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Department of Energy

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APR 0 1 1998

DOE-0636-98

Mr. James A. Saric, Remedial Project Manager
U.S. Environmental Protection Agency
Region V-SRF-5J
77 West Jackson Boulevard
Chicago, Illinois 60604-3590

Mr. Tom Schneider, Project Manager
Ohio Environmental Protection Agency
401 East 5th Street
Dayton, Ohio 45402-2911

Dear Mr. Saric and Mr. Schneider:

TRANSMITTAL OF: 1) DRAFT FINAL START-UP MONITORING PLAN FOR THE SOUTH FIELD EXTRACTION AND SOUTH PLUME OPTIMIZATION MODULES, AND 2) RESPONSES TO U.S. ENVIRONMENTAL PROTECTION AGENCY AND OHIO ENVIRONMENTAL PROTECTION AGENCY COMMENTS ON THE DRAFT START-UP MONITORING PLAN FOR THE SOUTH FIELD EXTRACTION AND SOUTH PLUME OPTIMIZATION MODULES

Reference:
1) Letter and attachment, Saric to Reising, "Start-up Plan for the Southfield and South Plume," dated February 18, 1998.

2) Letter and attachment, Schneider to Reising, "Approval: Draft Start-up Monitoring Plan," dated March 9, 1998.

This letter transmits the subject Draft Final Start-up Plan and response to comments on the above referenced comments, for your review and approval. The plan has been revised by incorporating actions resulting from the referenced comments.

If you have any questions regarding the documents in this submittal, please contact Robert Janke at (513) 648-3124, or John Kappa at (513) 648-3149.

Sincerely,

Johnny Reising

Johnny W. Reising
Fernald Remedial Action
Project Manager

FEMP:Kappa

Enclosure: As Stated

Recycled and Recyclable

cc w/enc:

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T. Schneider, OEPA-Dayton (total of 3 copies of enc.)
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RESPONSES TO U.S. AND OEPA COMMENTS ON THE DRAFT START-UP MONITORING PLAN FOR THE SOUTH FIELD EXTRACTION AND SOUTH PLUME OPTIMIZATION MODULES (JANUARY 1998)

FERNALD ENVIRONMENTAL MANAGEMENT PROJECT
FERNALD, OHIO

MARCH 1998

U.S. DEPARTMENT OF ENERGY
FERNALD AREA OFFICE

RESPONSES TO U.S. EPA COMMENTS ON THE DRAFT START-UP MONITORING PLAN FOR THE SOUTH FIELD EXTRACTION AND SOUTH PLUME OPTIMIZATION MODULES (JANUARY 1998)

GENERAL COMMENTS

1. Commenting Organization: U.S. EPA Commentor: Saric
Section#: NA Pg.#: NA Line#: NA Code:
Original General Comment# 1
Comment: The plan does not address the monitoring or reporting of data collected to evaluate the injection of treated groundwater. The plan should be revised to discuss the monitoring and reporting of groundwater data collected to evaluate the reinjection module.
Response: A separate monitoring plan (The Re-Injection Demonstration Test Plan, submitted in final form February, 1998) addresses the monitoring and reporting of data collected to evaluate the injection of treated groundwater. Therefore revision of the Start-Up Monitoring Plan for the South Field Extraction and South Plume Optimization Modules is not required.

As noted in Section 1.3 of the Start-Up Monitoring Plan for the South Field Extraction and South Plume Optimization Modules, start-up monitoring activities for the South Field and South Plume Optimization Modules will need to be integrated with re-injection demonstration activities. However, because re-injection is a demonstration, it requires separate tracking and evaluation in order to determine it's viability as an enhancement to the groundwater remedy at the FEMP.
Action: No revision to the start-up plan required.

SPECIFIC COMMENTS

2. Commenting Organization: U.S. EPA Commentor: Saric
Section#: 2.1 Pg.#: 11 Line#: 23 Code:
Original Specific Comment# 1
Comment: The text states that field data will be used to measure remedy performance and not model prediction accuracy. This statement appears to contradict the previous statement that the FEMP groundwater model will be used to help determine how pumping rates should be adjusted to maintain capture of the uranium plume. The model predictions must be calibrated to actual field data if the model is to be considered a useful tool in determining how pumping rates should be modified. DOE should compare field data to the model as necessary to aid in the determination of pumping rates.
Response: DOE does not believe that the two sentences in question are contradicting. Groundwater modeling is the only tool available to predict what will happen in the aquifer under various pumping/re-injection conditions. Therefore, if field data indicates that the aquifer remedy needs to be adjusted, the groundwater model will be used to project what adjustments are needed to produce the desired changes. Or as stated in the plan, "The FEMP groundwater model will be used to help determine how pumping rates should be adjusted to maintain capture of the uranium plume."

In the Integrated Environmental Monitoring Plan (IEMP), DOE presented a modeling performance evaluation process that compares field data to model predictions to refine the model as necessary and aid in the operation of the remediation system. This model evaluation is shown in Figure 3-19 of the IEMP.

Action: Revise lines 22 and 23 on page 11 to read as follows: "After changes have been made, field data will be collected to verify the model predictions that capture of the uranium plume is being achieved (i.e., field data will be used to measure remedy performance, not model predictions)."

3. Commenting Organization: U.S. EPA Commentor: Saric
Section#: 2.3 Pg.#: 15 Line#: 4 Code:
Original Specific Comment# 2

Comment: The plan is unclear in its description of how groundwater from the South Field wells will be routed to treatment or discharge. A flow diagram should be included to clearly present the decisions to be made concerning treatment and discharge of the groundwater from each individual well.

Response: The Start-up Monitoring Plan pertains only to the start-up time period for the South Field Extraction System and the South Plume Optimization System. The requested flow diagram is Figure 5-6 in the Operations and Maintenance Master Plan for the Aquifer Restoration and Wastewater Treatment Project (OMMP). Section 5 of the OMMP provides the Operations Plan for wastewater at the FEMP. Wastewater includes stormwater, remediation wastewater, and groundwater. Section 5 presents the FEMP wastewater treatment operations philosophy, treatment priorities, hierarchy of treatment decisions, and treatment decisions for all wastewater at the FEMP, including extracted groundwater. The final approved OMMP was submitted to EPA and Ohio EPA in November, 1997.

As identified in Section 2.3 of the Start-up Monitoring Plan, all flow from the ten South Field Extraction Wells will initially be routed to treatment. A portion of the South Field flow may later be routed to direct discharge without treatment. The decision regarding which wells to route to direct discharge will be based on well-specific total uranium concentration. That is, the lower the uranium concentration the more likely the flow from a particular well will be bypassed without treatment.

As presented in Section 2.3 of the plan, initially routing all South Field flow to treatment will facilitate the rapid start-up of the South Field Module. A treatment capacity of 1675 gallons per minute is anticipated to be available to handle the 1500 gallons per minute that will be pumped during start-up of the South Field Module. The uranium concentration coming from each of the ten South Field Wells will be monitored and documented. During this time, flow from the existing South Plume Recovery Wells will be discharged without treatment or a portion will be treated in one of the other site wastewater treatment facilities (AWWT Phase I, AWWT Phase II or IAWWT), as necessary, to maintain the 20 μg/L monthly average uranium limit to the Great Miami River.

To prepare for start up of the South Plume Optimization Wells, flow coming from individual South Field Wells with a total uranium concentration <20 μg/L will be diverted to discharge. This will free up some of the dedicated groundwater treatment capacity for a portion of the combined flow from the South Plume Optimization Wells and the existing South Plume Wells.

Note that other FEMP treatment facilities (AWWT Phases I & II and IAWWT), with the capability to treat both stormwater flow and groundwater flow, will likely be available to treat some groundwater. During 1997, these facilities treated over 300 million gallons of groundwater.

Action: No revision to the start-up plan required.

RESPONSES TO OEPA COMMENTS ON THE DRAFT START-UP MONITORING PLAN FOR THE SOUTH FIELD EXTRACTION AND SOUTH PLUME OPTIMIZATION MODULES (JANUARY 1998)

4. Commenting Organization: Ohio EPA Commentor: OFFO
Section#: 3.4 Pg.#: 22 Line#: Code: C
Original Comment# 1

Comment: This section is not entirely clear on the number and location of the direct push sampling. It sounds like seven direct push holes will be sunk prior to start-up in the seven locations depicted in Figure 3-1. Then during re-injection three locations will be revisited (described on page 23 lines 4 thru 11) and sampled quarterly. Then all seven locations will be revisited after the Re-injection Demo (page 23, lines 15).
Question one: When will vertical profiling be done? During the original push only or also during subsequent revisits?
Question two: Will the "wells" be installed during the first push and then sampled during the revisits or will the locations be revisited and an entirely new "push" be completed?

Response: In response to question one, the vertical profiling will be done as part of each push, both the original push and each subsequent revisit. A groundwater sample will be collected at the water table and at ten foot intervals beneath the water table until it can be verified that the entire vertical thickness of the 20 μg/L total uranium plume has been sampled.

In response to question two, wells will not be installed. The sampling locations will be revisited and a new push will be performed in the same area.

Action: The following text will be added to line 34 of page 22 to provide additional information on the sampling activity: "A groundwater sample will be collected at the water table and at ten foot intervals beneath the water table until it can be verified that the entire vertical thickness of the 20 μg/L total uranium plume has been sampled."

5. Commenting Organization: Ohio EPA Commentor: OFFO
Section#: 3-4 Pg.#: 21 Line#: Code: General
Original Comment# 2

Comment: Section 3.5.1.3 of the IEMP commits to measuring water quality in nine RCRA boundary monitoring wells and five of the South Plume monitoring wells prior to start-up of the Injection Demonstration Module. The data collected will be "used to document pre-injection plume conditions in the Injection demonstration area." The Start-Up Monitoring Plan does not mention this activity or any follow-up sampling of these fourteen wells. Water quality monitoring in this Plan is limited to the extraction well and seven direct push wells. Explain how sampling done for the IEMP will be integrated with sampling done for this plan.

Response: The Start-Up Monitoring Plan lists the additional sampling that will be done during start-up to supplement routine IEMP sampling. The Start-Up Monitoring Plan does mention the routine IEMP sampling. Lines 19 to 21 on page 21, states that: "Quarterly groundwater quality sampling outlined in the IEMP for total uranium and target FRL parameter analysis will continue during start-up of the South Field Extraction (Phase-1) and South Plume Optimization Modules."

Action: No revision to the start-up plan required.

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6. Commenting Organization: Ohio EPA Commentor: HSI GeoTrans
Section #: 4.0 Pg. #:33 Line#: 21-31 Code: C
Original Comment# 3

Comment: The discussion of long term capture suggests that well extraction rates will not be adjusted by FEMP unless several quarters of water level data consistently show that capture is not being achieved. If there is any indication at any time that capture is not being achieved, FEMP should use other means to verify groundwater flow directions (e.g., colloidal borescope readings) and should adjust extraction rates accordingly in timely fashion. In addition, FEMP should avoid use of the term "net plume capture." The discussion should, rather, indicate that capture will be re-established when it is verified that capture has not been achieved.

Response: This comment raises 2 issues which require clarification: 1) FEMP response time when data indicate plume capture is not being maintained, and 2) Use of the Term "net plume capture".

1) Actual capture of the plume will be assessed using water level measurements and flow direction measurements (Colloidal Borescope). If there are indications that capture is not being achieved, as suggested in the comment, the FEMP will adjust extraction rates (within system constraints) accordingly, in a timely fashion.

2) The commentor's objection with using the term "net plume capture" is understood. The suggestion provided by the commentor will be used instead.

The design of the groundwater remedial system at the FEMP and projected capture of the plume is being predicted using a steady state groundwater model that is calibrated to represent average aquifer conditions. Since the model predicts groundwater levels and associated capture zones under average conditions the model predictions may not be in full agreement with capture zones derived from actual measured water levels due to seasonal recharge effects or other transient phenomena not accounted for in the model. A short-term excursion does not necessarily indicate a long term problem.

Action: Lines 20 to 31 on page 33 and lines 1 and 2 on page 34 will be revised to read as follows:

"If there are indications that capture is not being achieved the FEMP will adjust extraction rates (within system constraints) accordingly, in a timely fashion.

Capture zones defined from measured water levels will also be compared to capture zones predicted by the model during start-up. Capture of the plume during start-up is being predicted using a groundwater model that is calibrated to average aquifer conditions. Model predictions of groundwater levels during start-up may not be in full agreement with actual measured water levels due to seasonal variations in precipitation and aquifer recharge."

7. Commenting Organization: Ohio EPA Commentor: HSI GeoTrans
Section#: 4.0 Pg.#: 34 Line#: 25 Code: C
Original Comment# 4

Comment: The text should provide a discussion of how the data will be utilized to assess the need for RW-8. Reiterating the five bulleted "triggers" in Section 5.4.6 of the Baseline Remedial Strategy Report would be sufficient.

Response: A list of the five bulleted "triggers" will be added to the start-up plan as suggested.

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Action: The following text will be added to line 2 on page 35:

"Conditions that could result in the need to install Well 3N include:

- The off property uranium plume expands beyond the actual capture zone of the initial overall South Plume System
- Significant cross-fence line migration of the on-property uranium plume occurs due to ineffective injection well operations along the FEMP fence line
- New uranium hot spots with significantly higher concentrations are identified far away from the initial recovery wells
- Concentrations in most of the off-property groundwater monitoring wells quickly reach asymptotic values above the groundwater FRL even after adjusting the extraction rates of the existing wells (i.e., higher rates and/or pulsed pumping)
- The actual FEMP outfall uranium concentrations are constantly lower than the limit (i.e., 20 ppb) even after increasing the extraction rates of existing wells in the hot spots (i.e., RW-6, RW-7, and Well 22) to full capacity (i.e., 400 gpm per well)."

8. Commenting Organization: Ohio EPA Commentor: HSI GeoTrans
Section#: 5.0 Pg.#: 36 Line#: 10-15 Code: C
Original Comment# 5
Comment: The context should indicate that these data will be provided electronically with the quarterly IEMP reports.
Response: There will be no problem supplying the requested electronic data. This has actually become a routine IEMP deliverable for groundwater data.
Action: The sentence in lines 11 and 12 on page 36 will be revised to read as follows: "Data (both published and issued in an electronic medium) and interpretation will be provided in the IEMP quarterly status/update reports and annual comprehensive reports."

RESPONSES TO U.S. AND OEPA COMMENTS ON THE DRAFT START-UP MONITORING PLAN FOR THE SOUTH FIELD EXTRACTION AND SOUTH PLUME OPTIMIZATION MODULES (JANUARY 1998)

FERNALD ENVIRONMENTAL MANAGEMENT PROJECT
FERNALD, OHIO

MARCH 1998

U.S. DEPARTMENT OF ENERGY
FERNALD AREA OFFICE

RESPONSES TO U.S. EPA COMMENTS ON THE DRAFT START-UP MONITORING PLAN FOR THE SOUTH FIELD EXTRACTION AND SOUTH PLUME OPTIMIZATION MODULES (JANUARY 1998)

GENERAL COMMENTS

1. Commenting Organization: U.S. EPA Commentor: Saric
Section#: NA Pg.#: NA Line#: NA Code:
Original General Comment# 1
Comment: The plan does not address the monitoring or reporting of data collected to evaluate the injection of treated groundwater. The plan should be revised to discuss the monitoring and reporting of groundwater data collected to evaluate the reinjection module.
Response: A separate monitoring plan (The Re-Injection Demonstration Test Plan, submitted in final form February, 1998) addresses the monitoring and reporting of data collected to evaluate the injection of treated groundwater. Therefore revision of the Start-Up Monitoring Plan for the South Field Extraction and South Plume Optimization Modules is not required.

As noted in Section 1.3 of the Start-Up Monitoring Plan for the South Field Extraction and South Plume Optimization Modules, start-up monitoring activities for the South Field and South Plume Optimization Modules will need to be integrated with re-injection demonstration activities. However, because re-injection is a demonstration, it requires separate tracking and evaluation in order to determine it's viability as an enhancement to the groundwater remedy at the FEMP.
Action: No revision to the start-up plan required.

SPECIFIC COMMENTS

2. Commenting Organization: U.S. EPA Commentor: Saric
Section#: 2.1 Pg.#: 11 Line#: 23 Code:
Original Specific Comment# 1
Comment: The text states that field data will be used to measure remedy performance and not model prediction accuracy. This statement appears to contradict the previous statement that the FEMP groundwater model will be used to help determine how pumping rates should be adjusted to maintain capture of the uranium plume. The model predictions must be calibrated to actual field data if the model is to be considered a useful tool in determining how pumping rates should be modified. DOE should compare field data to the model as necessary to aid in the determination of pumping rates.
Response: DOE does not believe that the two sentences in question are contradicting. Groundwater modeling is the only tool available to predict what will happen in the aquifer under various pumping/re-injection conditions. Therefore, if field data indicates that the aquifer remedy needs to be adjusted, the groundwater model will be used to project what adjustments are needed to produce the desired changes. Or as stated in the plan, "The FEMP groundwater model will be used to help determine how pumping rates should be adjusted to maintain capture of the uranium plume."

In the Integrated Environmental Monitoring Plan (IEMP), DOE presented a modeling performance evaluation process that compares field data to model predictions to refine the model as necessary and aid in the operation of the remediation system. This model evaluation is shown in Figure 3-19 of the IEMP.

Action: Revise lines 22 and 23 on page 11 to read as follows: "After changes have been made, field data will be collected to verify the model predictions that capture of the uranium plume is being achieved (i.e., field data will be used to measure remedy performance, not model predictions)."

3. Commenting Organization: U.S. EPA Commentor: Saric
Section#: 2.3 Pg.#: 15 Line#: 4 Code:
Original Specific Comment# 2

Comment: The plan is unclear in its description of how groundwater from the South Field wells will be routed to treatment or discharge. A flow diagram should be included to clearly present the decisions to be made concerning treatment and discharge of the groundwater from each individual well.

Response: The Start-up Monitoring Plan pertains only to the start-up time period for the South Field Extraction System and the South Plume Optimization System. The requested flow diagram is Figure 5-6 in the Operations and Maintenance Master Plan for the Aquifer Restoration and Wastewater Treatment Project (OMMP). Section 5 of the OMMP provides the Operations Plan for wastewater at the FEMP. Wastewater includes stormwater, remediation wastewater, and groundwater. Section 5 presents the FEMP wastewater treatment operations philosophy, treatment priorities, hierarchy of treatment decisions, and treatment decisions for all wastewater at the FEMP, including extracted groundwater. The final approved OMMP was submitted to EPA and Ohio EPA in November, 1997.

As identified in Section 2.3 of the Start-up Monitoring Plan, all flow from the ten South Field Extraction Wells will initially be routed to treatment. A portion of the South Field flow may later be routed to direct discharge without treatment. The decision regarding which wells to route to direct discharge will be based on well-specific total uranium concentration. That is, the lower the uranium concentration the more likely the flow from a particular well will be bypassed without treatment.

As presented in Section 2.3 of the plan, initially routing all South Field flow to treatment will facilitate the rapid start-up of the South Field Module. A treatment capacity of 1675 gallons per minute is anticipated to be available to handle the 1500 gallons per minute that will be pumped during start-up of the South Field Module. The uranium concentration coming from each of the ten South Field Wells will be monitored and documented. During this time, flow from the existing South Plume Recovery Wells will be discharged without treatment or a portion will be treated in one of the other site wastewater treatment facilities (AWWT Phase I, AWWT Phase II or IAWWT), as necessary, to maintain the 20 μg/L monthly average uranium limit to the Great Miami River.

To prepare for start up of the South Plume Optimization Wells, flow coming from individual South Field Wells with a total uranium concentration <20 μg/L will be diverted to discharge. This will free up some of the dedicated groundwater treatment capacity for a portion of the combined flow from the South Plume Optimization Wells and the existing South Plume Wells.

Note that other FEMP treatment facilities (AWWT Phases I & II and IAWWT), with the capability to treat both stormwater flow and groundwater flow, will likely be available to treat some groundwater. During 1997, these facilities treated over 300 million gallons of groundwater.

Action: No revision to the start-up plan required.

RESPONSES TO OEPA COMMENTS ON THE DRAFT START-UP MONITORING PLAN FOR THE SOUTH FIELD EXTRACTION AND SOUTH PLUME OPTIMIZATION MODULES (JANUARY 1998)

4. Commenting Organization: Ohio EPA Commentor: OFFO
Section#: 3.4 Pg.#: 22 Line#: Code: C
Original Comment# 1

Comment: This section is not entirely clear on the number and location of the direct push sampling. It sounds like seven direct push holes will be sunk prior to start-up in the seven locations depicted in Figure 3-1. Then during re-injection three locations will be revisited (described on page 23 lines 4 thru 11) and sampled quarterly. Then all seven locations will be revisited after the Re-injection Demo (page 23, lines 15).
Question one: When will vertical profiling be done? During the original push only or also during subsequent revisits?
Question two: Will the "wells" be installed during the first push and then sampled during the revisits or will the locations be revisited and an entirely new "push" be completed?

Response: In response to question one, the vertical profiling will be done as part of each push, both the original push and each subsequent revisit. A groundwater sample will be collected at the water table and at ten foot intervals beneath the water table until it can be verified that the entire vertical thickness of the 20 μg/L total uranium plume has been sampled.

In response to question two, wells will not be installed. The sampling locations will be revisited and a new push will be performed in the same area.

Action: The following text will be added to line 34 of page 22 to provide additional information on the sampling activity: "A groundwater sample will be collected at the water table and at ten foot intervals beneath the water table until it can be verified that the entire vertical thickness of the 20 μg/L total uranium plume has been sampled."

5. Commenting Organization: Ohio EPA Commentor: OFFO
Section#: 3-4 Pg.#: 21 Line#: Code: General
Original Comment# 2

Comment: Section 3.5.1.3 of the IEMP commits to measuring water quality in nine RCRA boundary monitoring wells and five of the South Plume monitoring wells prior to start-up of the Injection Demonstration Module. The data collected will be "used to document pre-injection plume conditions in the Injection demonstration area." The Start-Up Monitoring Plan does not mention this activity or any follow-up sampling of these fourteen wells. Water quality monitoring in this Plan is limited to the extraction well and seven direct push wells. Explain how sampling done for the IEMP will be integrated with sampling done for this plan.

Response: The Start-Up Monitoring Plan lists the additional sampling that will be done during start-up to supplement routine IEMP sampling. The Start-Up Monitoring Plan does mention the routine IEMP sampling. Lines 19 to 21 on page 21, states that: "Quarterly groundwater quality sampling outlined in the IEMP for total uranium and target FRL parameter analysis will continue during start-up of the South Field Extraction (Phase-1) and South Plume Optimization Modules."

Action: No revision to the start-up plan required.

6. Commenting Organization: Ohio EPA Commentor: HSI GeoTrans
Section #: 4.0 Pg. #:33 Line#: 21-31 Code: C
Original Comment# 3

Comment: The discussion of long term capture suggests that well extraction rates will not be adjusted by FEMP unless several quarters of water level data consistently show that capture is not being achieved. If there is any indication at any time that capture is not being achieved, FEMP should use other means to verify groundwater flow directions (e.g., colloidal borescope readings) and should adjust extraction rates accordingly in timely fashion. In addition, FEMP should avoid use of the term "net plume capture." The discussion should, rather, indicate that capture will be re-established when it is verified that capture has not been achieved.

Response: This comment raises 2 issues which require clarification: 1) FEMP response time when data indicate plume capture is not being maintained, and 2) Use of the Term "net plume capture".

1) Actual capture of the plume will be assessed using water level measurements and flow direction measurements (Colloidal Borescope). If there are indications that capture is not being achieved, as suggested in the comment, the FEMP will adjust extraction rates (within system constraints) accordingly, in a timely fashion.

2) The commentor's objection with using the term "net plume capture" is understood. The suggestion provided by the commentor will be used instead.

The design of the groundwater remedial system at the FEMP and projected capture of the plume is being predicted using a steady state groundwater model that is calibrated to represent average aquifer conditions. Since the model predicts groundwater levels and associated capture zones under average conditions the model predictions may not be in full agreement with capture zones derived from actual measured water levels due to seasonal recharge effects or other transient phenomena not accounted for in the model. A short-term excursion does not necessarily indicate a long term problem.

Action: Lines 20 to 31 on page 33 and lines 1 and 2 on page 34 will be revised to read as follows:

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7. Commenting Organization: Ohio EPA Commentor: HSI GeoTrans
Section#: 4.0 Pg.#: 34 Line#: 25 Code: C
Original Comment# 4

Comment: The text should provide a discussion of how the data will be utilized to assess the need for RW-8. Reiterating the five bulleted "triggers" in Section 5.4.6 of the Baseline Remedial Strategy Report would be sufficient.

Response: A list of the five bulleted "triggers" will be added to the start-up plan as suggested.

Action: The following text will be added to line 2 on page 35:

"Conditions that could result in the need to install Well 3N include:

- The off property uranium plume expands beyond the actual capture zone of the initial overall South Plume System
- Significant cross-fence line migration of the on-property uranium plume occurs due to ineffective injection well operations along the FEMP fence line
- New uranium hot spots with significantly higher concentrations are identified far away from the initial recovery wells
- Concentrations in most of the off-property groundwater monitoring wells quickly reach asymptotic values above the groundwater FRL even after adjusting the extraction rates of the existing wells (i.e., higher rates and/or pulsed pumping)
- The actual FEMP outfall uranium concentrations are constantly lower than the limit (i.e., 20 ppb) even after increasing the extraction rates of existing wells in the hot spots (i.e., RW-6, RW-7, and Well 22) to full capacity (i.e., 400 gpm per well)."

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Section#: 5.0 Pg.#: 36 Line#: 10-15 Code: C
Original Comment# 5
Comment: The context should indicate that these data will be provided electronically with the quarterly IEMP reports.
Response: There will be no problem supplying the requested electronic data. This has actually become a routine IEMP deliverable for groundwater data.
Action: The sentence in lines 11 and 12 on page 36 will be revised to read as follows: "Data (both published and issued in an electronic medium) and interpretation will be provided in the IEMP quarterly status/update reports and annual comprehensive reports."