Ohio EPA
40 years and moving forward

John R. Kasich, Governor
Mary Taylor, Lt. Governor
Scott J. Nally, Director

December 28, 2012

RE: JEFFERSON COUNTY
APEX SANITARY LANDFILL
ENG

Apex Environmental, LLC
Attention: Scott Lockhart, Corporate Engineer
P.O. Box 157
Amsterdam, OH 43903

Subject: PTI Application No. 06-8448,
Notice of Deficiency # 2, Hydrogeological Review

Dear Mr. Lockhart:

On December 11, 2012, Ohio Environmental Protection Agency forwarded to Apex Environmental, LLC Notice of Deficiency # 2 for Permit-to-Install (PTI) Application No. 06-08448 with the exception of the Hydrogeological Review (Attachment C). At this time, the Southeast District Office's Division of Drinking and Ground Water has completed their review and has provided deficiencies and comments as attached here.

Please respond to each item within the resubmission's cover letter and revise the application as necessary. This attachment will be forwarded to CEC in Microsoft's Word format to aid in their preparation of your response to this letter.

Should you have any questions regarding our review of this permit application, I may be reached at (740) 380-5440.

Sincerely,

Craig Walkenspaw
District Engineer
Division of Material and Waste Management

Attachment

CW/cb

cc:	Jefferson County General Health District	w/ attachment
cc:	Dale Warner, SEDO-DMWM	w/ attachment
cc:	Civil & Environmental Consultants, Inc. 333 Baldwin Road Pittsburgh, PA 15205-9702	w/ attachment

Interoffice Memo

To: Craig Walkenspaw through Rich Fox, DMWM-SEDO
From: Joe Laughery through Steve Williams, DDAGW-SEDO
Date: December 28, 2012
Facility: Apex Sanitary Landfill, DMWM ID# 148118, Jefferson County
Subject: Permit to Install Application Apex Sanitary Landfill Lateral Expansion

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INTRODUCTION

Apex Environmental, LLC and Civil and Environmental Consultants, Inc. submitted a Permit to Install (PTI) application number 06-08448 on August 29, 2011, to expand the existing Apex Sanitary Landfill. The current landfill consists of approximately 118 acres. The expansion area of approximately 180 acres is located along the perimeters and portions of the existing landfill. Apex is located along the western edge of Jefferson County near Amsterdam, Ohio. The existing landfill started accepting waste in November of 2005 and is subject to the requirements of OAC 3745-27 rules. The purpose of this review is to determine compliance with the PTI requirements of OAC rules 3745-27-07(H)[siting criteria]; 3745-27-06(B) [plan drawings, cross sections]; 3745-27-06(C)(3) [Hydrogeologic site investigation]; 3745-27-10 [groundwater monitoring].

FACILITY GEOLOGY AND HYDROGEOLOGY

The site is part of the Appalachian Plateau Region and is located in the unglaciated portion of Ohio. The geology of the site consists of Quaternary-Age unconsolidated deposits underlain by the Pennsylvanian-Period Monongahela and Conemaugh Formation bedrock. The unconsolidated materials are mine spoil and some deposits of residual un-mined soil. Very little structure is associated with the unconsolidated deposits. The #8 Pittsburgh Coal has been previously removed from the site through mining. Immediately below the Pittsburgh Coal is the Upper Pittsburgh Member, made up of thin layers of shale overlaying several feet of limestone that overlies shale. Beneath the upper Pittsburgh is the Bellaire Member which is made up of mostly shale at the site however the literature indicates that regionally it is more often sandstone. The Summerfield member is stratigraphically beneath the Bellaire and it varies greatly across the site ranging from shale to siltstone with a few sandstone and limestone nodules and a few thin seams of poor quality coal. Stratagraphically beneath the Summerfield are the Connellsville/Morgantown members that are fine to medium grained sandstones.

The facility has determined that the uppermost aquifer system (UAS) at the site is the Connellsville/Morgantown. In general, flow in the Connellsville/Morgantown is toward the north, however there appears to be a divide in the south west with flow to the south towards a large valley. With the unconsolidated mine spoil, Pittsburgh limestone, and Bellaire/Summerfield designated as significant zones of saturation. Groundwater within the Bellaire/Summerfield generally follows topography with flow to the southeast and toward the valleys to the south. The limestone/shallow bedrock SZS also follows topography and flow is towards the south. Flow in the mine spoil is more localized flowing towards topographic lows, towards the south in the southern portion of the expansion and to the northeast in the northern portions. Apex has also determined that a section of high yield shallow bedrock (Pittsburgh Limestone) would qualify as UAS where it exists, but this limestone will be removed during landfill construction.

SITING DEFICIENCIES

The facility has not adequately addressed the siting criteria requirement of OAC 3745-27-07 (H)(2)(e): the isolation distance between the UAS and the bottom of the recompacted liner shall not be less than 15 feet. More information is needed about the limestone UAS and the extent of its removal. Apex must also provide more information about the water supply well located within 1000 feet of the expansion in order to show compliance with OAC 3745-27-07 (H)(3)(c). The site has also previously had limestone mining and because of this they have requested an exemption for locating in a limestone quarry. Apex does not believe that the former limestone mining operations at the site would be considered a quarry based on siting criteria guidance and the exemption has been granted by DMWM previously. DMWM is also working with DSW to determine if there is a stream segment designated by Ohio EPA as either a state resource water, a coldwater habitat, or an exceptional warmwater habitat within 1,000 feet of the site. Specific comments are listed in the attachment to this memo.

CONCLUSION

DDAGW has completed a review of the Permit to Install Application for the Apex Sanitary Landfill Lateral Expansion. In accordance with OAC rule 3745-27-07(H), no major deficiencies of the citing criteria were found in the PTI application. However more explanation is needed regarding the 15 feet of isolation between the liner and the UAS and more information is needed regarding a water supply well within 1000 feet of the limits of waste. Also, DDAGW has requested some additional monitoring wells to be proposed for detection monitoring in order to meet OAC 3745-27-10. All deficiencies are listed in detail in attachment A. Please contact me if you have questions.

cc: Lindsay Taliferro, DDAGW, CO (w/ Attachment)
GW work request No.: 3333341684

ATTACHMENT

APEX SANITARY LANDFILL DEFICIENCIES

DEFICIENCIES

OAC 3745-27-07 (H) - Siting Criteria Issues

1. OAC 3745-27-07 (H)(2)(e) - *The isolation distance between the top of the uppermost aquifer system (UAS) and the bottom of the recompacted liner shall not be less than 15 feet.* Apex needs to better explain and define the boundary of the shallow bedrock UAS and how the area that needs to be removed was determined. It appears from the cross sections that much of the shallow bedrock SZS/UAS is being removed during landfill construction but this is not clear from the text. Include a discussion of this issue in the application and at a minimum reference that discussion in this section. Also to better demonstrate this information graphically please include a drawing that shows the outline of the shallow bedrock to be removed, the outline of the shallow bedrock considered UAS, and plot the limestone piezometers and wells with their average yields.

2. OAC 3745-27-07 (H)(3)(c) – *One thousand feet from a water supply well.* Apex states that the well meets the requirements of OAC 3745-27-07 (H)(3)(c)(iii) "The water supply well or developed spring is separated from the limits of solid waste placement of the sanitary landfill facility by a hydrogeologic barrier". Apex needs to include a discussion of the hydrogeologic barrier that separates the well from the limits of solid waste. Apex should also provide some basic information about the well and its use including: depth of the well, what formation it draws water from, and is it a potable water source.

OAC 3745-27-06(C) – Hydrogeologic Site Investigation Report

1. OAC 3745-27-06(C)(3) – *Hydrogeologic Site Investigation Report, Introduction.* Apex states that the investigation included advancing 34 soil borings. Ohio EPA recommends one boring per 4 acres per OAC 3745-27-06(C)(3)(f)(v), please indicate if there are other soil borings not included here that would allow you to comply with this recommendation.

2. OAC 3745-27-06(C)(3)(b)(i) – *Identification and average yield of regional aquifer.* Apex does not include the average yield from ODNR well logs within one mile of the site. Please include the average yield calculated from ODNR well logs.

3. OAC 3745-27-06(C)(3)(c) - *Site mining activity.* Apex is planning to remove a considerable amount of the Pittsburgh Limestone at the site, please include in this section the possible mining activities associated with this limestone removal.

4. OAC 3745-27-06(C)(3)(c)(iv) – *Army Corps Wetland Delineation letter.* The letter is not included in the application. Please submit this letter to be included with the application.

5. OAC 3745-27-06(C)(3)(d) – *Site Geology and Hydrogeology.* Please include some discussion of methodology explaining how sample depths were chosen for the soil borings

6. OAC 3745-27-06(C)(3)(d)(iv) – *Uppermost Aquifer System.* Apex did not include the average regional yield or the average yield at the site in this discussion of how the UAS was determined. In table C3-9 it appears as if the UAS wells are being compared with site average yield of the UAS. When determining the UAS at the site the average regional yield should be used to make that determination/comparison. Please include the average yields of the formations and the average regional yield in this discussion and revise table C3-9 as needed.

7. OAC 3745-27-06(C)(3)(d)(iv) – *Mine Spoil Significant Zone of Saturation.* Figure 3G shows 11 wells in the mine spoil, yet the text indicates that yield testing was only conducted on six piezometers. Please discuss these other wells and why they were not included in the yield testing.

8. OAC 3745-27-06(C)(3)(d)(iv) – *Bellaire/Summerfield Significant Zone of Saturation.* Apex states that: "Based on the yield data evaluation provided below and the fact that the unit does not exist beneath the entire facility, the Bellaire/Summerfield unit has been designated as an SZS for the facility." A unit does not have to be below the entire facility to be a UAS, please consider revising this statement.

9. OAC 3745-27-06(C)(3)(d)(iv)(a) – *Temporal fluctuations in ground water levels.* Water levels show an increasing trend from October to March (table C3-6). Please discuss this trend in the text of this section. Does more recent data shown any change, have the water levels continued to rise?

10. OAC 3745-27-06(C)(3)(d)(iv)(b) – *Interpretation of ground water flow system (Connellsville/Morgantown).* More wells may be needed to describe groundwater flow in the valley near B-7B. Well 7B may be located on a groundwater divide, with flow to the north and the south. Does groundwater discharge to the valley?

11. OAC 3745-27-06(C)(3)(d)(iv)(b) – *Interpretation of ground water flow system (Bellaire/Summerfield).* It appears that the Bellaire/Summerfield should discharge to the valleys. Are seeps or springs evident in these valleys to the south? With groundwater likely discharging to surface water in the valleys on the south side of the expansion area, underdrains may be necessary in these locations. Please either include a discussion about the possible need for underdrains in this section or reference another section where the need for underdrains is discussed.

12. OAC 3745-27-06(C)(3)(d)(iv)(c) – *Identification and characterization of recharge and discharge areas.* This section needs to include a discussion of any springs or seeps in the valleys to the south. Potentiometric maps indicate that these valleys affect ground water flow. Based on these maps Ohio EPA would expect to see water discharging from the Bellaire and possibly the Connellsville/Morgantown at these locations. Please include a discussion of these valleys in this section.

13. OAC 3745-27-06(C)(3)(e) – *Ground Water Quality.* Groundwater quality was established by sampling 18 wells but 25 wells were used for yield testing. Explain the methodology behind this choice, why were the same 25 wells not sampled and how were the wells that were sampled chosen?

14. OAC 3745-27-06(C)(3)(f)(i)(a) – *Wells within one mile of the Facility.* Drawing 2E was not included with the application, please submit Drawing 2E.

15. OAC 3745-27-06(C)(3)(f)(ii)(f)(i) – *Hydraulic conductivity measurements for unconsolidated units.* This section should include a discussion/comparison of the lab testing vs the slug testing results.

16. OAC 3745-27-06(C)(3)(f)(ii)(f)(iii) – For saturated consolidated stratigraphic units, at least one field measurement of hydraulic conductivity per saturated consolidated unit and one additional measurement per saturated consolidated unit for each twenty acres. Apex does not include the number of test performed on each consolidated unit in this section or show that they meet the minimum requirement stated above. It does appear that Apex has performed enough tests to meet the minimum requirement but it should be stated in this section to show compliance with the rule.

17. OAC 3745-27-06(C)(3)(f)(v)(f) – *Depth to phreatic and piezometric surfaces.* Ohio EPA was not able to locate a discussion about the depth to the water table in the sections specified. Please include a discussion of the depth to the water table across the site in this section.

18. OAC 3745-27-06(C)(3)(g)(i) – *BBC & M May 2001 HIS Investigation.* Please include the results for this investigation as a table or appendix in the application.

OAC 3745-27-10 Ground Water Monitoring Plan

1. OAC 3745-27-10(B)(1) - *Ground Water Monitoring System, Page 9 Second paragraph:* The text states that the shallower SZS wells will only be installed if ground water is encountered during the drilling of the deeper UAS well. This section must be expanded to specify how the determination will be made that the upper SZS units are saturated or not. Please outline the drilling procedure that will be employed. Drilling down to a formation and leaving the borehole open for a few minutes is not acceptable. Also, how will it be determined whether water in the borehole is from the Bellaire or shallow limestone above? Please outline the drilling procedures, and a method to determine if the SZS is in fact saturated.

2. OAC 3745-27-10(B)(1) - *Ground Water Monitoring System & Drawing A-1:* An insufficient number of wells are proposed on the south side of the proposed expiation area. Ohio EPA recommends an additional well cluster be installed on the south side of the proposed landfill between the 424 and 425 clusters for the shallow limestone (if present), the Bellaire and the Connelsville/Morgantown formations. Ohio EPA believes that the valley between these two proposed locations could topographically influence ground water flow patterns in this area of the site and this valley could be a preferential flow path.

3. OAC 3745-27-10(B)(1) - *Ground Water Monitoring System & Drawing A-1:* No shallow limestone wells are shown on the west side of the site on Drawing A-1. The cross sections appear to show the shallow limestone present on the west side of the site. If during drilling the

deeper UAS well, the presence of the limestone and whether it is saturated or not needs to be evaluated. Please include this in the text on page 9 of the ground water monitoring program plan.

4. OAC 3745-27-10(B)(1) - *Ground Water Monitoring System & Drawing A-1, page 11:* Ohio EPA understands that Apex will not know how many underdrains will be needed until construction commences, however it appears based on topography, presence of valleys, cross sections and potentiometric maps that there is a probability that at least two underdrains on the south side of the proposed facility will be needed. Please note this in the text on page 11.

5. OAC 3745-27-10(B)(2) - *Uppermost Aquifer System, Page 12:* The bottom paragraph states that the Connellsville/Morgantown UAS is generally unconfined. This is not a huge issue but the cross sections reveal water levels above the top of the unit in many wells. It would seem that generally, the unit is confined. Further discussion in the text could help in understanding why Apex has determined that the unit is unconfined.

6. OAC 3745-27-10(B)(2) - *Uppermost Aquifer System, Page 13:* The discussion at the top of the page states that ground water flow on the eastern portion of the site is to the north. Based on Ohio EPA's comments on the hydrogeological study this conclusion regarding flow to the north opposite the dip of the southeastern valley, may have to be revised. Ohio EPA believes that flow on the southeastern side of the proposed site may be to the south as found on the western side of the site.

7. OAC 3745-27-10(B)(2) - *Uppermost Aquifer System, Page 13:* At the bottom of page 13 Apex states their opinion concerning a dry well and what warrants a violation for inadequate well network. Ohio EPA believes this kind of language is not needed in the GWMP and should be removed. Ohio EPA agrees that a well that is dry because the formation that it monitors lacks sufficient water to sample does not warrant a notice of violation for inadequate well network. It is Ohio EPA's opinion though, that a dry well is not always sufficient evidence that the formation is dry at that location. In some cases other evidence is available or becomes available that would allow for the possibility that the formation could produce enough water for sampling if the well's location, depth, or screened interval was adjusted. Failure to adequately characterize and/or monitor a formation could be interpreted as a violation of OAC 3745-27-06 and 10.

8. OAC 3745-27-10(B)(3) - *Well Construction, page 16 & Drawing A-1:* The table on page 16 provides the abandonment schedule for the wells used in the hyrdrogeological study. Drawing A-1 provides for the abandonment of P-6S, P-6L, B-7A, B-7B and P-10S located on the southern side of the site. The table on page 16 does not list these wells. Ohio EPA would recommend that all of these wells be left in place for water level measurements and possibly assessment if ever an SSI is detected on this side of the site. The cross sections indicate these wells produce water. Ohio EPA would also accept well P-8A as being left in place for water level data in the mine spoil. Please add these wells to the GWMP for water level measurements.

9. OAC 3745-27-10(C)(2)(c)(i) - *Well Evacuation, Page 20:* Please make it clear in this section that as many wells as possible will have dedicated pumps installed.

10. OAC 3745-27-10(C)(2)(c)(i) - *Well Evacuation, Page 21 Minimum/No Purge Sampling:* It is unclear why no purge sampling is needed and when it would be used. Please either remove this section or expand the text to justify the use of this sampling technique. If a well cannot be sampled with a low flow procedure, then pumping the well dry and allowing it to recover would be a viable option. Using the bailer method outlined on page 22 is acceptable as well. The no flow sampling is confusing and requires additional discussion.

11. OAC 3745-27-10(C)(3) - *Measurements of Groundwater Elevations:* The text states that a potentiometric map will only be constructed if more than 50% of the wells in a formation are not dry. Please remove this sentence from the text. A plot of the data on a map will be sufficient when insufficient data exists.

12. OAC 3745-27-10(C)(6) - *Underdrains, Page 34:* The last sentence of the first paragraph states that if it is determined that a waste derived release to the underdrain has occurred then assessment would be initiated. Appendix C states in the flow chart that assessment would be entered only if deemed appropriate by Ohio EPA. Please revise so that the appendix and the text correlate. Ohio EPA would accept the provisions of the appendix.

13. *Table 2:* Please revise the table listing the monitoring well network and whether a well is up or down gradient based upon Ohio EPA comments on the hydrogeological report and the GWMP.