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TECHNICAL REVIEW AND COMMENTS REPORT FOR THE DRAFT FEASIBILITY STUDY FOR OPERABLE UNIT 6 (OU6) NAS CECIL FIELD FL

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DYNAMIC CORPORATION

NAS CECIL FIELD, FLORIDA

Technical Review and Comments Report for the Draft Feasibility Study for Operable Unit 6

Prepared for:

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Waste Management Division
Atlanta, Georgia

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1.0 INTRODUCTION

Gannett Fleming, Inc., received the Draft Feasibility Study (FS) for Operable Unit (OU) 6, Naval Air Station (NAS) Cecil Field, Jacksonville, Florida, (Draft FS) from the U.S. Environmental Protection Agency (EPA), Region IV, under Regional Oversight Contract, Zone 2 (ROC 2), contract number 68-W6-0015, work assignment number 4-0015-011-1. Gannett Fleming, Inc., assigned review of the Draft FS to ROC 2 team firm Dynamac Corporation (Dynamac). The Draft FS, dated September 1997, was developed by ABB Environmental Services, Inc., (ABB-ES) for the U.S. Department of the Navy, Southern Division, Naval Facilities Engineering Command.

This technical review focused on whether the Draft FS accomplished its purpose and complied with federal regulations. The Draft FS was reviewed for technical content, validity, accuracy and completeness.

The purpose of a Draft FS is to identify remedial action objectives (RAOs), identify and evaluate remedial action alternatives that will achieve those objectives and evaluate the alternatives that best meet the evaluation criteria. However, the Draft FS has not met its objectives by not providing sufficient information to support the remedial alternatives selected for groundwater remediation, nor has the Draft FS presented reliable data to support whether groundwater remediation is even necessary. The Draft FS should be revised to better evaluate the contaminant of concern in groundwater and determine if the remedial alternatives selected are effective based on the geochemical properties of the contaminant.

Sections 2.0 and 3.0 of this Technical Review and Comments (TRC) Report contain general and specific comments, respectively. General comments identify concerns throughout the Draft FS, while specific comments identify concerns within individual pages, sections, paragraphs, figures and tables of the document.

The following references were used during the review of the Draft FS.

ABB-ES. 1996a. *Draft General Information Report, NAS Cecil Field, Jacksonville, Florida*, August.

ABB-ES. 1996b. *Draft Remedial Investigation for Operable Unit 6, Site 11, NAS Cecil Field, Jacksonville, Florida (Draft RI)*, December.

EPA. 1988. *Guidance for Conducting Remedial Investigations and Feasibility Studies Under CERCLA, Interim Final*, October.

EPA. STF. *Soil Fate and Transfer (STF) Database.* USEPA Kerr Laboratories, Ada, OK.

2.0 GENERAL COMMENTS

The following general comments were generated during review of the Draft FS.

1. The Draft FS does not provide sufficient or reliable data to support a decision for groundwater remediation. The recommendation to implement remedial action for groundwater is based on one contaminant, 1, 2-dibromo-3-chloropropane (DBCP), detected once in a monitor well adjacent to Anomaly 4. In addition, the sample may not be reliable since the Draft FS references a potential problem associated with suspended particles in the groundwater samples. Since the groundwater data is not statistically significant and possibly not reliable due to turbidity, additional groundwater samples should be collected to fully characterize the groundwater before making a decision to proceed with groundwater remediation.

2. The Draft FS presents inconsistent information about the geochemical properties of DBCP and therefore raises concerns about the effectiveness of the groundwater remedial alternatives evaluated in the detailed analysis section of the report. For example, DBCP is a mobile contaminant which degrades slowly (half-life of 35 years for abiotic hydrolysis) and has a very low Henry's Constant or volatility (i.e., difficult to "strip" from water) (EPA, SFT). However, the Draft FS states that DBCP is volatile when used on agricultural soil, has a half-life of 8 weeks to 1 year and may occur under anaerobic conditions. Other sections of the report reference DBCP as having low volatility and degrading under aerobic conditions. These inconsistencies in the physical and geochemical properties of DBCP and how the inconsistencies are evaluated have a significant effect on which remedial alternatives are selected. For example, three of the remedial alternatives, which use volatilization/air stripping may be totally ineffective if DBCP is difficult to strip from the groundwater. The Draft FS should clarify these inconsistencies relating to the physical and geochemical properties of DBCP and evaluate whether the groundwater remedial alternatives selected for this operable unit are appropriate.

3. When reviewing the remedial action alternatives for groundwater, it was noted that the groundwater sampling intervals vary for the different remedial action alternatives. The text should clarify the reason different alternatives use different time intervals for sampling groundwater monitoring wells (i.e. bimonthly, semiannually). See specific comments.

4. There are inconsistencies between the way the cost estimates were prepared for Alternatives GW-2, GW-3 and GW-5 and the way cost estimates were prepared for Alternatives GW-4 and GW-6. The cost estimates should be reevaluated to ensure that the applicable costs are consistent. Two examples include the sampling and analysis portion of the cost estimates and the five-year review portion of the cost estimates. See Specific Comments.

3.0 SPECIFIC COMMENTS

The following specific comments were generated during review of the Draft FS.

- **Page 2-6, 1st Paragraph**. The text states that "The groundwater flow direction is to the southeast toward Rowell Creek . . ." However, the next paragraph states, "Based on the southwest groundwater flow direction . . ." Review of the Draft RI as well as Figure 1-2 show that groundwater flow direction is to the southwest toward Rowell Creek. The text should be corrected.

- **Page 2-21, 2nd Paragraph**. This paragraph provides some of the physical data on DBCP; however, some of the data is confusing since both soil and water are presented together. A more detailed description of the physical, chemical and biological properties of DBCP should be presented separately for soil and groundwater in this section of the Draft FS.

  The reference to the half-life of DBCP (8 weeks to one year) does not specify whether this is applicable to soil or groundwater. The half-life as referenced in the EPA's Soil Transport and Fate (STF) database is 35 years. This discrepancy should be resolved.

  The statement that "some biodegradation [DBCP] may occur under anaerobic conditions" should be discussed in more detail since this will have an impact on the selection of remedial alternatives.

- **Page 3-18, Section 3.2.7, !st Paragraph**. The last sentence of the paragraph states that air injection can stimulate microbial degradation of contaminants if the required microbes thrive in an aerobic environment. However, Section 2.6.2 of the Draft FS states that some biodegradation may occur under anaerobic conditions. The Draft FS should determine the predominant conditions under which biodegradation occurs since this may have a significant impact on the remedial alternative selected.

- **Page 4-5, Section 4.2.2, 3rd Paragraph**. The text states, "This alternative [Alternative S-2] would comply with ARARs [applicable or relevant and appropriate requirements] identified for this site." (Alternative S-2 consists of limited action under which contaminants would remain in place.) Although this is a true statement, it is misleading since there are no federal or state-promulgated cleanup values (ARARs) for soil. However, concentrations in soil exceed the Florida Department of Environmental Protection (FDEP) Soil Cleanup Goals guidance criteria. The text should be revised.

- Page 4-7, Section 4.3.1, 2nd Paragraph. The text states, "Site clearing and preparation would include . . . collection of one composite soil sample for offsite laboratory analysis . . ." However, the cost estimate for Alternative S-3, located in Appendix B, includes analysis for five omposite samples. This discrepancy should be corrected.

- Page 4-15, 7th Paragraph. The paragraph addresses the implementability of Alternative GW-1, the no-action alternative. The text states, "Five-year reviews present an administrative burden indefinitely." However, five-year reviews are not part of Alternative GW-1. The text should be deleted.

- Page 4-17, Section 4.5.1, 3rd Paragraph. This paragraph addresses Alternative GW-2's compliance with ARARs. The text states, "This alternative would comply with ARARs identified for this site." However, Alternative GW-2 is for limited action (i.e. site monitoring) and does not include any remedial activities. This alternative does not comply with ARARs identified for this site. The text should be corrected.

- Page 4-20, 3rd Paragraph. The text states, "Inorganic contamination at OU6 is assumed to be primarily associated with suspended particles in groundwater samples." This statement is significant since suspended particles or turbidity may have also affected the DBCP concentrations which are in turn driving groundwater remediation. Groundwater samples should be collected when turbidity or Nephelometric Turbidity Units (NTUs) are below 10 NTUs. If turbidity is high, then an alternative sampling method, such as low-flow low-volume method, should be used to collect groundwater samples. The Draft FS should provide additional information on the turbidity of the groundwater samples and whether this has had a significant impact on the data.

- Page 4-20, 4th Paragraph. The text states that DBCP has a low volatility which makes stripping efficiency (for groundwater remediation) low. The text then states that "volatilization to the atmosphere is the dominant mechanism controlling DBCPs fate once applied to the soil." It is unclear how the volatilization of DBCP applied to soils relates to the stripping efficiency of DBCP in groundwater. The text then goes on to recommend a low profile air stripper followed by carbon polishing as the remedial alternative for groundwater. The Draft FS needs to provide additional information or reference material to support air stripping as an effective treatment process for groundwater remediation.

- Page 4-23, 2nd Paragraph. This paragraph addresses groundwater monitoring for Alternative GW-3. The text states, "Groundwater monitoring would be conducted to monitor remediation progress and to verify inorganic concentrations as described for Alternative GW-2 in Subsection 4.5.1. The

monitoring frequency was assumed to be semiannual." However, according to the cost estimate for Alternative GW-3, located in Appendix B, site monitoring consists of "one sample twice per month (compliance monitoring), performance sampling (6 wells quarterly)." This discrepancy should be clarified. The text on page 4-23 needs to be consistent with the cost estimate for Alternative GW-3. In addition, groundwater monitoring for Alternative GW-2 is described in Section 4.5 not Subsection 4.5.1. This text should be corrected.

- **Page 4-29, 3rd Paragraph**. The text states, "Alternative GW-4 would incorporate elements of the 5-year review discussed for GW-2." However, the cost estimate for Alternative GW-4, located in Appendix B, does not contain a 5-year review. Instead, it contains an annual closeout review. If the closeout review is being performed annually then this fact should be explained in the text on Page 4-29. However, if it is actually a 5-year review which was divided by 5 to determine annual costs, then it is an incorrect calculation. Instead, the present worth cost analysis should be performed on the cost for the 5-year review. This discrepancy should be corrected.

- **Page 4-29, Table 4-5 and Page 4-43, Table 4-7**. Table 4-5 and Table 4-7 contain cost summary tables for Alternatives GW-4 and GW-6, respectively. These cost summaries do not include the ten percent contingency cost which was included in all of the other alternatives. This discrepancy should be corrected.

- **Page 4-33, 2nd Paragraph**. The last sentence of the paragraph states that removal of contaminants can occur by volatilization or biodegradation during the air injection process. Since the Draft FS has not determined whether DBCP will degrade under anaerobic or aerobic conditions, the reference to biodegradation should be deleted.

- **Page 4-35, 1st Paragraph**. This paragraph addresses groundwater monitoring for Alternative GW-5. The text states, "The monitoring frequency for this alternative was assumed to be bimonthly." However, according to the cost estimate for Alternative GW-5, located in Appendix B, site monitoring consists of "(one sample twice per month (compliance monitoring), performance sampling (6 wells quarterly)." This discrepancy should be clarified. The text on Page 4-35 should be consistent with the cost estimate for Alternative GW-5.

- **Page 4-38, 2nd Paragraph**. The text states, "This 8-inch diameter and 20-foot deep well would contain negative pressure air circulation equipment to provide the required in situ gas transfer." However, the initial remediation concept for Alternative GW-6, located in Appendix B, states that "one in-situ UUB-400 (400 stands for a 400 mm or 16 inch diameter well casing) standard or reverse flow groundwater circulation system" will be used. Furthermore, Appendix C,

In-Situ Stripping Design Calculations, states that the well radius is assumed to be 8.00 inches. This discrepancy concerning the diameter of the well should be clarified.

- **Page 4-38, 2nd Paragraph**. The text states, "Time to cleanup was calculated using the techniques described in a paper by Parrington et, al, and is estimated to be 14 years. Calculations are presented in Appendix C." However, no reference by Parrington et. al. is included in the reference section. The calculation in Appendix C referenced a paper by Todd Schrauf and Leslie Pennington. This discrepancy should be corrected.

- **Page 4-40, 4th Paragraph**. This paragraph addresses five-year site reviews for Alternative GW-6. The text states, "Under CERCLA 121c, remedial actions that result in hazardous substances, pollutants, or contaminants remaining onsite must be reviewed at least every 5 years." This sentence is very informative and should have been included in some of the other alternatives rather than in just the last alternative.

- **Page 5-4 and 5-6, Table 5-2**. In Table 5-2, for the criterion Reliability of controls under the Alternative S-1: No Action column, the text states, "Five-year site reviews would be used to assess change in site conditions over time to ensure long-term effectiveness and permanence." In addition, for the criterion Monitoring considerations under the Alternative S-1: No Action column, the text states, "Five-year site reviews would be required." However, in Section 4.1, Detailed Analysis of Alternative S-1: No Action, there is no mention of five-year site reviews. If five-year site reviews are required, the text in Section 4.1 should state this and there should be a cost estimate for Alternative S-1 to account for the cost of the five-year site reviews. Otherwise, the text in Table 5-2 should be corrected.

- **Page 5-12, Table 5-4**. According to Table 5-4, for Alternatives GW-3, GW-4, GW-5 and GW-6, decontamination water would be treated at the NAS Cecil Field wastewater treatment plant. This implies that implementation of these alternatives will generate decontamination water. However, when reviewing the cost estimates for these alternatives, only the cost estimate for Alternative GW-4 included a cost for "decon" ($100/hr for 30 hours). It appears that the cost estimates for the other alternatives should also include a cost for "decon" activities. This discrepancy should be corrected.

- **Page 5-13, Table 5-4**. In Table 5-4, for the criterion, Protection of workers during remedial actions, under the Alternative GW-1: No Action column, the text states. "Workers would follow an approved health and safety plan during monitoring." However, in Section 4.4, Detailed Analysis of Alternative GW-1: No Action, there is no mention of monitoring activities. This discrepancy should

be corrected. (It should be noted that there are monitoring activities listed for Alternative GW-2.)

- **Appendix A**. In the surface soil volume calculations, the text states, "Area 2 is associated with Anomaly 8." However, review of Figure A-2 indicates that Area 2 is associated with Anomaly 4. The text should be corrected.

- **Appendix A**. The subsurface soil volume calculations for Area 2 associated with Anomaly 4 show the volume of the subsurface soil, 2,880 ft^3, is equal to the surface area, 480 ft^2, multiplied by the depth of subsurface soil (neglecting surface soil excavation), 6 feet. However, a portion of this Area 2 overlaps with a portion of the Area 2 used to calculate surface soil volume with a depth of 3 feet. It appears that the subsurface soil volume should be calculated using a depth of 3 feet (soil excavation from 3 feet to 6 feet). This would decrease the subsurface soil volume to 1,440 ft^3 which in turn would impact the total soil volume and the cost estimate for Alternative S-3, Removal of Soil.

- **Appendix B, Alternative S-2 and Alternative GW-2**. The cost estimates for Alternative S-2 and Alternative GW-2 include a total cost for five-year site reviews (every 5 years for 30 years) under the "Operations and Maintenance Costs" section. This cost, $79,408, was calculated using "Present Worth of 5-year costs at I = 6%." However, a review of this calculation yielded a present worth of approximately $59,000. The total cost for five-year site reviews should be recalculated to ensure accuracy.

- **Appendix B, Alternative S-3**. The cost estimate for Alternative S-3 includes a 10 percent contingency. However, the contingency was actually calculated at 12.3%. This discrepancy should be corrected. (It should be noted that the correct contingency was used in Table 4-2, located on Page 4-14.)

- **Appendix B, Alternative S-3**. The cost estimate for Alternative S-3 states that the analysis for organophosphorus pesticides is USEPA Method 8141 and the analysis for DBCP is 8010B. However, in Section 4.3.1, the text states that the "[composite soil] sample will be analyzed for toxicity characteristic leachate procedure inorganics (USEPA Method 6000/7000), organophosphorus pesticides (USEPA Method 8140) and DBCP (USEPA Method 8260). . . [and the confirmatory soil] samples will be analyzed for TAL metals, DBPC, and organophosphorus pesticides by USEPA Methods 6000/7000, 8260, and 8140, respectively." It appears that the cost estimate is for the incorrect analytical methods. This discrepancy should be corrected.

- **Appendix B, Alternative GW-2**. The cost estimate for Alternative GW-2, located in Appendix B, contains the cost for an analysis of five groundwater samples which will be performed annually for thirty years. However, according

to the text on Page 4-16, "The site monitoring program proposed for this alternative would include collecting quarterly groundwater samples for the first year, semiannually from year 1 to 5 and then annually thereafter." It appears that the cost estimate for Alternative S-2 concerning the sampling program and analysis was copied and pasted into the cost estimate for Alternative GW-2. The cost estimate for Alternative GW-2 should be revised to reflect the proposed site monitoring program stated on Page 4-16.

- Appendix B, Alternative GW-3 and Alternative GW-4. The cost estimates for Alternatives GW-3 and GW-4 show the 5-year review cost to be $24,300. However, the present worth of this 5-year review cost at "i = 6%" was not calculated. This discrepancy should be corrected.

- Appendix B, Alternative GW-4. The cost estimate for Alternative GW-4 includes groundwater monitoring analysis for only VOCs at $140 per sample. However, Alternatives GW-2, GW-3 and GW-5 include groundwater monitoring analysis for TAL metals (USEPA Method 6000/7000) at $185 per sample, TCL VOCs/DBCP (USEPA Method 8260) at $108 per sample and organophosphorus pesticides (USEPA Method 8140) at $108 per sample. This discrepancy should be clarified.

- Appendix B, Alternative GW-6. The cost estimate for Alternative GW-6 includes a present worth analysis of annual costs. According to the text on Page 4-42, "O&M costs include annual groundwater sampling for a 14-year period . . ." However, the present worth analysis was for a 13-year period with the statement that this was for the remaining 13 years. If the present worth analysis was for years 2 through 14 then it was calculated incorrectly and should be recalculated. Otherwise, the present worth analysis should be calculated using a 14-year period. In addition, the cost estimate incorrectly calculated the cost for the 5-year review. The present worth cost should be calculated for the 5-year review cost at "I = 6%."

- Appendix B, Alternative GW-6. The cost estimate for Alternative GW-6 includes an annual sampling and analysis cost which is the same as the annual sampling and analysis cost for Alternative GW-4. However, the sampling and analysis cost for Alternative GW-4 is for groundwater samples whereas the sampling and analysis cost for Alternative GW-6 is for groundwater samples and air monitoring (see Subsection 4.9.1). This discrepancy should be corrected.

- Appendix C, Alternative GW-3 and Table C-1. The estimated porosity used in the model for evaluation of groundwater extraction and treatment (Alternative GW-3) is 20 percent according to Table C-1. However, the estimated porosity used for all other calculations (i.e., volume of contaminated groundwater, groundwater alternatives GW-4 through GW-6) is 25 percent. This discrepancy

should be clarified and the model for evaluation of groundwater extraction and treatment should be calculated using a porosity value of 25 percent.

- **Appendix C, Alternative GW-3 and Table C-1**. In Table C-1, the calculated number of pore volumes, N, is shown as 16.125. However, during the review, the number of pore volumes calculated using the equation provided in Alternative GW-3, "N = R ln (Ci/TCL)," N was calculated to be 18.096. This discrepancy should be clarified.

- **Appendix C, Table C-3**. In Table C-3, In-Situ Stripping Design Calculations, some of the parameter values used appear to be different from parameter values used for other calculations. These include the values for the partitioning coefficient of DBCP ($uK_{oc} = 2.11$) and the bulk density ($B = 80.00$ lb/ft^3). Values for parameters should be consistent throughout the Draft FS.