7/24/2012

M E M O R A N D U M

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SUBJECT: Staff Analysis for Draft Reuse Permit WRU I-0054-04 (Industrial Recycled Water)
Darling International, Inc.

## 1. PURPOSE

The purpose of this memorandum is to satisfy the requirements of IDAPA 58.01.17.400.05, "Recycled Water Rules," for issuing reuse permits. This memorandum addresses draft permit WRU I-0054-04, for the Industrial wastewater treatment and reuse system owned and operated by Darling International, Inc. (Darling). Darling's treatment and reuse system is currently permitted under the terms of reuse permit LA-000054-03.

## 2. SUMMARY OF EVENTS

The Department of Environmental Quality (DEQ) issued permit LA-000054-03 to Darling on August 1, 2007. The current permit was issued to allow for continued operation of the wastewater treatment and reuse system serving the Darling industrial facility located near Kuna, Idaho. The permit will expire on August 1, 2012 and DEQ has prepared a draft permit to allow the facility to continue their reuse activities after the current permit expiration date.

A permit renewal application from Darling was received on April 16, 2012, 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 Darling's wastewater reuse facilities.

## 3. PREVIOUS PERMITTING PERIOD DISCUSSION

The site and treatment processes discussed in the staff analysis for Darling's current permit have not changed since that time. For complete discussions regarding these items, refer to the staff analysis for the draft version of reuse permit LA-000054-03, dated April 4, 2007. A fact sheet summarizing the process and site descriptions has also been created for this facility and is included as Appendix A of this staff analysis.

This section of the staff analysis will address the reuse activities performed by the permittee during the current permitting cycle (2007 to 2012). The current permit requires that the facility submit an annual report each year which includes the results of the required monitoring during that year, all required calculations to demonstrate compliance with the permit conditions, and a discussion regarding the results and any potential impacts to the environment. The facility submitted all of the required annual reports during the permitting cycle and completed

most of the required monitoring, with a few exceptions. The information presented in these annual reports was used to assess the permittee' s ability to comply with the permit conditions in the current permit and any potential impacts to the environment from the reuse activities.

### 3.1. Permit Limits

The current permit contains a hydraulic loading limit and constituent loading limits for chemical oxygen demand (COD) and nitrogen. Wastewater application is only allowed during the growing season and must be substantially equal to the irrigation water requirement (IWR) for the crop grown on the site. The hydraulic loading rates during the permitting cycle ranged between 48% and 60% of the IWR on MU-005401 and between 50% and 58% of the IWR on MU-005402. DEQ understands that some discretion is necessary when determining the most appropriate loading rates for the crops based on the conditions during the growing season, but watering at least than the IWR can affect the health of the crop which will affect the ability of the crop to remove nutrients from the soil. The facility must continue to work towards watering their crops substantially at the IWR to ensure the most effective operation of the land application site. Compliance Activity CA-054-01, as discussed in Section 4.2 of this document, requires that the permittee submit an updated plan of operation, which should include a section regarding hydraulic loading on the sites.

The monthly hydraulic loading rates are used to determine the COD and nitrogen loading rates to each of the hydraulic management units (MUs). The COD loading rates on both fields was consistently below the permit limit of 50 pounds (lbs) per acre day throughout the permitting cycle. The COD loading rate ranged between 2.9 and 5.4 lbs/acre/day on MU-005401 and between 2.7 and 4.8 lbs/acre/day on MU-005402, which is less than 10% of the permit limit.

The maximum nitrogen loading limit in the current permit is specified as 150% of typical crop uptake, which is defined as the median constituent crop uptake from the three (3) most recent years the crop has been grown. The permittee slightly exceeded the permit limit on both sites during two of the five growing seasons, MU-005401 received 105% (2007) and 137% (2011) of the allowable limit and MU-005402 received 111% (2008) and 125% (2011) of the allowable limit. It was also noted in the 2011 annual report review that the crop uptake for 2011 from MU-005402 was significantly lower than previous years at 67 lbs/acre versus 242 lbs/acre and 334 lbs/acre, which will also affect the typical crop uptake value for the next two years. The permittee acknowledged the decrease in alfalfa production in the last two years and has indicated in their permit renewal application that they are working closely with the farmer to come up with an alfalfa regeneration project. They also indicated that lab analysis on the soils shows a dire need for fertilization and it may take a couple of years of fertilization to improve the soils enough for proper crop production.

### 3.2. Required Monitoring

The current permit requires monitoring of the wastewater and any supplemental irrigation water that is land applied to the MUs, the ground water both up gradient and down gradient of the MUs, the soil in the MUs, and the crops that are grown on the MUs. As stated previously, all of the sampling and monitoring requirements were met during the permitting cycle, with a few exceptions. All of the required samples were collected, but not all of the required analyses were performed on the samples. There were also a few sample results that did not appear to be representative of the samples. Each of these items are discussed below.

Based on increasing levels of total dissolved solids (TDS) in the down gradient ground water wells during the previous permitting cycle (2002-2006), the current permit requires sampling the wastewater for TDIS on a quarterly basis as it would better characterize the nature of the TDS land applied to the site. The permit also required the quarterly samples collected during the first year of the permit to also be analyzed for TDS and volatile dissolved solids (VDS). The TDS and VDS concentrations would be used to determine the non-volatile

dissolved solids (NVDS) concentration in the samples and establish a relationship between NVDS and TDIS. That correlation could then be used to estimate future NVDS loading rates, as needed. TDIS was only reported for two of the three sampling events during the first year and it appears it was calculated instead of measured. In both instances, the calculated TDIS was greater than the measured TDS concentrations. Therefore, a relationship between TDIS and NVDS could not be established based on the results. As such, the samples are recommended to be collected again this permitting cycle to establish the relationship between NVDS and TDIS.

During the previous permitting process, the facility requested a reduction in the buffer zone distance requirements. A Microbial Risk Analysis (MIRA) was performed and the buffer zones were reduced based on the results of the analysis. The memo from Rick Hardy, P.E., to Steve Ogle, P.E., dated March 14, 2007, indicates that the analysis is conservative and, therefore, protective and adequate for making permitting decisions. However, the analysis did include some assumptions that could be improved by recommendations included in the memo, which include wastewater serotyping and, at a minimum, some limited analysis for Listeria Monocytogenes. As such, the current permit contains the requirement to analyze the wastewater on a quarterly basis during the first year for Fecal Coliform, Total Coliform, Fecal Streptococcus, Pseudomonas, and Listeria. Only one of the three samples collected provided useful results, as one set of results showed a higher concentration of fecal coliform than total coliform and the other indicated that both the fecal coliform and total coliform colony counts were greater than 1600 (which did not provide sufficient information to determine the ratio of fecal coliform to total coliform). The Pseudomonas Species ranged between >25,000 to 44,000,000. And the samples were only analyzed for Listeria Monocytogenes for one of the three sample events which produced a result of non-detect. These results could not be used to verify the assumptions used in the MIRA model. However, it appears that the subdivision that was proposed at the time of the last permit renewal process is no longer being considered for development. Therefore, the additional wastewater characterization sampling has not been included in the draft permit. The statement that "in the event that new, inhabited dwellings are to be constructed in the vicinity of the facility, DEQ may issue a draft modification to the permit in accordance with the "Recycled Water Rules" to revise the buffer zone requirements" has been maintained in the draft permit. Additional sampling of the wastewater may be required at that time.

The ground water quality samples collected during the first four years of the permit contained instances where the concentration of iron exceeded the ground water quality standard specified by IDAPA 58.01.11, "Ground Water Quality Rule". The current permit requires that the sample be analyzed for dissolved iron whenever the ground water quality standard is exceeded. The additional analysis was never performed.

### 3.3. Soil and Ground Water Monitoring Results

The current permit requires that the soils on both sites be monitored for various constituents on an annual basis in October after all harvesting has been conducted. The ground water monitoring wells are also required to be monitored for various constituents twice per year in April and October. Both of these monitoring requirements are required to assess compliance with IDAPA 58.01.11, "Ground Water Quality Rule", and to determine if there is potential for leaching contaminants into the ground water. The results of the monitoring may be used to adjust the permit limits if deemed necessary for protection of human health and the environment.

#### 3.3.1. Soil Monitoring Results

The following graphs contain the soil monitoring analysis results for both MU-005401 (Field 1) and MU-005402 (Field 2) for nitrate, plant available phosphorous (PAP), and sodium absorption ratio (SAR) during the last two permit cycles (2002-2011). Each sampling event included a sample from each of the following soil depths: 1) 0 to 12 inches, 2) 12 to 24 inches, and 3) 24 to 36 inches. Increasing concentrations of contaminants in the lower depths of the soil may indicate the potential for leaching of nutrients to the ground water. The blue line represents the first foot of soil (0-12 inches), the red line represents the second foot of soil (12-24) inches, and the green line represents the third foot of soil (24-36 inches).

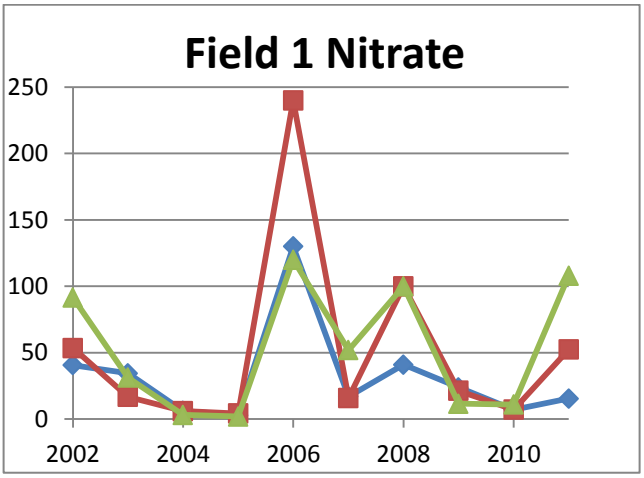

Figure 1: Field 1 Soil Nitrate

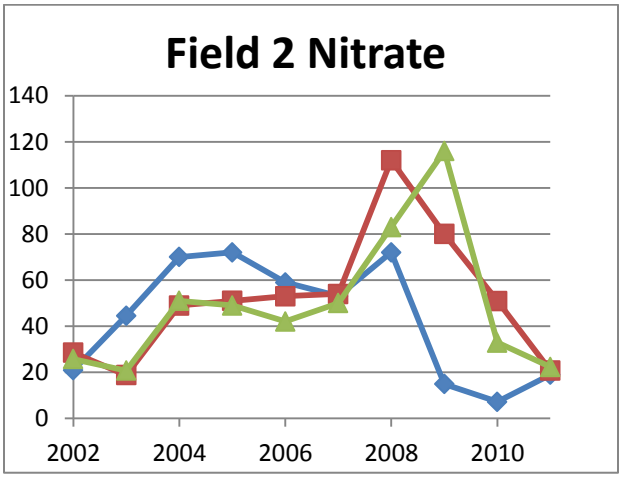

Figure 2: Field 2 Soil Nitrate

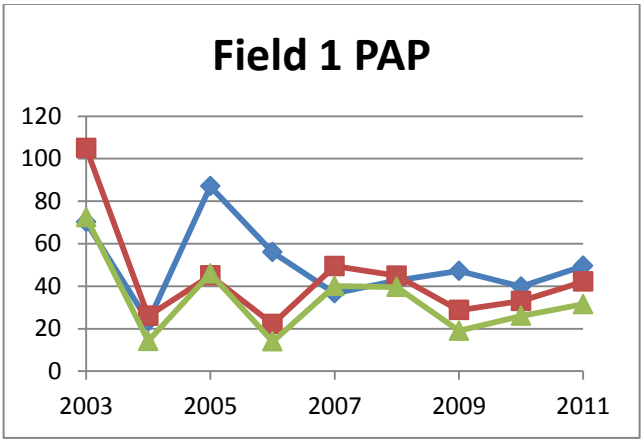

Figure 3: Field 1 Soil PAP

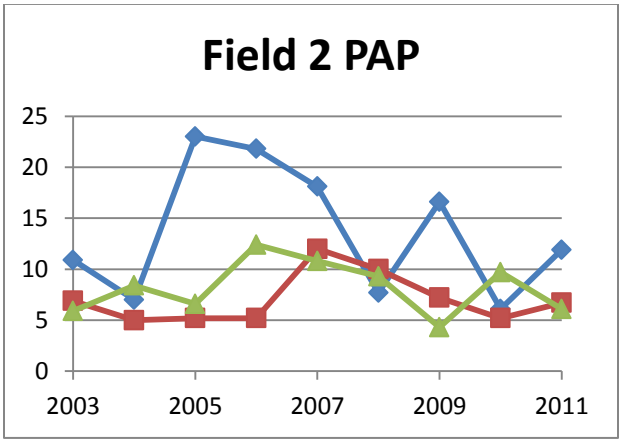

Figure 4: Field 2 Soil PAP

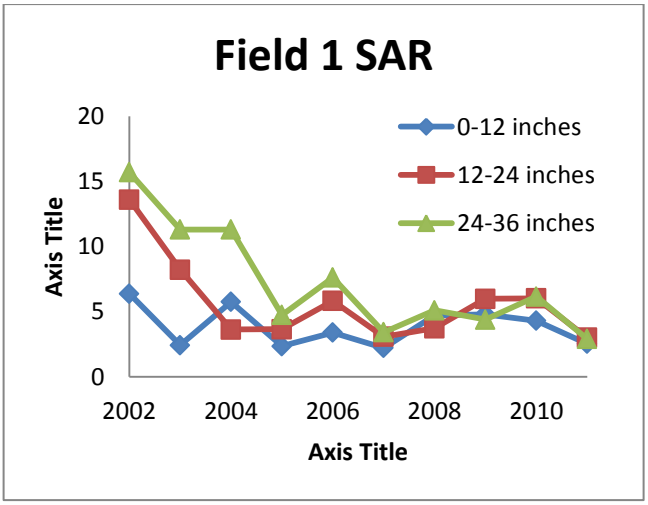

Figure 5: Field 1 Soil SAR

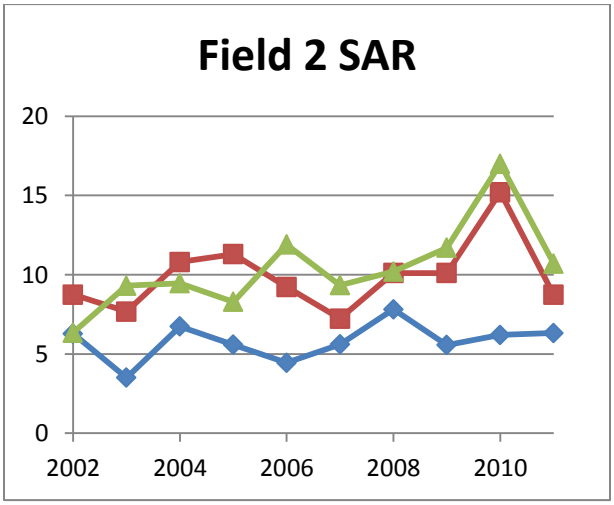

Figure 6: Field 2 SAR

As can be seen in Figure 1, the soil nitrate concentrations for Field 1 have varied widely since 2002 with the greatest concentrations in 2006, 2008 and 2011. In those three years, the soil nitrate concentrations increased significantly in the second and third layers of the soil. It is unclear why the nitrate concentrations in the soils increased significantly during those years as the hydraulic loading rates were not exceeded and the nitrogen loading rate was only exceeded in 2011 (by 37%). Figure 2 shows that Field 2 experienced a generally increasing trend in the nitrate concentration in all three layers of soil through 2008 and then started to decrease significantly through 2011.

Figures 3 and 4 show the PAP concentration in the soils of both land application sites. The PAP concentration has generally decreased on both fields from historical values. The PAP concentration for Field 1 fluctuated some during the previous permitting cycle, but remained steady during the current permitting cycle. The PAP concentration for Field 2 increased during the previous permitting cycle, but generally decreased during the current permit cycle allowing the concentrations to return to the 2003 concentrations.

As depicted in Figure 5, the SAR values for Field 1 have decreased significantly from the historically high values in 2002 and experienced a generally decreasing trend during the previous permitting period. The increasing SAR concentrations on Field 2 during the previous permitting cycle were noted in the previous staff analysis and they continued to increase through 2010. In 2011 the SAR values in the first two levels reduced to approximately the same values in 2002, but the third layer of soil remained greater than the values in 2002. Excessive sodium in soils can reduce crop yields and cause soil structures issues that will impeded the soil's ability to infiltrate water. DEQ's current guidance indicates that soils with a SAR value above 13 are classified as sodic or alkali and may possibly experience infiltration problems due to deflocculation of soil colloids. Some textures of soils can become affected at values lower than 13. The SAR concentrations on Field 2 exceeded 13 in 2010 at 15.2 ppm in the second layer and at 17 in the third layer. The SAR levels decreased to below 13 in all three layers in 2011. The Guidance recommends incorporating gypsum or calcium chloride, or if the soil contains lime near the surface, elemental sulfur or ferrous sulfate to maintain acceptable soil structure whenever the SAR levels in the soil are between 10 and 15.

### 3.3.2. Ground Water Monitoring Results

The ground water monitoring network for the Darling land application site consists of one up gradient well, GW-005404 (MW4) and two down gradient wells, GW-005401 (MW1) and GW-005402 (MW 2) . The majority of the constituents that are monitored in the ground water monitoring wells have either a primary constituent standard (based on the protection of human health) or a secondary constituent standard (based on aesthetic qualities) specified in the "Ground Water Quality Rule". None of the primary constituent standards were exceeded in any of the wells during the previous permitting period. Two of the secondary constituent standards, iron and TDS, were exceeded in all of the monitoring wells.

#### 3.3.2.1. Iron

As discussed previously, the current permit requires that any ground water samples that exceeded the secondary constituent standard for iron of 0.3 mg/l was to be analyzed for dissolved iron, but this was not done for any of the exceedances. As can be seen from Figure 7 below, there does not appear to be an apparent trend in the iron concentration in any of the wells. As such, the draft permit does not recommend any actions associated with the exceedances at this time.

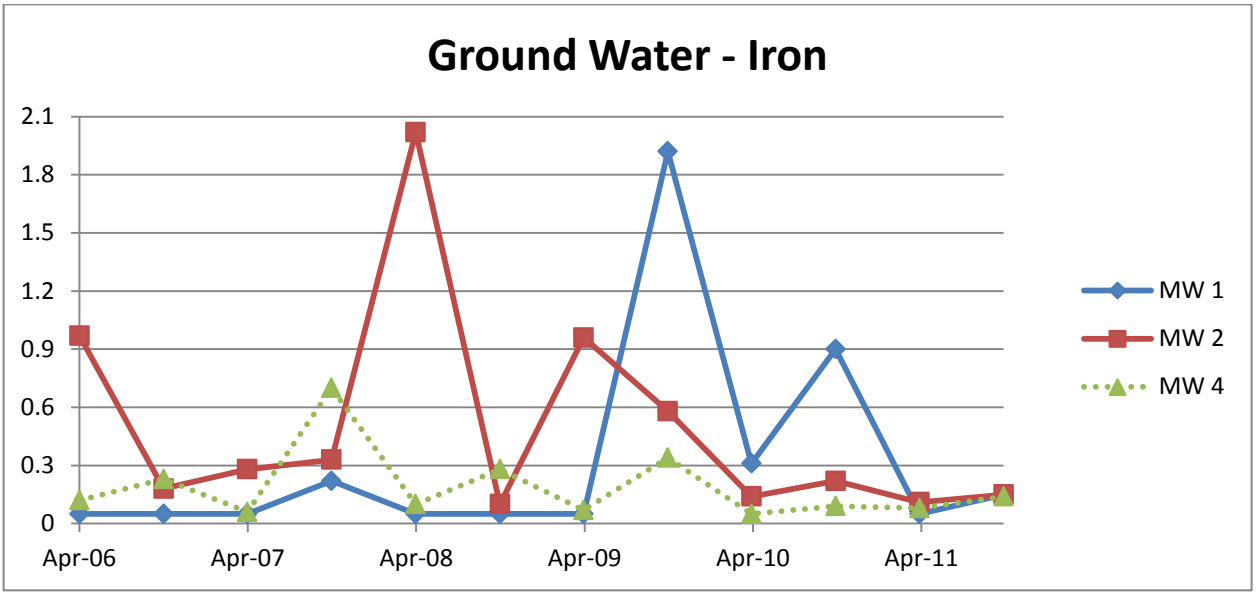


Figure 7: Iron concentration in the ground water monitoring wells

#### 3.3.2.2. Total Dissolved Solids

Figure 8 shows the measured TDS concentrations in the ground water monitoring wells between April 2006 and October 2011. The TDS concentration in all three wells has generally increased during the previous permitting period and the concentration in all three wells has exceeded the secondary constituent standard of 500 mg/L. The TDS concentrations in MW 2 (down gradient from Field 2) and MW 4 appear to follow the same trends with the down gradient concentrations slightly greater than the up gradient concentration. The TDS concentration in MW 1 (down gradient from Field 1) has large fluctuations and occasionally drops below the concentrations measured in the up gradient well. It is unclear why MW 1 has large differences between certain sampling events.

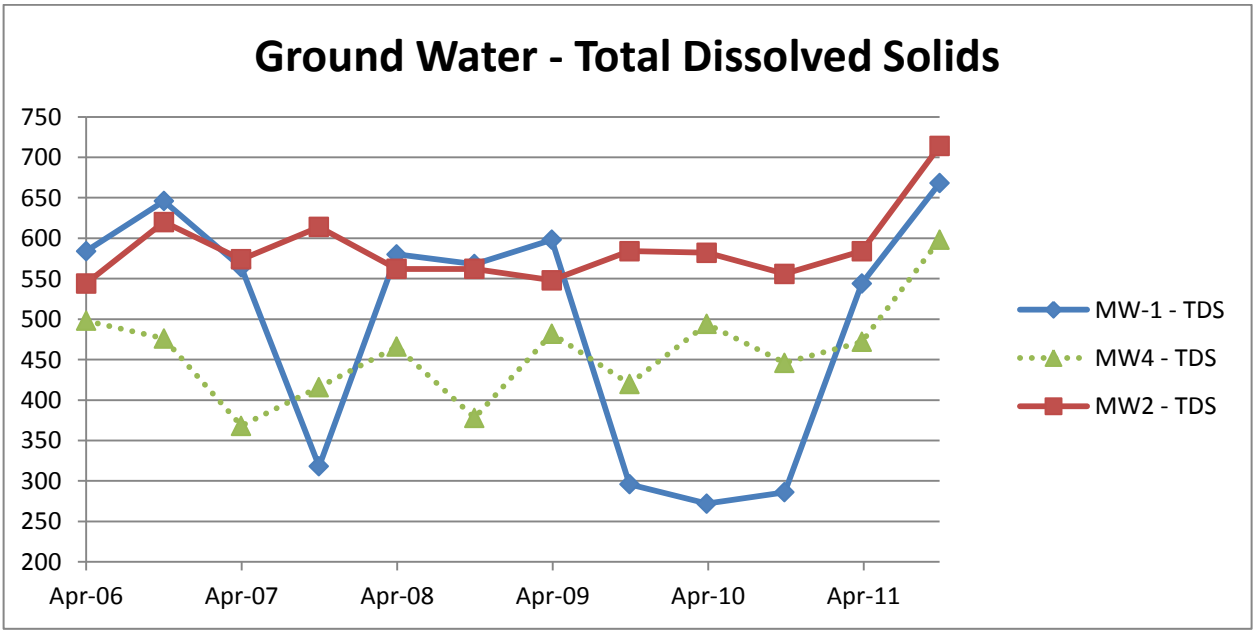


Figure 8: TDS concentration in the ground water monitoring wells

The staff analysis for the current permit calculated the NVDS loading rates between 2002 and 2005 and compared them to the annual crop uptake of TDS for each field using the reported crop ash removal rates. The crop removal of TDS was greater than the NVDS loading rate from the wastewater. Therefore, based on this analysis it was determined that the wastewater land application rates were not expected to adversely impact ground water quality. As discussed previously, a relationship between TDIS and NVDS was not established for the wastewater, which means that the NVDS loading rates could not be calculated for this permitting cycle. Based on this and the fact that the TDS concentrations increased in the up-gradient monitoring well as well as the down-gradient wells, a compliance activity has been included in the draft permit to evaluate whether the reuse activities are potentially impacting the ground water. A TDIS loading limit is not recommended in the draft permit at this time, but may need to be established in the future based on the results of the TDS impact analysis.

#### 3.3.2.3. Nitrate

The current permit contains a nitrogen loading limit to ensure that excessive nitrogen does not leach into the ground water and increase the nitrate concentration. Figure 9 shows the measured nitrate concentration in all three ground water monitoring wells between April 2006 and October 2011. Again, the concentrations in MW 2 generally follow the trends of the concentrations in MW 4, but the concentrations in MW 2 are greater than those in MW 4. The concentrations in MW 1 fluctuate greatly and are both greater than and less than the concentrations in MW 4. While there are seasonal fluctuations, there does not appear to be an increasing trend in any of the wells during the previous permitting cycle. The results also indicate that the nitrate concentrations in all of the wells are below the primary constituent standard of 10 mg/L.

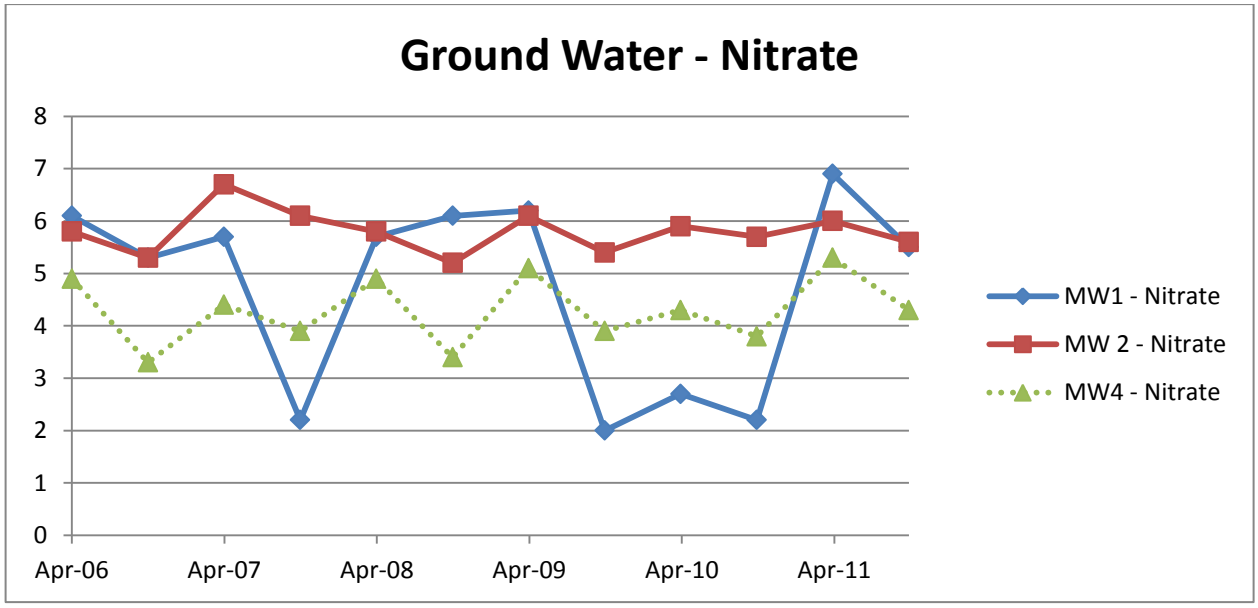


Figure 9: Nitrate concentration in the ground water monitoring wells

#### 3.3.2.4. Baseline Chemistry

The current permit requires that the ground water samples collected in April 2007 and April 2011be analyzed for additional parameters to monitor the baseline chemistry of commonly occurring ground water species. The additional parameters can be used as a quality assurance/quality control tool as the sum of the milliequivalents per liter (meq/l) of the cations should be equal to the sum of the meq/l of the anions. According to DEQ's wastewater reuse guidance, the difference between the two sums should not be more than 5%. The difference between the anions and cations was below this threshold in all three monitoring wells for the April 2007 samples

with a 4% difference for MW 1, 3% difference for MW 2, and 5% difference for MW 4 based on the measured parameters (sodium, potassium, calcium, magnesium, sulfate, carbonate, bicarbonate, chloride, and nitrate). In all three monitoring wells the sum of the cations was greater than the sum of the anions. The samples collected in April 2011 were not analyzed for the additional parameters. A separate sample was collected, but the samples were not analyzed for chloride and nitrate, so the analysis could not be performed for the second set of additional parameters. The results in milligrams per liter (mg/l) of the additional analyses are presented in Table 1 as well as the percent difference between the first and second sample results. The results for all of the parameters (except for carbonate) are generally slightly higher in the down gradient wells than the up gradient well. Most of the parameters experienced only slight differences between the beginning of the permitting cycle and the end. The greatest difference occurred in the sulfate concentrations for all three wells and each well experienced a decrease of approximately 12 to 17%.

| | | Sodium | Potassium | Calcium | Magnesium | Sulfate | Carbonate | Bicarbonate |
|---|---|---|---|---|---|---|---|---|
| **MW 1** | April 2008 | 75.9 | 7.3 | 69.4 | 28.3 | 186 | 0 | 165 |
| | May 2012 | 80.5 | 7 | 71.2 | 27.5 | 163 | 0 | 147 |
| | % Difference | 106% | 96% | 103% | 97% | 88% | 0% | 89% |
| **MW 2** | April 2008 | 72.5 | 6.9 | 74.6 | 24.2 | 184 | 0 | 167 |
| | May 2012 | 79.2 | 6.6 | 75.5 | 23.3 | 158 | 0 | 170 |
| | % Difference | 109% | 96% | 101% | 96% | 86% | 0% | 102% |
| **MW 4** | April 2008 | 63.9 | 5.4 | 59.8 | 24 | 138 | 0 | 181 |
| | May 2012 | 66.7 | 5.2 | 59.3 | 24.3 | 115 | 0 | 186 |
| | % Difference | 104% | 96% | 99% | 101% | 83% | 0% | 103% |

Table 1: Baseline chemistry concentrations

### 3.4. Seepage Testing

The facility does not have an influent flow meter to measure the amount of wastewater that is generated by the industrial process, but they estimate that they generate approximately 24 million gallons (MG) of wastewater annually. The amount of wastewater applied to the hydraulic management units during the previous permitting cycle ranged between 3.3 MG to 9.4 MG, and the total amount of storage in the lagoon system is approximately 14.2 MG. Based on the difference between the estimated wastewater generation rate and the amount of wastewater that has been land applied each year, the previous staff analysis recommended that the permittee be required to monitor the amount of influent into the wastewater lagoons. The facility requested that the requirement be removed because they did not have a flow meter on the influent line and felt it would be burdensome to add one. DEQ removed the requirement based on the fact that a water balance could be performed on the system if seepage tests continued to be conducted on the lagoons. Therefore, the requirement to conduct a seepage test was included in the monitoring section of the current permit, but a seepage rate limit was not established for the lagoons. The seepage test was conducted in April 2009 and the results did not indicate an excessive amount of seepage from the lagoons. The seepage rates of Lagoons 1, 2, and 3 were estimated together at 0.059 inches/day, with the seepage rates of the other lagoons able to be measured separately. Lagoon 4's average measured seepage rate was -0.023 inches/day; Lagoon 5, 0.030 inches/day; and Lagoon 6, 0.048 inches/day.

### 3.5. Compliance Activities

The current permit contains four compliance activities. The permittee was required to submit an updated plan of operation for review and approval within one year of permit issuance (CA-054-01), submit an updated odor management plan within one year of permit issuance (CA-054-02), submit a revised sludge management plan within one year of permit issuance (CA-054-03), and meet with DEQ for a pre-application conference and submit a permit renewal application six months prior to the permit expiration date.

The first three compliance activities were due on August 1, 2008. The facility requested a six-month extension for all three activities, which was granted by DEQ on July 29, 2008. CA-054-01 and CA-054-02 were received on February 2, 2009. A letter from DEQ requesting revisions and additional information added to the updated operation and maintenance manual was sent to the permittee on March 3, 2009. There does not appear to be a revised operation and maintenance manual submittal after that date and none of the files contain an approval letter for the updated plan of operation. However, the permittee indicated that the compliance activity was complete in the 2008 Annual Report.

CA-054-02 was submitted with the updated plan of operation received by DEQ on February 2, 2009. The letter dated March 3, 2009 that contained the comments on the plan of operation also indicated that the updated odor management plan was approved.

The submittal for CA-054-01 and CA-054-02 indicated that the permittee was working on details relating to waste solids management and that they would supply an updated Waste Solids Management Plan (CA-054-03) as those details were resolved. This proposal was approved in the letter dated March 3, 2009, and DEQ requested that the permittee provide ongoing updates in the annual reports regarding the status of the plan. The permit renewal application indicates that the facility is currently in discussions with a landfill and Western States Dewatering regarding disposal of their solids and that a plan will be submitted after an agreement has been made on sludge disposition.

A request to extend the due date for the permit renewal application submittal (CA-054-04) to March 1, 2012 was granted by DEQ in a letter dated January 27, 2012. A pre-application meeting was then scheduled for February 15, 2012 in conjunction with an inspection of the facility. During the meeting, the permittee indicated that they would need more time to prepare the renewal application based on the discussions about the requirements for the renewal application. A second extension was granted for April 16, 2012 and the permit renewal package was received on that date.

### 3.6. Inspections

The facility was inspected twice during the permitting period, in August 2009 and February 2012. There were a few minor items noted during both inspections and one item that required a corrective action plan was noted during the 2012 inspection. Both inspections noted that the facility is applying as much water as possible, but are generally below the irrigation water requirement for the crops that are grown on the site. During the last inspection, it was discovered that the well that is used to provide water to the industrial facility also provides drinking water to the employees. Due to the number of the employees, the drinking water system is designated as a public drinking water system. As such, the facility is not able to meet the buffer distance of 1000 feet between land application areas and public water supply wells. The 2012 inspection report required that a corrective action plan be submitted to address the buffer distance issue between Field 1 and the public drinking water well.

## 4. PERMITTING DISCUSSION

The following sections outline changes made to the terms of the draft renewal permit, based on evaluations of past performance with previous permit requirements and 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. Changes made to update language and regulatory references are also not addressed in this document.

### 4.1. Section 1. Facility Information

Much of the facility information that was included in the previous permit template has been removed in the new permit template. The facility information that remains in the new template is basically the same as the information in the current permit. However, the facility contact information was updated from Dana Young to Dan Kilkenny, who is the Manager of Environmental Affairs for Darling International, Inc.

### 4.2. Section 2. Compliance Schedule for Required Activities

The draft permit contains four compliance activities: CA-054-01 Plan of Operation,CA-054-02 Well Location Acceptability Analysis, CA-054-03 TDS Impact Analysis, and CA-054-04 Permit Renewal Pre-Application Meeting. Compliance Activity CA-054-01, as it appears in the draft permit, requires that the permittee submit an updated plan of operation (PO) six months after permit issuance. The PO must be updated to reflect the most recent permit conditions and the most recent Plan of Operation checklist, as necessary. The updated PO is also required to include a Grazing Management Plan, as well as any updates necessary for the Waste Solids Management Plan and Odor Management Plan.

Compliance Activity CA-054-02, as it appears in the draft permit, requires that the facility submit to DEQ for review and approval a well location acceptability analysis for the well that is currently serving drinking water to the Darling International, Inc. Kuna facility. As discussed in Section 3.5 above, the most recent inspection of the facility identified that the drinking water well for the facility is not able to meet the buffer zone requirements specified in the current permit. As such, the facility is required to demonstrate that the location of the public drinking water well with respect to the land application sites is protective of human health. If the location is not protective of human health, the facility must indicate the actions that will be taken by the facility to ensure that a sufficient buffer zone is provided for the public drinking water well.

Compliance Activity CA-054-03, as it appears in the draft permit, requires that the facility prepare a TDS Impact Analysis. The TDS concentration is increasing in both the up gradient and down gradient wells, and the TDS Impact Analysis will be used to determine if the wastewater reuse activities at the facility are potentially impacting the ground water. The TDS impact analysis will be required to assess the NVDS loading to the sites during the first three years of the permit cycle as well as the amount of solids removed by the crops grown on the land application sites. If the analysis indicates that the NVDS loading rate is greater than the amount of solids removed by the crops, the permittee is required to identify and implements actions that will reduce the amount of NVDS applied to the land application sites to ensure that the concentration of TDS in the ground water is not impacted by the wastewater reuse activities on the site.

Compliance Activity CA-054-04, as it appears in the draft permit, requires that the permittee schedule a pre-application meeting with DEQ one year prior to the expiration date of the permit if the permittee intends to continue wastewater reuse activities after the permit expiration date. The pre-application meeting will allow the permittee to discuss any proposed modifications to the wastewater reuse activities and discuss any issues that may occur during the permitting cycle. DEQ will also address the requirements for the permit renewal application that is required by Section 6 of the draft permit.

### 4.3. Section 3. Permit Limits and Conditions

Five changes were made to the Permit Limits and Conditions in the draft permit. First, the acreage of MU-005401, Field 1, was updated to 16 acres from 18 acres in Section 3.1 of the draft permit. The total acreage was also updated to 56 acres from 58 acres. Two acres were removed from MU-005401 to provide a sufficient buffer distance between the hydraulic management unit and South Cole Road.

The current permit requires that a Grazing Management Plan be submitted to DEQ for review and approval prior to any grazing activities. This was done on an annual basis during the previous permitting cycle through written requests to DEQ. As an annual review and approval requires time and effort for both the permittee and DEQ,

Section 3.2 of the draft permit has been modified to require that grazing be conducted in accordance with the approved Grazing Plan required by compliance activity CA-054-01. This grazing plan must be approved by DEQ prior to implementation. Please see Section 4.2 above for a discussion regarding the requirements of CA-054-01.

As discussed in Section 3.2 above, the current permit contains a maximum COD loading limit of 50 pounds/acre/day, which the facility easily met with loading rates less than 10% of the loading limit during the previous permitting cycle. As such, permit limit has been removed from the draft permit, with a note that a draft modification to the permit and staff analysis may be issued in the event that DEQ determines a loading limit is necessary. Monitoring of the wastewater for COD remains in the draft permit to allow DEQ to ensure that the COD concentration does not increase significantly from the historical range of 450 parts per million (ppm) and 2160 ppm.

As discussed in Section 3.3.3 of this memo, the requirement to seepage test the lagoons is included in Section 4. Monitoring Requirements of the current permit. Due to changes made to the permit template, the seepage testing requirement has been moved to Section 3.5 Other Permit Limits and Conditions. The last seepage test was conducted in 2009, so the draft permit requires that the seepage test be conducted in 2014.

The requirements to calibrate all flow measurement devices and test all backflow prevention devices on an annual basis have also been moved from Section 4. Monitoring Requirements in the current permit to Section 3.5 Other Permit Limits and Conditions in the draft permit. The "Supplemental Irrigation Water Protection Requirement" in the current permit was also combined with the backflow prevention testing requirement as they both address the backflow prevention requirements for interconnections between the wastewater system and supplemental irrigation systems. This was generally done to accommodate the changes made to the monitoring section of the new reuse permit template.

Also in Section 3.5 of the current permit, Other Permit Limits and Conditions, is a requirement that in each year's annual report, proof be submitted of water rights sufficient to sustain the crop. It was already required in Section E., Site Specific Permit Conditions, of LA-000054-03 that sufficient water rights be available for all permitted fields; the newly added requirement in WRU I-0054-04 is that proof of these water rights be submitted in all annual reports.

### 4.4. Section 4. Monitoring Requirements

Wastewater reuse permits typically require that the permittee monitor the wastewater, ground water, soil, and plant tissues (if applicable) to demonstrate compliance with the recycled water permit requirements. The majority of the monitoring requirements in the draft permit are the same as the current permit. The monitoring section in the new permit template (Section 4) has been updated to provide a separate subsection for each type of monitoring (i.e., recycled water and irrigation water monitoring, ground water monitoring, etc.).

A few changes have been made to the Recycled Water and Irrigation Water Monitoring (Section 4.1). As discussed in Section 3.2 above, the loading limit for COD has been removed in the draft permit. Therefore, monthly monitoring for COD is no longer necessary to calculate the loading rates and the requirement to monitor the wastewater for COD has been reduced to quarterly. Monitoring for COD has been maintained to ensure that the COD concentration does not increase significantly which could indicate that a permit limit may need to be re-established in the future. As discussed in Section 3.2 of this memo, the wastewater effluent monitoring requirement for TDS and VDS is required for the entire permitting cycle as the previous analysis results were not sufficient to establish a relationship between TIDS and NVDS.

All of the ground water monitoring (Section 4.2), soil monitoring (Section 4.3), and plant tissue monitoring requirements (Section 4.4) are the same as the requirements in the current permit.

### 4.5. Section 5. Reporting Requirements

The current permit includes reporting requirements in Section 4. Monitoring Requirements. The new permit template has moved the specific reporting requirements to Section 5.1.2. All of the required calculations in the current permit are maintained in the draft permit, except for the requirement to calculate the COD loading rate as the draft permit does not contain a COD loading limit.

### 4.6. Section 9. Site Maps

Section 9 of the permit contains a facility map and a vicinity map for the facility. The maps were updated to reflect the new permitting naming convention (WRU-I-054).

## 5. RECOMMENDATIONS

Based on review of applicable state rules, staff recommends that DEQ issue draft reuse permit WRU I-0054-04 for a public review and comment period. The draft permit contains compliance activities in Section 2. Compliance Schedule for Required Activities of the permit. Hydraulic and constituent loading limits for the recycled water treatment system, as well as terms and conditions required for operation of the reuse system are included in Section 3. Permit Limits and Conditions of the draft permit. Monitoring and reporting requirements to evaluate system performance and to determine permit compliance have been specified in Sections 4. Monitoring Requirements and Section 5. Reporting Requirements.

## 6. REFERENCES

Darling International, Inc. Wastewater Reuse Permit No. LA-000054-03, Renewal Application. April 13, 2012

Darling International, Inc. Annual Reports submitted to DEQ. 2008 – 2011.

DEQ. Guidance for Reclamation and Reuse of Municipal and Industrial Wastewater. September 2007.

DEQ. Industrial Wastewater Reuse Permit LA-000054-03. August 1, 2007

Staff Analysis for Draft Wastewater Reuse Permit No. LA-000054-03. April 4, 2007.

**Appendix A**
**Fact Sheet**

## Process and Site Descriptions

### Process Description:

Darling operates an animal byproduct recycling facility in Kuna, Idaho. The wastewater generated at this facility comes from three main sources: 1) wash water (e.g., used to clean processing equipment, floors, etc.), 2) byproduct water generated from the cooking process, and 3) entrainment water from the air scrubbers used to control atmospheric releases. The facility also generates brine wastewaters; however, this effluent stream is managed separately from other wastewater streams (i.e., brine water is retained/evaporated in Brine Pond No.3). After generation, the three primary wastewater streams are collected and routed through a mechanical skimmer to remove oils, grease, and other large solids. Skimmer effluent is then pumped from a lift station to the secondary treatment system, which consists of two anaerobic lagoons in series (Lagoon Nos. 1 and 2), followed by an aerated lagoon (Lagoon No. 3) used to reduce the biological oxygen demand (BOD) of the wastewater. Treated wastewater is then held in one of two lagoons (Lagoon Nos. 4 and 5). As needed, the treated wastewater is routed from the holding lagoons to the pump house located immediately south of Field 1, where it is mixed with irrigation water prior to final land-application treatment. Irrigation water is taken from a dedicated irrigation well located immediately outside of the pump house, directly to the east. Wastewater and/or irrigation water can be land applied via the wheel line system of Field 1 or the center pivot distribution system on Field 2.

According to the permit application, 24 million gallons (MG) of wastewater is generated annually with no seasonal variation in gallons per day. The lagoon system has a total capacity of 14.22 MG with the following individual capacities: Lagoon 1- 0.43 MG, Lagoon 2 - 0.86 MG, Lagoon 3 - 4.31 MG, Lagoon 4 - 7.47 MG, and Lagoon 5 - 1.15 MG.

### Site Description:

The land application site consists of two fields, Field 1 and Field 2. Soils on the sites consist of Colthorp, Power, and Purdam silt loams 20 to 40 inches deep, underlain by basalt. The USDA Natural Resource Conservation Service (NRCS) describes all three silt loams as well drained with very slow to medium runoff and moderately slow permeability. Ground water at the site is approximately 260 feet below the ground surface and generally flows in the south-east direction.

Field 1 was originally 18 acres, but has been reduced to 16 acres to meet buffer requirements, and is irrigated using a wheel line. Field 2 is 40 acres and is irrigated with a center pivot system. Alfalfa has generally been used as the cover crop and grain is planted whenever the alfalfa must be removed.

The ground water around the site is monitored with three monitoring wells, GW-005401 is down gradient from MU-054-01, GW-005402 is down gradient from MU-054-02, and GW-005404 is up gradient from the site. Well logs indicate that the three monitoring wells are screened in 30-foot intervals near the bottom of each well, with screened sections extending roughly 20 feet below the water table elevation detected at each well during construction.