



MEMORANDUM

August 14, 2013

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

FROM:  Scott MacDonald, EIT, MBA, Associate Engineer

SUBJECT: **Staff Analysis for Draft Reuse Permit for the City of Georgetown, Idaho -
Permit M-235-01**

Executive Summary

The City of Georgetown has not applied for, nor operated under a reuse permit previously. The permit application is a request for a new reuse permit. The city relies on evaporation from their treatment lagoons, and discharges to the Bear River to maintain lagoon levels. Existing lagoons are in compliance with all seepage testing requirements. The city did not previously own property suitable for land application, but they now own a parcel of agricultural property suitable to receive applied effluent. The permit duration for this new reuse facility will be five years.

1 Purpose

The purpose of this memorandum is to satisfy the requirements of IDAPA 58.01.17.400.05, "Recycled Water Rules," for issuing wastewater reuse permits. This memorandum addresses draft permit M-235-01, for the municipal wastewater treatment and new reuse system owned and operated by the City of Georgetown, Idaho. The city's treatment and reuse system is not currently permitted under the terms of a wastewater reuse permit. Staff recommends the issuance of M-235-01 as attached.

2 Process Description

2.1.1 System History

The City of Georgetown is located on Highway 30 in Bear Lake County, between the cities of Soda Springs and Montpelier. The city has operated their evaporative and facultative sewage lagoon system since the 1978 when the city's treatment system was initially constructed. The treatment facility is designed to treat municipal effluent through the biological removal of a majority of the organic waste and other contaminants.

2.1.2 Growth and Flow Estimates

Georgetown is a community of 476 residents as of 2010, with 200 service connections. The population has decreased 0.9% since the 1990 census, but a negative growth rate is impractical for future planning. Instead, a 1% growth rate was used for planning effluent flow increases. The design flow rate assumes a population increase from 476 residents, to 642 in 2040. The consultant used a ‘higher than actual’ growth estimate to avoid designing an undersized system, in the event growth increases above the actual negative growth rate. The facility planning study and technical report estimate future effluent flows at approximately 79,000 gallons per day (gpd) in 2040 with 642 residents; or 125 gpd per capita at that time. The flow study also found that inflow and infiltration (I&I) constituted a portion of the accumulated effluent volume. A portion of the I&I was estimated to be coming in the trunk line after the lift station. This project will eliminate the lift station and replace the trunk line which should reduce the I&I. A conservative 30 year design was used for future site loading estimates. Figure 1 shows the Georgetown treatment system, inset into the vicinity map.

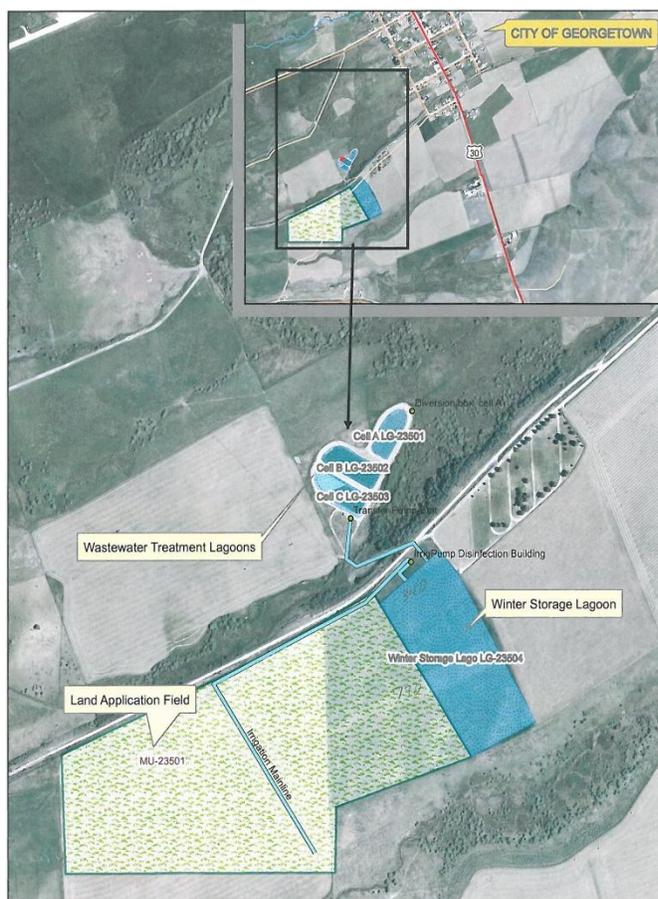


Figure 1. Vicinity map of Georgetown treatment system

lagoon, where it will be treated to Class D disinfection standards prior to being land applied. Wastewater will not be land applied directly from cell C, since it must be treated to Class D standards prior to land application.

2.1.3 Permit Application

The city submitted a technical report on April 1, 2013, as an application for a new wastewater reuse permit. The city chose land application as a preferable alternative to potential fines levied by EPA, for surface water discharge without an NPDES permit. The city has been discharging to a tributary of the Bear River, and has been contacted by EPA concerning this activity. The city’s discharge is based on a 2005 ‘Request for Information and Compliance Order.’ (Keller, June 2013)

2.1.4 System Components and Upgrades

The wastewater collection system operates on gravity flow to collect and direct wastewater to the first of the three treatment lagoons. The lagoons are operated in series with aeration only on cell A. Wastewater flows sequentially from aerated cell A, to facultative cell B, and into the final facultative cell C. Effluent will be pumped from cell C to the new 20.4 million gallon winter storage

Upgrades to the city's current system will provide treated effluent suitable for sprinkle irrigated land application. Facility upgrades include construction of a new pump station at the treatment lagoon site that will use a 7.5 hp pump to transport treated wastewater to the new winter storage lagoon. The city will maintain their existing three-cell treatment system, and will construct an additional fourth cell at the new land application site for winter storage. To pressurize the irrigation wheel lines, a 25 hp pump will be installed adjacent to the winter storage lagoon. The winter storage lagoon outlet piping functions as a contact chamber where effluent is chlorinated prior to the pump can at the pump house. A flow-proportioned chemical pump will inject dosed chlorine into the contact chamber to achieve complete mixing prior to land application.

A new 7.5 hp pump at the treatment lagoon site will transport the effluent from cell C, through a new pipeline to the winter storage lagoon. A new pump building will be built at the land application site, adjacent to the winter storage lagoon and will include the filter, the chlorinator, and electrical control panels. The flow proportioning chlorinator injects a mixed liquid sodium hypochlorite chlorine solution to the wastewater, using a chemical metering pump calibrated to the pump flow rate.

The city will chlorinate the effluent from the winter storage lagoon to a Class-D wastewater disinfection goal of <230 CFU/100 mL. The chlorine contact chamber is not dependent on the irrigation piping capacity to achieve contact time. A recording flow meter in the pump house will measure effluent volume, and irrigation water volume to the land application site.

The City of Georgetown has purchased their new land application site as a permanent management unit for municipal wastewater application. The site is southwest of the cemetery and is well established as agricultural land. There are no features of concern such as public water supply wells, domestic wells, or surface water features that would reduce the useable acreage within the property acquired by the city. See Figure 2 below.

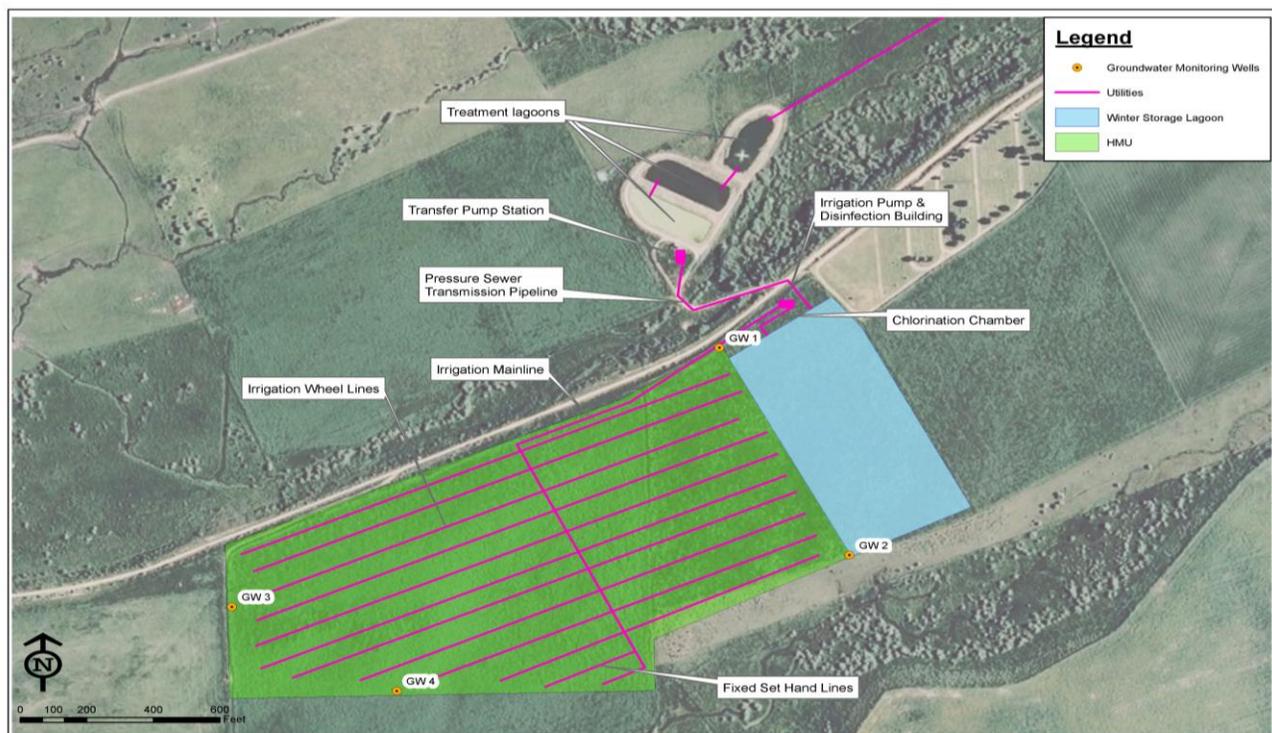


Figure 2. Site property boundary, sprinkler layout, and lagoons (Keller 2013, Figure 2-1)

A Facility Planning Study for the system improvements was submitted to Pocatello Regional Office for review and approval. The revised Facility Planning Study was submitted on April 28, 2011, with an approval provided on May 30, 2011. Plans and Specifications for site work were submitted on February 6, 2013, and were approved on April 19, 2013.

2.1.5 Site Operation

The land application site will be managed primarily as a wastewater treatment site for the uptake of wastewater nutrients through crop production. Municipal wastewater will be applied to 30 acres of the site initially, (33 acres at build-out) permitted as a single management unit.

The facility is permitted to land apply municipal effluent consisting of the sources described in the permit application including effluent from homes and businesses. The permit prohibits land application of industrial sources of wastewater or other waste streams not specifically permitted or identified in the permit or permit application. Effluent will be land applied only during the growing season which is April 1 through October 31.

The land application site shown in Figure 2 above is located in a rural agricultural area. The initial plan for crop management maintains the current farming practices established on site. The city obtained water rights for supplemental irrigation water with the site purchase. A contract farmer will manage crops onsite, including sprinkler operation and crop removal. When supplemental irrigation water is applied, the source will be sampled for required constituents and quantity as a monitoring point listed in the Permit Section 5.1.

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 City of Georgetown has not operated under any reuse permit in the past. The new wastewater reuse permit is the first reuse permit for this municipality. The municipal effluent treatment facilities are located within the City of Georgetown, with the land application site located to the south of the city's treatment lagoon area. The following items have led to the preparation of the draft permit and staff analysis.

- November 30, 2012 – DEQ received an application including a preliminary technical report.
- December 10, 2012 – DEQ responded with comments on the submittal requesting additional information.
- April 1, 2013 – DEQ received a revised Permit Application and Technical Report for the City of Georgetown
- April 15, 2013, – DEQ sent a clarifying e-mail to Keller Associates on the permit application
No action required
- May 1, 2013 – DEQ sent the completeness determination letter to the City of Georgetown

- May 30, 2013 DEQ sent the preliminary decision letter to complete the Draft Permit
- August 15, 2013 – DEQ issued a Draft Permit and Staff Analysis for review and comment.

A revised permit application and Technical Report from the City of Georgetown was received on April 1, 2013, 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 Georgetown wastewater reuse facilities.

3.2 Inspection and Annual Report Review Findings

The proposed wastewater reuse permit is the first for this facility. There have been no reuse inspections completed or annual reports submitted for the proposed land application management unit. Onsite inspections were conducted by DEQ prior to land purchase, to provide the city with confidence that the site would be able to be permitted under the reuse program. The City of Georgetown previously discharged only to surface water, but without an official discharge permit. No DEQ reuse inspections were conducted as part of those actions.

4 Discussion

This section presents relevant issues concerning site conditions, data, and proposed management practices that are used as the basis for determining permit conditions. Discussion items include; operations, hydraulic management unit configuration, site soils, groundwater, surface water, proposed site loading, wastewater quality and quantity, storage structures, site management, and compliance activities.

4.1 Plan of Operation

The facility plan of operation is required to be submitted under compliance activity CA-235-01 within 12 months following issuance of the new permit, and must be updated or modified as operations and regulatory requirements change. The facility will complete an updated plan of operation which will detail the operations of the wastewater system, the new chlorine system, and flow measurement equipment, along with detailed operating practices and agricultural management activities at the land application site. Operating plans include system operations and explain standard permit reporting requirements.

The permittee may submit management plans required in CA-235-01 as individual documents or as sub-parts incorporated into a comprehensive, system-wide plan of operation. The Plan of Operation should be completed according to the checklist in the Guidance, and in accordance with IDAPA 58.01.17, “Recycled Water Rules,” Section 300.05.

4.2 Hydraulic Management Unit Configuration

The city purchased a 42 acre parcel for land application of municipal effluent, and for construction of a new winter storage lagoon at the new site. The city will initially develop 30 acres for their land application site approximately 300 feet southeast of the treatment lagoons. Loading calculations are based on 33 acre usage at build-out. The permit application indicates that the site will meet the city's effluent treatment needs to accommodate 30 years of population growth. The city will use wheel lines and fixed set hand lines to irrigate the site. The outline of the proposed sprinkler layout is shown in Figure 3. The system is designed for 5 gpm on each sprinkler head at 70% efficiency. Sprinkler system efficiency is designated as E_i in permit Section 4.1, reflecting permit application materials. The established efficiency of 70% is an acceptable midpoint between the high of 75% and the low of 65% efficiency for wheel lines.

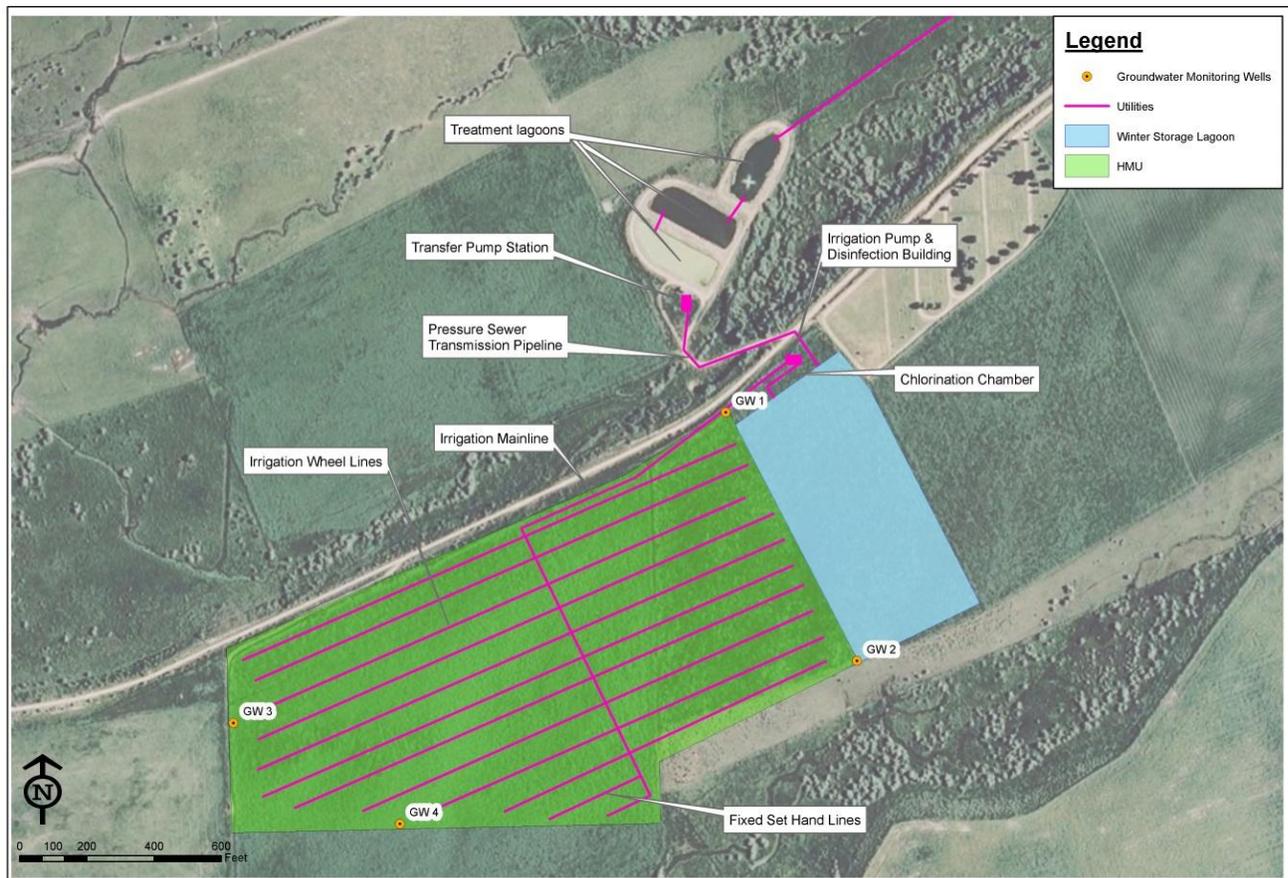


Figure 3. System configuration, and sprinkler system layout. (Keller 2013 Figure 2-1)

Site Elevations

Management unit elevations range from approximately 5980 feet to 6010 feet, with the treatment lagoons established at an elevation of 5970 feet above mean sea level (MSL). The proposed lagoon elevation for cell C is 5961.5 feet above MSL. The new winter storage lagoon surface operating elevation is shown as 5992 feet above MSL, requiring a pump to deliver effluent 28.5 feet above the surface of cell C to the winter storage lagoon operating level. This effluent transport pump is a 7.5 hp pump used as a slow rate transport mechanism to maintain the treatment lagoon levels.

The system hydraulic profile is shown in Figure 4 below.

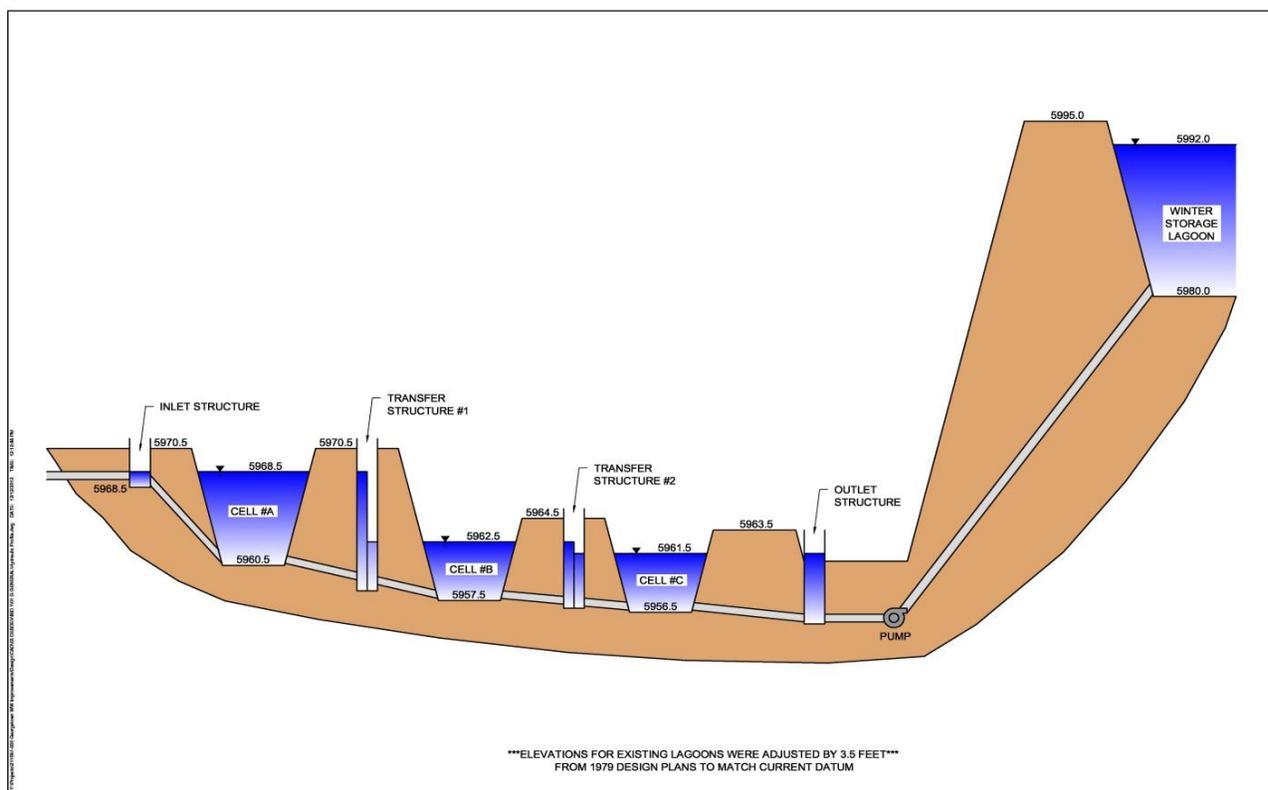


Figure 4. System elevations and hydraulic profile (Keller 2013, Figure 2-2)

The hydraulic management unit has been managed as agricultural land in the past. The site should serve as an effective land application site for final wastewater treatment by growing crops for wastewater nutrient removal. The city plans to grow and harvest alfalfa, with at least two cuttings per year, according to local crop production rates.

4.2.1 Site Runoff Control

Permit compliance activity CA-235-01 requires submittal of a runoff management plan for the new management unit within 12 months of permit issuance. The plan will be submitted to DEQ for review and approval. The plan should show that the management unit is designed for control and mitigation of site run off.

Wastewater will be applied in the summer months during the growing season when infiltration is highest, and chances for effluent runoff from spring thaws are minimal. Application during the growing season will allow for a significant period following effluent application when no effluent is applied to the crops, so that winter precipitation or spring thaws should prevent effluent runoff. The runoff management plan submitted in the Permit Application Technical Report appears to be complete with control structures installed during site development, and should be resubmitted in the final facility plan of operation. Site development includes construction of permanent storm water runoff control structures to ensure that applied wastewater is contained within the site boundaries. Stormwater run-on is not of significant volume to be of regulatory concern.

4.3 Site Soils

Site soils are generally well suited for the sprinkle application of wastewater. The permit application technical report shows no significant variation in the soil types across the site. Site soils are reported as Rexburg-Iphil complex soils, which are generally described as silt loams. Site soils have an infiltration rate of 0.57 to 1.98 in/hr ($9\mu\text{m/s} = 30.6 \text{ in/day}$), providing adequate infiltration, and minimizing ponding or runoff. A detailed soil report can be found in the Permit Application Technical report, Appendix A - Soil Report. (Keller 2013).

Table 1 below identifies specific soil types and mapping unit symbols for soils found on the management unit.

Table 1. Soil Mapping Unit Symbols (Source, Keller 2013 Table 3-3)

| Map Unit Symbol | Map Unit Name | Acres in AOI | % of AOI | Typical Profile | | SAR | Hydraulic Conductivity | | Hydrologic Soil Group |
|-----------------|--|--------------|----------|-----------------|-----------|-----|------------------------|--------|-----------------------|
| | | | | Depth (in) | Descr. | | $\mu\text{m/sec}$ | in/day | |
| 172 | Rexburg-Iphil complex 4 to 8 % slopes | 38.8 | 100 % | 0-60 | Silt Loam | 8.0 | 9.0 | 30.6 | B |

Table 2 Soil Mapping Units (NRCS) (Source, Keller 2013 Appendix A)

| Bear Lake County Area, Idaho (ID712) | | | |
|--------------------------------------|--|--------------|----------------|
| Map Unit Symbol | Map Unit Name | Acres in AOI | Percent of AOI |
| 172 | Rexburg-Iphil complex, 4 to 8 percent slopes | 38.8 | 100.0% |
| Totals for Area of Interest | | 38.8 | 100.0% |

Soil Monitoring

The permit application shows soil characteristics across the site that are well suited for land application. Salts are identified as the primary constituent of concern, and will be continually monitored for constituent build-up. The permit requires annual soil monitoring for pH, plant available P (Olsen Method), $\text{NO}_3\text{-N}$ (nitrate nitrogen), $\text{NH}_4^+\text{-N}$ (ammonium nitrogen), electrical conductivity, and percent organic matter monitored annually. The permit also requires that SAR, percent organic matter, chloride, DTPA-Fe, and DTPA-Mn be monitored and reported the first year of the permit.

4.4 Groundwater

Groundwater flow direction is shown to be toward the west-southwest; similar to the surface water flow direction of the creek north of the site. Measurements of groundwater near the site indicate groundwater at 15 to 55 feet below ground surface, depending on surface topography. There are two wells within $\frac{1}{4}$ mile of the management unit identified as irrigation wells in the well logs; ID#389751, and ID#268417. Beneficial groundwater uses include agricultural use. No known nitrate priority areas apply to the area.

Groundwater Monitoring Data:

The permittee is required to monitor groundwater at the hydraulic management unit. The permittee will sample the new monitoring wells installed at the site and near the winter storage lagoon. The four proposed monitoring wells will be monitored twice per year for: static water level (in hundredths of a foot), nitrate-nitrogen, total phosphorus, total dissolved solids, volatile dissolved solids, nonvolatile dissolved solids, total and dissolved iron, total and dissolved manganese, pH, chloride, and total coliform. Table 7-1 from the Guidance was used to verify the applicability of the sampling requirements. Field parameters and other recommended analytical parameters will be monitored as recommended in the Guidance Table 7-1. The permit does not include recommendations for domestic well sampling.

4.5 Surface Water

The nearest natural surface water to the site is an unnamed drainage located 120 feet to the south of the management unit southern boundary. There is a man-made canal ditch 160 feet to the north of the management unit, between the land application site and the treatment lagoons. The canal is filled seasonally. Georgetown Creek is over ½ mile to the north of the treatment lagoons. The Bear River became the default surface water discharge point for the municipal effluent. The Bear Lake subbasin, including The Bear River and Georgetown Creek lists beneficial uses for aquatic life, as cold water salmonid spawning, and uses as primary contact recreation. There are no springs reported in the area.

To help protect surface waters from contact with wastewater, compliance activity CA-235-01 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 nearby surface waters.

4.6 Historic and Proposed Site Loading

Loading rates for individual management units are determined by individual crop watering requirements. The permit limits growing season hydraulic loading to the crop specific IWR, in any combination of treated wastewater and supplemental irrigation water if it is applied to the site. Calculations require specific methodology to determine the crop IWR. The permittee may use either thirty-year data or current climatic and agronomic information, but whatever method is used the permit requires that it must be used consistently throughout the permit period.

4.6.1 Historic Flows and Proposed Hydraulic Loading Rate

The permit will limit annual loading to 29 MG of wastewater applied annually. Generated wastewater quantities are not expected to exceed the IWR of the available acreage. Annual IWR calculations are required to proactively plan for the most effective use of wastewater (and supplemental water if available) to ensure efficient crop growth, and to maximize wastewater nutrient uptake by the crop.

To plan for crop water needs, DEQ staff used data available from ETIdaho¹ and from information in the permit application materials to compare proposed application rates with the IWR of alfalfa crops in the area. The IWR, or precipitation deficit (P_{def}) for alfalfa for the site, is reported at 22 total inches of combined wastewater and supplemental irrigation water during the growing season. Using the 70% efficiency of the sprinkler system, the IWR equates to 31 inches of required water for an alfalfa crop in the area. Staff does not envision the city being limited by hydraulic loading for the foreseeable future.

Table 3. Growing Season IWR Estimates for Alfalfa near Georgetown

| Growing Season IWR Estimates | | | | | | |
|---|----------------|------------------|-------------|-----------|----------------------|-----------------|
| Inches per day | Days per month | Inches per month | gal/acre-in | acres | Sprinkler efficiency | |
| | | | 27154 | 33 | 70% | |
| 0.00354 | 30 | 0.1062 | 2884 | 95,164 | 135,948 | April |
| 0.0669 | 31 | 2.0739 | 56315 | 1,858,384 | 2,654,835 | May |
| 0.2004 | 30 | 6.012 | 163250 | 5,387,245 | 7,696,064 | June |
| 0.1799 | 31 | 5.5769 | 151435 | 4,997,360 | 7,139,085 | July |
| 0.1535 | 31 | 4.7585 | 129212 | 4,264,006 | 6,091,437 | August |
| 0.1015 | 30 | 3.045 | 82684 | 2,728,570 | 3,897,957 | September |
| 0.011 | 31 | 0.341 | 9260 | 305,564 | 436,520 | October |
| http://www.kimberly.uidaho.edu/ETIdaho/online.php | | | | | 28,051,847 | DEQ estimate |
| | | | | | 28,057,607 | Keller Estimate |

4.6.2 Wastewater Quality and Sampling

The new wastewater reuse permit requires regular wastewater monitoring for land application reporting to DEQ. Considering the fairly flat population numbers, and lack of industrial flows to the treatment plant, the city's wastewater characteristics are likely to remain consistent from year to year. Table 4 below lists the average 2006-2010 wastewater constituent data from the permit application. Sampling and reporting will be conducted according to a facility Quality Assurance Project Plan (QAPP).

Table 4. Average Concentration of Key Constituents (Keller 2013, Table 4-2)

| Parameter | Concentration | |
|------------------|---------------|---------|
| | Units | Average |
| BOD ₅ | mg/L | 14.5 |
| TSS | mg/L | 19.3 |
| Ammonia-N | mg/L | 12.1 |
| Nitrate | mg/L | 1.0 |
| Nitrite | mg/L | 0.1 |
| E. coli | #/100 mL | 54 |
| pH | SU | 7.6 |

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

Calculations in the permit application indicate that the site will approach hydraulic loading limits before any land limiting constituent loading limits have been reached. Nitrogen and possibly COD loading would likely be the limiting constituents and are reported in more detail below. The wastewater reuse permit will include the standard, minimum, Class D treatment limits for total coliform rather than *E. coli*, as shown in Table 4 above.

The permit requires the facility to monitor the volumes of wastewater and supplemental irrigation water 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. The facility will take a minimum of three samples in the first 30 days of application at the beginning of each year to be certain coliform limits are within permitted requirements.

4.6.3 Hydraulic Flow, and Storage

Growing season wastewater application limit is 29 million gallons annually. The loading limit is established as a conservative estimate of future flows for a 30 year population growth estimate.

Flow meter calibration for wastewater and supplemental irrigation water application is a requirement in the permit. The treatment lagoon pump house will contain the flow meter used to record supplemental irrigation water volume from the adjacent canal or irrigation well. Effluent flow is measured as it is pumped from the winter storage lagoon to the land application site. Effluent samples are taken at the pump house. Following chlorination, city personnel collect grab samples from the designated sampling point at the land application site.

The permit lists four active containment structures. The four wastewater storage structures and capacities are listed in Table 5 below. The three treatment cells are clay lined while the winter storage lagoon is HDPE lined. The three treatment lagoons have a total operating capacity of 2.51 million gallons. The winter storage lagoon has a design capacity of 20.4 million gallons. Each of the treatment lagoons has been seepage tested in 2009 and 2010. The seepage plans and results were reviewed and approved by DEQ April 18, 2011, (DEQ 2011). The winter storage lagoon will be required to be seepage tested in compliance activity CA-235-02.

Table 5. Wastewater Storage Structures and Capacity.

| Serial number | Description | Estimated Surface Area, acres | Maximum Operating Volume, MG | Liner Type |
|----------------------|-----------------------------|--------------------------------------|-------------------------------------|-------------------|
| LG-23501 | Cell A Primary Treatment | 0.37 | 0.94 | Clay |
| LG-23502 | Cell B Primary Treatment | 0.53 | 0.84 | Clay |
| LG-23503 | Cell C Primary Treatment | 0.42 | 0.73 | Clay |
| LG-23504 | Winter Storage Lagoon | 5.2 | 20.4 | HDPE |

4.6.4 Nitrogen Loading

Comparisons between site nitrogen loading and crop nitrogen uptake values are not yet established. However, the permit application includes the standard table value of 52 lb nitrogen removal rate per ton of alfalfa, which is reasonable for the area.

The permit application materials estimate site-specific nitrogen removal rate as 52 lb_N per ton of alfalfa, with 5.5 tons per acre average yield, resulting in a theoretical removal rate of 286 lb nitrogen per acre. Using typical crop yields of 2-3 tons per acre for alfalfa in Bear Lake County with the typical 2 cuttings, DEQ is still in agreement that the nutrient uptake rates will exceed nitrogen loading rates. Multiplying the theoretical removal rate of 286 lb nitrogen per acre by the 150% of removed nitrogen loading limit in the permit, the permittee would be limited to 429 lb nitrogen per acre, if the standard nitrogen is removed. The estimated loading rate is 88.2 lb nitrogen per acre; well below 429 lb per acre. This estimate is for total loadings at build out, so the permittee should be able to manage the site effectively for nitrogen loading and uptake for quite some time, as long as nitrogen removal rates are maintained.

The permitted nitrogen loading limit is 150% of the median three-year crop uptake for all sources, including fertilizer application. The permit application does not include information on historical fertilizer application, since the land has only recently been purchased by the city and was not farmed by them. Required annual reporting must list supplemental fertilizer application if applied on site.

4.6.5 COD Loading

Municipal effluent COD concentrations are reported at 3.3 lb COD per acre per day, which is less than 7% of the standard limit of 50 lb/ac/day. As with most municipal effluent, the COD concentration is below levels of regulatory concern. The new permit will not include requirements for monthly wastewater monitoring for COD, or a COD loading limit.

4.6.6 Other Constituent Loading - Trace Element Management

The permit will require monitoring of supplemental irrigation water sources. Any supplemental irrigation water source will be monitored for quantity on a daily basis when being applied to the site, and sampled twice per year in the first year of the permit for TKN, nitrate nitrogen, nitrite nitrogen, total-P, TDS, and pH. Application materials specify the supplemental irrigation water source as a pressure irrigation line adjacent to the site. The permit includes provisions for volume measurement and supplemental water source sampling as it is applied to the site.

4.7 **Site Management Plans Described in the Permit Application**

4.7.1 Buffer Zones

Buffer zones for draft permit M-235-01 reflect the standard municipal buffer zone distances for Class D municipal effluent, (Secondary effluent quality - disinfected to <230 CFU/100 ml¹),

listed in Table 6 below. The permit compliance activity CA-235-01 requires submittal of a Buffer Zone Plan within 12 months of permit issuance.

Table 6. Level of Wastewater Disinfection and Resulting Buffer Zones.

| Serial Number | Buffer Distances (in feet) from Hydraulic Management Units | | | | | |
|---------------|--|------------------------|---------------------|--|-------------------------------|--------------------------------|
| | Public Water Supplies | Private Water Supplies | Inhabited Dwellings | Permanent and Intermittent Surface Water | Irrigation Ditches and Canals | Areas Accessible to the Public |
| MU-23501 | 1,000 | 500 | 300 | 100 | 50 | 50 |

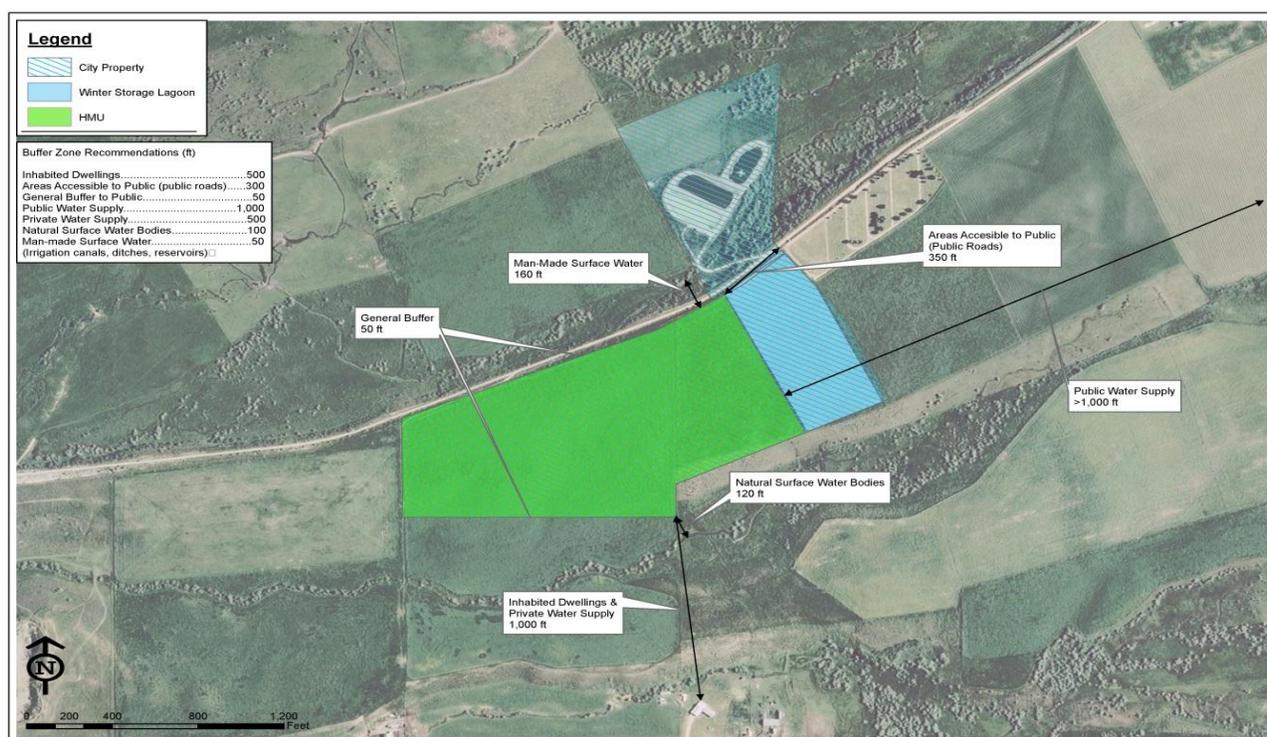


Figure 5. Buffer Zone Distances (Keller 2013 Figure 5-1)

4.7.2 Crop Management

The city will grow alfalfa on the site and may rotate in other crops, such as grains as necessary to maintain healthy crop production. The new permit will require an update to the plan of operation, including a cropping plan.

The city has proposed grazing on the site for fall clean-up of remaining stubble. The permit requires the city to have an approved grazing management plan prior to grazing animals on-site.

4.7.3 Nuisance Odor Management Plan

The new permit includes a compliance activity requirement in CA-235-01, for submittal of a nuisance odor management plan for the treatment lagoons, and for wastewater reuse land

application activities. Although the effluent composition is not known to produce nuisance odors, the permit requires submittal of the plan to show how they will respond to odor complaints. The plan will include complaint recording and reporting methods.

The treatment lagoons, the winter storage lagoon, and the land application site must be managed without causing nuisance conditions, according to standard permit requirements.

4.8 Compliance Schedule for Required Activities – Permit Section 3

CA-235-01 requires submittal of an updated plan of operation within one year of permit issuance to include a buffer zone plan, cropping plan, a grazing management plan, a nuisance odor management plan, a well location acceptability analysis, a waste solids management plan, an irrigation management and scheduling plan, and a runoff management plan. The permittee may submit the required plans in CA-235-01 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-235-02 requires submittal of a Quality Assurance Project Plan (QAPP), within 6 months of permit issuance.

CA-235-03 requires submittal of a seepage testing plan for review and approval prior to seepage testing the new winter storage lagoon.

- Treatment cell A was seepage tested in 2009 (0.0577 in/day),
- Cells B and C were seepage tested in 2010 (0.1429 in/day, and 0.1565 in/day respectively).
- The three existing cells were constructed before April 15, 2007 and seepage rates are below the required 0.250 inches per day limit. A seepage testing approval letter was sent for all three cells on April 18, 2010.
- Storage structures will be retested at 10 year intervals as required by rule.

CA-235-04 requires submittal of a monitoring well network installation plan to ensure that the monitoring well location and design is approved by DEQ prior to installation.

CA-235-05 requires attendance at a pre-application workshop 1 year prior to permit expiration.

CA-235-06 requires submittal of permit renewal information a minimum of 180 days prior to permit expiration.

4.9 Permit Limits and Conditions – Permit Section 4

The City of Georgetown 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 treated municipal effluent. Industrial effluent is not described in the permit application and is not permitted to be sent to the treatment lagoons or to the land application system.

The buffer zone criteria in the permit reflect standard buffer zones for Class D municipal effluent. Operating plans and buffer zone maps should reflect the buffer distances in the permit Section 4.4.

4.10 Monitoring and Reporting – Permit Sections 5 & 6

The permit requires the facility to monitor the volume of wastewater and supplemental irrigation water applied on the land application site on a daily basis, wastewater composite sampling and reporting is required on a monthly basis when effluent is being applied.

The facility is required to calibrate wastewater and supplemental irrigation water flow measuring equipment annually, or as required by the manufacturer. Other monitoring requirements listed in Section 6.1.2 of the draft permit include calculation of the monthly irrigation water requirement for each crop, the annual hydraulic loading rates, the annual nutrient loading rates, along with 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 31 of each year, and will address operations conducted from November 1 through October 31 of the preceding years.

5 Recommendation for Issuance of Permit

Based on review of applicable state rules, staff recommends that DEQ issue draft Permit M-235-01 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. As a new permit, the permit duration will be for five years.

6 References

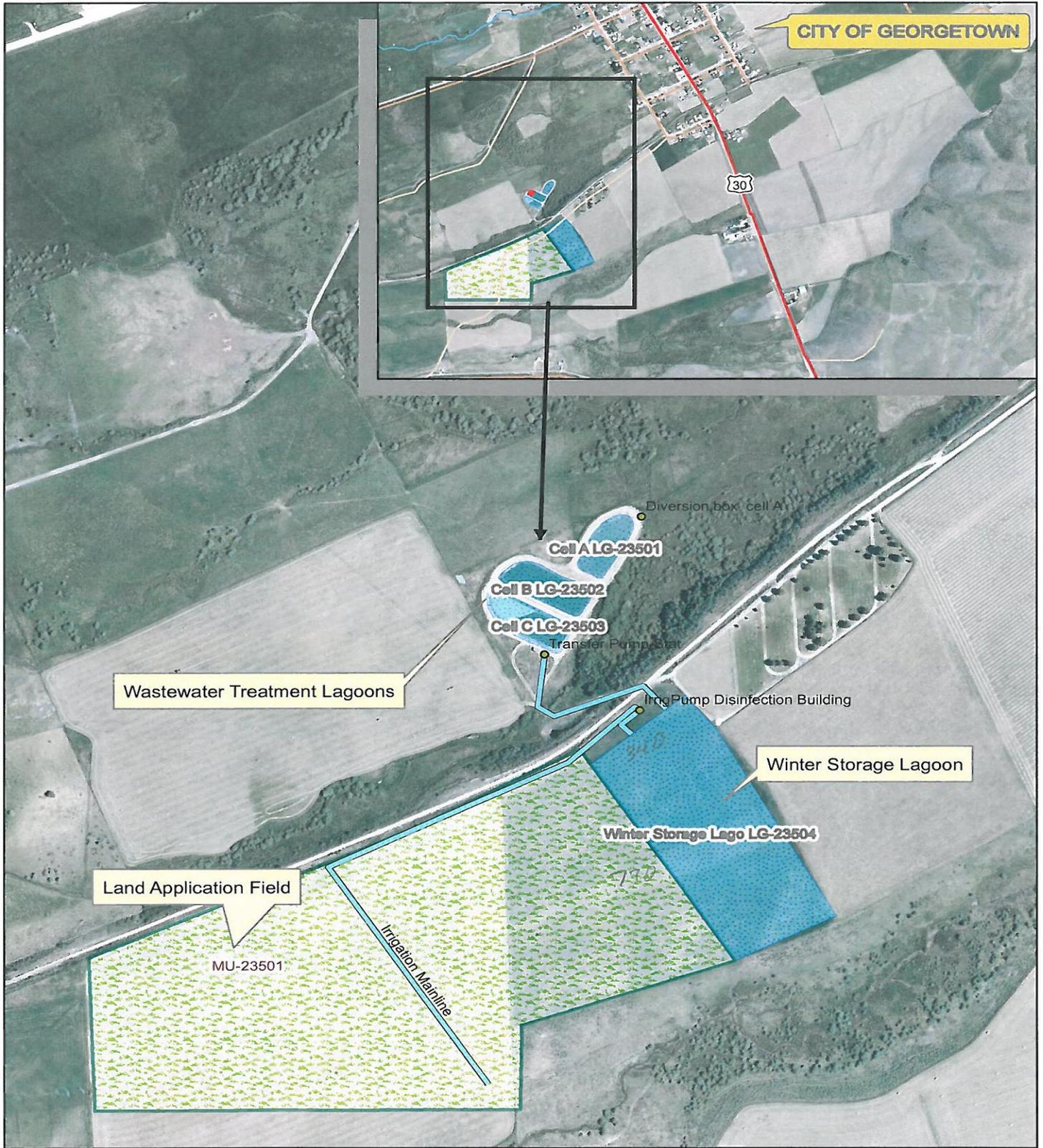
Keller Associates, April 1, 2013, Wastewater Reuse Application (Permit Technical Report and Permit Application), City of Georgetown.

DEQ 2011, Seepage testing approval letter TRIM # 2011AGD1270.

Keller Associates, June 26, 2013, e-mail attachment correspondence from EPA on NPDES discharge, and subsequent follow-up correspondence. TRIM# 2013AGH1028.

Appendix A: Site Maps

Appendix Figure 1. City of Georgetown Vicinity map, lagoons, and land application site



Appendix Figure 2. City of Georgetown Management Unit, pivot area, and lagoons. (Keller 2013, Figure 2-1)

