REGION 8
DENVER, CO 80202

Ref: 8 Montana

SENT VIA EMAIL
DIGITAL READ RECEIPT REQUESTED

Mr. Ron Edwards
Big Sky Water & Sewer District #363
Ron@WSD363.com

Re: Inspection Report for Big Sky Water & Sewer District #363, unpermitted

Dear Mr. Edwards:

On July 7, 2023, representatives of the U.S. Environmental Protection Agency completed a site visit to the Big Sky Water & Sewer District #363's Water Resource Recovery Facility (facility) in Big Sky, Montana, to evaluate the facility and investigate claims from a complaint. The inspection was conducted under the authority of Section 308 of the Clean Water Act (Act). Enclosed is a report of the inspection.

Based on the information reviewed before, after, and obtained during the inspection, I did not document any findings and am not requesting additional information at this time. Recommendations are provided in the Inspection Conclusion at the end of the report. Please contact me at 406-457-5022 or Prideaux.Lisakay@epa.gov if you have any questions regarding this letter or the enclosed report.

Sincerely,
Prideaux, LisaKay
Digitally signed by Prideaux, LisaKay
Date: 2024.02.13 10:13:36 -07'00'
Lisa-kay Prideaux
NPDES and Wetlands Enforcement Section
Enforcement and Compliance Assurance Division

Enclosures:
1) NPDES Wastewater Treatment Inspection Report
2) Photo Log

cc (electronic):

Aaron Pettis – Montana Department of Environmental Quality

NPDES Inspection Report – Water Treatment Plant

National Database Information	
Inspection Date: July 7, 2023	Inspection Type: Wastewater Treatment Plant
Entry/Exit Time: 10:00 / 16:00	NPDES ID Number: Unpermitted
NAICS Code: 221320	Inspection ID: 202307_BigSkyWSD
Lead inspector and affiliation: Lisa-kay Prideaux / EPA Region 8 Montana Operations Office	
Inspector and affiliation: Erik Makus / EPA Region 8 Montana Operations Office	
Inspector and affiliation: Kenley Stone / EPA Region 8 Montana Operations Office	

Facility Location Information (*Name/Location/ Mailing Address*)	
Site/Facility Name & Location: Big Sky Water Resource Recovery Facility 45.270251°; -111.283646° (Facility) 45.269039°; -111.291335° (Ponds)	Mail Report to: Ron Edwards Ron@WSD363.com

Contact Information	
	Name(s)/Title
Facility Contacts:	Ron Edwards / General Manager / Big Sky County Water & Sewer District #363 / present during the inspection
	Susan Swimley / Attorney at Law / Big Sky County Water & Sewer District #363 / present during the inspection
Person/Company meeting definition of "Operator"	Ron Edwards/ General Manager / Big Sky County Water & Sewer District #363
Authorized Official(s)	Ron Edwards / General Manager / Big Sky County Water & Sewer District #363

Permit Information	
Is the permit on site and available? Unpermitted	
Effective Date: Unpermitted	Expiration Date: Unpermitted
Latitude: 45.270251°N	Longitude: -111.283646°W
Receiving Water(s): No permitted discharge	
Regulatory Inspector's source of information: Complainant information, Montana Department of Environmental Quality staff, Big Sky Water & Sewer District's website and presentations, Cottonwood Environmental Law Center files and presentations, Ozark Underground Laboratory studies, reports, and presentations, Western Groundwater Services studies, reports and presentations, facility representatives and facility observations.	

Areas Evaluated During Inspection		
Permit	Self-Monitoring Program	Pretreatment
Records	Compliance Schedule	Pollution Prevention

Facility Site Review	Laboratory	Stormwater
Effluent/Receiving Waters	**Operations and Maintenance**	Combined Sewer Overflow
Flow Measurement	Sludge Handling/Disposal	Sanitary Sewer Overflow

Report Review and Signature		
Drafter Name	Address/Phone Number	Date
	U.S. EPA Region 8, Montana Operations Office 10 West 15th Street, Suite 3200 Helena, Montana 59626	**02.08.2024**
Lisa-kay Prideaux	406-457-5022	
Reviewer Name	Address/Phone Number	Date
Prideaux, LisaKay Digitally signed by Prideaux, LisaKay Date: 2024.02.13 10:14:47 -07'00'	U.S. EPA Region 8, Montana Operations Office 10 West 15th Street, Suite 3200 Helena, Montana 59626	**01.10.2024**
Erik Makus	406-457-5017	
Management Signature/Name	Address/Phone Number	Date
EMILIO LLAMOZAS Digitally signed by EMILIO LLAMOZAS Date: 2024.02.13 09:05:33 -07'00'	U.S. EPA Region 8 1595 Wynkoop Street 8ENF-W-NW Denver, Colorado 80202	02/08/2024
Emilio Llamozas, NPDES & Wetlands Enforcement Section Supervisor	303-312-6407	

Inspection Narrative and Site Description

Complaint Description:
The original complaint was received by the Montana Department of Environmental Quality (MDEQ), stating that the Big Sky Water Resource Recovery Facility's water balance didn't equate, and therefore must be discharging (through leaky lagoons and/or overwatering of land application areas) without a MPDES permit. The complaint was investigated and MDEQ determined there was no support and closed the complaint. The complaint was then informally brought to the Environmental Protection Agency (EPA). After several presentations and review of various information (discussed below), the EPA conducted a site visit to see all areas mentioned in the complaint for better understanding.

The EPA conducted an announced inspection at the Big Sky Water Resource Recovery Facility (facility, District, WRRF), to evaluate the facility's compliance with the Clean Water Act and investigate claims from a complaint. The inspection was conducted under the authority of Section 308 of the Clean Water Act.

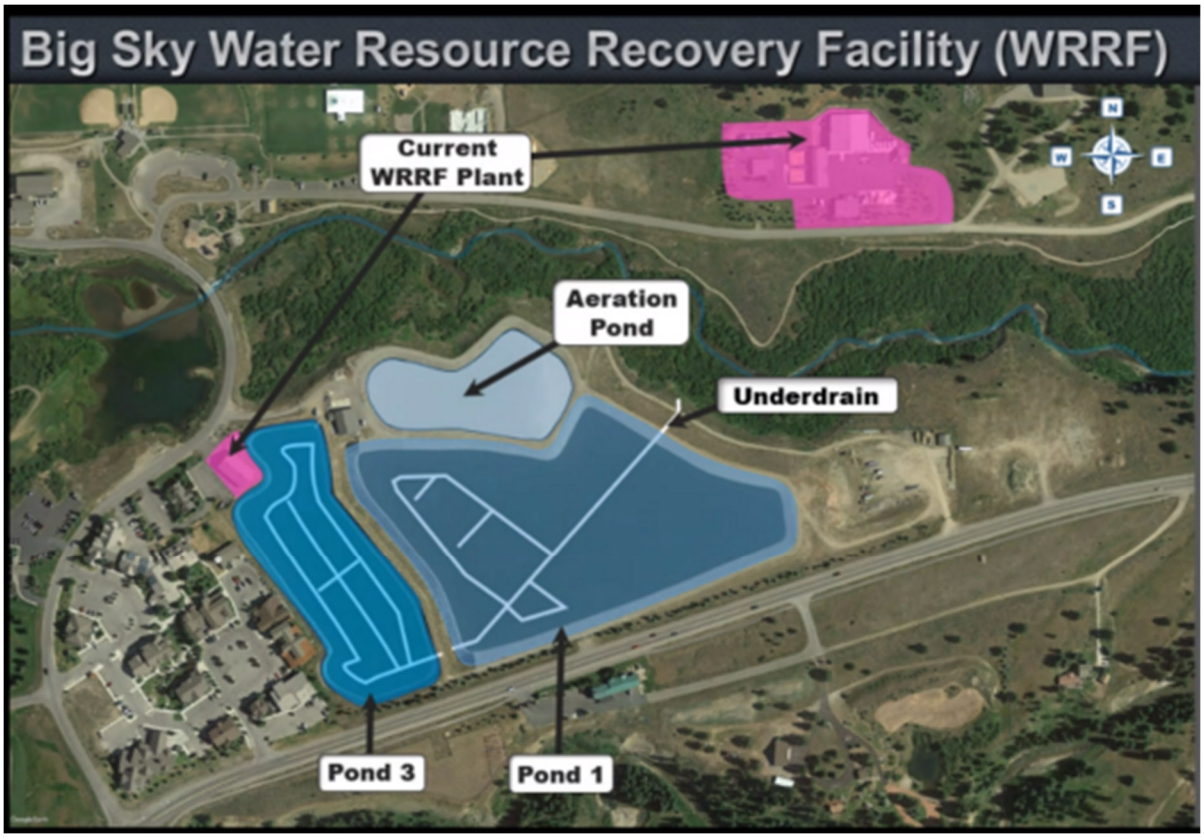
On July 7, 2023, I, EPA inspector Lisa-kay Prideaux, along with Erik Makus, NPDES Permit Writer and Kenley Stone, Wastewater Infrastructure Specialist of the EPA, arrived at the Big Sky Water and Sewer District at approximately 10:00 am. After arriving at the office, I presented my inspector credentials to Ron Edwards, Facility General Manager, and Susan Swimley, Attorney at Law, and had an opening conference to explain the purpose of the inspection trip. During this time, we had a conversation regarding the complaint filed against the facility, current facility operations, and the upgrade which was underway. Throughout the site visit, observations and photograph descriptions were documented in a field logbook. Photographs taken during the inspection are included in the attached photo log. Note: not all photographs taken during the inspection are included in the attached photo log. Two cameras were used during the inspection operated by Lisa-kay Prideaux and Kenley Stone. Several photographs were taken by both cameras of the same location, the photo log depicts the best photo(s) to represent the area. Some photos have the same identifier number taken from each camera; however, the photo is different. In the Facility Site Inspection section of the report below, photos taken by Lisa-kay Prideaux will have an extension of "_1" at the end of the photo number. In the photo log each photo is identified through the photo taker. All photos are maintained by EPA in accordance with the Quality Assurance Field Activities Procedure and Standard Operating Procedure.

Big Sky Water and Sewer District #363 (District) owns and operates the Big Sky Water Resource Recovery Facility. The facility serves the residential and business community of the Big Sky area with a population of approximately 3,100.

Background

Facility Description:
Wastewater treatment was originally constructed for the area in the mid to late 1970s as a bentonite-lined lagoon. In 1982, the Westfork Meadows Subdivision dedicated its sewer treatment system to the Gallatin County Special Improvement District #305 to operate, maintain, and hook up new development in the area. In 1993, the Big Sky County Water & Sewer District #363 was formed. Also in 1993, a moratorium was placed on new construction, in part to decide what and how to upgrade the wastewater treatment system. In 1996, the moratorium was lifted and from 1996-1997, the District

completed improvements to the facility to include lining and expanding the storage ponds from 67 million gallons (MG) to 83 MG of storage, demolishing the old treatment plant, constructing a new filtration treatment plant, and installing a new golf course irrigation system on the Meadow Village Golf Course. With the installation of new liners, the facility installed a system of perforated piping that collects groundwater beneath two of the ponds (see diagram below). The underdrain pipe is not connected to the facility storage ponds; instead, it creates a preferential pathway for groundwater that naturally sits beneath the ponds, lowering the groundwater table and preventing groundwater from pushing up on, or "floating" the pond liners, which would damage the liners. Collected groundwater travels through the underdrain and discharges through a pipe into a small wetland northeast of the holding ponds. The wetland is approximately 130 feet away from the West Fork Gallatin River. From 2002-2004, an upgrade to the treatment system was completed to include a sequencing batch reactor (SBR) with a capacity to treat up to 0.65 million gallons per day (MGD). In 2008, the District installed a rock riprap apron and aeration in holding pond 1.



The current treatment system consists of a headworks with screen and grit removal, three SBR treatment trains, an equalization basin, aeration pond, filter building (three sand filters with chlorine gas injection), two storage ponds, and aerobic digestion. Storage pond #1 is approximately 11.4 acres in size and holds approximately 88 million gallons; pond #2 (aeration basin) is approximately 3.1-acres and holds approximately 10.91 million gallons; storage pond #3 is approximately 4.85 acres in size and holds approximately 17.07 million gallons. The facility currently has agreements with Spanish Peaks Mountain Club and the Yellowstone Club to send treated wastewater to holding ponds located on their properties for use in snowmaking/golf course irrigation. The amount of water sent to the off-site holding ponds depends on several factors and varies from year to year. The District does not own, operate, maintain, or control the properties or infrastructure relating to golf courses, ski areas, or holding ponds

(other than the three ponds located on their property). The District is not responsible for obtaining or maintaining any nutrient management plan for the golf courses. The District is responsible for sampling the holding pond water in pond 1 and pond 3 and sharing the information with entities receiving the water.

The District is currently in the middle of a $50 million dollar upgrade of their wastewater treatment system. No changes to the holding ponds or irrigation systems are planned. The upgrade is to increase capacity and to further treat for conventional pollutants and nutrients to reach a higher classification (class A-1) of water reuse. The system is upgrading to a 5-stage Barden flow membrane bioreactor (MBR) which will bring the treatment capacity up to 1.3 MGD. They are also pouring concrete for three additional MBR trains for future expansion which will allow the plant to grow to a three MGD treatment capacity when fully operational. The storage ponds are part of the future treatment just as they are in the current system. A portion of the upgrade also includes rebuilding their headworks for a greater volume, and re-purposing areas of the old treatment system to serve as emergency/maintenance waste storage.

West Fork Gallatin River:
The facility is located between the West Fork Gallatin River (to the north) and the South Fork West Fork Gallatin River (to the south). The South Fork West Fork joins the West Fork approximately 0.83 river miles downstream (east) of the facility's groundwater drainage pipe, and in another approximate 1.0 river miles downstream of that junction, the West Fork joins the Gallatin River. The West Fork Gallatin River is impaired for nitrogen and has a state-administered Total Maximum Daily Load (TMDL) which identifies wastewater-derived nitrogen loads as a significant source of nitrogen.

Facility Site Inspection:
The site inspection began with the current wastewater treatment system. We walked through the current on-site laboratory where collected samples are analyzed for process control (photo 699).
We did not go into the current headworks building as there was active construction activity and was unsafe for us to walk though. We then walked through the SBR trains; one train was in its aeration/mixing cycle (photo 712_1), the other was in its equalization/settling cycle (photo 713_1). From the current SBR treatment (and future MBR treatment) waste activated sludge is pumped to the existing aerobic digesters (photo 683) prior to the dewatering building. In the dewatering building, sludge from the digesters enters the filter belt press (photos 701, 703, and 704) where it is dewatered and stored in a bay (photo 700) to await composting. The facility composts on-site by adding raw materials (photo 705) and mixing with the dewatered sludge (photo 702) to create a finished compost (photo 705). Treated wastewater from the current SBR treatment (and future MBR treatment) is pumped across the West Fork Gallatin River, into pond 2, the aeration pond (photo 708). For construction purposes, the facility had to stop flow to the current plant to tie in connections to the new plant, so on July 5, 2023, the facility pumped all influent into pond 2. Because of this, at the time of the inspection pond 2 had a layer of sludge on top (photo 707). The facility is skimming from the top of the pond and slowly introducing it back into the headworks building for treatment. NOTE: pond 2 is not connected to the other ponds or to the irrigation pipes. Wastewater from pond 2 is then pumped into the filter building (photo 724) where it moves through three sand filter units and is then treated with chlorine gas (photo 730_1). Finished water then flows into pond 3 (photos 720, 724, 722_1, and 724_1) or pond 1 (photos 714, 718, 719, 721, 723, 721_1, and 725_1) for storage. Pond 3 and pond 1 are connected via a valved pipe. Pond 3 pumps to Meadow Village Golf Course, and various parks and

pastures in the Big Sky area. Pond 1 pumps to the Yellowstone Club and Spanish Peaks Mountain Club holding ponds for their irrigation uses. We viewed the irrigation pumps readouts (photo 727_1) and plumbing (photo 728_1) for both ponds. All three ponds are lined with a 60 ml polyethlene liner. We drove and/or walked around most of the three ponds. Visual damage to the surface of the pond liners was not observed. The underdrain system is under the entirety of pond 3 and under the western end of pond 1. The underdrain system is designed to intercept and drain groundwater so it does not interfere with the pond liners. The underdrain system flows under pond 1 to the northeast; the pipe moves through a manhole (photo 713) and then daylights into a wetland/riparian area of the West Fork Gallatin River (photos 712, 718_1, 719_1).

While on site, we walked through the construction of the new facilities. We went into the new building (photo 684), in which we were shown the new MBR trains and basins (photos 687-690), new generators (photo 691), screens in the new headworks (photo 692), and pumps/piping for aeration and liquid movement (photo 686). We also looked at the new clear well building (photo 715), which will have the capacity to allow the facility to bypass any of the ponds for inspection and/or maintenance. The facility has a temporary concrete batch plant located on facility grounds (near the District's maintenance shop) (photo 717) during construction only.

We then drove to the Meadow Village Golf Course for the last portion of the inspection. The first stop was at 'Chapel spring' which was described as a French tile system originating from one of the first homes on the golf course in the early 1970's. According to facility personnel, the system was originally used for basement sump pump and roof rain drainage system but may also include drainage from the golf course to eliminate stormwater runoff and high groundwater. The drain daylights out a pipe into an open ditch which runs approximately 500 feet to the northeast where it intersects with the wetland/riparian zone of the West Fork Gallatin River (photo 725). We also viewed one of the pasture areas which receives irrigation water from pond 3 (photo 728). We drove through most of Meadow Village Golf Course (photos 731_1-737_1), signs of overwatering in the form of puddled water, muddied areas, or erosion rills were not identified.

Records Review:

Records reviewed as part of the inspection include facility flow spreadsheets (2015-2020) for the water balance, tracer dye study results conducted in July 2021, court proceedings, decisions, opinions, and rulings, and EPA guidance.

Water Balance:

In a December 9, 2022, report written by Trevor Osorno, Senior Hydrogeologist at Ozark Underground Laboratory (OUL), and titled *Water Balance Study and Data Review for the Sewage Treatment and Disposal System of the Big Sky County Water and Sewer District No. 363 Big Sky, Montana*, Mr. Osorno stated he reviewed flow data from 2015-2020 and conducted a water balance to determine a leakage rate from the holding ponds, as well as a discussion on the results of the tracer dye study conducted by OUL. This report states through the calculations conducted, the mass balance had an uncertainty (on average) of 25.7 million gallons per year (MGY) from 2015-2020. It is also alleged the irrigation water was being distributed at a rate of three times the water demand, and the irrigation water had total nitrogen concentrations as high as 50.1 mg/L (October 1, 2020, sample).

I reviewed the numbers described in Mr. Osorno's report to re-construct basic water balance

calculations, averaging all six years in the study (2015-2020). Using the numbers in Mr. Osorno's report, over the course of the six-year study inflow to the ponds (i.e., sewage inflow, direct precipitation, and runoff from nearby areas) averaged 163.5 MGY, while outflow from the ponds (i.e., irrigation/export and evaporation) averaged 163.6 MGY. This represents a very good mass balance with a difference of less than 0.1% between estimated inflows and estimated outflows (see Table 1 below). There is significantly more variation within each year, but considering the admitted uncertainty associated with many of the measurements (e.g., precipitation and evaporation were estimated, assumption of no year-to-year change in storage for ponds 1 and 3, etc.), it makes more sense to review the data over a longer period of time so as to minimize the impact of these uncertainties. Mr. Osorno's report states the ponds have an average discrepancy of 25.7 MGY (70,410 GPD), which is approximately 15-18% of influent into the facility. However, his analysis takes the "net" difference each year, regardless of whether it nets in a positive or negative direction and uses those absolute values to come up with the average discrepancy (see Table 1 below). His analysis more properly indicates that the water balance has some uncertainty and could be refined with better input data, rather than drawing any large conclusions about the water loss or water gain. The data presented by OUL is not positive evidence that there is a water leak, but the EPA agrees that better records and more refinement of the water balance may better answer that question. The facility has stated because they do not have a NPDES discharge permit, keeping meticulous records of flows and pond volumes is not required, and acknowledges there are gaps in their records.

Table 1:
This data originated from the 2022 Osorno report

	MGY	MGY	MGY	Absolute (MGY)
Year	**Total In**	**Total Out**	**Difference**	**Absolute (Difference)**
2015	129.888	170.059	-40.171	40.171
2016	143.242	180.503	-37.261	37.261
2017	173.12	137.261	35.859	35.859
2018	191.76	182.177	9.583	9.583
2019	168.582	144.614	23.968	23.968
2020	174.489	167.232	7.257	7.257
Total	**981.081**	**981.846**		**Absolute Average: 25.7**
Per Year Avg.	163.5135	163.641	**0.077%**	

Chemical Analysis:
In response to the water balance study, the facility indicated they wanted to investigate it further and hired Mark Cunnane, an engineer and hydrogeologist with Western Groundwater Services, to complete a chemical analysis using total Ammonia, and total Nitrogen (Nitrate+Nitrite (N+N) and Total Kjeldahl Nitrogen (TKN)). Mr. Cunnane wrote a report in May 2021 titled *Technical Report Cottonwood et. al. v. BSWD.* According to the chemical study in the report, 17 samples were collected from, April 2020 to April 2021 including sampling and analysis of the facility's effluent (out of the filter building before the storage ponds), irrigation water (out of the ponds), and underdrain water (out of the discharge pipe from the underdrain system). Data shows total nitrogen mean levels to be 27.39 mg/L in the effluent, 24.82 mg/L in the irrigation water, and 2.02 mg/L in the underdrain water, and total ammonia mean levels to be 24.02 mg/L in the effluent, 21.37 mg/L in the irrigation water, and 0.02 mg/L in the

underdrain water (see Table 2 below). These numbers suggest that water from the holding ponds is not being discharged to the underdrain at the significant rate suggested by OUL.

Table 2:
Data originates from *Technical Report Cottonwood et. al. v. BSWD.*

Parameter	WRRF Effluent (mg/L)	Irrigation Water (mg/L)	Underdrain Water (mg/L)
Total Nitrogen	27.39	24.82	**2.02**
Ammonia	24.02	21.37	**0.02**

Tracer dye study:
Cottonwood Law Center provided the December 9, 2022 report titled *Water Balance Study and Data Review for the Sewage Treatment and Disposal System of the Big Sky County Water and Sewer District No. 363 Big Sky, Montana* written by Trever Osorno of which indicates on July 13, 2021, Mr. Osorno placed charcoal samplers (used to detect the presence or absence of many tracer dyes) at select locations as well as grabbed samples at other locations as background samples; there were 10 different locations in total. Also, on July 13, 2021, Mr. Osorno, with the permission of Big Sky Water Sewer District, introduced a total of 16-pounds of fluorescein tracer dye into the three holding ponds resulting in a dye concentration of approximately 22.21 parts per billion (PPB). After administering the tracer dye, grab samples were collected at the same sites, on July 15, 2021, July 20, 2021, July 27, 2021, August 6, 2021, and August 12, 2021. Samples collected were split with the facility and two different laboratories analyzed the samples. I reviewed laboratory data obtained from both the Western Groundwater Services and OUL, as well as reports generated from both. In reviewing the fluorometric analysis, positive results were identified in grab samples at the Underdrain Runoff sample location on July 24, 2021, the Underdrain MH-1 sample location on July 15, 2021, and July 20, 2021, and the irrigation location on July 15, 2021, July 22, 2021, and August 4, 2021. Several of the charcoal samplers detected the presence of fluorescein dye in receiving waters. Additionally, the first detection of tracer dye in a grab sample was on July 15, 2021, at the underdrain manhole location, with a concentration of 0.232 PPB. This concentration value is approximately 1% of the original concentration value. Based on the rapid detection of fluorescein dye in the underdrain system, it is likely that there is some leakage occurring, but calculations provided by the WRRF based on the concentration of dye in the underdrain indicate that it is likely less than 1 gallon per minute (GPM). Based on the low detection concentration, another possibility could be the dye water, from spray irrigating the Meadow Village Golf Course, percolated into the groundwater and was then captured by the underdrain system.

Closing conference:
A closing conference was held on-site with Mr. Edwards and Ms. Swimley, during which I discussed the preliminary observations with the current treatment system as well as the upgrade for the new treatment system, answered questions and discussed the process for the inspection report. The inspection concluded at approximately 16:00.

Inspection Conclusion:
Based on the information reviewed before, after, and obtained during the inspection, I did not document conclusive findings to support the complaint of discharging through leaky lagoons and/or overwatering of land application areas without a MPDES permit. It is recommended that Big Sky Water Sewer District No. 363 refine its water mass balance calculations by keeping records of all flows and

pond volumes and that it obtain a MPDES permit from the state if the treated wastewater volume cannot be contained solely through winter storage/summer irrigation and results in a discharge. As the permit issuing authority, MDEQ may conduct further investigations as appropriate. EPA is developing guidance on determining whether an indirect discharge via groundwater is the functional equivalent of a direct discharge. This guidance is expected to be available in the future. A draft guidance document is available for review at https://www.epa.gov/system/files/documents/2023-11/maui-draft-guidance.pdf.