.1, pp. 2-20 through 2-22: The conceptual site model presented in this section represents a significant compression of the generic conceptual site model presented in EPA's fact sheet on the Presumptive Remedy for CERCLA Municipal Landfill Sites. This can be accounted for in part by discounting contaminant release/transport mechanisms that are not active at the Grinder Landfill (e.g., surface expression of leachate). However, some release mechanisms and exposure routes have been omitted without explanation. Also, the probable release mechanisms and potential deviations are not consistent with application of the presumptive remedy. Examples of some of the inconsistencies and problems with the conceptual site model are as follows:

Direct contact/ingestion has been retained as a probable exposure pathway for terrestrial wildlife but identified as a potential deviation for humans. The presumptive remedy's cover component will eliminate this pathway for humans and should eliminate this pathway for most terrestrial wildlife. We

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would expect to see a substantial portion of the sampling effort to be devoted to assessing probable release mechanisms, but no biota or subsurface landfill sampling is planned to assess this potential ecological risk. Either the direct contact/ingestion pathway for terrestrial wildlife should be identified as potential deviation or the lack of sampling for a probable exposure pathway should be explained.

Volatilization and inhalation of volatile organic compounds (VOCs) buried in the landfill should be presented as a distinct transport mechanism and pathway from landfill gas. Generally, we are referring to methane when we mention landfill gas. Methane poses a significant potential risk due to explosivity and to a lesser degree, poses a risk as an asphyxiant. VOCs, such as tetrachloroethylene and other chlorinated solvents that may have been landfilled, are carcinogens. Methane and VOCs pose different risks and require different sampling strategies. Therefore, they warrant distinction in the conceptual site model.

Potential deviations (1) and (2) need to be more clearly distinguished. As written, they appear to be identical. Surface water and sediments in nearby lakes and ponds may be impacted by discharge of groundwater contaminated by landfill leachate. Surface water and sediment in ponds and lakes could also be impacted by contaminants carried in surface water runoff from the landfill as the soil cover erodes. Another deviation which is not reflected in the conceptual model but is covered in the sampling plan is human receptor contact with or ingestion of contaminated surface soil. As a result of settlement, erosion, inadequate cover placement at landfill closure, or utilities excavation, waste and contaminated soil may be exposed at the landfill surface. Sampling directed at determining soil cover thickness and presence of contaminants is appropriate and is included in the sampling plan. But, this potential deviation should be depicted in the conceptual site model.

Comment 5, Paragraph 2, direct contact/ingestion for biota is kept as a probable exposure pathway because terrestrial organisms could burrow through the soil cover even if the presumptive remedy is properly implemented and maintained. The direct contact/ingestion for humans is a potential deviation because the only way for this exposure to occur is during intrusive activities. This will be more clearly explained in the text.

Comment 5, Paragraph 3, the conceptual site model (Figure 2-4) block labeled "Landfill Gases" will be revised to read "Landfill Gases (Methane and/or VOCs)." Different sampling strategies and methods for VOCs and methane are outlined in Section 3.2.

Comment 5, Paragraph 4, potential deviation no. 2 - Contaminated off-site groundwater - will be changed to a probable condition. The text and Figure 2-4 will be revised to clarify this scenario. Direct contact/ingestion of surface soil will be added to the conceptual site model as a potential deviation and explanatory text will be added.

6. Sect. 2.7.2.2, pp. 2-24 through 2-26: EPA risk assessment guidance requires development of current exposure estimates and potential future exposure estimates. To avoid confusion, land use options from the base reuse plan should be referred to as "future reuse scenarios" rather than "current reuse scenarios".

The list of potential receptors appears incomplete and requires some clarification. The site maintenance worker at the landfill may be exposed to landfill gas (methane), VOCs and contaminated soil or waste. Recruits housed in the barracks adjacent to the landfill and off-base residents just to the west of the landfill should be identified as potential receptors. Methane gas could potentially migrate laterally through the soil and accumulate at explosive levels in nearby buildings. An attempt should be made to better define the distinction between on-site and off-site receptors. For this purpose, on-site might be defined by the boundary of the landfill as determined by geophysical survey and sampling.

Instead of assuming that no utilities pass through the former landfill, historical records of the local government, Navy and Air Force should be checked.

In Comment 6, Paragraph 1, "current reuse scenarios" will be changed to "future reuse scenarios" as suggested.

In Comment 6, Paragraph 2, the conceptual site model and Tables 2-4 through 2-6 indicate that both probable and potential exposure pathways will be evaluated during the RI. The conceptual site model considers the presence of landfill gases, regardless of the source of the contaminant (including methane and VOC emissions), thus keeping the emphasis on a simple conceptual site model. This will be clarified in the text and Figure 2-4. The proposed 175 soil vapor implants around the perimeter of the landfill will permit monitoring for contaminants at a sampling frequency appropriate to findings of prior soil vapor analyses. For purposes of these discussions, "on site" refers to anything within the boundary of the landfill as defined by the geophysical survey and sampling programs. The terms "on site" and "off site" will be more clearly defined in the text.

In Comment 6, Paragraph 3, it is recognized that there may be some utilities which currently pass through the landfill wastes. But the use of the presumptive remedy would preclude the maintenance of existing utilities or installation of any future utilities. This is why the workplan states that any future reuse scenarios would involve the abandonment of any utilities which pass through landfill wastes. The text will be revised to clarify this point.

7. Section 2.7.3.2, p. 2-35: The listing of probable and potential contaminated media in the second paragraph should be revised as follows:

The probable contaminated media are subsurface soil (within and beneath the landfill) and groundwater; potential contaminated media include air, surface water, surface soil, and sediment.

The first sentence in the third paragraph should be revised as follows:

the likely CPCs at the North Grinder Landfill include organics, inorganics, chemicals derived from biomedical waste, and possibly radionuclides.

Changes will be made as suggested.

8. Section 2.8, p. 2-41: The value of surface geophysics to determine soil cover thickness is questionable given prevailing landfill operation and closure practices in the 1960s. We would not expect to see an abrupt change in soil density or soil type between the "final cover" and intermediate or daily soil cover as we would at a landfill closed in the 1990s. In the sixties, the same local soil would be used for daily, intermediate, and final cover. There may not have been any specifications for final cover regarding compaction and thickness. Over the years, the soil cover may have settled or eroded such that it now contains entrained waste and is indistinguishable from soil mixed with the waste. This problem is acknowledged on page 3-3. To ensure that we do obtain sufficient data to assess cover adequacy, EPA recommends that soil cover thickness be determined at each soil gas sampler location and at each surface soil sampling station (after the soil sample is collected).

Comment 8 was discussed at the BCT on January 12 and 13, 1995 (regarding the OU 1 workplan), and the BCT agreed to proceed as outlined in the workplan, with the proviso that if the geophysical program is inconclusive regarding the thickness of final cover, then hand-augured holes will be used to verify the thickness of the cover material at an appropriate number of locations. In addition one hand-augered hole along each ground penetrating radar (GPR) traverse will be advanced and the thickness of the soil cover will be determined by a professional geologist to verify the thickness and aid in the interpretation of the GPR data. Also, one geotechnical sample will be collected from each 4-acre block to support engineering cap evaluation. Appropriate text will be added in Section 3.0 to reflect this.

9. Table 2-5, p. 2-43: To make clear EPA's position, please note that in the description of probable condition and reasonable deviation for groundwater, we interpret "contaminated" to mean contains contaminant concentrations at levels that pose a risk to human health and "offsite" to mean beyond the "zone of discharge" as defined in FDEP regulations.

"Off site" will be defined as all areas beyond the boundaries of the landfill.

10. Sect. 2.9, pp. 2-45 and 2-46: This section should be deleted or substantially revised since it pays only lip service to CERCLA guidance on the data quality objectives (DQO) process. data collection objectives are specified, but not DQOs. EPA's *Data Quality objectives process for Superfund, EPA/540/g-93/071* describes a seven step DQO process. Prior to and during the development of the RI work plan, ABB completed the first four steps but failed to complete the next three critical steps: develop a decision rule; specify limits on decision errors; and optimize the sampling design. At this late stage, it would not be productive to do more than develop a decision rule for each medium. An example of a decision rule for soil cover might be: if the mean soil cover thickness is less than two feet, the cover will be considered inadequate and require remedial action.

Comment 10. One of the goals of a workplan is to establish DQOs that will support risk evaluation and remedial alternative evaluations. As agreed upon at the BCT, decision rules for determining whether remediation is warranted will be developed during the RI evaluation consistent with the presumptive remedy, with input from EPA and FDEP. At this point in the RI/FS process, it is not deemed appropriate to

develop decision rules for potential pathways and exposures, since they have not been demonstrated to exist.

It is believed that the proposed sampling plan and associated DQOs sufficiently support the project goal of collecting data to design the presumptive remedy and evaluate possible risks associated with potential pathways, as shown in the conceptual site model. As stated in the EPA comment, the effort to develop acceptable error in the sampling program is not warranted when considering that remedial alternatives to eliminate the probable pathways have already been determined. Thus, the focus of data collection and evaluation is for the support of engineering design and not risk evaluation.

11. Sect. 3.1, p. 3-1: Two objectives should be added to the geophysical survey program. One, determine the depth of waste fill relative to groundwater. It is important to determine if waste lies below the water table because this will impact selection of remedial technologies. Two, support and supplement intrusive methods to define subsurface lithology.

Comment 11 was discussed at the BCT meeting of January 12 and 13, 1995 and it was agreed that the workplan would not be revised because (1) geophysics will probably not be of use in determining the depth of waste at OU 2, and (2) it will also likely be of little use in defining subsurface lithology because the literature indicates the surficial aquifer is reasonably homogeneous.

Any uncertainties which remain after the remedial investigation is completed can be managed through development of contingent actions during the remedial alternatives evaluation and design.

12. Sect. 3.2, pp. 3-3 and 3-4: Please specify the number of passive soil gas samplers that will be installed and the method for selecting sample locations. Since the passive soil gas samplers do not produce air or soil gas concentration data, use of the results may be limited to identifying areas within the landfill where volatile liquids are buried. However, unless the samplers are closely spaced this effort may not produce meaningful results. Contrary to the first bullet item, the data produced by the passive samplers will not be of use in designing a soil gas collection system because the results cannot be used to evaluate risk due to inhalation of toxic VOCs. In order to determine if VOCs are being released through the cover at levels that may pose a risk to onsite receptors, it makes more sense to measure ambient air concentrations of target compounds at multiple locations on the landfill.

Is the methane sampler identified in this section a conventional explosive gas meter? Also, the critical values for methane are the lower explosive limit (LEL), about 4% to 5%, and 25% of the LEL. Is the specified accuracy of the meter to be used (0.3 to 5.0 percent) a percent of total volume of percent of the methane concentration?

In response to Comment 12, 175 passive soil gas samplers will be installed around the perimeter of the landfill (approximately one every 50 ft). At the BCT meeting of January 12 and 13, 1995, it was agreed that the passive soil gas data were to be used

only in engineering considerations during cap design and would not be used for evaluating risk. After the presumptive remedy is implemented, a portion of the monitoring program under the presumptive remedy will include ambient air monitoring.

~~The workplan specifies in Section 3.2 that an ADC Model LFG 10 or equivalent will be used to measure methane concentrations. This section also specifies that concentrations are quantified (as a percent of total volume) to within 0.3 to 5.0 percent accuracy~~

The instrument specified in the draft workplan is no longer available. The workplan will specify that a Neotronics Digiflame 2000 or equivalent will be used. This instrument is not a conventional explosive gas meter; it is designed specifically to measure methane concentrations. The specified accuracy for this piece of equipment is +0.25% by volume from 0% to 5% methane (the Lower Explosive Limit). At the LEL the analyzer automatically switches scales to read from 5% to 100% by volume, with an accuracy of +5%.

13. Sect. 3.3, pp. 3-5 through 3-7: The strategy for subsurface investigation using the Terraprobe and Cone Penetrometer Testing (CPT) requires major adjustments. ABB proposes to start with the TerraProbe™ and collect groundwater samples at the water table and at refusal or thirty feet, whichever is shallower. Next, a cone penetrometer rig would be used to map subsurface lithology and collect shallow depth groundwater samples at 15 locations and at six locations, collect groundwater samples, every ten feet in the surficial aquifer. This approach, in EPA's opinion, is backwards, redundant, and results in sampling groundwater, blindly. A better approach would be to first map the subsurface lithology using the CPT, possibly preceded by a geophysical survey, identify the more transmissive zones within the surficial aquifer, then selectively target these zones for groundwater sampling.

What is the "desired sampling depth" for the TerraProbe™ installed perimeter gas samplers? Methane and VOCs could be expected to preferentially move laterally within the more transmissive zones above the water table. It may be best to do some exploratory soil borings or CPT probes before installing the gas samplers.

During discussions at the BCT on January 12 and 13, 1995, the rationale was provided for the subsurface investigation strategy presented in the workplan. In those discussions, a step-by-step approach was presented starting with the geophysical program, and continuing with the TerraProbe™, cone penetrometer, and monitoring well installation programs. This resulted in a consensus from members of the BCT that the strategy is sound. Accordingly, the text will not be revised.

14. Sect. 3.4.1, p. 3-8: Regarding the first paragraph, please note the comments above on DQOs and statistically based sampling design.

PCBs should be included in the list of analytes for surface soil samples. However, some of the secondary parameters listed are appropriate only for aqueous samples.

In accordance with changes made in Section 2.6 resulting from EPA Comment no. 4 and other considerations, the first paragraph in Subsection 3.4.1, pp. 3-8 and 3-9 was revised to be consistent with the biased sampling approach suggested by EPA and FDEP. This first paragraph has been replaced with the following two paragraphs:

"The surface soil sampling program will be conducted based on the sampling methodology presented in Section 2.6. Although it is believed that the landfill cover was derived from a clean source and is not considered a contaminated medium, one surface soil sample of the existing cover will be collected for laboratory analysis from each acre (99 samples). The objective of this sampling and analysis activity is to confirm that the existing soil cover is not contaminated. The samples will be collected from a depth range of 0 to 1 foot. Samples for SVOC and metals analyses will be composited from five equidistantly spaced sample locations within each acre (Figure 3-). Samples for VOC analysis will not be composited, but will be collected from the central node of the composite pattern. Statistical evaluation of the results will be performed and additional sampling will be conducted if outliers are found.

Within the McCoy Annex Landfill, one geotechnical soil sample will be collected per 4 acres (for a total of approximately 25). At each location a Shelby tube sample will be collected for determination of undisturbed vertical permeability (ASTM D5084/EPA 9100), moisture content (ASTM D2216), in-place density (ASTM D2937), and Atterberg Limits (ASTM D4318). A standard proctor test (ASTM D698) will also be performed at each sampling location to determine the degree of compaction of the existing soil cover. Within each 4-acre block, these samples will be collected above landfill trenches if possible."

As per discussions at the BCT meeting of January 12 and 13, 10% of samples in each medium (soils, groundwater, surface water, and sediment) will be submitted for PCB analysis. Dioxins will only be analyzed for if PCBs are detected. The text has been revised in several places to reflect this modification.

The comment regarding secondary parameters does not apply to OU2.

15. Sect. 3.4.2, pp. 3-8 through 3-10: The closest body of surface water in the assumed groundwater flow direction, Lake Spier is about 1800 feet from the landfill. Given the likely problems that would arise in assessing data from a lake in an urban setting, additional contingencies should be applied to subsurface water sampling plans. Sample surface water if groundwater is contaminated and it is likely that contaminants have migrated to the surface water body.

What is the basis for the list of radionuclides that various media samples would be tested for? Attached is a listing of radionuclides and corresponding DOD installation sources prepared by region IV's Office of Radiation Programs. Please review this list and make appropriate adjustments to the radionuclide list for environmental media sample analysis in this work plan.

Leachability analysis of sediment samples would provide no useful data. Total constituent analysis (dry weight basis) is all that is needed. Also, PCBs should be run if sediment samples are collected.

Paragraph 1 of Comment 15 is not applicable to OU 2, the McCoy Annex Landfill. The text in Subsection 3.4.2, Paragraph 1 should remain unchanged.

Regarding Paragraph 2 of Comment 15, because the source of the radium used in the painting process has not been verified, both potential sources (uranium and thorium) and daughter products would be analyzed for. This would also be useful in comparing against upgradient concentrations because decay of naturally occurring uranium and thorium could lead to relatively high levels of radium that would not be a result of materials placed in the landfill. Specific radionuclides will only be analyzed for if MCL exceedances of gross alpha or background screening values for gross beta are detected.

Leachability tests will not be performed during the sediment and surface water sampling phase. However, if laboratory results indicate significant contamination in the sediments, additional samples will be collected to determine if (1) the sediments are hazardous wastes by characteristic (TCLP, ignitability, corrosivity, and reactivity) and (2) pretreatment (e.g., stabilization) will be required prior to disposal. PCB analyses will be performed as discussed in Comment 14.

16. Sect. 3.5 p. 3-12: The well types "up gradient", "lateral", "downgradient" and characterizations should be defined in the text.

The terms listed in Comment 16 will be defined appropriately in the text. The following text will be added to the workplan on p. 3-13 in the middle of the third complete paragraph:

"'Upgradient' refers to any point relative to the site in the direction from which groundwater flows. 'Downgradient' refers to any point relative to the site in the direction toward which groundwater flows. The term 'lateral' refers to any downgradient location that is also offset laterally from the direction of groundwater flow. Implicit in all three terms is their spatial relationship to a point of interest, in this case, the McCoy Annex Landfill. 'Characterization' is a term that refers to the placement of monitoring wells within a contaminant plume such that they characterize the plume sufficiently to predict contaminant concentrations and migration pathways. The ultimate goal of the placement of characterization wells and wells outside of a contaminant plume is to enable evaluation of risks, remedial alternatives, and further monitoring to support potential remedial actions."

17. Sect. 5.1.3 pp. 5-3 and 5-4: The text indicates that cancer risks and hazard indices will be determined for CPCs. Risks and HIs should also be determined for each scenario. Presumably, the recreational user/site worker will be exposed to landfill gas and surface soil. Presumably, the offsite resident will be exposed to surface soil and groundwater, the assumption being that the gas will

become diluted in its passage off the landfill. It is important to determine the total risk for a receptor from all media.

Risks and hazards should be calculated for a receptor in each given use scenario. By restricting the risks to pathways or media, the actual cleanup levels may be too high. In this regard, the NCP (40 CFR 300) states:

For known or suspected carcinogens, acceptable exposure levels are generally concentration levels that represent an excess upper bound lifetime cancer risk to an individual between 10^{-4} and 10^{-6} ...

on page 8-16 of RAGS, it states:

... the risk assessor should clearly identify those exposure pathway combinations for which a total risk estimate or hazard index is being developed.

Supplemental region IV Guidance on PRGs and RGOs (attached) indicates that chemicals of concern (COCs) are determined in regard to each use scenario.

Regarding Comment 17, implementation of the presumptive remedy will eliminate exposure risks on site, and as such, exposure risks on site will not be evaluated. Off-site risks will be evaluated consistent with identified exposures indicated on the conceptual site model or as developed during the remedial investigation.

18. Sect. 6.2, p. 6-4: Placing soil cuttings back in the borehole(s) is acceptable only for shallow borings (i.e., 10 feet or less) In addition, the borehole must not have encountered a major change in lithology or extend below the water table.

The first sentence of Section 6.4 has been revised to read, "IDW will be containerized for characterization and classification." No IDW will be redeposited back to its originating borehole. IDW will be handled in accordance with Chapter 6 of the workplan and the POP (ABB-ES, 1994a, Section 4-10, pp. 4-68 to 4-70).

19. Sect. 6.6, p. 6-6: Please note that RCRA waste listings are retroactive. RCRA listed wastes or contaminated media containing listed waste, if actively managed after the effective date of the RCRA regulations must be managed in accordance with RCRA subtitle C regulations, regardless of when the listed wastes were originally disposed. Also, is there text missing between the bottom of page 6-6 and the top of the next page?

Part 1 of Comment 19 is noted. Part 2 of Comment 19 does not apply to OU2.

20. Sect. 6.8, pp. 6-7 and 6-8: EPA does not believe it is necessary or reasonable to leave the time limit on storage of IDW at the Field Staging Area open-ended. ABB and the navy should commit to the removing and/or disposing of all classes of IDW within a limited number of days (e.g., 30 days) after field work is completed, or relevant analytical data is received, whichever is less. Also, you should note that EPA Region IV and state RCRA Compliance Program Offices have taken enforcement

action against facilities that store RCRA hazardous IDW in unapproved (i.e., lacking a permit or interim status) storage units for greater than 90 days.

Except when exposure to radioactive materials occurs, the incidental contact with waste or contaminated media by personal protective equipment (PPE) typical of CERCLA site investigations does not warrant management of PPE as hazardous waste. Generally, PPE should be handled as a non-hazardous, solid waste.

It is the Navy's position that IDW will be handled in a manner consistent with the CERCLA program (even though NTC, Orlando is not an NPL-listed site) and consistent with RCRA requirements and base standard procedures.

Regarding Part 2 of Comment 20 (PPE), the text under the heading PPE has been revised to read, "The incidental contact with waste or contaminated media by personal protective equipment (PPE) typical of CERCLA site investigations does not warrant management of PPE as hazardous, solid waste. However, if exposure to radioactive materials occurs, PPE will only be regarded as hazardous if radiological contamination levels are greater than 10,000 disintegrations per minute (dpm) per 100 cm² for beta-gamma radioactivity or greater than 1,000 dpm per 100 cm² for alpha radioactivity. Isotope-specific criteria will be established by the project health physicist."

21. Sect. 7.0, p. 7-1: The RI report should be made available to the NTC Restoration Advisory Board for review when it is submitted to the BRAC Cleanup Team.

The RI report will be made available to the NTC Restoration Advisory Board when it is submitted to the BRAC Cleanup Team.

22. Sect. 8.1, p. 8-1: Please note that the referenced presumptive remedy for CERCLA landfill sites is applicable to CERCLA municipal landfill sites. This presumptive remedy may be applicable to the military base landfills on a case-by-case basis.

During the BCT of January 12 and 13, 1995, it was discussed and agreed upon by the BCT that, consistent with the preamble of the presumptive remedy, any aspect of the CERCLA municipal landfill guidance should be utilized where applicable.

23. Table 8-1, pp. 8-2 through 8-6: Regarding the description of the composite barrier on page 8-3, please note that a 20 millimeter thick membrane is almost an inch thick. EPA recommends a minimum thickness of 30 mils for the synthetic membrane component of a composite cover system.

There does not appear to be any difference trench vents and interceptor trenches in the process options listings for landfill gas. Consider eliminating one.

Regarding Comment 23, Part 1, text on Table 8-1, p. 8-3 has been revised to read "Compacted clay covered with a synthetic membrane (0.020 to 0.030 inches minimum) followed... ."

Part 2 of Comment 23 does not apply to OU2.

24. Appendix A, p. A-5: 40 CFR Part 270 should be deleted from the ARARs list. The permitting requirements of 40 CFR part 270 are administrative, not substantive standards. Also, we recommend that 40 CFR Part 258 be cited in lieu of, or in addition to 40 CFR part 257.

As recommended in Comment 24, 40 CFR Part 270 was deleted from the ARARs list because no offsite remedial actions are anticipated. 40 CFR Part 257 has also been replaced with 40 CFR Part 258 as the more appropriate solid waste regulation.