

October 4, 2016

Exhibit H - St. Tammany South Central Site Groundwater Supply Well Capacity Assessment

Mr. Toby J. Lowe
Sod Farm, LLC
476 Old Hwy 35 South
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Re. St. Tammany South Central Site Groundwater Supply Well Capacity Assessment, Abita Springs Sod Farm, St. Tammany Parish, LA

In order to establish the regional physiography and subsurface conditions, Pivotal Engineering, LLC reviewed available regional and local geologic and hydrogeological documents. Through the review of these documents a general understanding of the subsurface conditions was developed. The property is located on Highway 36 between Abita Springs and Lacombe, Louisiana. The site is comprised of a 352-acre parcel. The site is located in St. Tammany Parish.

Regional Hydrogeology

While there are no readily available public water supply lines in the vicinity of the site this is not uncommon as nearly 100 percent of all businesses in the area use groundwater for their potable water needs due to abundance of potable groundwater readily available.

In 2005, about 22.8 million gallons per day (mgpd) of potable water were withdrawn from water sources in St. Tammany Parish.

- **Almost 100 percent (22.7 mgpd) was withdrawn from groundwater**, and less than 1 percent (0.06 mgpd) was withdrawn from surface water.

Withdrawals for public supplies accounted for 70 percent (16 mgpd) of the total water withdrawn. Withdrawals for domestic use were 28 percent (6 mgpd). (*Source: USGS/La DOTD, Water Resources of St. Tammany Parish, Fact Sheet 2009-3064, Revised Sept. 2011*).

The aquifers in St. Tammany Parish constitute one of the largest sources of potable fresh ground water in Louisiana. There are 12 Major aquifers that yield water of good quality at rates of 1,000 gallons per minute to more than 3,000 gallons per minute to large-capacity wells as deep as 3,354 feet. Water levels in the shallow aquifer range from near land surface to as much as 80 feet below land surface. Water levels in the shallow aquifer below the sod farm site average near 20 feet below land surface. With water levels this shallow, the costs of extraction are minimal as sometimes they are flowing artesian wells.

Fresh groundwater (water with a chloride concentration less than 250 milligrams per liter [mg/L]) is present from land surface to about 3,000 to 3,500 ft. below National Geodetic Vertical Datum of 1929 (NGVD 29) in most of northern St. Tammany Parish and to about 2,400 to 3,200 ft. below GVD 29 in southeastern parts of the parish. Freshwater from aquifers in St. Tammany Parish is soft (less than 60 mg/L, as calcium carbonate [CaCO₃]) and generally does not exceed the U.S. Environmental Protection Agency's (EPA) 2006 Secondary Maximum Contaminant Levels (SMCLs)' for drinking water for chloride, iron, manganese, and dissolved solids.

Local Hydrogeology

In 2005, Well-registration records from the Louisiana Department of Transportation and Development (DOTD) indicated that there were about 10,860 active wells screened in the aquifers in St. Tammany Parish, including about 9,740 domestic, 650 public supply, 430 irrigation, and 40 industrial wells. About 23 Mgal/d of groundwater was withdrawn in St. Tammany Parish in 2005, and most was for public-supply (16 Mgal/d) and domestic (6 Mgal/d) use. A one-mile radius registered water well search from the approximate center of the sod farm site (Lat 30 26' 20", Long 89 58' 12") found 10 registered water wells ranging in depths from 160 to 945 feet with yields ranging up to 300 gal/min (432,000 gal/day).

A total of 4 water wells were observed on the sod farm site, two active and two inactive. The water well data base lists yields for two of the wells

- **250 and 300 gal/min (360,000 and 432,000 gal/day respectively).**

These two wells are both 16-inch diameter and have depths of 167 and 187 feet with 60 feet of slotted steel screen.

While no analytical data is recorded on these wells, one should assume that their water quality is similar to the other local wells with a chloride concentration less than 250 milligrams per liter and the water being soft (less than 60 mg/L, as calcium carbonate [CaCO₃]) and not exceeding the U.S. Environmental Protection Agency's (EPA) 2006 Secondary Maximum Contaminant Levels (SMCLs) for drinking water for chloride, iron, manganese, and dissolved solids. These wells have been in service since the 1980s and have irrigated the sod farm since then and still are today.

Summary

Considering that there are currently two shallow water wells on-site that have documented yields of 360,000 and 432,000 gal/day, there should not be any problem producing up to 250,000 gal/day of groundwater at this site. Additionally, there is documentation of deeper water wells in the region producing up to 1,000 gallons per minute to more than 3,000 gallons per minute, or approximately 1.4 Mgal/d to 4.3 Mgal/d respectively.

Sincerely,



Lamar Melder, Consulting Geologist

References

- Subsurface Geology of St. Helena, Tangipahoa, Washington, and St. Tammany Parishes, Louisiana, LGS, 1962; Water Resources of Lake Pontchartrain Area, Louisiana, Water Resources Bulletin No. 12, LGS and LDPW, 1967; Groundwater Resources of Tangipahoa and St. Tammany Parishes, Southeastern Louisiana, USGS and LDOTD, Water Resources Technical Report, 1978; Water resources Special report no. 16, Water use in Louisiana, 2005, B. Pierre Sargent, U.S. Geological Survey, Published by Louisiana Department of Transportation and Development, Baton Rouge, Louisiana, 2007; Water Resources of St. Tammany Parish 2009 Fact Sheet, published by the U.S. Geological Survey, in cooperation with the Louisiana Department of Transportation and Development (DOTD), revised September 2011