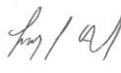


May 14, 2013

**MEMORANDUM**

**TO:** David Anderson, Engineering Manager  
DEQ – Twin Falls Regional Office

Bill Allred, Regional Administrator  
DEQ – Twin Falls Regional Office

**FROM:** Larry Waters, Scientist 3   
DEQ, State Office of Technical Services

**SUBJECT:** Staff Analysis for Draft Municipal Reuse Permit M-001-04 (previous permit No. LA-000001-03) for the City of Rupert

**1. PURPOSE**

The purpose of this memorandum is to satisfy the requirements of the *Recycled Water Rules*, IDAPA 58.01.17.400.05, for issuing reuse permits. This memorandum addresses draft permit M-001-04 for the municipal treatment and reuse system owned and operated by the City of Rupert. The City of Rupert's treatment and reuse system is currently permitted under the terms of LA-000001-03.

**2. SUMMARY OF EVENTS**

The Department of Environmental Quality (DEQ) issued Permit LA-000001-03 to the City of Rupert on June 29, 2007. The permit is for continued operation of the reuse system serving the City of Rupert. This facility is located at 200 South 50 West, Rupert, Idaho in Minidoka County. The purpose of the draft permit is to renew permit LA-000001-03, which expired on June 29, 2012.

A permit renewal application from the City of Rupert was received by DEQ on April 6, 2012, and largely serves as the basis for the terms and conditions contained in the draft permit. As required by the *Recycled Water Rules*, IDAPA 58.01.17.400.07.b 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 Rupert reuse facility.

**3. PROCESS AND SITE DESCRIPTIONS**

The wastewater treatment facility (aeration lagoons, clarifiers, filters, ultraviolet disinfection, and belt filter presses) is located approximately one (1) mile south of the City of Rupert and is owned and operated by the City. The reuse site, facultative lagoons, and chlorine disinfection system are located approximately six (6) miles northeast of the City of Rupert and are owned by the City. Although the City owns the reuse

site, the irrigation equipment is operated by a local farmer under the direction of the City's wastewater land application operator. The City of Rupert discharges approximately 181 million gallons annually (MGA) of recycled water to their reuse site. Wastewater entering the wastewater treatment facility consists of municipal wastewater from residential and commercial users, as well as wastewater from two major industries: Idaho Foods (formerly Idahoan Foods), a potato processor, and Brewster Cheese (formerly Kraft), a cheese processor.

### 3.1 Process Description

The City has recently completed Phase 2 of its treatment plant upgrade. The improvements include a new operations building, tertiary filtration, ultraviolet disinfection, and solids dewatering equipment. With these improvements the treatment facility consists of the following major components, listed in sequence of flow:

- Head works with mechanical bar screen and flow measurement;
- Secondary treatment with two (2) aeration basins and two (2) clarifiers;
- Tertiary treatment with two (2) Nova Water Ultrascreen filter systems;
- Ozonia Aquaray ultraviolet disinfection;
- Solids dewatering using two (2) belt filter presses;
- Effluent transfer pump station and mainline;
- A three (3) cell facultative lagoon system with a total design surface area and holding volume of 233 acres and 457 MG, respectively;
- A two (2) center pivot land application system (231 acre total);
- An additional 64 acre handset area is permitted but not currently in use, based on the City of Rupert staff comments made during the 2012 DEQ site inspection.

With the treatment facility improvements, the City has been able to provide class B effluent to the reuse site allowing the farmer the option of growing food crops. In addition, once the infrastructure (i.e., purple pipe) can be provided, the City has proposed that Class A recycled water be provided to residential customers throughout the city. In order for the City to provide Class A recycled water, the City will need to apply for a major permit modification or go through the re-permitting process with DEQ. The City will need to provide documentation that shows that the City can consistently produce Class A recycled water as part of the permit modification or re-permitting process at that time and meet all of the additional requirements in 58.01.17 for Class A reuse.

### 3.2 Site Soils

The wastewater reuse site currently in use consists of 231 acres divided into two (2) center pivot management units (MU). An additional 64 acre handset area is permitted but not currently in use. The site soils are distributed as shown in Table 1 below:

Table 1: City of Rupert, Reuse Site Soils			
% Total Acres	Soil Map Number	Soil Name	Soil Description
50	45	Vining sandy loam, 1 to 8 % slopes	Fine sandy loam to 23 inches, un-weathered bedrock below
32	17	Kecko fine sandy loam, 1 to 4 % slopes	Fine sandy loam to 21 inches, very fine sandy loam below
9	24	Portneuf silt loam, 1 to 4 % slopes	Silt loam to greater than 60 inches
3	25	Portneuf silt loam, 4 to 8 % slopes	Silt loam to greater than 60 inches
4	36	Sluka silt loam, 1 to 4 % slopes	Silt loam to 23 inches, cemented material from 23 inches to 38 inches, silt loam below
1	26	Power silt loam, 1 to 4 % slopes	Silt loam to 8 inches, silty clay loam from 8 inches to 31 inches, silt loam below
1	7	Bahem silt loam, 8 to 12 % slopes	Silt loam to greater than 60 inches

Note: information taken from the USDA web soil survey located at <http://websoilsurvey.nrcs.usda.gov>. A site soil map can be found in Appendix A.

The permit requires that Nitrate - N, Ammonium – N, Electrical Conductivity (EC), and plant available Phosphorus be monitored for each soil monitoring unit. Results of the current composite soil samples are summarized in Table 2 below. Since no recycled water was land applied to MU-00105 (handset area between facultative lagoons 1 and 3) during the time periods shown, SU-00105 was not included in Table 2 below.

As can be seen from Table 2, each of the soil constituents of concern except Phosphorus has, for the most part, increased with soil depth through April 2, 2012 and then has experienced a decrease with soil depth afterward. Phosphorus has experienced a decrease with soil depth throughout the time periods shown. The decrease with soil depth for most of the soil constituents is attributed to the facility upgrade to Class B which was completed in July 2012. This upgrade reduced the constituent concentrations being land applied resulting in a decrease in constituent levels with depth.

Table 2: City of Rupert, Composite Soil Sample Data									
Parameter	Date	SU-00101				SU-00102			
		0 – 12 inches	12 – 18 inches	18 – 24 inches	24 – 36 inches	0 – 12 inches	12 – 18 inches	18 – 24 inches	24 – 36 inches
Nitrate-N (ppm)	March 31, 2011	6.0	7.0	9.0	8.0	6.0	6.0	6.0	1.8
	October 20, 2011	7.0	8.0	9.0	6.0	5.0	3.0	3.0	3.0
	April 2, 2012	8.0	5.0	29.0	15.0	17.0	7.0	18.0	12.0
	October 16, 2012	5.0	4.0	4.0	3.0	16.0	11.0	11.0	11.0
Ammonium-N (ppm)	March 31, 2011	3.1	2.6	2.3	2.1	3.9	2.3	1.8	1.5
	October 20, 2011	2.7	2.3	1.9	2.3	2.9	2.2	1.8	1.9
	April 2, 2012	4.7	3.7	3.5	2.3	4.1	3.5	3.3	2.1
	October 16, 2012	3.4	2.3	2.1	1.9	3.3	2.6	2.3	2.2
EC (salts) (μmhos/cm)	March 31, 2011	0.8	0.9	1.5	2.4	0.8	0.9	1.5	2.7
	October 20, 2011	1.8	2.3	2.9	2.7	1.7	3.2	3.6	3.2
	April 2, 2012	1.4	2.0	2.9	3.0	1.5	2.9	2.4	3.2
	October 16, 2012	1.2	1.7	1.7	2.7	1.7	2.1	2.0	2.9
Plant Available Phosphorus (ppm)	March 31, 2011	24	19	17	12	21	17	13	14
	October 20, 2011	16	13	10	8	16	11	10	6
	April 2, 2012	17	14	9	6	16	17	11	7
	October 16, 2012	15	13	11	12	19	15	14	8

### 3.3 Surface Water

The closest surface water to the lagoons and reuse site is the East Drain located over one half (0.5) mile northwest of the site. As a result, the reuse site should have no effect on the surrounding surface waters. The reuse site is also located outside of the 100 year flood plain.

### 3.4 Ground Water

There is a shallow ground water aquifer (approximately 100 feet below ground surface) and a deeper

ground water aquifer below the reuse site. All the domestic drinking water wells on record have been completed in the shallow aquifer. Five domestic drinking water wells are currently being used to monitor the effects the reuse site and the lagoons are having on this shallow aquifer. The ground water flow direction of the shallow aquifer is in the northwest direction. This flow direction is based on field measurements taken in the summer of 2003 and data available from the Idaho Department of Water Resources database. Table 3 below summarizes the domestic wells used to monitor ground water with the associated permit serial number and position with respect to the reuse site.

Table 3: City of Rupert, Ground Water Monitoring Wells		
Permit Serial Number	Description	Position
GW-000101	Leonard Larson well (Domestic) located at 600 North, 150 East	Down-gradient
GW-000102	Paul Crane well (Domestic) located at 560 North, 275 East	Side-gradient
GW-000103	Richard Strickler well (Domestic) located at 400 North, 300 East	Up-gradient
GW-000104	Sam Sanderson well (Domestic) located at 380 North, 100 East	Side-gradient
GW-000105	Bruce Bagnall well (Domestic) located at 500 North Meridian	Down-gradient

Generally DEQ considers wells located within one quarter mile of the land application site boundaries to be those wells affected by the site. The two wells listed as down-gradient wells in Table 3 are over one mile from the land application site (i.e., GW-000101 is 1.07 miles and GW-000105 is 1.47 miles from the site). Careful study of Figure 3 in the permit application (a copy is included for reference in Appendix B) and using a northwest flow direction shows that GW-000105 is not really down-gradient of the site but is off to the side (side-gradient). In addition, GW-000101 is down-gradient only to MU-000102 (pivot 2). There is no monitoring well located directly down-gradient from lagoons 1 & 3 or MU-000101 (pivot 1). Well logs attached to the permit application show that the monitoring wells are pumping ground water from deeper areas of the shallow aquifer rather than the upper portion of the shallow aquifer as required by DEQ monitoring well sampling procedures.

Monitoring results from the five monitoring wells over the past permit cycle show that ground water quality is below maximum constituent contaminant levels. However, these results are not reliable because the wells are placed too far from the site to adequately monitor site constituents, the monitoring wells are not situated down-gradient of the site, and the monitoring well pumps are sampling from too deep in the shallow aquifer. Staff recommends removing the ground water monitoring requirements from the draft permit based on the following: the wastewater treatment facility has been up-graded to a Class B facility, the facility records show that the recycled water effluent produced has consistently met Class B requirements since July of 2012, the ground water is approximately 100 feet below ground surface, the soil monitoring results in Table 2 indicate that soil constituent levels have been decreasing with depth since the Class B upgrade, and the existing domestic well network is not designed to evaluate the potential impacts from the reuse operations. With these conditions, staff does not see any potential public health or environmental concerns related to the ground water quality with respect to the land application site. As a result, staff does not recommend writing the permit to include Class C recycled water as requested in the permit application. However, if the facility is unable to consistently maintain Class B recycled water quality standards for the water applied to the reuse site, DEQ shall require modifying the permit to include Class C recycled water and require down-gradient ground water monitoring wells be installed along the north and west perimeters of the land application and storage lagoon site.

#### 4. PERMITTING DISCUSSION

The following sections outline the staff recommended changes to be made to the terms of the current permit. The recommended changes are based on information received with the permit renewal application, the City of Rupert’s past performance with respect to permit requirements, reviews of the City of Rupert’s annual reports, and/or updates required by changes to the *Recycled Water Rules*, or any other applicable regulatory standards. Terms and conditions that are unchanged from the current permit, and remain applicable to the facility, are not addressed in this document. Corrected typographical errors and other minor changes to the facility information or table of contents are also not addressed in this document.

##### 4.1 Compliance Schedule for Compliance Activities

The following Table 4 summarizes the current status for the compliance activities in the current permit. Following the table are recommendations for compliance activities to be included in the draft permit.

Table 4: City of Rupert, Current Permit (LA-000001-03) Compliance Activity Summary			
Compliance Activity	Description	Due Date	Current Status
CA-004-01R	Seepage Testing	June 29, 2010	Completed in April 2010. (Lagoon seepage test results and other lagoon information are shown in Table 5 below).
CA-004-02R	Site Suitability Report	Prior to recycled water application to MU-00103, 04, 06, and 07	Was not completed since the City does not intend to use these sites.
CA-004-03R	Runoff Management Plan	June 29, 2008	Submitted July 3, 2008. Approved July 15, 2008
CA-004-04R	Permit Renewal Application	January 2, 2012	The permit application was received by DEQ on April 6, 2012.

The following Table 5 shows the seepage test results and other lagoon information for the existing lagoons. Since the reported seepage rate for each of the three lagoons in Table 5 is less than the maximum seepage rate of 0.25 in/day (IDAPA 58.01.16.493.03.b), lagoon seepage testing will not be required in the draft permit. However, section 7.1.7 of the draft permit requires that all existing municipal lagoons be seepage tested every ten (10) years. Therefore, all the existing lagoons shall be re-tested prior to April 30, 2020.

Existing Lagoon	Date Seepage Test Completed	Reported Seepage Rate (in/day)	Estimated Nominal Lagoon Surface Area (Acres)	Days Wetted Per Year	Estimated Lagoon Seepage (MG/year)	Liner
Cell #1	4/7/2010	0.17	63	365	106.15	Soil-Cement Liner
Cell #2	4/21/2010	0.11	73	0	0	Soil-Cement Liner
Cell #3	4/7/2010	0.08	96	365	76.12	Soil-Cement Liner

The site suitability report for MU-00103 (Pivot 4, south of Lockwood pivot), 04 (Pivot 5, south of Zimmatic pivot), 06 (handset area south of Cell#3), and 07 (handset area southwest of Cell #3) was not completed, since the City has no future plans to use these sites. As a result, staff recommends removing this compliance activity from the draft permit. In addition, these sites will not be listed as permitted sites in the draft permit. In the event that these sites may be needed in the future, a site suitability report will need to be submitted to and approved by DEQ for each site as part of a major permit modification.

Requirements for permit modifications can be found in the *Recycled Water Rules* IDAPA 58.01.17.

**Plan of Operations (PO):** A new compliance activity will need to be added to the draft permit requiring an update of the Plan of Operations (PO). The PO shall be submitted to DEQ for review and approval. The PO shall reflect current facility operations and incorporate the applicable requirements stated in IDAPA 58.01.17.300.05 and shall address applicable items in the PO checklist in the DEQ Guidance. The guidance document is available online at:

[http://www.deq.idaho.gov/media/516329-guidance\\_reuse\\_0907.pdf](http://www.deq.idaho.gov/media/516329-guidance_reuse_0907.pdf)

In anticipation of using the waste solids from the newly installed belt filter presses, the City has submitted to DEQ for approval a Waste Solids Management Plan (which would include a Biosolids Management Plan if the biosolids from the belt filter press will be used on the land application site). The updated PO shall include the Runoff Management Plan, the Buffer Zone Plan, the Nuisance Odor Management Plan, and the DEQ approved Waste Solids Management Plan, each updated as applicable.

The PO shall be updated as needed to reflect current operations. The facility shall notify DEQ of material changes to the PO. Staff recommends that the updated PO, with the above modifications, be submitted to DEQ within six (6) months of permit issuance.

Quality Assurance Project Plan (QAPP): To assure quality in the required monitoring, the facility shall prepare and implement a QAPP that incorporates all monitoring and reporting required by the permit. A copy of the QAPP along with written notice that the facility has implemented the QAPP shall be provided to DEQ.

The QAPP shall be designed to assist in planning for the collection, analysis, and reporting of all monitoring in support of the permit and in explaining data anomalies when they occur. At a minimum, the QAPP must include the following:

1. Details on the number of measurements, number of samples, type of sample containers, preservation of samples, holding times, analytical methods, analytical detection, and quantitation limits for each target compound, type and number of quality assurance field samples, precision and accuracy requirements, sample preparation requirements, sample shipping methods, and laboratory data delivery requirements.
2. Maps indicating the location of each monitoring, and sampling point.
3. Qualification and training of personnel.
4. Names, addresses, and telephone numbers of the laboratories used by or proposed to be used by the permittee.
5. Example formats and tables that will be used by the facility to summarize and present all data in the annual report.

The format and content of the QAPP should adhere to the recommendations and references in the Quality Assurance and Data Processing sections of the DEQ Guidance.

The facility shall amend the QAPP whenever there is a modification in sample collection, sample analysis, or other procedure addressed by the QAPP. The facility shall notify DEQ of material changes to the QAPP and copies shall be kept on site and made available to DEQ upon request.

Pre-application Workshop: If the permittee intends to continue operating the reuse facility beyond the expiration date of this permit, the permittee shall contact DEQ and schedule a pre-application workshop to discuss the compliance status of the facility and the content required for the reuse permit application package.

Permit Renewal Application: The permittee shall submit to DEQ a complete permit renewal application package, which fulfills the requirements specified at the pre-application workshop.

#### 4.2 Permit Limits and Conditions

The general formatting of the draft permit has changed and may affect the location of some permit limits and conditions. However, the same information is included in this section along with appendices sections of the current permit.

The City of Rupert wastewater treatment facility has recently undergone significant treatment upgrades. With these new upgrades the facility is capable of producing Class B reuse water as a result of the addition of tertiary filters and UV disinfection. Therefore, the permit limits and conditions and the monitoring requirements of the draft permit will reflect Class B effluent requirements. If the City chooses at a later date to achieve Class A recycled water classification, a major permit modification will have to be processed as required in Recycled Water Rules (IDAPA 58.01.17.700). Conditions for permit modifications are addressed in section 9.2.1 of the draft permit.

#### 4.3 Monitoring Requirements

In the permit application, the City requested to reduce the monitoring sampling frequency of the ground water monitoring wells since the monitoring results over the permit cycle have all been below the ground water maximum contaminant levels. As discussed in section 3.4 above, since the facility records show that the recycled water effluent produced has consistently met Class B requirements since July of 2012, the ground water is approximately 100 feet below ground surface, the soil monitoring results in Table 2 indicate that soil constituent levels have been decreasing with depth since the Class B up-grade, and the existing ground water monitoring network is not designed as a monitoring system for the reuse activities, staff recommends removing the ground water monitoring requirement from the draft permit. With these conditions, staff does not see any potential public health or environmental concerns related to the ground water quality with respect to the land application site.

### **5. RECOMMENDATIONS**

Based on review of applicable state rules, staff recommends that DEQ issue draft Permit Number M-001-04 for a public review and comment period. The draft permit contains effluent quality requirements for the wastewater treatment system, hydraulic and constituent loading limits, and terms and conditions required for operation of the reuse system. Compliance activities have been incorporated into Section 3 of the draft permit to address outstanding compliance issues. Finally, monitoring and reporting requirements have been included to demonstrate compliance with the permit conditions, and demonstrate protection of human health and the environment.

APPENDIX A



APPENDIX B

