ADEQ Arizona Department of Environmental Quality

DRAFT FACT SHEET

ARIZONA POLLUTANT DISCHARGE ELIMINATION SYSTEM (AZPDES)

This document gives pertinent information concerning the reissuance of the AZPDES permit listed below. This facility is a wastewater treatment plant (WWTP) with a design capacity of 0.04 million gallons per day (mgd) and is considered to be a minor facility under the NPDES program. The effluent limitations contained in this permit will maintain the Water Quality Standards listed in Arizona Administrative Code (A.A.C.) R18-11-101 et seq. This permit is to be issued for a period of 5 years.

I. PERMITTEE INFORMATION	
Permittee's Name:	Virgin River Domestic Wastewater Improvement District (VRDWID)
Permittee's Mailing Address:	Virgin River Domestic Wastewater Improvement District (VRDWID) P.O. Box 725 Littlefield, Arizona 86432
Facility Name:	Virgin River Domestic Wastewater Improvement District (VRDWID) Wastewater Treatment Plant (WWTP)
Facility Address or Location:	3454 East Beaver Dam Drive Beaver Dam, Arizona 86432
County:	Mohave County
Contact Person(s): Phone/e-mail address	Tammy Giebink, President of Board of Directors (702) 205-8255 / tammygiebink@gmail.com
AZPDES Permit Number:	AZ0023655
Inventory Number:	102428
LTF Number:	86942

II. STATUS OF PERMIT(s)	
AZPDES permit applied for:	Renewal
Date application received:	December 2, 2020
Date application was determined administratively complete:	December 29, 2020
Previous permit number (if different):	N/A
Previous permit expiration date:	May 31, 2021

208 Consistency: In accordance with A.A.C. R18-9-A903(6), a permit cannot be issued for any discharge inconsistent with a plan or plan amendment approved under section 208(b) of the Clean Water Act. Based on review of the application, there are no changes to the facility that require a new determination of consistency with the Regional Water Quality Management Plan.
The VRDWID has the following permits issued by ADEQ applicable to the VRDWID WWTP:

Type of Permit		
Aquifer Protection Permit (APP)	P102428	Regulates discharges to the local aquifer

III. GENERAL FACILITY INFORMATION	
Type of Facility:	Publicly owned treatment works (POTW)
Facility Location Description:	VRDWID WWTP is located southeast of the Beaver Dam Estates subdivision, on the northeast side of Beaver Dam Wash
Permitted Design Flow:	0.0366 MGD
Treatment level (WWTP):	Secondary
Treatment Processes :	The WWTP consists of an Ecolo Chief wastewater treatment package plant with a multiple tank system that comprises a primary separation tank, anoxic tank, aeration tank, recycle pump and ultraviolet (UV) disinfection system. A backup chlorination and dechlorination disinfection system is also available at the site.
Sludge Handling and Disposal:	The sludge is periodically taken by tank truck to the Mesquite Wastewater Treatment Plant (WWTP) for additional processing and final disposal. Sludge hauling takes place two or three times per year.
Nature of facility discharge:	Domestic wastewater from residential and/or commercial sources in Beaver Dam
Total Number of significant industrial Users (SIUs):	None
Average flow per discharge:	The applicant reported that the average daily discharge flow through the outfall is 0.25 MGD
Service Area:	VRDWID Service Area
Service Population:	Homes in VRDWID service area are primarily secondary homes used during the winter months. Following are the population served during winter and summer seasons: Winter Population served: 375 ERUs (Equivalent Residential Units) Summer Population served: 125 ERUs
Reuse / irrigation or other disposal method(s):	None
Continuous or intermittent discharge:	Continuous

IV. RECEIVING WATER	
The State of Arizona has adopted water quality standards to protect the designated uses of its surface waters. Streams have been divided into segments and designated uses assigned to these segments. The water quality standards vary by designated use depending on the level of protection required to maintain that use.	
Receiving Water :	Beaver Dam Wash, just upstream from its confluence with Virgin River. The approximate distance in stream miles from the outfall to Virgin River is 0.7 miles.
River Basin:	Colorado – Grand Canyon Watershed HUC 8: 15010010
Outfall Location(s):	Outfall 001: Township 40 N, Range 15 W, Section 5 Latitude 36° 54' 02", Longitude 113° 55' 51" W
Designated uses for the receiving water listed above:	Beaver Dam Wash: Aquatic and Wildlife warm water (A&Ww) Full Body Contact (FBC) Fish Consumption (FC) Agricultural Livestock Watering (AgL)
Designated uses for downstream receiving water:	The outfall discharges approximately 0.7 miles upstream of the confluence of Beaver Dam Wash with Virgin River. Therefore, this permit was written to also protect the designated uses of Virgin River. Virgin River: Aquatic and Wildlife warm water (A&Ww) Full Body Contact (FBC) Fish Consumption (FC) Agricultural Irrigation (AgI) Agricultural Livestock Watering (AgL)
Is the receiving water on the 303(d) list?	Beaver Dam Wash is not listed on Arizona's 2018 303(d) list. Stream Segment 15010010-003: This segment of Virgin River from Beaver Dam Wash to Big Bend Wash is listed on Arizona's 2018 303(d) list as impaired for selenium (total) (2004), suspended sediment concentration (2004), and E. coli (2010). Stream Segment 15010010-004: This segment of Virgin River from Sullivan's Canyon to Beaver Dam Wash is listed on Arizona's 2018 303(d) list as impaired for selenium (total) (2004). <u>Total Maximum Daily Loads (TMDLs):</u> ADEQ has not issued any TMDLs for Beaver Dam Wash or Virgin River. The Nevada Division of Environmental Protection (NDEP) wrote a TMDL for total boron in the lower Virgin River, extending from the Arizona-Nevada state line to Lake Mead. The TMDL was approved by EPA on January 14th, 2003. The TMDL concluded that the majority of the boron load to the waterbody originated in the States of Arizona and Utah, and that observed concentrations were dependent on streamflow with higher flows leading to lower concentrations. The TMDL contains a load allocation in the form of a flow-dependent equation. Using the equation, the TMDL estimated the load allocation to be 0.5 tons/day of total boron at Littlefield, AZ based on an average daily

	streamflow of 245 cfs for the years 1930-1998. Although the previous permit did not require monitoring for boron, the Permittee did sample the effluent once for boron with a result of 250 mg/L. At Virgin River DWID WWTP's constructed design flow of 0.0366 MGD, a concentration of 250 mg/L amounts to a load of 3.82×10^{-5} tons/day of boron, which is significantly below the allocation of 0.5 tons/day estimated at Littlefield, AZ in the TMDL. Even allowing for potential variances in streamflow that have occurred since 1998, Virgin River DWID WWTP is presumed to still be a de minimus source of boron at the Arizona-Nevada state line. Therefore, monitoring for boron has not been included in the permit.

Given the uses stated above, the applicable narrative water quality standards are described in A.A.C. R18-11-108, and the applicable numeric water quality standards are listed in A.A.C. R18-11-109 and in Appendix A thereof. There are two standards for the Aquatic and Wildlife uses, acute and chronic. In developing AZPDES permits, the standards for all applicable designated uses are compared and limits that will protect for all applicable designated uses are developed based on the standards.

In addition to the above, the Colorado River has a salinity standard. Per A.A.C. R18-11-110, the flow-weighted average annual concentration of total dissolved solids shall not exceed 723 milligrams per liter (mg/L) in the river below Hoover Dam. In order to meet this standard, discharges must meet the plan of implementation requirements developed by the Colorado River Basin Salinity Control Forum.

V. DESCRIPTION OF DISCHARGE

Because the facility is in operation and discharges have occurred, effluent monitoring data are available. The following is the measured effluent quality reported during the previous permit term.

Parameters	Units	Maximum Daily Discharge Concentration
Biochemical Oxygen Demand (5-day) (BOD_5)	mg/L	12
Total Suspended Solids (TSS)	mg/L	38
Total Kjeldahl Nitrogen (TKN)	mg/L	15
E. coli	cfu / 100 mL	>2419.2
Facility design removal rates:		BOD 85% TSS 85%

VI. STATUS OF COMPLIANCE WITH THE PREVIOUS AZPDES PERMIT

Date of most recent inspection:	6/4/2019 – There were two action items for the Permittee as a result of this on-site inspection. The action items were as follows: 1. Submit two consecutive lab reports demonstrating compliance with the discharge limit of 85% removal of TSS. 2. Submit training log for the plant staff to ADEQ. The inspector also noted that the Permittee submitted missing ammonia data logs for August 2018 thru April 2019 on 6/6/2019. On 7/2/2019 and 7/3/2019, the Permittee submitted two consecutive months of lab reports demonstrating compliance with the limit of 85% removal of TSS, and ADEQ deemed the Permittee to be in compliance.

DMR files reviewed:	7/2016 through 10/2020
Lab reports reviewed:	7/2016 through 11/2020
DMR Exceedances:	DMRs: Total Residual Chlorine (October 2016, November 2016, December 2016); Mercury (December 2018); Ammonia Impact Ratio (AIR) (March 2017, February 2018); Total Suspended Solids (TSS) (March 2017 September 2019); TSS Percent Removal (June 2017, April 2019, September 2019) Additionally, all reported cyanide values were below the reporting limit, but the reporting limit was above the assessment levels in the permit. Also, there were numerous monitoring and reporting errors throughout the previous permit term.
NOVs issued:	1. Case 167907 – NOV was issued 1/20/2017 for exceedances of the required 15 minute sample holding time for total residual chlorine (TRC) samples and issues related to the operation of the facility's UV disinfection system. 2. Case 181703 – NOV was issued 3/12/2019 for exceedance of permitted mercury effluent limits.
NOVs closed:	1. Case 167907 – NOV was closed on 4/7/2017 after January and February 2017 DMRs showed that the UV disinfection system was achieving compliance with E. coli limits. 2. Case 181703 – As required by the NOV, the Permittee submitted results of two consecutive samples that were within permitted mercury limits. The NOV was closed on 4/18/2019.
Compliance orders:	A Consent Judgement issued on December 21, 2015. The terms of the Consent Judgement included requiring Virgin River DWID to hire and continuously keep a Grade 2 or better WWTP operator, hire an engineer to complete an assessment of the collection system, and prepare and submit an operation and maintenance manual, quality assurance plan and an emergency response plan. The Permittee met the terms of the Consent Judgment during the previous permit term, and the Consent Judgment was closed on December 24, 2020.

VII. PERMIT CHANGES

The following table lists the major changes from the previous permit in this permit.

Parameter	Previous Permit	Current Permit	Reason for Change
Permitted Design Flow	0.04 MGD	0.0366 MGD	The permitted design flow was previously rounded. It has been set equal to the constructed design flow. All loading limits have been updated to reflect this change.
Reporting Location	Mail in hard copies of DMRs and other attachments	DMRs and other reports to be submitted	Language added to support the NPDES electronic DMR reporting rule that became effective on December 21, 2015.

		electronically through myDEQ portal	
Ammonia Impact Ratio (AIR)	Limits (Table 1 in Permit) Daily Maximum Limit: 1	Limits (Table 1 in Permit) Daily Maximum Limit: 2	The revised daily maximum AIR limit was established using procedures outlined in the EPA *Technical Support Document for Water-Quality Based Toxics Control* (TSD) (EPA/502/2090-001). The previous AIR limit was not calculated as a separate daily maximum limit. This change fixes a technical mistake made in the previous permit.
Biochemical Oxygen Demand (5-day) (BOD_5) and Total Suspended Solids (TSS)	Limits (Table 1 in Permit) Monthly Average Loading Limit: 4.5 kg/day Weekly Average Loading Limit: 6.8 kg/day	Limits (Table 1 in Permit) Monthly Average Loading Limit: 4.2 kg/day Weekly Average Loading Limit: 6.2 kg/day	The old loading limits were calculated using a rounded design flow of 0.04 MGD. The new loading limits were calculated using the constructed design flow of 0.0366 MGD.
Bis (2-ethylhexyl) phthalate	None	Assessment Levels (Table 2 in Permit) Monthly Average: 3 µg/L Daily Maximum: 4 µg/L Monitoring Frequency: 1x/6 months Effluent characterization monitoring: 3x/Permit term	Data submitted indicated there may be reasonable potential to cause or contribute to an exceedance of the surface water quality standard. Monitoring frequency set to be consistent with frequencies required for minor facilities to adequately determine compliance.
Chlorine, Total Residual (TRC)	Limits (Table 1 in Permit) Monthly Average Loading Limit: 1.4 g/day Daily Maximum Loading Limit: 2.7 g/day	Limits (Table 1 in Permit) Monthly Average Loading Limit: 1.2 g/day Daily Maximum Loading Limit: 2.5 g/day	The old loading limits were calculated using a rounded design flow of 0.04 MGD. The new loading limits were calculated using the constructed design flow of 0.0366 MGD.
Chlorodibromo-methane	None	Effluent characterization monitoring: 3x/Permit term	Data submitted indicated there may be reasonable potential to cause or contribute to an exceedance of the surface water quality standard. However, the one sample that triggered this finding was taken in 2016 when chlorine was being used for disinfection. Soon after, the facility switched to using their UV disinfection system and all samples were near or below reporting levels. While the facility continues using their UV system, this parameter is not expected to be a pollutant of concern. Therefore, only effluent characterization monitoring will be required, and only while chlorine is used for disinfection.

Chromium VI	Limits (Table 1 in Permit) Monthly Average Loading Limit: 1.2 g/day Daily Maximum Loading Limit: 2.5 g/day Monitoring Frequency: 1x/Year	Limits (Table 1 in Permit) Monthly Average Loading Limit: 1.1 g/day Daily Maximum Loading Limit: 2.2 g/day Monitoring Frequency: 1x/6 Months	The old loading limits were calculated using a rounded design flow of 0.04 MGD. The new loading limits were calculated using the constructed design flow of 0.0366 MGD. Monitoring frequency increased to be consistent with frequencies required for minor facilities to adequately determine compliance.
Chromium, Total	Limits (Table 1 in Permit) Monitoring Frequency: 1x/Year	Limits (Table 1 in Permit) Monitoring Frequency: 1x/6 Months	Total chromium is monitored in the Limits Table as a surrogate for chromium VI unless total chromium is greater than 8 µg/L. Monitoring frequency changed to be consistent with Chromium VI monitoring frequency.
Copper	Limits (Table 1 in Permit) Monthly Average Limits: 16.5 µg/L, 2.50 g/day Daily Maximum Limits: 33.1 µg/L, 50.1 g/day Monitoring Frequency: 1x/Year	Limits (Table 1 in Permit) Monthly Average Limits: 17 µg/L, 2.6 g/day Daily Maximum Limits: 43 µg/L, 6.5 g/day Monitoring Frequency: 1x/6 Months	Limits updated with respect to most recent effluent hardness measurements. Loading limits now calculated using the constructed design flow of 0.0366 MGD instead of a rounded design flow of 0.04 MGD. Monitoring frequency increased to be consistent with frequencies required for minor facilities to adequately determine compliance.
Cyanide	Assessment Levels (Table 2 in Permit) Monitoring Frequency: 1x/Year	Assessment Levels (Table 2 in Permit) Monitoring Frequency: 1x/6 Months	Monitoring frequency increased to be consistent with frequencies required for minor facilities to adequately determine compliance.
Dichlorobromo-methane	None	Effluent characterization monitoring: 3x/Permit term	Data submitted indicated there may be reasonable potential to cause or contribute to an exceedance of the surface water quality standard. However, the one sample that triggered this finding was taken in 2016 when chlorine was being used for disinfection. Soon after, the facility switched to using their UV disinfection system and all samples were near or below reporting levels. While the facility continues using their UV system, this parameter is not expected to be a pollutant of concern. Therefore, only effluent characterization monitoring will be required, and only while chlorine is used for disinfection.
E. coli	Monitoring Frequency: 4x/month	Monitoring Frequency: 1x/month	In 2007, the Permittee requested a major modification to their permit to decrease the monitoring frequency for E. coli from 4x/month to 1x/month with the

			justification that the distance from the facility to the nearest certified environmental laboratory was prohibitive. The modification was granted and the 1x/month frequency was maintained until the permit was renewed in 2016 when it was increased back to 4x/month. The Permittee has indicated that the 4x/month frequency continues to be impracticable. In 2016, the facility underwent significant efforts to fix issues with their UV disinfection system, and as of January 2021, the facility's E. coli data have not shown an exceedance of the water quality standards in four years. With that in mind, and taking into account that the closest certified laboratory is a 3 hour drive from the facility, the monitoring frequency for E. coli has been decreased back down to 1x/month.
Hardness	<u>Limits (Table 1 in Permit)</u> Monitoring Frequency: 1x/Year <u>Assessment Levels (Table 2 in Permit)</u> None	<u>Limits (Table 1 in Permit)</u> Monitoring Frequency: 1x/6 Months <u>Assessment Levels (Table 2 in Permit)</u> Monitor and report Monitoring Frequency: 1x/6 months concurrent with lead monitoring	As hardness must be sampled concurrently with copper, lead, silver, and zinc, the monitoring frequency has been changed to match the monitoring frequency of these metals.
Iron	<u>Assessment Levels (Table 2 in Permit)</u> Monthly Average: 819 µg/L Daily Maximum: 1640 µg/L Monitoring Frequency: 1x/6 months Effluent Characterization monitoring only: 3x/Permit term	Effluent Characterization monitoring only: 3x/Permit term	Data submitted indicated no reasonable potential to cause or contribute to an exceedance of the iron surface water quality standard. Assessment Levels have been removed and only effluent characterization monitoring will continue to be required.
Lead	Effluent Characterization monitoring only: 3x/Permit term	<u>Assessment Levels (Table 2 in Permit)</u> Monthly Average: 7.63 µg/L Daily Maximum: 15.3 µg/L	Data submitted indicated that there may be reasonable potential to cause or contribute to an exceedance of the lead surface water quality standard. Monitoring frequency set to be consistent with frequencies required for minor

		Monitoring Frequency: 1x/6 months Effluent characterization monitoring: 3x/Permit term	facilities to adequately determine compliance.
Mercury	<u>Limits (Table 1 in Permit)</u> Monthly Average Concentration Limit: 0.01 µg/ Monthly Average Loading Limit: 0.002 g/day Monitoring Frequency: 1x/Year	<u>Limits (Table 1 in Permit)</u> Monthly Average Concentration Limit: 0.007 µg/ Monthly Average Loading Limit: 0.0009 g/day Monitoring Frequency: 1x/6 Months	Rounding errors in concentration limit corrected. The old loading limits were calculated using a rounded design flow of 0.04 MGD. The new loading limits were calculated using the constructed design flow of 0.0366 MGD. (This did not cause a change in the daily maximum loading limit.) Monitoring frequency increased to be consistent with frequencies required for minor facilities to adequately determine compliance.
Oil & Grease	<u>Limits (Table 1 in Permit)</u> Monthly Average Loading Limit: 1.5 kg/day Daily Maximum Loading Limit: 2.3 kg/day	<u>Limits (Table 1 in Permit)</u> Monthly Average Loading Limit: 1.4 kg/day Daily Maximum Loading Limit: 2.1 kg/day	The old loading limits were calculated using a rounded design flow of 0.04 MGD. The new loading limits were calculated using the constructed design flow of 0.0366 MGD.
Selenium	<u>Limits (Table 1 in Permit)</u> Monthly Average Loading Limit: 0.3 g/day Monitoring Frequency: 1x/Year	<u>Limits (Table 1 in Permit)</u> Monthly Average Loading Limit: 0.2 g/day Monitoring Frequency: 1x/6 Months	The old loading limits were calculated using a rounded design flow of 0.04 MGD. The new loading limits were calculated using the constructed design flow of 0.0366 MGD. (This did not cause a change in the daily maximum loading limit.) Monitoring frequency for selenium limits increased to be consistent with frequencies required for minor facilities to adequately determine compliance.
Silver	<u>Limits (Table 1 in Permit)</u> Monthly Average Limits: 8.29 µg/L, 1.26 g/day Daily Maximum Limits: 16.6 µg/L, 2.51 g/day Monitoring Frequency: 1x/Year	<u>Limits (Table 1 in Permit)</u> Monthly Average Limits: 13.3 µg/L, 1.84 g/day Daily Maximum Limits: 26.7 µg/L, 3.69 g/day Monitoring Frequency: 1x/6 Months	Limits updated with respect to most recent effluent hardness measurements. Loading limits now calculated using the constructed design flow of 0.0366 MGD instead of a rounded design flow of 0.04 MGD. Monitoring frequency increased to be consistent with frequencies required for minor facilities to adequately determine compliance.

Zinc	Limits (Table 1 in Permit) Monthly Average Limits: 131 µg/L, 19.8 g/day Daily Maximum Limits: 263 µg/L, 39.8 g/day Monitoring Frequency: 1x/Year	Limits (Table 1 in Permit) Monthly Average Limits: 154 µg/L, 21.3 g/day Daily Maximum Limits: 332 µg/L, 46.0 g/day Monitoring Frequency: 1x/6 Months	Limits updated with respect to most recent effluent hardness measurements. Loading limits now calculated using the constructed design flow of 0.0366 MGD instead of a rounded design flow of 0.04 MGD. Monitoring frequency increased to be consistent with frequencies required for minor facilities to adequately determine compliance.
WET Testing	Limits for Chronic Toxicity for *Pseudokirchneriella subcapitata* (Green algae) Monthly Median: 1.0 TUc Daily Maximum: 1.6 TUc	Action Levels for Chronic Toxicity for *Pseudokirchneriella subcapitata* (Green algae) Monthly Median: 1.0 TUc Daily Maximum: 1.6 TUc	Limits were met during the previous permit term. Reasonable potential to cause or contribute to an exceedance of a surface water quality standard exists, so limits are being changed to action levels.
Effluent Characterization Monitoring (Tables 4a-4d)	Monitoring frequency of dissolved oxygen at 3x/permit term. Monitoring frequencies of nitrate/ nitrite (as N), total Kjeldahl nitrogen, and total phosphorous at 4x/permit term.	Monitoring frequency of 1x/year for dissolved oxygen, nitrate/nitrite (as N), total Kjeldahl nitrogen, and total phosphorous.	Monitoring frequency increased to be consistent with frequencies required for minor facilities to adequately characterize effluent.

Anti-backsliding considerations – "Anti-backsliding" refers to statutory (Section 402(o) of the Clean Water Act) and regulatory (40 CFR 122.44(l)) requirements that prohibit the renewal, reissuance, or modification of an existing NPDES permit that contains effluent limits, permit conditions, or standards that are less stringent than those established in the previous permit. The rules and statutes do identify exceptions to these circumstances where backsliding is acceptable. This permit has been reviewed and drafted with consideration of anti-backsliding concerns.

No limits have been removed from the permit. Limits are retained in the permit for parameters where reasonable potential (RP) for an exceedance of a standard continues to exist or is indeterminate. In these cases, limits will be recalculated using the most current Arizona Water Quality Standards (WQS). If less stringent limits result due to a change in the WQS then backsliding is allowed in accordance with Section 303(d)(4) of the Clean Water Act if the new limits are consistent with antidegradation requirements and the receiving water is in attainment of the new standard; see Section XII for information regarding antidegradation requirements.

The WQS for some metals are dependent on hardness. The use of current hardness data in Beaver Dam Wash led to increases in the WQS, which then led to increases in the limits for the following parameters:

- Copper
- Silver
- Zinc

This is considered allowable backsliding under 303(d)(4). The effluent limitations in the current permit for these parameters were based on state standards, the respective receiving waters are in attainment for these parameters, and the revisions are consistent with antidegradation requirements.

The daily maximum ammonia impact ratio (AIR) limit has been changed from 1 to 2. The revised daily maximum AIR limit was established using procedures outlined in the EPA *Technical Support Document for Water-Quality Based Toxics Control* (TSD) (EPA/502/2090-001). The previous AIR limit was not calculated as a separate daily maximum limit. This change fixes a technical mistake made in the previous permit, and therefore meets an exception to anti-backsliding under Section 402(o)(2)(B)(ii) of the Clean Water Act.

VIII. DETERMINATION OF EFFLUENT LIMITATIONS and ASSESSMENT LEVELS

When determining what parameters need monitoring and/or limits included in the permit, both technology-based and water quality-based criteria were compared and the more stringent criteria applied.

Technology-based Limitations: As outlined in 40 CFR Part 133:
The regulations found at 40 CFR §133 require that POTWs achieve specified treatment standards for BOD_5, TSS, and pH based on the type of treatment technology available. Therefore, technology-based effluent limitations (TBELs) have been established for these parameters. Additionally, oil & grease will be monitored with a TBEL based on best professional judgment (BPJ). The average monthly limit of 10 mg/L and daily maximum of 15 mg/L are commonly accepted values that can be achieved by properly operated and maintained WWTPs. This level is also considered protective of the narrative standard at A.A.C. R18-11-108(B).

Numeric Water Quality Standards: As outlined in A.A.C. R18-11-109 and Appendix A:
Per 40 CFR 122.44(d)(1)(ii), (iii) and (iv), discharge limits must be included in the permit for parameters with "reasonable potential" (RP), that is, those known to be or expected to be present in the effluent at a level that could potentially cause any applicable numeric water quality standard to be exceeded. RP refers to the possibility, based on the statistical calculations using the data submitted, or consideration of other factors to determine whether the discharge may exceed the Water Quality Standards. The procedures used to determine RP are outlined in the *Technical Support Document for Water Quality-based Toxics Control (TSD)* (EPA/505/2-90-001). In most cases, the highest reported value for a parameter is multiplied by a factor (determined from the variability of the data and number of samples) to determine a "highest estimated value". This value is then compared to the lowest applicable Water Quality Standard for the receiving water. If the value is greater than the standard, RP exists and a water quality-based effluent limitation (WQBEL) is required in the permit for that parameter. RP may also be determined from BPJ based on knowledge of the treatment facilities and other factors. The basis for the RP determination for each parameter with a WQBEL is shown in the table below.

Ammonia water quality criteria vary based on the pH and temperature at the time of effluent sampling. As a result, no single ammonia concentration can be included as a permit limit. To overcome this, an Ammonia Impact Ratio (AIR) of 1 for the monthly average and a value of 2 for the maximum daily limits has been established as the permit limits for ammonia. The AIR is calculated by dividing the ammonia concentration in the effluent by the applicable ammonia standard based on the receiving water pH and temperature at the time of sampling. If no receiving water is present at the time of sampling, pH and temperature shall be monitored in the effluent instead. AIR values will be reported on DMRs and on the Ammonia Data Log, which is included as Appendix B in the permit.

It is assumed that RP exists for exceedance of water quality criteria for the pollutants *E. coli* and, if chlorine or bromine is used in the treatment process, total residual chlorine (TRC). These parameters have been shown through extensive monitoring of WWTPs to fluctuate greatly and thus are not conducive to exclusion from limitation due to a lack of RP. Therefore, the permit contains WQBELs for *E. coli* and TRC.

The permit limits were established using a methodology developed by EPA. Long Term Averages (LTA) were calculated for each designated use and the lowest LTA was used to calculate the average monthly limit (AML) and maximum daily limit (MDL) necessary to protect all uses. This methodology takes into account criteria, effluent

variability, and the number of observations taken to determine compliance with the limit and is described in Chapter 5 of the TSD. Limits based on A&W criteria were developed using the "two-value steady state wasteload allocation" described on page 99 of the TSD. When the limit is based on human health criteria, the monthly average was set at the level of the applicable standard and a daily maximum limit was determined as specified in Section 5.4.4 of the TSD.

Mixing Zone

The limits in this permit were determined without the use of a mixing zone. Arizona state water quality rules require that water quality standards be achieved without mixing zones unless the permittee applies for and is approved for a mixing zone. Since a mixing zone was not applied for or granted, all water quality criteria are applied at end-of-pipe.

Assessment Levels (ALs)

ALs are listed in Part I.B of the permit. An AL differs from a discharge limit in that an exceedance of an AL is not a permit violation. Instead, ALs serve as triggers, alerting the permitting authority when there is cause for re-evaluation of RP for exceeding a water quality standard, which may result in new permit limitations. The AL numeric values also serve to advise the permittee of the analytical sensitivity needed for meaningful data collection. Trace substance monitoring is required when there is uncertain RP (based on non-detect values or limited datasets) or a need to collect additional data or monitor treatment efficacy on some minimal basis. A reopener clause is included in the permit should future monitoring data indicate water quality standards are being exceeded.

The requirement to monitor for these parameters is included in the permit according to A.A.C. R18-11-104(C) and Appendix A. ALs listed for each parameter were calculated in the same manner that a limit would have been calculated (see Numeric Water Quality Standards Section above).

The following trace substances were not included as limits or assessment levels in the permit due to a lack of RP based on best professional judgment (BPJ): nitrates, nitrites, and manganese. The numeric standards for these pollutants are well above what would be expected from a WWTP discharge.

Hardness

The permittee is required to sample hardness as $CaCO_3$ at the same time the trace metals are sampled because the water quality standards for some metals are calculated using the water hardness values. The hardness value of 342 mg/L (the average hardness of the receiving stream) was used to calculate the applicable water quality standards and any assessment levels or limits for the hardness-dependent metals (cadmium, chromium III, copper, lead, nickel, silver and zinc).

Whole Effluent Toxicity (WET)

WET testing is required in the permit (Parts I.C and IV) to evaluate the discharge according to the narrative toxic standard in A.A.C. R18-11-108(A)(5), as well as whether the discharge has RP for WET per 40 CFR 122.44(d)(iv).

WET testing for chronic toxicity shall be conducted using the following three surrogate species:
[All three species are applicable to chronic and acute testing, if permit only has acute testing remove algae]

- *Ceriodaphnia dubia* (water flea) – for evaluating toxicity to invertebrates
- *Pimephales promelas* (fathead minnow) – for evaluating toxicity to vertebrates
- *Pseudokirchneriella subcapitata* (formerly known as *Selenastrum capricornutum or Raphidocelis subcapitata)* (a green alga) – for evaluating toxicity to plant life

ADEQ does not have a numeric standard for Whole Effluent Toxicity. However, ADEQ adopted the EPA recommended chronic toxicity benchmark of 1.0 TUc for a four day exposure period. Using this benchmark, the action levels for WET included in the permit were calculated in accordance with the methods specified in the *TSD*. The species chosen for

WET testing are as recommended in the *TSD* and in *Regions 9 & 10 Guidance for Implementing Whole Effluent Toxicity Testing Programs*.

An exceedance of an action level will trigger follow-up testing to determine if effluent toxicity is persistent. If toxicity above a limit or action level is found in a follow-up test, the permittee will be required to conduct a Toxicity Reduction Evaluation (TRE) and possibly a Toxicity Identification Evaluation (TIE) to identify the source of toxicity and reduce toxicity. These conditions are required to ensure that toxicants are not discharged in amounts that are toxic to organisms [A.A.C. R18-11-108(A)(5)]. A reopener clause is included in accordance with 40 CFR Parts 122 and 124 and AAC R18-9-B906.

The permit requires 8-hour composite samples be collected for WET testing. An 8-hour composite sample type was chosen over the suggested 24-hour composite for WET testing in order to have consistency with the type of sample required for other parameters requiring monitoring in this permit. WET sampling must coincide with testing for all the parameters in Parts I.A and B of the permit, when testing of those parameters is required, to aid in the determination of the cause of toxicity if toxicity is detected. Additional procedural requirements for the WET test are included in the permit.

The required WET monitoring frequency for this facility is consistent with the WET testing frequency required for facilities with a similar design flow. The permit requires WET test results to be reported on discharge monitoring reports and submittal of the full WET lab report to ADEQ.

Effluent Characterization (EC)

In addition to monitoring for parameters assigned either a limit or an AL, sampling is required to assess the presence of pollutants in the discharge at certain minimum frequencies for additional suites of parameters, whether the facility is discharging or not. This monitoring is specified in Tables 4.a. through 4.d., *Effluent Characterization Testing,* as follows:

- Table 4.a. – General Chemistry and Microbiology: ammonia, BOD-5, *E. coli*, total residual chlorine (TRC), dissolved oxygen, total Kjeldahl nitrogen (TKN), nitrate/nitrite, oil and grease, pH, phosphorus, temperature, total dissolved solids (TDS), and total suspended solids (TSS)
- Table 4.b. – Selected Metals, Hardness, Cyanide, and WET
- Table 4.c. – Selected Volatile Organic Compounds
- Table 4.d. – Selected Base-Neutral Compounds

NOTE: Some parameters listed in Tables 4.a., 4.b., 4.c. and 4.d. are also listed in Tables 1 or 2. In this case, the data from monitoring under Tables 1 or 2 may be used to satisfy the requirements of Tables 4.a., 4.b, 4.c and/or 4.d., provided the specified sample types are the same. In the event the facility does not discharge to a water of the U.S. during the life of the permit, EC monitoring of representative samples of the effluent is still required.

The purpose of EC monitoring is to characterize the effluent and determine if the parameters of concern are present in the discharge and at what levels. This monitoring will be used to assess RP per 40 CFR 122.44(d)(1)(iii)). EC monitoring is required in accordance with 40 CFR 122.43(a), 40 CFR 122.44(i), and 40 CFR 122.48(b) as well as A.R.S. §49-203(A)(7). If pollutants are noted at levels of concern during the permit term, this permit may also be reopened to add related limits or conditions.

Permit Limitations and Monitoring Requirements

The table that follows summarizes the parameters that are limited in the permit and the rationale for that decision. Also included are the parameters that require monitoring without any limitations or that have not been included in the permit at all and the basis for those decisions. The corresponding monitoring requirements are shown for each parameter. In general, the regulatory basis for monitoring requirements is per 40 CFR §122.44(i) *Monitoring requirements,* and 40 CFR §122.48(b), *Required monitoring*; all of which have been adopted by reference in A.A.C. R18-9-A905, *AZPDES Program Standards*.

Parameter	Lowest Standard / Designated Use	Maximum Reported Daily Value	No. of Samples	Estimated Maximum Value	RP Determination	Monitoring Requirement/ Rationale (1)
Flow	N/A	0.044 MGD	52	N/A	N/A	Discharge flow is to be monitored on a continual basis using a flow meter.
Biological Oxygen Demand (5-day) (BOD_5) and Total Suspended Solids (TSS)	30 mg/L 30-day average 45 mg/L 7-day average 85% removal/ Technology-based limits 40 CFR 133.102	BOD_5: 12 mg/L TSS: 38 mg/L	BOD_5: 52 TSS: 52	N/A	TBELs for BOD_5 and TSS are always applicable to WWTPs.	Monitoring for influent and effluent BOD_5 and TSS is to be conducted using composite samples of the influent and the effluent. The sample type required was chosen to be representative of the discharge. TBELs for BOD_5 and TSS are maintained in the permit. The requirement to monitor influent BOD_5 and TSS is included to assess compliance with the 85% removal requirement in this permit. At least one sample must coincide with WET testing to aid in the determination of the cause of toxicity, if toxicity is detected. Monthly Average Limits: 30 mg/L, 4.2 kg/day; Daily Maximum Limits: 45 mg/L, 6.2 kg/day; Monitoring Frequency: 1x/Month Removal Limit: Minimum of 85% removal on a monthly basis
Chlorine, Total Residual (TRC)	11 µg/L/ A&Ww chronic	< 20 µg/L	3	N/A	RP always expected when chlorine or bromine compounds are used for disinfection.	Virgin River DWID WWTP uses UV disinfection with chlorination as a backup. When chlorine or bromine compounds are used for disinfection, TRC is to be monitored as a discrete sample. WQBELs remain in the permit. 40 CFR Part 136 specifies that discrete samples must be collected for chlorine. At least one sample per month must coincide with WET testing to aid in the determination of the cause of toxicity, if toxicity is detected. Monthly Average Limits: 9.0 µg/L, 1.2 g/day; Daily Maximum Limits: 18 µg/L, 2.5 g/day; Monitoring Frequency: 1x/Week
E. coli	30-day geometric mean: 126 cfu /100 mL (4 sample minimum) Single sample maximum: 235 cfu /100 mL/ FBC	>2419.2 cfu/100 mL	52	N/A	RP always expected for WWTPs. See explanation above.	*E. coli* is to be monitored as a discrete sample and WQBELs remain in the permit. Monthly Average Limit (as a Geometric mean): 126 cfu/100 mL; Daily Maximum Limit: 235 cfu/100 mL; Monitoring Frequency: 1x/Month

Parameter	Lowest Standard / Designated Use	Maximum Reported Daily Value	No. of Samples	Estimated Maximum Value	RP Determination	Monitoring Requirement/ Rationale (1)
pH	Minimum: 6.5 Maximum: 9.0 / A&Ww, FBC, and AgL A.A.C. R18-11-109(B) Minimum: 6.0 Maximum: 9.0 Technology-based effluent limits 40 CFR 133.102	Minimum: 6.5 S.U Maximum: 7.8 S.U. (Effluent)	Minimum: 52 Maximum: 52	N/A	WQBEL or TBEL is always applicable to WWTPs.	pH is to be monitored using a discrete sample of the effluent. WQBELs remain in the permit as they are more stringent than the TBELs. 40 CFR Part 136 specifies that grab samples must be collected for pH. At least one sample must coincide with WET testing to aid in the determination of the cause of toxicity if toxicity is detected. pH monitoring in the receiving water (or effluent if no receiving water is present) must also occur and coincide with ammonia sampling when required. Effluent Limits: Not less than 6.5 standard units (S.U.) nor greater than 9.0 S.U. Monitoring Frequency: 1x/Week Monitoring Frequency in Receiving Water (or effluent if no receiving water present) to coincide with ammonia sampling: 1x/Month
Temperature	The maximum allowable increase in ambient water temperature due to a thermal discharge is 3.0°C / A&Ww R18-11-109(C)	33ºC (Effluent)	52	N/A	N/A	Effluent temperature is to be monitored for effluent characterization by discrete sample. 40 CFR Part 136 specifies that discrete samples must be collected for temperature. Temperature sampling in the receiving water (or effluent if no receiving water is present) must also occur and coincide with ammonia sampling when required. Monitoring Frequency in Effluent: 3x/Permit Term Monitoring Frequency in Receiving Water (or effluent if no receiving water present) to coincide with ammonia sampling: 1x/Month
Total Dissolved Solids (TDS)	723 mg/L flow-weighted annual average below Hoover Dam / A.A.C. R18-11-110 Colorado River Basin Salinity Control Forum requirements apply: Criteria for municipal dischargers – The increase in concentration between inflow and outflow cannot be greater than 400 mg/L.	960 mg/L (Effluent) 690 mg/L (Source Water) Maximum Increase in Concentration between Source Water and Effluent: 400 mg/L	4 (Effluent) 5 (Source Water) 3 (Number of times effluent and source water were sampled concurrently)	N/A	RP Indeterminate (Insufficient data)	During the permit term, the difference between the source water and effluent could be calculated for three sampling events. The maximum increase in TDS concentration between the source water and effluent was 400 mg/L, which is equal to the maximum allowable increase set by the Colorado River Basin Salinity Control Forum. A finding of "RP Indeterminate" has been made, and both the source water and the effluent shall continue to be monitored for TDS to determine compliance with Colorado River Basin Salinity Control Forum requirements Monitoring Frequency: 3x/Permit term

Parameter	Lowest Standard / Designated Use	Maximum Reported Daily Value	No. of Samples	Estimated Maximum Value	RP Determination	Monitoring Requirement/ Rationale (1)
Ammonia as Nitrogen and Ammonia Impact Ratio (AIR)	Ammonia as Nitrogen: Water quality standard varies with temperature and pH AIR: 1 (When the AIR = 1, the effluent concentration is equal to the water quality standard)	Ammonia as Nitrogen: 3.97 mg/L, AIR: 3.97	52	N/A	RP Exists	Ammonia is to be monitored by discrete sample and WQBELs in the form of an ammonia impact ratio (AIR) have been maintained in the permit (5). An ammonia data log with concurrent pH and temperature monitoring is also required. One sample must coincide with WET sampling to aid in the determination of the cause of toxicity, if toxicity is detected. Monthly Average Limit: AIR = 1 Daily Maximum Limit: AIR = 2 Monitoring Frequency: 1x/Month
Dissolved Oxygen	The discharge shall not cause the dissolved oxygen concentration in the receiving water to fall below 6 mg/l, unless the percent saturation of oxygen remains equal to or greater than 90%. / A&Ww	Maximum: 6.1 mg/L Minimum: 2.0 mg/L	3	N/A	RP Indeterminate (Insufficient data)	Monitoring required for effluent characterization. Monitoring Frequency: 1x/Year
Nutrients (Total Nitrogen and Total Phosphorus)	No applicable standards for Total Nitrogen or Total Phosphorous	Total Nitrogen: 24 mg/L Total Phosphorous: 2.7 mg/L	Total Nitrogen: 46 Total Phosphorous: 5	N/A	N/A	Monitoring required for nitrate/nitrite (as N), total Kjeldahl nitrogen, and total phosphorous for purposes of effluent characterization. Monitoring Frequency: 1x/Year
Oil & Grease	BPJ Technology-Based Level of 10 mg/L monthly average and 15 mg/L daily maximum	5.2 mg/L	5	N/A	N/A	Monitoring required and TBELs remain in the permit.. Monthly Average Limits: 10 mg/L, 1.4 kg/day; Daily Maximum Limits: 15 mg/L, 2.1 kg/day; Monitoring Frequency: 1x/Year
Antimony	30 µg/L/ A&Ww chronic	< 3.0 µg/L	17	3.6 µg/L	No RP	Monitoring required for effluent characterization. Monitoring Frequency: 3x/Permit term
Arsenic	30 µg/L/ FBC	7.2 µg/L	17	12 µg/L	No RP	Monitoring required for effluent characterization. Monitoring Frequency: 3x/Permit term

Parameter	Lowest Standard / Designated Use	Maximum Reported Daily Value	No. of Samples	Estimated Maximum Value	RP Determination	Monitoring Requirement/ Rationale (1)
Barium	98,000 µg/L / FBC	< 200 µg/L	14	300 µg/L	No RP	Permittee submitted data for barium showing twelve out of fourteen samples above reporting levels. No reasonable potential to cause or contribute to an exceedance of a surface water quality standard was found. Barium is not expected to be a pollutant of concern for this facility as reported levels are significantly lower than the applicable water quality standard. Therefore, no monitoring is being required.
Beryllium	5.3 µg/L/ A&Ww chronic	< 1.0 µg/L	16	1.25 µg/L	No RP	Monitoring required for effluent characterization. Monitoring Frequency: 3x/Permit term
Bis (2-ethylhexyl) phthalate	3 µg/L / FC	1.9 µg/L	9	6.1 µg/L	RP Indeterminate (Limited detectable data)	Permittee submitted data for bis (2-ethylhexyl) phthalate showing two out of nine samples above reporting levels. The source of this pollutant is unknown. Monitoring is required and assessment levels have been developed and added to the permit. Monthly Average Assessment Level: 3 µg/L Daily Maximum Assessment Level: 4 µg/L Monitoring Frequency: 1x/6 months
Boron	186,667 µg/L/ FBC	250 µg/L	1	3300 µg/L	No RP	Permittee submitted one data point for boron, which was above the reporting level. No reasonable potential to cause or contribute to an exceedance of a surface water quality standard was found. Boron is not expected to be a pollutant of concern for this facility as reported levels are significantly lower than the applicable water quality standard. Additionally, as discussed in Section IV, the facility is presumed to be a de minimus source of boron with respect to Nevada's boron TMDL at the Arizona-Nevada state line. Therefore, no monitoring is being required.
Bromoform	133 µg/L / FC	4.9 µg/L	8	16 µg/L	No RP	Permittee submitted data for bromoform showing three out of eight samples above reporting levels. No reasonable potential to cause or contribute to an exceedance of a surface water quality standard was found. No monitoring is being required as bromoform is not expected to be a pollutant of concern for this facility.
Cadmium (2)	5.54 µg/L/ A&Ww chronic	< 1.0 µg/L	16	1.3 µg/L	No RP	Monitoring required for effluent characterization. Monitoring Frequency: 3x/Permit term

Parameter	Lowest Standard / Designated Use	Maximum Reported Daily Value	No. of Samples	Estimated Maximum Value	RP Determination	Monitoring Requirement/ Rationale (1)
Chlorodibromomethane	13 µg/L / FC	5.5 µg/L	8	18 µg/L	RP Indeterminate (Limited detectable data)	Permittee submitted data for chlorodibromomethane showing two out of eight samples above reporting levels. This parameter is not expected to be a pollutant of concern while the facility utilizes their UV disinfection system. Therefore, effluent characterization monitoring only is required, and only when chlorine is used for disinfection. Monitoring Frequency: 3x/Permit Term
Chloroform	230 µg/L / FBC	10 µg/L	8	33 µg/L	No RP	Permittee submitted data for chloroform showing three out of eight samples above reporting levels. No reasonable potential to cause or contribute to an exceedance of a surface water quality standard was found. No monitoring is being required as chloroform is not expected to be a pollutant of concern for this facility.
Chromium (Total)	1,000 µg/L/ AgL	24 µg/L	18	58 µg/L	No RP	Indicator parameter for chromium VI. Monitoring required. If total chromium exceeds 8 µg/L, monitoring for chromium VI is required for the remainder of the permit term. Monthly Average Concentration: Report Daily Maximum Concentration: Report Monitoring Frequency: 1x/6 months
Chromium VI	11 µg/L/ A&Ww chronic	< 5 µg/L	1	40 µg/L	RP Indeterminate (Limited data)	Monitoring for total chromium is required as an indicator parameter for chromium VI. If total chromium exceeds 8 µg/L, monitoring for chromium VI is required for the remainder of the permit term. WQBELs remain in the permit with one small correction due to a previous rounding error. Monthly Average Limits: 8.0 µg/L, 1.1 g/day; Daily Maximum Limits: 16 µg/L, 2.2 g/day; Monitoring Frequency: 1x/6 Months
Copper (2)	26 µg/L/ A&Ww chronic	49 µg/L	16	180 µg/L	RP Exists	Monitoring required and WQBELs remain in the permit. WQBELs have been updated based on the most recent hardness data. Monthly Average Limits: 17 µg/L, 2.4 g/day; Daily Maximum Limits: 43 µg/L, 5.9 g/day; Monitoring Frequency: 1x/6 Months

Parameter	Lowest Standard / Designated Use	Maximum Reported Daily Value	No. of Samples	Estimated Maximum Value	RP Determination	Monitoring Requirement/ Rationale (1)
Cyanide	9.7 µg/L/ A&Ww chronic	< 50 µg/L	17	60 µg/L	RP Indeterminate (High LOQ)	Monitoring is required and assessment levels remain in the permit. Monthly Average Assessment Level: 7.9 µg/L Daily Maximum Assessment Level: 16 µg/L Monitoring Frequency: 1x/6 months
Di (2-ethylhexyl) adipate	560,000 µg/L /FBC	0.68 µg/L	8	2.2 µg/L	No RP	Permittee submitted data for di (2-ethylhexyl) adipate showing one out of eight samples above reporting levels. No reasonable potential to cause or contribute to an exceedance of a surface water quality standard was found. Di (2-ethylhexyl) adipate is not expected to be a pollutant of concern for this facility as reported levels are significantly lower than the applicable water quality standard. Therefore, no monitoring is being required.
Dichlorobromomethane	17 µg/L / FC	12 µg/L	8	40 µg/L	RP Indeterminate (Limited detectable data)	Permittee submitted data for dichlorobromomethane showing two out of eight samples above reporting levels .This parameter is not expected to be a pollutant of concern while the facility utilizes their UV disinfection system. Therefore, effluent characterization monitoring only is required, and only when chlorine is used for disinfection. Monitoring Frequency: 3x/Permit Term
Hardness	No applicable standard. Hardness is used to determine standards for specific metal parameters.	420 mg/L (Beaver Dam Wash) 470 mg/L (Effluent)	5 (Beaver Dam Wash) 8 (Effluent)	N/A	N/A	A&W water quality standards for cadmium, copper, lead, nickel, silver and zinc used for RP determinations were based on the average receiving water hardness value of 342 mg/L. Monitoring for hardness in the receiving water is required whenever monitoring for hardness-dependent metals is required. If no receiving water is present at the time of sampling, hardness shall be monitored in the effluent instead. Monitoring Frequency: 1x/6 months

Parameter	Lowest Standard / Designated Use	Maximum Reported Daily Value	No. of Samples	Estimated Maximum Value	RP Determination	Monitoring Requirement/ Rationale (1)
Hydrogen Sulfide	2 µg/L/ A&Ww chronic	No Data	0	N/A	RP Indeterminate (No Data)	Monitoring is required for sulfides as an indicator parameter for hydrogen sulfide. If sulfides are detected, monitoring for hydrogen sulfide is required for the remainder of the permit term. Sulfide data from the previous permit term were below the reporting limit of 50 µg/L. While this does not definitively indicate reasonable potential, reasonable potential for hydrogen sulfide cannot be ruled out because the reporting limit for sulfides (50 µg/L) was above the WQS for hydrogen sulfide (2 µg/L). Therefore, a "RP Indeterminate" finding has been made for hydrogen sulfide, and assessment levels for hydrogen sulfide remain in the permit with sulfides monitoring as an indicator parameter. Monthly Average Assessment Level: 2 µg/L Daily Maximum Assessment Level: 3 µg/L Monitoring Frequency: 1x/Year
Iron	1,000 ug/L / A&Ww chronic	240 µg/L	6	912 µg/L	No RP	Monitoring required for effluent characterization. Monitoring Frequency: 3x/Permit term
Lead (2)	9.31 µg/L / A&Ww chronic	< 15 µg/L	3	19 µg/L	RP Indeterminate (High LOQ)	Monitoring is required and assessment levels have been developed based on the most recent hardness data and added to the permit. Monthly Average Assessment Level: 7.63 µg/L Daily Maximum Assessment Level: 15.3 µg/L Monitoring Frequency: 1x/6 months
Mercury	0.01 µg/L/ A&Ww chronic	0.99 µg/L	23	4.1 µg/L	RP Exists	Monitoring is required and WQBELs remain in the permit with some small adjustments due to previous rounding errors. Monthly Average Limits: 0.007 µg/L, 0.0009 g/day; Daily Maximum Limits: 0.02 µg/L, 0.003 g/day; Monitoring Frequency: 1x/6 Months
Nickel (2)	147 µg/L/ A&Ww chronic	< 10 µg/L	12	14 µg/L	No RP	Monitoring required for effluent characterization. Monitoring Frequency: 3x/Permit term
Pentachlorophenol	9.5 µg/L / A&Ww chronic	0.042 µg/L	8	0.14 µg/L	No RP	Permittee submitted data for pentachlorophenol showing one out of eight samples above reporting levels. No reasonable potential to cause or contribute to an exceedance of a surface water quality standard was found. Pentachlorophenol is not expected to be a pollutant of concern for this facility as reported levels are significantly lower than the applicable water quality standard. Therefore, no monitoring is being required.

Parameter	Lowest Standard / Designated Use	Maximum Reported Daily Value	No. of Samples	Estimated Maximum Value	RP Determination	Monitoring Requirement/ Rationale (1)
Selenium	2 µg/L/ A&Ww chronic	3.2 µg/L	19	7.4 µg/L	RP Exists	Monitoring is required and WQBELs remain in the permit with one small correction due to a previous rounding error. Monthly Average Limits: 2 µg/L, 0.2 g/day; Daily Maximum Limits: 3 µg/L, 0.5 g/day; Monitoring Frequency: 1x/6 Months
Silver (2)	26.7 µg/L/ A&Ww acute	10 µg/L	7	35 µg/L	RP Indeterminate (Limited detectable data)	Monitoring required and WQBELs remain in the permit. WQBELs have been updated based on the most recent hardness data. Monthly Average Limits: 13.3 µg/L, 1.84 g/day; Daily Maximum Limits: 26.7 µg/L, 3.69 g/day; Monitoring Frequency: 1x/6 Months
Sulfides	No applicable standard	< 50 µg/L	5	N/A	N/A	Indicator parameter for hydrogen sulfide. Monitoring required. If sulfides are detected, monitoring for hydrogen sulfide is required for the remainder of the permit term. Sulfide data from the previous permit term were below the reporting limit of 50 µg/L. While this does not definitively indicate reasonable potential, reasonable potential for hydrogen sulfide cannot be ruled out because the reporting limit for sulfides (50 µg/L) was above the WQS for hydrogen sulfide (2 µg/L). Therefore, a "RP Indeterminate" finding has been made for hydrogen sulfide, and assessment levels for hydrogen sulfide remain in the permit with sulfides monitoring as an indicator parameter. Monthly Average Concentration: Report Daily Maximum Concentration: Report Monitoring Frequency: 1x/Year
Thallium	7.2 µg/L/ FC	< 1.0 µg/L	17	1.2 µg/L	No RP	Monitoring required for effluent characterization. Monitoring Frequency: 3x/Permit term
Zinc (2)	332 µg/L/ A&Ww acute and chronic	160 µg/L	16	448 µg/L	RP Exists	Monitoring required and WQBELs remain in the permit. WQBELs have been updated based on the most recent hardness data. Monthly Average Limits: 154 µg/L, 21.3 g/day; Daily Maximum Limits: 332 µg/L, 46.0 g/day; Monitoring Frequency: 1x/6 Months

Parameter	Lowest Standard / Designated Use		Maximum Reported Daily Value	No. of Samples	Estimated Maximum Value	RP Determination	Monitoring Requirement/ Rationale (1)
Whole Effluent Toxicity (WET)	No toxicity (A.A.C. R18-11-108(A)(6)	*Pseudo-kirchneriella subcapitata* (Green algae) *(3)*	1.0 TUc	1	N/A	RP Indeterminate (4)	Monitoring required and an action level is set. Monthly Median Action Level: 1.0 TUc Daily Maximum Action Level: 1.6 TUc Monitoring Frequency: 1x/4th year of the permit term during the winter months
		Pimephales promelas (Fathead minnow)	1.0 TUc	1	N/A	RP Indeterminate (4)	Monitoring required and an action level is set. Monthly Median Action Level: 1.0 TUc Daily Maximum Action Level: 1.6 TUc Monitoring Frequency: 1x/4th year of the permit term during the winter months
		Ceriodaphnia dubia (Water flea)	1.0 TUc	1	N/A	RP Indeterminate (4)	Monitoring required and an action level is set. Monthly Median Action Level: 1.0 TUc Daily Maximum Action Level: 1.6 TUc Monitoring Frequency: 1x/4th year of the permit term during the winter months

Footnotes:
(1) The monitoring frequencies are as specified in the permit.
(2) Hardness-dependent metal - the standard for this parameter is based on the average hardness value of the effluent or receiving water as indicated above.
(3) Formerly known as *Selenastrum capricornutum or Raphidocelis subcapitata.*
(4) Monitoring with ALs or Action Levels always required for WWTPs for these parameters unless RP exists and limits are set.
(5) An AIR will be calculated by dividing effluent ammonia concentration by the applicable standard, calculated using the receiving water (or the effluent if no receiving water is present) pH and temperature.

VIII. NARRATIVE WATER QUALITY STANDARDS

All narrative limitations in A.A.C. R18-11-108 that are applicable to the receiving water are included in Part I, Section E of the permit.

IX. MONITORING AND REPORTING REQUIREMENTS (Part II of Permit)

Section 308 of the Clean Water Act and 40 CFR Part 122.44(i) require that monitoring be included in permits to determine compliance with effluent limitations. Additionally, monitoring may be required to gather data for future effluent limitations or to monitor effluent impacts on receiving water quality.

Monitoring frequencies are based on the nature and effect of the pollutant, as well as a determination of the minimum sampling necessary to adequately monitor the facility's performance. Monitoring frequencies for some parameters may be reduced in subsequent permits if all monitoring requirements have been met and the limits or ALs for those parameters have not been exceeded during the first permit term.

For the purposes of this permit, an "8-hour composite" sample has been defined as a flow-proportioned mixture of two or more discrete samples (aliquots) obtained at equal time intervals over an 8-hour period (if only two samples are collected, they should be taken approximately 8 hours apart). The volume of each aliquot shall be directly proportional to the discharge flow rate at the time of sampling.

These criteria for composite sampling are included in order to obtain samples that are representative of the discharge given the potential variability in the duration, frequency and magnitude of discharges from this facility.

Discrete (i.e., grab) samples are specified in the permit for parameters that for varying reasons are not amenable to compositing.

Monitoring locations are specified in the permit (Part II.A.1 and Part III.J) in order to ensure that representative samples of the influent and effluent are consistently obtained.

The requirements in the permit pertaining to Part II, Monitoring and Reporting, are included to ensure that the monitoring data submitted under this permit is accurate in accordance with 40 CFR 122.41(e). The permittee has the responsibility to determine that all data collected for purposes of this permit meet the requirements specified in this permit and is collected, analyzed, and properly reported to ADEQ.

The permit (Part II.A.3) requires the permittee to keep a Quality Assurance (QA) manual at the facility, describing sample collection and analysis processes; the required elements of the QA manual are outlined.

Reporting requirements for monitoring results are detailed in Part II, Section B of the permit, including completion and submittal of Discharge Monitoring Reports (DMRs) and Ammonia Data Logs. The permittee is responsible for conducting all required monitoring and reporting the results to ADEQ on DMRs or as otherwise specified in the permit.

Electronic reporting

The US EPA has published a final regulation that requires electronic reporting and sharing of Clean Water Act National Pollutant Discharge Elimination System (NPDES) program information instead of the current paper-based reporting (Federal Register, Vol. 80, No. 204, October 22, 2015). Beginning December 21, 2016 (one year after the effective date of the regulation), the Federal rule required permittees to make electronic submittals of any monitoring reports and

forms called for in their permits. ADEQ has created an online portal called myDEQ that allows users to submit their discharge monitoring reports and other applicable reports required in the permit.

The permit also requires annual submittal of an Ammonia Data Log that records the results for temperature, pH, and ammonia samples and date of sampling (Part II.B.3). Because the ammonia standards in 18 A.A.C. 11, Article 1, Appendix A are contingent upon the pH and temperature at the time of sampling for ammonia, the permittee must determine the applicable ammonia standard using the ammonia criteria table(s) and calculate the Ammonia Impact Ratio for that ammonia sample result. The AIR is recorded on the DMR.

Requirements for retention of monitoring records are detailed in Part II.D of the permit.

X. BIOSOLIDS REQUIREMENTS (Part III in Permit)

Standard requirements for the monitoring, reporting, record keeping, and handling of biosolids, as well as minimum treatment requirements for biosolids according to 40 CFR Part 503 are incorporated in the permit.

XI. SPECIAL CONDITIONS (Part V in Permit)

Operation

This permit condition requires the permittee to ensure that the WWTP has an operator who is certified at the appropriate level for the facility, in accordance with A.A.C. R18-5-104 through -114. The required certification level for the WWTP operator is based on the class (Wastewater Treatment Plant) and grade of the facility, which is determined by population served, level of treatment, and other factors.

Permit Reopener

This permit may be modified based on newly available information; to add conditions or limits to address demonstrated effluent toxicity; to implement any EPA-approved new Arizona water quality standard; or to re-evaluate reasonable potential (RP), if assessment levels in this permit are exceeded [A.A.C. R18-9-B906 and 40 CFR Part 122.62 (a) and (b)].

XII. ANTIDEGRADATION

Antidegradation rules have been established under A.A.C. R18-11-107 to ensure that existing surface water quality is maintained and protected. The discharge from the Virgin River DWID WWTP will be to an intermittent water with Tier 1 antidegradation protection. This is a renewal permit for an existing facility with no new or expanded discharge, and the existing uses have been maintained. Therefore, an antidegradation review is not required at this time. Effluent quality limitations and monitoring requirements have been established under the permit to ensure that the discharge will meet the applicable water quality standards. As long as the permittee maintains consistent compliance with these provisions, the designated uses of the receiving water will be presumed protected, and the facility will be deemed to meet currently applicable antidegradation requirements under A.A.C. R18-11-107.

XIII. STANDARD CONDITIONS

Conditions applicable to all NPDES permits in accordance with 40 CFR, Part 122 are attached as an appendix to this permit.

XIV. ADMINISTRATIVE INFORMATION

Public Notice (A.A.C. R18-9-A907)
The public notice is the vehicle for informing all interested parties and members of the general public of the contents of a draft AZPDES permit or other significant action with respect to an AZPDES permit or application. The basic intent of this requirement is to ensure that all interested parties have an opportunity to comment on significant actions of the permitting agency with respect to a permit application or permit. This permit will be public noticed in a local newspaper after a pre-notice review by the applicant and other affected agencies.

Public Comment Period (A.A.C. R18-9-A908)
Rules require that permits be public noticed in a newspaper of general circulation within the area affected by the facility or activity and provide a minimum of 30 calendar days for interested parties to respond in writing to ADEQ. After the closing of the public comment period, ADEQ is required to respond to all significant comments at the time a final permit decision is reached or at the same time a final permit is actually issued.

Public Hearing (A.A.C R18-9-A908(B))
A public hearing may be requested in writing by any interested party. The request should state the nature of the issues proposed to be raised during the hearing. A public hearing will be held if the Director determines there is a significant amount of interest expressed during the 30-day public comment period, or if significant new issues arise that were not considered during the permitting process.

EPA Review (A.A.C. R18-9-A908(C)
A copy of the draft permit and any revisions made to the draft as a result of public comments received will be sent to EPA Region 9 for review. If EPA objects to a provision of the draft, ADEQ will not issue the permit until the objection is resolved.

XV. ADDITIONAL INFORMATION

Additional information relating to this permit may be obtained from:

Arizona Department of Environmental Quality
Water Quality Division – Surface Water Permits Unit
Attn: Angela Athey
1110 West Washington Street
Phoenix, Arizona 85007

Or by contacting Angela Athey at (602) 771 – 2323 or by e-mail at athey.angela@azdeq.gov.

XVI. INFORMATION SOURCES

While developing effluent limitations, monitoring requirements, and special conditions for the permit, the following information sources were used:

1. AZPDES Permit Application Forms 2A and 2S, received December 2, 2020, along with supporting data, facility diagram, and maps submitted by the applicant with the application forms.

2. Supplemental information to the application received by ADEQ on December 22, 2020 and January 20, 2021.

3. ADEQ files on Virgin River DWID WWTP.

4. ADEQ Geographic Information System (GIS) Website

5. Arizona Administrative Code (AAC) Title 18, Chapter 11, Article 1, *Water Quality Standards for Surface Waters,* adopted December 31, 2016.

6. A.A.C. Title 18, Chapter 9, Article 9. *Arizona Pollutant Discharge Elimination System* rules.

7. Code of Federal Regulations (CFR) Title 40:
   Part 122, *EPA Administered Permit Programs: The National Pollutant Discharge Elimination System.*
   Part 124, *Procedures for Decision Making*.
   Part 133. *Secondary Treatment Regulation.*
   Part 503. *Standards for the Use or Disposal of Sewage Sludge*.

8. EPA Technical Support Document for Water Quality-based Toxics Control dated March 1991.

9. *Regions 9 & 10 Guidance for Implementing Whole Effluent Toxicity Testing Programs*, US EPA, May 31, 1996.

10. *Short-term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to Freshwater Organisms* (EPA /821-R-02-013).

11. U.S. EPA NPDES Permit Writers' Manual, September 2010.