

February 16, 2012

**MEMORANDUM**

TO: Bill Allred  
Regional Administrator, Twin Falls Regional Office

Dave Anderson  
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FROM: Stephanie Ogle, P.E.   
Technical Services

SUBJECT: Staff Analysis for Draft Wastewater Reuse Permit LA-000103-06 (Industrial Wastewater)  
Glanbia Foods Inc – Gooding Facility

**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 wastewater reuse permits (WRPs). This memorandum addresses draft WRP No. LA-000103-06, for the industrial wastewater treatment and reuse system owned and operated by Glanbia Foods Inc (GFI) – Gooding Facility. GFI's Gooding Facility treatment and reuse system is currently permitted under the terms of WRP No. LA-000103-05.

**2. SUMMARY OF EVENTS**

The Department of Environmental Quality (DEQ) issued Permit No. LA-000103-05 to GFI on June 21, 2006. Please refer to the Staff Analysis for LA-000103-05 for the history of GFI's Gooding facility. These facilities are located Gooding, Idaho in Gooding County. The purpose of the draft WRP is to renew Permit No. LA-000103-05, which expired on June 21, 2011.

One thing to note in the history of the site is the existence of a settlement agreement between GFI and some local area residents. The settlement agreement was finalized in May of 2004 and portions of the agreement remain in effect as long as the GFI Gooding facility is in operation and land applies its wastewater. Per the agreement, the facility is required to pretreat the wastewater it generates prior to land application and the wastewater exiting the pretreatment system must contain no more than 50 parts per million (ppm) biological oxygen demand (BOD) and no more than 50 parts per million total suspended solids (TSS). Even though portions of the settlement agreement expired in November 2010, all of the permit requirements associated with the wording in the settlement agreement have been maintained in the draft permit.

A permit renewal application from GFI was received on November 1, 2010. The permit renewal application, the previous permit, and the settlement agreement are 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 GFI's Gooding Facility wastewater reuse facilities.

**3. PROCESS AND SITE DESCRIPTIONS**

GFI Gooding generates approximately 1.0 to 1.3 million gallons per day (MGD) of industrial wastewater from

their process in addition to raw groundwater used for equipment cleaning. The wastewater is sent through a filtration device and then to a lined equalization lagoon, which has a capacity of 1.2 million gallons (MG). The wastewater is pumped from the equalization lagoon to a 14 MG anaerobic digester followed by a 3.5 MG aeration basin and two 500,000 gallon anoxic tanks. The effluent from the anoxic tanks is sent to a 350,000 gallon clarifier and finally to the irrigation holding pond.

The GFI Gooding facility land application area consists of 13 hydraulic management units divided between two sites, Arkoosh and Wolfe. The Arkoosh site consists of 939.2 acres and the Wolfe site consists of 530.4 acres, for a total of 1469.6 acres. The components of the soil on the Arkoosh Site are sandy loams over hardpan and basalt. The components of the soil on the Wolfe Site are Ackleton fine sandy loam, Ackleton-Jesterick-Rock Outcrop complex, Harsan-Wako complex, and Idow-Wendell-Minveno complex. The facility rotates the crops that are grown on the site between the following: alfalfa, corn, and triticale. They also consider the following crops if conditions call for them: oats, barley, peas, and Sudan grass. The crops are harvested from the site and sold as animal feed.

#### **4. PREVIOUS PERMITTING PERIOD**

The previous permit contains requirements regarding pre-treatment of the wastewater from the facility prior to land application, hydraulic loading rates, runoff and ponding requirements, grazing management requirements, allowable crop requirements, ground water quality restrictions, loading rates for COD and nitrogen, buffer zones and wellhead protection restrictions, posting requirements, odor management requirements, and waste solids management requirements as well as various monitoring requirements to demonstrate compliance with the hydraulic loading and constituent loading rates. A ground water monitoring network has been established for both sites to monitor potential impacts to the ground water from the land application of the pre-treated wastewater with the wells sampled quarterly. Soil samples from each HMU are also required to be collected and analyzed once a year in April.

It appears that the permittee has performed all of the required monitoring and analyses required during the previous permitting period and has submitted the all of the required annual reports. The permittee included a discussion regarding the required monitoring and the results of that monitoring in the permit renewal application. The application did not compare the growing season application rate to the irrigation water requirement (IWR) to demonstrate that the maximum hydraulic loading rate from the previous permit was met; however, they did note that there was a general increasing trend in the hydraulic loading rate throughout the previous permitting period. The application did demonstrate that the non-growing season loading rates were all below the permitted hydraulic loading limit. The COD loading rates were also below the permit limit for both sites and generally decreased during the permitting period. The nitrogen loading limit was exceeded on four of the Arkoosh management units during the permitting period (MU-010322, 010326, 010325, and 010329). The nitrogen loading limit for MU-010322 was exceeded in 2007, 2008, and 2009. The nitrogen loading limit was exceeded one year for MU-010326 (2009) and MU-010325 (2008) and two years MU-010329 (2008 and 2009).

According to the permit renewal application, the facility “demonstrated a continued persistent inability of the wastewater pretreatment plant to dependably/routinely comply with the BOD and TSS limits of 50 ppm” during the previous permitting period. As a result of this inability to consistently comply with these permit requirements, DEQ required that the facility conduct a Failure Mode Effect Analysis (FMEA) to address the fact that the wastewater treatment plant was not able to adequately treat the wastewater. A Technical Services Report (Report) with a date of December 2010 was generated by GFI in response to the FMEA exercise. The Report contains recommended actions to prevent the issues that are potentially causing non-compliance with the reuse permit and determined a Risk Priority Number (RPN) for each potential cause. The Report indicated that a RPN greater than 18 was considered a high RPN. A compliance activity has been added to the permit that addresses the results of the report, see Section 5.1 below.

The permit renewal application also included a discussion regarding the ground water and soil sampling results. The only trend that was noted in the application with respect to the ground water monitoring wells was the upward trend in ground water monitoring well #1 (GMW-1) for all constituents between June 2007 and November 2008. This is an up-gradient well for the Arkoosh site and, therefore, the well should not be affected by activities at the site. However, DEQ also noted an upward trend in the TDS and chloride concentrations in the down gradient ground water monitoring well #4 (GMW-4) starting in approximately April 2008. See Figure 1 below for a graph of the concentrations of the constituents measured in GMW-4. The same apparent trend is not seen in the other up-gradient monitoring well GMW - 2. See Figure 2 below for a graph of the constituent concentrations measured in GMW - 2. Compliance activity CA-103-03 requires that the permittee conduct a TDS impact analysis for each site or update the impact analysis completed in 2005. No other changes have been made to the permit with respect to this potential trend, but staff recommends that both DEQ and the permittee monitor the constituent concentrations in Well #4. If the upward trend continues the permittee must consider any necessary actions to prevent further increases in the concentrations and DEQ may need to modify the permit if the trend continues.

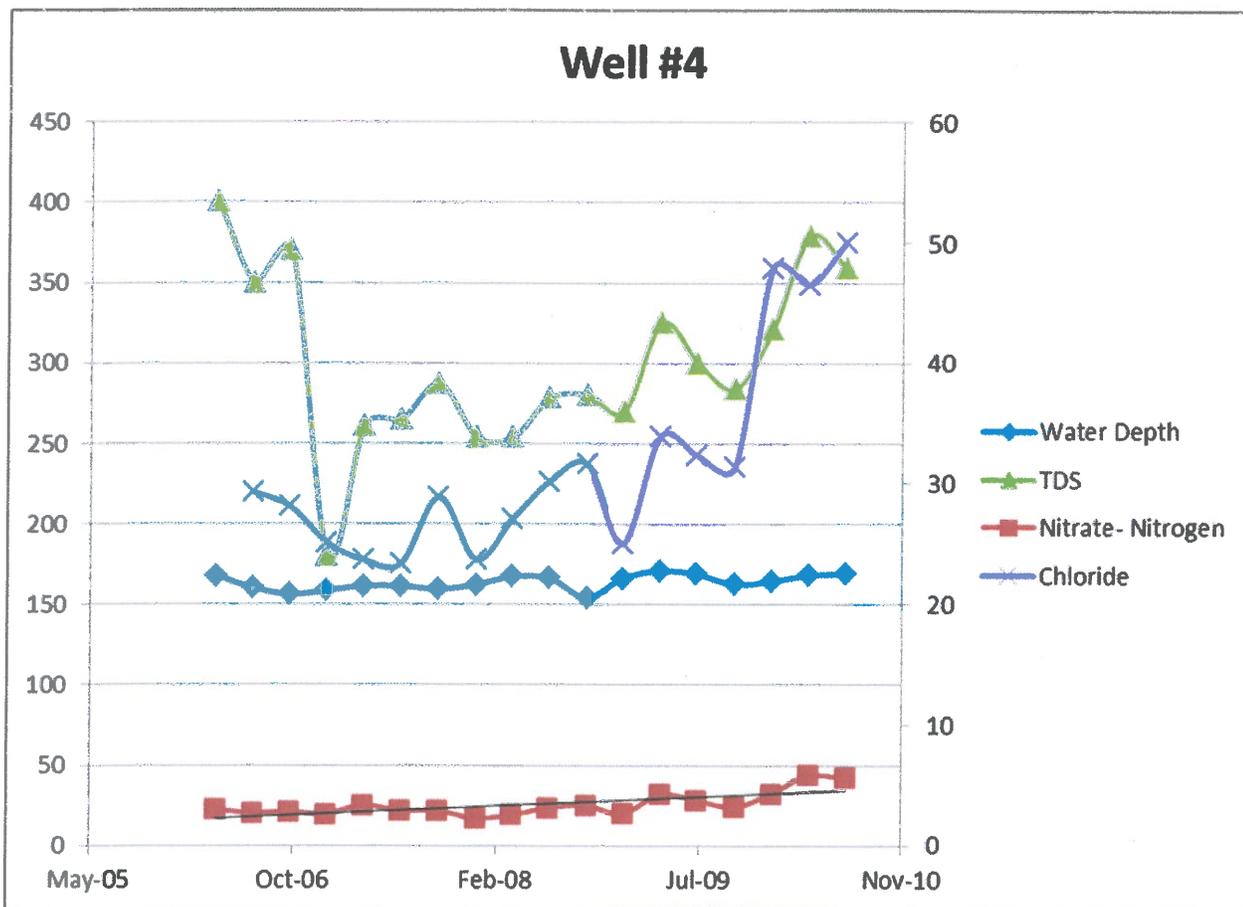


Figure 1: Ground water monitoring well #4. (Chloride and nitrate-nitrogen are plotted on the secondary y-axis)

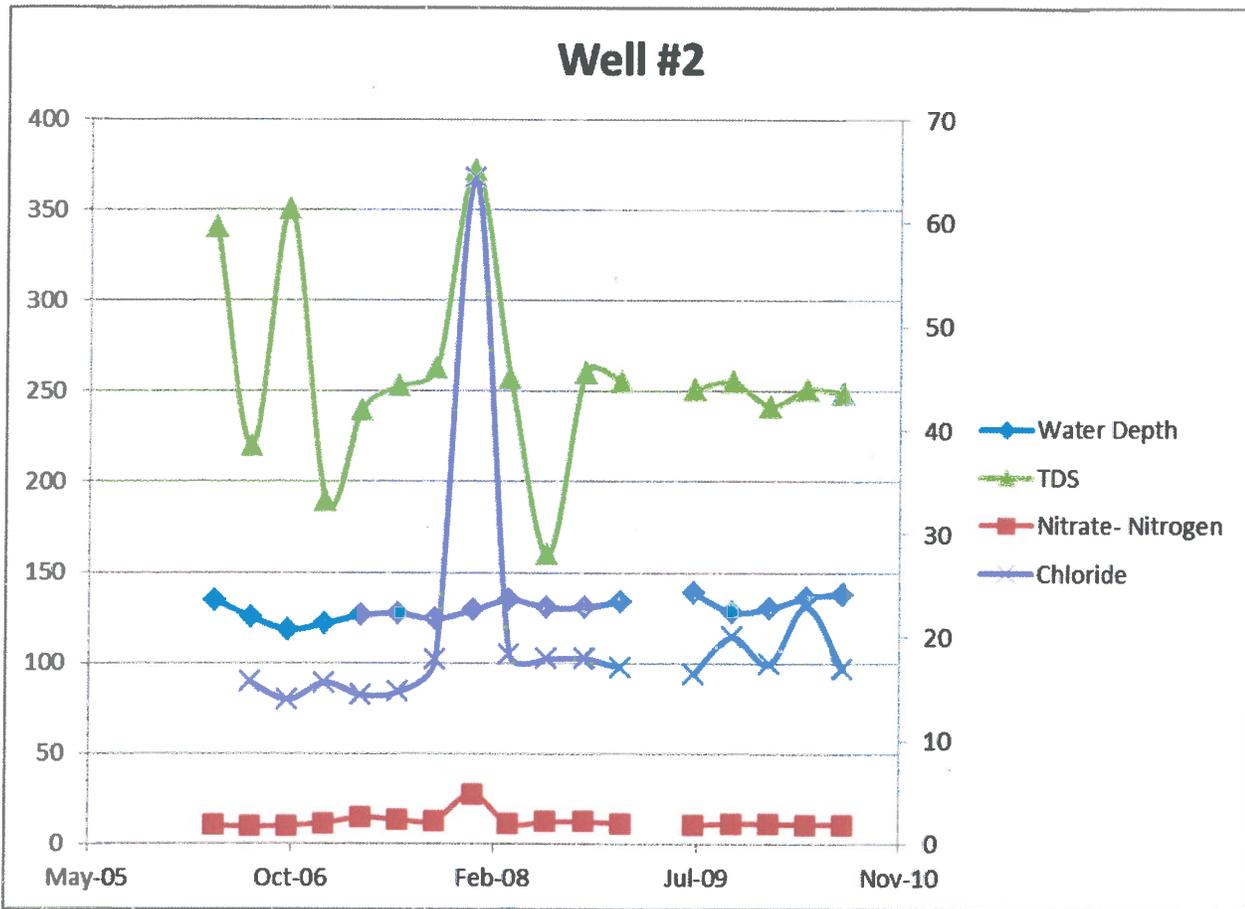


Figure 2: Ground water monitoring well #2. (Chloride and nitrate-nitrogen are plotted on the secondary y-axis)

As noted in the permit renewal application, the nitrate-nitrogen levels in the soils for both application sites have generally increased at all three levels. However, with the exception of MU-010321 on the Arkoosh site, the nitrate-nitrogen levels appear to be decreasing since the addition of the wastewater pre-treatment plant. This does not appear to be the same for the Wolfe sites as they all had a general upward trend in all three levels throughout the entire permitting period, with the exception of MU-010335. The majority of the wastewater is sent to the Arkoosh sites. Between 2006 and 2010, a total of 154 million gallons (MG) was sent to the Wolfe sites which consist of 530.4 acres. During the same time period, a total of 2,542 MG was sent to the Arkoosh sites which consist of 923.1 acres. As such, the loading limits have not been changed for the Wolfe site, however, the increasing nitrogen levels in the soil on the Wolfe site must be addressed in the waste solids management plan for the site.

## 5. PERMITTING DISCUSSION

The following sections outline changes made to the terms of the draft renewal permit, based on changes requested by the permittee, evaluations of past performance with previous permit requirements, 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 previous permit and remain applicable to the facility are not addressed in this document.

### 5.1 Section C – Abbreviations and Definitions

The definition of irrigation water requirement (IWR) was updated in Section C of the draft permit. The

definition has been changed to use Pdef instead of IR in the calculation of the IWR. Pdef is the same as IR; however, IR previously had to be calculated using the consumptive use for a given crop in a given climatic area (CU) and the effective precipitation (Pe). The “Evapotranspiration and Consumptive Irrigation Water Requirements for Idaho” website provided in the updated definition now contains the Pdef parameter, where they formally only contained the CU and Pe parameters. There is no actual change to the calculation of IWR, but the information that is now provided on the website makes the calculation easier.

## 5.2 Compliance Schedule for Required Activities – Section E

GFI’s previous permit required submittal of an updated Plan of Operation (O&M Manual), and DEQ received this updated submittal on August 1, 2007 with revisions received on November 15, 2007. The Plan of Operation for this facility will need to be updated again to address current operations and the requirements of the draft renewal permit after final issuance, including a Quality Assurance Project Plan. The Plan of Operation should also be updated to reflect the most current DEQ guidance entitled “Guidance for Reclamation and Reuse of Municipal and Industrial Water”. Consequently, Compliance Activity No. CA-103-01 requires an updated O&M Manual to be submitted within one year of permit issuance.

Wastewater lagoons may develop leaks over time and may no longer adequately contain the wastewater they were designed to hold. As such, periodic seepage testing of the lagoons is required to ensure that the lagoons are not in need of repair or replacement. It appears that the irrigation water storage pond (LG-010304) was seepage tested in 2005 with a measured seepage rate of 0.21 inches/day. The settlement agreement therefore established an acceptable seepage rate of 0.21 inches/day for that lagoon. According to the permit renewal application, the wastewater surge pond was tested in 2001. Generally, lagoons should be seepage tested once every ten years. Therefore, Compliance Activity No. CA-103-02 requires that wastewater surge pond be seepage tested by July 2013 and that the irrigation water storage pond be seepage tested by November 2015. A seepage test procedure for each lagoon must be submitted to DEQ for review and approval six months prior to the expected seepage testing date. A seepage rate of no more than 0.21 inches/day will be required for each lagoon and the compliance activity specifies the actions that must be taken by the permittee if one or both of the lagoons is shown to leak more than the allowable seepage rate.

The staff analysis for the previous permit indicates that a maximum total dissolved inorganic solids (TDIS) or non-volatile dissolved solids (NVDS) loading rate limit was not included in the previous permit based on the 1999 TDS Management Plan and the 2005 TDS Impact Analyses, although it was indicated that the reduced TDS loading (due to the pre-treatment plant) may impact the applicability/effectiveness of the 2005 TDS Impact Analyses. Compliance Activity CA-103-03 has been included in the draft permit to determine whether the land application of the of the treated wastewater is contributing to the degradation of the ground water quality with respect to TDS. CA-103-03 requires a TDS Impact Analyses be performed for each of the sites. If the results of the analyses indicate that the TDS loading on the sites from the wastewater will contribute to degradation of the ground water quality as defined by IDAPA 58.01.11, *Ground Water Quality Rule*, DEQ will take the actions specified in Section 400 of the *Ground Water Quality Rule*. The analyses must include all waste streams from the plant, including those that are not pre-treated (see CA-103-05). The analyses are being required based on the increased TDIS loading rate throughout the previous permitting period and the fact that GWM-4 appears to be showing an increasing trend in the concentration of TDS.

As discussed in Section 4 of this document, CA-103-04 requires the submittal to DEQ for review and approval of an assessment of the wastewater treatment plant to address the “continued persistent inability of the wastewater pretreatment plant to dependably/routinely comply with the BOD and TSS limits of 50

ppm”. The assessment is required to address the recommendations in the Glanbia “Technical Services Report, Gooding Waste Water FMEA Review”, specifically the four recommendations associated with the wastewater treatment plant that were given a high RPN (greater than 18). The assessment must include any actions that will be taken by the permittee to improve the consistency and reliability of the wastewater pre-treatment plant, including a schedule of when the actions will be implemented. As the facility has already performed the FMEA and has been aware of the recommendation in the report, the compliance activity is due within six (6) months of permit issuance.

The permittee has requested that certain wastewater streams may be sent directly to the Irrigation Water Storage Pond without being sent through the wastewater pre-treatment plant. The draft permit requires that, unless otherwise approved by DEQ in writing, all wastewater from the facility shall be discharged to a one-day holding pond, routed through the pretreatment plant, and then into a five day holding pond prior to land application as the final treatment process. Compliance Activity CA-103-05 requires that the permittee submit to DEQ for review and approval justification that the direct discharge of the aforementioned waste streams will meet the requirements of the permit. The submittal must include sample data from the waste streams to demonstrate compliance with the permit requirements and justify that the sample data is representative of the waste stream at all times. The submittal must also include the provisions that will be implemented to ensure that the permit requirements will be met. As stated in CA-103-03, these waste streams must be included in the TDS Impact Analyses.

If the permittee wishes to continue land applying wastewater after the expiration of the draft permit, Compliance Activity CA-103-06 requires that a permit renewal application be submitted six months prior to expiration of the permit.

## 5.2 Permit Limits and Conditions – Section F

There was one change made to Section F of the draft permit. The number of acres associated hydraulic management unit (HMU) MU-010321 was changed from 49.7 acres to 44 acres in the draft permit. This change was made to account for the 5.7 acres that were removed from the HMU to build the wastewater pre-treatment plant. This change also affected the non-growing season (NGS) maximum hydraulic loading rate. The NGS maximum hydraulic loading was changed from 10.8 million gallons (MG) to 9.6 MG.

Section F of the draft permit contains the permit requirements for the method of wastewater treatment, the requirement for a wastewater pretreatment system, and the effluent quality from the pretreatment system as well as the hydraulic loading limits, allowed vegetation, grazing, buffer zones, fencing and posting, runoff and ponding, construction plan submittals, odor management, and supplemental irrigation water protection associated with land application of the pre-treated wastewater. These limits and requirements in the draft permit are basically the same as the previous permit. The growing season hydraulic loading is again required to be substantially at the irrigation water requirement. The non-growing season maximum hydraulic loading limit is equal to the Soil Available Water Holding Capacity (AWC) minus the average precipitation that occurs during the non-growing season plus the average evapotranspiration that occurs during the non-growing season for each HMU. The Soil AWC for each HMU was assumed to be the same as was used for the previous permit, but the precipitation and evapotranspiration were updated to include the recorded data for the last five years. The changes to the non-growing season maximum hydraulic loading rate as a result of the updated data were minor. Grazing is still allowed in accordance with an approved Grazing Management Plan, but the Grazing Management Plan must be updated in accordance with CA-103-01.

Section F of the draft permit also specifies the constituent loading limits for each HMU. The nitrogen, phosphorous, and COD loading limits are the same as the previous permit. Again, the draft permit does

not contain a salt (NVDS) loading limit, however, a TDS Impact Analyses or update to the previous TDS impact analyses is required by Compliance Activity CA-103-03.

A new permit condition has been added to Section F regarding the direct discharge of pre-approved wastewater streams to the five day holding pond. The draft permit requires that, unless otherwise approved by DEQ in writing, all wastewater from the facility must be pre-treated through the wastewater treatment system. As such, compliance activity CA-103-05 requires that the permittee receive written approval from DEQ prior to directly discharging the requested wastewater streams directly to the five-day holding pond. The effluent from the pre-treatment plant must contain less than 50 parts per million (ppm) BOD and less than 50 ppm TSS and, therefore, the permittee must demonstrate that the untreated water will meet the same effluent requirements at all times. The permittee must also demonstrate that the constituent loading limits will not be exceeded due to the addition of the untreated water to the five-day holding pond. The permit requirement also requires continuous monitoring of the TSS of this waste stream. If any instantaneous reading of the TSS exceeds 50 ppm, the flow from this stream must be diverted to the wastewater pre-treatment plant to ensure that the treated wastewater in the irrigation pond will not exceed the wastewater treatment plant effluent requirements in the draft permit.

The permit application requested a path forward regarding the application of waste solids to the Wolfe Site. The permittee questioned whether the pressed sludge had to be considered a waste solid or if it could be considered a Soil and Plant Amendment as it has been certified by the Department of Agriculture as such. As the waste solids are generated from the facility's industrial process and will be applied to the sites on an on-going basis, the waste solids would not be considered a Soil and Plant Amendment by DEQ. As in the previous permit, Section F of the draft permit includes the requirement that a waste solids management plan must be submitted to and approved by DEQ prior to the application of waste solids to the Wolfe Site. It was noted during the review of the permit application data that the concentration of nitrogen in the soils increased at all levels throughout the previous permitting period for the Wolfe site. As such, the waste solids management plan for the Wolfe site must address this issue.

### 5.3 Monitoring and Reporting – Sections G and H

Monitoring and reporting is required by the permit to demonstrate compliance with the permit limits and conditions specified Section F of the permit. There are also a few monitoring requirements in the draft permit based on the settlement agreement discussed earlier. All of the previous monitoring requirements are included in the draft permit, with the exception of the initial monitoring required for the new Wolfe groundwater monitoring wells upon installation.

Two additional sampling requirements have been added to the microbial and constituent monitoring specified in Section G, both of which are related to the potential wastewater stream that will be sent directly to the irrigation holding pond. The additional requirements are for continuous monitoring for TSS and a weekly, 24-hour flow proportional composite sample of the wastewater stream(s) that will be directly discharged to the 5-day irrigation pond that must be analyzed for BOD and TSS. This requirement will not apply until the permittee has received written permission from DEQ to discharge the requested wastewater streams directly to the five-day holding pond. This monitoring requirement is the same as the monitoring required of the aerobic reactor effluent stream and will be used to demonstrate compliance with the BOD and TSS concentration requirements for the directly discharged stream.

There are two additional flow monitoring requirements and changes to the previous flow monitoring requirements in Section G of the draft permit. One additional requirement is to monitor the amount of wastewater that is bypassed around the pre-treatment plant and sent directly to the five-day holding pond. This requirement has been added to demonstrate compliance with the permit condition that all wastewater from the facility is routed through the pretreatment plant, unless otherwise approved by DEQ

in writing. The second additional requirement requires the permittee to document the calibration of all flow meters used directly or indirectly to measure wastewater or supplemental irrigation water flow rates, when such devices are used to assess or demonstrate compliance with the terms of this permit. Calibration is required to be conducted at least annually and more often if necessary. Accurate flow measurement is essential for demonstrating compliance with the permit conditions and the flow meters must be properly maintained to ensure continued accurate flow measurement. Also, the previous permit required that the permittee report the amount of wastewater that was applied to each management unit as well as the amount of supplemental irrigation water. The draft permit has specified the supplemental irrigation wells as specific flow monitoring points. The supplemental irrigation wells were determined using Figure 3 of the Wastewater Segregation Plan included as part of the Plan of Operations.

As stated in the first paragraph of this section, the initial monitoring for GW-010314 was removed from Section G of the draft permit. An additional constituent has been added to the ground water monitoring, *Escherichia coli*. Analyzing for *Escherichia coli* will only be required if the analysis for total coliform indicates a presence of total coliform. Total coliform has occasionally been detected in the ground water monitoring wells during the past five years, but further analysis for *Escherichia coli* will provide a better indication as to whether the impact is from land application of wastewater.

Two clarifying changes were made to the Ground Water Monitoring Point Descriptions in Appendix 1 of the draft permit. The previous permit indicated the GW-010306 (GWM1, Arkoosh) was a down gradient well while GW-0103010 (GWM5, Arkoosh) was an up gradient well. These two wells were switched in the draft permit, GW-010306 is now designated as an up gradient well and GW-0103010 is now designated as a down gradient well. It appears that this was a mistake in the previous permit and the permittee refers to the wells as they are currently designated in the permit application.

The permittee is also required to submit an annual report that includes all the information specified in Section G of the draft permit. During the inspection, the operator requested that the annual report deadline be extended to February 28<sup>th</sup> as they have had to request an extension during previous years. The annual report is now due by February 28<sup>th</sup> of each year, and should address operations conducted from November 1 through October 31 of the preceding application year.

## **6. RECOMMENDATIONS**

Based on review of applicable state rules, staff recommends that DEQ issue draft WRP No. LA-000103-06 for a public comment period. The draft permit contains pre-treatment requirements, effluent quality requirements for the wastewater treatment system, hydraulic and constituent loading requirements, and terms and conditions required for operation of the reuse system. Compliance activities have been incorporated into Section 4 of the 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 with respect to operation of the facility.