STATE OF IDAHO
DEPARTMENT OF
ENVIRONMENTAL QUALITY

444 Hospital Way #300 • Pocatello, Idaho • 83201

C.L. "Butch" Otter, Governor
Toni Hardesty, Director

Memorandum

To: Bruce Olenick, Regional Administrator

From: Scott MacDonald, EIT, MBA,

Date: July15, 2011

Re: Staff Analysis for Wastewater Reuse Permit, #LA-000032-04 for the Basic American Foods – Shelley, Idaho Facility

1. Purpose

The purpose of this memorandum is to satisfy the requirements of IDAPA 58.01.17.400.05, "Recycled Water Rules," for issuing wastewater reuse permits (WRP's). This memorandum addresses draft WRP #LA-000032-04, for the industrial wastewater treatment and reuse system owned and operated by Basic American foods Inc. Shelley Facility. The facility's treatment and reuse system is currently permitted under the terms of WRP #LA-000032-03.

The Basic American Foods (BAF) potato processing facility in Shelley, Idaho has requested renewal of #LA-000032, a permit authorizing the company's use of property in the Shelley, Idaho area for beneficial reuse of potato processing wastewater via land application.

Staff recommends the issuance of #LA-000032-04, as attached.

1.1. Staff Report

1.2. Process Description

Basic American Foods (BAF) operates a potato dehydration plant near Shelley, Idaho (Figure 1). Final wastewater treatment and wastewater reuse are accomplished using land application for nutrient recycling via crop nutrient uptake.

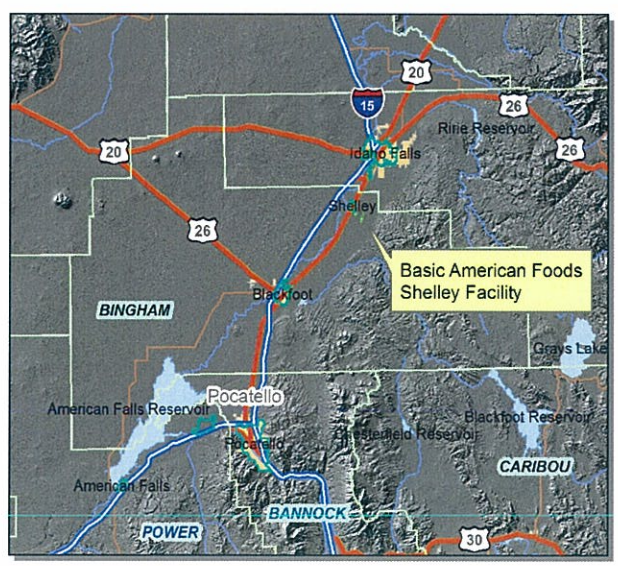


Figure 1-Shelly Idaho Vicinity

The facility land applies potato processing wastewater on eight hydraulic management units (HMU's)

Since BAF acquired the plant from the Pillsbury Company in 1999, the company has actively reduced overall water usage in their plant operations.

Figure 2 below shows the field configuration and pipeline layout for delivering process wastewater to the land app sites.

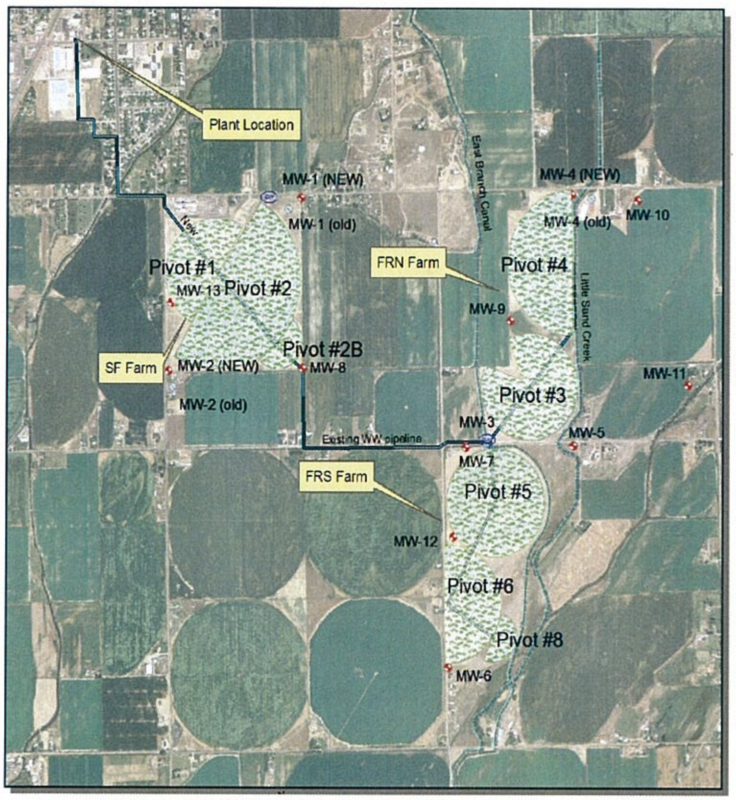


Figure 2-Field Configuration and Pipeline Layout

During the term of the current permit, #LA-000032-03, BAF also made significant in-plant treatment improvements with the addition of an advanced solids recovery system (reverse osmosis/ evaporation-ROVAP). Treatment systems have reduced constituent loadings up to 33% from pre-2000 levels.

In-plant treatment processes include a delta stack and vacuum filter for silt water treatment.

Plant cooling and waste streams are treated using primary screens, clarification and the ROVAP system.

Waste solids are recovered for animal feed with silt and rock sent to an off-site disposal location. Final wastewater treatment is accomplished via land application for crop nutrient uptake over 359.1 acres using 8 full or partial pivots. Crop irrigation needs are supplemented where necessary with water from the East Branch canal east of the fields.

BAF has reduced annual hydraulic loading from 382 million gallons in 1997 to 231 million gallons in 2010 (Figure 3 below).

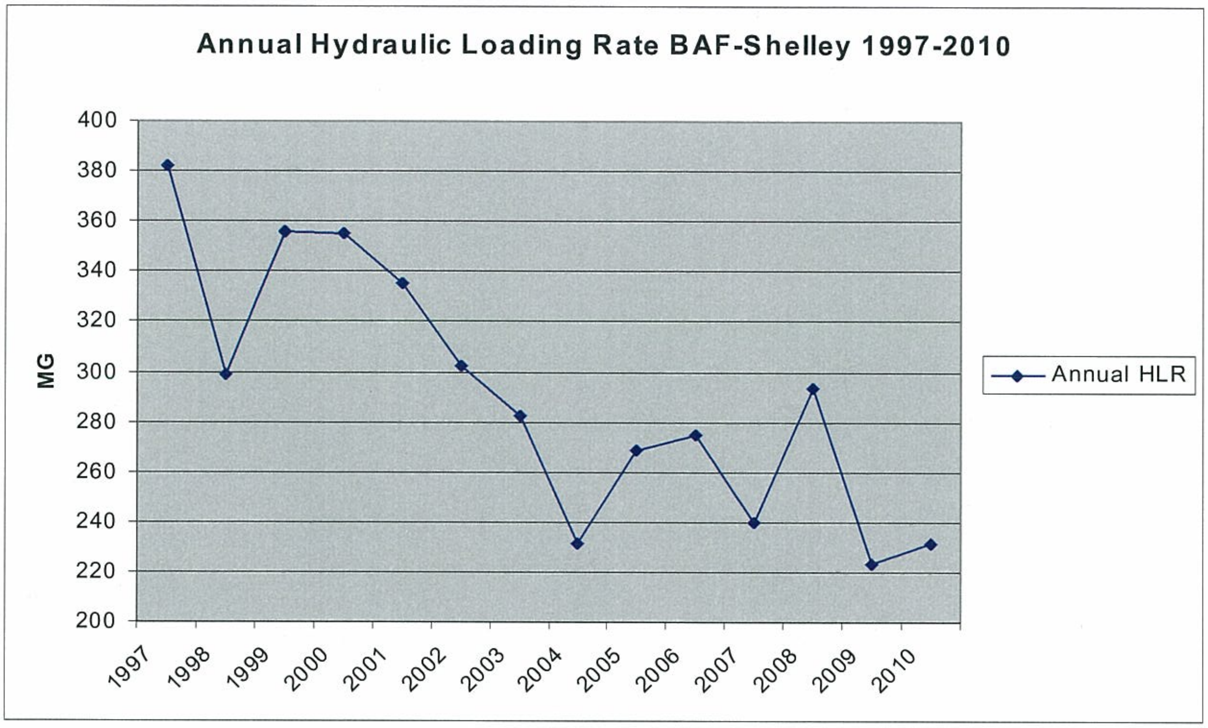


Figure 3-Annual Hydraulic Loading Rate

Summary of Events

- February 25, 2003 – Pre-application conference between representatives for Basic American Foods and the Department of Environmental Quality
- March 2003 to October 2005 – Various correspondence and submittals regarding permit renewal, completion of completion requirements, annual reports and inspections between the Department and BAF
- March 18, 2003 – DEQ received permit renewal application materials
- December 9, 2005 - Permit Renewal Meeting
- May 22, 2008 – DEQ sent hard copies of the Preliminary Draft Permit and Staff Analysis to BAF Shelley (John Kirkpatrick) for comment
- June 5, 2008 – Meeting with BAF Shelly representative to discuss comments
- June 27, 2008 - Comments received from BAF Shelley
- July 15, 2011 – Draft Permit issued for Public Comment Period

2. Discussion

2.1. Site Soils

Soil management units are delineated the same as the hydraulic management units and consist of the following four soil mapping units (as described by the United States Department of Agriculture, National Resources Conservation Service - USDA-NRCS). Table 1 identifies specific soil types and mapping unit symbols for soils found on the individual soil management units.

Table 1-Mapping Unit Symbols

Map Unit Legend	
Map	Bingham Area, Idaho
Mapping Unit Symbol (MUSYM)	Soil type
BaA	Bannock loam, 0 to 2 percent slopes
BoA	Bock loam, 0 to 2 percent slopes
StA	Stan fine sandy loam, 0 to 2 percent slopes
WOF	Wolverine sand, rolling

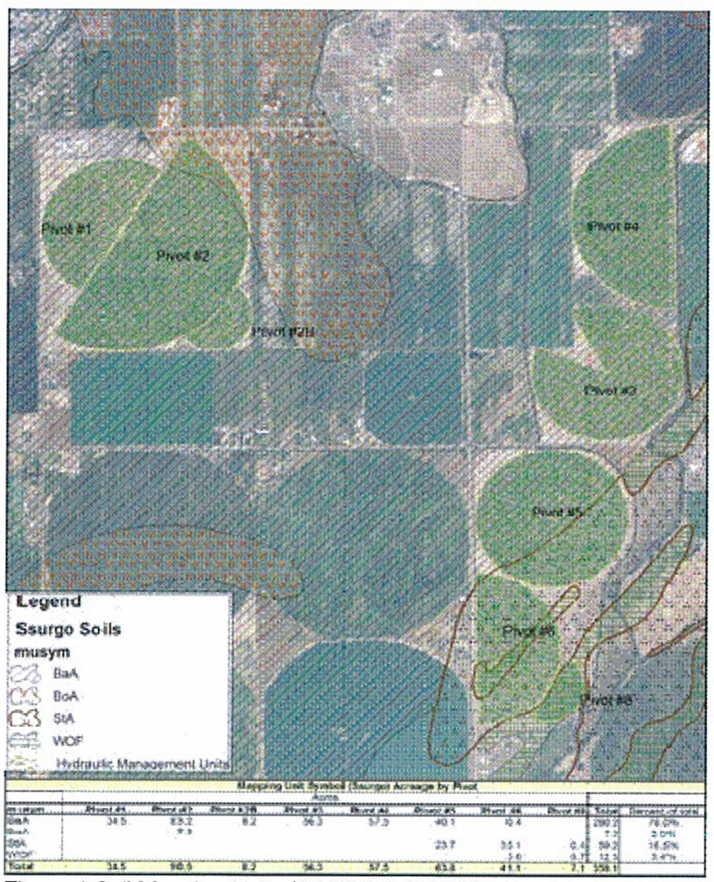


Figure 4-Soil Mapping Units (SSURGO & CES)

Figure 4-Soil Mapping Units (SSURGO & CES) portrays the distribution of soil types (soil mapping units) across individual soil management units.

The inset table gives the area of each soil type across all pivots and the occurrence of each mapping unit as a percentage of the total permitted acreage.

Table 2 – AWC for Individual Soil Mapping Units

		Profile Interval		Depth of Profile	AWC	Total AWC
	Soil Type	Inches		Inches	Inches	Inches
		Top	Bottom			
	BaA	0	6	6	0.17	1.02
		6	32	26	0.15	3.9
		32	60	28	0.04	1.12
Total Soil Type BaA						**6.04**
	BoA	0	10	10	0.17	1.7
		10	47	37	0.17	6.29
		47	60	13	0.04	0.52
Total Soil Type BoA						**8.51**
	StA	0	14	14	0.175	2.45
		14	38	24	0.175	4.2
		38	60	22	0.025	0.55
Total Soil Type StA						**7.2**
	WOF	0	6	6	0.07	0.42
		6	60	54	0.07	3.78
Total Soil Type WOF						**4.2**

Table 2 shows AWC values determined by NRCS, described by soil horizon, and are totaled over the soil depth from 0 - 60 inches.

Cascade Earth Sciences (CES) provided a detailed description of soil properties in the "Site Characterization and Management Plan for Recycling Potato Process Water on Farm Land for Crop Production" (1997). AWC values for each pivot were summarized according to the following:

1. Soil Unit A ≈ 5.35 inches (comparable to soil type BaA)
2. Soil Unit B ≈ 6.38 inches (comparable to soil type BoA)
3. Soil Unit C ≈ 4.44 inches (comparable to soil type StA)
4. WOF is not represented as a Soil Unit here

The greater of the two sets of values for AWC, those derived from NRCS, were used to compute AWC- weighted management unit specific, non-growing season hydraulic loading rates; see Table 3 for each individual field's calculated AWC.

Table 3 – Acreage-Weighted AWCs for Individual Management Units

	BaA		BoA		StA		WOF		AWC
Pivot #1	34.5 ac	100%							6.04
Pivot #2	83.3 ac	92%	7.2 ac	8%					6.24
Pivot #3	56.3 ac	100%							6.04
Pivot #4	57.5 ac	100%							6.04
Pivot #5	40.2 ac	63%			23.6 ac	37%			6.47
Pivot #6	0.42 ac	1%			35.02 ac	85.7%	5.8 ac	13.3%	6.77
Pivot #8					0.4 ac	6%	6.7 ac	94%	4.38
Pivot #2B	8.2 ac	100%							6.04

2.2. Ground Water

2.2.1. Characterization

Cascade Earth Sciences investigated aquifer characteristics in the vicinity of the land application area and reported the following (CES, 2001):

Table 4-Aquifer Information

Monitoring Well	Formation Material in Well Screen Interval	Transmissivity ft^2/day	Conductivity ft / day	Conductivity gal / day / ft^2
6	Sand / gravel (driller log)	42,300	423	3,163
11	Gravel with silt	2,000 to 10,600	20 to 106	149 to 791
12	Coarse gravel	1,057,100	10,571	79,068
13	Gravel with sand	192,000	192	1,438

Based on reported hydraulic conductivities (modified slightly in CES, 2002), DEQ calculated travel times for aquifer constituents as given in Table 5 (DEQ, 2004).

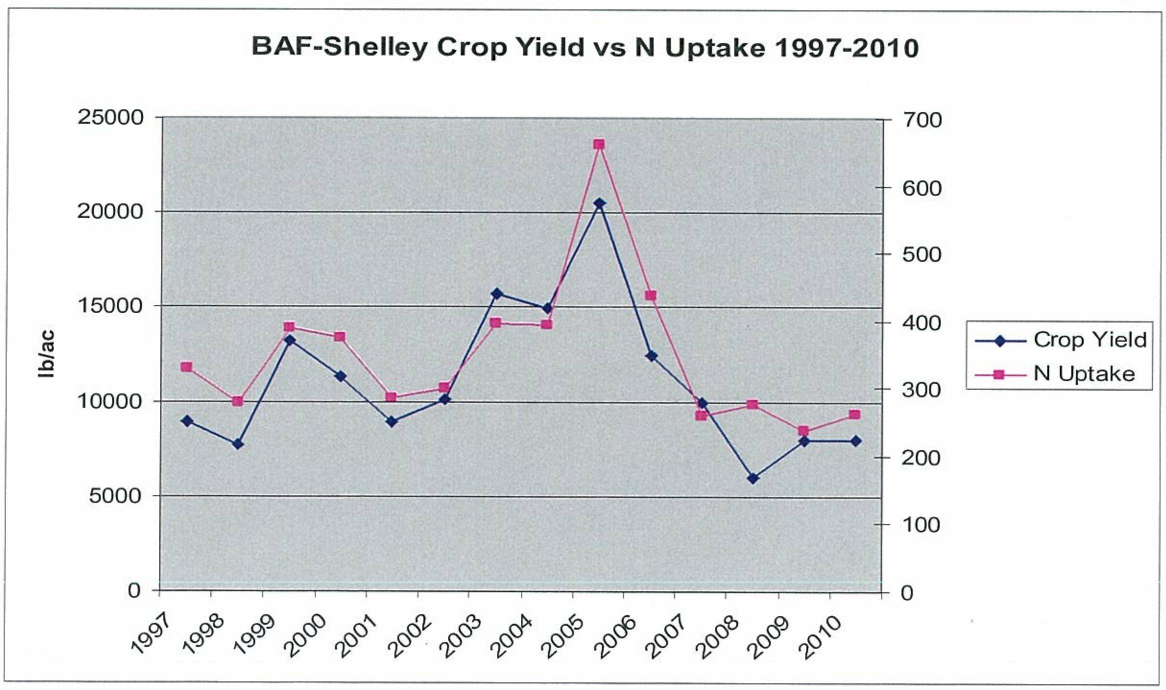
Table 5-Aquifer Time of Travel

Monitoring Well	Ground Water Velocity	Field	Ground Water Travel Time	Vadose Zone Travel Time	Combined Travel Time
	Ft / d		Years	Years	years
13	0.73	Fields 1 & 2	10	4	≈ 14
12	13.3 / 1.07	Field 5	0.4 / 4.6	4	≈ 4.4 / 8.6
11	0.83	Fields 3 & 4	13.4	4	≈ 17
6	0.53 / 1.07	Field 6	5.8 / 4.5	4	≈ 9.8 / 8.5

Combined travel time estimates range from 8.5 to 17 years, representing at least two to three permit cycles. This analysis is valid for water movement through the vadose zone and ground water system. However, it is possible that the movement of contaminants through the vadose zone and ground water system will lag behind the movement of water. The establishment of new geochemical equilibrium conditions in response to reduced nutrient loading instituted at the site will occur over some unknown time frame, and also the movement of the historic nutrient load through the vadose zone may lag behind the movement of water. The combined effect would be a "tailing off" of contaminants in response to ground water quality improvements.

The chart below shows the leveling off of applied nitrogen along with crop uptake averaged across all management units. The past five years of data indicate that the facility is managing nitrogen effectively.

Figure 5. Average Crop Nitrogen Application and Uptake



Ground water monitoring well locations and general flow direction is shown in Figure 6

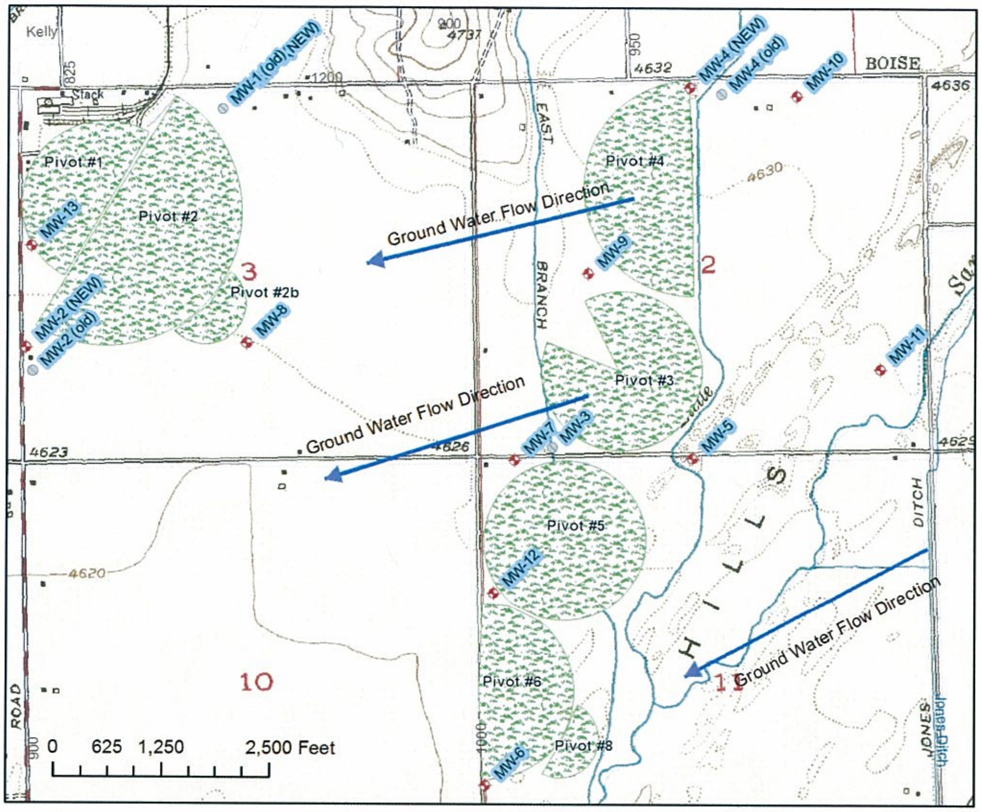


Figure 6-Ground water monitoring well network and flow direction

2.2.2 Ground Water Quality

Elevated TDS concentrations have been attributed to anaerobic conditions in site soils as a result of past land application practices. The mechanism for constituent release is assumed to be lowered soil pH as a result of anaerobic conditions resulting from saturated soils and excess nutrient loading. However, information relative to soil pH and soil moisture is not readily available. The anaerobic conditions apparently are not severe enough to produce site-wide denitrification since nitrate has been detected in most downgradient wells at levels above ambient concentrations. Iron and manganese have been detected only sporadically in ground water, another indication that anaerobic conditions are not widely occurring.

Table 6 (below) gives summary statistics for ground water quality data in downgradient monitoring wells where primary or secondary constituent standards were exceeded on a fairly consistent basis during the period from November of 1997 to July of 2007.

Table 6–Summary of Ground Water Quality Data

Serial Number	Common Name	Ground Water Analyte	Average Concentration	Maximum Concentration	Minimum Concentration	Number Samples
GW-003206	MW-6	Chloride	25.91	59.00	13.00	27
		Sulfate	76.72	95.00	56.20	9
		Total Iron	**2.25**	**21.00**	0.01	27
		Dis. Iron	0.21	1.17	0.01	13
		Total Manganese	**0.18**	**1.5**	0.0	26
		Dis. Manganese	0.04	0.11	0.01	13
		Nitrate	**35.8**	**47.9**	**24.5**	27
		TDS	**616**	**775**	440	26
GW-003207	MW-7	Chloride	9.69	24.00	6.11	20
		Sulfate	30.70	39.0	27.40	4
		Total Iron	**1.07**	**3.97**	0.03	20
		Dis. Iron	0.07	0.12	0.01	8
		Total Manganese	**0.06**	**0.20**	0.01	18
		Dis. Manganese	0.03	0.05	0.01	0.01
		Nitrate	1.01	9.94	0.25	20
		TDS	309	430	245	19
GW-003209	MW-9	Chloride	31.45	40.00	10.40	22
		Sulfate	43.32	52.00	30.60	5
		Total Iron	0.22	**1.00**	0.01	20
		Dis. Iron	0.07	0.10	0.01	8
		Total Manganese	0.02	0.05	0.00	13
		Dis. Manganese	0.04	0.05	0.01	8
		Nitrate	3.51	4.81	0.47	22
		TDS	436	**603**	330	21
GW-003211	MW-2 (new)	Chloride	22.53	39.00	0.16	23
		Sulfate	65.29	105.00	0.50	8
		Total Iron	**0.67**	**7.30**	0.01	23
		Dis. Iron	0.20	1.70	0.01	14

		Total Manganese	0.03	0.10	0.01	18
		Dis. Manganese	0.04	0.05	0.01	13
		Nitrate	5.47	**10.20**	0.12	23
		TDS	**508**	**613**	366	23
GW-003215	MW-12	Chloride	16.41	37.00	10.70	17
		Sulfate	40.80	49.00	34.30	9
		Total Iron	**3.21**	**11.00**	0.15	17
		Dis. Iron	0.82	2.88	0.10	9
		Total Manganese	**0.18**	**0.62**	0.02	17
		Dis. Manganese	0.07	0.15	0.05	9
		Nitrate	7.49	**10.20**	0.67	17
		TDS	459	**580**	354	16
GW-003216	MW-13	Chloride	50.05	76.00	19.40	17
		Sulfate	110.19	211.00	2.41	9
		Total Iron	**1.61**	**8.90**	0.10	17
		Dis. Iron	0.28	1.80	0.10	10
		Total Manganese	**0.07**	**0.23**	0.01	15
		Dis. Manganese	0.05	0.09	0.03	8
		Nitrate	5.30	8.34	0.80	17
		TDS	**781**	**940**	**510**	17

Note: Those values in bold are in exceedance of either the primary or secondary ground water standard (IDAPA 58.01.11.200.01). The standards for the constituents listed are as follows: Chloride = 250 mg/L, Sulfate = 250 mg/L, Total Iron = 0.3 mg/L, Dissolved (Dis.) Iron = no standard, Total Manganese = 0.05 mg/L, Dissolved (Dis.) Manganese = no standard, Nitrate = 10 mg/L, TDS = 500 mg/L. All are classified as secondary standards with the exception of nitrate, which is a primary standard.

2.2.3 Area Specific Ground Water Conditions

Summary of Fields 5 and 6

- It has been suggested that upgradient ground water east and north of the Foundry Road North (FRN) Farm (Pivots 3 & 4) and Foundry Road South (FRS) Farm (Pivots 5, 6, & 8) has elevated NO_3 concentrations, and that this water contributes to the elevated NO_3 levels at MW-6. Data from MW-5 has shown a downward trend in NO_3 concentrations since 1996; as of 2007 the well was below 0.5 mg/L, and as recent as 2010, the results remain at either 1 mg/L or below. This does not indicate impacted ground water upgradient of MW-5. MW-6 has elevated NO_3 and TDS relative to MW-5, although it is unclear if MW-5 is strictly upgradient of MW-6. While NO_3 concentrations in MW-6 tend to fluctuate, the only significant improvement that has been exhibited in overall water quality occurred following 2004-2005, coinciding with the facility's lowest non-growing season (NGS) loading years. It should be noted that nitrate concentrations also declined in MW-2, MW-12, and MW-13 during the aforementioned period (see Figure 6 below). Further investigation is needed into both the site's ground water and its subsequent trends before a definitive determination can be made with regard to the timeline of contaminant transport. For further discussion of past and future NGS loading rates, see Section 2.3.2.

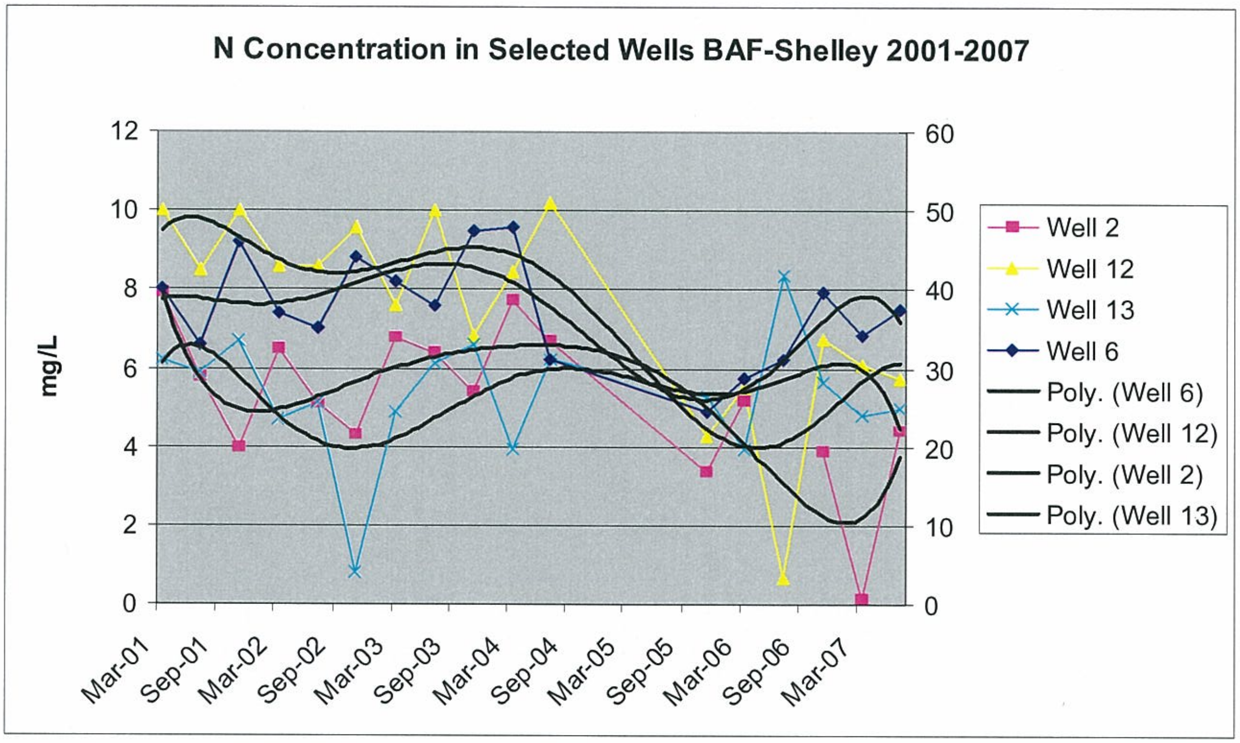


Figure 6 – Nitrate Concentrations in MW-2, MW-6, MW-12, and MW-13

Summary of Fields 1 and 2

- At the Sugar Factory Road (SFR) Farm, comprised of Pivots 1, 2, and 2B, downgradient wells (MW-2 and MW-13) show impacts for NO_3 and TDS when compared to upgradient monitoring wells. It has been suggested that historic land use activities such as disposal of beet wash water, a potato wastewater seepage pit, and a feed lot and/or a gravel pit on the SFR Farm may be contributing to elevated constituents in wells MW-2 and MW-13. More evidence is needed to support or refute this possibility. However, it should be noted that concentrations for both constituents have been generally decreasing in these wells over the past several years and are now below GWQR standards of 500 mg/L, with the exception of TDS in MW-13 which is declining but was most recently reported at 716 mg/L.

Summary of Fields 3 and 4

- For the FRN Farm, MW-9 has exhibited elevated constituent concentrations when compared to upgradient well MW-4, however, since the spring of 2006 this well has frequently been dry during samplings. Downgradient well MW-7 has constituent concentrations in the same range as upgradient wells and is the only downgradient well where land application impacts are not evident.

2.2.4 Static Ground Water Levels

Dry Monitoring Wells/Annual Water Quality Variations

A number of monitoring wells have been dry during recent sampling events, particularly in the spring. This leaves only two or fewer sampling events per year at these wells. It is recommended that these wells be rehabilitated or replaced as applicable, so that the wells yield samples from as close to the water table as possible throughout the year. For the full text of this condition see Section E, CA-032-02. Seasonal water level fluctuations should be fully defined by more frequent or continuous water level measurements so that the seasonal range of water table fluctuations can be clarified. Currently, water level fluctuations are defined by three water level measurements per year. It is unknown whether these measurements define the full range of seasonal water level fluctuations. Additional information could help determine if a revised sampling plan using the existing wells will be sufficient or if replacement wells are needed. Therefore, it is recommended that the current sampling frequency be investigated with regard to its adequacy and an alternate sampling schedule which more fully reflects water level fluctuations be proposed, if necessary as part of CA-032-2. For the full text of this condition see Table E-1 in Section E of the permit.

Ground Water Quality Conclusions

Combined vadose zone and ground water travel times across the land application fields range from approximately 8.5 to 17 years. Any potential contaminant transport will most likely lag behind ground water movement, resulting in response times that are longer than the estimates of groundwater transport times.

In view of the variations in water levels it is recommended that the monitoring wells be reevaluated. It is also possible that sampling schedules could be adjusted to coincide with adequate water levels. The full range of water level fluctuations and water quality variations should be evaluated and documented before monitoring schedule changes are approved. Additional monitoring wells or the rehabilitation of existing wells may be required at some locations if it is not possible to identify optimal times to collect samples.

A number of uncertainties remain with regard to the physical conditions at the site. It is not clear if adequate wastewater treatment in the soil horizon is being achieved with the current management practices and site conditions. However, based on the information presented, ground water quality improvements may occur over an extended period of time, particularly if non-growing season loadings are managed as recommended in Section 2.3.2. A variation of the required work plan from the previous permit should be completed to characterize treatment processes and contributions to ground water quality from the soil horizon. If this part of the treatment system is functioning effectively, the residual contaminant mass from historical loading in the deeper vadose zone can be placed in perspective. For the text of this permit condition see Section E, CA-032-03 of the permit.

2.3. Site Loading and Related Permit Compliance Requirements

2.3.1. Hydraulic Loading -Growing Season

Hydraulic loading for the growing season in the renewed permit will generally be the crop irrigation water requirement (IWR), inclusive of all water sources. Over the past several seasons, the facility's total hydraulic loading rates have either been at or near this limit. It is recommended that the permittee estimate crop irrigation water requirements and coordinate process water and supplemental irrigation water applications prior to the beginning of each growing season as necessary to optimize crop production.

2.3.2. Hydraulic Loading -Non-Growing Season

DEQ has typically calculated NGS hydraulic loading rates using the following formula:

HLR_{NGS} = Soil Available Water-Holding Capacity (AWC) – Precipitation + Evapotranspiration

Though the ETIdaho website (http://www.kimberly.uidaho.edu/ETIdaho/) does not have a monitoring station that is located precisely in Shelley, there are several available choices in the general area. In this case, the ET value was calculated using the actual daily ET values for alfalfa hay with frequent cuttings from the Idaho Falls FAA Airport Station. The precipitation value was calculated using the gross precipitation values from the same station. This data gives ET and precipitation values of 3.02 inches and 4.32 inches, respectively. Refer to Table 7 below for BAF-Shelley's guideline rates.

Table 7. Guideline Non-Growing Season Loading Limits

HMU	Description	AWC	NGS HLR (in/ac)	NGS HLR (MG)
MU-003201	Pivot #1	6.04	4.74	4.44
MU-003202	Pivot #2	6.24	4.94	12.14
MU-003203	Pivot #3	6.04	4.74	7.25
MU-003204	Pivot #4	6.04	4.74	7.40
MU-003206	Pivot #5	6.47	5.17	8.96
MU-003207	Pivot #6	6.77	5.47	6.14
MU-003209	Pivot #8	4.38	3.08	0.59
MU-003215	Pivot #2B	6.04	4.74	1.06
			Total:	**47.97**

This loading limit represents a 54% decrease from 2007's loading of 103.9 MG and a 50% decrease from 2004's loading of 95.0 MG, which was BAF's lowest loading year to date. Without the addition of a fairly large retention system or a substantial acreage expansion, these rates would not be achievable for the facility. Consequently, it is recommended that the permit include the following non-growing season loading rates which, while higher than what would typically be recommended, are weighted according to AWC and are substantially lower than both the current permit limit of 156 MG per year and the site's 10 year average loading of 126 MG.

Table 8. Recommended Non-Growing Season Loading Limits

HMU	Description	AWC	NGS HLR (in/ac)	NGS HLR (MG)
MU-003201	Pivot #1	6.04	10.54	9.9
MU-003202	Pivot #2	6.24	10.74	26.4
MU-003203	Pivot #3	6.04	10.54	16.1
MU-003204	Pivot #4	6.04	10.54	16.5
MU-003206	Pivot #5	6.47	10.97	19.1
MU-003207	Pivot #6	6.77	11.27	12.6
MU-003209	Pivot #8	4.38	8.88	2.0
MU-003215	Pivot #2B	6.04	10.54	2.4
			Total:	**105.0**

The loading rate total contained in Table 8 is approximately equal to the facility's five year average loading of 101 MG from 2005-2010, if distributed according to soil specific AWC. If adhered to, these recommended loading rates should prove to be less detrimental than both historical and current practices due to the fact that wastewater will be distributed more appropriately according to the site's various AWC values, versus a 15.6 in/ac blanket application rate. Both modeling and past history indicate that the new loading rates should have a relatively negligible impact on the site's ground water compared to projected impacts at previous guideline rates. It is therefore recommended that the field-specific loading rates contained above in Table 8 be included in the permit as a representation of both a reasonable and environmentally protective compromise to the guideline limits.

2.3.3. Constituent Loading

As with the previous permit, nitrogen loading is limited to150% of typical crop uptake, defined as the median constituent crop uptake from the three most recent years the crop has been grown. Generally, the facility has been in accordance with this limit on all management units for the past several years.

Currently, the facility is limited to a maximum COD loading of 50 lb/acre-day, calculated on a monthly basis and averaged by month over a seasonal basis, which they have been meeting on a fairly consistent basis for a number of seasons. For the full text of the condition, see Section F of the permit.

As has been discussed previously, there are a number of monitoring wells at the facility that consistently show TDS levels above the acceptable ground water quality standard, pointing to some probable influence due to constituent and hydraulic loading rates. Due to these levels it is recommended that the draft permit include a loading limit for non-volatile dissolved solids (NVDS), which are determined by taking the difference between total dissolved solids (TDS) and volatile dissolved solids (VDS) and are a rough estimate of the salts in wastewater. The recommended NVDS loading limit for this site is 4,500 lb/ac-yr, as listed in Table F-1 of the permit.

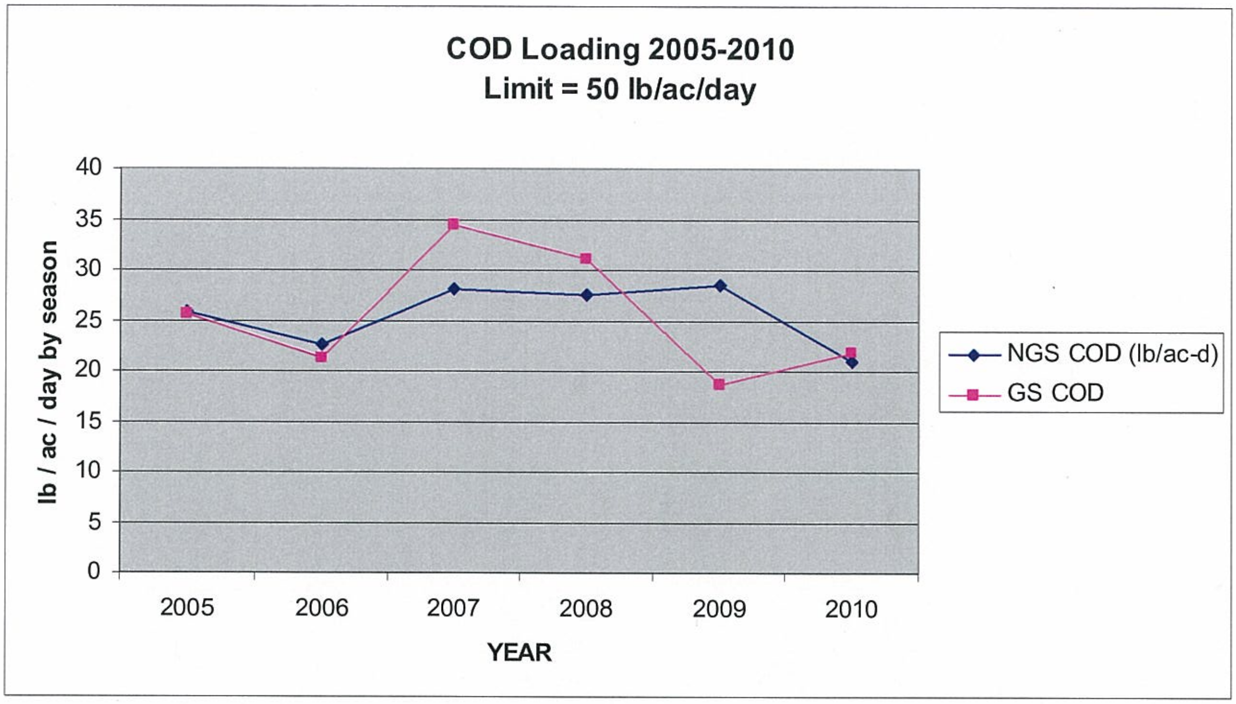


Figure 7. COD Loading last five years in lb/ac-day

2.3.4. Compliance Requirements

The permit includes four compliance requirements. If implemented, these requirements should improve regulatory compliance and resource protection efforts. The compliance requirements were driven by several considerations and are specifically designed to accommodate significant assertions made by the Permittee.

- CA-032-01

CA-032-01 requires management plan updates to reflect current operations, also revisions or modifications to site operations. These plans are not known to have been updated since the last permit was issued.

It is not expected that major changes will be required for the Plan of Operation / the Operations and Maintenance Manual, other than submittal of the individual management plans. A more significant change is the requirement for the preparation of a "Quality Assurance Project Plan (QAPP)" to incorporate a comprehensive description of all environmental sampling and analysis procedures along with monitoring wells statistical analyses adequate to detect and quantify impacts to groundwater as a result of the land application of wastewater.

The QAPP, previously called the SAP presents an opportunity for the Permittee to compile all applicable quality assurance/quality control (QA/QC) provisions. The QAPP will be an important regulatory resource for system operators to understand the general purpose and range of environmental sampling and monitoring required. It will also help with the specifics of how environmental samples are to be collected, maintained, and processed, as well as the interpretive uses for the data obtained.[1]

With respect to the inclusion of monitoring well statistical analyses, the intent is that ground water quality data should be subjected to statistical analyses such that interpretations and decisions flowing there from are defensible.

The Permittee has expressed a desire to modify waste solids management strategies; hence updates are necessary with respect to the Waste Solids Management Plan.

The permit requires submittal of a current Buffer Zone Plan, and a current Nuisance Odor Management Plan.

- CA-032-02

The compliance requirement addresses deficiencies with the ground water monitoring network apparently caused by declining ground water levels. The Permittee is required to submit a work plan addressing methods to ensure that the minimum required number of samples can be obtained and to implement mitigation measures as approved by the Department.

- CA-032-03

As has been previously discussed, the Department submits that ground water quality has been impacted by past wastewater reuse activities. However, the Permittee has requested that the Department acknowledge significant improvements in site operation and ground water quality and that improving trends are apparently continuing. Such acknowledgement is built into the permit, is addressed herein, and tied to the Permittee's ongoing compliance with permit requirements, specifically CA-032-03 and CA-032-04.

To comply with CA-032-03, the Permittee must further resolve site characterization in the context of hydraulic and constituent loading, particularly non-growing season hydraulic loading.

Item 1 requires a Ground Water Investigation Report (GWIR) that must also include an assessment of whether statistically significant constituent trends can be identified and used to predict a point in time when ground water quality levels will be more or less at "steady-state." If timelines and rates for ground water quality improvements can be quantified and site-specific ground water quality objectives proposed, the Permittee can use that information to develop the "Water Quality Improvement Plan" required in CA-032-04.

Item 2 recognizes BAF's legitimate concerns regarding the difficulty of trying to predict when the ground water system will reach a "steady-state," or predicting ground water quality levels at that point. Potentially this activity may or may not be required by the Department in the future. In the event predictions cannot be made without additional site characterization and data acquisition, Item 2 requires a Work Plan wherein the Permittee must identify specific data limitations and propose additional characterization and data collection timeframes. This data should eventually support accurate predictions about site-specific ground water quality levels, and predict a time period for ground water compliance. Should the information collected during the fulfillment of Item 1 prove sufficient then Item 2 becomes unnecessary.

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[1] It is not expected or required that the QAPP will reproduce sampling and analysis or QA/QC documentation existing in other locations. For example, QA/QC documentation maintained by a laboratory analyzing water or soil samples is not expected to be reproduced in the Permittee's QAPP. Likewise, written sampling procedures approved by the Permittee and adhered to by independent contractors would not need to be included in the Permittee's QAPP. The Permittee's QAPP will incorporate by reference external documentation as appropriate and will be updated as necessary to reflect changes or modifications.

- CA-032-04

The Permittee is required to submit a Water Quality Improvement Plan (WQIP) to propose an estimated time period for ground water compliance, along with site-specific ground water quality levels. The WQIP is intended as the mechanism for the Permittee to consolidate and propose both the site-characterization and performance modeling. This approach reflects the Department's intent to respond to BAF's assertions regarding the importance of improving trends in ground water quality provided that the statistical significance of improvements can be eventually substantiated and documented.

- CA-032-05

The Permittee must prepare and submit a Runoff Management Plan with control structures designed to prevent runoff from any site used for wastewater reuse to any property outside the permitted area.

3. Recommendation for Issuance of Permit

Groundwater near the BAF-Shelley process water treatment area exceeds standards for certain primary and secondary constituents. However, the permittee will be obligated to plan and implement a number of corrective actions to improve ground water quality via this wastewater reuse permit. The permit maximizes the flexibility available to BAF by encouraging the company to capitalize on existing site characterization and performance models in planning for system improvements. These factors, in concert with requirements and provisions in #LA-000032-04 should result in an effective Water Quality Improvement Plan that results in achievable and realistic site-specific ground water quality objectives.

The permittee will continue to implement a carefully designed environmental monitoring program and to develop additional statistical analyses for data validation and interpretation.

Based on the preceding discussion, and following an evaluation of materials submitted by Basic American Foods-Shelley Facility in the application for re-issuance of the land application permit, staff recommends that #LA- 000032-04 is issued as drafted.

3.1. List of References

Basic American Foods 1997-2010: Annual Site Performance Reports.

Cascade Earth Sciences, 1997: Site Characterization and Management Plan for Recycling Potato Process Water on Farm Land for Crop Production, March1997.

Cascade Earth Sciences, 2001. Hydrogeologic Information from Installation and Hydraulic Aquifer Testing of Four Monitoring Wells, Basic American Foods (BAF) Shelley (WLAP LA-000032-03), August 2001.

Cascade Earth Sciences, 2002. Non-volatile Dissolved Solids (NVDS) Assessment Report, Basic American Foods – Shelley, September 13, 2002.

Idaho Department of Environmental Quality (Department), 2004. Technical Memorandum from Joe Baldwin, Environmental Hydrogeologist, DEQ Technical Services to Tom Hepworth, Pocatello Regional Office, "Response to *BAF comment letter* signed by Jon Voiss, received at DEQ PRO on September 5, 2003. (letter undated), and *CES comment letter*, signed by Dan Bruner, dated September 5, 2003". January 5, 2004.

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