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June 27, 2024

Members of the Public
Heber Valley, Utah

Subject: Heber Valley Special Services District Concerns

To Whom It May Concern:

This letter responds to concerns raised to the Utah Division of Water Quality (DWQ) about the Heber Valley Special Services District (HVSSD) Wastewater Treatment and Disposal Facility (Facility). DWQ received phone calls and emails from concerned citizens about problems with the HVSSD Facility, its operations, performance, and potential adverse impacts to water quality. Specific concerns raised were that the Facility was the source of (local) offensive odors, surface water and groundwater pollution. The possibility that such pollution by the Facility could contribute to the occurrence of Harmful Algal Blooms (HABS) in Deer Creek Reservoir and other pollutants such as Per- and polyfluorinated substances (PFAS) in local waters was also raised. To address these concerns, DWQ interviewed operations personnel, inspected the facility, reviewed operating conditions, background, engineering, and performance records in order to determine if the Facility has operational or compliance deficiencies or limitations that may be causing pollution or contributing to related water quality problems. The findings from this investigation are summarized in the following paragraphs.

Inspection

HVSSD operates a publicly owned treatment works (POTW) under DWQ Individual Operating Permit No. UTOP9002 (Permit). The permitted facilities consist of a headworks, a series of aerobic treatment lagoons, wastewater storage, and treated effluent disposal by land application. The facility is also permitted to operate a mechanical wastewater treatment plant with treated effluent disposal via Rapid Infiltration Basin (RIB). There are no surface water discharges permitted for the facility.

The Facility receives incoming wastewater from Heber City and Midway City. All of Midway's wastewater and a portion of Heber's wastewater are treated in the wastewater lagoon system (lagoons). After treatment in the lagoons, this water is stored in storage ponds until it can be used. The Facility treats the remaining portion of Heber City wastewater in the mechanical system, which includes ultraviolet (UV) disinfection, before it is discharged into the RIB system.

DWQ staff visited the HVSSD Facility on January 23, 2024, and completed a reconnaissance inspection to evaluate compliance with UTOP9002. At the time of the inspection, all components of the Facility were operating properly, with the exception of the UV disinfection system, which was out of service and non-operational. Performance data indicate the Facility continues to meet the disinfection performance guidelines for *E. coli* as outlined in DWQ Approval in Concept document issued for the Facility expansion in 2010. Even so, DWQ has recommended that HVSSD repair the UV disinfection system.

With the exception of the UV system, the mechanical treatment that occurs prior to discharge to RIBs was operating as designed. The lagoons were properly aerated and mixed as needed for effective treatment. HVSSD was not land applying at the time of inspection due to winter conditions; treated wastewater is stored by the facility during winter. Overall, the Facility appeared to be operating in compliance with HSSVD's Permit. At the time of the inspection, odors at the Facility were typical of what is expected of wastewater treatment plant. Offsite wastewater odors were not observed. A copy of the inspection report is available by request.

Odors

Odors are a common occurrence in wastewater treatment, even with treated wastewater. The most common odor sources at wastewater treatment plants are on the receiving end, at facilities called headworks, though they can occur in other parts of treatment plants too. Wastewater treatment plants are designed to mitigate and control odors in many ways, usually with a combination of facility (location) siting, chemical treatment, enclosures/capture, air scrubbing, biofiltration, and aeration, among others.

Because of their size, lagoon odor is difficult to manage. Other than facility siting, the most common way is by aeration of the primary lagoon cells. Proper lagoon aeration results in treatment, reducing or eliminating chemicals that cause offensive odors. HVSSD aerates their treatment lagoons to treat pollutants and odor. HVSSD has enclosed headworks components when feasible and contains headworks operations in a building. HVSSD has the ability to add odor control chemicals (hydrogen peroxide and calcium nitrate solutions) to two lagoons to help manage odors. HVSSD is plans to upgrades the headworks and parts of the mechanical system to enhance its odor control system.

Lagoons may turn over in the spring and fall due to temperature fluctuation, which may produce stronger or even objectionable odors. Additionally, it is possible for odors to occur during spray irrigation of treated effluent, but based on HVSSD's land application request submitted to DWQ, the spray head used in the land application is designed to minimize wind drift. However, facilities should not be land applying treated effluent during excessively windy periods. Please note that local inversions during the winter months may intensify local odors.

Although DWQ does not have the authority to regulate odors, it will provide technical assistance to the Department of Health and Human Services (DHHS) as they investigate the odor complaints from the community surrounding the HVSSD Facility. For more information on these investigations, please contact Alejandra Maldonado with DHHS.

Wastewater Treatment

A few comments claimed that no wastewater treatment was occurring at HVSSD's Facility; this is not accurate, as all wastewater coming into the Facility is treated by either the lagoons or the mechanical plant, as mentioned above. Most of the wastewater that enters the Facility is treated in the lagoons, where treatment occurs through aeration, with the remaining pollutants treated by natural biology in the polishing ponds. In addition, HVSSD utilizes a mechanical treatment process that treats a portion of the flow that enters the HVSSD Facility; this flow is then directed to the RIB. HVSSD is generally in compliance with their Permit, excluding minor sampling and reporting violations. Minor violations noted within recent months include missed sampling during winter months due to snowfall; operators being unavailable due to illness; and sampling errors. See Environmental Protection Agency (EPA) Wastewater Technology Fact Sheets for more information on treatments discussed above (Attachment 1).

A majority of the HVSSD Facility's treated effluent is applied to specific neighboring fields for crop irrigation, in accordance with Permit. Soil samples collected between 2015 and 2020 show that nitrogen and phosphorus are removed via crop uptake from the land application site at a higher rate than they are applied via treated effluent. This equates to minimal nutrients in the effluent infiltrating into the groundwater via these fields, as they are taken up by crops. The Permit does not allow for the application of biosolids and HVSSD does not apply any biosolids onto fields.

Groundwater

In a recent study prepared by SWCA Environmental Consultants (SWCA) for the Wasatch County Health Department, SWCA identified groundwater quality in the Heber Valley aquifer as Class 1A Pristine Drinking Water (pg. 18, SWCA). HVSSD's Permit addresses discharges of treated wastewater to lined lagoons, a rapid infiltration basin, and land application for irrigation. Prior to the issuance of the Permit, DWQ evaluated the existing (background) groundwater in Heber Valley through the installation of monitoring wells around the proposed discharge locations. The purpose of the evaluation/study was to characterize the shallow ground water conditions at the proposed HVSSD site, including the RIB and lagoons, and the potential for phosphorus transport to the Provo River. The Engineering Report, completed by Sunrise Engineering, concluded that lagoon seepage had formed a groundwater mound, causing flow reversal near the Provo River. Still, the overall flow direction is generally west-southwest and away from the Provo River beneath the RIB site. The Sunrise Engineering Report also concluded that phosphorus travel time is slow, and the reversal of the groundwater flow due to mounding beneath the lagoons creates a longer flow path to surface water. Therefore, the likelihood of phosphorus impacts from the RIBs to the Provo River is low. The Permit requires HVSSD to continue monitoring the wells installed, and data reviewed over the last few years indicate there are minimal groundwater impacts to the Provo River from HVSSD discharges.

In 2014, a thesis was completed by a Master's student at Brigham Young University (BYU) titled "Source Apportionment of Wastewater Using Bayesian Analysis of Fluorescence Spectroscopy" (BYU Study) which sought to evaluate the amount of organic matter (which correlates to nutrients) and flow that the HVSSD lagoons may be contributing to the Provo River. The BYU Study evaluated samples taken from Lagoon Cell 3 (final lagoon cell) and the Provo River Upstream and Downstream of the lagoon (BYU, pg. 22). The results of the BYU study concluded that "approximately 3.6% of the organic matter content of the downstream location is from a source other than the upstream location, and can be attributed to the influence of the lagoons" (pg. 38, BYU).

Although the BYU study concludes that the increase in organic matter in the Provo River can be attributed to the influence of the lagoons, it does not speak to the overall quality of water that may reach the Provo River due to the groundwater mounding. HVSSD, per Permit requirements, monitors a number of different pollutants quarterly, including Total Inorganic Nitrogen (TIN); Nitrate; Nitrite; and Phosphorus. There are three (3) monitoring locations (MW-1, MW-2, and MW-3) between the HVSSD lagoons and the Provo River, for which a review of data generally indicates the quality of water that may flow into the Provo River due to the groundwater mound. A review of the data from MW-1, MW-2, and MW-3 from the last year indicates that the wells met ground water quality standards for TIN, Nitrate, and Nitrite, and that the average Phosphorus concentration was 1.38 mg/L. Although the lagoons may contribute organic matter (nutrients) to the Provo River, based on well monitoring data, the impact appears to be minimal.

The lack of significant impacts from the treatment plant and its discharges to groundwater were also documented and detailed in the SWCA study. In particular, the study indicates that as much as 6.5 times more nitrate may be contributed via septic systems per person than via the centralized wastewater treatment facility (p. 98, SWCA). The study found that the average nitrate concentrations in the Heber Valley Aquifer were 2.4 mg/L, which is below the Utah Division of Drinking Water Standard of 10 mg/L.

Although the BYU study indicates that the HVSSD lagoon system contributes organic matter and flow to the Provo River, the amount they contribute is a relatively small percentage compared to the organic matter present in the Provo River. Based on recent well monitoring data and the more recent SWCA study, the groundwater reaching the Provo River is generally of good quality. The groundwater in Heber Valley continues to be pristine and well below EPA Maximum Contaminant Levels (MCLs).

Surface Waters/Harmful Algal Blooms (HABS)

DWQ received a comment expressing concern that the HVSSD Facility was contributing to Harmful Algal Blooms (HABS) in the Provo River and Deer Creek Reservoir. The HVSSD Facility is located near the Provo River, which flows into Deer Creek Reservoir, which is located roughly 1.5 miles southeast of the Facility.

There is extensive background and history on water quality in the Deer Creek Reservoir Watershed. In 1974, the National Lake Eutrophic Study identified Deer Creek Reservoir as having poor water quality due to widespread algal mats during the warmer months. The reservoir was classified as eutrophic, meaning it had high biological productivity and low dissolved oxygen, threatening the aquatic life, recreation, and drinking water beneficial uses of the water. In 1975, a 208 Areawide Water Quality Management Study for Summit and Wasatch Counties confirmed these findings. As a result, in 1979, HVSSD received a \$10 million construction grant from the Utah Water Quality Board (UWQB) to eliminate their discharge and construct three aerated lagoons with winter storage, chlorination, and land application disposal to treat and dispose of municipal wastewater, which improved water quality by greatly reducing nutrient loading into surface waters. Other nutrient reduction efforts in the watershed led to improved water quality in Deer Creek Reservoir and its tributaries. Projects included updating the original 208 planning document; nutrient-reducing best management practices for agricultural operations; an information and education campaign; efforts by local land authorities to control sediment regionally from developmental sites; and the construction of Jordanelle Reservoir.

Despite these efforts, in 2000, Deer Creek was listed on the Clean Water Act's 303(d) List of Impaired Waterbodies for failing to meet its cold water aquatic life beneficial use due to low dissolved oxygen and high water temperatures. An in-depth water quality study of Deer Creek Reservoir (Total Maximum Daily Load (TMDL)) was completed by DWQ and approved by EPA in March 2002. The TMDL study linked poor water quality conditions to elevated phosphorus concentrations from both point and nonpoint sources of pollution. The TMDL determined that erosion during spring runoff and groundwater flow were significant sources of phosphorus to the reservoir. Discharges of nutrients to groundwater occur when water seeps through saturated soils, which lose their ability to bind nutrients. The TMDL report estimates that 18% of phosphorus loading was from groundwater flow. The only regulated point source identified in the TMDL was the Midway Fish Hatchery, which has specific phosphorus limits in its discharge Utah Pollutant Discharge Elimination System (UPDES) permit. Though HVSSD is regulated by DWQ, it does not discharge to surface waters and is not considered a point source discharge. Nonpoint (unregulated) sources include agricultural activities and stormwater runoff.

Since initial documented concerns in the mid-1970s, water quality conditions within the Deer Creek Reservoir have improved. There are significantly less widespread algal blooms and mean annual reservoir phosphorus concentrations have decreased in the past decade. The reservoir is considered to be mesotrophic in most years since 1996, meaning it has an intermediate level of productivity with clear water and medium nutrient content.

While past water quality improvement projects, such as land use management and agricultural stewardship, are achieving higher quality of water in the Middle Provo River watershed, more work needs to be done to protect the watershed, especially as this area is experiencing significant population growth demands. Current and proposed project implementation strategies include additional monitoring, outreach and education, agricultural and grazing improvement projects, and improved stormwater management. Managing and limiting phosphorus in Deer Creek Reservoir is crucial in preserving this vital natural resource.

While algal blooms no longer dominate Deer Creek Reservoir and phosphorus concentrations are reduced, some localized cyanobacteria blooms exist, including the more harmful species, though not as widespread. Harmful algal blooms (HABs) have the potential to release toxins that are harmful to both aquatic and human health. Local Health Departments (LHDs) in Utah use recreational health thresholds established by the DHHS to determine if and when a bloom presents a human health risk. DWQ supports LHDs through a monitoring and sampling program that prioritizes waters that are at risk for cyanobacteria blooms, experience high recreational use, or serve as drinking water sources. DWQ interprets and reports sampling results, and along with DHHS, makes recommendations to LHDs on the issuance of recreational health advisories based on sampling data and the best available science. LHDs have the authority to post health advisories and close water bodies. Information on HABs and current waterbody conditions can be found in the link below in Attachment 2.

PFAS

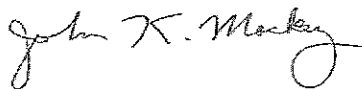
Per- and polyfluorinated substances (PFAS) are a group of chemicals found in numerous consumer, commercial, and industrial products. PFAS can enter the wastewater system in numerous ways, including via residential waste from the use of consumer products. In April 2024, the U.S. Environmental Protection Agency finalized a National Primary Drinking Water Regulation establishing legally enforceable levels for six PFAS in drinking water and is currently working on developing levels for surface waters. There is currently no data on PFAS levels in wastewater at the Facility, but based on PFAS data submitted from other wastewater treatment facilities throughout the state, DWQ expects the level to be nonzero. However, due to the lack of manufacturing presence in the valley, we expect PFAS levels to be relatively low compared to other areas nationwide. While there are currently no PFAS regulations in Utah, PFAS regulations in the state may change in the future, which may require wastewater facilities to monitor and treat PFAS. DWQ will happily accept any local PFAS data analyzed by a certified lab to help analyze the issue.

Additional Information

DWQ encourages individuals to explore resource links included in Attachment 1 for more information regarding or related to concerns.

DWQ hopes that concerns were addressed by this letter. If you have any additional concerns not addressed above, you may email wqcomments@utah.gov or call DWQ's front desk at (801) 536-4300. For all drinking water concerns and data, please contact the Utah Division of Drinking Water (801) 536-4200.

Sincerely,



John K. Mackey, Director
Division of Water Quality

Attachments (2):

1. References
2. Links to Additional Resources

Cc: Via Email with attachments

Dwight Hill, Wasatch County Health Department
Jennifer Berjikian, DWQ
Danielle Lenz, DWQ
Justine Marshall, DWQ
Leanna Littler-Woolf, DWQ
Ashley Sumner, DEQ
Wes Johnson, HVSSD
Alejandra Maldonado, DHHS
Rachel Edie, DAQ

Attachment 1: References

SWCA Environmental Consultants (2020). Characterization of Groundwater Quality in Wasatch County, Utah, with Recommendations for Septic System Development Regulations.

PSOMAS (March 2002). Deer Creek Reservoir Drainage TMDL Study.

Sunrise Engineering Report (2013). Final Summary Report Hydrogeologic Site Characterization and Groundwater Monitoring: Proposed Rapid Infiltration Basins.

Blake, Daniel B. Brigham Young University (2014). 2014-07-10 Source Apportionment of Wastewater Using Bayesian Analysis of Fluorescence Spectroscopy.

Attachment 2: Links to Additional Resources

Department of Environmental Quality Resources

1. HAB Factsheet
2. HAB Webpage

EPA Factsheets and Information Pages

1. [EPA Wastewater Technology Fact Sheet - Facultative Lagoons](#)
2. [EPA Wastewater Technology Fact Sheet - Rapid Infiltration Land Treatment](#)
3. [EPA Wastewater Technology Fact Sheet - Aerated, Partial Mix Lagoons](#)
4. [EPA PFAS Explained Homepage](#)

Studies Discussed in Letter

1. [2020 Groundwater Study SWCA](#)
2. [Deer Creek Reservoir Drainage TMDL Study](#)
3. [BYU Study](#)
4. [Sunrise Engineering Study](#)

Heber Valley Special Services District Resources

1. [HVSSD FAQ](#)
2. [HVSSD Odor Updates](#)
3. [HVSSD March 7, 2024 Press Release](#)

Attachments are available via email by request. Send requests to jberjikian@utah.gov.