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COMMENTS: PHASE II INJECTION TEST REPORT

11/12/96

OEPA

DOE-FN

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COMMENTS



State of Ohio Environmental Protection Agency

Southwest District Office

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George V. Voinovich
Governor

November 12, 1996

RE: DOE FEMP
MSL 531-0297
HAMILTON COUNTY
COMMENTS: PHASE II
INJECTION TEST REPORT

Mr. Johnny Reising
U.S. Department of Energy, Fernald Area Office
P.O. Box 538705
Cincinnati, OH 45253-8705

Dear Mr. Reising:

This letter provides as an attachment the Ohio Environmental Protection Agency comments on the draft "Phase II South Field Injection Test Report for OU5". This submittal was received by Ohio EPA on September 30, 1996.

If you have any questions, please contact Tom Ontko, Mike Proffitt, or me.

Sincerely,

Thomas A. Schneider
Fernald Project Manager
Office of Federal Facilities Oversight

cc: Jim Saric, U.S. EPA
Terry Hagen, FERMCO
Ruth Vandergrift, ODH
Mike Proffitt, DD&GW
Sharon McLellan, PRC
Manager, TPSS/DERR,CO
Dave Ward, GeoTrans

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(Kappal)
partial
action response
to doe-1417-96
(10036)

Ohio Environmental Protection Agency Comments on the Draft Phase II South Field Injection
Test Report for Operable Unit 5

- 1) Commenting Organization: OEPA Commentor: GeoTrans, Inc.
Section #: 1.0 Introduction Pg. #: 2 Line # 20-23 Code: M
Original Comment #
Comment: This statement is not supported by the conclusions in the Appendix F, which is the referenced geochemical study. The geochemical study says nothing about injected effluent from the SPIT and iron bacterial plugging problems.
- 2) Commenting Organization: OEPA Commentor: GeoTrans, Inc.
Section #: Pg. #: Line # Code: C
Original Comment #
Comment: Why were slug tests not completed in the well installed in the sandpack around the injection well? Completion of these tests, though not possible in the strictest definition of a slug test, might yield valuable information to the degree to which fouling may be taking place. This would, at least, provide comparative results before and after injection.
- 3) Commenting Organization: OEPA Commentor: GeoTrans, Inc.
Section #: 1.0 Introduction Pg. #: 2-3 Line # 30-1 Code: E
Original Comment #
Comment: This sentence appears to be two incomplete sentences. Please correct the text.
- 4) Commenting Organization: Ohio EPA Commentor: OFFO
Section #: 2 Pg #: Table2-1 Line #: Code:
Original Comment #:
Comment: The iron concentration in Well 31567 is listed as 123.4ug/l in Table 2-1 and in Table 5-2 the iron concentration in well 31567 is listed as ND with a detection limit of 100 ug/l. Is the reason for the discrepancy known? Does this in any way affect the validity of the conclusions drawn in this report?
- 5) Commenting Organization: Ohio EPA Commentor: DDAGW
Section #: 4.4 Pg #: 16 Line #: Code:
Original Comment #:
Comment: Was monitoring equipment repaired or replaced after failure?
- 6) Commenting Organization: OEPA Commentor: GeoTrans, Inc.
Section #: 5.1 Water Level Monitoring Results Pg.# 23 - 27 Code: C
Original Comment #
Comment: Were the water levels recorded during the injection test evaluated to determine hydraulic conductivity? If they were how do the results compare to past tests conducted at the same well and are they consistent with expected distribution of hydraulic conductivity in the

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South Field area.

- 7) Commenting Organization: Ohio EPA Commentor: DDAGW
Section #: 5.2 Pg #: 27 Line #: 22 Code:
Original Comment #:
Comment: Why did the O₂ fluctuate. Is this a reflection of a higher O₂ concentration in the test influent?
- 8) Commenting Organization: OEPA Commentor: GeoTrans, Inc.
Section #: 5.2 Groundwater Quality Monitoring Results Pg. #: 28 Line # 3-4 Code: C
Original Comment #
Comment: This statement is significant in the analysis of these test results. This may indicate that iron bacterial fouling will be a concern for long-term operation of injection wells.
- 9) Commenting Organization: OEPA Commentor: GeoTrans, Inc.
Section #: Table 5-3 Pg. #: Line # Code: C
Original Comment #
Comment: What is the smallest change in the hydraulic conductivity that is statistically significant? Ninety percent confidence limits could be used to make this determination. A two-tailed students t-test indicates the ranges of values at the 90% confidence interval for the pre-injection test results are from 290 to 306 feet per day with a mean of 298 feet per day and the post-injection test results range from 279 to 315 feet per day with a mean of 297 feet per day. As these ranges indicate, the hydraulic conductivity would have to be significantly impacted before a statistical significance could be implied. If this magnitude of change occurred in three days, what would the operational life of the wells be? Is it possible that even with the apparently unchanged hydraulic conductivity observed in this test, these wells could still have a short operational period between required maintenance events?
- 10) Commenting Organization: OEPA Commentor: GeoTrans, Inc.
Section #: 5.3 Slug Test Results Pg.# 29 - 30 Code: C
Original Comment #
Comment: Please provide an explanation of the methods and reasons for the "transformation" of the water level data from that recorded by the data logger to the "actual" water level displacement.
- 11) Commenting Organization: OEPA Commentor: GeoTrans, Inc.
Section #: 6.1 Conclusions Pg. #: Line # Code: M
Original Comment #
Comment: The conclusions to this report would be more meaningful and defensible if they were

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discussed in terms of the two problems to be overcome.

The first problem is chemical precipitation of iron in the well which will cause plugging of the well, well pack, or surrounding formation. This problem has been evaluated and apparently solved by removing iron from the water prior to injection.

The second problem is possible iron bacterial growth in the well, well pack, or surrounding formation. The bacteria sampling results as well as the chemistry of the mixed water indicate this will be a problem. A solution to the operational problems iron bacteria can cause needs to be developed.

- 12) Commenting Organization: OEPA Commentor: GeoTrans, Inc.
Section #: 6.1 Conclusions Pg. #: 50-51 Line # 39-3 Code: M
Original Comment #
Comment: This conclusion that iron biological growth can be controlled is not supported by the data. The duration of this test was not sufficient to determine the extent to which iron bacteria will cause plugging of the well and formation. As the biological sampling results on Table 5-4 indicate, the bacteria are present in the well and will probably spread into the formation if they not already present. Injection of water from the SPIT will create environmental conditions in the aquifer (DO levels) which will promote the growth of iron bacteria thus causing plugging in the aquifer proper. This will not be easily corrected by well treatment or redevelopment.
- 13) Commenting Organization: OEPA Commentor: GeoTrans, Inc.
Section #: Appendix B, Table B-1 Pg. #: 3 of 10 Line # Code: C
Original Comment #
Comment: In Table B-1, the data shows a DO increase in well 2065 presumably as a result of injection of aerated water into well 31567. Interestingly, there is also an approximate 15% increase in TDS at about the same time (3/22/96 through 3/23/98). Were any analytical tests performed on the groundwater from this well to determine what inorganic compounds were responsible for this apparent increase in TDS. This information may give insights into how this injected water will affect the geochemistry of the aquifer.
- 14) Commenting Organization: Ohio EPA Commentor: DDAGW
Section #: Appendix B Pg #: Table B-3 Line #: Column 7 Code:
Original Comment #:
Comment: Should this column be labeled DO mg/l, as it is in table B-2, instead of % DO mg/l?
- 15) Commenting Organization: OEPA Commentor: GeoTrans, Inc.
Section #: Appendix D Slug Test Data and Results Pg.# Code: C
Original Comment #
Comment: The data presented in the tables states that the initial displacement of water in the

