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RESPONSES TO
OHIO ENVIRONMENTAL PROTECTION AGENCY
COMMENTS ON THE
REVISED GROUNDWATER REMEDY EVALUATION
AND FIELD VERIFICATION PLAN
REVISION 0, FINAL

FERNALD CLOSURE PROJECT
FERNALD, OHIO

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U.S. DEPARTMENT OF ENERGY

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SPECIFIC COMMENTS

1. Commenting Organization: Ohio EPA Commenter: GeoTrans, Inc.
Section #: 1.0 Pg #: 1-2 Line #: 18 Code: C
Specific Comment #: 1
Comment: The text should summarize or provide a reference that documents the specific limitations of the DOE model and discusses uncertainties regarding its predictions.
Response: The DOE groundwater model used in the Groundwater Remedy Evaluation and Field Verification Plan is documented in Section 6 of "Integration of Data Fusion Modeling (DFM) With VAM3DF Contaminant Transport Code" (HydroGeoLogic, December 1999). Additional discussion of this model is provided in Section 3 of "Design for Remediation of the Great Miami Aquifer South Field Phase II Module" (DOE, May 2002) and in Appendix A of "Comprehensive Groundwater Strategy Report" (DOE, June 2003).
Action: No change to the plan required.

2. Commenting Organization: Ohio EPA Commentor: GeoTrans, Inc.
Section #: 2.0 Pg.#: 2-1 Line #: 13 Code: C
Specific Comment #: 2
Comment: State why Approach C cannot serve as a final design for the remedy
Response: Approach C was not chosen as a final design for the aquifer remedy because not all components of the aquifer remedy final design have been determined, such as the strategy of using infiltration through the Storm Sewer Outfall. As discussed in the text the final design will be decided upon once the outcome of field verification activities outlined in Section 5 has been determined.
Action: A change page for Page 2-1 is attached that clarifies why Approach C was not chosen for the final remedy design.

3. Commenting Organization: Ohio EPA Commentor: GeoTrans, Inc.
Section #: 2.0 Pg.#: 2-4 Line #: 15 Code: C
Specific Comment #: 3
Comment: Define the gamma parameter in Figures 2.2.2 and 2.2.3.
Response: The gamma parameter in Figures 2.2.2 and 2.2.3 is the semi-variogram Calculation result, given by:

$$\gamma(h) = \frac{1}{2N(h)} \sum_{i=1}^{N(h)} [Z_i - Z_{i+h}]^2 / [\sigma(-h)\sigma(+h)]$$

Where h is one of the separation vectors between N pairs of samples, Z_i is the sample value at location i, Z_{i+h} is the sample value at location $i+h$ that is separated from location i by the vector h, $\sigma(-h)$ is the lag standard deviation of Z_i, and $\sigma(+h)$ is the lag standard deviation of Z_{i+h} (standard deviation of the head and tail values of the vector h respectively).
Action: No change to the plan required.

4. Commenting Organization: Ohio EPA Commentor: GeoTrans, Inc.
Section #: 2.0 Pg.#: 2-4 Line #: 24 Code: C
Specific Comment #: 4
Comment: Residual statistics between the observed concentrations and the model results based on the average and maximum plumes should be discussed to support the claim that the average plume more closely matched the observed concentrations.
Response: DOE has performed the requested calculation of residual statistics. Results are shown in the attached table. The residual term [square of the difference between observed wellhead concentrations and initial modeled (i.e., kriged) concentrations at wellhead locations at model time zero] was computed for two cases. In the first case, residuals were calculated using the initial conditions from the South Field Phase II Model Study ["Design for Remediation of the Great Miami Aquifer South Field Phase II Module" (DOE, May 2002)]. In the second case, residuals were calculated using the initial conditions used in the Groundwater Remedy Evaluation and Field Verification Plan. Since model time zero represents two different times in each of the studies, the observed wellhead concentrations for calculating the residuals are taken at corresponding times (e.g. 3/31/02 for the South Field Phase II modeling study and 12/31/03 for the Groundwater Remedy Evaluation and Field Verification Plan modeling study).

Averaging of observed wellhead concentrations to develop kriged initial conditions for the model provides initial conditions that more closely match observed wellhead concentrations than maximum wellhead concentrations as evidenced by the lower sum of squared residual term in the table. While there are specific exceptions to this rule as evidenced in the table, the averaging technique tends to provide better results (i.e., smaller squared residuals) for the extraction wells with higher observed concentrations (e.g., Extraction Wells WSA 1, 2, and 4, and SF 22).
Action: No change to the plan required.

5. Commenting Organization: Ohio EPA Commentor: GeoTrans, Inc.
Section #: 2.0 Pg.#: 2-5 Line #: 19 Code: C
Specific Comment #: 5
Comment: The text states that 1200 gpm will be available in subsequent pumping periods. Section 2.0 indicates that at site closure, up to 1800 gpm of treatment capacity will be available for groundwater. The text should be corrected to indicate that 1800 gpm will be available.
Response: The CAWWT will provide a total treatment capacity of 1800 gpm. When the CAWWT becomes operational, 1200 gpm will initially be assigned to the treatment of groundwater. and 600 gpm will be assigned to the treatment of storm water. Upon site closure in 2006, storm water treatment will no longer be required; so the full 1800 gpm of CAWWT capacity can be assigned to the treatment of groundwater.
Action: A change page for Page 2-1 is attached which clarifies that 1800-gpm water treatment capacity will be provided by CAWWT. A change page for 2-5 is also attached.

6. Commenting Organization: Ohio EPA Commentor: GeoTrans, Inc.
Section #: 2.0 Pg.#: 2-5 Line #: 20 Code: C
Specific Comment #: 6
Comment: For clarity, this document should include a figure showing a plot of available treatment capacity, total volume extracted, and total volume treated versus time from the start of Approach C through to the end of the simulation in 2023.
Response: Attached is a plot with the requested information from 2005 thru 2023. Water treatment priorities and planned capacities (through March 2006) are taken from Section 5 of the OMMP. In March of 2006 it is anticipated that site storm water treatment needs will end.

Treatment priorities from March 2006 to the end of groundwater treatment will be addressed in a future revision of the OMMP.

Action: No change to the plan required.

7. Commenting Organization: Ohio EPA Commentor: GeoTrans, Inc.
Section #: 3.0 Pg.#: 3-1 Line #: 6 Code: C
Specific Comment #: 7
Comment: State why Approach C-Improved cannot serve as a potential final design for the remedy.
Response: Approach C-Improved was not chosen as a final design for the aquifer remedy because not all components of the aquifer remedy final design have been determined, such as the strategy of using infiltration through the Storm Sewer Outfall. As discussed in the text the final design will be decided upon once the outcome of field verification activities outlined in Section 5 has been determined.
Action: A change page for Page 3-1 is attached that clarifies why Approach C-Improved was not chosen for the final remedy design

8. Commenting Organization: Ohio EPA Commentor: GeoTrans, Inc.
Section #: 3.0 Pg.#: 3-2 Line #: 25 Code: C
Specific Comment #: 8
Comment: The upstream limit of the 10 model nodes corresponds to where the glacial overburden is no longer present. The text should explain how the downstream limit of the SSOD recharge zone (the 10th node downstream along the channel) was determined.
Response: The downstream limit of the SSOD recharge zone was chosen to concentrate the 10 model recharge nodes in an area where field observations indicate a tendency for runoff to pond and where flattening of the surface gradient is indicated by topographic maps of the SSOD.
Action: No change to the plan required.

9. Commenting Organization: Ohio EPA Commentor: GeoTrans, Inc.
Section #: 3.0 Pg.#: 3-3 Line #: 19 Code: C
Specific Comment #: 9
Comment: Previous text indicates that 1800 gpm treatment capacity will be available which seems to be inconsistent with the referenced text.
Response: The 1800 gpm treatment capacity refers to the total treatment capacity of the CAWWT. When the CAWWT becomes operational, 1200 gpm of the capacity will initially be assigned to the treatment of groundwater, and 600 gpm will initially be assigned to the treatment of storm water. Upon site closure in 2006, storm water treatment will no longer be required, so the full 1800 gpm of treatment capacity can be assigned to the treatment of groundwater.
Action: A change page will be issued for Page 3-3 that clarifies planned treatment capacities.

10. Commenting Organization: Ohio EPA Commentor: GeoTrans, Inc.
Section #: 5.0 Pg.#: 5-2 Line #: 24 Code: C
Specific Comment #: 10
Comment: Well 23279 cannot be located on Figure 5.1.
Response: Noted.
Action: Well 23279 will be added to Figure 5.1. A revised figure is attached to this comment response document.

11. Commenting Organization: Ohio EPA Commentor: GeoTrans, Inc.
Section #: 5.0 Pg.#: 5-4 Line #: 9 Code: C
Specific Comment #: 11

Comment: Is the approximately one foot water level depression in the vicinity of OSDF Cell 5 real or a measurement artifact? If real, what is DOE's explanation for the low water levels in this area?

Response: The subject water level depression depicted in Figure 5.3, in the vicinity of the OSDF Cell 5, is not real. The two wells causing the depression were re-surveyed. It was determined that the top-of-casing elevations being used to calculate water table elevations were not correct. The 2004 water level maps that will be presented in the 2004 SER will be based on the true top-of-casing elevations for this area.

Action: No change to the plan required.

12. Commenting Organization: Ohio EPA Commentor: GeoTrans, Inc.
Section #: 5.0 Pg.#: 5-5 Line #: 16 Code: C
Specific Comment #: 12

Comment: The measurement capacity of the downstream weir should be increased to exceed the upstream flow meter capacity (1000 gpm).

Response: Agree. DOE is in the process of preparing design specifications for the test. It has been decided that Flumes will be used in place of Weirs to provide added dependability. The flume at the location of the culvert will have a capacity of 13.4 cfs (approx. 6000 gpm).

Action: No change to the plan is required.

13. Commenting Organization: Ohio EPA Commentor: GeoTrans, Inc.
Section #: 5.0 Pg.#: 5-5 Line #: 2 Code: C
Specific Comment #: 13

Comment: It is also possible that following remediation of the SSOD, bottom sediment conductivity may be increased and the northeast branch alone could infiltrate the 500 gpm test flow.

Response: Agree. Activity 4 (Page 5-7) will establish an optimal long-term flow rate for enhancing recharge to the GMA.

Action: No change to the plan required.

14. Commenting Organization: Ohio EPA Commentor: GeoTrans, Inc.
Section #: 5.0 Pg.#: 5-7 Line #: 1 Code: C
Specific Comment #: 14

Comment: A specific time frame when DOE intended to conduct Activity 1 was indicated in the text (by early Winter 2005). When does DOE intend to conduct Activities 2 through 4?

Response: Gauging of seasonal flows in the SSOD (Activity 2) will begin as soon as the flumes are installed. Activities 3 and 4 will take place following completion of the SSOD source removal excavation activities.

Action: No change to the plan required.