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Mr. Randi Wille
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March 19, 2013

Re: Hydrogeological Report Addendum

Project No. G06088E

- ☑ For Review
- ☐ For Your Use
- ☐ As Requested

Sent By: Robert L. Mason, CHMM/lkj

COPIES	DATE	DESCRIPTION
2	03/2013	Hydrogeological Report Addendum, Aggregate Industries, Chelsea Plant, Waterloo Township, Michigan
1	03/2013	Figure C1 – Existing Conditions
1	03/2013	Figure C2 – Site Layout Plan
1	03/2013	Figure C3 – Site Grading Plan
1	03/2013	Figure C4 – Landscape Plan

COMMENTS

If you have any questions or require additional information, please contact me at 269-544-6949 or rlmason@ftch.com.

By client pick up

Hydrogeological Report Addendum for Aggregate Industries Chelsea Plant Waterloo Township, Michigan

Prepared for:
Aggregate Industries
Kalamazoo, Michigan

March 2013
Project No. G06088E

Fishbeck, Thompson, Carr & Huber
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HYDROGEOLOGICAL REPORT ADDENDUM

AGGREGATE INDUSTRIES

CHELSEA PLANT

WATERLOO TOWNSHIP, MICHIGAN

PREPARED FOR:
AGGREGATE INDUSTRIES
KALAMAZOO, MICHIGAN

MARCH 5, 2013
PROJECT NO. G06088E

Fishbeck, Thompson, Carr & Huber, Inc. Engineers • Scientists • Architects • Constructors
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amsl above mean sea level
FTC&H Fishbeck, Thompson, Carr & Huber, Inc.
MDEQ Michigan Department of Environmental Quality
MDNR Michigan Department of Natural Resources

EXECUTIVE SUMMARY

Aggregate Industries, Inc. (AI) currently conducts sand and gravel mining activities at the Chelsea Plant site in two areas of the site, the North Plant area and the South Plant area. AI is proposing to conduct additional sand and gravel mining activities on two parcels of land owned by the State of Michigan (the proposed expansion area) located near the northwest corner of the South Plant area. Gravel mining below the water table is restricted to only the North Plant area, per the terms of the existing MDEQ Part 301 Inland Lakes and Streams Permit No. 12-038-0010-P. All proposed sand and gravel mining at the proposed expansion area will be conducted above the water table.

AI has previously conducted numerous hydrogeological investigations related to the sand and gravel mining operations at the site. Groundwater flow is generally from the South Plant area, towards Clear Lake to the northwest. Additionally, AI has been conducting water level monitoring in site monitoring wells and nearby surface water bodies. Water level changes measured at the site show a clear annual cycle. The water levels exhibit the lowest water levels after the end of summer and the end of the growing season, while the highest observed water levels occur after the end of winter and near the beginning of the growing season. The observed seasonal cycles are very common for natural groundwater surface-water interactions. The range of water level variation in Clear Lake, only 1.22 feet, are much less than those observed at, and adjacent to, AI's Chelsea Plant. The limited range of water level fluctuations and the lack of strong seasonal/cyclic water level changes are consistent with the water levels in Clear Lake being largely controlled by the outflow hydraulics of Clear Lake, more so than groundwater level fluctuations.

As the proposed sand and gravel mining in the proposed expansion area will be conducted only above the water table, no changes to groundwater flow direction or groundwater velocity will occur from the proposed sand and gravel mining activities. Therefore, the observed groundwater conditions at the site will remain within the range of normal variations, similar to those that have already been identified at the site.

If sand and gravel mining is approved for the proposed expansion areas, trees will be removed, as needed, in the proposed expansion area to access the sand and gravel deposits. The removal of these trees during the mining process will eliminate the transpiration losses of rain water, thus allowing more precipitation to infiltrate and recharge the groundwater. The sand and gravel mining on the proposed expansion area is expected to increase the quantity of groundwater that recharges the aquifer and results in groundwater flow towards Clear Lake. Based on the result of this hydrogeological evaluation, the proposed expansion of AI's sand and gravel mining operation will not result in a negative impact on the local groundwater or surface water systems.