

MEMORANDUM

January 27, 2012

TO: Bruce Olenick, Regional Administrator
Tom Hepworth, Engineering Manager, Pocatello Regional Office

FROM: Scott MacDonald, EIT, MBA, Associate Engineer

SUBJECT: **Staff Analysis for Draft Wastewater Reuse Permit LA-000034-02 Municipal Wastewater Reuse Permit for the City of Lava Hot Springs**

1 Purpose

The purpose of this memorandum is to satisfy the requirements of the State of Idaho Administrative Code IDAPA 58.01.17.400.05, "Recycled Water Rules," for issuing wastewater reuse permits. This memorandum addresses draft permit LA-000034-02, for the municipal wastewater treatment and reuse system owned and operated by the City of Lava Hot Springs. The city's treatment and reuse system is currently permitted under LA-000034-01.

2 Process Description

The City of Lava Hot Springs is located approximately 10 miles east of the City of McCammon in Bannock County. The city's four-cell municipal effluent treatment system has not changed significantly since it was originally constructed in the 1970's. The treatment facility is designed to treat municipal effluent by biologically removing a majority of the organic waste and other contaminants, and provides treated water suitable for sprinkle-irrigated land application.

The city has been evaluating alternative land application properties for many years, and has identified new acreage to use as a permanent land application site. A 90 acre parcel has been purchased for construction of a new 20 acre winter storage lagoon, with the remaining 70 acres being operated as a single land application management unit. Additional system upgrades are being completed as part of a two phase project to upgrade the treatment lagoons, build new pumping facilities, and install a pipeline to the new land application site. A closure plan will be required for the former land application site. No further application of municipal effluent will be allowed on that site. The city will be permitted to use the new winter storage lagoon for storage during the non-growing season and land application acreage during the growing season.

The city currently has an NPDES permit for discharge of effluent to the Portneuf River during the non-growing season. Permitted discharges to the river, flow by gravity and do not require pumping. The discharge limits associated with the NPDES permit have necessitated a change in operations from wastewater discharge, to storage for land application. The city will now send wastewater to the new winter storage lagoon during the non-growing season. The city plans to keep the NPDES permit active.

The Lava Hot Springs wastewater treatment facility consists of a four-cell, aerated/facultative lagoon system. The treatment system consists of two aerated lagoon cells and two facultative cells having a combined storage capacity of 17.7 MG. Operating parameters indicate 91.6% biological oxygen demand (BOD) removal.

At the lagoon site there are two facility buildings. One building houses the pumps and electrical panels along with the old aeration blower piping. The lift station grinder pumps are in a pit below the building next to the wet well. The second building north of cell #4 houses the chlorination system. A well adjacent to the chlorinator building supplies water for adding chlorine to the wastewater stream prior to land application. Figure 1 below shows the layout of the lagoon system with flow from right to left.



Figure 1. Facility Treatment Lagoons

At the lift station building next to lagoon #1, wastewater from the 12-inch city trunk line discharges to the headworks, and into the wet well below the building. The wastewater is then lifted from the wet well through a six inch pressure line to the diversion box at the head of the lagoon system. Wastewater is pumped from the wet well at the influent level using grinder pumps, where it is lifted to the pond level; approximately 15 to 20 feet in elevation. All flow is by gravity from the diversion box through the lagoon system to the outlet.

Aeration is provided in the first two cells using temporary floating aerators. The original stationary aeration system failed and is no longer in use. The aeration blower pumps inside the lift station building have been disconnected. When the ponds are drained for repairs and sludge removal as part of the planned system upgrades, the old aeration system piping in the ponds will be removed. An updated aeration system is planned as part of the system upgrades.

Following treatment in the fourth cell at the lagoon site, wastewater was previously pumped from the chlorinator building directly to land application. The new design allows the city to pump effluent only to the new 33 MG winter storage lagoon located at the north end of the land application site. Effluent pumped from the winter storage lagoon will be treated with chlorine in a contact chamber. It will be treated to class D standards of less than 230 CFU/100mL for a 3 day median and less than 2,300 CFU/mL in any sample. Wastewater will be land applied only during the growing season; which is April 1 through October 31.

Municipal wastewater will be applied to the 70 acre site which is permitted as a single hydraulic management unit (HMU), for the production of crops and the uptake of wastewater nutrients. While permitted as a single HMU, wastewater will be applied to the acreage in four zones, with the majority applied in July and August when alfalfa water needs are the highest. Four sets of wheel lines will sprinkle irrigate the site at a design capacity of 640 gpm. The wheel line irrigation efficiency is 75% and is estimated to apply 1.98 inches of wastewater during weekly sets. See Figure 2 below for the irrigation system layout.



Figure 2. Irrigation System Layout

The facility is permitted to land apply municipal effluent consisting of the sources described in the permit application including effluent from homes, schools, businesses, hot water discharges from pools, natural hot springs, and thermal heating systems.

The permit prohibits land application of any industrial sources of wastewater or other waste streams not specifically permitted or identified in the permit application. A flow diagram of the Lava Hot Springs land application system is included in Appendix A.

Supplemental irrigation water will be supplied from the canal source that crosses the site. The canal is unnamed but is owned and operated by the Topaz Canal Company, so it is referred to as the Topaz Canal. The city has included a copy of the deed in the permit application showing 71 shares of canal water available for irrigation. The supplemental irrigation water source will be sampled as a new monitoring point listed in the permit Table K-3.

Both supplemental irrigation water from the canal ditch and effluent from the 33 MG winter storage lagoon will be piped to the pump house on the west side of the storage lagoon. The chlorine contact chamber is also located to the west of the lagoon and will be used to inject chlorine as the effluent flows from the storage lagoon to the pump house. The pump house will include the chlorinator pump and irrigation pumps that will provide operating pressure to sprinkle irrigate the site with either the treated effluent or with supplemental irrigation water.

3 Summary of Events

The permit history, inspection findings, annual report review information, and relevant permit information is presented in this section.

3.1 Permit History

The Department of Environmental Quality (DEQ) issued permit LA-000034 to the City of Lava Hot Springs on May 29, 1992. The permit is for continued operation of the wastewater treatment and reuse system serving the City of Lava Hot Springs. These facilities are located in the City of Lava Hot Springs, with a new land application site located west of the city. The purpose of the draft permit is to renew permit LA-000034, which has an expiration date of May 22, 1997. The city continues to operate under the limits in the original permit.

A permit renewal application from the City of Lava Hot Springs was received on October 5, 2011, and largely serves as the basis for the terms and conditions contained in the draft permit. As required by the Recycled Water Rules, the draft permit will be presented for a public comment period. After the comment period has closed, DEQ will provide written responses to all relevant comments and prepare a final permit for the City of Lava Hot Springs wastewater reuse facilities.

3.2 Inspection and Annual Report Review Findings

Facility inspections have not revealed issues of noncompliance with the land application practices. There have been operational issues such as the failure of the aeration system, sludge build up in the lagoons, and a lack of sufficient flow measurement devices, but these maintenance issues are being addressed in the facility upgrade projects. Annual reports failed to list monitoring well static water levels. This will be addressed with the installation of the new monitoring wells at the new land application site, and with the monitoring requirements in the new permit.

The facility annual reports submitted pursuant to previous permit requirements have provided only minimal information regarding site loading. The city will be required to bring annual reporting procedures into compliance with currently accepted practice.

4 Discussion

This section presents relevant issues concerning site conditions, along with historical and proposed management practices used as the basis for determining permit conditions. Discussion items include; operations, hydraulic management unit configuration, site soils, groundwater, surface water, historic and proposed site loading, wastewater quality and quantity, storage structures, site management, and compliance activities. A 'conclusions and recommendations' summary is included at the end of this section.

4.1 Plan of Operation

An updated plan of operation will be completed for the new facility operations that will incorporate the new chlorine and flow measurement equipment and the operations at the new land application site. Operators will need an updated plan to clearly understand the operations of the new system as well as the reporting requirements in the new permit. The plan of operation is required to be updated or modified as operations and regulatory requirements change, and must be made current within 12 months following issuance of the new permit. The Permittee may submit management plans required in CA-34-01 and CA-34-02 as individual documents or as sub-parts incorporated into a comprehensive, system-wide plan of operation.

4.2 Hydraulic Management Unit Configuration

The city now owns 90 acres for their new land application site 1.8 miles west of the city. The ground slopes downward toward the north away from the foothills of the Portneuf Range. Site elevation ranges from 5000 feet to 5140 feet. Over half of the site is rated by NRCS as limited for disposal of wastewater due to the ground having a greater than 4% slope. However, the site has a long history of being managed effectively as farm ground, so the sloped areas appear to pose no hindrance to use as an effective land application site for growing alfalfa.

Twenty acres of the new site have been used to construct a winter storage lagoon to store effluent year-round, while the remaining seventy acres is available for growing-season land application. The land application site will not be subdivided into smaller management units, and will be managed as a single unit. Wheel lines will be the primary sprinkle irrigation method configured as shown in Figure 2, with a small triangular section near the lagoon watered by hand lines. The four wheel lines will be 1,260 feet long, with six foot wheels, double wheels on each end with 32 self-leveling sprinkler heads per line. The city plans to grow alfalfa, and will have the option to bring the four sections of the 70 acre site into use for wastewater application in stages as wastewater quantities increase. The permit application indicates that 48 acres would be needed as the initial requirement for land application leaving the rest of the 70 acres for land application as additional wastewater is generated. DEQ has updated the original LA-000034 management unit serial number to a new serial number listed in Table K-1 of the new permit.

A preliminary runoff plan containing maximum theoretical flows with minimal infiltration has been reviewed by DEQ. Site run-on will be diverted to the extent possible, and the site has been designed with basins, and has been graded to retain precipitation on site. A complete runoff management plan will be required as a compliance activity in the new permit, to be submitted to DEQ within 12 months of permit issuance for review and approval.

According to the annual reports, the city only applied effluent twice during the growing season with their total annual allotment being applied in July and October. The permit application describes similar effluent use so that the wastewater is applied during the hotter months of July and August. The remainder of the season, fresh water will be applied to the crops prior to winter so that any winter precipitation or spring thaws will not result in effluent runoff.

4.3 Site Soils

Soil survey information from NRCS as listed in the permit application is shown below.

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI	Depth (inches)	Description
9	Bancroft silt loam, 4 to 12 percent slopes	18.5	18.0%	0 - 7	Silt loam
				7 - 37	Silty clay loam
				37 - 60	Silt loam
10	Bancroft silt loam, 12 to 20 percent slopes	6.1	5.9%	0 - 7	Silt loam
				7 - 37	Silty clay loam
				37 - 60	Silt loam
65	Lanoak silt loam, 1 to 4 percent slopes	25.6	24.9%	0 - 22	Silt loam
				22 - 44	Silt loam
				44 - 60	Silt loam
72	Lanoak-Hades complex, 6 to 20 percent slopes	10.3	10.0%	0 - 22	Silt loam
				22 - 44	Silt loam
				44 - 60	Silt loam
93	Rexburg silt loam, 1 to 4 percent slopes	7.5	7.3%	0 - 7	Gravelly silt loam
				7 - 14	Gravelly silt loam
				14 - 60	Gravelly silty clay loam
97	Ririe silt loam, 1 to 4 percent slopes	4	3.9%	0 - 10	Silt loam
				10 - 26	Silt loam
				26 - 60	Silt loam
98	Ririe silt loam, 4 to 12 percent slopes	16.7	16.2%	0 - 12	Silt loam
				12 - 60	Silt loam
				12 - 60	Silt loam
100	Ririe-Watercanyon complex, 4 to 12 percent slopes	11.4	11.1%	0 - 12	Silt loam
				12 - 60	Silt loam
				0 - 7	Silt loam
101	Ririe-Watercanyon complex, 12 to 20 percent slopes	2.8	2.7%	7 - 16	Silt loam
				16 - 60	Silt loam
				0 - 7	Silt loam
Totals for Area of Interest		102.7	100.0%	0 - 7	Silt loam
				7 - 16	Silt loam
				16 - 60	Silt loam

Figure 3. Site soil information as listed in the permit application Table 3-4 (Keller).

4.3.1 Soil Monitoring

The permit requires annual soil monitoring for pH, plant available P (Olsen Method), NO₃-N (nitrate nitrogen), NH₄⁺-N (ammonium nitrogen), EC, and %OM monitored annually, with SAR, DTPA-Fe, and DTPA-Mn monitored and reported the first year of the permit. The annual reports for the previous land application site have not indicated elevated levels of constituents in the soil profile that would warrant additional constituent sampling or monitoring. The quantities of fresh water discharged to the sewage lagoons from the pools and thermal sources make the effluent stream more dilute than traditional municipal effluent streams, leading to less chance for soils to become clogged or overloaded.

4.4 Groundwater

Groundwater measurements of existing wells near the site have shown groundwater to be approximately 145 feet below ground surface near the upper portion of the site, and 55 feet below ground surface near the lagoon at the lower end of the site. Keller Associates submitted a plan for the installation of three monitoring wells to monitor groundwater influences at the site. One well will be installed near the center of the upper portion of the site to measure ambient background constituents of groundwater flowing toward the site for comparison with the measured constituents from the wells at the lower portion of the site. The application reports that groundwater flows from the upper elevations to the north toward the Portneuf River. Two new monitoring wells will be installed north of the winter storage lagoon to monitor any potential groundwater influences from the lagoon or from the land application activities on the site.

4.4.1 Ground Water Monitoring Data:

The permittee is required to conduct groundwater monitoring twice annually in the spring and fall. These monitoring requirements have been included in the new permit to monitor the three new monitoring wells for potential impacts on groundwater from site loading activities, and as an early indicator of any influence from potential lagoon seepage. The permittee will be required to submit collected monitoring data as required by section G of the permit in the annual reports. The three wells previously sampled; the Roberts, Flick, and Community wells will no longer be sampled since they are over a mile away from the new land application site. The well at the treatment lagoon site is also listed as an active monitoring point.

4.5 Surface Water

The nearest surface water to the site is the Portneuf River which is 1,325 feet from the northern end of the land application site. There are no springs reported in the area, but minor surface drainage passes near the site. The site has been graded to contain precipitation so it does not runoff from the site. An irrigation ditch passing through the site has been enclosed in a buried 36" pipeline, with the ends of the pipeline extended 50 feet on either side of the property so that overspray from the application of wastewater will not come in contact with the canal water.

To help protect surface waters from contact with wastewater, compliance activity CA-34-02 in the new permit will require the facility to submit a runoff management plan. The runoff plan will describe how wastewater applied to the permitted HMU will be contained on-site and not allowed to flow to properties not owned by the city or to nearby surface waters.

4.6 Historic and Proposed Site Loading

Crop requirements determine loading rates for individual management units. The permit will limit growing season hydraulic loading to the crop specific irrigation water requirement (IWR), in any combination of process water and supplemental water. Calculations require specific methodology to determine the crop IWR. The permittee is allowed to use either thirty-year data or current climatic and agronomic information, but whatever method is used it must be used consistently throughout the permit period.

4.6.1 Historic Flows and Proposed Hydraulic Loading Rate

Staff used data available from ETIdaho¹ to compare past application rates with the IWR of the crops on the former management unit. The comparisons show hydraulic loading for the management unit did not exceed the IWR during this period. The former management unit was loaded up to the permit limit of 9 MG of wastewater annually on 39.2 acres of the permitted 60 acre site. The reported loadings equate to approximately 8 inches of wastewater per acre on those acres receiving wastewater. The IWR, or precipitation deficit (P_{def}) for alfalfa for the new site is reported as 43.57 inches of combined wastewater and supplemental irrigation water. Using the same 43.57 inches for the crop specific IWR, the 70 acre site could require up to 82 MG of water annually to sustain an alfalfa crop with frequent cuttings. Staff does not envision the city being limited by hydraulic loading for the foreseeable future.

Proposed loadings will increase beyond the current permit limit of 9 MG annually, since the city will be sending wastewater to the winter storage lagoon for growing season land application instead of discharging to the Portneuf River during the non-growing season. The application materials indicate that 2011 wastewater production will be 51.1 MG, with a maximum estimation for the year 2040 of 66.4 MG. The permit limit is 66 MG annually. Generated wastewater quantities are not expected to exceed the IWR of the available acreage. Annual IWR calculations are required to plan for the most effective use of wastewater and supplemental irrigation water (SIW) to ensure vibrant crop growth and to maximize crop nutrient uptake.

4.6.2 Wastewater Quality and Sampling

Wastewater characteristics appear to remain consistent from year to year. Although flows and constituents change seasonally with tourism and school attendance, the annual average values remain consistent. The key constituents in Figure 4 include nitrate, nitrite, TKN, total suspended solids, and COD averages from 1999 to 2010. Comparisons do not indicate substantial variations. The city monitors constituent characteristics for land application permit reporting to DEQ and for NPDES reporting to EPA.

The permit application calculates loading rates for COD and nitrogen based on the average constituent concentrations from 1999 to 2010 listed in Figure 4. COD and nitrogen are believed to be the land limiting constituents. Nitrogen and COD loading analyses are reported in more detail below. Calculations indicate that the site will approach hydraulic loading limits before any land limiting constituents have been reached. This is consistent with the dilute nature of the wastewater which includes the inflow from pools and other thermal water sources that do not contain high constituent levels.

Parameter	Concentration	
	Units	Average
BOD ₅	mg/L	6.5
COD	mg/L	69.4
TSS	mg/L	7.3
Ammonia-N	mg/L	2.0
Total Nitrogen	mg/L	4.6
Nitrate-N	mg/L	1.2
Nitrite-N	mg/L	0.1
TKN	mg/L	3.3
Total-Phosphorus	mg/L	2.7
pH	SU	8.1
Note: Total Nitrogen = Nitrate + Nitrite + TKN		

Figure 4. Constituent Concentrations (Keller).

¹ (<http://www.kimberly.uidaho.edu/ETIdaho/>)

The permit will require the facility to report wastewater and supplemental irrigation water quantities applied on the land application site on a daily basis. Wastewater sampling is required on a monthly basis when effluent is being applied to the site. Wastewater monitoring parameters will be more involved than the previous permit, and may require additional training by the operators to complete the new monitoring and reporting requirements.

4.6.3 Nitrogen Loading

Historic application rates show nitrogen uptake of 122.1 lb/ac, meaning that nitrogen would be able to be loaded at 150% of the reported crop uptake, or 183 lb_N/ac. At the maximum loading rate of 66 MG annually estimated for the year 2040, nitrogen loading would be only 40 lb_N/ac. This estimate is well below the historic nitrogen removal rate.

Any supplemental fertilizer application must be reported in the annual report. The nitrogen loading limit listed in the permit is 150% of the median three-year crop uptake for all sources.

4.6.4 Hydraulic Flow, and Storage

Historically, a total of 9 MG of wastewater has been applied to the former management unit during the growing season. Future operations will direct all effluent to land application rather than discharging to the Portneuf River, meaning that the city will likely be applying wastewater during all months of the growing season as shown in the application table estimates below. Previous land application occurred only during July and October. The figure below shows a decrease in SIW usage over time as effluent application increases.

Month	WW Applied (gal)		Irrigation Water Applied (gal)	
	2011	2040	2011	2040
January	0	0	0	0
February	0	0	0	0
March	0	0	0	0
April	4,429,903	4,429,903	0	0
May	13,423,405	13,423,405	0	0
June	16,337,163	16,342,752	5,588	0
July	4,080,378	15,571,810	16,827,968	5,336,536
August	4,217,226	5,506,850	12,855,861	11,566,237
September	4,219,015	5,467,039	7,394,515	6,146,491
October	4,395,889	5,685,513	1,573,506	283,882
November	0	0	0	0
December	0	0	0	0
Totals	51,102,979	66,427,272	38,657,439	23,333,146

Figure 5. Estimated wastewater application rates (Keller)

Wastewater was previously pumped from the treatment lagoons directly to the land application site irrigation piping. The new design directs all effluent to the winter storage lagoon. Effluent pumped from the storage lagoon has chlorine injected at the inlet of the chlorine contact chamber prior to being pumped to the irrigation wheel lines. Chlorine contact time is achieved in the chlorine contact chamber, with additional contact time provided in the irrigation lines as the effluent is piped to the sprinkler spray heads.

Effluent flow will not be measured at the treatment lagoons as it is pumped to the winter storage lagoon. All sampling and flow measurement for land application will now be measured within the pump house at the winter storage lagoon. The pump house at the storage lagoon will be the only active sampling and flow measurement point listed in the permit.

There are a total of five wastewater storage structures listed in Table 1. The treatment cells are clay lined while the new winter storage lagoon is HDPE lined. It is likely that at least two of the treatment lagoons will be HDPE lined as the planned construction projects. The total volume of the four treatment lagoons will remain unchanged at the estimated operating capacity of 17.7 MG. The original design capacity is between 15.5 MG and 19.1 MG depending on whether the depth at cell four is at 6 feet or 9 feet respectively. The new winter storage lagoon has a design capacity of 33 MG. All storage lagoons have been seepage tested, with the results submitted to DEQ as required. Two of the treatment lagoons will be re-tested following the planned lagoon upgrades.

Table 1. Wastewater Storage Structures.

Storage Structure	Serial Number	Design Capacity (Million Gallons)
Cell1	LG-003401	2.8
Cell 2	LG-003402	3.9
Cell 3	LG-003403	1.7
Cell 4	LG-003404	7.1 (6ft. depth) 10.7 (9 ft. depth)
Winter Storage Lagoon	LG-003405	33

4.6.5 COD Loading

COD loading from 1999 to 2010 indicates an average application of 1.8 lb_{COD}/ac per day. The previous permit required monthly sampling for COD. However, since the maximum COD levels have been shown to be only 3.6% of the standard limit of 50 lb/ac/day, the new permit will not include COD loading limits or requirements for monthly wastewater COD monitoring.

4.6.6 Other Constituent Loading - Trace Element Management

The previous permit did not include a requirement for monitoring supplemental irrigation water sources. Supplemental water likely came from the land owner's on-site well. At the time the permit was written, requirements to sample supplemental sources were not included. The new permit will require supplemental irrigation water (SIW) source monitoring for quantity on a daily basis when being applied to the site, and SIW sampling twice per year for TKN, nitrate and nitrite nitrogen, total-P, EC, pH, and TDS.

4.7 Site Management and Related Permit Recommendations

4.7.1 Buffer Zones

Buffer zones for LA-000034-02 reflect the standard municipal buffer zone distances listed below in Figure 6 for Class D municipal effluent.

<i>DEGREE OF TREATMENT</i>	Primary (Disinfected to <230 CFU/100) ml ⁽¹⁾
<i>FEATURE OF INTEREST</i>	Class D
Inhabited Dwellings (feet)	500
Areas Accessible to Public (feet)	300
Public Water Supply (feet)	1,000
Private Potable Water Supply (feet)	500
Natural Surface Water Bodies	100
Man-made Surface Water (Irrigation canals, reservoirs)	50
FENCING TYPE	Three-Wire Pasture Fence
Required	Yes
POSTING ⁽²⁾	Class D
Required	Yes

(1) The median number of total coliform organisms does not exceed two hundred thirty (230) per one hundred (100) milliliters, as determined from the bacteriological results of the last three (3) days for which analyses have been completed. No sample shall exceed two thousands three hundred (2300) organisms per one hundred (100) milliliters in any confirmed sample.

(2) When using Class D recycled water for irrigation, the personnel at the use area must be notified that the water used is recycled water and is not safe for drinking. For the public, signs must be posted around the perimeter of the irrigation site stating that recycled water is used and is not safe for drinking or human contact. Signs shall be posted and must state "Warning: Recycled Water - Do Not Enter", or equivalent signage both in English and in Spanish, posted every 500 feet and at every corner of the outer perimeter of the site.

Figure 6. LA-000034-02 Buffer Zone Table.

4.7.2 Crop Management

The previous land application site was planted with alfalfa and was managed effectively over the term of the previous permit. The city proposes to plant alfalfa at the new site and may rotate in grain crops as necessary to maintain healthy crop production. The new permit will require an update to the plan of operation, which will include a crop management plan. The city has not proposed any grazing on the site, and they do not have an approved grazing management plan.

4.7.3 Nuisance Plan

The new permit will not include a compliance activity requirement for submittal of a nuisance odor management plan for the land application activities. The effluent composition is not known to produce nuisance odors. The treatment lagoons must continue to be managed without causing nuisance conditions according to standard permit requirements.

4.8 Compliance Schedule for Required Activities – Permit Section E

The original wastewater reuse permit for the City of Lava Hot Springs included two compliance conditions, but the permit did not use the term ‘compliance activity’ at that time. The conditions included installation of a monitoring well upgradient to the site by October of 1992, and the second requirement was for the posting of signage around the fenced perimeter of the land application site. From all indications the requirements have been met. However, since the site location is changing, any ongoing monitoring or maintenance related to those conditions is no longer applicable to the new permit. The requirements for installation of monitoring wells and maintenance of posted signage will be required for the new site only.

CA-34-01 requires submittal of an updated plan of operation within one year of permit issuance to include an updated quality assurance project plan, and a buffer zone plan. The permittee may submit the required plans in CA-034-01 as individual documents or as sub-parts incorporated into a comprehensive, system-wide plan of operation. Individual management plans will be reviewed and approved separately.

CA-34-02 requires the permittee to submit a runoff management plan. The runoff management plan describes control structures and other best management practices designed to control runoff from any site used for wastewater reuse.

CA-34-03 requires the permittee to prepare a closure plan for the former land application hydraulic management unit. The closure plan ensures that the closed land application hydraulic management unit has been abandoned appropriately and does not pose a threat to human health and the environment.

4.8.1 Permit Limits and Conditions – Section F

The City of Lava Hot Springs’ wastewater reuse facilities constitute a municipal wastewater land application system. Current standards for municipal wastewater reuse systems are incorporated into the draft permit. The wastewater reuse permit is for the land application of municipal effluent. No industrial effluent is described in the permit application and is not permitted to be sent to the treatment lagoons or to the land application system.

The previous permit specified buffer zone criteria for the land application site as: 1) 500 feet to any private domestic water supply, and 2) 300 feet to any private dwellings. The new permit also includes the standard recommendations for buffer zones of 1,000 feet to public water supply wells, 500 feet to private potable water supply wells, 300 feet to inhabited dwellings, 100 feet to surface water bodies, and 50 feet to public access areas, and 50 feet to man-made surface water bodies. Operating plan updates and buffer zone plan maps should reflect those recommended distances.

4.8.2 Monitoring and Reporting – Sections G & H

The permit requires the facility to monitor the volume of wastewater and supplemental irrigation water applied on the land application sites on a daily basis, wastewater composite sampling and reporting is required on a monthly basis when effluent is being applied. Wastewater monitoring parameters have been updated from the previous permit into the new draft permit.

The facility will conduct groundwater monitoring and soil monitoring annually. The facility is also required to conduct calibrations of wastewater and supplemental irrigation water flow measuring equipment annually or as required by the manufacturer. Other monitoring requirements listed in Section G of the draft permit include calculation of the monthly irrigation water requirement for each crop, annual hydraulic loading rates, annual nutrient loading rates, crop yield, and crop nutrient uptake as the crop is removed from the site.

The permittee is required to submit an annual report that includes 1) all monitoring conducted under the terms of the permit, 2) the status of compliance activities required by the permit, and 3) an interpretive discussion of the monitoring data with particular respect to any potential environmental impacts. The annual report is due by January 31st of each year, and will address operations conducted from November 1 through October 31 of the preceding years.

4.9 Conclusions and Recommendations from this section

4.9.1 New Monitoring Requirement Recommendations

Based on the new permit requirements, DEQ makes the following recommendations:

- The permittee is required to calculate crop specific annual water requirements and to monitor wastewater application to avoid exceeding the crop IWR or the hydraulic loading limits.
- Nitrogen loading will be limited to 150 percent of crop uptake on applicable acreage.
- The permittee should consult with their engineer or with DEQ concerning the new reporting requirements, which may be more complicated than the requirements in the previous permit.
- The new monitoring wells and the well at the treatment lagoon site will be required to be sampled and reported in the annual report as required by the monitoring requirements in Table G-1 of the permit.

4.9.2 Other Recommendations

Other recommendations for the draft permit include the following:

- All recommended buffer zone requirements will be updated in the facility maps and applicable management plans to reflect the distances listed in permit Table F-2.

5 Recommendations

Based on review of applicable state rules, staff recommends that DEQ issue draft permit LA-000034-02 for a public review and comment period. The draft permit contains effluent quality requirements for the wastewater treatment system, as well as terms and conditions required for operation of the reuse system.

6 References

Keller Associates 2011, Wastewater Reuse Permit Technical Report (Permit Application), City of Lava Hot Springs, September.

Appendix A: Figures and Maps

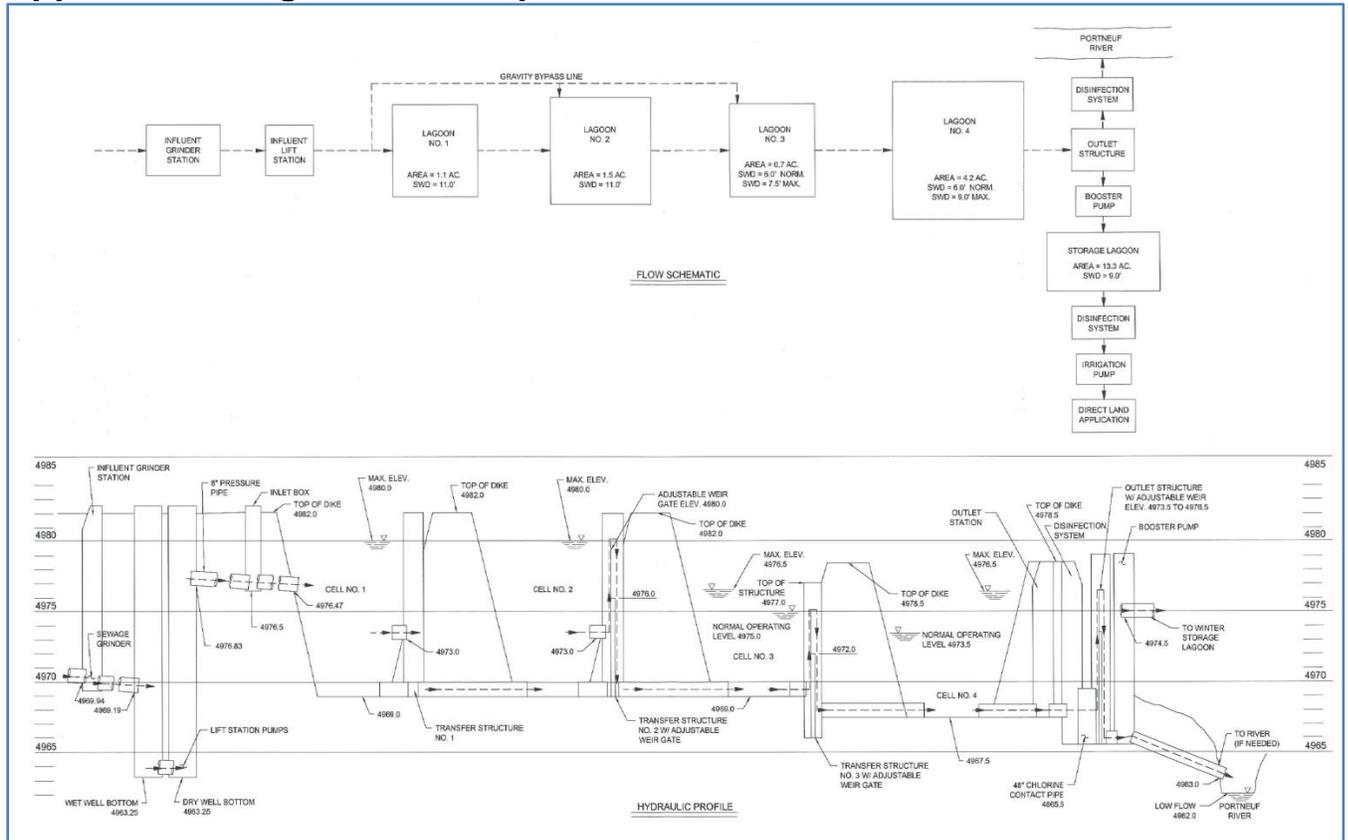


Figure A-1. City of Lava Hot Springs wastewater flow diagram

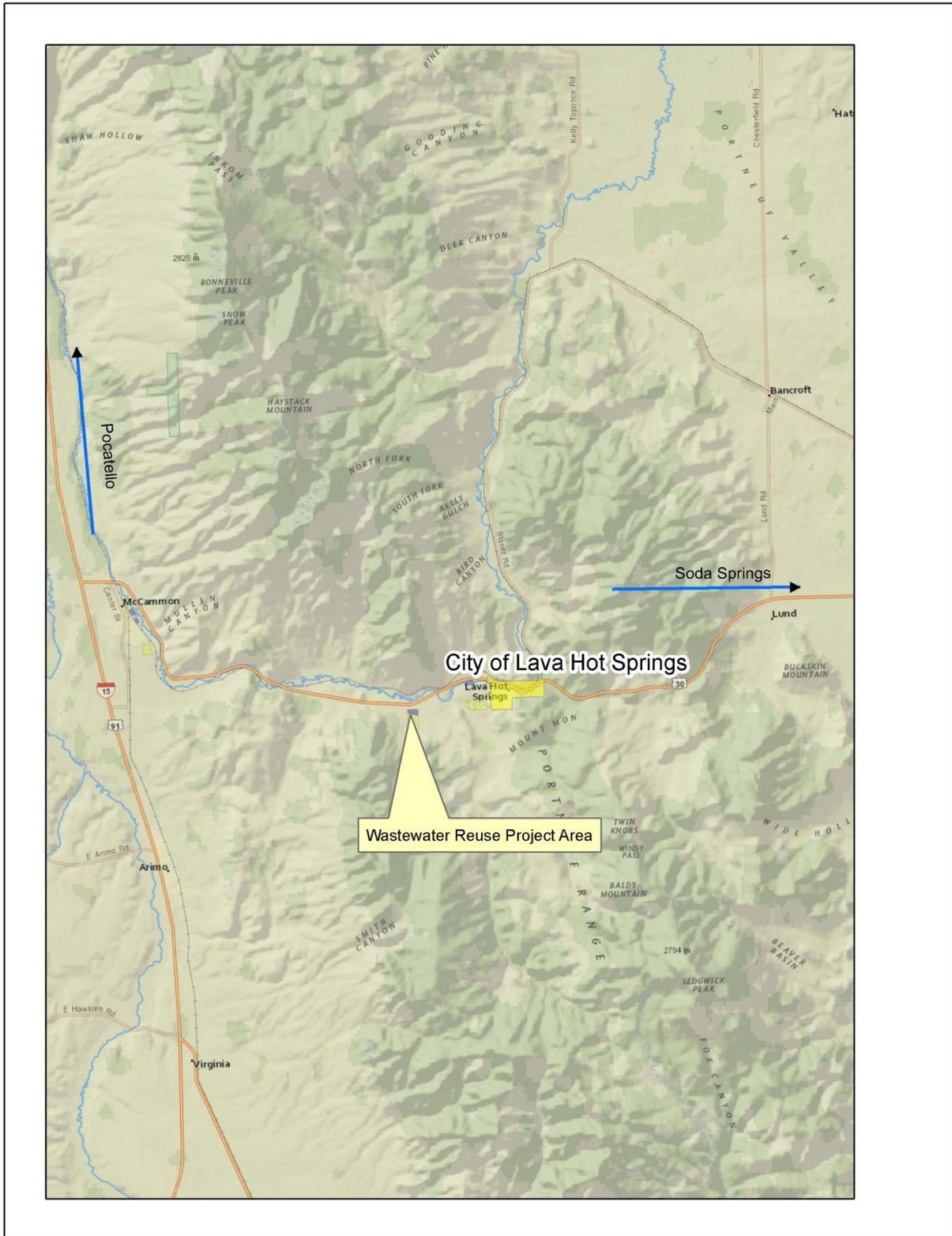


Figure A-2. City of Lava Hot Springs vicinity map

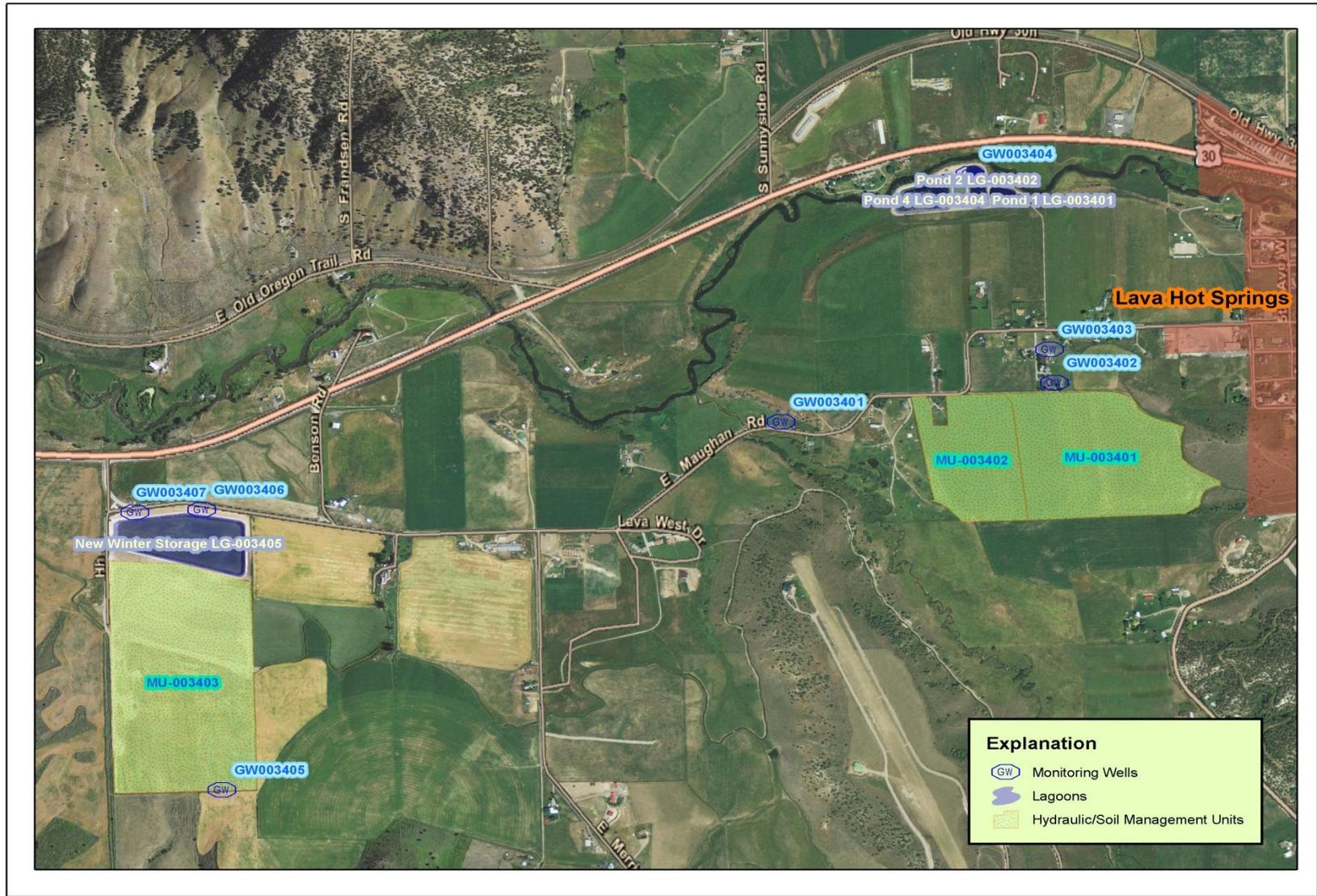


Figure A-3. City of Lava Hot Springs land application hydraulic management units, lagoons, and vicinity



Figure A-4. City Of Lava Hot Springs lagoon location and abandoned land application site