



MEMORANDUM:

To: Bruce Olenick, Regional Administrator, Pocatello Regional Office
Tom Hepworth, Engineering Manager, Pocatello Regional Office
Tressa Nicholas, Wastewater Analyst, State Office
Larry Waters, Engineer, State Office

From: ~~S~~ Scott MacDonald, EIT, MBA, CPM, Associate Engineer

Date: May 5, 2016

**Subject: Staff Analysis for the *Draft* Recycled Water Reuse Permit, Wada Farms Potatoe, Inc.,
Permit Number I-171-04 (Previous Permit Number LA-000171-03)**

Executive Summary

- The Wada Farms Potatoes, Inc. Facility is an industrial, fresh pack potato processor.
- The facility uses 138 irrigated acres receiving roughly 39 MG of recycled water annually
- The facility is permitted for both growing season, and non-growing season application.
- There have been no significant changes to the facility since the last permit was issued, with the exception of combining two MU's into one, and inclusion of an MU for solids application.
- Map updates resulted in no changes in overall irrigated acreage.
- Inspections and annual reports show no exceedances or permit violations.
- This is a routine permit renewal.
- Staff recommends issuance of I-171-04, for a period of 10 years.

1 Introduction

The purpose of this memorandum is to satisfy the requirements of IDAPA 58.01.17.400 for issuing Recycled Water Reuse Permits. It briefly states the principal facts and significant questions considered in preparing the draft permit, and provides a summary of the basis for the draft permit conditions.

- The current permit was issued on June 13, 2011, expiration date June 12, 2016.
- The pre-application conference was conducted on June 12, 2015.
- Final permit application materials were received December 30, 2015.
- DEQ's Completeness Determination letter issued on April 12, 2016.

2 Site Location and Ownership

Wada Farms owns and operates the fresh pack processing facility and land application management units near Pingree, Idaho. Permitted management units include the Center Pivot (and Pasture) as MU-17101, and the Hand Lines field as MU-17102. The Center Pivot is 95 acres, and the Hand Lines Field is 43 acres, for a total of 138 irrigated acres receiving recycled water, all owned and operated by Wada Farms. A site map is included at the end of this report.

3 Process Description

Wada Farms Potatoes, Inc. is a potato fresh pack facility located approximately 3 miles north of Pingree, Idaho on State Highway 39. The facility was constructed in 1998 to wash and package fresh potatoes year-round. The facility receives fresh pack grade potatoes by truck throughout the year. Potatoes are premium quality and intended for direct consumption. Aside from washing and sorting, no further processing occurs at the Wada Farms facility. Washing and sorting operations generate relatively low strength industrial recycled water containing mostly soil residue with small quantities of total Kjeldahl nitrogen (TKN), nitrate + nitrite Nitrogen, total phosphorus (P), chemical oxygen demand (COD), electrical conductivity (EC), total dissolved solids (TDS), volatile dissolved solids (VDS) and non-volatile dissolved solids (NVDS).

The Wada Farms facility conducts fresh pack operations only; potato processing operations are limited to washing, conveyance, and packaging. In-plant water usage includes only washing, with no cooking or processing of potato products. Following in-plant use, the facility's pretreatment includes solids screening, and primary clarification. Additional settling of silt occurs in the storage lagoon.

Process water receives primary clarification via 3, in-series cyclone-type clarifiers for mud separation and removal. Management plans reference flocculants used to help separate solids. Clarifier underflow solids are sent to MU-17104 to dry the settled mud on a 32 acre solids management site.

Following clarification, process water is pumped approximately 1,700 feet through a 4 inch diameter, PVC pipeline to a storage/mixing pond. The mixing pond is also used to receive and store canal water when needed for supplemental irrigation. From the mixing pond, a combination of process and fresh water is pumped to the land treatment fields. These include two permitted hydraulic management units. The fields are irrigated via hand lines and one center pivot using recycled water and canal water mixed in the retention pond. Occasionally the settled pond solids are removed and applied to the management units.

Silt water from potato washing in the plant process averages 39 million gallons annually at full production. There are no additional industrial or municipal streams that are sent to the reuse system. The plant operates 5 days per week during the year. Process water, as well as process water blended with water from the canal as Supplemental Irrigation Water (SIW), is applied to the permitted hydraulic management units.

Recycled water is land applied to grow primarily alfalfa, which may be rotated with other crops. Waste solids, such as cull potatoes or potato parts are recovered for animal feed. Settled silt material is dried on the corner of MU-17104, and is used to fill low spots on other management units.

The recycled water treatment system makes use of a single, HDPE lined storage lagoon, prior to irrigation. When recycled water is insufficient to meet crop needs, crop needs are supplemented with water from the Aberdeen-Springfield Canal.

Supplemental irrigation water can be applied directly on the fields without mixing with the recycled water. Each irrigation system has a separate flow meter to report applied irrigation water.

Recycled water and supplemental irrigation water are applied between April and October. The facility is also permitted for non-growing season application of recycled water from Nov. 1, to March 31.

There has been no municipal sludge or biosolids generated at the site. Municipal wastewater is not connected to the recycled water system. On-site sewage is disposed of in a subsurface drain system, originally permitted and installed in 1997.

The 3 management units consist of 138 irrigated acres, which is unchanged from the previously permitted acreage, although the acreage under the pivot has been combined from two MU's into one. The site topography is relatively flat, rural farm land with slopes between 0% and 2%. The elevation is around 4,460 feet above mean sea level across the site. Land use in the area is rural agricultural, irrigated agriculture, and some rural residential.

4 Site Characteristics

4.1 Site Management History

The reuse system has been in operation since it was first permitted in 1997.

4.2 Climatic Characteristics

The climatic characteristics in Pingree are very similar to the climate in Aberdeen, where climatic information is readily available. Weather data from the Regional Climate Center at the Aberdeen Experimental Station is summarized below:

- Average annual precipitation of 8.84 inches.
- Minimum monthly average precipitation of 0.45 inches, between 1914 - 2009.
- Maximum monthly average precipitation of 1.10 inches in June, between 1914 - 2009.
- Average minimum temperature of 11.0 degrees F in January between 1914 - 2009.
- Average maximum temperature of 87.9 deg. F, in the months of July.
- Winds are primarily out of the southwest.

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
Average Max. Temperature (°F)	31.1	37.0	47.1	59.1	68.9	77.7	87.9	86.3	75.8	62.8	45.7	34.1	59.4
Average Min. Temperature (°F)	11.0	16.0	23.3	30.0	37.7	44.3	49.9	47.2	38.3	29.6	21.6	13.9	30.2
Average Total Precipitation (inches)	0.72	0.64	0.72	0.85	1.10	0.92	0.45	0.47	0.67	0.81	0.72	0.79	8.84
Average Total Snow Fall (inches)	6.5	4.1	2.0	1.3	0.1	0.0	0.0	0.0	0.0	0.5	1.5	5.1	21.1
Average Snow Depth (inches)	3	2	1	0	0	0	0	0	0	0	0	2	1

Figure 1. Western Regional Climate Center Climatic Data 1914-2009.

The net irrigation water requirement for alfalfa with frequent cutting is roughly 43 inches on average over the growing season. The plan of operation provides operators with watering schedules, in accordance with the site-specific irrigation water requirements, and takes into account the effects of climatic variability on water requirements.

4.3 Soils

On-site soils generally consist of well-drained loam, silt-loam, or sandy loams with depths ranging from 12 inches to greater than 60 inches with slopes ranging from 0-2%. Analytical data indicates that on-site soils are suitable for continued use as treatment media to receive process water for nutrient recycling through crop nutrient uptake. Soil from excavations was evaluated for color, texture, consistency, rooting depth, and soil layering. Soil infiltration rates were estimated from published National Resources Conservation Service (NRCS) data. Soil chemical qualities are within acceptable ranges for productive agricultural soils. The facilities nitrogen loading is minimal, with loading rates well below the nitrogen uptake levels. Soil management unit delineations in the permit are the same as the hydraulic management unit acreage.

Site soils are suited to function as process water treatment media, if the Permittee operates the process water land application system in accordance with the facility management plans, and within the terms and conditions in the new permit.

4.4 Surface Water

The facility has implemented a Runoff Management Plan to manage potential stormwater runoff from entering surface waters. Berms and canal banks are also in place to prevent potential runoff to surface waters. The Aberdeen-Springfield Canal is the nearest surface water to the north of the facility and management units. The canal is at a higher elevation than the adjacent management units, so any applied recycled water or storm water would not flow off site and into the canal. The established buffer distances from the management units to canals, ditches, and other surface waters are addressed in Section 4.4 of the permit.

Reuse facilities in the area would use the design objective for containment of a 10-year, 24-hour storm event on 24 inches of snow, with no infiltration (frozen ground). According to the isopluvial maps in the Guidance excerpted from NOAA data, the 10 year/24 hour storm could produce 1.8 inches of water. In addition, snow might already be present on the site, so snow moisture content was conservatively assumed to be 1 inch of water per foot of snow, or a total of 3.6 inches of water. A 25 year/24 hour storm is estimated to produce 1.8 inches of water, which is the 25 year/24 hour mapping for Idaho¹. The associated infiltration/evaporation should accommodate 3.6 inches of water; which is effectively double the volume expected from a 25year/24 hour storm.

DEQ concurs that this is a conservative design basis and that there is minimal potential for storm runoff or thaw that has possibly contacted recycled water to leave the permitted management units and enter any nearby surface waters.

¹ NOAA, Atlas 2, Volume 5, Figure 28

4.5 Ground Water and Hydrogeology

Hydrogeological characteristics of the site have been assessed by the Permittee, in consultant's submittals, and by DEQ in the course of this and previous permitting processes. Water is typically encountered 50 feet below ground surface in the regional Snake River Plain Aquifer, with relatively small seasonal variations due to the scale of the regional aquifer. Ground water flows toward the south-southeast, according to the permit application.

The permit requirements, together with a comprehensive, updated, Plan of Operation, act as an effective ground water quality protection strategy. The Permittee's adherence to terms and conditions in the permit and to practices identified in site management plans should continue to result in ground water quality, maintainable at levels acceptable to DEQ. Ground water quality is not likely to exhibit detectable degradation as the result of recycled water land application.

The facility should continue to ensure that site reuse activities, and the management of silt dirt will not affect ground water.

4.6 Recycled Water Characterization and Loading Rates

4.6.1 Recycled Water Characterization

Constituent concentrations vary during the reporting year, but constituent concentrations remain fairly consistent over time, due to low variability in the input stream. And while total nitrogen loadings are fairly low, the permit limits nitrogen loading from recycled water and supplemental fertilizers to 150% of typical crop uptake. Figure 2 below, lists measured constituent concentrations.

Sample Date	Total Kjeldahl Nitrogen	Total Phosphorus	Electrical Conductivity
	mg/L		µS
11/26/2014	33.3	25.3	643
12/30/2014	5.97	23.4	463
1/29/2015	60.1	36.4	620
2/25/2015	71.5	44.4	848
3/25/2015	36.7	23.8	581
4/30/2015	73.0	46.0	619
5/28/2015	28.9	34.1	766
6/24/2015	7.03	1.69	300
7/30/2015	24.2	27.1	486
8/28/2015	23.2	5.35	339
9/30/2015	11.9	10.7	350
10/27/2015	17.8	13.60	405

NOTES:
Abbreviations: mg/L = milligrams per liter, µS = microsiemens
Italicized entries indicate samples were not collected, so values are averages of prior and following month.

Figure 2. Table 5 from the Wada Farms 2014-2015 Annual Report

Figure 3 below lists the per-acre nitrogen loading summary, all reported nitrogen loadings are well below the permitted nitrogen loading limit.

Table 6. Nitrogen Loading Summary
Wada Farms Potatoes, Inc. - Pingree, Idaho

Month	Pasture	Center Pivot	Hand Lines
	pounds per acre		
Nov-2014	8	8	0
Dec-2014	2	2	0
Jan-2015	11	11	0
Feb-2015	18	18	0
Mar-2015	9	9	0
Apr-2015	18	18	0
May-2015	3	3	6
Jun-2015	1	1	2
Jul-2015	3	3	2
Aug-2015	2	2	5
Sep-2015	3	3	0
Oct-2015	5	5	0
Annual ¹	82	82	14
Annual Loading Limit ²	374	374	186

NOTES:
¹ Annual values are sums of monthly values.
² Annual loading limits for nitrogen were calculated as 150% of median crop nitrogen removals reported in previous three annual reports.

Figure 3. Table 6 from the Wada Farms 2014-2015 Annual Report

Figure 4 below lists the per-acre phosphorus loading summary, the permit does not include a phosphorus loading limit at this time.

Table 7. Phosphorus Loading Summary
Wada Farms Potatoes, Inc. - Pingree, Idaho

Month	Pasture	Center Pivot	Hand Lines
	pounds per acre		
Nov-2014	6	6	0
Dec-2014	7	7	0
Jan-2015	6	6	0
Feb-2015	11	11	0
Mar-2015	6	6	0
Apr-2015	12	12	0
May-2015	4	4	7
Jun-2015	0	0	0
Jul-2015	3	3	2
Aug-2015	1	1	1
Sep-2015	2	2	0
Oct-2015	4	4	0
Annual ¹	62	62	11

NOTES:
¹ Annual values are sums of monthly values.

Figure 4. Table 7 from the Wada Farms 2014-2015 Annual Report

4.6.2 Hydraulic Loading Rates

Results from recycled water sampling show a relatively consistent production flow rate over the years. An average production volume of 39 MG over 138 acres is only 10.4 inches per acre on an annual basis. A mixture of grasses and hay are generally the intended crops, with an irrigation water requirement of 33 to 40 inches in the growing season. Winter wheat has also been rotated into the cropping schedule. The Permittee is required to add supplemental irrigation water as necessary to preserve crop vitality and productivity during periods when reuse water is insufficient to meet crop requirements. The facility reports that they have sufficient water rights from the canal to meet crop water needs during the growing season.

The Permittee is required to estimate crop water requirements at the beginning of each year and to sufficiently pre-plan recycled water and supplemental irrigation water applications to ensure crop vitality for maximum nutrient uptake. An analysis of the irrigation water requirement and irrigation scheduling is provided in the Permittee's plan of operation. The plan of operation provides operators with watering schedules, in accordance with the crop-specific irrigation water requirements.

4.6.3 Constituent Loading Rates

As with the previous permit, nitrogen loading is limited to 150% of typical crop uptake calculated separately for each hydraulic management unit, inclusive of any permitted NGS loading allowances. Nitrogen loading from fertilizers or from applied silt dirt must also be accounted for when calculating annual nitrogen loading rate limits.

COD loading is limited to 50 lb/acre-day for both the growing season and the non-growing season, calculated on a monthly basis and averaged by month over a seasonal basis; likewise COD loading is reported on an individual HMU basis. COD loading is not averaged between the growing season and the non-growing season.

Hydraulic loading limits for the growing season will be the irrigation water requirement of the crop, but cannot exceed the nitrogen loading limit of 150% of typical crop uptake² as stated in the permit.

5 Site Management

- Monitoring is addressed in Section 6 of this staff analysis.
- Site 'operation and maintenance' is addressed in Section 8 of this staff analysis.
- Compliance activities are addressed in Section 9 of this staff analysis.
- A brief cropping plan evaluation is included in this section as a site management topic.

5.1.1 Buffer Zones

The buffer zone plan was approved by DEQ on April 13, 2016. The new permit will not require an updated buffer zone plan to be submitted. The management units are located in a rural area off of publically accessible roads, so restrictive buffer zones are not required for the facility.

² Typical crop uptake is the median constituent crop uptake from the three (3) most recent years the crop has been grown. Typical crop uptake is determined for each hydraulic management unit. For new crops having less than three years of on-site crop uptake data, regional crop yield data and typical nutrient content values, or other values approved by DEQ may be used.

5.1.2 Runoff

The Runoff Management Plan was approved by DEQ on April 16, 2012. The resubmittal was reviewed on April 13, 2016. No changes or updates have been made at the facility to warrant updating the Runoff Management Plan. The plan is current and does not require revision at this time.

Recycled water applied to the land surface must be restricted to the premises of the application site. Any wastewater discharges to surface water that require a permit under the Clean Water Act must be authorized by the United States Environmental Protection Agency.

5.1.3 Seepage Rate Testing

The facility uses a single storage lagoon for mixing the low strength potato wash water with canal water, prior to land application. The lagoon was seepage tested in 2010. Seepage testing will be evaluated during the next permit cycle.

5.1.4 Waste Solids, Biosolids, Sludge, and Solid Waste

A Waste Solids Management Plan was submitted as part of the overall Plan of Operation as required by the previous permit. The revised Waste Solids Management Plan was approved by DEQ on April 13, 2016. A plan update will not be necessary as a separate compliance activity in the new permit.

The facility does not generate biosolids, sludge, or solid waste as part of the reuse activities.

5.1.5 Nuisance Odors

A Nuisance Odor Management Plan was submitted as part of the overall Plan of Operation, and was approved on January 7, 2014. The revised plan was approved by DEQ on April 13, 2016. A plan update will not be necessary as a separate compliance activity in the new permit. The facility has not received any odor complaints that DEQ is aware of.

Reuse permitting requirements includes buffer zone setbacks to reduce spray drift off site, and to reduce nuisances caused by odors generated from applying process water on site management units near areas where public access may lead to odor complaints.

5.1.6 Cropping Plan

The Plan of Operation has been updated, including the cropping plan on page 17 of that plan. An analysis of crop yield is listed in Section 6.1.5 below.

5.1.7 Grazing

Grazing is not proposed for the site, and submittal of a grazing management plan is not necessary as a new permit requirement. Should grazing be considered, the facility will follow the recommendations listed below.

See DEQ Guidance, section 6.4 for grazing management information. A DEQ-approved grazing plan is required prior to any grazing activities on a permitted reuse site.

5.1.8 Salts

Salt loading has not been identified as a potential deterrent to crop growth on the reuse management units, and submittal of a salt loading management plan is not necessary as a new permit requirement.

5.1.9 Monitoring Well Installation Requirement

As an alternative to the installation of monitoring wells, the Permittee chose to provide a technical assessment based on site-specific data, to document that the potential for impacts to groundwater from recycled water application are minimal. The permittee submitted a Land Application Study Report. DEQ's Technical Services Staff reviewed findings presented in the study. The assumptions in the approved documents indicated that the study would transfer tensiometer data and soil water constituent data into percolate flow and ground water constituent concentration data. DEQ's Technical Services Staff independently verified the conclusions of the study, and determined through their own models that at the current loading rates, there is little chance of impact on groundwater at the site, and that if loading rates are maintained at current levels, monitoring wells will not be required at this time.

The Permittee will be required within the Annual Reports to verify that the assumptions and loading rates described in the study are being maintained. Requirements for monitoring wells will not be a requirement in the new permit.

6 Monitoring

6.1.1 Recycled Water Monitoring

Through permitting, DEQ requires environmental sampling, monitoring, and analysis to assess the performance of hydraulic and soil management unit operations. Sampling and analysis assure that recycled water reuse practices do not adversely impact natural resources or public health. Permit I-171-04 includes standard permit language requiring sampling and analysis as shown in the facility's Quality Assurance Project Plan (QAPP) to record the quantity and quality of crop uptake, to measure soil health and productivity, and to ensure acceptable ground water quality.

DEQ views the available treatment capacity and the effective management of all permitted management units as long-term, beneficial recycled water uses.

Section 5.1.1 of the permit includes the following recycled water monitoring requirements. The facility generally monitors TKN, ammonium-nitrogen, nitrate-nitrogen, total phosphorus, COD, electrical conductivity, pH, sulfate, total dissolved solids, volatile dissolved solids, and non-volatile dissolved solids.

Supplemental irrigation water will be sampled twice during the permit cycle for TKN, nitrate-nitrogen, total phosphorus, and TDS.

6.1.2 Soil Monitoring

Soil monitoring has been completed each year according to the permit, and is reported in the annual reports. The permit application materials include updated soil monitoring information, and detailed soil analyses. The permit application indicates that the past data summaries are consistent with the findings from the most recent soil analysis.

Soil characteristics at the site have been thoroughly investigated and reported in the course of prior permit applications and compliance activity processes. Soils generally consist of well-drained loam, silt loam or sandy loam with depths ranging from 12 inches to 60 inches.

Analytical data consistently indicates that on-site soils are suitable for continued use as treatment media to receive recycled water for nutrient recycling through proper application and crop uptake. Soils across the two management units are suited to function as process water treatment media if the Permittee operates the land application system in accordance with recommendations in site management documents and within the terms and conditions in the permit.

Fields were analyzed to estimate the soil AWC, or volume of water capable of being retained by the soil during the NGS. Hydraulic and constituent loading objectives have been established according to the recommended water holding capacity to provide NGS storage and reduce leaching to groundwater. Likewise, soil chemical qualities are generally within acceptable and characteristic ranges for productive agricultural soils. AWC estimates are listed in the right hand column below.

**Table 6. Soil Physical and Hydraulic Data
Wada Farms Potatoes, Inc.**

Depth	Texture	Sand	Silt	Clay	Bulk Density	Porosity	Water Content at Field Capacity	Water Content at Wilting Point	Available Water Capacity
inches		%			g/cm ³	%	cm ³ /cm ³		in
Soil Unit A									
0-10	loam	50.8	44.4	4.8	1.53	42.3	0.29	0.12	1.72
10-28	loam	45.2	44.0	10.8	1.46	44.9	0.33	0.15	3.17
28-48	loam	61.2	32.0	6.8	1.56	41.1	0.25	0.11	2.68
48-60	loam	47.8	46.4	5.8	1.41	46.8	0.32	0.12	2.42
								Total	9.99
Soil Unit B									
0-12	loam	32.0	45.6	22.4	1.38	47.92	0.28	0.13	1.80
12-24	loam	49.2	36.8	14.0	1.48	44.15	0.23	0.10	1.56
24-36	loam	36.0	47.6	16.4	1.43	46.04	0.26	0.11	1.80
								Total	5.16

Figure 5. Soil sample results from Table 6 of the Permit Application Technical Report.

The table below includes the soil monitoring results from the 2014-2015 Annual Report.

**Table 9. Soil Sample Concentrations from Solids Management Area
Wada Farms Potatoes, Inc. - Pingree, Idaho**

Sample Date	Sample Depth	Nutrient Concentrations							
		OM	NH ₄ -N	NO ₃ -N	P	K	SO ₄ -S	pH	EC
		percent	ppm					s.u.	mmhos/cm
10/28/2014	0-12	2.2	6.3	8.8	61	443	6	7.6	0.60
	12-24	1.55	5.3	5.5	26	246	10	8.1	0.72
	24-36	0.56	4.5	3.0	7	187	16	8.3	0.85
	36-48	0.78	4.8	3.3	1	176	32	8.3	0.99
	48-60	0.53	4.8	1.8	1	175	22	8.4	0.93
6/11/2015	0-12	1.86	12	4.3	15	190	8	8.6	0.63
	12-24	1.12	8	1.0	3	133	10	8.8	0.66
	24-36	0.88	9.8	8.3	2	156	14	8.9	0.73
	36-48	0.94	8.5	5.5	1	147	22	8.8	0.91
	48-60	0.74	8.3	5.8	1	171	32	8.7	0.97

NOTES:
Abbreviations: OM = organic matter, NH₄-N=ammonia as nitrogen, NO₃-N=nitrate as nitrogen, P=phosphorus, K = potassium, SO₄-S = sulfate as sulfur, EC = electrical conductivity, ppm = parts per million, mmhos/cm = millimhos per centimeter, s.u. = standard units

Figure 6. Soil sample results from Table 9 of the 2014-2015 Annual Report.

In addition to low nitrogen loading rates shown in section 4.6.1 above, the facility loads COD at a minimum compared to the 50lb/ac-day permit limit. Nitrate-nitrogen results from the soil samples listed above indicate the need for possibly supplementing site soils with nitrogen fertilizer to help meet crop needs.

Phosphorus levels in the one foot soil depth show the highest concentration, while the lower depths show that applied phosphorus is likely being used by the crops. Site soils do not appear to show increasing constituent concentrations that would hinder crop growth. Maintaining recycled water application rates, and proper crop management should continue to yield sustained crop production.

6.1.3 Supplemental Irrigation Water and Monitoring

With respect to process water hydraulic loading, Permit I-171-04 imposes limits for growing season and non-growing season hydraulic loading. Loading rates from recycled water alone do not meet crop irrigation water requirements. Crop water needs must be met by application of supplemental irrigation water (SIW) during the growing season. Mixing process water with SIW can also help to reduce odors, and reduces constituent build up in site soils.

The new permit includes the Aberdeen-Springfield Canal as the facility’s supplemental irrigation water source. This is the same SIW source listed in the previous permit. Water rights are available to use the reported volume for land application. Facility canal connections include backflow prevention.

Supplemental irrigation monitoring will continue according to the permit requirements.

6.1.4 Crop Yield and Tissue Monitoring

The facility is required to sample crop yield and crop tissue during each harvest, reporting moisture content, TKN, nitrate-N, phosphorous, and ash content. The facility grows a variety of grass hay crops, but additional crops are rotated in as needed to maintain healthy crop production. Yield is as high as 6.1 tons per acre, with a low of 4.2 tons per acre.

Nitrogen removal is reported in the 2014-2015 annual report between 178 - 284 lb of nitrogen per acre for alfalfa, with a median nitrogen removal between 211 and 245 lb of nitrogen per acre. The facility reports an average nitrogen loading rate of 82 lb nitrogen per acre, on the pivot irrigated field, and only 14 lb per acre on the hand-lines field. Crops can also receive nitrogen from applied fertilizer, but the most recent annual report shows no fertilizer application.

Year	Yields – tons per acre		Nitrogen Uptake – pounds per acre	
	Center Pivot	Handlines	Center Pivot	Handlines
2011	4.9	5.8	237	284
2012	4.2	5.9	178	249
2013	5.3	5.9	199	222
2014	5.3	6.1	208	240
Median	5.1	5.9	211	245

Figure 7. Soil sample results from Table 9 of the 2014-2015 Annual Report.

6.1.5 Calculation Methodologies

The facility calculates crop tissue monitoring in each annual report, and provides copies of the lab sheets for DEQ to use to verify calculation methods and crop nutrient uptake. Crop uptake is carefully tracked across all management units, and crop yields are typical for area harvests. Wada Farms employees harvest crops from the reuse sites.

Field loadings for applied constituents are calculated from the lab sample results and from the flow meter measurements for each management unit.

The facility Quality Assurance Project Plan (QAPP) includes detailed descriptions for measuring crop yield.

7 Quality Assurance Project Plan

The Quality Assurance Project Plan (QAPP) is a written document outlining the procedures used by the permittee to ensure the data collected and analyzed meets the requirements of the permit. The QAPP was submitted to DEQ, and the DEQ response was sent on April 13, 2016. The QAPP must be revised as necessary to incorporate any monitoring changes presented in the new permit, or personnel or position updates.

In support of the agency mission, DEQ is dedicated to using and providing objective, correct, reliable, and understandable information. Decisions made by DEQ are subject to public review and may at times, be subject to rigorous scrutiny. Therefore, DEQ's goal is to ensure that all decisions are based on data of known and acceptable quality.

The QAPP is a permit requirement and must be submitted to DEQ as a stand-alone document for review and acceptance. The QAPP is used to assist the permittee in planning for the collection, analysis, and reporting of all monitoring data in support of the reuse permit and explaining data anomalies when they occur.

DEQ does not approve QAPPs, but reviews them to determine if the minimum EPA guideline requirements are met, and that the reuse permit requirements are satisfied. The reason DEQ does not approve QAPPs is that the responsibility for validation of the facility sampling data lies with the permittee's quality assurance officer and not with DEQ.

The format of the QAPP should adhere to the recommendations and references in 1) the Assurance and Data Processing sections of the DEQ Guidance and 2) EPA QAPP guidance documents. EPA QAPP guidance documents are available at the following website:

<http://www.epa.gov/quality/qapps.html>

8 Site Operation and Maintenance

The Wada Farms facility is an industrial recycled water reuse facility. The facility has an updated Plan of Operation for facility operations and maintenance.

The facility is not required to have a licensed operator for the system at this time.

Maintenance will be performed by the facility operators. Cropping and farming operations are conducted under the supervision of the Wada Farms facility management.

9 Compliance Activities

The following is an itemized summary and status of the compliance activities in the current permit, including a list and explanation of the compliance activities that will be required in the new permit.

9.1.1 Status of Compliance Activities in the Current Permit

The Wada Farms Permit LA-000171-03 included three Compliance Activities to ensure the safe and efficient operation of this recycled water, land application system. The updated facility management plans in CA-171-01 and CA-171-02 have been approved as of April 13, 2016. The requirements of CA-171-03 have also been acknowledged in the review letter.

CA-171-01 requires that the various management plans – Operations Plan, Odor Management Plan, and Buffer Zone Plan – be updated to reflect detailed and current operations on all permitted hydraulic management units. The Waste Solids Management Plan is also listed in this compliance activity, and the revised version is incorporated within the updated Plan of Operation.

CA-171-02 requires the Permittee to prepare and submit to DEQ for approval, a Runoff Management Plan with control structures and other BMP's (e.g. collection basins, berms, etc.) designed to control runoff from any management unit receiving wastewater.

CA-171-03 requires a Quality Assurance Project Plan (QAPP) to provide a comprehensive description of environmental sampling and analysis procedures, and provide quality control/quality assurance provisions.

9.1.2 Compliance Activities Required in the New Permit

DEQ worked with the facility and their consultant up-front, to get all standard management plans updated, reviewed, and approved, so the permit could be issued with no compliance activities as follow-up plan submittal requirements. The facility management plans must be kept current. The following Compliance Activities are standard requirements specified in the draft permit:

1. CA-171-01, The permittee will be required to schedule a Pre-Application Workshop, one year prior to permit expiration.
2. CA-171-02, The permittee will be required to submit a complete Permit Application Package to DEQ, 180 days prior to permit expiration.

10 Recommendations

Staff recommends the draft recycled water reuse permit be issued. The permit specifies hydraulic and constituent loading limits and establishes monitoring and reporting requirements to evaluate system performance, environmental impacts, and permit compliance.

11 References

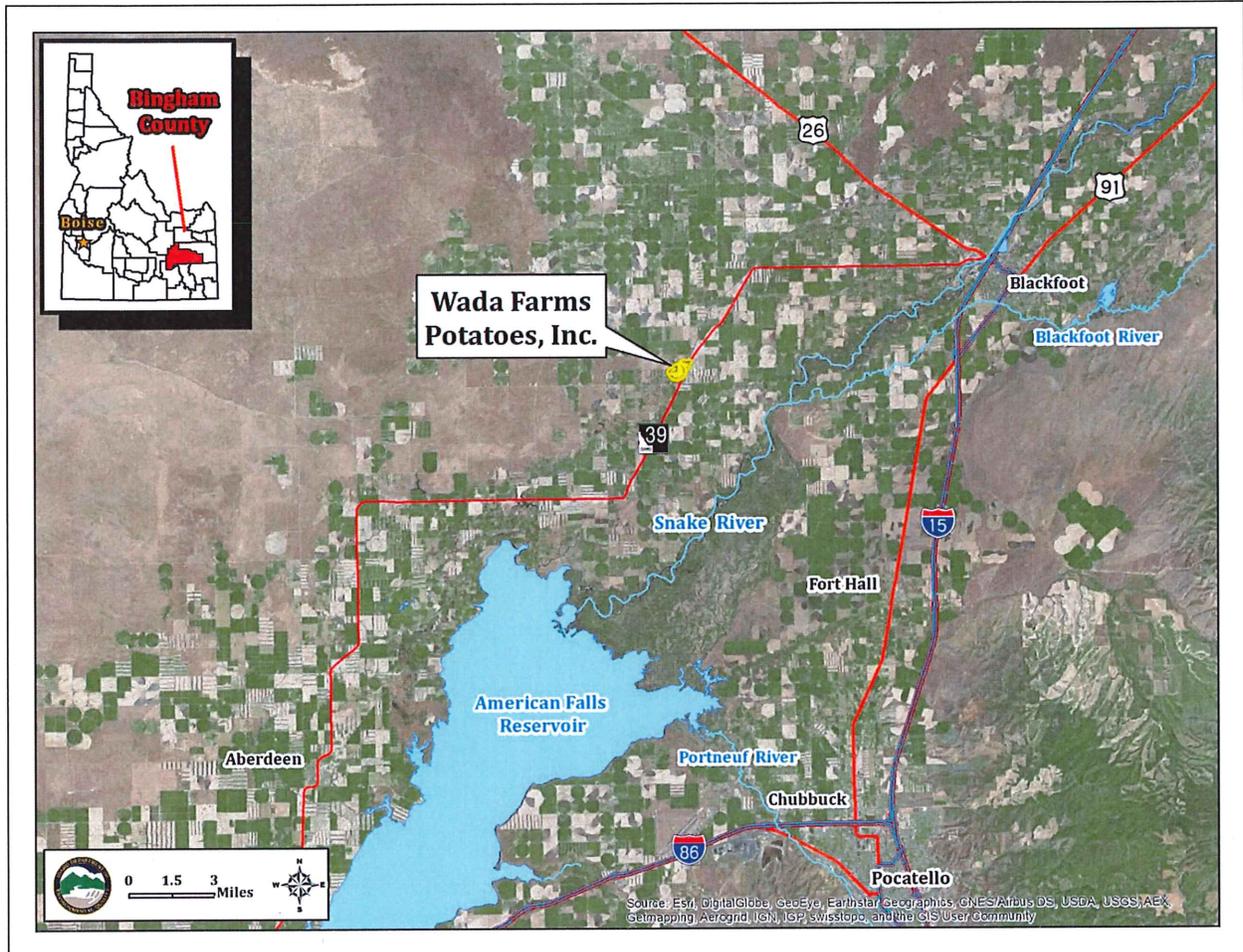
CES, December 2015, Preliminary Technical Report for Reuse Permit Renewal - Wada Farms Potatoes, Inc. Pingree, Idaho, TRIM 2015AGH1946

Wada Farms 2014-2015 Annual Report, TRIM # 2016AGH226

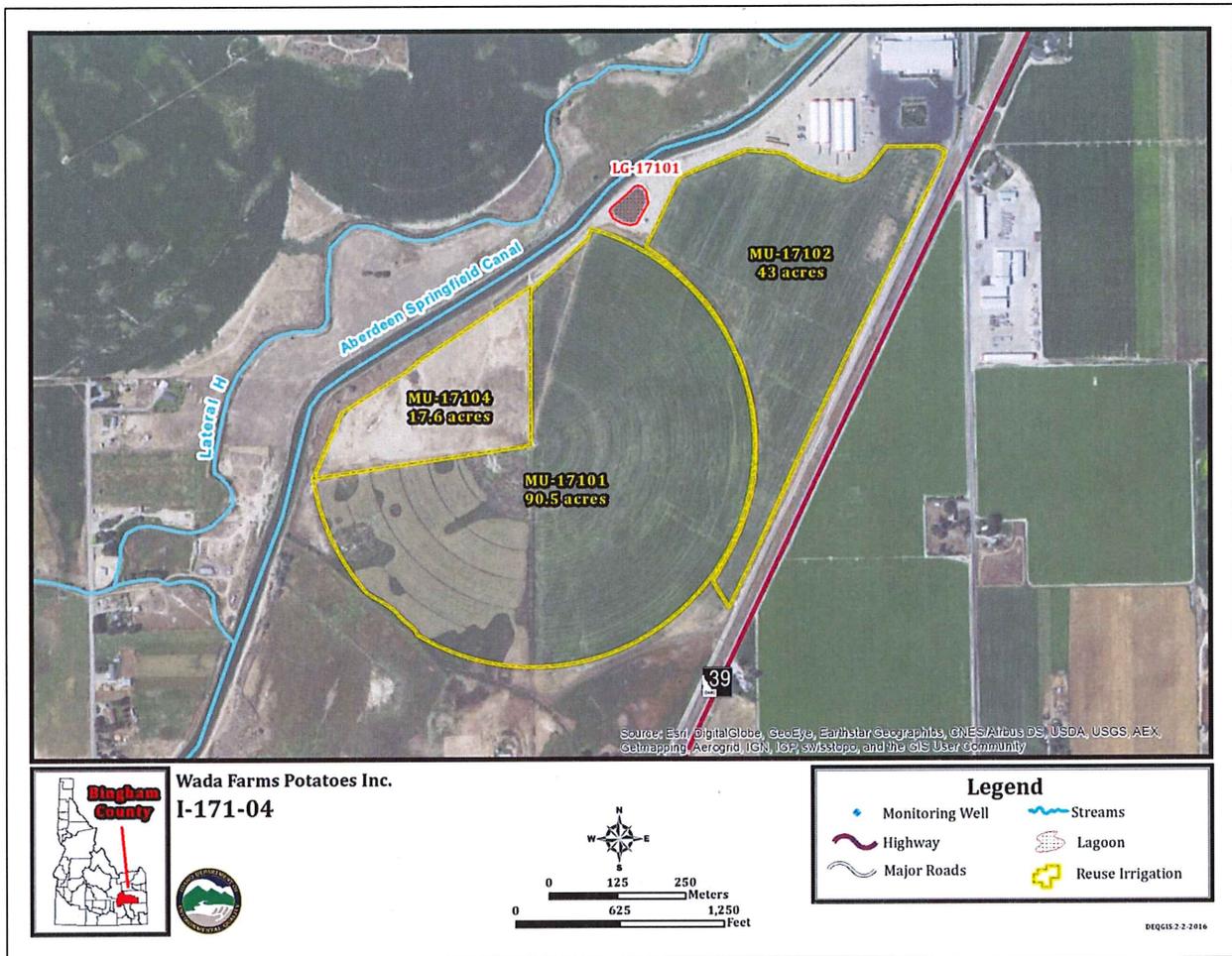
Portions of the wording in this Staff Analysis may be copied from the permit application, or from a previous DEQ Staff Analysis, because the technical wording could not be improved upon.

Appendix A. Site Maps

Appendix A, Figure 1. Regional Map, showing the reuse site in relation to major surrounding features such as cities, water bodies, highways and roads, county boundaries, state boundaries, etc.



Appendix Figure 1. Regional Map



Appendix Figure 2. Hydraulic Management Units, the Lagoon, and the Solids Management Site