Golder Associates

May 30, 2014 Project No. 1301525

Recology Yuba-Sutter
3001 North Levee Road
Marysville, CA 95901

Attention: Mr. Phil Graham

RE: COMPOST WATER STATUS REPORT FOR FEATHER RIVER ORGANICS, RECOLOGY YUBA-SUTTER FACILITY, MARYSVILLE, CALIFORNIA

Dear Mr. Graham:

Golder Associates Inc. (Golder) has prepared this report to: (1) describe the temporary compost water collection system that currently is in place at the Recology Yuba Sutter (RYS) site and explain how that system performed during the rainy season of 2013-2014; and (2) present a proposal for upgrading that system to accommodate composting operations at the Feather River Organics facility (FRO) at the RYS site over the following three to five years.

1.0 EXISTING TEMPORARY COMPOST WATER MANAGEMENT SYSTEM

In 2013, in accordance with the requirements of Cleanup & Abatement Order R5-2013-0704 (Aug. 29, 2013), Recology constructed a temporary compost water collection and storage system. This system was designed to collect and convey surface water run-off from the compost operations area for a 24-hour storm event of up to 1.0 inch of precipitation. Based on rainfall data for Marysville, California that extends back to 1982, the average number of days per year with measurable rainfall that exceeded 1.0 inch is 4.4 days, which represents approximately 7 percent of the days with measureable rainfall (an average of approximately 60 days per year of measureable rain).

The existing compost water management system consists of a 5,000 gallon concrete vault located in the Hog Farm that pumps the water to two 21,000 gallon Baker Tanks. Two additional vaults and pumps collect water from the southern end of the compost operations to an additional 21,000 gallon tank. This system provides a total of 63,000 gallons of storage capacity. These existing pumps range from 0.5 to 0.75 horsepower (HP) pumps.

As a matter of routine operations during the 2013-2014 rainy season, FRO pumped the storage tanks to a tanker truck during and immediately following large rain events to ensure there was storage capacity at the end of each day. The tanker truck applied the water to the active compost or hauled the water to an on-site discharge point to the POTW. This practice helped increase the capacity of the system. During the 2013-2014 wet season, FRO successfully managed all of the compost water through this method of storage and trucking to the on-site POTW discharge point. There were no discharges of water from the composting operations to the Hog Farm.

Two rain events during 2013-2014 system exceeded the one inch design limit: Rain totaling 2.4 inches occurred on February 8th following an unusually extended dry period (and therefore there was a large absorption of the initial rain event by the compost materials and dry compost pad surface), and rain totaling 1.06 inches occurred on February 28th. FRO was able to prevent any discharge from the composting operations to the Hog Farm by trucking 38,250 gallons of compost water on February 8th and 9th to the on-site POTW discharge point, and 104,110 gallons between February 28th and March 6th (note there were additional smaller rain events between February 8th and March 6th; these smaller events resulted in some water being in the tanks as of the February 28 rain event). Table 1 summarizes the daily volumes of compost water hauled to the on-site POTW discharge point during the 2013-2014 wet season.

Table 1: Summary of Compost Contact Water Transferred to the On-Site POTW Discharge Point

Date	No. of Loads	Volume (gallons)
February 8, 2014	8.75	26,250
February 9, 2014	4	12,000
February 28, 2014	6.5	19,500
March 1, 2014	10	30,610
March 4, 2014	10	30,000
March 6, 2014	8	24,000

2.0 PROPOSED UPDGRADE TO THE EXISTING SYSTEM

The feasibility and cost-effectiveness of upgrading the existing compost water management system to accommodate the temporary continuation of composting operations at FRO over the next three to five years are largely dependent on the maximum volume of compost water that can be discharged to the local POTW. RYS has a verbal agreement with the City of Marysville to allow the trucking of compost water to an on-site POTW discharge point. As an alternative, RYS investigated the possibility of completing a direct pipeline discharge to the sewer system, which would require prior approval from the City of Marysville. RYS staff contacted the Marysville POTW to discuss the maximum volume of compost water that could be accepted. Mr. Dave Lamon, a representative of the POTW, informed RYS staff that it could accept up to 65,000 gallons per day from the FRO compost operations.

During a precipitation event, the initial precipitation is absorbed by the compost materials and the compost pad surface. As this absorption capacity decreases, water runs off from the FRO operations area to the collection system. Each one-inch of run-off generates 315,000 gallons of compost water to manage. Thus, the POTW's discharge limit of 65,000 gallons per day represents approximately 0.2-inches of run-off from the FRO operations area and therefore presents only a minimal opportunity for handling the run-off. This is a key constraint for the collection system because excess run-off must be stored on-site.

Via email dated May 29, 2014, staff of the Central Valley Regional Water Quality Control Board provided to Recology precipitation-frequency data for Marysville downloaded from Department of Water Resources (DWR) website. According to this data, the following storm events are indicated:

- 2-year, 24-hour storm event – 1.72 inches
- 5-year, 24-hour storm event – 2.31 inches
- 10-year, 24-hour storm event – 2.70 inches
- 25-year, 24-hour storm event – 3.16 inches

Golder notes that National Oceanic and Atmospheric Administration (NOAA), Atlas 14, Volume 6 (2014) provides more conservative estimates of the 2-year and 5-year, 24-hour storm events, at 2.2 inches and 3.0 inches respectively. This interactive database interpolates from multiple weather stations (if available) and considers multiple precipitation distribution models. Based on the NOAA data, Golder previously completed hydraulic modeling of a 2.2-inch storm event and determined that this capacity would be achieved by adding two new 0.5-horsepower (HP) pumps to transfer water through 4-inch diameter pipes to the on-site sewer line to the POTW. The capacity can be further increased to optimize the system to ensure the discharge to the POTW matches its limit of 65,000 gallons per day (or slightly less), and by adding two Baker tanks to increase on-site tank storage capacity to 105,000 gallons. Although additional hydraulic modeling would be needed to determine the precise capacity of this system above 2.2 inches of rain, Golder is very confident that this upgraded system would be able to accommodate a storm event of 2.31 inches (DWR's 5-year, 24-hour storm event) and that this system may accommodate a storm event

2.70 inches (DWR's 10-year, 24-hour storm event). Thus, it is Golder's determination that the proposed system upgrade is consistent with the temporary duration (three to five years) of the FRO operations. Further, an evaluation of daily precipitation data over the past 32 years obtained from the Western Regional Climate Center for Marysville, indicates that 2.31 inches of rainfall (DWR's 5-year, 24-hour storm event) has only been exceeded 3 times during this period.

Additionally, Golder recommends that RYS seek approval from the City of Marysville for a direct sewer connection in lieu of truck transport to the on-site sewer discharge point. This would provide a more efficient and reliable method for discharging to the POTW.

In summary, Golder has determined that the proposed upgrades would be able to accommodate a storm event that is between the 5-year, 24-hour storm event and 10-year, 24-hour storm event per the DWR data above. Based on the previous 32 years of historical data, the level of protection provided by the upgraded system would accommodate more than 99.5 percent of the rainfall events that have occurred since January 1, 1982.

However, at progressively higher storm events, the beneficial impacts of the initial absorption of the rainfall by the compost pad surface and compost materials significantly diminishes, which means that the amount of run-off to the collection system significantly increases. Given the severe limitations on the discharge to the POTW, significant on-site storage facilities would be necessary to accommodate much larger storm events. In our opinion, significant upgrades to meet such larger storm events are not reasonably feasible given the short duration of the composting operations.

3.0 CLOSURE

This submittal summarizes the performance of the existing compost water collection system and proposes additional upgrades to this system to increase the capacity to accommodate FRO composting operations over the next three to five years. Please call if you have any questions or need additional information.

Sincerely,

GOLDER ASSOCIATES INC.

Kenneth G. Haskell, P.E
Principal / Practice Leader