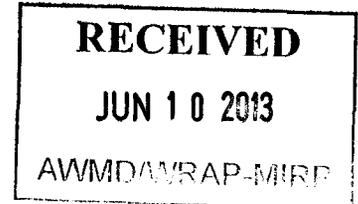


June 6, 2013

Michael J. Sherbak II, Plant Manager  
Koch Nitrogen Company  
11559 US Highway 50  
P. O. Box 1337  
Dodge City, KS 67801-1337



**RE: RCRA Post-Closure Permit Application - Supplement to Part B Permit Renewal Application:  
Groundwater Recovery System Upgrades  
Koch Nitrogen Company, Dodge City  
EPA ID# KSD044625010**

RCRA



525396

Dear Mr. Sherbak:

The Kansas Department of Health and Environment (KDHE) and the United States Environmental Protection Agency (EPA) have reviewed the Supplement to the Part B Permit Application which details the groundwater recovery system for the Dodge City facility. The document was submitted by Koch Nitrogen Company, LLC (KNC) on February 18, 2013 as additional information for the Part B Post-Closure Permit Application. KDHE's comments are provided below. EPA's comments are enclosed.

1. Section 3, Third Paragraph, Page 7: The last sentence states that water from TW-26 is piped directly to the wastewater system. However, Figure 13 depicts water from this well is piped to the reverse osmosis unit. Please correct this discrepancy.
2. Figures 13: For clarity, indicate in the title that the flow schematic shown in Figure 13 is for the existing groundwater recovery system, not the proposed recovery system.
3. Section 6: The first sentence of this section mentions that the current groundwater recovery system consists of 61 active wells, but does not identify these wells. Please include a table identifying the current groundwater recovery system.
4. Table 5 and Figure 4: Table 5 includes TW-18 as a recovery well while Figure 4 depicts this well as a monitoring well. Please rectify this discrepancy or otherwise include a sentence in the text to explain the status of TW-18.
5. Figure 13: This figure does not include TW-90 in the groundwater recovery system although it is shown as a recovery well in all of the figures depicting pumping wells. Please explain or otherwise rectify this discrepancy.

Please respond to EPA Geologist's Comments #3 and #8 within fourteen (14) days of receipt of this letter to provide information for the permitting process and respond to the remainder of the comments by July 9,

Mr. Michael Sherbak II

June 6, 2013

Page 2 of 2

2013. If you have any questions regarding this letter, you may contact me via e-mail at [espellman@kdheks.gov](mailto:espellman@kdheks.gov) or by phone at (785) 296-1616.

Sincerely,



Everett Spellman  
Professional Geologist  
Hazardous Waste Permits Section

Encl: EPA Comments

cc: **Andrea Stone** - EPA Region 7/RCAP Branch  
Erich Glave - KDHE/DEA/SWDO/Waste Programs  
Bill Bider - KDHE/BWM

**EPA COMMENTS**  
**May 22, 2013**

Project Manager's (PM's) General Comment:

1. It is premature to revise the groundwater recovery system before the soil and groundwater delineation of the vertical and horizontal extent of contamination is defined. The groundwater recovery system needs to be designed to capture the groundwater contamination efficiently and effectively. Making changes at this point before all the data has been collected and evaluated could potentially miss areas where the contamination is more concentrated. For example, once we have all of the soil data, there may be an area with high levels of contamination, but there is no recovery well near that location. Based on that data, a recovery well could be placed near that high level of soil contamination to capture any contamination that is migrating from the soil to the groundwater.

PM's Specific Comments:

1. Section 1.1 Overview, Last Sentence, Page 1: This sentence reads, "By prior agreement with the Agencies, KNC has prepared this supplement as a proposal to amend the current corrective action program to incorporate newly obtained groundwater information and improvements to the groundwater recovery and treatment system to better meet project objectives." The EPA, KDHE and KNC discussed permit renewal changes last year; however, we do not specifically recall agreeing to the submission of this supplement. As stated above, the EPA thinks that it is premature to make changes to the groundwater recovery system before all of the soil and groundwater data has been collected and analyzed.
2. Section 2.6.1.2 South, North and East Ponds, Second Paragraph, Page 5&6: In the second sentence it states, "Total and hexavalent chromium analyses performed as part of the RFI Work Plan implementation only identified detectable hexavalent chromium in six samples (shallower than 6 ft bgs) in the South Pond and 1 sample in the East Pond (also shallower than six feet) with the total chromium concentrations generally delineated to background levels with depth (KNC, 2012a). It further states, "Hexavalent chromium was not detected above the detection limit of 20 milligrams per kilogram (mg/kg) in the north pond. As mentioned to KNC previously, the Regional Screening Levels for Hexavalent Chromium have changed from 20 mg/kg to 5.6 mg/kg for industrial soil. Most of the sampling for hexavalent chromium occurred when the RSL was at the higher level of 20 mg/kg; therefore, additional sampling for hexavalent chromium needs to be conducted and analyzed at the RSL of 5.6 mg/kg for Hexavalent Chromium. This additional sampling should be completed in the current phase of the RFI.
3. Section 2.6.2.1 30,000-Ton UAN Tank Leak, Page 6: This paragraph discusses the leak from this tank in 1992; however, the quantity of the leak was not specified. Please provide the amount, if known, of the leak; otherwise, provide an explanation in the responses to these comments.
4. Section 7 Groundwater Recovery System Upgrades Configuration, Page 18: The second sentence of the first paragraph on this page states, "Three additional pumping wells (RW-1, RW-2 and RW-3) are proposed to be constructed along the southern edge of the site (Figure 18) with conversion of TW-80 from monitoring to groundwater recovery."

On Figure 18, it shows proposed RW-1 as being on the southwest part of KNC's property; proposed RW-2, RW-3 and TW-80 are shown as being located south of the railroad tracks and the KNC property. In the past, pumping wells were installed north of the KNC property and caused the contaminant plume to migrate north of the property. The EPA is concerned that the proposed locations of the new recovery wells and converting

monitoring well TW-80 to a recovery well will cause the contamination to be pulled south of the KNC property; and, potentially impact the private residence's drinking water well and irrigation well also located south of the KNC property.

5. Section 7.3 Equipment Decontamination and Investigation Derived Waste Management, Page 19: The last sentence in this section states that, "All waste and debris generated during drilling activities will be drummed, labeled, and stored on site for management under KNC plant protocols." Describe KNC plant protocols or attach the KNC Plant protocols as an appendix to this document.
6. Section 7.4 Well Vault Installation, Page 19: The first sentence of the second paragraph states, "The horizontal force main will connect to the pitless adapter in the well casing and run though the well vault." There is a typographical error in this sentence. Please change "though" to "through" in this sentence. Also, please include a diagram(s) of the horizontal force main and the pitless adapter and provide a reference in this section to that diagram(s).
7. Section 7.6 Pumping Well/Permanent Pump Assessment, #2 bullet item, Page 21: This bulleted item states, "swab the pumping well between the bottom to the top of the screened section;" There are several different methods of swabbing a well. Please describe the specific techniques/methods that will be used to "swab" a well or attach the information as an appendix to this document.
8. Section 7.6 Pumping Well/Permanent Pump Assessment, 1<sup>st</sup> Paragraph, Page 22: KNC will need prior approval from the EPA and KDHE if KNC decides to use biocides and/or viscosifiers. Change the last sentence in this paragraph to read, "In the event that biocides and/or mud viscosifiers are required, KNC will contact KDHE and EPA, and obtain approval prior to use."
9. Section 8.3 Regulatory Implementation, Page 24: The last sentence in this section states, "KNC welcomes the opportunity to discuss the type(s) of data, in addition to those proposed in Section 8.2, that KDHE would require to make operational changes more fluid through Annual Groundwater Corrective Action or other reports (e.g., quarterly RCRA progress reports) as conditions dictate." Please revise and add, "and EPA" after "KDHE" in this sentence.
10. Table 1 Flow Meter Data Collection Summary: Some of the calculations do not add up. For example: average gpm (flow rate) and time change (min) in the calculations area of the table. Please revise as appropriate.
11. Figure Number 12: There appears to be a typographical error on this figure. It lists 548 inches per year in one small area, and the other areas are listed as 0.5 inches per year and one other area is listed as 3.65 inches per year. Please revise or explain in the response to the comments.

#### Geologist Comments:

1. General Comment. The EPA is concerned that an incomplete evaluation of hydraulic capture of the groundwater contaminant plumes at the Koch Nitrogen Company Dodge City, Kansas facility (Facility) will result in continued ineffectual and inefficient control and remediation of the plumes.

A great deal of effort during the RFI was geared toward characterizing the three-dimensional extent and concentration distributions of the chromium, nitrate, nitrite, and volatile organic compound (VOC) plumes with the intention that this information would be used in assessing the current level of recovery system effectiveness, and in the course of so doing identify ways to improve the recovery system effectiveness and efficiency. This effort of characterizing the three-dimensional extent of groundwater contamination and

relating it to the optimization of the recovery system is not reflected in the Supplement, and must be done so in order to result in the improved effectiveness and efficiency of the recovery system.

The EPA would like to recommend to Koch an EPA guidance document which may prove helpful, titled "*A Systematic Approach for Evaluation of Capture Zones at Pump and Treat Systems*" (EPA/600/R-08/003, January 2008) (Guidance). The Supplement in its current form considers only two dimensional (horizontal) captures, and provides no assessment of vertical capture. Absence of consideration of vertical capture has been identified as one of the primary causes of failure of many pump and treat systems. In the Guidance cited above, Figure 1 illustrates both horizontal and vertical capture zones and is useful in pointing out the importance of assessing vertical capture. Of particular relevance to the conditions at the Facility is that the illustration of vertical capture in Figure 1 is based on a partially penetrating recovery well, as are the current recovery wells at the Facility. Assessment of groundwater contamination during the RFI focused on evaluating the vertical as well as the horizontal extent of contamination with the idea of providing this information for a detailed assessment of the current recovery system. In Figure 6 of the Supplement, several plumes are presented in horizontal aspect only, and need to be considered vertically as well. This may be accomplished by transecting the plumes in several directions with cross sections similar to the one shown in Figure 1 of the Guidance. Once illustration of the plumes has been done at a considerably larger scale than that used in Figure 6 of the Supplement, the next step would be to add or superimpose selected recovery wells onto the plume maps and appropriately scaled cross sections in order to complete a depiction of the current plumes with the current recovery system.

Another factor that needs to be considered is whether there are particular zones that may contain high concentrations of contaminants. If extraction is focused on such areas then much more effective and efficient remediation may be achieved by removing higher concentrations of contaminants.

Finally, once it has been determined where extraction would be most beneficial to successful containment and remediation of groundwater contamination, configuration and operation of an ideal extraction system might be considered and evaluated. For example, effective containment of the plumes might be achieved with a much smaller number of wells pumping at higher rates in strategic locations, and such a system might prove to be more cost effective with a much smaller number of wells to operate, maintain, and plumb into a collection system. Evaluation of a wide variety of different combinations of numbers, locations and arrays, screened intervals, and pumping rates of wells could be evaluated using carefully calibrated groundwater models.

The EPA believes the level of effort described in this comment is essential in order to begin an analysis of the performance of the current groundwater recovery system and how it might be improved upon.

2. Page 4, Section 2.6, First Paragraph. In discussing the distribution of the contaminants of concern (COCs) at the facility, there is no discussion or illustration of vertical distribution. A discussion of vertical distribution of the COCs must be included, and sufficient cross sections must be prepared in order to illustrate the vertical distribution and concentrations of the COCs.
3. Page 7, Section 3, Current Groundwater Recovery System. The Supplement needs to present more information regarding the current recovery system relative to the current configuration of the COC plumes. It should present figures at a suitable scale such as that used for Figure 3 (approximately 1" = 800'). These figures should show (1) the locations of the recovery wells, (2) the most recent water level elevation contours produced from water level data collected during the most recent groundwater sampling event, and (3) illustration of the plume of one of the COCs showing isoconcentration contours from the fourth quarter 2012 data (a figure should be produced for each of the COCs). Next, from each of these figures, an appropriate number of cross sections should be prepared to show views through the contaminant plume which depict it in several directions. Each cross section should show (1) the entire thickness of the

unconsolidated zone from ground surface down to the Graneros Shale, (2) the groundwater surface, (3) the recovery wells through which the section was prepared including the screened intervals, (4) the monitoring wells through which the section was prepared including the screened intervals, and (5) the plume of the COC showing isoconcentration contours. Completion of these figures and cross sections will provide a clear three-dimensional depiction of the current groundwater COC plumes along with the configuration of the monitoring and recovery wells.

If not done previously, the following information should be put into a table both to assist in the preparation of the cross sections and to provide for future reference: for each well, (1) designate whether it is for monitoring or recovery purposes, (2) present elevations of the top and bottom of the screened interval, (3) present the elevation of the base of the unconsolidated aquifer at the well location, and (4) present static water level elevations of the water table collected during September 2012.

4. Page 9, Section 4.2.1. The text states that the “pumping wells have a local effect on the Ogallala Aquifer where the recovery in each individual pumping well is as much as 30 feet, however the overall flow direction did not noticeably change the resulting groundwater flow field with a northwest to southeast flow direction.” The EPA is not entirely clear on what this statement means. Does it mean that water levels within certain wells drop as much as 30 feet while influence on water levels outside the well are minimal or undetectable? If so, this probably indicates a large loss in well efficiency or specific capacity, indicating intake problems such as a clogging well screen.
5. Page 10, Section 4.3. The Supplement should discuss whether there has been any aquifer parameter testing previously done during the Facility history that may provide valuable information.
6. Pages 10 and 11, Section 4.3.1. The accuracy of the data resulting from a rising head slug test in which a submersible pump was used to “instantaneously” remove a volume of water over a 10-20 second period of time is very questionable.
7. Page 11, Section 4.3.1. The Hvorslev solution method was initially developed for confined aquifers, although it may be modified for use with unconfined aquifers. Was consideration given to using other methods for analyzing slug test data, such as Bouwer and Rice and other methods, given the various assumptions for the methods such as confined or unconfined conditions, partially or fully penetrating wells, etc.?
8. Page 11, Section 4.3.3. There is no indication that consideration was given to the interval of the unconsolidated aquifer that was tested, since hydraulic conductivity can vary with depth. The screened interval of the well being tested should be matched up with its drilling log, and only wells that are screened across approximately the same zones should be averaged together. This process of ensuring that similarly screened wells are grouped together for averaging may be useful in locating zones of higher permeability, if present, in the unconsolidated aquifer.
9. Pages 16 and 17, Section 6.3. The EPA is in general agreement that discontinuing pumping of the wells north of Highway 50 is a productive measure, since the natural groundwater flow direction is to the south-southeast. Before this is done, Koch should contact the surrounding property owners and ensure there have been no irrigation wells installed since the last well survey that could influence the contaminant plumes upon shutdown of the proposed wells. Also, in order to have a better understanding of what effects it may have on the plumes, Koch needs to prepare the plume maps and cross sections described in the previous comment on Section 3 so this information may be considered before the proposed shutdown. Also, shutdown of the wells will affect the flow regime at and around the Facility, so water levels need to be collected before shutdown, and afterward until the levels equilibrate. If after evaluating the data after the

shutdown Koch, KDHE, and the EPA are in agreement to leave the wells off, the effects of the shutdown will need to be considered insofar as capture zone analysis for the Facility is concerned.

10. Pages 18 - 22, Section 7. The EPA believes that the proposal of changes to the recovery system insofar as the installation of additional wells and piping is premature in light of the considerations that should be made that the EPA has pointed out in these comments. These proposed changes should be deferred until a more thorough assessment of the three-dimensional extent of contamination and other considerations as detailed in these comments has been performed.