{In Archive} KNC Dodge City - Draft Responses to Comments
Burke, Annie
to:
AndreaR Stone, KDunn, Wray Rohrman, ESpellma
10/20/2005 03:39 PM
Cc:
Art.Willden, "Ellingson, Stephen", "LeRock, Gary", WBrady, TPeel
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Cc: Art.Willden@mfgenv.com, "Ellingson, Stephen" <Steve.Ellingson@KOCHIND.COM>, "LeRock, Gary" <lerockg@KOCHIND.COM>, WBrady@GeoSyntec.com, TPeel@GeoSyntec.com

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1 Attachment

Spec Coms 20 Oct 05.pdf

Hello, Andrea, Kathy, Randy and Everett,

Here are the draft responses to your comments of 9/30/05, in draft form for your review, as we discussed in our conference call on Monday. We would appreciate your comments. If it will work for your schedule, we can set up another conference call to discuss these when you are ready.

The workplan for background determination is being sent to you in a separate e-mail due to the size of the file.

Please let me know if you have any questions. Thanks!

AnnieLaurie Burke, PE
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Submitted via e-mail 10-20-05

PROPOSED RESPONSES
TO
COMMENTS ON THE FIELD SAMPLING PLAN

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<u>General Comment #8</u>. SWMU #26 and AOC #6 appear to be missing from the investigation work that is proposed in the FSP. SWMU #26 is the West-side pit (Neutralization Waste Pit #4), and AOC #6 is the Chromium contamination to the underlying Dakota Aquifer. Based on the discussion at the August 26, 2005, meeting, agreement was reached that a new deep well would be installed in the Dakota aquifer by the former injection well #1, and three other deep wells would be sampled to characterize the Dakota aquifer. These other three wells included Well #B-2, Land O'Lakes deep well, and Kansas Byproducts deep well. EPA expressed concerns regarding the integrity of well B-2 in its April 27, 2005, comment letter in Appendix B, Comment #17. EPA reserves the right to request the installation of an additional deep well, if testing on B-2, and if the new well installed by former injection well #1 exhibits significantly different water level elevation measurements different from well B-2. Please revise and include SWMU#26 and AOC #6 in the FSP.

<u>Proposed KNC Response</u>: SWMU #26 and AOC #6 were addressed in prior submittals to the Agencies, the June 2, 2005, Field Sampling Plan and the August 2, 2005 RCRA Facility Investigation Work Plan (i.e., Sections 4.1.8 and 6.3).

The September 27, 2004 letter from KNC provided a description of SWMU #26 and in the October 26, 2004, letter KNC provided sampling data from this SWMU that showed that because all of the constituents were below the detection limit, additional investigative activities were not warranted. A copy of the sampling data for SWMU #26 was also provided in Appendix A of the October 27, 2004 draft RFI Work Plan and Appendix F of the August 1, 2005 RCRA Facility Investigation Work Plan. In the June 2, 2005 letter from KNC, these sample results were summarized and " . . . *KNC proposed to not conduct any additional investigative activities at SWMU 26*."

In the June 2, 2005 Field Sampling Plan and the August 2, 2005 RCRA Facility Investigation Work Plan, KNC proposed to investigate AOC #6. This work would consist of advancing a boring near SWMU #4 (Former Disposal Well No 1), completing a vertical profile of groundwater quality in that borehole and constructing and sampling a well (i.e., Well No. SIT-RG-07) screened in the Dakota Formation about 450 feet below land surface.

During the August 26, 2005 meeting between KNC and the Agencies, the Agencies elaborated on their objectives for the investigation of the Dakota Formation. They stated that site-specific information on the direction of groundwater flow in the Dakota Formation would be important to make certain Well No. SIT-RG-07 was installed down gradient of SWMU #4. KNC agreed with the need for this information and is in the process of identifying nearby wells screened in the Dakota Formation, obtaining access to

those wells and measuring the water level in those wells to verify the site-specific direction of groundwater flow.

For this investigation, KNC is not proposing to collect additional groundwater quality samples from the Land O'Lakes Feedmill or Kansas Byproducts wells, which are both screened in the Dakota Formation. Under the Part I Permit, these wells are sampled every quarter for nitrate plus nitrite and chromium. These data are provided to the Agencies every six months. The recent levels of nitrate plus nitrite and chromium are not elevated in samples from these two wells.

Available records indicate that Well B-2, which is screened in the Dakota Formation, is suitable for groundwater sampling and water levels measurements. In fact, KNC is planning to sample Well B-2 during the third quarter groundwater sampling event and will provide those data to the Agencies. The water level in Well B-2 is about 60 feet lower than the water level observed in Well B-1, which is screened in the overlying unconsolidated deposit. The water level in Well B-2 is consistent with the regional water in the Dakota Formation. The May 2, 2005, pumping test demonstrated that Wells B-1 and B-2 not hydraulically connected and they are functioning properly (i.e., screened exclusively in the unconsolidated deposits and Dakota Formation, respectively).

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KNC understands that the Agencies reserved the right to request the installation of an additional deep well, if testing on Well B-2, and if the new well installed by former injection well #1 exhibits significantly different water level elevations.

KNC is not proposing to sample SWMU #26 again. The text of the FSP has been revised to clarify the scope of work for AOC #6 and addressed in other Agency comments.

<u>Specific Comment #2</u>. FSP, Page I-6, Section I-2.4 RFI Strategy, second paragraph: In this paragraph it states, "Source characterization and delineation of the specific constituents present at each SWMU/AOC will be accomplished through the collection and analysis of soil, settleable matter, and surface water (if present)..." Please add, "for totals" after (if present), and add "sediment, sludge" after "soil," so the sentence reads, "Source characterization and delineation of the specific constituents present at each SWMU/AOC will be accomplished through the collection and analysis of soil, sediment, sludge, settleable matter, and surface water (if present) for totals at each SWMU/AOC, and north of SWMU2. These samples will be used to determine the detection (presence or absence) of constituents in the soil, sediment, sludge, settleable matter and surface water."

<u>Proposed KNC Response</u>: KNC described material in the lime landfills and ponds as "settleable material." During the October 11, 2005, conference call between KNC, EPA, and KDHE, KNC requested clarification of this comment. EPA and KDHE raised concerns about alleged on-site disposal of "sludge" from the settling basin next to Andco Unit (SWMU # 14). Historic records indicate that material from the settling basin next to Andco Unit may have been placed in Trench #3 (SWMU # 19). KNC is aware of the

apparent historical disposal practices at Trench #3 (SWMU # 19) and has proposed sampling and broad parametric coverage for this trench. Section 4.1.3 of the August 1, 2005 RFI Work Plan states that, "*Available records indicate that the former owner appears to have disposed of settleable matter from the Settling Basin in Trench 3 of the West Lime Industrial Landfill (SWMU 19).*" KNC is not aware of any other site material that may be considered "sludge or sediment" and desires to address "sludge" that may have been disposed of in Trench #3 as "settleable material" for consistency.

The following text has been added to the first paragraph of Section I-2-4 (RFI Strategy), Soil and groundwater samples will be analyzed for "total" concentrations. These samples will be used to determine the detection (presence or absence) of constituents in the soil and groundwater. Nitrate-Nitrite and chromium detected in these samples will be compared to background levels determined for the site and approved by the Agencies.

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<u>Specific Comment #11</u>.FSP, Page I-21, Section I-3.3.1, General Requirements: Wells to be installed in the Dakota Formation are proposed to terminate at 450 feet below ground surface. Please explain KNC's rationale for selecting this depth.

<u>Proposed KNC Response:</u> Based on "Weekly Reports" prepared by the prior owner, an occlusion of the well was identified at about 360 ft bls in August of 1976. The well was reconditioned until it was determined that the surface casing had apparently corroded between 400 and 500 feet. The target drilling depth of 450 ft bls corresponds to the mid-depth of the reported corroded casing.

The proposed vertical profiling from the top of the Dakota to the target depth is proposed to determine if the operation of Former Injection Well #1 may have release constituents into the Dakota Formation. KNC is proposing to conduct the vertical profiling from the top of the Dakota Formation to a depth of about 450 ft bls. If elevated constituent levels are observed at 450 ft bls, the vertical profiling activities will continue to determine the vertical extent of the constituents. If the constituents levels are low, a well will be completed and sampled about 450 ft bls.

Prior to the September 1976 abandonment activities, KNC is not aware of any information indicating that the well casing of the former Injection Well No.1 collapsed about 502 ft bls. In reviewing the well plugging record, it appears that the borehole was intentionally collapsed by the contractor to facilitate abandonment of the well.

No changes are proposed to the FSP text.

<u>Specific Comment #31</u>.Table I-2-1, Page 2 of 13, SWMU #4, Former Disposal Well #1: Field activities proposed for disposal wells UIC #2 and UIC #3 focus on the drill cuttings that were deposited into mud pits. Disposal practices for these two wells, which were installed in the 1990's, included the use of lined mud pits for drill cuttings that contained elevated concentrations of chloride. In contrast, drill cuttings from disposal well UIC #1, which was installed in 1968 as the facility was

being constructed, were likely deposited into an unlined mud pit. Because the boring for UIC #1 penetrated the same geologic formations as those penetrated while installing UIC #2 and UIC #3, the drill cuttings likely contain similar chloride concentrations. Therefore, the Field Sampling Plan should be revised to include an investigation of the mud pit for UIC #1. In addition, chloride should be added to the list of analytes for soil and water samples collected from locations downgradient of UIC #1.

Proposed KNC Response: As a follow-up to the October 11, 2005 conference call, KNC has assessed historic conductivity measurements (1982 through 2000) from wells near the former Injection Well No. 1 and Injection Wells No. 2 and 3. It was believed that conductivity measurements would provide a good surrogate for chloride that may have leached from the mud pits and reached the underlying groundwater. Our initial assessment of historic specific conductance data indicates that differentiating potential chloride sources in shallow groundwater using specific conductance as a surrogate is problematic, much like identifying nitrate and chromium sources in shallow groundwater is difficult due to overlapping plumes. KNC proposes to review chloride data obtained in the GRITS database by KDHE to determine if available information provides evidence of chloride migrating to groundwater from the above-mentioned units. KNC will also evaluate the potential analysis of chloride from select wells, as recommended by KDHE, to determine if it may be used as conservative tracer for characterizing plume migration. As part of the RFI, KNC will attempt to define the boundaries for the mud pits used for injection wells 1, 2, and 3 using geophysical methods. KNC does not propose intrusive sampling at this time due to concerns of puncturing liners that may have been used to contain the drilling muds. If the chloride data contained in the GRITS database do not provide conclusive information, KNC will discuss potential paths forward with EPA and KDHE.

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Tables I-2-1 and I-2-3 will be revised to delete reference to any intrusive sampling activities at the mud pits.

Internal Working Note: KNC would propose to use similar text as a response to Specific Comment #35.

Specific Comment #36.Table I-2-1 Summary of RFI SWMU/AOC Characterization Activities, SWMU #7, (Landfill for General Plant Trash), Page 5 of 13: In the April 27, 2005, comment letter, the Agencies stated in Appendix A, comment #23 that, "It would be difficult to get a representative sample from the "landfill" material in the Former General Facility Trash Landfill without taking a large number of samples." The comment goes on to say that the "material disposed is most likely so heterogeneous that even a large number of samples would not necessarily be representative of the contents. Therefore instead of taking a sample of the "landfill" material, it would be more beneficial to take a sample of the soil below the "landfill" material (subsurface) and groundwater sampling." This could be accomplished using angled boring so as not to disturb the actual landfill. If this landfill has a liner, EPA does not want the landfill liner punctured. Revise the description for

SWMU #7 to take angled borings/samples beneath the landfill without disturbing the liner or the contents of the landfill. Use of surface geophysics should be used to determine the length and depth of the landfill. In addition, under column "Analyses / Test Methods", delete reference to SPLP analysis. Also, any waste may have been disposed in the landfill for general plant trash. Therefore, include pesticides and herbicides in the list of constituents to be analyzed in soil samples from this SWMU. Modify Table I-2-1 accordingly. Also, conduct total chromium analysis on the samples collected from SWMU #7.

Proposed KNC Response: During the October 11, 2005 conference call KNC indicated that, based on the age of this unit, this landfill was likely not lined. Therefore, angled borings are not proposed. KNC proposes to perform herbicide and pesticide analysis, as prescribed in the EPA and KDHE comments on soil samples collected from this SWMU. The scope of work in Tables I-2-1 and I-2-3 has been revised to reflect this change.

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Specific Comment #38.Table I-2-1 Summary of RFI SWMU/AOC Characterization Activities, SWMUs #10 (East Cell of the Lime Sludge Pond), Page 8, #11 (West Cell of the Lime Sludge Pond), Page 8), #17 (East Lime Sludge Landfill), Page 9 and #19 (West Lime Sludge Landfill), Page 10: Please refer to comments #17, 18, 19, 20 and 21, of Appendix A of EPA's April 27, 2005 letter. Comment #21 lists what the samples in these SWMUs should be sampled for. Please refer back to those comments and revise Table I-2-1 for the SWMUs accordingly. In addition, for SWMUs 10, 11, & 17, under column "Analyses / Test Methods", for the native soil samples change SPLP analysis to analysis for total chromium. For SWMU 19, under column "Analyses / Test Methods", for Trenches 1 and 2, for native soil change SPLP analysis for chromium to analysis for total chromium. Under column "Analyses / Test Methods", for Trench 3, for native soil change SPLP analysis for VOCs, SVOCs, TPH, and Appendix IX metals to "total" analyses for these constituents. Also, the entry for Trench 3 indicates soil samples will be analyzed for VOC, SVOC, TPH, Appendix IX metals, Hexavalent Chromium, Total Chromium, Nitrate-Nitrite, Sulfate, and pH. However, the entry for SWMU #19 SS08 / SB08 in Table I-2-3 does not identify these analyses will be run for this sample. As mentioned previously in comment 27 above, please ensure that Table I-2-1 and Table I-2-3 are consistent with regard to the list of analytes to sample for at each SWMU/AOC, etc. Rectify this discrepancy by adding applicable entries in Table I-2-3.

Proposed KNC Response: See response to Specific Comment #2. Available records indicate that the former owner disposed of settleable matter from the settling basin near the Andco Unit and other sources in Trench 3 of the West Lime Industrial Landfill (SWMU 19). The focused parametric coverage described above was previously proposed for Trench #3.

The material placed in the other lime landfills has been well characterized, disposal was approved by KDHE (see Appendix N of the August 1, 2005 RCRA Facility Investigation Work Plan) and thus the more focused parametric coverage (VOC, SVOC, TPH,

Appendix IX metals) planned for Trench #3 is not proposed for the other lime landfills. Table I-2-1 and I-2-3 have been revised to reflect changes from SPLP to totals and have been cross-checked to ensure consistency. Sulfate analysis has been added to the analytical program for Trench #3. No other changes have been made to the text or tables to address this comment.

Specific Comment #39.The EPA recommends that Koch consider an alternative approach to investigating soils at the three spill areas. Because it is not known if all three spills were of sufficient volume to infiltrate to groundwater (approximately 90 feet below ground surface) and it is also not known exactly where the pathway(s) to groundwater are, it is recommended that an initial investigation focus on the areal (horizontal extent) of chromium contamination, and contamination at a shallow depth (0-3 feet). This could be done very effectively with a shallow excavation (test pit) approach, using visual evidence of contamination and real-time field analysis such as x-ray fluorescence to determine the areal extent of contamination and an initial evaluation of vertical extent and identification of pathway(s) to deeper areas. Once the horizontal extent and initial evaluation of the vertical extent of contamination is completed, KNC can then focus on determining the full extent of the vertical extent of contamination down to groundwater.

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Proposed KNC Response: As discussed in the October 11, 2005 conference call, KNC has investigated the potential use of XRF and prefers to perform laboratory analysis. An excavation (test pit) approach is not proposed at this time due to spatial and Facility constraints in the area of the former spills. KNC is planning to complete hand auger borings in the vicinity of the spills stepping out from the source area to determine if chromium can be visually observed in these soils. If the results of these borings indicate that the spill areas can be delineating using a visual approach, the work plan will be revised to incorporate this approach.

KNC proposes to schedule this soil investigation after the background concentration of chromium in soil has been determined. Once the background value for chromium is determined, it will be compared to previously collected data in this AOC to determine where additional lateral or vertical delineation is required. Consequently, the scope of work described in Tables I-2-1 and I-2-3 has not been modified. KNC proposes to submit a revised scope of work for this AOC once existing data is compared to site background to identify lateral and vertical delineation gaps.

Specific Comment #40.Table I-2-1 Summary of RFI SWMU/AOC Characterization Activities, Page 12 of 13, AOC #4 (Former Gas Shed on the Old Farm): Please refer to comment #25 in Appendix A of EPA's April 27, 2005 letter. Comment #25 lists what analytes are to be sampled for. KNC has left out"sulfate" in its description for AOC#4 in Table I-2-1. Please revise the Table to include "sulfate" in the list of analytes to sample for at AOC #4.

The EPA recommends that Koch consider an alternative approach to investigating soils at this AOC. Because of the uncertainty of how and where contamination may

have been released at this AOC, an initial effort could be made to characterize the shallow (0-2 foot) interval, using the same total number of proposed samples but covering many more locations (36).

Proposed KNC Response: Sulfate analysis has been added to the proposed analytical program in Tables I-2-1 and I-2-3. Per EPA and KDHE request on October 11, 2005, KNC has revised the proposed scope of work for this program. The proposed changes are documented in Tables I-2-1 and I-2-3. Proposed sampling locations are provided on the revised Figure I-2-16. As discussed during the October 11, 2005 teleconference, KNC does not believe that surface soil sampling (0 to 2') is sufficient to characterize potential VOC impacts. As requested, we have increased the number of sampling locations from 6 to 9 and will collect 4 soil samples at all locations for a total of 36 samples. Soil samples from 0 to 6", 6" to 2', 2 to 4 feet, and 4 to 6 feet bls will be submitted for analytical testing from each boring location. If site-related constituents are not delineated laterally and vertically with these borings, additional sampling and analysis will be performed to complete delineation efforts in this area. Tables I-2-1 and I-2-3 have been revised to reflect these changes.

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During discussions during the October 11th teleconference, KDHE indicated that a water well was formerly located in the vicinity of AOC 4. KNC obtained additional information from an employee who was present prior to and during the construction of the plant. The Conrardy family, who owned the site before construction of the plant had a water well that was located just west of their farmhouse. During the construction of the Plant and for a short time thereafter, Farmland Industries used the farmhouse as temporary office space. They also used the well to provide water during this period. Eventually, both the house and the well were demolished to make room for other Plant structures.

<u>Specific Comment #41</u>.Table I-2-1 Summary of RFI SWMU/AOC Characterization Activities, Page 12 of 13. AOC #5: Please provide the rationale for the array of soil borings on the North side of the former tank. Please also refer to comment #31 Appendix A, in EPA's April 27, 2005 letter. The EPA recommends that Koch consider an alternative approach to investigating this AOC. Because the goal is to locate the area(s) where leakage from the tank occurred, a shallow excavation approach covering a large area and using field analytical methods with quick turnaround for results could be used to more precisely locate all areas of significant contamination. These areas could then be evaluated for the vertical extent of contamination. Please revise the Table accordingly.

<u>Proposed KNC Response</u>: The proposed soil borings to the north of the former UAN tank were based on a review of existing data to potentially relevant screening standards.

KNC proposes to schedule this soil investigation after the background concentration of nitrate-nitrite in soil has been determined. Once the background value is determined, it will be compared to previously collected data in this AOC to determine where additional lateral or vertical delineation is required. Consequently, the scope of work described in

Specific Revisions to Table I-2-1

SWMU/AOC Number	Area Name	Area Description	Approximate Period of Operation	Previous Investigation Activities	RFI Objectives	RFI Scope	Analyses / Test Methods
AOC #4	Former Gas Shed on the Old Farm	Former Gas shed (former farm storage structure) used for chemical storage and disposal before the facility was built. Potential source of chlorinated solvents	< 1966	none (former farm storage structure, RFA says may be source of chlorinated solvents)	Determine the nature and extent of contamination at the former Gas Shed.	Advance 9 borings to a depth of 6 ft.* - 9 surficial samples (0-6 inches) - 9 subsurface samples (6-24 inches) - 9 subsurface samples (2-4 -9 subsurface samples (4-6) * If elevated head space readings are encountered at the 6 ft interval, the boring will continue until no elevated head space readings are obtained. Additional samples will be collected as necessary to complete the horizontal and vertical delineation. Locations for additional shallow and/or deeper samples will be determined based on results of shallow soil samples Sample locations are shown on Figure I-2-16.	Soil Samples: VOCs (EPA 8260B), SVOCs (EPA 8270), TPH (OA1 & OA2), organochlorine pesticides (EPA 8081), organochlorine herbicides (EPA 8151), app IX metals, hex Cr (EPA 7196), sulfate (EPA 9056), and nitrate-nitrite (EPA 353.2) app 9 metals 6020 mercury 7471B
SWMU #7	Landfill for General Plant Trash	General facility trash landfill operated from 1976 to 1979, covered with soil following closure. No hazardous waste suspected. Authorized by Permit No. 242	1976 - 1979	none (no hazardous waste disposal suspected, release unlikely) Groundwater: ongoing quarterly sampling at TW-89	Determine the boundaries of the landfill. Determine if constituents have migrated to soils beneath the landfill.	Conduct GPR and EM geophysical surveys to determine the location of the landfill. Conduct test pits or advance soil borings to confirm the extent of the landfill. Survey the boundary of the landfill. Soils: Advance 4 DPT soil borings through landfilled materials using dual tube methodology and 1 ft into native soil and collect samples as follows: - 2 soil samples (0 to 2 ft for geotechnical testing) - 4 native soil samples (top ~ 1 ft of native soil) Sample locations are shown on Figure I-2-10.	Native Soil: Chemical Analyses: VOCs (EPA 8260B), SVOCs (EPA 8270), TPH (OA1 & OA2), app IX metals (EPA 6020/7471B), hex Cr (EPA 7196), nitrate-nitrite (EPA 353.2), sulfate (EPA 9056), pH (9045), organochlorine pesticides (EPA 8081), and organochlorine herbicides (EPA 8151) Geotechnical Testing: gradation-sieve analysis and hydrometer (ASTM D 422), Atterberg Limits (ASTM D 4318), soil classification (ASTM D 2487)

Specific Revisions to Table I-2-1

SWMU/AOC Number	Area Name	Area Description	Approximate Period of Operation	Previous Investigation Activities	RFI Objectives	RFI Scope	Analyses / Test Methods
SWMU #10	East Cell of the Lime Sludge Pond	Constructed in 1990s (eastern portion of Trench 6), estimated capacity of 6000 cy based on 0.37 acres and 10-ft thickness. Regulated by Permit No. 375 for disposal of spent lime and other material. Records indicate historical disposal of spent lime, settleable matter from the ammonia cooling tower, and asphalt from the demolition of the load out area. Currently full and inactive.	1990s - 2001	none (settleable matter may have alkaline pH but no hazardous constituents expected), currently INACTIVE; records indicate analytical results for settleable matter and asphalt provided to KDHE, KDHE approved disposal in Oct 2000 and Jul 2001) Groundwater: wells at TW-9, 8, 72, 74, 82, 83.	Confirm the thickness of the settleable matter. Determine the chemical and geotechnical characteristics of the settleable matter. Characterize the nature and extent of constituents.	Advance 4 DPT borings through the settleable matter and 1 ft into native soil. Chemical Analysis: - Collect 4 settleable matter samples (2-3, 4-5, 6-7, and 8-9 ft) for chemical analysis (different depth from each boring). - Collect 4 native soil samples from beneath the settleable matter (from the first 1 ft of native soil. Geotechnical: Collect 1 settleable matter sample from DPT cutting from 6-8 ft Sample locations are shown on Figure I-2-12	Settleable Matter: hex Cr (EPA 7196), total Cr (EPA 6020), nitrate-nitrite (EPA 353.2), and pH (EPA 9045) Native Soil hex Cr (EPA 7196), total Cr (EPA 6020), nitrate-nitrite (EPA 353.2), and pH (EPA 9045) Geotechnical: visually log DPT samples for texture, color, and consistency, moisture content (ASTM D 2216); gradation – sieve analysis and hydrometer (ASTM D 422); Atterberg Limits (ASTM D 4318); soil classification (ASTM D 2487)
SWMU #11	West Cell of the Lime Sludge Pond	Constructed in 1990s (western portion of Trench 6), estimated capacity of 18,000 cy based on 1.14 acres and 10-ft thickness. Regulated for disposal of spent lime. Records indicate historical disposal of spent lime, settleable matter from the ammonia cooling tower, and asphalt from the demolition of the load out area.	1990s - 2001	none (settleable matter may have alkaline pH but no hazardous constituents expected, currently ACTIVE; prior owner records indicate analytical results for settleable matter and asphalt provided to KDHE, KDHE approved disposal in Oct 2000 and Jul 2001) Groundwater: wells at TW-1A, 8, 9, 28, 71, 72.	Confirm the thickness of the settleable matter. Determine the chemical and geotechnical properties of the settleable matter. Characterize the nature and extent of constituents.	Advance 6 DPT borings through the settleable matter and 1 ft into native soil. Chemical Analysis: - collect 6 settleable matter samples (2-3 ft, 3-4 ft, 4-5 ft, 5-6 ft, 6-7, and 8-9 ft) for chemical analysis (different depth from each boring). - Collect 6 native soil samples from beneath the settleable matter (from the first 1 ft of native soil). Geotechnical: Collect 2 settleable matter samples from DPT cuttings as follows: - 1 sample from 2-4 ft - 1 sample from 8-10 ft Sample locations are shown on Figure I-2-12.	Settleable Matter: hex Cr (EPA 7196), total Cr (EPA 6020), nitrate-nitrite (EPA 353.2), and pH (EPA 9045) Native Soil: hex Cr (EPA 7196), total Cr (EPA 6020), nitrate-nitrite (EPA 353.2), and pH (EPA 9045) Geotechnical: visually log DPT samples for texture, color, and consistency, moisture content (ASTM D 2216); gradation – sieve analysis and hydrometer (ASTM D 422); Atterberg Limits (ASTM D 4318); soil classification (ASTM D 2487)

Specific Revisions to Table I-2-1

SWMU/AOC Number	Area Name	Area Description	Approximate Period of Operation	Previous Investigation Activities	RFI Objectives	RFI Scope	Analyses / Test Methods
SWMU #17	East Lime Sludge Landfill	Consists of Trenches 4 & 5. Trench 4 (0.49 ac) was used until 1994. Trench 5 (0.38 ac) was used until 1999. Authorized by Permit No. 375. Prior owner records indicate disposal of monoethanolamine (MEA) charcoal, high temperature shift (HTS) catalyst, and spent lime. Neither trench used by KNC. Covered with soil by prior owner but no formal closure documentation identified.	1990 - 1999	none (prior owner records indicate disposal of monoethanolamine (MEA) charcoal, high temperature shift (HTS) catalyst, and spent lime; analysis of non-lime materials provided to KDHE, KDHE approved disposal in May 1992 and Aug 1988) Groundwater: wells TW-2, 4, 8, 30, 31.	Confirm the thickness of the settleable matter. Determine the chemical and geotechnical characteristics of the settleable matter. Characterize the nature and extent of constituents.	Trench 4: Advance 1 DPT boring through settleable matter and 1 foot into native soils and collect samples as follows: Chemical Analyses: - 1 subsurface settleable matter sample (5-7 ft) - 1 native soil sample (first 1 ft below settleable matter) Geotechnical Testing: - 1 surface soil sample (0-2 ft) for geotechnical testing - 1 settleable matter sample for geotechnical testing (8-10 ft) Trench 5: Advance 1 DPT boring through settleable matter and 1 foot into native soils and collect samples as follows: Chemical Analyses: - 1 subsurface settleable matter sample (5-7 ft) - 1 native soil sample (first 1 ft below settleable matter) Geotechnical Testing: - 1 surface soil sample (0-2 ft) for geotechnical testing - 1 settleable matter sample for geotechnical testing (8-10 ft) Sample locations are shown on Figure I-2-13.	Settleable Matter: hex Cr (EPA 7196), total Cr (EPA 6020), nitrate-nitrite (EPA 353.2), and pH (EPA 9045) Native Soil: hex Cr (EPA 7196), total Cr (EPA 6020), nitrate-nitrite (EPA 353.2), and pH (EPA 9045) Geotechnical Settleable Matter: visually log DPT samples for texture, color, and consistency, moisture content (ASTM D 2216); gradation – sieve analysis and hydrometer (ASTM D 422); Atterberg Limits (ASTM D 4318); soil classification (ASTM D 2487) Geotechnical Soil Cover (0 to 2 ft): gradation – sieve analysis and hydrometer (ASTM D 422); Atterberg Limits (ASTM D 4318); soil classification (ASTM D 2487)

Specific Revisions to Table I-2-1

SWMU/AOC Number	Area Name	Area Description	Approximate Period of Operation	Previous Investigation Activities	RFI Objectives	RFI Scope	Analyses / Test Methods
SWMU # 19	West Lime Sludge Industrial Landfill	Consists of Trenches 1,2,& 3. Trench 1 (0.28 ac) and Trench 2 (0.08 ac) were covered with soil in 1992, regulated under Permit No. 375. Trench 3 (0.3 ac) not covered but inactive. Trenches 1&2: prior owner records indicate disposal of spent resin, MEA charcoal, HTS catalyst, and spent lime; analysis of non-lime materials provided to KDHE, KDHE approved disposal in Apr 1986, Aug 1988, and May 1992. Trench 3: indicate disposal of spent resin, MEA charcoal, HTS catalyst, sandblasting sand, tank settleable matter, wastewater settleable matter, asphalt and spent lime. Records indicate chrome settleable matter, spent iron ore converter catalyst, alumina balls, molecular sieve, oil-soaked soil, and neutralizer residue may have been placed in Trench 3.	<1986 - 1992	none (Trenches 1&2: analysis of non-lime materials provided to KDHE, KDHE approved disposal in Apr 1986, Aug 1988, and May 1992. Trench 3: analysis of non-lime materials provided to KDHE, documentation of KDHE approval in Appendix J). **Records indicate prior owner may have placed chrome settleable matter, spent iron ore converter catalyst, alumina balls, molecular sieve, oil-soaked soil, and neutralizer residue in Trench 3, no records of KDHE approval located. Groundwater: well TW-94	Confirm the locations and dimensions of trenches 1, 2, and 3. Evaluate the thickness and the geotechnical properties of the cover soil. Determine the thickness of waste materials present in each trench. Characterize the chemical and geochemical properties of the waste material within the trenches. Determine the nature and extent of any contaminants that may have migrated from each trench.	Use geophysical survey methods and test pits to determine aerial extent of Trenches 1 and 2. **Trench 1:** Advance 5 DPT borings through the waste and 1 ft into the native soils. Chemical Analysis Samples: - 5 surface soil samples (0 to 6 inches) - 5 subsurface samples (4 to 6 ft) - 5 native soil samples (~1 ft into native soil) Geotechnical Samples: - 2 soil cover samples (0-2 ft) - 2 samples from settleable matter for lab analysis (estimated intervals: 4-6 and 8-10 ft in lime waste) **Trench 2:** Advance 2 DPT borings through the waste. Chemical Analysis Samples: - 2 surface soil samples (0 to 6 inches) - 2 subsurface samples (4 to 6 ft) - 2 native soil samples (~1 ft into native soil) Geotechnical Samples: - 1 soil cover sample (0-2 ft) - 1 samples from settleable matter for lab analysis (estimated interval 6-8 ft in lime waste) **Trench 3:** Advance 5 DPT borings through the settleable matter and 1 ft into native soil. Chemical Analysis Samples: - 5 samples (0 to 6 inches and 4 to 6 ft) - 5 samples from first 1 ft of native soil Geotechnical Samples: - 3 samples (2-4, 4-6, and 6-8 ft – different depth interval from each boring) Sample locations are shown on Figure I-2-14.	**Trenches 1 and 2:** Settleable Matter: hex Cr (EPA 7196), total Cr (EPA 6020), nitrate-nitrite (EPA 353.2), and pH (EPA 9045) Native Soil: nitrate-nitrite (EPA 353.2) and pH (904 plus SPLP analysis (EPA 1312) for Cr (EPA 6020) Geotechnical Settleable Matter: visually log DPT samples for texture, color, and consistency, moisture content (ASTM D 2216); gradation – sieve analysis and hydrometer (ASTM D 422); Atterberg Limits (ASTM D 4318); soil classification (ASTM D 2487) Geotechnical Soil Cover (0 to 2 ft): gradation – sieve analysis and hydrometer (ASTM D 422); Atterberg Limits (ASTM D 4318); soil classification (ASTM D 2487) **Trench 3:** Soil (Surface & Subsurface): VOCs (EPA 8260B), SVOCs (EPA 8270), TPH (OA1 & OA2), app IX metals (EPA 6020/7471B), hex Cr (EPA 7196), total Cr (EPA 6020), nitrate-nitrite (EPA 353.2), sulfate (EPA 9056), and pH (EPA 9045) Native Soil: VOCs (EPA 8260B), SVOCs (EPA 8270), TPH (OA1 & OA2), app IX metals (EPA 6020/7471B), nitrate-nitrit (EPA 353.2), and pH (9045) Geotechnical Settleable Matter: visually log DPT samples for texture, color, and consistency, moisture content (ASTM D 2216); gradation – sieve analysis and hydrometer (ASTM D 422); Atterberg Limits (ASTM D 4318); soil classification (ASTM D 2487)

Table I-2-3
Proposed Sample Identification, Location, Depth Intervals, and Analytes for Solids Investigation
Koch Nitrogen Company

SWMU / AOC	Location	Sample ID	Estimated Sample Interval (ft BLS)	Sample Retrieval Method*	Matrix	Description	Field OVA Screening	Field Nitrate with Hach Kit (Method 8039)	Field Screening of Metals	VOCs (EPA 8260B)	SVOCs (EPA 8270C)	TPH (OA1 & OA2)	Appendix IX Metals (EPA 6020/7471B)	Hexavalent Chromium (EPA 7196)	Nitrate-Nitirte (EPA 353.2)	Sulfate (EPA 9056)	pH (9045)	Organochlorine Pesticides (EPA 8081)	Organochlorine Herbicides (EPA 8151)	SPLP VOCs (EPA 1312 & 8260B)	SPLP SVOCs (EPA 1312 & 8270C)	SPLP TPH (EPA 1312 & OA1 & OA2)	SPLP Appendix IX Metals (EPA 1312 & 6020/7471B)	Total Chromium (EPA 6020)	TCLP Chromium (EPA 1311/6020)	SPLP Chromium (EPA 1312 & 6020)	Fraction of Organic Carbon (ASTM D 2974-87)	Cation/Anion Exchange Capacity (EPA 9056 or 9081)	XRD (SW846 Draft Method 6300)	Moisture Content (ASTM D 2216)	Gradation - sieve and hydrometer (ASTM D 422)	Atterberg Limits (ASTM D 4318)	Soil Classification (ASTM D 2487)	Hydraulic Conductivity (ASTM D 5084)
SWMU #7 Landfill for General Plant Trash	SS01 / SB01	S07-SS01-002	0-2 ft	HA	Soil	surface soil																										X	X	X	
		S07-SB01-010	9-10 ft	DPT	Soil	first foot of native soil below landfill materials(1)	X			X	X	X	X	X	X	X	X	X	X																
	SB02	S07-SB02-010	9-10 ft	DPT	Soil	first foot of native soil below landfill materials(1)	X			X	X	X	X	X	X	X	X	X	X																
	SS03 / SB03	S07-SB03-002	0-2 ft	HA	Soil	surface soil																										X	X	X	
		S07-SB03-010	9-10 ft	DPT	Soil	first foot of native soil below landfill materials(1)	X			X	X	X	X	X	X	X	X	X	X																
	SB04	S07-SB04-010	9-10 ft	DPT	Soil	first foot of native soil below landfill materials(1)	X			X	X	X	X	X	X	X	X	X	X																
SWMU #10 East Cell of the Lime Sludge Pond	LS01 / SB01	S10-LS01-003	2-3 ft	DPT	SM	settleable matter samples from various depths								X	X		X							X											
		S10-LS01-008	6-8 ft	DPT	SM	settleable matter samples from various depths																								X	X	X	X	
		S10-SB01-012	11-12 ft	DPT	Soil	first foot of native soil below the settleable matter								X	X		X							X											
	LS02 / SB02	S10-LS02-005	4-5 ft	DPT	SM	settleable matter samples from various depths								X	X		X							X											
		S10-SB02-012	11-12 ft	DPT	Soil	first foot of native soil below the settleable matter								X	X		X							X											
	LS03 / SB03	S10-LS03-007	6-7 ft	DPT	SM	settleable matter samples from various depths								X	X		X							X											
		S10-SB03-012	11-12 ft	DPT	Soil	first foot of native soil below the settleable matter								X	X		X							X											
	LS04 / SB04	S10-LS04-009	8-9 ft	DPT	SM	settleable matter samples from various depths								X	X		X							X											
		S10-SB04-012	11-12 ft	DPT	Soil	first foot of native soil below the settleable matter								X	X		X							X											
SWMU #11 West Cell of the Lime Sludge Pond	LS01 / SB01	S11-LS01-003	2-3 ft	DPT	SM	settleable matter samples from various depths								X	X		X							X											
		S11-LS01-010	8-10 ft	DPT	SM	settleable matter samples from various depths																								X	X	X	X	
		S11-SB01-012	11-12 ft	DPT	Soil	first foot of native soil below the settleable matter								X	X		X							X											
	LS02 / SB02	S11-LS02-004	3-4 ft	DPT	SM	settleable matter samples from various depths								X	X		X							X											
		S11-SB02-012	11-12 ft	DPT	Soil	first foot of native soil below the settleable matter								X	X		X							X											
	LS03 / SB03	S11-LS03-005	4-5 ft	DPT	SM	settleable matter samples from various depths								X	X		X							X											
		S11-SB03-012	11-12 ft	DPT	Soil	first foot of native soil below the settleable matter								X	X		X							X											
SWMU #11 West Cell of the Lime Sludge Pond (continued)	LS04 / SB04	S11-LS04-004	2-4 ft	DPT	SM	settleable matter samples from various depths																								X	X	X	X	
		S11-LS04-006	5-6 ft	DPT	SM	settleable matter samples from various depths								X	X		X							X											
		S11-SB04-012	11-12 ft	DPT	Soil	first foot of native soil below the settleable matter								X	X		X							X											
		S11-LS05-007	6-7 ft	DPT	SM	settleable matter samples from various depths								X	X		X							X											

Table I-2-3
Proposed Sample Identification, Location, Depth Intervals, and Analytes for Solids Investigation
Koch Nitrogen Company

SWMU / AOC	Location	Sample ID	Estimated Sample Interval (ft BLS)	Sample Retrieval Method*	Matrix	Description	Field OVA Screening	Field Nitrate with Hach Kit (Method 8039)	Field Screening of Metals	VOCs (EPA 8260B)	SVOCs (EPA 8270C)	TPH (OA1 & OA2)	Appendix IX Metals (EPA 6020/7471B)	Hexavalent Chromium (EPA 7196)	Nitrate-Nitirte (EPA 353.2)	Sulfate (EPA 9056)	pH (9045)	Organochlorine Pesticides (EPA 8081)	Organochlorine Herbicides (EPA 8151)	SPLP VOCs (EPA 1312 & 8260B)	SPLP SVOCs (EPA 1312 & 8270C)	SPLP TPH (EPA 1312 & OA1 & OA2)	SPLP Appendix IX Metals (EPA 1312 & 6020/7471B)	Total Chromium (EPA 6020)	TCLP Chromium (EPA 1311/6020)	SPLP Chromium (EPA 1312 & 6020)	Fraction of Organic Carbon (ASTM D 2974-87)	Cation/Anion Exchange Capacity (EPA 9056 or 9081)	XRD (SW846 Draft Method 6300)	Moisture Content (ASTM D 2216)	Gradation - sieve and hydrometer (ASTM D 422)	Atterberg Limits (ASTM D 4318)	Soil Classification (ASTM D 2487)	Hydraulic Conductivity (ASTM D 5084)
SWMU #11 West Cell of the Lime Sludge Pond (continued)	LS05 / SB05	S11-SB05-012	11-12 ft	DPT	Soil	first foot of native soil below the settleable matter								X	X		X							X										
	LS06 / SB06	S11-LS06-009	8-9 ft	DPT	SM	settleable matter samples from various depths								X	X		X							X										
		S11-SB06-012	11-12 ft	DPT	Soil	first foot of native soil below the settleable matter								X	X		X							X										
SWMU #17 East Lime Sludge Landfill	SS01 / SB01	S17-SS01-002	0-2 ft	DPT	Soil	Trench 4 surface soil																									X	X	X	
		S17-SB01-007	5-7 ft	DPT	SM	Trench 4 settleable matter sample								X	X		X							X										
		S17-SB01-010	8-10 ft	DPT	SM	Trench 4 settleable matter sample																									X	X	X	
		S17-SB01-011	10-11 ft	DPT	Soil	first foot of native soil below the Trench 4 settleable matter								X	X		X							X										
	SS02 / SB02	S17-SS02-002	0-2 ft	DPT	Soil	Trench 5 surface soil																									X	X	X	
		S17-SB02-007	5-7 ft	DPT	SM	Trench 5 settleable matter sample								X	X		X							X										
		S17-SB02-010	8-10 ft	DPT	SM	Trench 5 settleable matter sample																									X	X	X	
		S17-SB02-011	10-11 ft	DPT	Soil	first foot of native soil below the Trench 5 settleable matter								X	X		X							X										
SWMU #19 West Lime Sludge Industrial Landfill	SS01 / SB01	S19-SS01-0.5	0-0.5 ft	DPT	Soil	Trench 1 surface soil								X	X		X							X										
		S19-SS01-002	0-2 ft	DPT	Soil	Trench 1 surface soil																									X	X	X	
		S19-SB01-006	4-6 ft	DPT	Soil	Trench 1 subsurface sample								X	X		X							X							X	X	X	
		S19-SB01-010	8-10 ft	DPT	Soil	Trench 1 subsurface sample																									X	X	X	
		S19-SB01-011	10-11 ft	DPT	Soil	Trench 1 native soil								X	X		X							X										
	SS02 / SB02	S19-SS02-0.5	0-0.5 ft	HA	Soil	Trench 1 surface soil								X	X		X							X										
		S19-SB02-006	4-6 ft	DPT	Soil	Trench 1 subsurface sample								X	X		X							X										
		S19-SB02-011	10-11 ft	DPT	Soil	Trench 1 native soil								X	X		X							X										
	SS03 / SB03	S19-SS03-0.5	0-0.5 ft	DPT	Soil	Trench 1 surface soil								X	X		X							X										
		S19-SS03-002	0-2 ft	DPT	Soil	Trench 1 surface soil																									X	X	X	
SWMU #19 West Lime Sludge Industrial Landfill (continued)	SS03 / SB03 (continued)	S19-SB03-006	4-6 ft	DPT	Soil	Trench 1 subsurface sample								X	X		X							X							X	X	X	
		S19-SB03-011	10-11 ft	DPT	Soil	Trench 1 native soil								X	X		X							X										
	SS04 / SB04	S19-SS04-0.5	0-0.5 ft	HA	Soil	Trench 1 surface soil								X	X		X							X										
		S19-SB04-006	4-6 ft	DPT	Soil	Trench 1 subsurface sample								X	X		X							X										
		S19-SB04-011	10-11 ft	DPT	Soil	Trench 1 native soil								X	X		X							X										
	SS05 / SB05	S19-SS05-0.5	0-0.5 ft	HA	Soil	Trench 1 surface soil								X	X		X							X										
		S19-SB05-006	4-6 ft	DPT	Soil	Trench 1 subsurface sample								X	X		X							X										
		S19-SB05-011	10-11 ft	DPT	Soil	Trench 1 native soil								X	X		X							X										
		S19-SS06-0.5	0-0.5 ft	HA	Soil	Trench 2 surface soil								X	X		X							X										
		S19-SS06-002	0-2 ft	HA	Soil	Trench 2 surface soil																									X	X	X	

Table I-2-3
Proposed Sample Identification, Location, Depth Intervals, and Analytes for Solids Investigation
Koch Nitrogen Company

SWMU / AOC	Location	Sample ID	Estimated Sample Interval (ft BLS)	Sample Retrieval Method*	Matrix	Description	Field OVA Screening	Field Nitrate with Hach Kit (Method 8039)	Field Screening of Metals	VOCs (EPA 8260B)	SVOCs (EPA 8270C)	TPH (OA1 & OA2)	Appendix IX Metals (EPA 6020/7471B)	Hexavalent Chromium (EPA 7196)	Nitrate-Nitirte (EPA 353.2)	Sulfate (EPA 9056)	pH (9045)	Organochlorine Pesticides (EPA 8081)	Organochlorine Herbicides (EPA 8151)	SPLP VOCs (EPA 1312 & 8260B)	SPLP SVOCs (EPA 1312 & 8270C)	SPLP TPH (EPA 1312 & OA1 & OA2)	SPLP Appendix IX Metals (EPA 1312 & 6020/7471B)	Total Chromium (EPA 6020)	TCLP Chromium (EPA 1311/6020)	SPLP Chromium (EPA 1312 & 6020)	Fraction of Organic Carbon (ASTM D 2974-87)	Cation/Anion Exchange Capacity (EPA 9056 or 9081)	XRD (SW846 Draft Method 6300)	Moisture Content (ASTM D 2216)	Gradation - sieve and hydrometer (ASTM D 422)	Atterberg Limits (ASTM D 4318)	Soil Classification (ASTM D 2487)	Hydraulic Conductivity (ASTM D 5084)
SWMU #19 West Lime Sludge Industrial Landfill (continued)	SS06 / SB06	S19-SB06-006	4-6 ft	DPT	Soil	Trench 2 subsurface sample								X	X		X							X										
		S19-SB06-008	6-8 ft	DPT	Soil	Trench 2 subsurface sample																									X	X	X	
		S19-SB06-010	9-10 ft	DPT	Soil	Trench 2 native soil								X	X		X							X										
	SS07 / SB07	S19-SS07-0.5	0-0.5 ft	HA	Soil	Trench 2 surface soil								X	X		X							X										
		S19-SB07-006	4-6 ft	DPT	Soil	Trench 2 subsurface sample								X	X		X							X										
		S19-SB07-010	9-10 ft	DPT	Soil	Trench 2 native soil								X	X	.	X							X										
	SS08 / SB08	S19-SS08-0.5	0-0.5 ft	HA	Soil	Trench 3 surface sample	X			X	X	X	X	X	X	X	X																	
		S19-SB08-006	4-6 ft	DPT	Soil	Trench 3 subsurface sample	X			X	X	X	X	X	X	X	X													X	X	X	X	
		S19-SB08-010	9-10 ft	DPT	Soil	Trench 3 native soil	X			X	X	X	X	X	X	X	X																	
	SS09 / SB09	S19-SS09-0.5	0-0.5 ft	HA	Soil	Trench 3 surface sample	X			X	X	X	X	X	X	X	X																	
		S19-SB09-006	4-6 ft	DPT	Soil	Trench 3 subsurface sample	X			X	X	X	X	X	X	X	X																	
		S19-SB09-008	6-8 ft	DPT	Soil	Trench 3 subsurface sample	X																							X	X	X	X	
		S19-SB09-010	9-10 ft	DPT	Soil	Trench 3 native soil	X			X	X	X	X	X	X	X	X																	
	SS10 / SB10	S19-SS10-0.5	0-0.5 ft	HA	Soil	Trench 3 surface sample	X			X	X	X	X	X	X	X	X																	
		S19-SB10-006	4-6 ft	DPT	Soil	Trench 3 subsurface sample	X			X	X	X	X	X	X	X	X																	
		S19-SB10-010	9-10 ft	DPT	Soil	Trench 3 native soil	X			X	X	X	X	X	X	X	X																	
	SS11 / SB11	S19-SS11-0.5	0-0.5 ft	HA	Soil	Trench 3 surface sample	X			X	X	X	X	X	X	X	X																	
		S19-SB11-004	2-4 ft	DPT	Soil	Trench 3 subsurface sample	X																							X	X	X	X	
		S19-SB11-006	4-6 ft	DPT	Soil	Trench 3 subsurface sample	X			X	X	X	X	X	X	X	X																	
		S19-SB11-010	9-10 ft	DPT	Soil	Trench 3 native soil	X			X	X	X	X	X	X	X	X																	
	SS12 / SB12	S19-SS12-0.5	0-0.5 ft	HA	Soil	Trench 3 surface sample	X			X	X	X	X	X	X	X	X																	
		S19-SB12-006	4-6 ft	HA	Soil	Trench 3 subsurface sample	X			X	X	X	X	X	X	X	X																	
		S19-SB12-010	9-10 ft	DPT	Soil	Trench 3 native soil	X			X	X	X	X	X	X	X	X																	
AOC #4 Former Gas Shed on the Old Farm	SS01 / SB01	A04-SS01-0.5	0-0.5 ft	HA	Soil	surface soil	X			X	X	X	X	X	X	X	X	X	X															
		A04-SB01-002	0.5-2 ft	HA	Soil	subsurface soil	X			X	X	X	X	X	X	X	X	X	X															
		A04-SB01-004	2-4 ft	HA	Soil	subsurface soil	X			X	X	X	X	X	X	X	X	X	X															
		A04-SB01-006	4-6 ft	DPT	Soil	subsurface soil	X			X	X	X	X	X	X	X	X	X	X															
	SS02 / SB02	A04-SS02-0.5	0-0.5 ft	HA	Soil	surface soil	X			X	X	X	X	X	X	X	X	X	X															
		A04-SB02-002	0.5-2 ft	HA	Soil	subsurface soil	X			X	X	X	X	X	X	X	X	X	X															
		A04-SB02-004	2-4 ft	HA	Soil	subsurface soil	X			X	X	X	X	X	X	X	X	X	X															
		A04-SB02-006	4-6 ft	DPT	Soil	subsurface soil	X			X	X	X	X	X	X	X	X	X	X															
	SS03 / SB03	A04-SS03-0.5	0-0.5 ft	HA	Soil	surface soil	X			X	X	X	X	X	X	X	X	X	X															
		A04-SB03-002	0.5-2 ft	HA	Soil	subsurface soil	X			X	X	X	X	X	X	X	X	X	X															
		A04-SB03-004	2-4 ft	HA	Soil	subsurface soil	X			X	X	X	X	X	X	X	X	X	X															
		A04-SB03-006	4-6 ft	DPT	Soil	subsurface soil	X			X	X	X	X	X	X	X	X	X	X															
		A04-SS04-0.5	0-0.5 ft	HA	Soil	surface soil	X			X	X	X	X	X	X	X	X	X	X															

Table I-2-3
Proposed Sample Identification, Location, Depth Intervals, and Analytes for Solids Investigation
Koch Nitrogen Company

SWMU / AOC	Location	Sample ID	Estimated Sample Interval (ft BLS)	Sample Retrieval Method*	Matrix	Description	Field OVA Screening	Field Nitrate with Hach Kit (Method 8039)	Field Screening of Metals	VOCs (EPA 8260B)	SVOCs (EPA 8270C)	TPH (OA1 & OA2)	Appendix IX Metals (EPA 6020/7471B)	Hexavalent Chromium (EPA 7196)	Nitrate-Nitirte (EPA 353.2)	Sulfate (EPA 9056)	pH (9045)	Organochlorine Pesticides (EPA 8081)	Organochlorine Herbicides (EPA 8151)	SPLP VOCs (EPA 1312 & 8260B)	SPLP SVOCs (EPA 1312 & 8270C)	SPLP TPH (EPA 1312 & OA1 & OA2)	SPLP Appendix IX Metals (EPA 1312 & 6020/7471B)	Total Chromium (EPA 6020)	TCLP Chromium (EPA 1311/6020)	SPLP Chromium (EPA 1312 & 6020)	Fraction of Organic Carbon (ASTM D 2974-87)	Cation/Anion Exchange Capacity (EPA 9056 or 9081)	XRD (SW846 Draft Method 6300)	Moisture Content (ASTM D 2216)	Gradation - sieve and hydrometer (ASTM D 422)	Atterberg Limits (ASTM D 4318)	Soil Classification (ASTM D 2487)	Hydraulic Conductivity (ASTM D 5084)
AOC #4 Former Gas Shed on the Old Farm	SS04 / SB04	A04-SB04-002	0.5-2 ft	HA	Soil	subsurface soil	X			X	X	X	X	X	X	X	X	X	X															
		A04-SB04-004	2-4 ft	HA	Soil	subsurface soil	X			X	X	X	X	X	X	X	X	X	X															
		A04-SB04-006	4-6 ft	DPT	Soil	subsurface soil	X			X	X	X	X	X	X	X	X	X	X															
	SS05 / SB05	A04-SS05-0.5	0-0.5 ft	HA	Soil	surface soil	X			X	X	X	X	X	X	X	X	X	X															
		A04-SB05-002	0.5-2 ft	HA	Soil	subsurface soil	X			X	X	X	X	X	X	X	X	X	X															
		A04-SB05-004	2-4 ft	HA	Soil	subsurface soil	X			X	X	X	X	X	X	X	X	X	X															
		A04-SB05-006	4-6 ft	DPT	Soil	subsurface soil	X			X	X	X	X	X	X	X	X	X	X															
	SS06 / SB06	A04-SS06-0.5	0-0.5 ft	HA	Soil	surface soil	X			X	X	X	X	X	X	X	X	X	X															
		A04-SB06-002	0.5-2 ft	HA	Soil	subsurface soil	X			X	X	X	X	X	X	X	X	X	X															
		A04-SB06-004	2-4 ft	HA	Soil	subsurface soil	X			X	X	X	X	X	X	X	X	X	X															
		A04-SB06-006	4-6 ft	DPT	Soil	subsurface soil	X			X	X	X	X	X	X	X	X	X	X															
	SS07 / SB07	A04-SS07-0.5	0-0.5 ft	HA	Soil	surface soil	X			X	X	X	X	X	X	X	X	X	X															
		A04-SB07-002	0.5-2 ft	HA	Soil	subsurface soil	X			X	X	X	X	X	X	X	X	X	X															
		A04-SB07-004	2-4 ft	HA	Soil	subsurface soil	X			X	X	X	X	X	X	X	X	X	X															
		A04-SB07-006	4-6 ft	DPT	Soil	subsurface soil	X			X	X	X	X	X	X	X	X	X	X															
	SS08 / SB08	A04-SS08-0.5	0-0.5 ft	HA	Soil	surface soil	X			X	X	X	X	X	X	X	X	X	X															
		A04-SB08-002	0.5-2 ft	HA	Soil	subsurface soil	X			X	X	X	X	X	X	X	X	X	X															
		A04-SB08-004	2-4 ft	HA	Soil	subsurface soil	X			X	X	X	X	X	X	X	X	X	X															
		A04-SB08-006	4-6 ft	DPT	Soil	subsurface soil	X			X	X	X	X	X	X	X	X	X	X															
	SS09 / SB09	A04-SS09-0.5	0-0.5 ft	HA	Soil	surface soil	X			X	X	X	X	X	X	X	X	X	X															
		A04-SB09-002	0.5-2 ft	HA	Soil	subsurface soil	X			X	X	X	X	X	X	X	X	X	X															
		A04-SB09-004	2-4 ft	HA	Soil	subsurface soil	X			X	X	X	X	X	X	X	X	X	X															

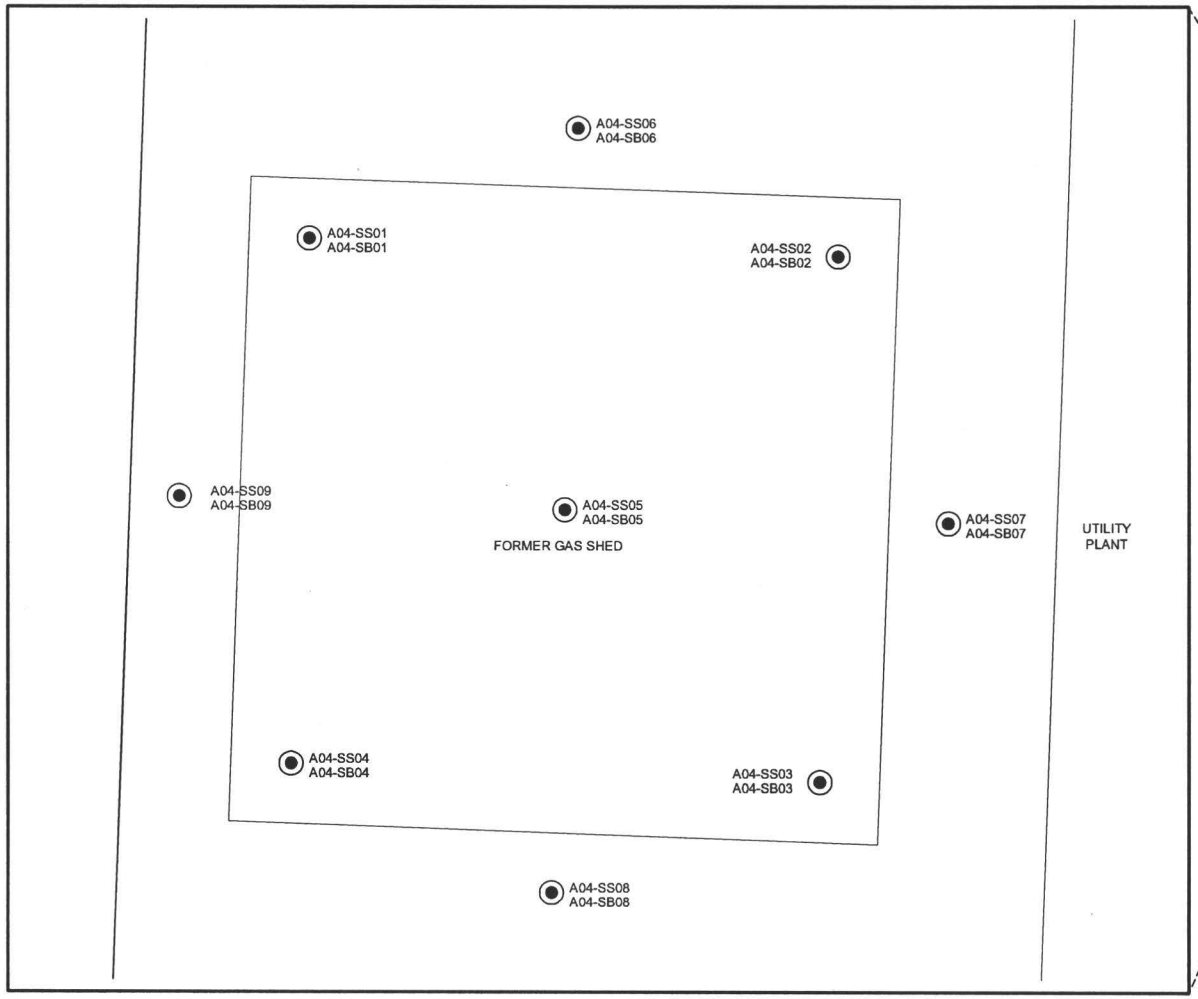
* Sample retrieval method may vary according to field conditions (DPT, HA, Sonic)
(1) Sample only to be collected if settleable matter is present.
(2) Field analysis for chromium and hexavalent chromium will be conducted using field test kits. At least 20% of any samples analyzed with a field screening method will be confirmed using the off-site laboratory.
(3) Field screening for nitrate wil be conducted using a HACH test kit. All 0 to 6 inch samples and 6 to 24 in samples, as well as 20% of the samples from the water table borings, will also be analyzed by the off-site laboratory for nitrate-nitrite.
(4) Sample depth interval to be determined based on test pit excavation.
(5) Sample only to be collected if disposed material is visible during test pit excavation.

Asphlt = Asphalt
BLS = Below Land Surface
CC = Concrete Chip
DPT = Direct Push Technology
HA = Hand Auger
LS = Lime Sludge

Table I-2-3
Proposed Sample Identification, Location, Depth Intervals, and Analytes for Solids Investigation
Koch Nitrogen Company

SWMU / AOC	Location	Sample ID	Estimated Sample Interval (ft BLS)	Sample Retrieval Method*	Matrix	Description	Field OVA Screening	Field Nitrate with Hach Kit (Method 8039)	Field Screening of Metals	VOCs (EPA 8260B)	SVOCs (EPA 8270C)	TPH (OA1 & OA2)	Appendix IX Metals (EPA 6020/7471B)	Hexavalent Chromium (EPA 7196)	Nitrate-Nitirte (EPA 353.2)	Sulfate (EPA 9056)	pH (9045)	Organochlorine Pesticides (EPA 8081)	Organochlorine Herbicides (EPA 8151)	SPLP VOCs (EPA 1312 & 8260B)	SPLP SVOCs (EPA 1312 & 8270C)	SPLP TPH (EPA 1312 & OA1 & OA2)	SPLP Appendix IX Metals (EPA 1312 & 6020/7471B)	Total Chromium (EPA 6020)	TCLP Chromium (EPA 1311/6020)	SPLP Chromium (EPA 1312 & 6020)	Fraction of Organic Carbon (ASTM D 2974-87)	Cation/Anion Exchange Capacity (EPA 9056 or 9081)	XRD (SW846 Draft Method 6300)	Moisture Content (ASTM D 2216)	Gradation - sieve and hydrometer (ASTM D 422)	Atterberg Limits (ASTM D 4318)	Soil Classification (ASTM D 2487)	Hydraulic Conductivity (ASTM D 5084)

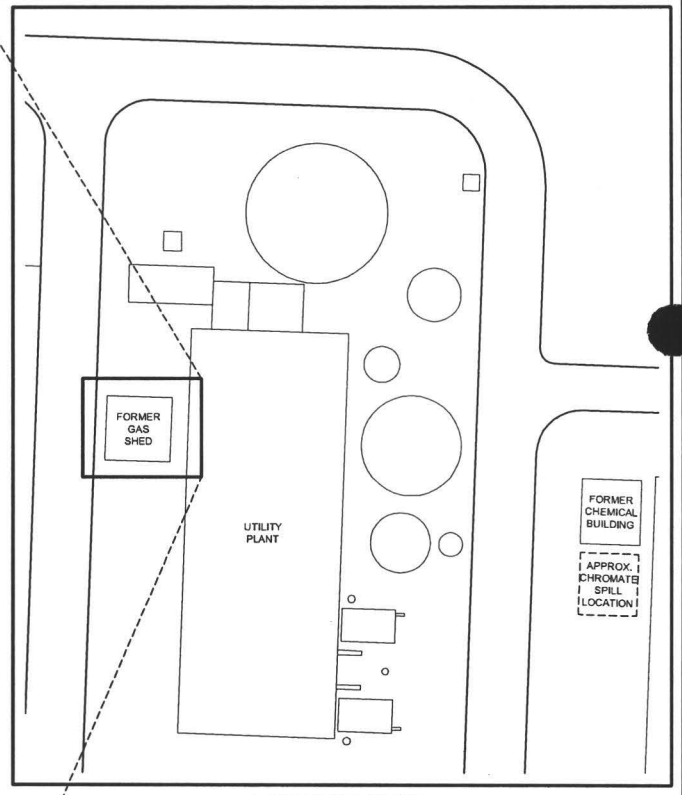
SM = Settleabale Matter
Sonic = Sonic Drilling
SW = Surface Water
TBD = To Be Determined



DETAIL MAP

4 2 0 4

SCALE IN FEET



LOCATION MAP

40 20 0 40

SCALE IN FEET

LEGEND

PROPOSED SOIL BORING LOCATION

N

AOC 4
FORMER GAS SHED
ON THE OLD FARM

PREPARED FOR:

KOCH
KOCH NITROGEN COMPANY
11559 US HIGHWAY 50 - P.O. BOX 1337
DODGE CITY, KS 67801

PREPARED BY

GEOSYNTEC CONSULTANTS

PROJECT NO.	FR0760.01	FIGURE NO.	I-2-16
DATE.	MAY 2005	FILE NO.	FR0760.01-F025

Tables I-2-1 and I-2-3 has not been modified. KNC proposes to submit a revised scope of work for this AOC once existing data is compared to site background to identify lateral and vertical delineation gaps.

<u>Specific Comment # 44.</u> **Table I-2-2 Summary of Proposed Groundwater Characterization Activities: In order to ensure that all groundwater contaminants are identified, the EPA believes that an initial broad scan of analytes should be performed when the new monitoring wells resulting from the groundwater contamination delineation and vertical profiling, and the new Dakota well, are first sampled. These analytes should include VOCs, SVOCs, Appendix IX metals, hexavalent chromium, total petroleum hydrocarbons, nitrate, sulfate, and laboratory pH. The EPA believes it is important to do this because it is possible that not all potential sources of groundwater contamination may be known at this time.**

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It is also recommended that the same broad scan should be run on groundwater samples collected from several existing monitoring wells located in key positions downgradient from SWMUs and AOCs from which contaminants of unknown nature may have been released. These areas include the South Pond (SWMU 1), the North Pond (SWMU 2), the East Pond (SWMU 3), and the Former Gas Shed on the Old Farm (AOC 4). The EPA will defer selection of specific wells to Koch.

Proposed KNC Response: As requested during the October 11, 2005, conference call, KNC has revised Table I-2-2 to identify the wells located in the vicinity of SWMU 1, SWMU 2, SWMU 3 and AOC 4 that are proposed to be analyzed for a wider parametric coverage. The wells proposed for wider parametric coverage near each of the SWMUs listed above were identified through a review of previous EPA comments dated January 24, 2003. In the January 24, 2003 EPA comment letter, wells in the area of the Former Gas Shed (AOC 4) were not identified. Three wells (TW-26, TW-64, and CP-1) located near the Former Gas Shed on the Old Farm were selected by KNC for the analysis described above.

Table I-2-2
Summary of Proposed Groundwater Characterization Activities
Koch Nitrogen Company

[1]Wells	Analysis Currently Performed			Scheduled for Testing as Part of RFI Delineation Activities			Geochemical Parameters Scheduled for Testing as Part of RFI Attenuation Capacity Activities							[4]Supplemental Groundwater Investigation	Rationale
	VOCs	Chromium	Nitrate	VOCs	[2,3]Chromium	[2,3]Nitrate	[2]Total Organic Carbon	[3]pH	[3]DO	[3]ORP	[2]Orthophosphate	[3]Ferrous Iron (Fe^{2+})	[2]Alkalinity		
Quarterly Monitoring Well Network															
TW-05		X	X	X			X	X	X	X	X	X	X		Groundwater VOC delineation, and characterization of geochemistry in area of high nitrate.
TW-08	X	X	X					X	X	X				X	ORP data will be collected to supplement DO and pH data already collected as part of quarterly groundwater monitoring, recommended for full parameteric coverage in January 24, 2003 EPA Comment Letter - East Pond Supplemental
TW-11		X	X				X	X	X	X	X	X	X		Characterize background groundwater geochemistry for comparisons to on-site
TW-16		X	X					X	X	X					
TW-22		X	X					X	X	X					
TW-23		X	X					X	X	X					
TW-26	X	X	X				X	X	X	X	X	X	X	X	Characterization of groundwater geochemistry in area of nominal chromium levels, and supplemental investigation near AOC 4 (Former Gas Shed)
TW-28	X	X	X					X	X	X					
TW-37		X	X					X	X	X					
TW-39		X	X					X	X	X				X	Recommended for full parameteric coverage in January 24, 2003 EPA Comment Letter - North Pond Supplemental Investigation
TW-40		X	X					X	X	X				X	Recommended for full parameteric coverage in January 24, 2003 EPA Comment Letter - South Pond Supplemental Investigation
TW-52		X	X					X	X	X					
TW-56		X	X				X	X	X	X	X	X	X		Characterize background groundwater geochemistry for comparisons to on-site
TW-63		X	X					X	X	X					
TW-74	X	X	X					X	X	X					
TW-76		X	X					X	X	X					
TW-77		X	X					X	X	X					
TW-78		X	X					X	X	X					
TW-79		X	X					X	X	X					
TW-80		X	X					X	X	X				X	Recommended for full parameteric coverage in January 24, 2003 EPA Comment Letter - South Pond Supplemental Investigation
TW-89		X	X	X			X	X	X	X	X	X	X		Groundwater VOC Delineation requested by USEPA to assess potential impacts from SWMU 7, and characterization of geochemistry in an area of nominal nitrate.
TW-93		X	X					X	X	X					
A-3B	X	X	X				X	X	X	X	X	X	X		Characterization of groundwater geochemistry in area of elevated chromium
B-1	X	X	X					X	X	X					
C-3B	X	X	X												
Bogner		X	X												
Buehne		X	X												
Chaffin		X	X-7/21/04												
Tawzer (Fromer Cline)		X	X												
Coker		X	X												
Conrardy		X	X												
Land O'Lakes Feed Mill (Formerly Farmland)		X	X												
Lix		X	X												
Kansas Byproducts (Formerly UPI)		X	X												
Maxwell		X	X												

Table I-2-2
Summary of Proposed Groundwater Characterization Activities
Koch Nitrogen Company

[1]Wells	Analysis Currently Performed			Scheduled for Testing as Part of RFI Delineation Activities			Geochemical Parameters Scheduled for Testing as Part of RFI Attenuation Capacity Activities							[5]Supplemental Groundwater Investigation	Rationale
	VOCs	Chromium	Nitrate	VOCs	[2,3]Chromium	[2,3]Nitrate	[3]Total Organic Carbon	[3]pH	[3]DO	[3]ORP	[2]Orthophosphate	[3]Ferrous Iron (Fe^{2+})	[2]Alkalinity		
Semi-Annual Monitoring Well Network															
TW-14		X	X												
TW-19		X	X												
TW-31		X	X												
TW-38		X	X												
TW-46		X	X												
TW-49		X	X												
TW-58		X	X												
TW-68		X	X												
TW-73		X	X												
TW-84		X	X												
TW-87		X	X											X	Recommended for full parameteric coverage in January 24, 2003 EPA Comment Letter - North Pond Supplemental Investigation
TW-91		X	X												
TW-94		X	X											X	Recommended for full parameteric coverage in January 24, 2003 EPA Comment Letter - South Pond Supplemental Investigation
Supplemental Monitoring Network															
TW-1A															
TW-02														X	Recommended for full parameteric coverage in January 24, 2003 EPA Comment Letter - East Pond Supplemental Investigation
TW-04															
TW-07															
TW-09															
TW-10															
TW-12															
TW-13															
TW-15															
TW-17															
TW-18															
TW-20															
TW-21				X										X	Groundwater VOC delineation, requested by USEPA to assess potential impacts from SWMU 7, and recommended for full parameteric coverage in January 24, 2003 EPA Comment Letter - North Pond Supplemental Investigation
TW-24															
TW-25															
TW-27				X											Groundwater VOC delineation
TW-29				X											Groundwater VOC delineation
TW-30															
TW-36															

Table I-2-2
Summary of Proposed Groundwater Characterization Activities
Koch Nitrogen Company

[1]Wells	Analysis Currently Performed			Scheduled for Testing as Part of RFI Delineation Activities			Geochemical Parameters Scheduled for Testing as Part of RFI Attenuation Capacity Activities							[6]Supplemental Groundwater Investigation	Rationale
	VOCs	Chromium	Nitrate	VOCs	[2,3]Chromium	[2,3]Nitrate	[3]Total Organic Carbon	[3]pH	[3]DO	[3]ORP	[3]Orthophosphate	[3]Ferrous Iron (Fe^{2+})	[3]Alkalinity		
TW-47															
TW-48															
TW-51															
TW-53															
TW-54															
TW-55															
TW-57															
TW-59															
TW-60															
TW-61															
TW-62															
TW-64														X	Supplemental investigation in the area of AOC 4 (Former Gas Shed)
TW-65														X	Recommended for full parameteric coverage in January 24, 2003 EPA Comment Letter - East Pond Supplemental Investigation
TW-66															
TW-67															
TW-69															
TW-70			X - 4/15/04											X	Recommended for full parameteric coverage in January 24, 2003 EPA Comment Letter - East Pond Supplemental Investigation
TW-71															
TW-72															
TW-75															
TW-81A															
TW-82															
TW-83															
TW-85															
TW-86															
TW-88				X											Groundwater VOC delineation
TW-90															
TW-92														X	Recommended for full parameteric coverage in January 24, 2003 EPA Comment Letter - South Pond Supplemental Investigation
CP-1														X	Supplemental investigation in the area of AOC 4 (Former Gas Shed)
CP-2															
CP-3															
CP-4															
CP-5															
A-1															
A-2															
B-2					X	X									Characterize chromium and nitrate in the Dakota aquifer.
C-2															
SIT-RG01-60					X	X									Off-site chromium and nitrate delineation

Table I-2-2
Summary of Proposed Groundwater Characterization Activities
Koch Nitrogen Company

[1]Wells	Analysis Currently Performed			Scheduled for Testing as Part of RFI Delineation Activities			Geochemical Parameters Scheduled for Testing as Part of RFI Attenuation Capacity Activities							[5]Supplemental Groundwater Investigation	Rationale
	VOCs	Chromium	Nitrate	VOCs	[2,3]Chromium	[2,3]Nitrate	[3]Total Organic Carbon	[3]pH	[3]DO	[3]ORP	[3]Orthophosphate	[3]Ferrous Iron (Fe^{2+})	[3]Alkalinity		
SIT-RG01-75					X	X									Off-site chromium and nitrate delineation
SIT-RG01-90					X	X									Off-site chromium and nitrate delineation
SIT-RG02-60					X	X									Off-site chromium and nitrate delineation
SIT-RG02-75					X	X									Off-site chromium and nitrate delineation
SIT-RG02-90					X	X									Off-site chromium and nitrate delineation
SIT-RG03-60					X	X									Off-site chromium and nitrate delineation
SIT-RG03-75					X	X									Off-site chromium and nitrate delineation
SIT-RG03-90					X	X									Off-site chromium and nitrate delineation
SIT-RG04-60					X	X									Off-site chromium and nitrate delineation
SIT-RG04-75					X	X									Off-site chromium and nitrate delineation
SIT-RG04-90					X	X									Off-site chromium and nitrate delineation
SIT-RG05-60					X	X									Off-site chromium and nitrate delineation
SIT-RG05-75					X	X									Off-site chromium and nitrate delineation
SIT-RG05-90					X	X									Off-site chromium and nitrate delineation
SIT-RG06-60					X	X									Off-site chromium and nitrate delineation
SIT-RG06-75					X	X									Off-site chromium and nitrate delineation
SIT-RG06-90					X	X									Off-site chromium and nitrate delineation
SIT-RG07-60				X	X	X									Vertical VOC, chromium, and nitrate delineation
SIT-RG07-75				X	X	X									Vertical VOC, chromium, and nitrate delineation
SIT-RG07-90				X	X	X									Vertical VOC, chromium, and nitrate delineation
[4]SIT-RG07-175															Vertical VOC, chromium, and nitrate delineation
SIT-RG07-190															Vertical VOC, chromium, and nitrate delineation
SIT-RG07-205															Vertical VOC, chromium, and nitrate delineation
SIT-RG07-220															Vertical VOC, chromium, and nitrate delineation
SIT-RG07-235															Vertical VOC, chromium, and nitrate delineation
SIT-RG07-250															Vertical VOC, chromium, and nitrate delineation
SIT-RG07-265															Vertical VOC, chromium, and nitrate delineation
SIT-RG07-280															Vertical VOC, chromium, and nitrate delineation

Table I-2-2
Summary of Proposed Groundwater Characterization Activities
Koch Nitrogen Company

[1]Wells	Analysis Currently Performed			Scheduled for Testing as Part of RFI Delineation Activities			Geochemical Parameters Scheduled for Testing as Part of RFI Attenuation Capacity Activities							[5]Supplemental Groundwater Investigation	Rationale
	VOCs	Chromium	Nitrate	VOCs	[2,3]Chromium	[2,3]Nitrate	[2]Total Organic Carbon	[3]pH	[3]DO	[3]ORP	[2]Orthophosphate	[2]Ferrous Iron (Fe^{2+})	[2]Alkalinity		
SIT-RG07-295															Vertical VOC, chromium, and nitrate delineation
SIT-RG07-310															Vertical VOC, chromium, and nitrate delineation
SIT-RG07-325															Vertical VOC, chromium, and nitrate delineation
SIT-RG07-340															Vertical VOC, chromium, and nitrate delineation
SIT-RG07-355															Vertical VOC, chromium, and nitrate delineation
SIT-RG07-370															Vertical VOC, chromium, and nitrate delineation
SIT-RG07-385															Vertical VOC, chromium, and nitrate delineation
SIT-RG07-400															Vertical VOC, chromium, and nitrate delineation
SIT-RG07-415															Vertical VOC, chromium, and nitrate delineation
SIT-RG07-430															Vertical VOC, chromium, and nitrate delineation
SIT-RG07-450 (New Dakota Well)					X	X								X	Vertical VOC, chromium, and nitrate delineation, supplemental investigation of other potential site constituents in Dakota
SIT-RG08-60					X	X									Vertical VOC, chromium, and nitrate delineation
SIT-RG08-75					X	X									Vertical VOC, chromium, and nitrate delineation
SIT-RG08-90 (Near TW-08)					X	X									Dakota Groundwater Verification near Injection Well #1

Notes:
[1] As discussed in Section I-4.2.1, samples collected from existing monitoring wells will be named in accordance with the existing nomenclature currently in use for these locations.
[2] Analytical methods for laboratory based testing are provided in Table II-2-1 of the QAPF
[3] Analytical methods for field based testing are provided in Table II-1-5 of the QAPF
[4] The temporary groundwater sampling locations have been given a name and an anticipated depth to represent the three distinct vertical zones to be sampled. The actual depth of each of these zones may vary during field operations and will be the last two characters of the sample name revised to account for these depth
[5] The EPA Supplemental Investigation was requested in a comment letter dated 29 September 2005. Analysis includes the following: VOCs, SVOCs, Appendix IX metals, hexavalent chromium, total petroleum hydrocarbons, nitrate, sulfate, and laboratory pH. Analytical methods are provided in Table II-2-1 of the QAI
[6] Sampling nomenclature assumes that the top of the saturated Dakota Formation is encountered at approximately 175 ft bls
X - designates wells or discrete groundwater sample intervals where groundwater samples will be collected for analytical testing.
Analytical and geotechnical testing on solids (e.g., aquifer matrix) as part of the groundwater program are provided in Tables I-2-1 and I-2-3.
The analytical parameters identified for the EPA Supplemental Investigation will be analyzed on new wells installed in the unconsolidated deposits after the delineation activities described in the FSP are completed.
Bold wells are currently being monitored as background wells by KNC.

Water levels will be gauged in each well prior to sampling.