MEMORANDUM

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Aaron Scheff, Administrator, DEQ Boise Regional Office
Valerie Greear, PE, Engineering Manager, DEQ Boise Regional Office

FROM: Dan Smith, PE, Senior Water Quality Engineer, DEQ Boise Regional Office

DATE: June 13, 2022

SUBJECT: **M-211-04 Avimor Water Reclamation Company**
Staff Analysis supporting reuse permit issuance

Executive Summary

The Avimor Water Reclamation Company (AWRC or facility or permittee) owns and operates a private municipal wastewater treatment plant (Avimor Water Reclamation Facility; AWRF) and municipal Class B recycled water reuse facilities in the Avimor Planned Community, approximately ten miles north of the City of Eagle, Idaho. In 2020 the facility reused approximately 23.6 million gallons of recycled water on approximately 22 acres of landscaped common areas interspersed within the community, along with rapid infiltration basins (RIBs) during the winter non-growing season.

Through its first three permits, the facility has generally been able to optimize operation of the AWRF and there are relatively few compliance issues that have arisen in recent years. Draft permit M-211-04 generally recommends continuation of the limits and monitoring established during permit M-211-03. One change of note is the increase in allowable hydraulic loading rate to the RIBs. This change allows the facility to operate at the RIBs' original design capacity, as opposed to the reduced capacity required by previous permits as a safety factor for a new treatment system.

Staff recommends the issuance of a renewal permit for this facility for a five (5) year term.

1 Introduction

This memorandum satisfies the requirements of the "Recycled Water Rules" (IDAPA 58.01.17.400) for issuing reuse permits. The principal facts and significant questions considered in preparing the draft permit and a summary of the basis for the draft permit conditions are provided.

A note: This staff analysis does not go into great detail regarding reasoning/justification for conditions that remain unchanged from the previous permit. For documentation regarding these items, the reader is referred to the 2016 Staff Analysis (Carroll 2016).

A brief summary of the current permit and permit renewal application timeline:

- The current permit (M-211-03) was issued on May 2, 2016 and expired on May 2, 2021; the permit has been administratively extended until the new permit becomes effective.
- There were no major modifications to the treatment facility during the term of the current permit; the facility is operated much as it was reported at the time of the previous permit renewal.
- A pre-application workshop for permit renewal was held on July 29, 2020; a Letter of Needs was sent as a follow-up to this meeting on July 30, 2020.
- On November 2, 2020, a permit renewal application was received; a Completeness Determination Letter deeming the application incomplete was sent to the permittee on December 2, 2020.
- A revised application was received on January 14, 2021; a Completeness Determination Letter deeming the application complete was issued on January 28, 2021.
- The Completeness Determination Letter informed the permittee that their existing permit could be administratively extended until issuance of the new permit, since a complete application was received prior to the expiration of the current permit.
- A Preliminary Decision Letter informing the permittee that a draft permit would be prepared was issued on February 25, 2021.
- The Draft Permit was sent to the permittee for review on May 20, 2022; no substantive changes were made to the draft permit as a result of their review.

2 Site Location and Ownership

Avimor is a planned community located approximately 10 miles north of Eagle, Idaho (Figure 1). The wastewater collection, treatment and recycled water systems are owned by the Avimor Water Reclamation Company (AWRC or facility or permittee) and operated under contract by Operations Management Consulting Services (OMCS). AWRC recently changed ownership and is now controlled by Avimor Infrastructure Holdings, LLC, which is managed by Thomas Puttman of Puttman Capital LLC/Puttman Infrastructure. Recycled water application sites are interspersed within the community, and include rapid infiltration basins (RIBs), irrigated common spaces, and designated slow rate irrigation sites that are currently not used (Figure 2). The treatment system is located in the southern end of the development. Private residences, agricultural land and undeveloped range land surround the community.

The facility formerly held an IPDES permit (ID0028371) which allowed them to discharge treated effluent into Spring Valley Creek during October through March. That permit was allowed to expire, and the facility is in the process of re-applying for a new discharge permit.

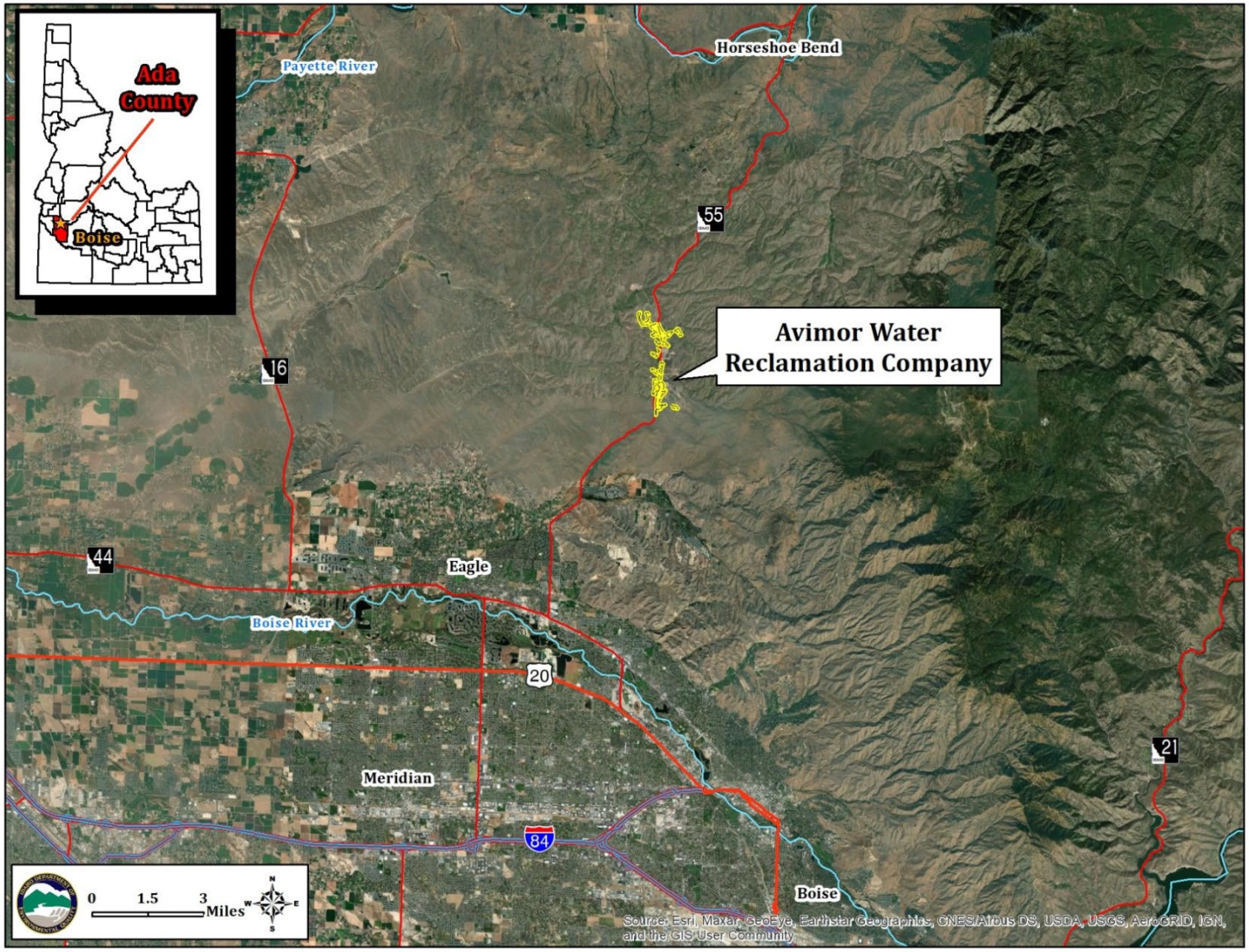


Figure 1: Avimor vicinity map.

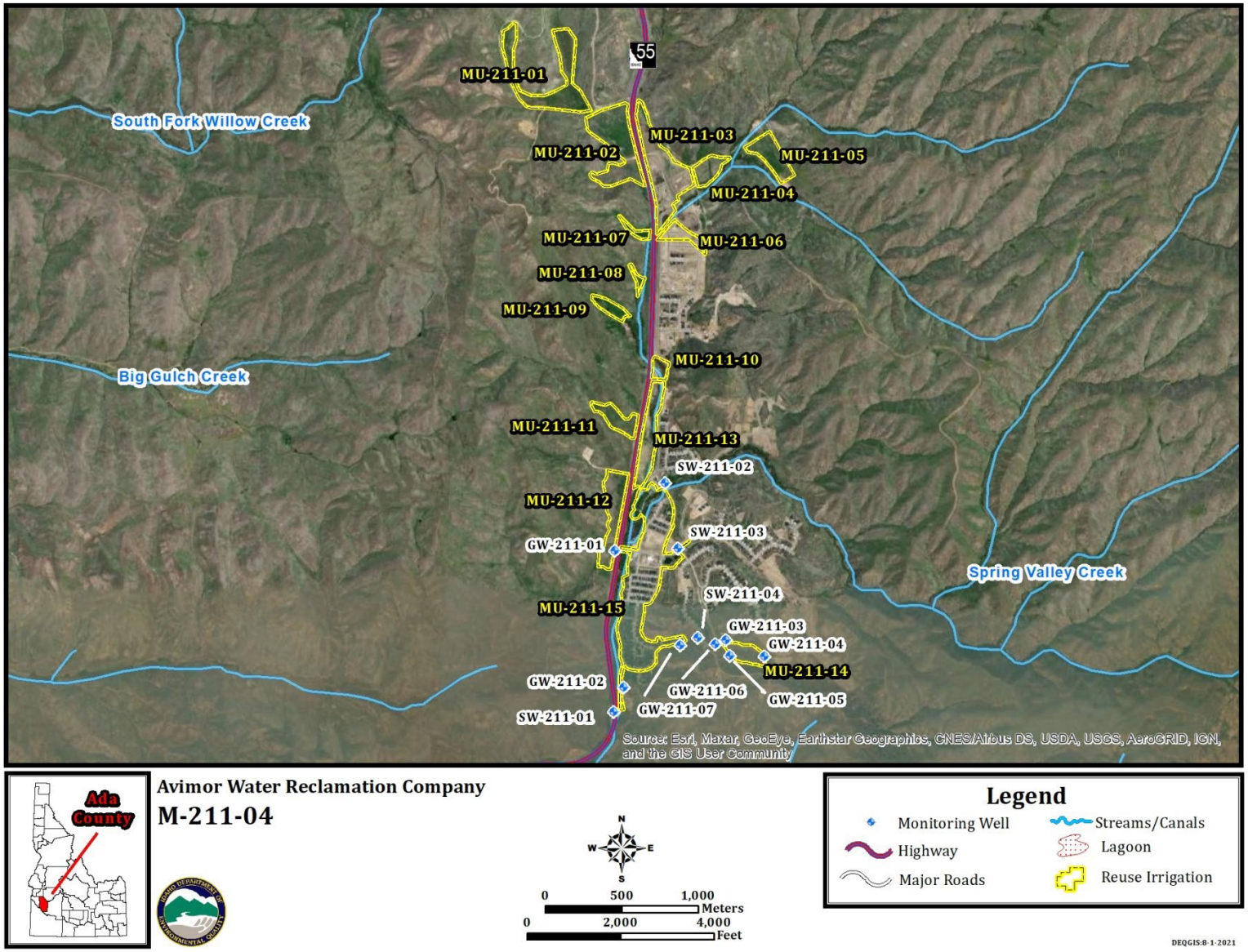


Figure 2: Site map, including management units.

3 Process Description

The wastewater collection and treatment systems discussed in the three previous staff analyses for the reuse permit have not changed. Wastewater from Avimor is collected in a wastewater collection system and is conveyed by gravity to an influent pump station at the Avimor Water Reclamation Facility (AWRF). The design average flow of the AWRF is 0.33 million gallons per day (MGD). Recycled water production during the current permit is shown in Table 1.

Table 1. Recycled water production at Avimor.

Year	Total Recycled Water (MG)
2017	17.6
2018	16.0
2019	19.3
2020	23.6

The Influent Pump Station pumps the raw wastewater into the AWRF, which consists of primary, secondary/tertiary, and disinfection treatment. The AWRF is designed to produce effluent that complies with the requirements of Class B recycled water (IDAPA 58.01.17 §§ 601.02 and 602.01 Tables 1 and 2).

Primary treatment consists of fine screening (3 mm fine screen drum screen), and a 71,000-gallon equalization basin. Screened wastewater is pumped from the equalization basin to secondary/tertiary treatment, which consists of an activated sludge membrane bioreactor (MBR) that incorporates biological nutrient removal (BNR) to reduce nitrogen levels and chemical addition for phosphorus reduction. The activated sludge MBR consists of an anoxic tank, followed by an aeration tank, followed by three membrane tanks.

Disinfection following the secondary/tertiary treatment is accomplished by chlorination. The membrane permeate is pumped into a chlorine contact chamber and sodium hypochlorite is metered into the chlorine contact chamber influent box. The chlorine contact chamber is an "L-shaped" channel, with a cross sectional area of 51 square feet by 143 feet long on the south and west side of the AWRF. The chlorine contact chamber provides 30-minutes detention time at design peak daily flow (0.66 MGD).

The disinfected final effluent (Class B recycled water) flows over a weir into the effluent pump station and is pumped to the reuse facilities.

Waste activated sludge is pumped from the MBR tanks to an aerated sludge holding tank, thickened to 5% solids in a gravity belt thickener, and hauled off-site to a landfill. Screenings and grit are hauled off-site for disposal at a landfill.

Figure 3 depicts the process flow diagram for the AWRF.

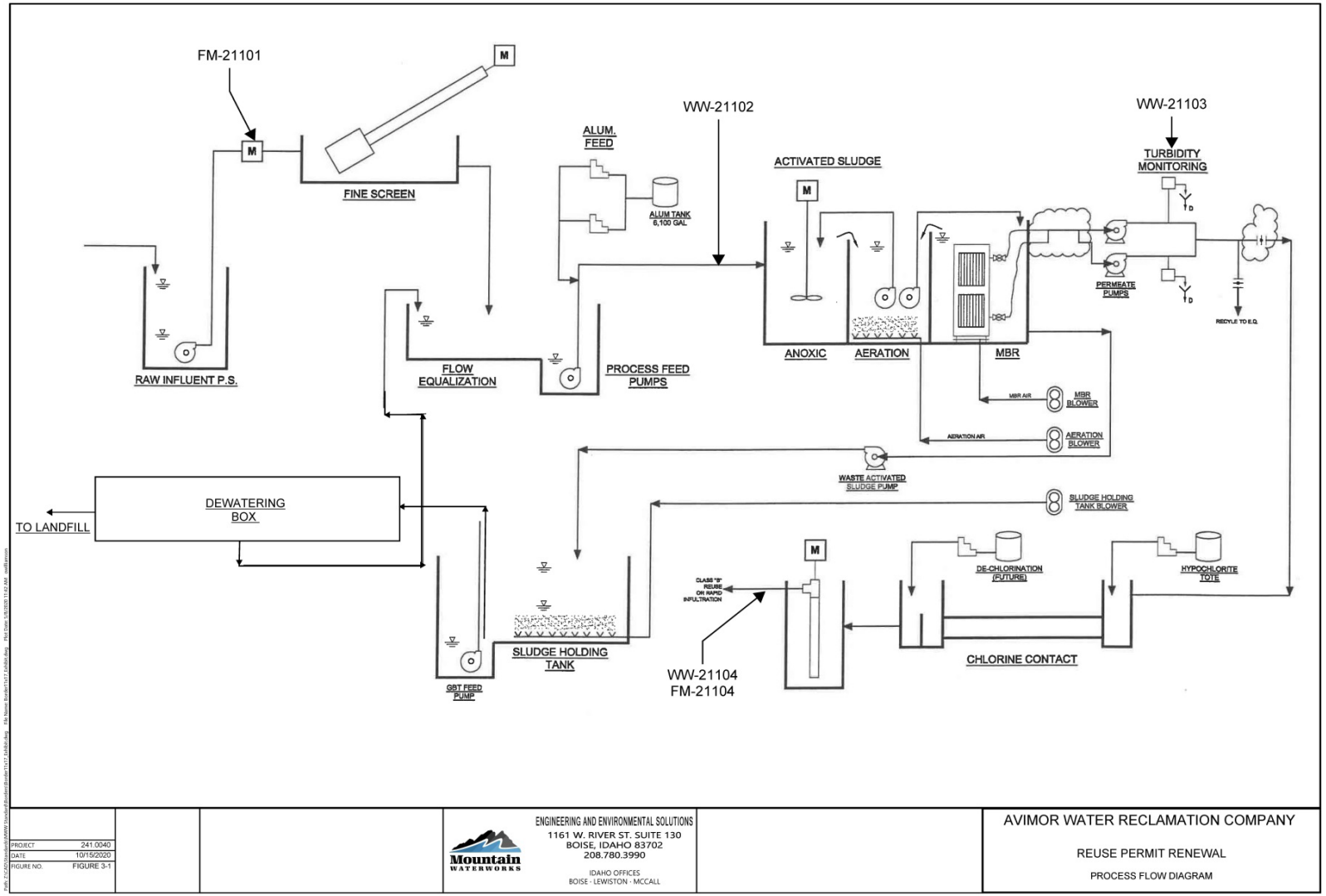


Figure 3: Process flow diagram.

Supplemental irrigation water is provided from Town Lake, which can be supplied from two sources:

- Spring Valley Creek: Spring Valley Creek is diverted into the Town Lake and can be used for supplemental irrigation. A pump station on the Town Lake pumps supplemental irrigation water into the pressurized irrigation system.

- Potable water: Potable water can also be utilized for supplemental irrigation water. There is a pipe connection from the Avimor drinking water distribution system into Town Lake. The potable pipeline into Town Lake has a mechanical water meter.

Supplemental irrigation water is sampled from the pump station at Town Lake on a monthly basis when irrigating and analyzed for total Kjeldahl nitrogen, nitrate, and total phosphorus.

The recycled water application areas, also known as management units (MU), are summarized in Table 2. The MUs include agricultural areas which are currently not used, along with irrigated public spaces and RIBs. The acreage of MU-21115 was updated to reflect the actual acreage used; previous permits had inadvertently listed a smaller acreage.

Table 2: Summary of management units at Avimor.

Serial Number	Description	Maximum Acres Allowed
MU-21101	Agricultural Area 1	23.4
MU-21102	Agricultural Area 2	27.9
MU-21103	Agricultural Area 3	28.9
MU-21104	Agricultural Area 4	6.8
MU-21105	Agricultural Area 5	10.2
MU-21106	Agricultural Area 6	6.5
MU-21107	Agricultural Area 7	2.9
MU-21108	Agricultural Area 8	1.6
MU-21109	Agricultural Area 9	1.9
MU-21110	Agricultural Area 10	3.3
MU-21111	Agricultural Area 11	7.1
MU-21112	Agricultural Area 12	16.2
MU-21113	Agricultural Area 13	11.4
MU-21114	Rapid Infiltration Basins	0.68
MU-21115	Irrigation Areas	22.5
Total irrigation acreage (excludes RIB area)		**170.6**

4 Site Characteristics

4.1 Site Management History

Recycled water from the AWRF has been applied on the MUs since June 2013. Only MU-21114 and MU-21115 have historically been used for recycled water; all other MUs have yet to be developed for use.

4.2 Climatic Characteristics

Climatic characteristics can be found in the previous Staff Analysis (Carroll 2016) and in Section 4.2 of the permit renewal Technical Report (Mountain Waterworks, Inc. 2021).

4.3 Soils

Soils characteristics at the MUs can be found in the previous Staff Analysis (Carroll 2016) and in the permit renewal Technical Report (Mountain Waterworks, Inc. 2021).

Soil monitoring data collected during the previous permit term is summarized in Table 3. This data is discussed in more detail in Section 4.3 of the permit renewal Technical Report (Mountain Waterworks, Inc. 2021).

Table 3: Soil monitoring summary for SU-21115.

Soil Monitoring Unit and Location	Sample Depth (in)	Nitrate, as N (mg/kg)	Ammonium (mg/kg)	Extractable Phosphorus (mg/kg)	Conductivity (µmhos/cm)	pH (s.u.)	Sodium Adsorption Ratio (SAR) (mg/kg)	DTPA Extractable Iron (mg/kg)	DTPA Manganese (mg/kg)	Cation Exchange Capacity (CEC) (meq/100g)
2013*	0-12	0.8	5.31	19.8	2020	6.7	-	-	-	-
	12-24	0.4	6.23	18	363	7.2	-	-	-	-
	24-36	0.8	7.7	15.5	383	7.3	-	-	-	-
2014*	0-12	0.7	2.44	18.9	293	7.1	-	-	-	-
	12-24	1.3	1.79	33.2	331	7.4	-	-	-	-
	24-36	1.1	2.65	26.8	263	7.1	-	-	-	-
2015*	0-12	1	2.15	17.8	401	7.3	-	-	-	-
	12-24	1.3	3.47	23.7	494	7.3	-	-	-	-
	24-36	0.8	15.9	36	462	7.3	-	-	-	-
2016**	0-12	-	-	-	-	-	-	-	-	-
	12-24	-	-	-	-	-	-	-	-	-
	24-36	-	-	-	-	-	-	-	-	-
2017***	0-12	-	-	-	-	-	-	-	-	-
	12-24	-	-	-	-	-	-	-	-	-
	24-36	-	-	-	-	-	-	-	-	-
2018	0-12	0.6	1.94	21.9	293	7.2	-	-	-	-
	12-24	0.7	1.54	38.6	347	7.5	-	-	-	-
	24-36	1.8	2.09	33.5	285	7.2	-	-	-	-
2019	0-12	0.7	1.7	29.7	401	8	2.12	72.9	19.3	-
	12-24	0.7	1.1	35.4	383	8.1	2.1	71.9	19.8	-
	24-36	0.8	1.8	37.3	296	8.1	2.01	19.6	39.6	-

Notes:
** Data prior to 2016 has been included to provide context for how the constituent concentrations have changed over time.*
Soil sampling was not conducted in 2016 despite reuse water being applied because the permit was issued after the date identified in the monitoring schedule, **Table 4-6.
****Soil sampling was not conducted in 2017 because reuse water was not applied to the HMUs*

As can be seen in Table 3, based on typical values reported by Stukenholtz Laboratory (DEQ 2007, Section 2.5.1, p. 2-57), the nitrate in the soil remains relatively low, though phosphorus at all depths is typically in the medium to high range, near 30 mg/kg. More recent monitoring data is also in this same range. These values warrant the continued monitoring of phosphorus in the soil, as well as in groundwater.

4.4 Surface Water

Avimor is located along the main channel of Spring Valley Creek in the lower portion of the Spring Valley Creek watershed basin. According to previously provided permit renewal documents, approximately 90 percent of the watershed basin develops within or upstream of the Avimor site from several intermittent and ephemeral tributaries. The major drainage channels are comprised of the main channel of Spring Valley Creek and the North Fork of Spring Valley Creek. An ephemeral tributary, called Burnt Car Draw, drains approximately the southern half of the Avimor site. All three of these include areas that are potential jurisdictional wetlands.

The current reuse permit requires surface water monitoring matching previous permit terms. Data from surface water monitoring during the previous permit term is provided in Section 4.4 of the permit renewal Technical Report (Mountain Waterworks, Inc. 2021). It is worth noting that several of the monitoring locations (SW-21103 and SW-21104) do not have any data because historically they are dry during required collection periods. These monitoring locations will remain in the permit, in the event that water is ever present during monitoring events.

4.5 Groundwater/Hydrogeology

According to Section 4.5 of the permit renewal Technical Report, there are two separate aquifers beneath the overall Avimor site: a shallow aquifer near Spring Valley Creek and a deeper aquifer located under the upland areas to the east of Spring Valley Creek; the domestic wells in the area are drilled into the deeper aquifer. Based on past documentation provided to DEQ, there is a third aquifer located immediately to the west of Spring Valley, referred to as the Sandy Hill Aquifer. Groundwater flow direction is generally toward the west along Burnt Car Draw and to the south along the Spring Valley Creek.

Groundwater monitoring well locations are depicted in Figure 4. A summary of groundwater depth and quality data from the monitoring wells included in the reuse permit is presented in Table 4. Please note that results from RAMW-8 (GW-21104) are not included because that well is typically dry, or water that is present is stagnant and below the screened interval. That well is also constructed within the footprint of the uppermost basin, and so it is not believed to be representative. Based on recommendations in the Technical Report, a replacement well has been drilled to the east (up-gradient) of the basins and will be used as the monitoring point from now on.

Groundwater quality has generally met “Ground Water Quality Rule” (IDAPA 58.01.11.200) primary and secondary standards throughout the monitoring period. The Technical Report discusses several exceedances of the secondary standard for TDS, namely in RAMW-10 (GW-

21106), but any link between these values and recycled water application is unclear. The next monitoring well immediately downgradient, RAMW-11 (GW-21107), has not exhibited any high TDS levels. Groundwater phosphorus concentrations have not shown any appreciable increase over the current permit term. Nitrate concentrations have been variable, trending towards minimal increase, if any, overall during the current permit term.

Required groundwater monitoring will remain the same in the new permit, with the exception of the relocated RAMW-8a as a new monitoring location to replace RAMW-8. The groundwater monitoring point serial number will remain GW-21104 for the relocated well. Total coliform has also been removed from the required constituents to monitor in groundwater, because it does not provide any meaningful data relevant to facility operations.



Figure 4: Groundwater monitoring well locations.

Table 4: Groundwater monitoring summary, 2016-2019.

Monitoring Well	Sampling Round	Water Table Depth	TKN	Nitrate*	Nitrite +Nitrate	Total P, as P	pH	Conductivity	Temperature
		(feet)	(mg/L)	(mg/L)	(mg/L)	(mg/L)		(µmhos/cm)	(C)
MW-1	Spring	16.4	0.11	4.4	3.83	0.23	6.9	339	12.4
	Fall	17.5	0.17	4	3.54	0.26	6.9	349	12.6
MW6-R	Spring	14.9	0.35	3.4	4.30	0.29	6.8	316	9.3
	Fall	15.3	0.29	2	6.93	0.18	6.7	443	14.6
RAMW-7	Spring	86.6	1.10	2.6	1.89	0.53	7.3	150	16.3
	Fall	85.6	0.31	3.7	1.62	0.40	7.2	161	15.5
RAMW-8	Spring	-	-	-	-	-	-	-	-
	Fall	-	-	-	-	-	-	-	-
RAMW-9	Spring	17.7	0.25	< 0.2	0.71	0.22	5.7	581	9.4
	Fall	19.0	0.23	-	0.88	0.12	4.2	21	13.9
RAMW-10	Spring	89.5	0.21	5.7	2.57	0.15	7.2	311	15.1
	Fall	88.9	0.19	5.7	2.37	0.15	7.2	272	15.2
RAMW-11	Spring	43.0	0.15	6	5.74	0.35	7.2	214	14.1
	Fall	42.6	0.15	6.6	7.37	0.31	7.2	224	14.7

An analysis of groundwater depth data from the wells surrounding the RIBs suggests that there has been a slight increase in groundwater level in the area over the last 10 years. This includes up-gradient, down-gradient, and side-gradient wells from the basins, though the most pronounced increase is found in RAMW-10, immediately down-gradient of the basins. Despite this increase in groundwater level, the water table remains appears to remain at least 60 feet below the elevation of the lowermost basin. This suggests that any mounding effects are minimal and that there is no pronounced or significant mounding occurring at current loading rates.

4.6 Recycled Water Characterization and Loading Rates

4.6.1 Recycled Water Characterization

The AWRF is designed to produce effluent that complies with the requirements of Class B recycled water (IDAPA 58.01.17 §§ 601.02 and 602.01, Tables 1 and 2). The draft reuse permit allows the use of municipal Class B recycled water only. The draft reuse permit specifies Class B recycled water quality limits, along with other site-specific limits to protect groundwater quality. The monthly and annual monitoring results from the 2016 through 2019 Annual Report are summarized in Table 5. As seen in the table, the facility has had no major issues with meeting permit requirements for recycled water.

Table 5: Monthly average recycled water constituent monitoring, 2016-2019.

Month	BOD (mg/L)	COD* (mg/L)	TKN (mg/L)	Nitrate + Nitrite (mg/L)	Total N (mg/L)	Ammonia (mg/L)	Total P (mg/L)
January	<3.0	<20	1.29	5.97	7.26	0.50	0.05
February	<3.0	<20	0.56	5.02	5.58	<0.04	0.08
March	<3.0	<20	0.65	4.87	5.52	0.02	0.14
April	<3.0	<20	0.55	4.61	5.16	<0.04	0.13
May	<3.0	<20	0.55	5.48	6.03	<0.04	0.16
June	<3.0	<20	0.69	6.29	6.98	0.15	2.56
July	<3.0	<20	0.78	5.91	6.69	<0.04	3.44
August	<3.0	<20	0.72	7.39	8.10	<0.04	3.81
September	<3.0	<20	0.65	6.73	7.38	<0.04	3.40
October	<3.0	<20	0.89	5.80	6.69	0.30	0.21
November	<3.0	<20	0.53	6.51	7.04	<0.04	0.05
December	<3.0	<20	0.51	4.38	4.89	<0.04	0.07
Average	**<3.0**	**<20**	**0.70**	**5.75**	**6.44**	**0.08**	**1.17**

The draft reuse permit continues the following limits from the current permit:

- Turbidity, prior to disinfection (monitoring point WW-21103): The daily arithmetic mean of all measurements of turbidity cannot exceed 2 NTU. Turbidity cannot exceed 5 NTU at any time.

- Total coliform (monitoring point WW-21104): The median number of total coliform organisms cannot exceed 2.2 total coliform organisms/100 mL, as determined from the bacteriological results of the last 7 days for which analyses have been completed. No single confirmed sample can exceed 23 total coliform organisms/100 mL.

- Disinfection Requirements: The total chlorine residual at the point of compliance (monitoring point WW-21104) cannot be less than one (1) mg/L after a minimum contact time of 30 minutes at peak flow. The current permit does not specify a contact time.

- 5-day Biochemical Oxygen Demand (BOD_5) (monitoring point WW-21104): The monthly concentration of BOD_5 based on a 24 hour composite sample cannot exceed 5.0 mg/L.

- Total nitrogen when discharging recycled water to the RIBs (MU-21114; monitoring point WW-21104): The monthly concentration of total nitrogen based on 24 hour composite samples cannot exceed 8.0 mg/L.

- Total phosphorus when discharging recycled water to the RIBs (MU-21114; monitoring point WW-21104): The monthly concentration of total phosphorus based on a 24 hour composite sample cannot exceed 0.35 mg/L. The draft permit includes a compliance activity that would allow the permittee to perform site-specific phosphorus attenuation modeling and propose a new phosphorus limit based on results of that modeling. The results of the modeling and any proposed change in limit would need to be reviewed and accepted by DEQ prior to a new limit becoming effective.

4.6.2 Hydraulic Loading Rates

No change is proposed in hydraulic loading limit for MU-21101 through MU-21113 or MU-21115. The hydraulic loading limit will remain as "Substantially at the irrigation water requirement (IWR)" for these MUs. The facility has not had any significant issues maintaining compliance with this limit in the past.

The original design report for the RIBs from 2007 suggested a conservative hydraulic loading rate of 3.1 feet per day per basin, resulting in a recommendation of roughly 300,000 gallons per day as an overall hydraulic loading limit. The current Technical Report revisited this analysis and determined that, at that time, onsite testing had suggested that infiltration rates as high as 14 inches per hour (27 feet per day) could be applied. Further analysis of the actual loading rates of each basin during 2019 appears to suggest that the basins were successfully loaded at rates ranging from 0.5 up to 7.0 feet per day, with the bulk of loading around 2.0 feet per day. The facility conducted additional open pit infiltration testing performed on Basins 1 and 4 during October 2020, which found that rates of 1.4 to 4.8 inches per hour were appropriate loading rates for the soils present in those basins. These rates correspond to 2.9 to 9.6 feet per day, very closely matching the original conservative suggested design capacity outlined in the design report from 2007.

Based on the results from site-specific testing, the Technical Report proposes a new hydraulic loading limit of 300,000 gallons per day, which matches the original proposed design for the basins. This revised loading limit is justified based on the site-specific infiltration testing performed at the site in 2007 and 2020, combined with the groundwater depth data presented. The revised loading rate will be an approximately 58% increase from the previous limit of 190,000 gallons per day, but remains within the original design constraints for the basins. It is not anticipated that the proposed increase in hydraulic loading to the basins will result in excessive groundwater mounding or nuisance conditions.

4.6.3 Constituent Loading Rates

The only constituent with a loading limit in the current permit is nitrogen, which is limited to 150% of typical crop update for MU-21101 through MU-21113 and 330 lb/acre for MU-21115. No change is proposed in these overall limits; however, the limit on MU-21115 has been adjusted to range between 220-330 lb/acre, depending on frequency of lawn clipping removal. This was done to give additional flexibility to the landscaping crews if desired. Previous permits required the removal of clippings at all times; it is anticipated that this will continue to be the case and so the effective nitrogen limits will remain the same. However, if the facility decides to start leaving clippings in place some or all of the time, nitrogen loading will need to be tracked and coordinated with the frequency of clipping removal as that would reduce the applicable limit. The facility has not had any significant issues maintaining compliance with these limits in the past, and careful coordination should ensure continued future compliance.

5 Site Management

5.1 Buffer Zones

The current reuse permit requirements for buffer distances between the boundary of a MU and a physical feature are presented in Table 4. These buffers are proposed to be continued in the draft reuse permit.

Table 6: Required buffer distances.

Serial Number	Buffer Distances (feet) from Management Units				
	Public Water Supplies	**Private Water Supplies**	**Inhabited Dwellings**	**Permanent and Intermittent Surface Water[a]**	**Areas Accessible to the Public**
MU-21101 MU-21102 MU-21103 MU-21104 MU-21105 MU-21106 MU-21107 MU-21108 MU-21109 MU-21110 MU-21111 MU-21112 MU-21113 MU-21114	Site Specific (requires DEQ plan and specification review and approval prior to construction of irrigation system)	500	100	10 (mitigation measures to prevent runoff to surface waters shall be employed)	0
MU-21115	Site Specific (requires DEQ plan and specification review and approval prior to construction)	500	As specified in the Buffer Zone Plan included in CA-211-01[b]	10 (mitigation measures to prevent runoff to surface waters shall be employed)	0

a. No Class B recycled water may enter surface waters unless an IPDES discharge permit authorizing the discharge is in place. A buffer zone may be necessary for a Class B system utilizing sprinkler application near surface waters.

b. The Buffer Zone Plan shall be updated as needed to reflect current site characteristics at each irrigated area within MU-21115.

Table 6 shows that the required buffer distances to public water supply wells are site specific. Presently there are no public water supply wells in Avimor or near any AWRC reuse facilities. Plans and specifications for public water supply wells are required to be submitted to DEQ for review and approval prior to construction. The buffer distances to any reuse facilities will be reviewed by DEQ at that time and an appropriate buffer distance will be determined. Unless

there are specific circumstances that require otherwise, the buffer distance between public water supply wells and reuse facilities will be 1,000 ft.

The draft reuse permit also requires that the permitted recycled water application sites be posted with warning signs as required in IDAPA 58.01.17.603.02.

5.2 Runoff

Runoff from any permitted recycled water application site is prohibited. Previous permits have had a compliance activity requiring the development of, and periodic updates to, a Runoff Management Plan. The original plan has been modified during subsequent permit terms to current operations. The draft reuse permit requires the update of the Runoff Management Plan included in the Plan of Operation (PO; CA-211-01) as needed to reflect current operations.

5.3 Waste Solids, Sludge, and Solid Waste

Management of sludge, and solid waste (i.e., screenings, grit) is addressed in the Operation and Maintenance Manual (OMM), which is a component of the PO. The draft reuse permit requires that any changes in the management of sludge and solid waste must be addressed in updates of the OMM and submitted to DEQ for review and approval.

5.4 Nuisance Odors

The potential for nuisance odors and prevention of such are addressed in the OMM. Up to this point, there have been no known issues with nuisance odors resulting from the operation of the AWRF and the reuse facilities,. The draft reuse permit requires that a nuisance and odor management plan be developed as a component of the PO.

5.5 Cropping Plan

In the event that any of the agricultural MUs are developed for use, the draft reuse permit requires that a Crop Management Plan be developed and submitted to DEQ for review and approval prior to use of those MUs.

5.6 Grazing

Prior to grazing, the permittee shall submit a Grazing Management Plan and receive written approval from DEQ. The Grazing Management Plan shall be included in the PO. Grazing will not be allowed on MU-21114 or MU-21115.

6 Monitoring

The proposed monitoring requirements for the draft permit are described in detail in the following subsections. In general, monitoring and limits are the same as the current permit. All monitoring will be conducted in accordance with the facility's Quality Assurance Project Plan (QAPP). See Section 7 for requirements regarding the QAPP.

6.1 Wastewater and Recycled Water Monitoring

Monitoring of flow and wastewater and recycled water quality and constituents is required in the draft reuse permit (Section 5.1). Proposed monitoring matches the monitoring in the existing permit M-211-03, and includes BOD_5, turbidity, total phosphorus, TKN, nitrate+nitrite, ammonia, total coliform, total chlorine residual, pH, and flow at various locations.

6.2 Soil Monitoring

Monitoring of soil is required in the draft reuse permit (Section 5.4) for MUs when recycled water is being applied to those areas, excluding the RIBs. Proposed soil monitoring generally matches the monitoring in the existing permit M-211-03, and requires composite soil samples to be collected and analyzed annually in March for electrical conductivity, nitrate, ammonium, plant available phosphorus, and pH. The requirement to monitor soils intermittently for DTPA extractable iron and manganese, sodium adsorption ratio, percent organic matter and cation exchange capacity in existing MUs has been removed, and these are now only required once prior to commencing use of new MU areas.

6.3 Groundwater Monitoring

There are seven groundwater monitoring wells required to be monitored in the draft permit (Section 5.2). These wells are intended to show an approximation of up-, side-, and down-gradient conditions from the facility, generally focused on the RIBs. Proposed groundwater monitoring generally matches the monitoring in the existing permit M-211-03, and includes twice-annual sampling (April and October) and analysis for, nitrate, total phosphorus, total dissolved solids, and standard groundwater monitoring parameters such as pH, conductivity, temperature, and water table depth. Sampling groundwater for coliform bacteria is not recommended to be continued in the draft permit because any bacteria present in groundwater is not likely to be due to irrigation with disinfected Class B recycled water. To date, there have been no issues with the presence of coliform bacteria in the monitoring wells. Similarly, TKN, ammonia, and chloride have been removed from required monitoring.

6.4 Surface Water Monitoring

There are four surface water monitoring locations included in the draft permit (Section 5.3). The surface water monitoring locations and requirements in the draft permit match the requirements of the existing permit, and include twice-annual sampling (April and October) and analysis for TKN, nitrate+nitrite, ammonia, total phosphorus, dissolved orthophosphorus, chloride, pH,

temperature, and dissolved oxygen. Two of the monitoring locations have historically been dry during monitoring periods, but they are included in the draft permit in the event that water is present in future monitoring periods.

6.5 Supplemental Irrigation Water Monitoring

Monitoring of supplemental irrigation water is required in the draft reuse permit (Section 5.1) on an annual basis during July, which tends to have the highest use of supplemental irrigation. This is less frequent than the existing permit M-211-03; however, the supplemental irrigation water has been adequately characterized, so a single annual sample is sufficient. Monitored constituents include total phosphorus, TKN, and nitrate from the Town Lake pressurized irrigation pump station.

6.6 Crop Yield and Tissue Monitoring

Crop harvest and plant tissue monitoring is required by the draft permit when crops are grown on the agricultural areas, which are currently all undeveloped. If they become developed during this permit period, it is proposed that monitoring match previously recommended monitoring in the existing permit M-211-03, including crop type, harvest dates and acreage, sample collection dates, as-harvested yields and moisture content, dry yields, lab moisture content, total nitrogen, and phosphorus.

6.7 Calculation Methodologies

Flow meters will be used to monitor and report wastewater, recycled water, and supplemental irrigation water volumes. Wastewater influent to the treatment facility (FM-21101) will be measured by the influent flow meter downstream of the raw influent pump station. Recycled water flow (FM-21104) will be measured by the reuse pump station flow meter. Supplemental irrigation water, from either Town Lake or potable water supply (FM-21105 and FM-21106), is measured at one of two flow meters located at the pressurized irrigation pump station. These flow meters are calibrated on a biennial basis.

Hydraulic loading rates will continue to be tracked using the reported acreages of each MU and the flows calculated from the flow meters described previously. Because irrigation infrastructure largely remains the same, irrigation efficiencies will continue to be assumed the same as they have been in previous permits. New irrigation areas, if any, will have similar assumed efficiencies as other irrigation systems of the same type. IWR for the irrigated areas is calculated using data from the University of Idaho Kimberly Research and Extension Center data from the Boise WSFO Airport Station.

Constituent loading rates are calculated based on hydraulic loading rates and constituent concentrations assumed from monthly grab samples for nitrogen and phosphorus. The loading limit calculation methodologies for nitrogen have been previously established during prior permit cycles and are based on theoretical uptake of the vegetation at each MU, along with lawn clipping removal frequency in turf areas.

7 Quality Assurance Project Plan

The QAPP outlines the procedures used by the permittee to ensure the data collected and analyzed meets the requirements of the permit.

To support its mission, DEQ is dedicated to using and providing objective, correct, reliable, and understandable information. Decisions made by DEQ are subject to public review and may at times, be subject to rigorous scrutiny. Therefore, DEQ's goal is to ensure that all decisions are based on data of known and acceptable quality.

The QAPP is a permit requirement and must be submitted to DEQ as a stand-alone document for review and acceptance. The QAPP is used to assist the permittee in planning for the collection, analysis, and reporting of all monitoring data in support of the reuse permit and explaining data anomalies when they occur.

DEQ does not approve QAPPs, but reviews them to determine if the minimum EPA guideline requirements are met and that the reuse permit requirements are satisfied. DEQ does not approve QAPPs because the responsibility for validating of the facility's sampling data lies with the permittee's quality assurance officer and not with DEQ.

The format of the QAPP should adhere to the recommendations and references in the Assurance and Data Processing sections of the DEQ *Guidance for Reclamation and Reuse of Municipal and Industrial Wastewater* (DEQ 2007) and EPA QAPP guidance documents *https://www.epa.gov/sites/production/files/2015-06/documents/g5-final.pdf*.

A QAPP was submitted in fulfillment of CA-211-02 in the previous permit and was formally accepted on April 26, 2017. The draft reuse permit requires a revised QAPP, applicable to the facility as currently operated, be submitted for review and acceptance.

8 Site Operation and Maintenance

The facility and recycled water application sites are owned by Avimor Water Reclamation Company. Operation, maintenance and management of the wastewater and recycled water systems is contracted to Operations Management Consultant Services, LLC (OMCS), who have staff with the proper certifications to manage a Class I collection system, Class IV treatment system, and recycled water land application site. Maintenance of turf grass areas is hired out to a landscape contractor.

9 Compliance Activities

The list of compliance activities included in the current permit and those that will be required by the new permit is provided below.

9.1 Status of Compliance Activities in Current Permit

1. CA-211-01. Appropriate portions of the PO were approved by DEQ throughout 2017.
2. CA-211-02. The QAPP was accepted by DEQ on April 26, 2017.
3. CA-211-03. The agricultural areas throughout Avimor have not been developed, and so no P&S have been required to be submitted for review and approval.
4. CA-211-04. The agricultural areas throughout Avimor have not been developed, and so no Groundwater Monitoring Plan has been prepared.
5. CA-211-05. The Pre-Application Workshop was held on June 20, 2020.
6. CA-211-06. A Renewal Permit Application was received on November 2, 2020 and was deemed complete on January 28, 2021.

9.2 Compliance Activities Required in New Permit

The following Compliance Activities are specified in the draft permit:

1. CA-211-01 Submit an updated PO that incorporates the requirements of the new permit. The PO must include, as appropriate, an updated OMM, Crop Management Plan, Irrigation Management and Scheduling Plan, Emergency Operating Plan, Nuisance and Odor Management Plan, and Runoff Management Plan.
2. CA-211-02 Submit an updated QAPP, including verification that the plan has been implemented by the facility.
3. CA-211-03 For any of the slow rate land application areas not currently used, plans and specifications are required to be submitted for DEQ review and approval prior to construction of any irrigation pipelines or systems.
4. CA-211-04 Prior to applying recycled water to any of the agricultural MUs, a Groundwater Monitoring Plan for those areas must be submitted to DEQ for review and approval.
5. CA-211-05 If the permittee wishes to change the phosphorus limit for application to the RIBs, they will be required to perform site-specific phosphorus attenuation modeling and present a proposed revised limit to DEQ for review and acceptance.
6. CA-211-06 Schedule a Pre-Application Conference prior to permit expiration, as specified.
7. CA-211-07 Submit a permit renewal application, as specified, prior to expiration of the existing permit.

10 Recommendations

Staff recommends the draft reuse permit be issued. It is recommended that the duration be a five-year permit. The permit specifies hydraulic and constituent loading limits and establishes monitoring and reporting requirements to evaluate system performance, environmental impacts, and permit compliance.

11 References

Avimor Water Reclamation Company. 2016. *Idaho Department of Environmental Quality Reuse Permit M-211-03.*

Carroll, C. Gary. 2016. *M-211-03 Avimor Water Reclamation Company (formerly LA-000211-02), Staff Analysis Supporting Reuse Permit Issuance.*

DEQ (Idaho Department of Environmental Quality). 2007. *Guidance for Reclamation and Reuse of Municipal and Industrial Wastewater*.

HyQual. 2007. *Avimor Rapid Infiltration Basin System Design Report for Water Reuse at the Avimor Planned Community.*

Mountain Waterworks, Inc. 2021. *2020 Wastewater Land Application Annual Report Avimor Water Reclamation Company Reuse Permit No. M-211-03.*

Mountain Waterworks, Inc. 2021. *Technical Report, Avimor Water Reclamation Company Reuse Permit M-211-03 Renewal.*