Final Report of the Oklahoma Department of Agriculture, Food, and Forestry's Swine Licensed Managed Feeding Operations Monitoring Well Sampling and Laboratory Analyses Program for FY 2016-2017

Oklahoma Department of Agriculture, Food, and Forestry

FY16/17 §106 Project 09

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OKLAHOMA WATER RESOURCES BOARD

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Introduction

In Oklahoma, large swine producing facilities containing more than 1,000 animal units in roof-covered structures for 90 consecutive days or more in a 12-month period and which use liquid waste management systems are defined as Concentrated Animal Feeding Operations (CAFOs) under the state CAFO Act. Legislation signed in 1997 and 1998 makes licensing of CAFOs mandatory by the Oklahoma Department of Agriculture, Food, and Forestry (ODAFF) and these swine facilities are referred to as Licensed Managed Feeding Operations (LMFOs). The animal waste generated by LMFOs is stored in wastewater ponds, or lagoons, located near the swine barns. The waste may contain large amounts of nitrates, ammonia, phosphorus and bacteria and, if not managed properly, can impact groundwater quality. LMFOs must effectively deal with the manure and wastewater animals produce so that waters of the state, including groundwater, are not polluted.

Concentrated animal feeding operations are defined as point sources subject to the license program established pursuant to the provisions of the Act. Title 2 §20-12 of the Oklahoma Swine Feeding Operations Act relates to measures put in place that prohibit the hydrologic connection between generated wastewaters from these point sources and waters of the State (including groundwater sources). To prevent contamination of groundwater from leaking LMFO lagoons, the CAFO Act and rules have strict lagoon construction criteria in place. Even with proper lagoon construction at a facility, leakage from the lagoon to the groundwater might occur. The Act requires all swine LMFOs to install a leak detection system or monitoring wells around the perimeter of each animal wastewater lagoon. Key provisions of this Act include: 1) standards for liquid waste retention structures (lagoons); 2) liner requirements (including annual inspections to ensure liner integrity) to retain liquid animal wastes; 3) establishment of a minimum separation (10 feet) between the bottom of the retention structure and the maximum historical groundwater elevation; 4) installation of a leak detection system or sufficient monitoring wells around the perimeter of each retention structure and 5) annual collection of groundwater samples for comparison against established baseline data.

To meet the requirement in the Act showing no hydrologic connection has developed between the swine wastewater in lagoons and the groundwater, a lagoon monitoring well sampling program was developed by ODAFF. Beginning in the fall of 1999 to the present year, yearly sampling of the monitoring wells around the waste lagoons for nitrate-nitrogen, ammonium-nitrogen, total phosphorus, fecal coliform bacteria, pH and electrical conductivity (parameters specified by the Act) is conducted. The baseline data for the facilities serves as a reference point to potential change in groundwater quality over time. The main goal of the monitoring program is to determine if groundwater resources at or near the LMFOs are being subject to any degradation as a result of the operation of the facility and storage or land application of the animal waste.

The work conducted this year and the results of that work are the subject of this report which is funded in part by a Clean Water Act §106 grant from EPA. Special thanks to the Office of the Oklahoma Secretary of Energy and Environment (OSEE) for continuous approval of the use of these Clean Water Act funds to offset the costs of the monitoring well sampling program.

Purpose of the Project

ODAFF, through OSEE, submitted a work plan proposal to the U.S. EPA seeking federal Clean Water Act §106 grant funds to support statewide monitoring well sampling objectives at swine LMFOs. Beginning in the fall of 1999 and continuing through the end of FY 00, ODAFF staff collected the initial round of sampling as required by provisions in the Act. ODAFF again collected samples during the second year of monitoring. Beginning in September 2001 (the start of the third year of the sampling program), ODAFF contracted the sampling work to the Oklahoma Water Resources Board (OWRB) through an Interagency Agreement and this arrangement has continued uninterrupted to the present time. This report covers Sample Year 17 (2015-2016).

The EPA approved a work plan for this project entitled, Licensed Managed Feeding Operations Monitoring Well Sampling (FY16/17 §106 I-006400-15, Project 9). It covers the time period frame from July 1, 2015 through June 30, 2017 with a corresponding budget period beginning July 1, 2015 through June 30, 2017. The base funding was for the amount of $170,000 (federal resource allocation).

Stipulated in the Interagency Agreement was the requirement that before commencement of any work on the project, a Quality Assurance Project Plan (QAPP) must first be approved by EPA. EPA requires approved QAPPs for all applicable projects and tasks using federal funding and involving environmental data to ensure the project and task is documented and reviewed before the work is started. A QAPP is a written document that describes the quality assurance procedures, quality control specifications, and other technical activities that must be implemented to ensure that the results of the project or task to be performed will meet project specifications. Primary data collection, secondary data usage, and data processing project activities are described and documented in QAPPs.

The current QAPP was approved by EPA on August 2, 2016 (QTRAK 13-443). The ODAFF/OWRB performed an annual review of the QAPP and applied for re-certification because of personnel changes in July 2016. These changes were approved by EPA in August 2016 and QAPP is current until July 28, 2019.

For this report, the ODAFF evaluated if concentrations of nitrate and other parameters in the groundwater around the swine lagoons are increasing over time at LMFO facilities. The report presents groundwater quality data obtained from the annual investigation and sampling of 939 monitoring wells between October 2015 and June 2016. The report provides a comprehensive summary of all laboratory data, analysis of the sampling protocols and an accounting of the total expenditures under this agreement by the OWRB. This report also provides general details of enforcement and remediation activities required by ODAFF of the swine LMFO licensees based on monitoring well sampling results.

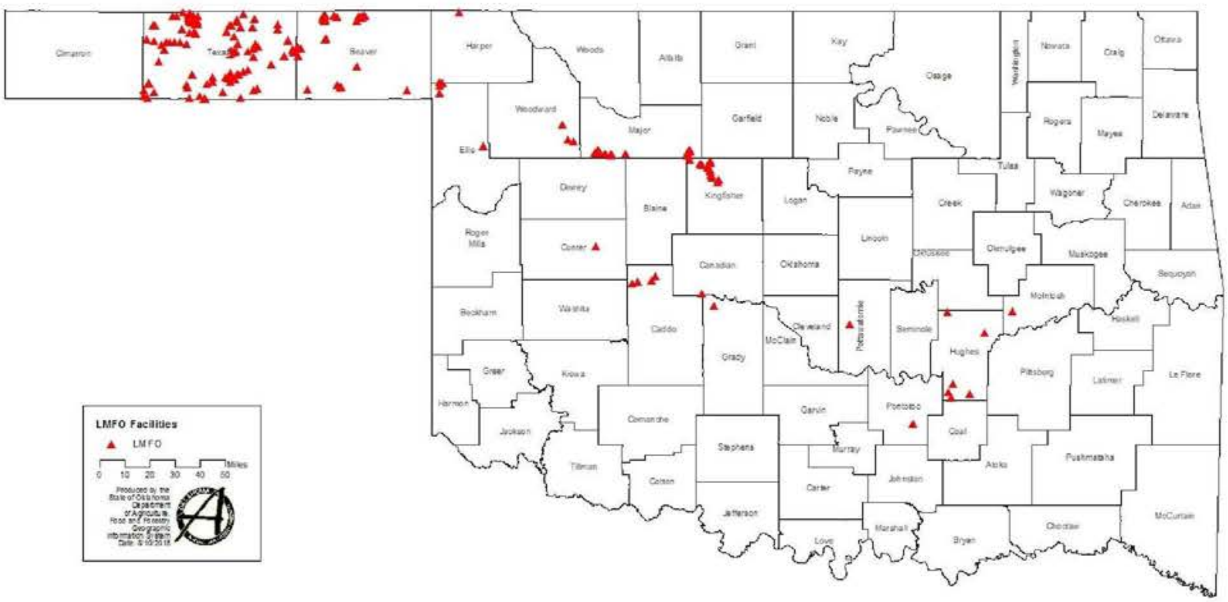

Figure 1. LMFO Facilities in Oklahoma

Scope of Project

Methodology

ODAFF's swine LMFO monitoring program objective is to: (1) evaluate if over time concentrations of NO_3-N in the groundwater are increasing above 10 mg/L, which is the Safe Drinking Water Act maximum contaminate level, the highest level of a contaminant that is allowed in drinking water, and (2) to better understand the groundwater flow regime and the possible effects of effluent land application or potential leakage from lagoons or offsite influence.

ODAFF also reviewed electrical conductivity (EC) results from the wells. Electrical conductivity, or specific conductance, is a measure of water's ability to conduct electricity, and therefore a measure of the water's ionic activity. Higher EC reflects higher salt content in groundwater. If over time, the amount of dissolved constituents in groundwater changes, the EC will also change so that a rise or decline in nitrate content (and/or other ionic species) in groundwater often typically correlates with a corresponding response in EC. ODAFF specifically focuses on those wells whose NO_3-N content has increased by more than 2.5 mg/L above the drinking water MCL (10 mg/L), with a minimum of five annual occurrences, and whose EC has a corresponding increase of 25% or more over the period of record. These wells are placed on Table 12, Monitoring Wells with Increasing Nitrate and Electrical Conductivity over Period of Record, of this document.

The historical (first year) data collected by ODAFF staff for each monitoring well establishes the baseline concentration for the project parameters that all subsequent analytical results are compared against. Consequently, they are the benchmark value that both the LMFO and ODAFF compliance staff work from as far as assessing changes in water quality over time.

LMFO licensees who have facilities with monitoring wells that meet or exceed these criteria are or have been required by ODAFF to make assessments and evaluations of causative affects and to take corrective action(s). Additionally, ODAFF has prepared time series graphs comparing nitrate-nitrogen and electrical conductivity of the 41 individual monitoring wells that appear on Table 12 of this years' report (see Groundwater Investigation Plans by Facility). The Groundwater Investigation Plans by Facility section of this report also indicate the dates of sampling events (including routine, intensified or special such as finger printing analysis or isotope testing), hydrogeologic investigation techniques and activities, drilling of new monitoring wells, closure of monitoring wells, and closure of lagoons.

Additionally, many of these wells have historically or are currently being investigated for potential sources because they meet the 2.5 mg/L nitrate and 25% EC (over baseline) increase. Some of the investigations due to increased parameters (NO_3-N and EC) have been determined to be from an offsite source or corrections/repairs were made and the status is to continue annual monitoring to evaluate NO_3-N and EC trends post correction/repair. If wells met the 2.5 mg/L NO_3 increase and 25% EC increase, ODAFF may have chosen to leave these wells on Table 12, but does not necessarily mean ODAFF will require additional work at this time.

Description of Report Appendices

Appendix I contains a summary of project costs (categories of expense) for the work performed by OWRB for this report.

Appendix II, and a separate electronic PDF file, contain data summaries of laboratory analytical and monitoring well data for the monitoring year subject of this report.

Quality Assurance

Water Quality Sampling Procedures

Sampling protocols, procedures and quality assurance practices were strictly adhered to by OWRB field sampling staff as described and documented in the Project's Quality Assurance Project Plan (refer to QAPP, on file at USEPA Region VI Offices) to help maintain the reliability and integrity of the data. There are three sections to the ODAFF QAPP: 1) the OWRB's field sampling standard operating procedures (SOP) for the LMFO monitoring program, chain of custody documentation and quality assurance objectives; 2) the ODAFF Inorganic Laboratory's Quality Manual that describes the quality assurance program used to determine the correctness and reliability of the analytical analysis performed by the Inorganic Section; and 3) the ODAFF Quality Management Plan, that ensures all environmental data generated by the agency will be of known and acceptable quality. Since the last QAPP recertification on August 13, 2013 for this project, there have been certain personnel changes that were sent by letter from ODAFF on July 17, 2014 to EPA via the Office of the Secretary of Energy and Environment to update and recertify the QAPP. EPA approved the changes to the QAPP in August 2016 and it is certified until July 28, 2019.

In general, the project field tasks are:

- Verify secure status of well with the presence of ODAFF numbered security seal
- Measure well and water level depth and determine purge volume (3+ well volumes)
- Select appropriate sampling equipment for bailed versus pumped wells
- Monitor field parameters throughout the purging process to verify stabilization of the water prior to using the Hydrolab©Quanta-G multi-parameter water quality monitoring system
- Collect samples (process/preserve/package) following the purge process
- GPS well
- Decontaminate sampling equipment
- Dispose of purge water and re-secure the well
- Maintain chain of custody documentation

The data collected during the monitoring project will:

- Determine water characteristics of each water sample that will serve as indicators of stable ambient water prior to sample collection, and
- Determine nutrient and physical parameter concentrations of nitrate-nitrogen, ammonium-nitrogen, total phosphorus, fecal coliform bacteria, pH and electrical conductivity

Measurement of Depth to Water, Total Depth of Well and Purge Volume

The depth to water (DTW) and total depth (TD) of the well is measured from top of the casing (to the nearest .01 feet), and their difference (TD-DTW) represents the initial column water height (CW, feet). The values for DTW, TD and CW are recorded on the Monitoring Well Purge and Sampling Data Forms field sheets. For 2-inch (diameter) wells, the initial well volume (WV) in gallons is determined by multiplying the CW by 0.163 (cubic feet (CF)-volumetric conversion factor, feet to gallons). The purge volume criteria (before sample collection) is three well volumes. The WV (gallons) is multiplied by a factor of 3 to determine the purge volume for the well. These values as well as the well number and purge volume are recorded on the field sheets.

Purge and Sample Extraction

Uniform sampling procedures as documented in the QAPP were used to ensure sample representativeness. A minimum of three well volumes were pumped/bailed from each monitoring well to purge stagnant water from the water column (this held true in most cases although some wells yielded only fractions of a well volume). Companion to the removal of three well volumes were collections of periodic water stabilization indicator parameters (pH, specific conductance, temperature, and dissolved oxygen) using Hydrolab-Quanta-G water quality monitoring systems. These indicators enabled field staff to observe convergence of field parameter readings at the conclusion of the pumping/bailing process, ensuring that a representative sample of the aquifer would be the end result. The criteria in Table 1 will satisfy the project requirement for purge water stability. After these conditions are met, sample collection can occur. For complete sampling procedures and methods used for groundwater data collection at swine LMFOs, see the QAPP.

Table 1. Precision of Water Quality Parameters to Meet Stable Water Objectives

Precision Criteria for Field Parameters Bailed Parameters	Precision Criteria for Field Parameters Pumped Parameters
SC +/- 5% microsiemens/centimeter (µS/cm)	EC +/- 3% µS/cm
pH +/- 0.2 standard pH units (s.u.)	pH +/- 0.2 standard pH units
T +/- 0.5 degrees Celsius (C)	T +/- 0.2 degrees Celsius
DO mg/L	DO +/- 0.3 mg/L
These criteria relate to the end of the purge cycle time and should hold for at least 2 successive readings. If criteria cannot be met, purge another well volume, collect 3 reading and calculate their mean for use as final water stability values. EC = electrical conductivity; T = temperature; DO = dissolved oxygen	

Table 1 lists the instruments performance specifications. Project requirements for precision shown in Table 1 above are achievable based on the instruments specifications shown in Table 2.

Table 2. Manufacturers Performance Specifications for the Hydrolab© Quanta-G

Parameter	Range	Accuracy	Resolution
EC	0-100,000 µS/cm	+/- 1% of reading +/- 1 count	4 digits
pH	2 to 12 units	+/- 0.2 s.u.	0.01 .s.u.
T	-5°C to 50°C	+/- 0.2 °C	0.01°C
DO	0 to 50 mg/L	+/- 0.2 mg/L , 20 mg/L +/- 0.6 mg/L > 20 mg/L	0.01 mg/L

Sample Collection

Samples were collected as soon as possible after the purging process was deemed complete based on water quality purge stability criteria (to maintain the representativeness of the sample). Polyethylene sample bottles were used for nutrient and physical parameter sample collection and sterile microbiological plastic bottles were used to containerize water to be analyzed for fecal coliform content. Sample bottles remained capped prior to sample collection. The 500 mL sample bottles were pre-rinsed (3 times) with groundwater (from bailer or pump sample tubing) by filling 150-200 mL, capping and swirling the rinse water to contact all interior surfaces. Following drying of the residue (drops), the bottles for were tilted and slowly filled to the neck of the bottle, and added sulfuric acid to pH<2 mg/L to preserve the sample. The 100 mL bottle (for fecal coliform analysis) was only filled to the 100 mL marked line on the bottle that left about an inch of headspace in the bottle. Table 3 shows the constituents that were analyzed, as well as their collection and analysis methods.

Table 3. Project Analytical Parameters: Container, Preservative, Holding Times, Reference Methods and Reporting Limits

Parameter	Container	Preservative	Holding Times	Reference Method	Laboratory Reporting Limit
Ammonium-Nitrogen	500 mL Polyethylene	H_2SO_4, ice	28 days	EPA 350.1	0.11 mg/L
Fecal Coliform Bacteria	Sterile microbiological plastic bottle	$Na_2S_2O_3$, Ice	24 hours	SM-9222-D	1 CFU/100 ml
Specific Conductivity	500 mL Polyethylene	Ice	28 days	EPA 120.1/SM-2510-B	1 µS/cm
Nitrate-Nitrogen	500 mL Polyethylene	Ice	48 hours	EPA 9056/EPA 300.1	0.02 mg/L
pH	500 mL Polyethylene	Ice	Instantaneous	EPA 150.1/SM4500H-B	ODAFF project management requires this test. Results will be flagged. EPA requires pH determination within 15 minutes of sample collection
Total Phosphorus	500 mL Polyethylene	H_2SO_4, ice	28 days	EPA 365.1	0.02 mg/L

Sample Identification

Clear, adhesive shipping labels are fixed to the sample bottles prior to the sample workweek. The labels are computer generated and include the following pre-information; the LMFO company name, the name of the facility, the well number, and the preservative type. Other label fields that are completed during the purge process with sharpie markers (blue for iced 500 mL sample, red for acidified 500 mL sample, and black for the fecal sample) include the date and time, sampler(s) initials, and sample type that is a number between 1 and 4 which denotes environmental, split or replicate, trip and field equipment blank respectively. The bottle lids are also labeled with the well number (using the corresponding red, blue or black color) and the word "acid" is written on the lid of the bottles preserved with acid as a safety precaution for the lab personnel.

The red-labeled bottle are preserved with sulfuric acid (<2 pH) immediately after sample collection. Lids are secured and the 500 mL sample bottles are placed at the bottom of the chests and completely imbedded with crushed ice. The 100 mL bottles are double bagged (zip lock type) to insulate the samples from over-chilling and to prevent melt water from potentially contaminating the sample. These samples are then placed in to the ice chest so that the crushed ice comes to the level of the top cap. This process also stabilizes the sample bottles reducing the likelihood of tipping.

Chain of Custody Documentation

For each well sample submitted for analysis, the following information was included on the Chain of Custody form:

- LMFO company name, facility name, license number and well ID number(s)
- The samplers name (printed) and signature
- The date and time the samples were relinquished to the courier or the lab
- List of analytical parameters
- Preservative type(s)
- The QA code which corresponds to sample type (environmental, replicate or split etc.)
- The sample date and time for each corresponding sample
- The total number of sample containers that accompany the particular chain of custody
- Sample delivery mode (by courier or field sampling crew)
- Mailing address of LMFO company for billing purposes and for analytical results delivery

Space is also provided on the Chain of Custody form so that ODAFF laboratory personnel may perform/record the following operations:

- Sign, date and record the time of sample delivery
- Login the sample and assign the internal sample tracking number which is then recorded on the Chain of Custody form
- Insert comments that relate to sample integrity or security and/or labeling or transcription errors by OWRB personnel or non-agreement in count of total sample containers reported by OWRB on the Chain of Custody form as to the number of sample containers in the ice chest, etc.

Quality Assurance Objectives

An important aspect of any monitoring plan requires that analytical results can be reproduced by the analytical laboratory and that field sampling techniques are designed and carried out so as not to affect the integrity of the sample. The OWRB/ODAFF Quality Assurance Project Plan (QAPP) approved by EPA is the guiding document on the methods/protocols used to collect, preserve and safely deliver samples from the field to the receiving laboratory. Another point of emphasis described in the document relates to maintaining a consistent schedule of equipment calibration, using clean sampling techniques, and cleaning (decontamination) of sampling equipment prior to its subsequent use at the next well.

Quality Assurance (QA) samples are collected and used to document the laboratory's analytical capabilities in reproducing analytical results. QA samples are also used to test if field-sampling personnel are collecting and handling samples and maintaining their sampling equipment in a manner that will limit the possibility of sample contamination, ensuring that a representative groundwater sample is collected.

Replicate samples were collected from 38 monitoring wells. Replicate and environmental sample agreement occurred 85.4% of the time utilizing a formula that calculates relative percent difference and accounting for the laboratory's precision and accuracy levels (described in the QAPP) based on concentration ranges (Tables 12 & 13). There were two (2) Total Phosphorous replicate pairs with greater than 100% RPD.

Table 4. Precision and Accuracy Criteria of ODAFF Laboratory

Analyte Concentration	Precision	Accuracy	Completeness
> 2 mg/L	10% (90-110%)	90-110% or +/- 3sd	90%
>0.1 to 2 mg/L	25% (75-125%)	75-125% or +/- 3sd	90%
<0.1 mg/L to <100 ug/L	50% (50-150%)	50-150% or +/- 3sd	90%

Table 5. Replicate Results

Replicate Parameter	Total # of Replicates	Non-Detect	Average RPD	Non-Conforming Samples
Fecal Coliform	38	37	-----	0
Nitrate-nitrogen	38	1	3.64%	3
Total Phosphorous	38	2	22.90%	8
Ammonium-nitrogen	38	36	11.35%	0

A total of 33 QA "blank" water samples were submitted during the course of project sampling. Blank samples and their results serve to determine if OWRB's cleaning protocols were adequate to prevent contaminants being transferred to subsequent monitoring well sites and to serve as a check on the integrity (chemical neutrality) source of the blank water.

Analytical results for 30/33 blank samples were non-detect for nitrate-nitrogen. The three "hits" were at low concentrations (0.03, 0.03 and 0.06 mg/L). No specific cause was ascertained though the levels found in the three samples were negligible. "Blank" analytical results for ammonium-nitrogen were non-detect. Analytical results for 32/33 blank samples were non-detect for total phosphorous. The laboratory sample containing detectable total phosphorous had a value equal to the detection limit of 0.02 mg/L. Overall, the results of the blank sample analysis are strongly indicative that the measures taken and protocols used to clean sampling equipment prevents any significant carryover of contaminants from one well to another.

The OWRB believes that the results of the quality assurance samples bears out that using methods and protocols as prescribed in the EPA approved QAPP for this program will lead to scientifically credible results by limiting bias from either sample collection/handling or laboratory analytical procedures.

Field and Laboratory Results

This report will provide a comprehensive summary of all laboratory data, analysis of the sampling protocols, ArcView GIS shape files that incorporate location and attribute information for new monitoring wells and an accounting of the total expenditures under this agreement including the category of expense (provided by the OWRB). This report will also provide details of enforcement and remediation activities required by ODAFF of the swine LMFO licensees based on monitoring well sampling results.

Analytical data for groundwater samples collected by OWRB field staff is provided by the ODAFF Laboratory Services Division, Water and Inorganics Section. They are certified (Lab Certification #9927) to perform general water quality chemistry through the State of Oklahoma Department of Environmental Quality's laboratory certification program. They are responsible for receiving, analyzing and reporting out parameter concentrations under this project. For documentation of their internal operations with respect to instrument calibration, procedures, calibration frequency and analytical procedures utilized, refer to the ODAFF Inorganic Section Quality Manual and Standard Administrative Procedures in the QAPP.

The data collected by the OWRB will be used by ODAFF to determine if pollution to groundwater resources adjacent to LMFO facilities is occurring. Specific response actions by ODAFF to data collected for this program are described in the section of this report entitled, "Groundwater Investigation Plans by Facility". Evaluation of the data has triggered special studies of nitrate and microbial sources and has involved the sampling of domestic wells in areas potentially impacted by swine wastes to provide additional information. ODAFF has required corrective action measures to be implemented by LMFO companies based on sampling results and facility inspections. A LMFO's failure to comply with ODAFF requests to implement corrective actions can lead to enforcement actions against the LMFO.

Geographic Information System Data

Program monitoring wells have been GPS surveyed and GPS files have been exported to ArcGIS. Historical water quality has been uploaded to the geodatabase. The geodatabase will allow for better project organization and provide a direct relationship between the wells and the associated water quality data results from the ODAFF lab.

Key attribute fields included in the geodatabase are:

1. Licensee – Legal Licensed Name Swine Entity,
2. License Number – OK State Swine CAFO License Number,
3. Primary ID – Links groups of wells to a particular facility; primary reference number to link to the water quality table,
4. Facility Name – Swine facility name and/or type (sow, nursery, finisher, etc.),
5. Well Number,
6. Legal Location of facility/wells,
7. Gradient (Up or down gradient status of the monitoring well relative to its position adjacent to the lagoon and local groundwater flow direction at the facility),
8. Well status (Active, Active-Idle or Inactive),
9. Total Depth (Depth of Well in Feet Below the Top of the Casing),
10. First sampling period (When the sampling period of record began),
11. Last Sampling period (the last sampling period the well was utilized in the monitoring

program prior to its abandonment-place holder status),

12. Return Date - Relates to wells with status of AI (Active-Idle) that were dry for three consecutive years that were placed in an idle status for three years and then returned to the monitoring program to evaluate if the well had received recharge,
13. Latitude and Longitude (GPS coordinates of the well location).

Well Investigation

Nine-hundred thirty-nine (939) monitoring wells were investigated during the 2016 sampling period. Samples were collected from 369 monitoring wells between October 13, 2015 and April 28, 2016, and 570 monitoring wells were evaluated as dry.

Relative to dry wells, an amendment to Title 2 of the Oklahoma Statutes, House Bill 3015 (HB 3015), that was enacted into Law on July 1, 2006, stipulated that the frequency of sampling/evaluating wells that have been found to be dry for at least three (3) consecutive years may be reduced to once every three years. As a consequence of HB 3015 and as reflected in Table 6 below, the total number of monitoring wells investigated and total number of reported dry wells is variable over time (particularly beginning in 2007). If an intermittently wet/dry well is examined and found to be dry for three (3) consecutive years; then like perpetually dry wells, the wells are dropped from evaluation for three (3) consecutive years. Monitoring well sampling and investigation results since the inception of the LMFO well program are summarized in Table 6.

Table 6. Total Number of Monitoring Wells Investigated

Parameter	Fiscal Year																
	2000	**2001**	**2002**	**2003**	**2004**	**2005**	**2006**	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**
Monitoring Wells Investigated (includes sampled and dry wells)	810	779	930	1005	1088	1054	1060	575	560	562	1083	640	578	606	899	930	939
Wells Sampled	362	437	457	496	582	519	521	515	541	551	590	584	544	386	387	374	369
Dry Wells	448	342	473	509	506	535	552	59	19	11	493	56	34	36	512	556	570

Laboratory Analytical Results

Project laboratory analytical parameters specified in the work plan included nitrate-N, ammonium-N, total P, fecal coliform bacteria, pH and electrical conductivity (EC). The ODAFF Laboratory Services Division, Water and Inorganics Section performed the analytical work.

During previous years, monitoring wells were subject to re-sampling if nitrate-N or ammonium-N concentrations exceeded thresholds established by the ODAFF Director of Agricultural Environmental Management Services Division (AEMS). The threshold values pertain to wells that have: increasing nitrate concentrations from baseline conditions that are at least 2.5 mg/L greater than the MCL (10 mg/L); electrical conductivity that has increased at least 25% over the Bench Electrical Conductivity (BEC) and five or more years of data.

However, beginning in sampling year 2013-2014, no re-sample events were scheduled due to budget reductions to this program. Only one round of sampling per well resulting in the comprehensive suite of parameters described above was performed and continues to be performed in this fiscal year. Consideration of re-instatement of re-sampling for wells that meet the above criteria will be on a year-to-year evaluation.

Table 7 shows summary statistics for laboratory analytical and supporting field data for the initial phase of sampling. The minimum and maximum values are listed with their corresponding facilities and the median and mean are for the entire sampling year dataset.

Monitoring well sampling results since the inception of the well LMFO sampling program are summarized in Table 8.

Table 7. 2015-2016 Summary Statistics for Laboratory and Field Data

Parameter	Minimum Value	Min. Value Corresponding Facility	Corr. Monitoring Well	Maximum Value	Max. Value Corresponding Facility	Corr. Monitoring Well	Median	Mean
Fecal coliform	0	Hanor Trails End BGF #1	10	74	W-7 Swine Farm	3	0.01	0.26
Nitrate-N	0.02	Mansion Farms	5	174	Murphy Brown Tumbleweed-Sage Brush	60	9.21	13.7
Ammonium-N	0.17	5-D Swine, Inc.	3	3.64	Murphy Brown Trahern	414	0.58	1.16
Total P	0.02	Bolin Hog Facility	6A	18.70	L & M Farms Trust	1	0.34	0.91
Lab pH in SU	6.39	Hanor Roberts Ranch	105	8.26	Mansion Farms	3	7.36	7.32
Lab EC in µS/cm	100	L & M Farms Trust	1	14200	Houston Contracting Farms, LTD.	2	788	1260
Field pH in SU	5.63	W-7 Swine Farm	3	8.35	SB Stewart and Payne Finisher (420-423)	21	6.92	6.91
Field EC in µS/cm	2.82	Hanor Roberts Ranch	96	13883	Houston Contracting Farms, LTD.	2	750	1245

Table 8. LMFO Monitoring Well Historical Sample Results

Parameter	Fiscal Year																
	2000	**2001**	**2002**	**2003**	**2004**	**2005**	**2006**	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**
Nitrate-N detections >/= 0.02 mg/L	328	425	442	482	495	485	506	497	529	526	528	515	530	373	378	355	359
Nitrate-N >/= 10 mg/L (Includes 1st and re-sample events)	90	138	192	210	215	213	232	234	259	271	272	292	304	362	184	155	160
Nitrate-N < 0.02 mg/l	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	10	10	13	7	29	17
Ammonium-N detections >/= 0.11 mg/L	7	34	68	35	29	25	48	25	28	23	25	29	17	23	17	16	15
Ammonium-N >/= 1 mg/L (Includes 1st and re-sample events)	3	17	16	8	12	10	12	7	6	10	7	6	10	11	4	5	5
Ammonium-N < 0.11 mg/L	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	375	389	363	368	345	360
Total P detections (>/= 0.02 mg/L)	341	327	351	362	391	382	368	360	396	396	380	391	389	377	376	363	353
Total P > 0.5 mg/L	35	33	75	85	130	76	71	78	72	78	91	155	132	178	134	166	140
Total P < 0.02 mg/L	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	19	17	9	9	16	31
Wells with fecal coliform (FEC)	N/A	N/A	13	12	14	12	19	16	11	18	17	12	13	12	15	6	6
Wells w/3 or more FEC colonies	N/A	N/A	N/A	N/A	N/A	N/A	11	8	7	15	9	7	7	6	9	3	5

Results of Ammonium-N

Ammonium-N was detected in 15 monitoring well samples in 2015-2016 (4% of 369 samples analyzed). Historically, detection of NH^{+}_{4}-N in monitoring wells samples has ranged from 2 to 20 percent of the sample events over sixteen sampling cycles. See Table 9 on the following page.

Results of Total Phosphorus

Total Phosphorous at a level of ≥ 0.02 mg/L was detected in 353 monitoring well samples in 2015-2016 (95% of the 369 total samples). Thirty-one were less than 0.02 mg/L detection limit (8% of 369 samples). Reported concentrations have lowered slightly from 2015 to 2016 (see Table 10). Samples submitted for laboratory analysis are unfiltered, chilled and acidified. See Table 10 on the following page.

Results of Nitrate-N

Nitrate contamination generally decreases with increasing soil depth to ground water. Median nitrate concentration and percent of wells from which water exceeds the EPA drinking-water standard for nitrate (10 mg/L) are highest for shallow ground water (up to 100 feet deep). The water table in shallow wells is closer to the land surface and to potential sources of contamination, such as fertilizers and septic systems. In contrast, contamination is less likely to occur in deeper ground-water reservoirs because contaminants have farther to travel.

The numbers of samples that met or exceeded the ODAFF threshold values are as follows:

> Nitrate-N ≥ 10 mg/L (that corresponds to EPAs Safe Drinking Water Maximum Contaminant Level (SDWMCL) occurred in 160 wells.
> Ammonium-N ≥ 1 mg/L (EPA) occurred in five wells; same as in 2014-15 monitoring.

In 2016, NO_3-N in 17 monitoring wells was below the laboratory detection limit of 0.02 mg/L (5%). Nitrate was detected (≥0.02 mg/L) in 359 wells (97% of 369 samples). A total of 160 wells out of 369 wells sampled (43%) have nitrate values over 10 mg/L.

ODAFF's monitoring program's objective is to evaluate if concentrations of NO_3-N and other constituents in the groundwater are increasing over time at swine LMFO facilities. Summary statistics of NO_3-N are shown in Table 11 on the following page for 16 years of monitoring data. The median value of nitrate concentrations increased from 2015 to 2016, and the mean value for NO_3-N decreased in 2016. It should be noted that a majority of the new wells that ODAFF has required the LMFO Licensees to drill over time have targeted sites with high nitrates to better understand the groundwater flow regime and the possible effects of effluent land application or potential leakage from lagoons or offsite effluence. As a consequence, the number of monitoring wells at licensed facilities with known high nitrate nitrogen concentrations has risen whereas the number of monitoring wells at sites with lower nitrate concentrations has remained the same. This explains, in part, why the statistics shown in Table 11 reflect an upwardly increasing trend.

Table 9. Period of Record Summary Statistics of Ammonium-N Concentrations. Values reported are in units of milligrams per liter (mg/L).

Statistic	Fiscal Year																
	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
Minimum	0.30*	0.01*	0.12	0.01	0.16	0.07	0.11	0.11	0.12	0.22	0.12	0.15	0.20	0.12	0.11	0.13	0.17
Maximum	1.00*	7.00*	3.65	4.30	2.46	3.80	3.49	1.73	3.86	6.27	2.27	6.93	3.90	27.19	3.75	7.98	3.64
Mean	0.60*	0.70*	0.74	1.08	0.54	0.68	0.64	0.69	0.71	1.30	0.64	1.24	1.21	2.26	0.42	1.44	1.16

* Years 2000, 2001 had a small representative data set and a true minimum, maximum, and mean could not be computed.

Table 10. Period of Record Summary Statistics of Total P Concentrations. Values reported are in units of milligrams per liter (mg/L).

Statistic	Fiscal Year																
	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
Minimum	0.02	0.02	0.02	0.02	0.04	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02
Median	0.08	0.11	0.16	0.15	0.16	0.14	0.12	0.12	0.12	0.12	0.14	0.28	0.25	0.42	0.27	0.15	0.34
Maximum	15.10	18.18	73.03	6.27	63.11	28.74	13.74	19.54	12.52	22.24	14.06	18.74	10.93	28.28	25.91	21.00	18.70
Mean	0.43	0.35	0.87	0.46	0.89	0.56	0.59	0.49	0.48	0.59	0.46	0.87	0.73	1.24	0.82	1.40	0.91

Table 11. Period of Record Summary Statistics of Nitrate-N Concentrations. Values reported are in units of milligrams per liter (mg/L).

Statistic	Fiscal Year																
	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
Minimum	0.02	0.02	0.05	0.02	0.03	0.02	0.05	0.04	0.04	0.09	0.04	0.04	0.02	0.03	0.22	0.02	0.02
Median	4.90	5.21	5.62	6.13	6.20	6.47	6.72	7.54	7.80	7.75	7.86	9.27	9.18	9.68	9.65	8.15	9.10
Maximum	60.80	78.55	87.50	100.90	88.67	99.42	81.64	71.55	207.20	221.20	92.62	99.51	108.30	110.2	144.52	178.0	174.0
Mean	7.21	9.20	9.31	9.39	8.89	8.98	9.45	10.10	11.18	12.53	12.61	13.31	13.76	14.92	14.79	27.52	13.78

Well Selection Based on Reporting Limits

Electrical conductivity (EC) is a measure of water's ability to conduct electricity, and therefore a measure of the water's ionic activity. Higher EC reflects higher salt content in groundwater. If over time, the amount of dissolved constituents in groundwater changes, the EC will also change so that a rise or decline in nitrate content (and/or other ionic species) in groundwater often typically correlates with a corresponding response in EC. Some monitoring wells have had significant increases in NO_3-N without a corresponding or proportionate increase in EC. However, it should be noted that swine lagoons contain extremely low amounts of NO_3-N.

Table 12 identifies wells that have increases in both NO_3-N and EC. Table 12 lists 41 monitoring wells (two fewer than reported last year) with at least five annual sample events whose NO_3-N content has increased over the period of record, whose NO_3-N content has increased by more than 2.5 mg/L above the drinking water MCL of 10 mg/L and whose EC has a corresponding increase of 25% or more over the period of record. Six of the 41 monitoring wells are new to this list and are marked with an asterisk (*). Table 12 identifiers include facility name, monitoring well number, baseline NO_3-N concentration (BNC), the 2015-2016 analytical value for nitrate, the baseline EC (BEC) value and the 2015-2016 laboratory value for EC.

Table 12. Monitoring Wells with Increasing Nitrate and Electrical Conductivity over Period of Record. New wells for FY 2016 are denoted by an asterisk (*) in the 'MW' field.

Facility Name	Facility	Monitoring Well No.	License No.	Baseline Sample Year	Baseline NO_3-N (mg/L)	2016 NO_3-N (mg/L)	Baseline EC (µS/cm)	2016 EC (µS/cm)
5-D Swine, Inc.	---	2	990003	2000	3.67	65.70	4555	6990
Hanor Huffman G/F Sites 25-28	Site 28	16*	990015	2000	10.18	15.50	347	467
Hanor Major Farms	BGF # 1	1	1311	2000	1.19	14.70	517	963
		2	1311	2000	2.75	28.60	474	728
		3	1311	2000	3.33	32.10	509	922
		6	1311	2000	11.42	42.40	203	534
Hanor Roberts Ranch	Finisher 2	22	1489	2000	3.84	25.60	140	753
		123	1489	2003	3.00	46.90	120	534
	Finisher 4	105*	1489	2003	2.00	13.40	175	277
		106	1489	2003	8.00	26.20	408	535
	Finisher 5	83	1489	2003	8.00	40.00	262	543
	Finisher 8	115	1489	2003	12.00	68.20	511	856
	Finisher 10	47*	1489	2000	4.77	22.20	295	1340
	Nursery 1	60	1489	2000	7.61	19.30	234	430
		90	1489	2003	8.00	17.20	238	547
	Nursery 8	80	1489	2000	10.42	24.10	271	496
		81A*	1489	2011	19.07	31.70	306	425
Hanor Trails End	BGF # 1	7	1311	2000	4.92	22.70	563	1360
		10	1311	2000	4.54	22.10	525	922
		11	1311	2000	2.10	24.30	580	1000
		12	1311	2000	3.99	26.40	551	1070
Hitch Ent. Nursery Sites 5-8	Nursery 6	91	970008	2000	35.90	41.90	959	1500
L&M Farms Trust	---	3*	980002	2000	1.72	15.20	497	1100
Luthi Farms, LLC	Sow	1	980026	2000	8.85	22.50	595	839
Murphy Brown Plum Thicket	Nursery 1	29	980019	2000	5.70	16.40	2760	4070
	Nursery 4	37*	980019	2000	8.10	12.70	1703	2760
	Finisher 2	53	980019	2000	7.00	16.50	1330	2050
Murphy Brown Trahern	Nursery 2	409	200011	2001	4.00	18.00	512	703
Murphy Brown Tumbleweed/Sagebrush	Sow	60	980011	2003	0.10	174.0	1.00	3440
Seaboard Fairview	Finisher 6	28	1356	2000	15.78	21.40	554	711
	Finisher 7	30	1356	2000	5.26	18.10	285	484
		32	1356	2000	24.70	41.70	900	1190
	Sow 2	39	1354	2008	14.68	19.60	536	736
Seaboard Nichols Radcliff	Nursery 137	254	990012	2000	8.80	15.30	746	1120

Facility Name	Facility	Monitoring Well No.	License No.	Baseline Sample Year	Baseline NO_3-N (mg/L)	2016 NO_3-N (mg/L)	Baseline EC (µS/cm)	2016 EC (µS/cm)
Seaboard Stewart & Payne	Finisher 1	19	12623	2000	12.48	18.10	519	676
	Finisher 2	22	12623	2000	9.43	42.50	764	1240
		24	12623	2000	4.77	22.70	684	1000
	Finisher 3	10	12623	2000	8.25	16.10	948	1230
Seaboard Watson	Finisher 424	580-04	12613	2001	8.48	70.80	752	1050
		580-07	12613	2008	26.21	46.90	566	1020
Tumbleweed, LLC	Farm 6 BG	20	1412	2000	3.8	66.1	1243	2750

Groundwater Investigation Plans By Facility

ODAFF, Agricultural Environmental Management Services Division (AEMS), has required additional assessments and evaluations of specific monitoring wells based on the sampling data acquired from the LMFO Monitoring Well Sampling and Laboratory Results Program. These facilities are reported as the 2015 Table 12. Increased monitoring efforts were and are required by ODAFF of specific swine feeding operation licensees for certain ODAFF identified monitoring wells that meet the ODAFF criteria of an increase in nitrate levels above 12.5 mg/L and a 25% increase above baseline electrical conductivity. ODAFF has required Swine Feeding Operation LMFO licensees to conduct additional evaluations/assessments and when appropriate, to take corrective actions. The additional required monitoring, plus timelines and assessments and evaluations of causative effects for the increased nitrates and electrical conductivity follow.

Each investigation plan contains time-series plots of nitrate-nitrogen and electrical conductivity for listed monitoring wells. Time-series plots were generated using mean values for each fiscal year. If only one sample was recorded for the fiscal year, this value was used. Mean values are denoted with an asterisk (*) next to the year on the x-axis.

5-D SWINE

MW# 2: was newly listed to the 2015 Table 12 and continues to be on the 2016 Table 12. On February 2, 2015, the consultant for the facility submitted a proposed plan to investigate the groundwater by: 1) recording groundwater elevations and determining groundwater flow direction; 2) sample groundwater monitoring wells and the lagoon and develop Stiff and Tri-Linear plots and 3) report back to ODAFF. ODAFF approved the plan by letter dated February 17, 2015 and set a due date for the report as May 1, 2015 with a request for all analytical data, diagrams and recommendations for next steps to also be submitted. The reports were received by ODAFF on April 28, 2015 and June 29, 2015.

On July 2, 2015, ODAFF sent a letter to continue quarterly sampling of MW# 2 until September 2015 with quarterly reports due October 30, 2015, December 31, 2015, March 31, 2016, June 30, 2016 and the final report due August 15, 2016. ODAFF will review and assess the report for further investigations.

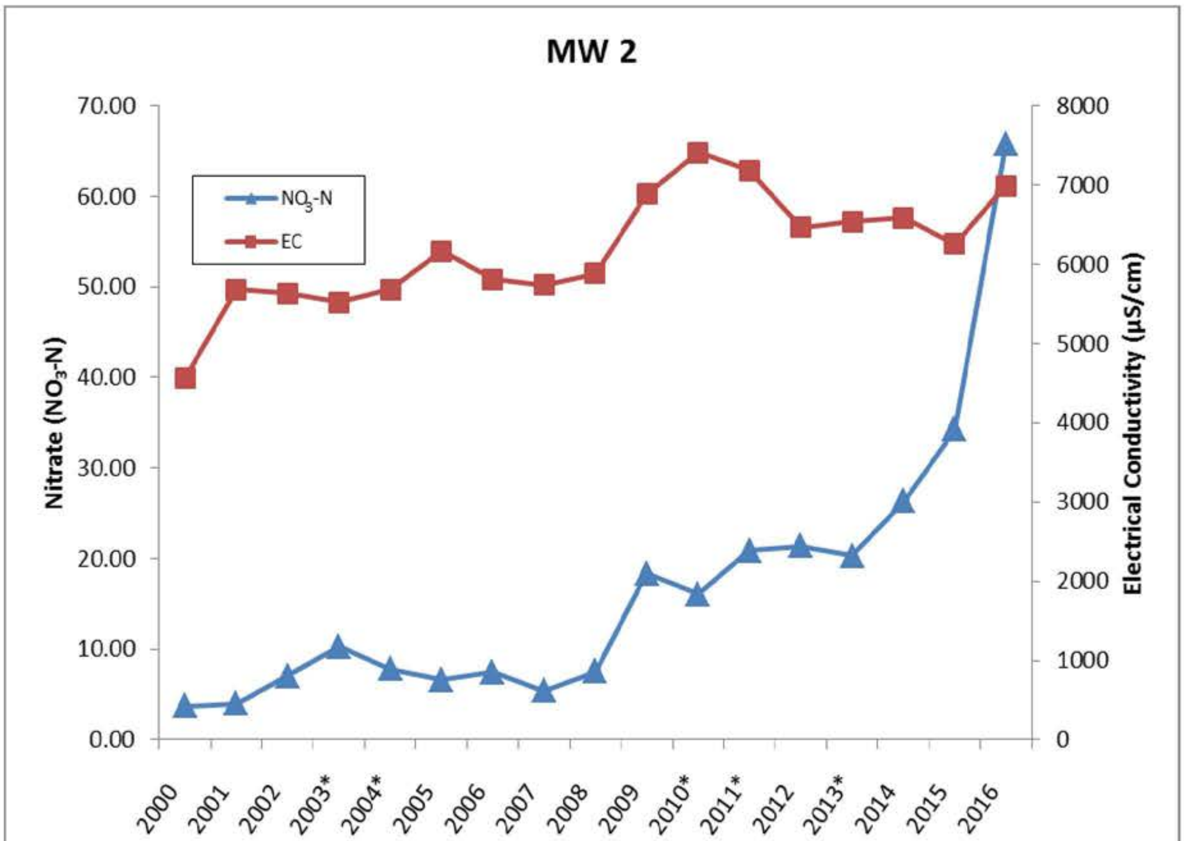

Figure 2. Time-series plot of nitrate-nitrogen (NO_3-N) and electrical conductivity (EC) for MW 2, 5-D Swine. Years denoted with an asterisk (*) represent mean values for the sampling year.

HANOR, INC.

A Groundwater Monitoring Program to address the concerns associated with monitoring wells at the Hanor Swine Feeding Operations LMFOs/CAFOs at Hanor Roberts Ranch, Hanor Trails End BGF#1, Hanor Trails End BGF #2 and Hanor Major Farms was submitted by Hanor to ODAFF on November 14, 2013. The plan assigned an Impact Level ranging between 1 and 4 to each well, with quarterly, bi-annual, or annual monitoring, as the basis for the Plan. It was approved by ODAFF on November 26, 2013. It summarizes the future investigative activity requirements for their impacted wells. These wells included: MW# s 2, 3, 7, 10, 11, 12, 13, 22, 47, 60, 68, 80, 82, 83, 90, 97, 105, 106, 107, 112, 115, 121 and 123.

On November 12, 2014, the annual review of the groundwater monitoring plan was received by ODAFF. This report covered MWs # 2, 3, 7, 82, 83, 112, 105, 106, 47, 121, 123, 60, 115, 22, 80, 90, 107, 11, 12, 13, 10, 68 and 97 at Roberts Ranch, Hanor Major and Trails End facilities. These wells were sampled quarterly, bi-annually or annually. The laboratory analytical results from November 2013 to August 2014 were included, as were Concentration vs Time Graphs for each well. Groundwater recommendations were developed for each well for further evaluation to determine the source and associated cause of the elevated nitrates and TSS levels. The next sampling event was scheduled for November 2014.

On December 30, 2014, ODAFF contacted Hanor by letter which addressed increasing nitrate in monitoring wells at farms:

Hanor Major/Trails End BGF #1—MW #s 2, 3, 7, 10, 11 and 12
Hanor Roberts Ranch Finisher 2—MW #s 22 and 123
Hanor Roberts Ranch Finisher 4—MW # 106
Hanor Roberts Ranch Finisher 5—MW #s 83, 111 and 112
Hanor Roberts Ranch Nursery 1—MW #s 60 and 90
Hanor Roberts Ranch Nursery 3—MW #91
Hanor Roberts Ranch Nursery 8—MW #80
Hanor Trails End BGF #2—MW #13

A plan specifying procedures to determine if groundwater near these monitoring wells is subject to degradation due to current waste management practices was due to ODAFF by February 13, 2015. The letter also requested that Hanor include the following information as part of plan deliverables: 1) testing for Na, Mg, Ca, K, pH, B, Cl, NO_3-N, SO_4-S, CO_3^{-2}, HCO_3, Total Soluable Salts, EC, SAR, Total Dissolved P (ICP from water sample) and NH_4-N; 2) sampling from the waste retention structure for Na, Mg, Ca, K, pH, B, Cl, NO_3-N, SO_4-S, CO_3^{-2}, HCO_3, Total Soluable Salts, EC, SAR, Total Dissolved P (ICP from water sample) and NH_4-N; 3) Stiff and Tri-Linear diagrams to assess any correlation between the lagoon contents and the chemistry of the monitoring wells and 4) any other pertinent areas to be used to evaluate the subsurface conditions.

The report was received by ODAFF on February 13, 2015 for the following wells:

MWs# 2 and 3: Major/Trails End BGF #1.

These wells were on the 2015 Table 12 and continue to be on the 2016 Table 12. On February 13, 2015, the consultant submitted a proposed groundwater assessment plan for Monitoring Wells #2 and 3 that included: 1) top of casing elevation survey and current groundwater elevations to determine current groundwater flow direction; 2) sample the monitoring wells and lagoons and develop Stiff and Tri-Linear diagrams to fingerprint groundwater; 3) perform isotope studies of monitoring wells; and 4) report findings to ODAFF. ODAFF approved this plan on March 6, 2015 and asked for additional items to be submitted: 1) description of groundwater sampling activities; 2) current map of groundwater flow; 3) tabulated analytical results and lab reports; 3) Tri-Linear and Stiff diagrams; and 4) recommendations for any additional actions based on results, to be received no later than August 31, 2015. ODAFF reviewed and responded to a request for supplemental monitoring based on the results of the August 31, 2015 report. A plan of action submitted by the facility's consultant was approved by ODAFF on December 29, 2015. The submitted plan includes annual monitoring of groundwater parameters and reporting subsequent to monitoring that includes a full interpretation of results.

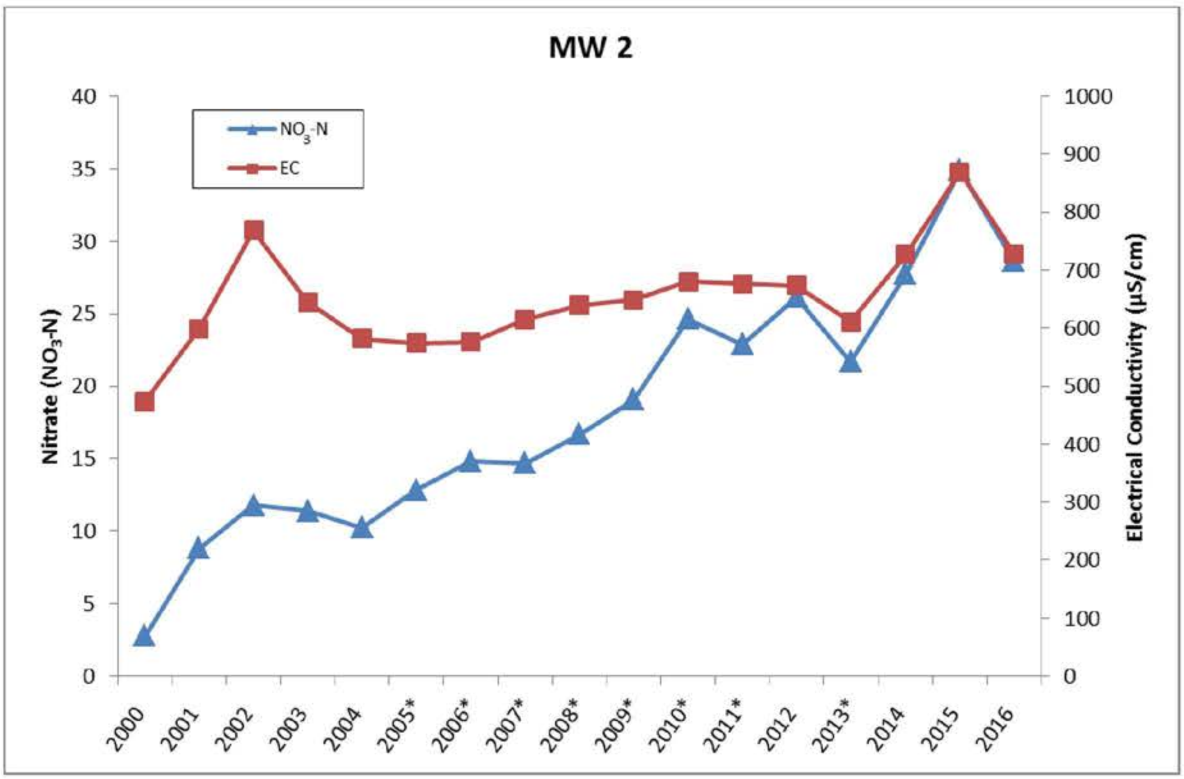

Figure 3. Time-series plot of nitrate-nitrogen (NO_3-N) and electrical conductivity (EC) for MW 2, Hanor Major/Trails End BGF #1. Years denoted with an asterisk (*) represent mean values for the sampling year.

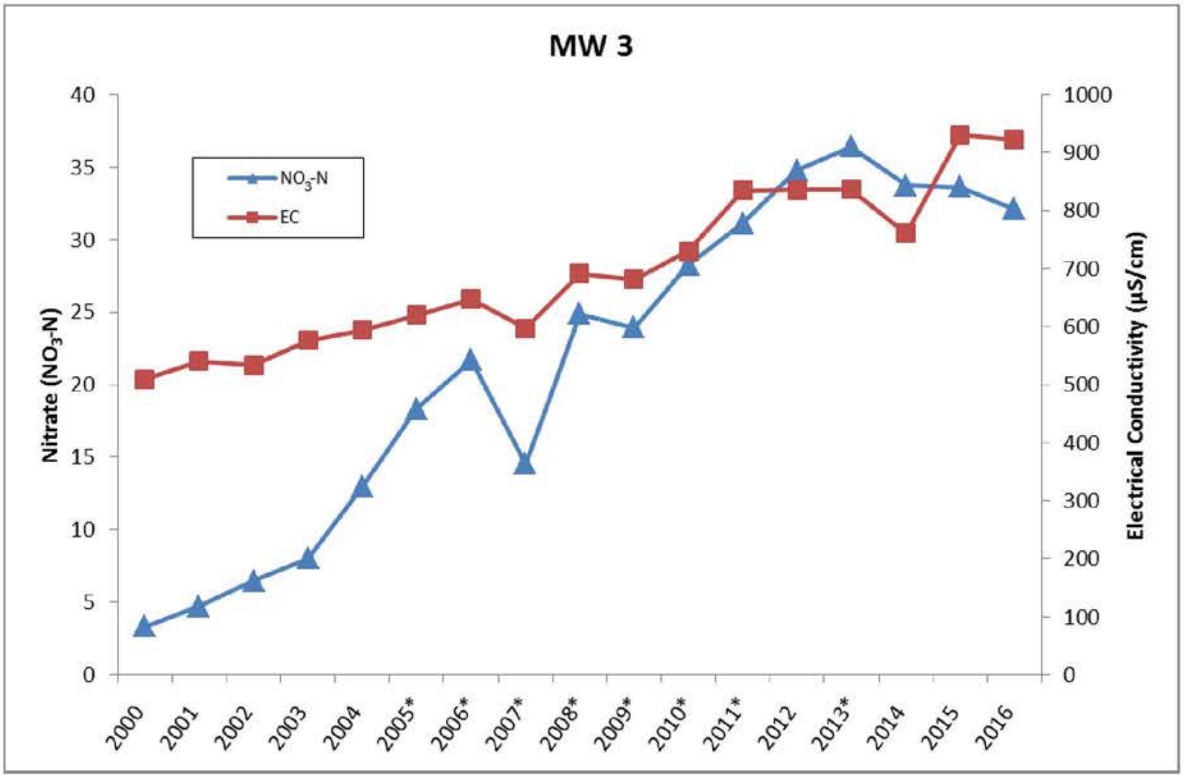

Figure 4. Time-series plot of nitrate-nitrogen (NO_3-N) and electrical conductivity (EC) for MW 3, Hanor Major/Trails End BGF #1. Years denoted with an asterisk (*) represent mean values for the sampling year.

MWs# 1 and 6: Major/Trails End BGF #1.

These wells were on the 2015 Table 12 and continue to be on the 2016 Table 12. ODAFF reviewed and responded to a request for supplemental monitoring based on the results of the August 31, 2015 report. A plan of action submitted by the facility's consultant was approved by ODAFF on December 29, 2015. The submitted plan includes annual monitoring of groundwater parameters and reporting subsequent to monitoring that includes a full interpretation of results and recommendations. The report is planned to be submitted following the first quarter of 2016. Further analyses will be determined following the submittal.

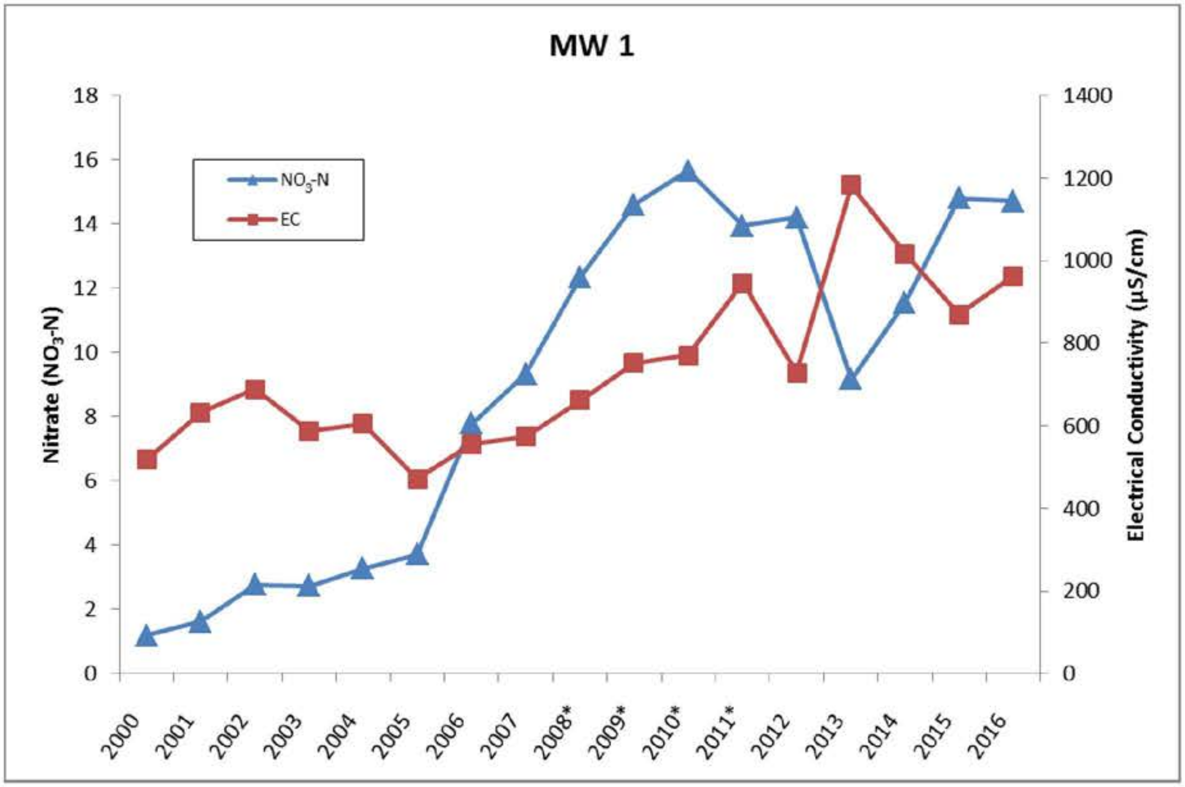

Figure 5. Time-series plot of nitrate-nitrogen (NO_3-N) and electrical conductivity (EC) for MW 1, Hanor Major/Trails End BGF #1. Years denoted with an asterisk (*) represent mean values for the sampling year.

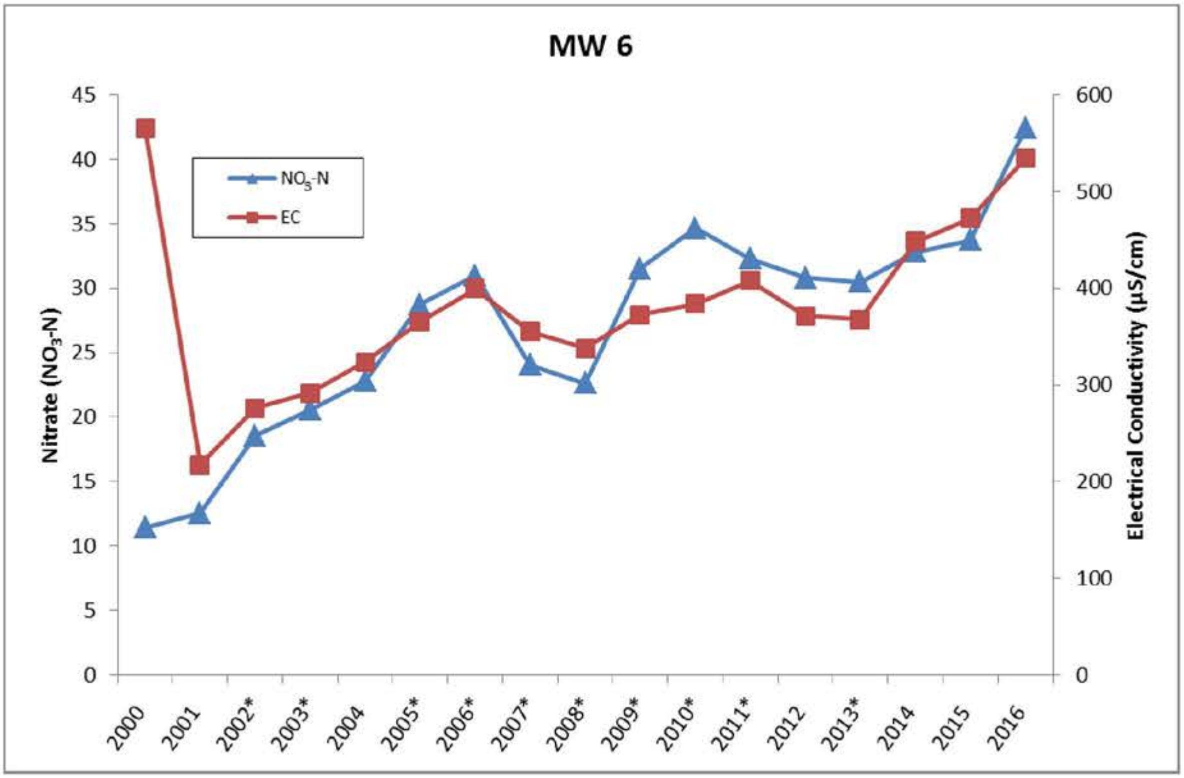

Figure 6. Time-series plot of nitrate-nitrogen (NO_3-N) and electrical conductivity (EC) for MW 1, Hanor Major BGF #1. Years denoted with an asterisk (*) represent mean values for the sampling year.

MWs# 7, 10, 11 and 12: Trails End BGF #1.

These wells were on the 2015 Table 12 and continue to be on the 2016 Table 12. On February 13, 2015, the consultant submitted a proposed groundwater assessment plan for Monitoring Wells #7, 10, 11 and 12 that included: 1) top of casing elevation survey and current groundwater elevations to determine current groundwater flow direction; 2) sample the monitoring wells and lagoons and develop Stiff and Tri-Linear diagrams to fingerprint groundwater; 3) perform isotope studies of monitoring wells; and 4) report findings to ODAFF. ODAFF approved this plan on March 6, 2015 and asked for additional items to be submitted: 1) description of groundwater sampling activities; 2) current map of groundwater flow; 3) tabulated analytical results and lab reports; 3) Tri-Linear and Stiff diagrams; and 4) recommendations for any additional actions based on results, to be received no later than August 31, 2015. ODAFF reviewed and responded to a request for supplemental monitoring based on the results of the August 31, 2015 report. A plan of action submitted by the facility's consultant was approved by ODAFF on December 29, 2015. The submitted plan includes annual monitoring of groundwater parameters and reporting subsequent to monitoring that includes a full interpretation of results.

Additional work on MW 12 was completed in the first quarter of 2016 as a supplemental investigation regarding elevated nitrate levels in at the location. The recommendation that no additional investigation was required was approved by ODAFF on April 14, 2016 and that annual monitoring with status reporting is to resume for this well.

On July 29, 2016, a report was submitted by the facility's consultant for MW 7, 10, 11 and 12. Based on evidence provided, the nitrate levels in both the upgradient (MW 12) and downgradient (MW 7, 10, 11) increased over the previous sampling year. An isotopic analysis of the monitoring wells revealed that MW 10, 11 and 12 had an animal waste source present, and MW 7 results indicated a commercial fertilizer source. Based on the additional investigation completed in April on the upgradient area of the retention structure that indicated elevated nitrate levels, no clear connection to the lagoon could be discerned for the downgradient wells. The consultant recommends that annual sampling resume and to continue monitoring groundwater flow direction. ODAFF agrees with this recommendation and will further evaluate the conditions to determine the present animal waste source at the facility.

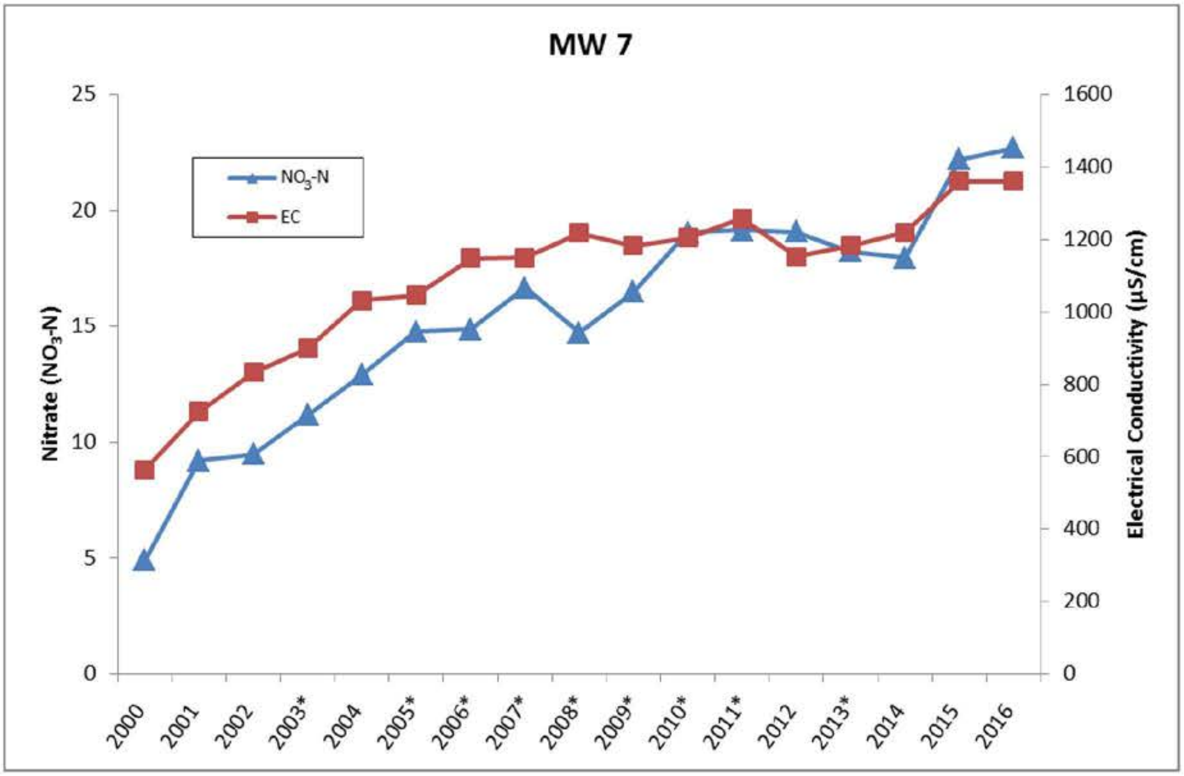

Figure 7. Time-series plot of nitrate-nitrogen (NO_3-N) and electrical conductivity (EC) for MW 7, Hanor Trails End BGF #1. Years denoted with an asterisk (*) represent mean values for the sampling year.

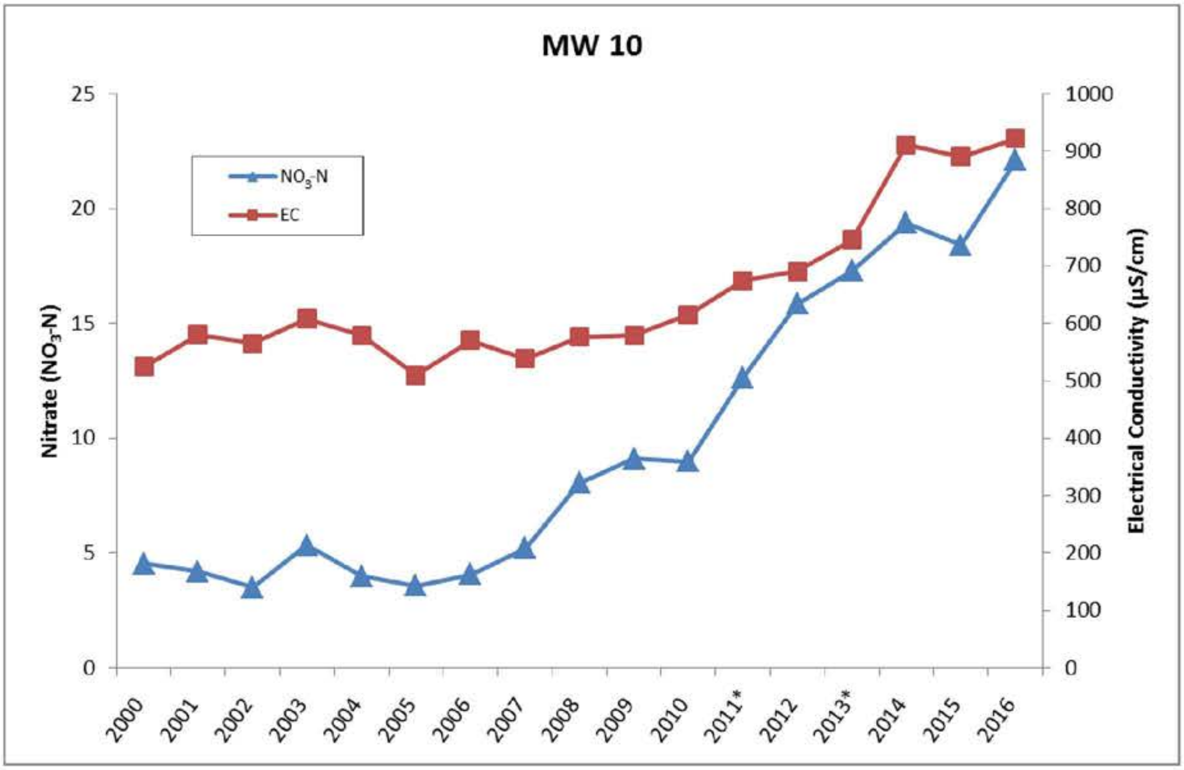

Figure 8. Time-series plot of nitrate-nitrogen (NO_3-N) and electrical conductivity (EC) for MW 10, Hanor Trails End BGF #1. Years denoted with an asterisk (*) represent mean values for the sampling year.

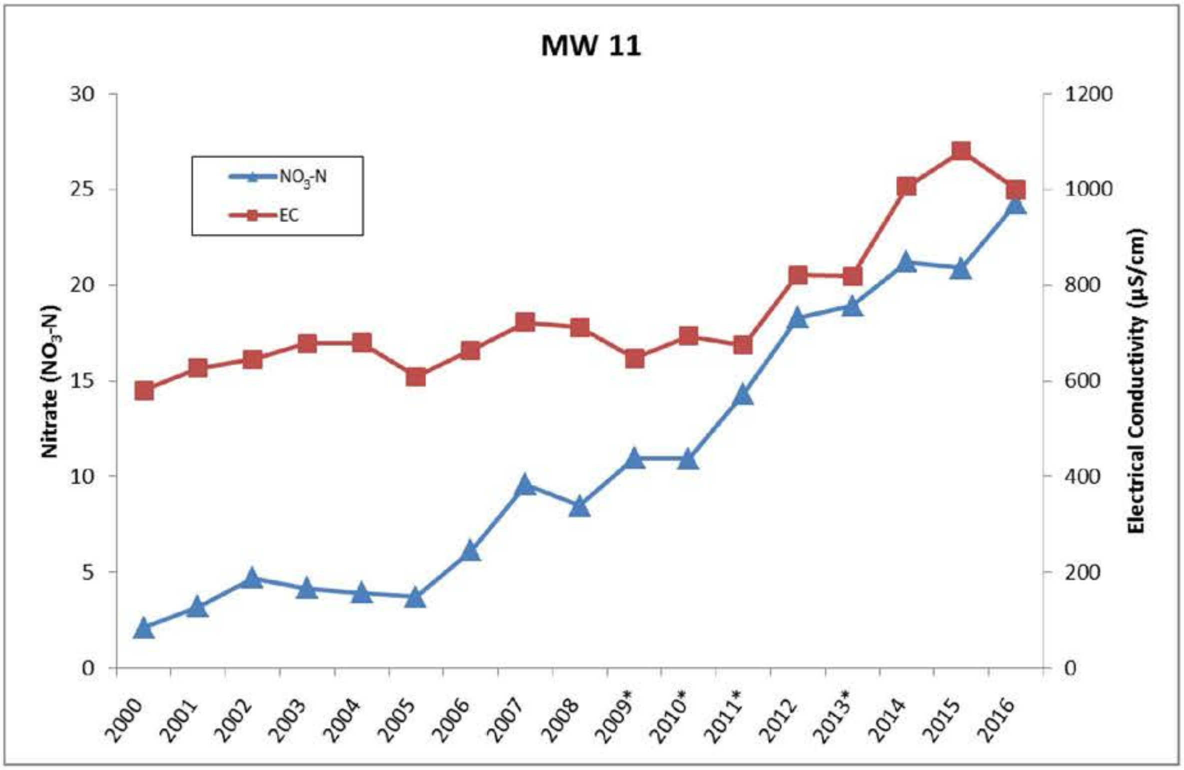

Figure 9. Time-series plot of nitrate-nitrogen (NO_3-N) and electrical conductivity (EC) for MW 11, Hanor Major/Trails End BGF #1. Years denoted with an asterisk (*) represent mean values for the sampling year.

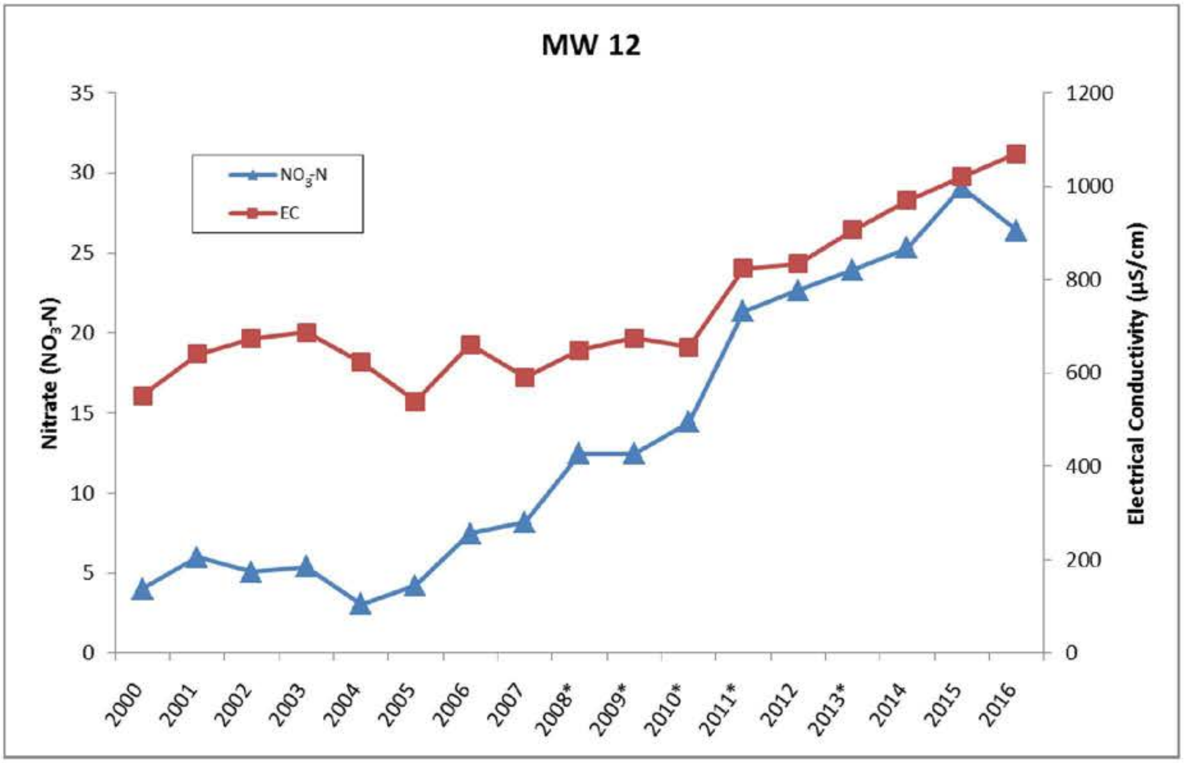

Figure 10. Time-series plot of nitrate-nitrogen (NO_3-N) and electrical conductivity (EC) for MW 12, Hanor Major/Trails End BGF #1. Years denoted with an asterisk (*) represent mean values for the sampling year.

MWs# 22 and 123: Roberts Ranch Finisher 2.

These wells were on the 2015 Table 12 and continue to be on the 2016 Table 12. On February 13, 2015, the consultant submitted a plan for proposed investigation activities for Monitoring Well #22 and 123. The facility proposed to: 1) complete a top of casing survey and record current groundwater elevations to determine groundwater flow direction; 2) perform a direct push groundwater investigation; 3) report the findings of the direct push study back to ODAFF and 4) continue monitoring MW #123, as it is concluded the nitrate in the well is from commercial fertilizer. ODAFF approved the plan by letter dated March 6, 2015 and requested results be submitted to ODAFF no later than August 31, 2015. The report submitted to ODAFF on August 31, 2015 indicated that no clear connection was determined between the groundwater and lagoon. A supplemental investigation was proposed that included direct-push borings to further investigate the increased nitrate trend, and a plan of action was submitted to ODAFF on November 18, 2015 and approved on December 29, 2015.

A report submitted by the consultant on July 29, 2016 indicated that nitrate conditions were increasing in the upgradient (MW 123) well and decreasing in the downgradient well (MW 22). Isotopic analysis indicates that no clear connection can be determined between the lagoon and the water collected from the monitoring wells. The consultant recommends that annual monitoring with reporting be continued to monitor the trends. ODAFF agrees and will further evaluate the conditions at the facility following the following year's sampling period.

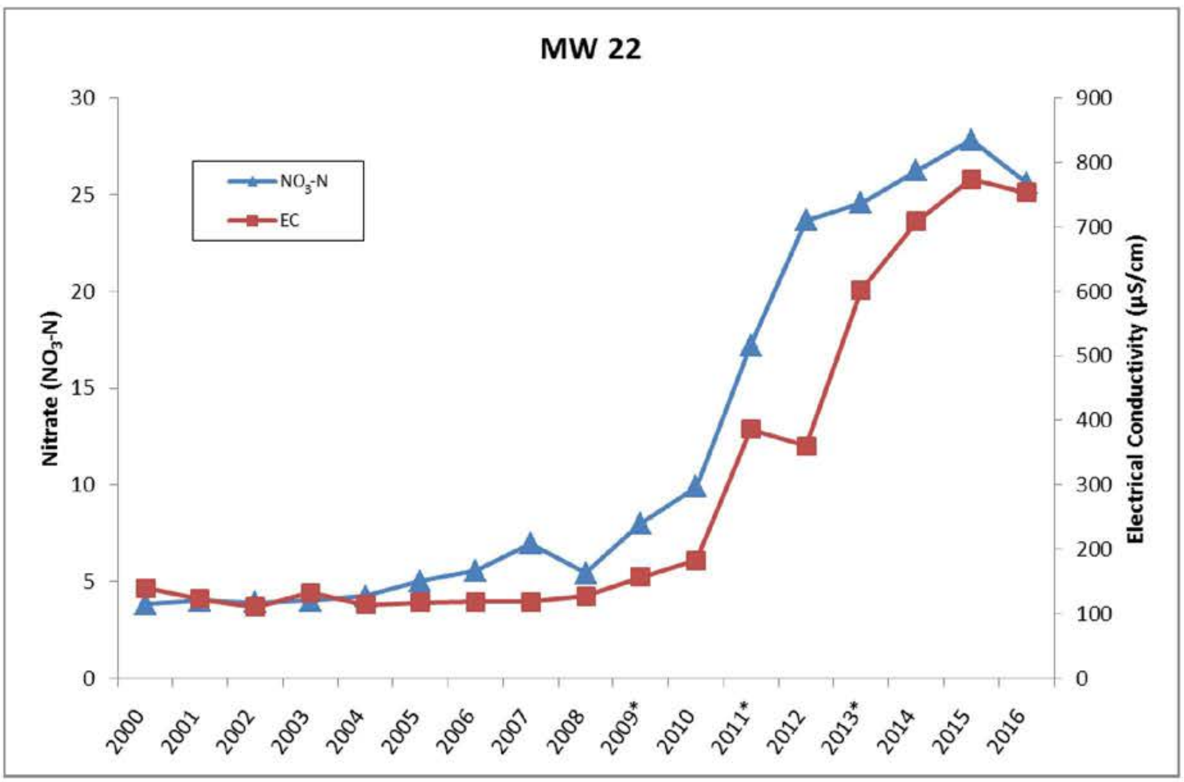

Figure 11. Time-series plot of nitrate-nitrogen (NO_3-N) and electrical conductivity (EC) for MW 22, Hanor Roberts Ranch Finisher #2. Years denoted with an asterisk (*) represent mean values for the sampling year.

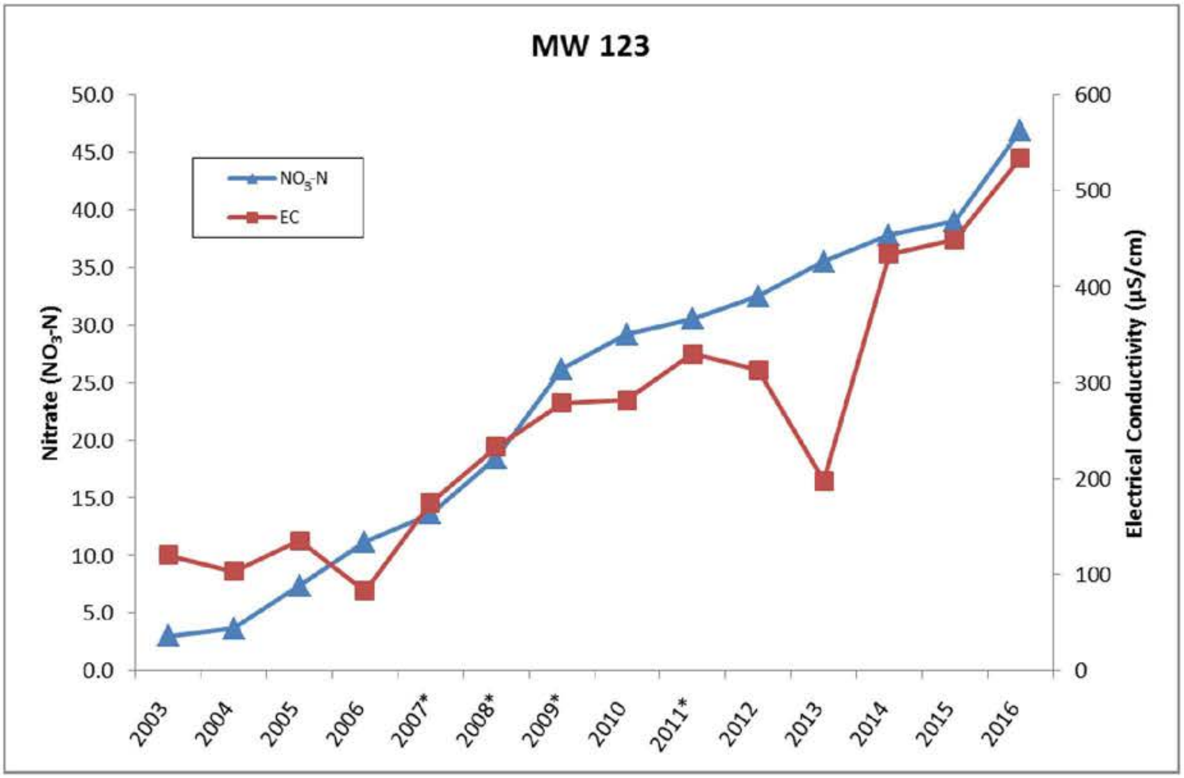

Figure 12. Time-series plot of nitrate-nitrogen (NO_3-N) and electrical conductivity (EC) for MW 123, Hanor Roberts Ranch Finisher #2. Years denoted with an asterisk (*) represent mean values for the sampling year.

MW# 106: Roberts Ranch Finisher 4.

This well was on the 2015 Table 12 and continues to be on the 2016 Table 12. On February 13, 2015, the consultant submitted a plan for proposed investigation activities for Monitoring Well #106. The facility proposed to: 1) complete a top of casing survey and record current groundwater elevations and determine groundwater flow direction; 2) perform isotope studies and 3) report the findings to ODAFF. ODAFF approved the plan by letter dated March 6, 2015 and requested results be submitted to ODAFF no later than August 31, 2015 as well as submitting: 1) a description of groundwater sampling activities; 2) a current map of groundwater flow direction; 3) tabulated analytical results and lab reports; 4) Stiff and Tri-Linear diagrams; and 5) recommendations for any additional activities. Based on the conclusions of the reports submitted, ODAFF was in agreement with the consultant's recommendation to resume annual monitoring on this well to commence in the first quarter of 2016.

On July 29, 2016 a report was submitted by the consultant to further evaluate the conditions at the lagoon regarding MW 106. Conclusions indicate that no correlation was found between the groundwater and lagoon from a fingerprinting and isotopic analysis. Furthermore, the historical comparison of nitrate levels indicates that background nitrate levels have been elevated since the commencement of the monitoring period. ODAFF agrees with the consultant that continued annual monitoring is warranted for the facility to document the current trends and conditions.

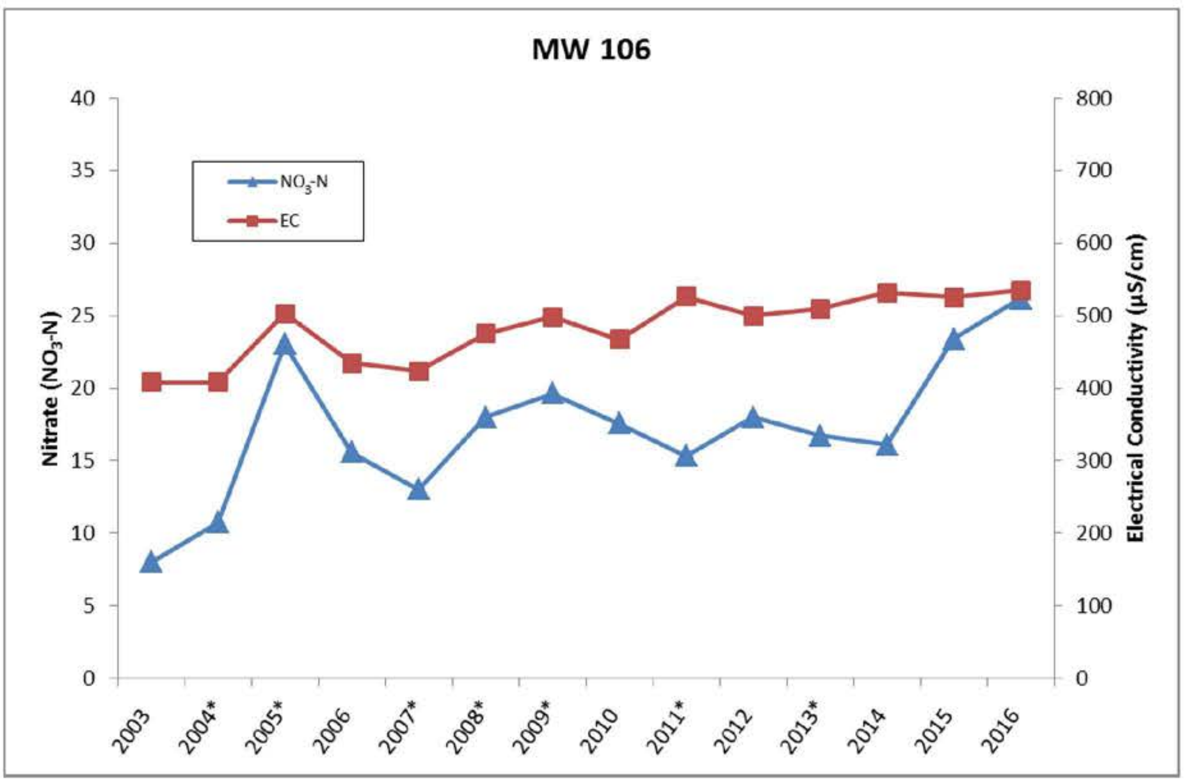

Figure 13. Time-series plot of nitrate-nitrogen (NO_3-N) and electrical conductivity (EC) for MW 106, Hanor Roberts Ranch Finisher #4. Years denoted with an asterisk (*) represent mean values for the sampling year.

MW# 83: Roberts Ranch Finisher 5.

On February 13, 2015, the consultant submitted a plan for proposed investigation activities for Monitoring Wells #83. The facility proposed to: 1) record current groundwater elevations to determine a groundwater flow pattern; 2) complete the delineation of the groundwater plume to the south; and 3) report the findings to ODAFF. Results from the report submitted by the consultant on August 31, 2015 indicate that there is no clear impact from the facility on the nearby groundwater. An annual sampling schedule was recommended and approved by ODAFF on December 29, 2015 with monitoring status reports to be submitted within 45 days of the sampling events. Further evaluations will be determined based on these results.

On July 29, 2016 a report was submitted by the consultant to further evaluate the conditions at the lagoon regarding MW 83. Fingerprinting and isotopic analyses were used in an attempt to determine conditions at the facility. Conclusions from the consultant indicate that no connection to groundwater was determined and that the source of increased nitrate was commercial fertilizer. Given that MW 83 is directly downgradient from the lagoon, and the recent increasing trend over the past three sampling periods, ODAFF suggests that an additional investigation is needed to further evaluate the source of the significant increase in nitrate levels in MW 83. Further actions are pending based on the upcoming sampling event(s).

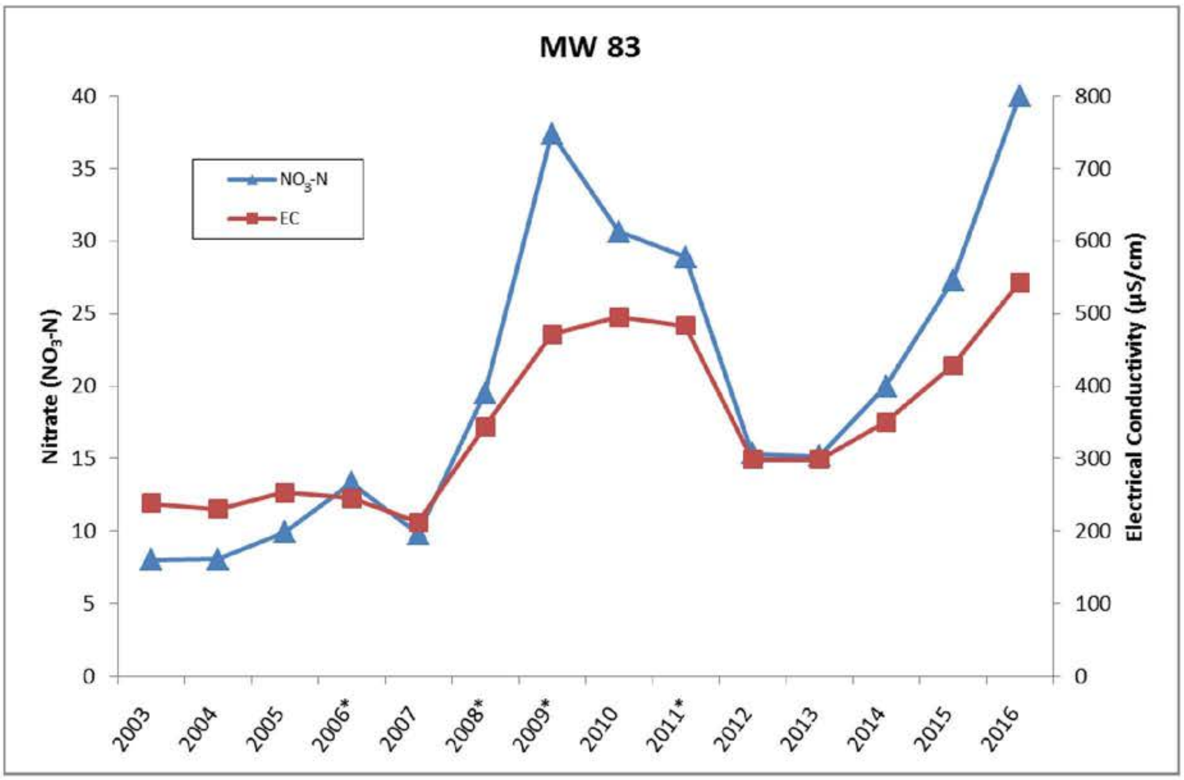

Figure 14. Time-series plot of nitrate-nitrogen (NO_3-N) and electrical conductivity (EC) for MW 83, Hanor Roberts Ranch Finisher #5. Years denoted with an asterisk (*) represent mean values for the sampling year.

MW# 115: Roberts Ranch Finisher 8.

This well was new to the 2015 Table 12 and remains listed on the 2016 Table 12. On November 18, 2015 a plan of action was submitted by the consultant for first quarter 2016 sampling of this well that includes comprehensive analysis for major cations and anions, and completion of a report including recommendations. This report is pending submittal for 2016 and further analyses and investigations will be determined following review.

On July 29, 2016 a report was submitted by the consultant to further evaluate the conditions at the lagoon regarding MW 115. Based on the conclusions indicated in the report, no additional evaluations beyond annual monitoring were indicated. The last sample collected by OWRB and ODAFF on November 3, 2015 was 68.2 mg/L and the sample collected by the consultant on March 22, 2016 was 8 mg/L, showing a significant decrease at this well. ODAFF agrees with the recommendation of annual monitoring to document recent trends.

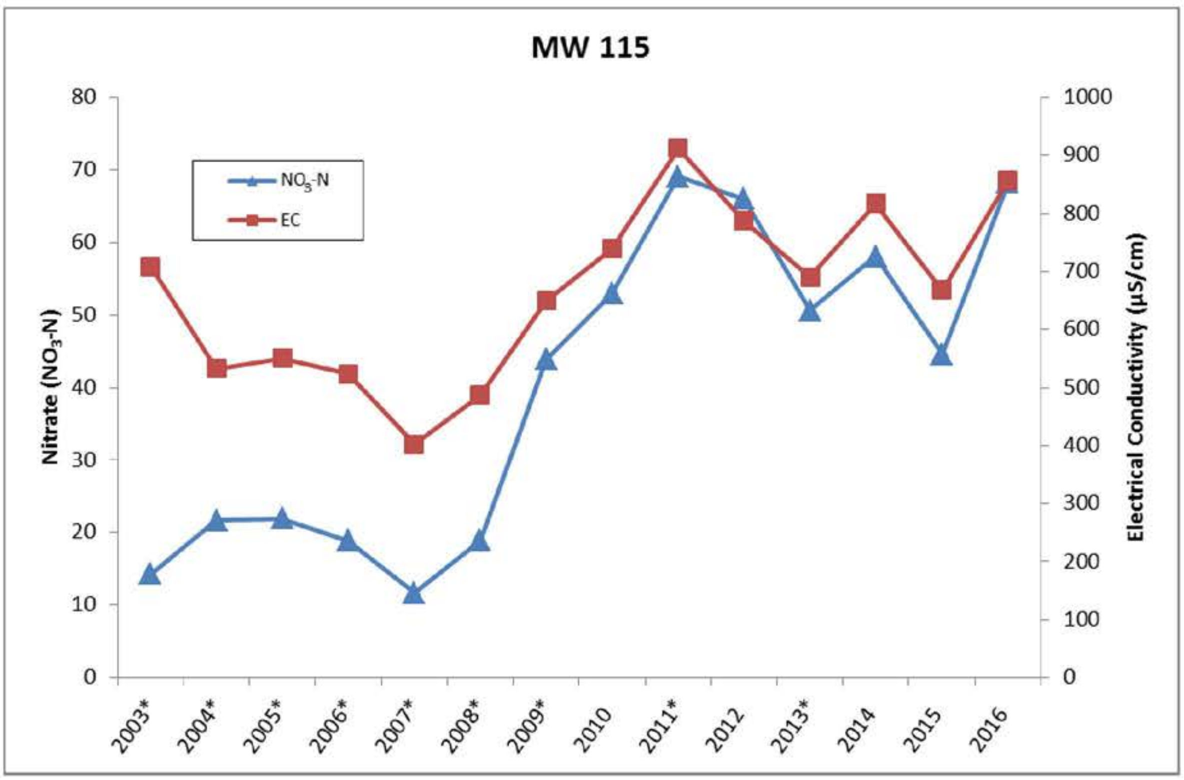

Figure 15. Time-series plot of nitrate-nitrogen (NO_3-N) and electrical conductivity (EC) for MW 115, Hanor Roberts Ranch Finisher #8. Years denoted with an asterisk (*) represent mean values for the sampling year.

MWs 60 and 90: Roberts Ranch Nursery 1.

These wells were on the 2015 Table 12 and continue to be on the 2016 Table 12. On February 13, 2015, the consultant submitted a plan for proposed investigation activities for Monitoring Wells #60 and 90. The facility proposed to: 1) record current groundwater elevations to determine a groundwater flow pattern; 2) perform an isotope study; and 3) report the findings to ODAFF. Following a report submitted on August 31, 2015 and approval by ODAFF of the November 18, 2015 plan of action, the facility is scheduled to resume annual monitoring and no impacts were determined from the facility at these locations.

On July 29, 2016 a report was submitted by the consultant to further evaluate the conditions at the lagoon regarding MW's 60 and 90. Continued annual monitoring was recommended at the site due to isotopic and geochemical analysis showing no correlation to animal waste signatures. The consultant indicated that the increase in nitrates at MW-60 is most likely due to application of commercial fertilizer. Further evaluations will be made following the next sampling period.

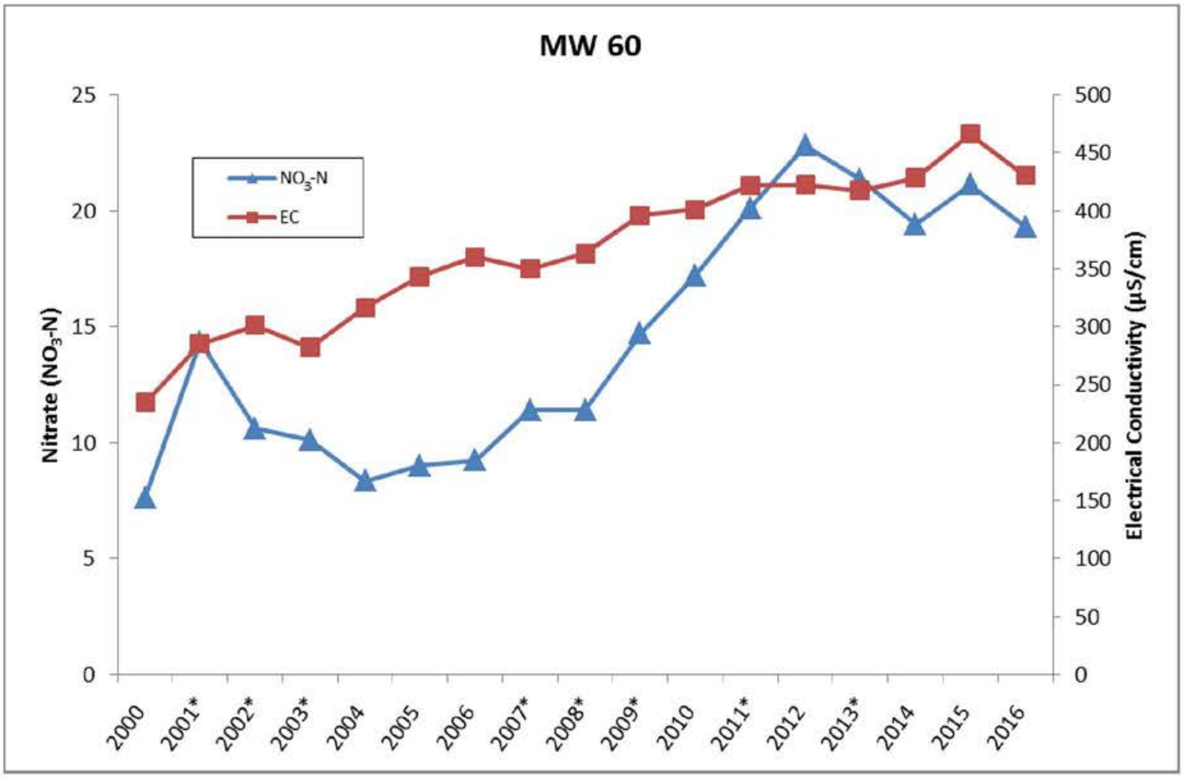

Figure 16. Time-series plot of nitrate-nitrogen (NO_3-N) and electrical conductivity (EC) for MW 60, Hanor Roberts Ranch Nursery #1. Years denoted with an asterisk (*) represent mean values for the sampling year.

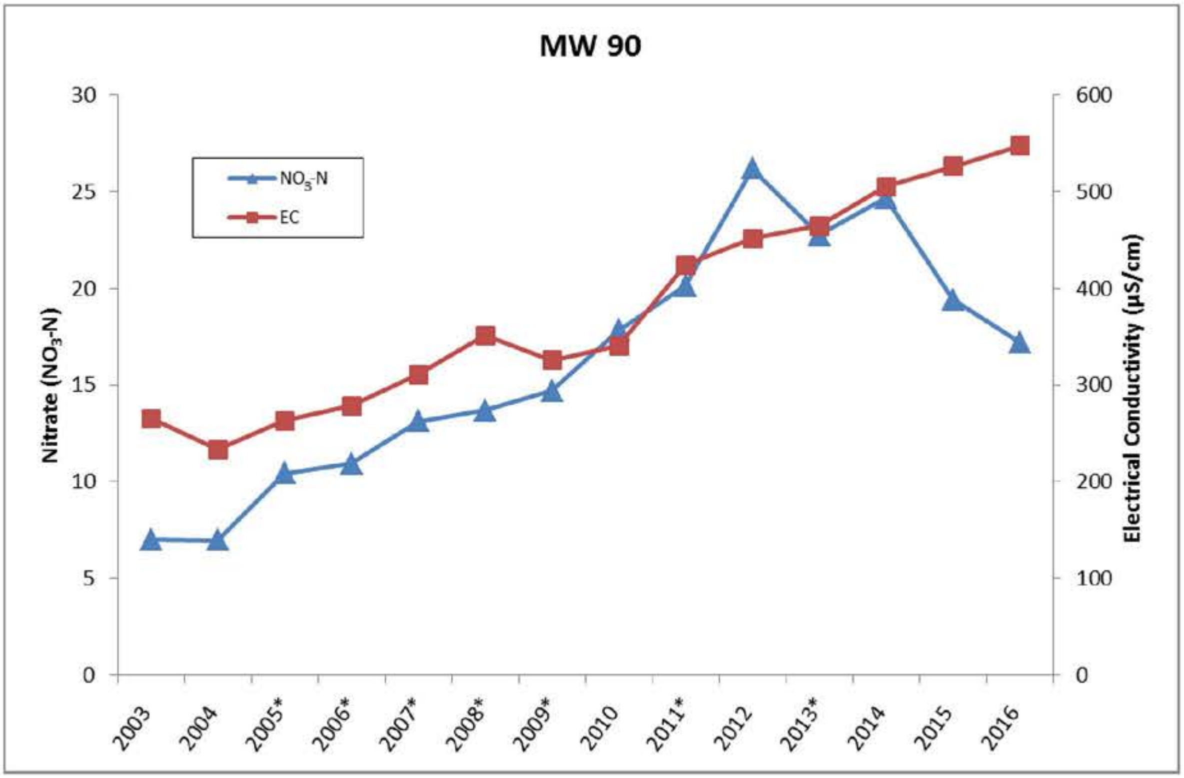

Figure 17. Time-series plot of nitrate-nitrogen (NO_3-N) and electrical conductivity (EC) for MW 90, Hanor Roberts Ranch Nursery #1. Years denoted with an asterisk (*) represent mean values for the sampling year.

MW# 80: Roberts Ranch Nursery 8.

This well was on the 2015 Table 12 and continues to be on the 2016 Table 12. On February 13, 2015, the consultant submitted a proposed plan for investigation on this well. The facility proposed to 1) complete a top of casing elevation survey and record current groundwater elevations and determine groundwater flow direction; and 2) report findings to ODAFF. ODAFF approved the plan on March 6, 2015 and requested the report be submitted no later than August 31, 2015 with these additional items: 1) a current map depicting groundwater flow and 2) recommendations for any actions based on results. Following a report submitted on August 31, 2015 and approval by ODAFF of the November 18, 2015 plan of action, the facility is scheduled to resume annual monitoring and no impacts were determined from the facility at these locations.

On July 29, 2016 a report was submitted by the consultant to further evaluate the conditions at the lagoon regarding MW 80. The consultant concluded that based on a fingerprinting analysis and groundwater characteristics that there is no relation to indicate a connection between the groundwater and lagoon. The isotope analysis suggested the increasing trend was due to commercial fertilizer. ODAFF agrees with this recommendation and to continue annual monitoring for future determinations.

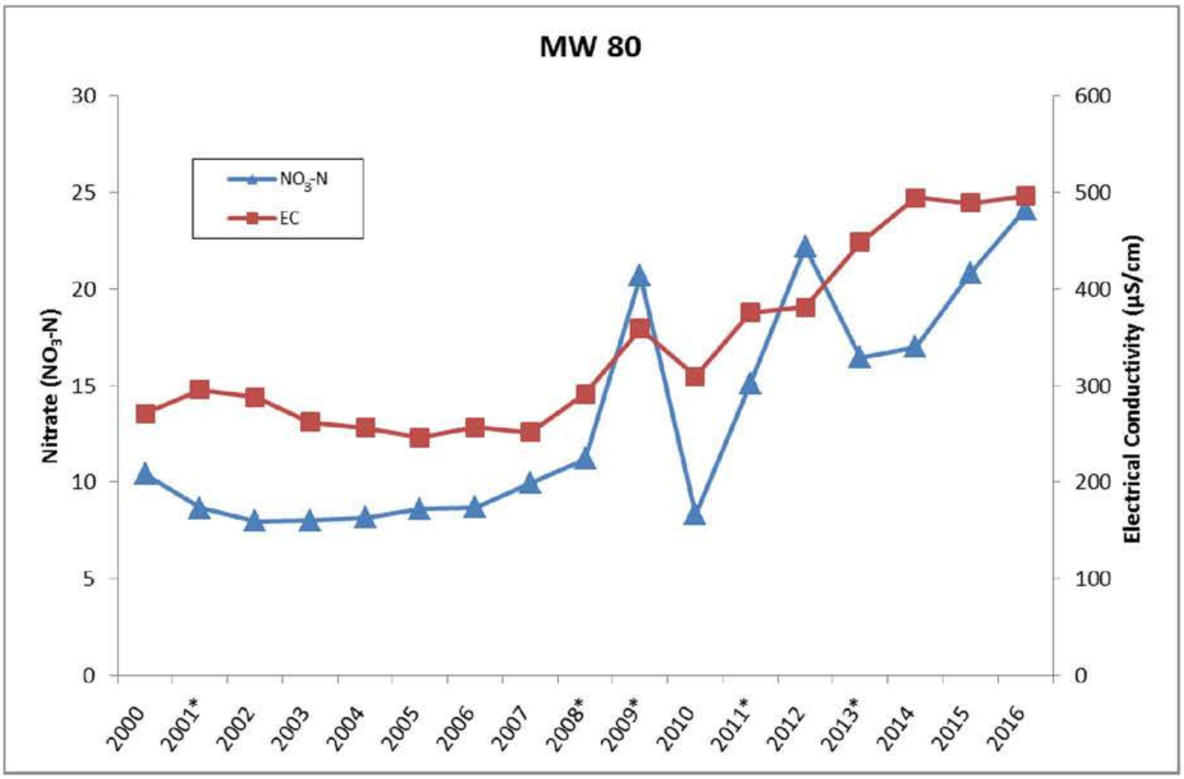

Figure 18. Time-series plot of nitrate-nitrogen (NO_3-N) and electrical conductivity (EC) for MW 80, Hanor Roberts Ranch Nursery #8. Years denoted with an asterisk (*) represent mean values for the sampling year.

***New** additions to the Hanor facilities for the 2016 Table 12 include*:

MW# 16: Hanor Huffman G/F Sites 25-28

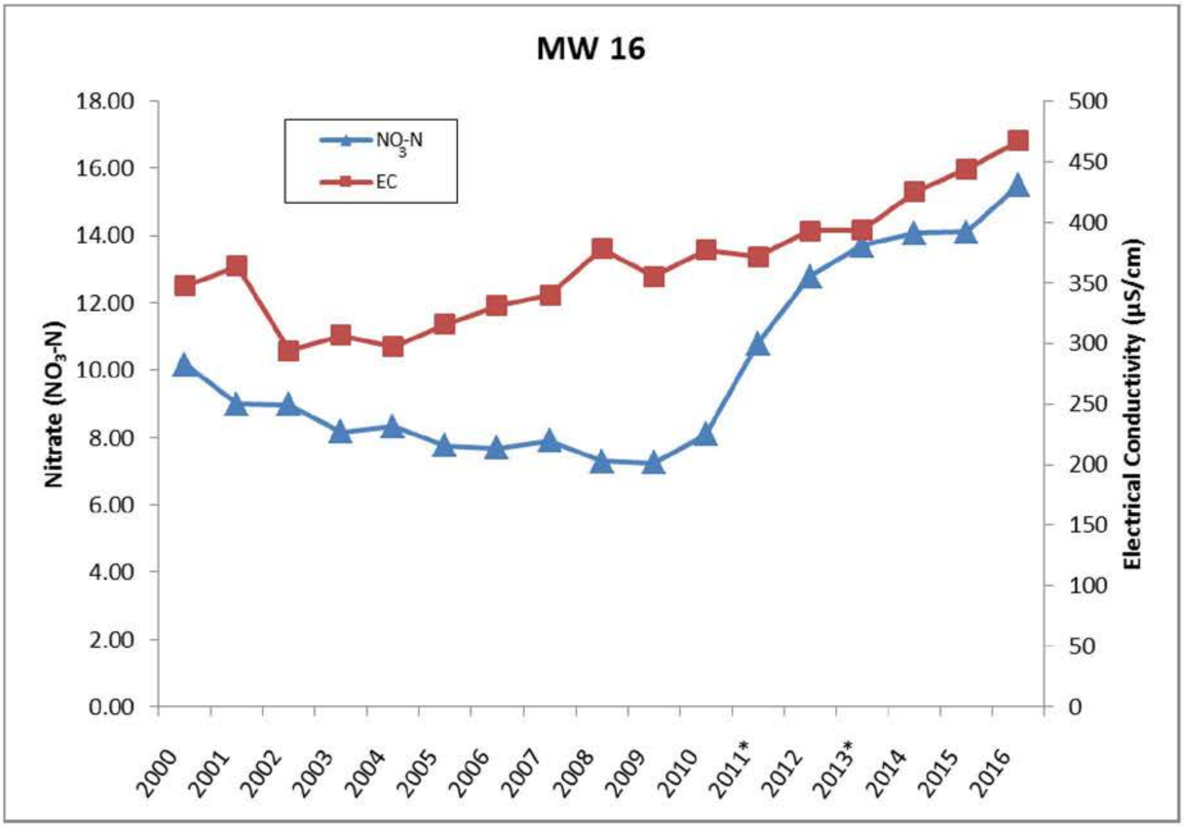

Figure 19. Time-series plot of nitrate-nitrogen (NO_3-N) and electrical conductivity (EC) for MW 16, Hanor Huffman G/F Sites 25-28. Years denoted with an asterisk (*) represent mean values for the sampling year.

MW# 105: Hanor Roberts Ranch, Finisher 4

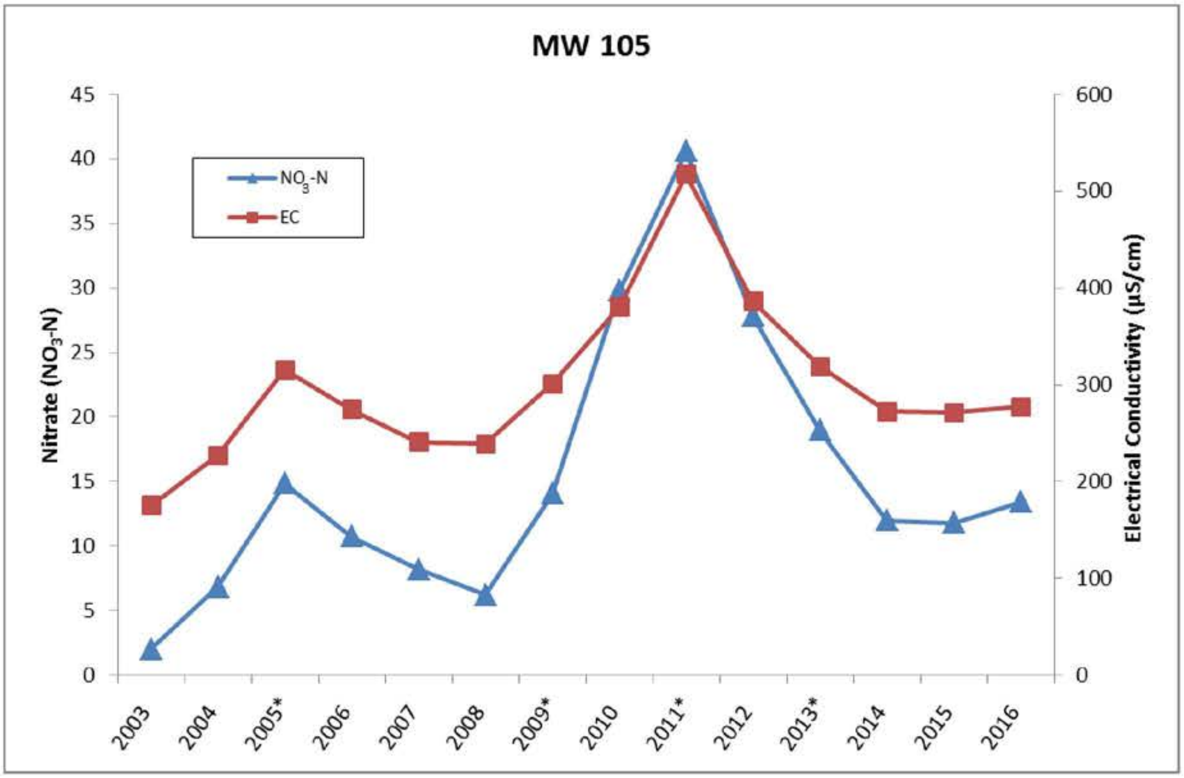

Figure 20. Time-series plot of nitrate-nitrogen (NO_3-N) and electrical conductivity (EC) for MW 105, Hanor Roberts Ranch, Finisher 4. Years denoted with an asterisk (*) represent mean values for the sampling year.

MW# 47: Hanor Roberts Ranch, Finisher 10

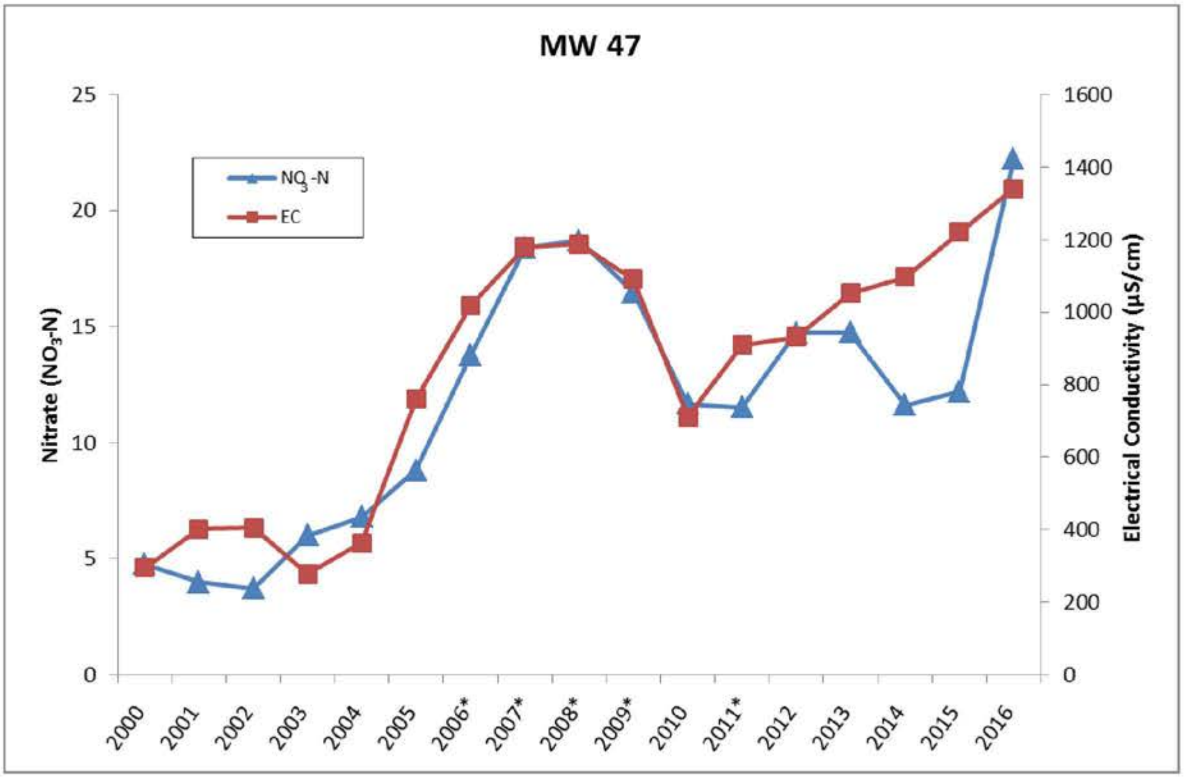

Figure 21. Time-series plot of nitrate-nitrogen (NO_3-N) and electrical conductivity (EC) for MW 47, Hanor Roberts Ranch, Finisher 10. Years denoted with an asterisk (*) represent mean values for the sampling year.

MW# 81A: Hanor Roberts Ranch, Nursery 8

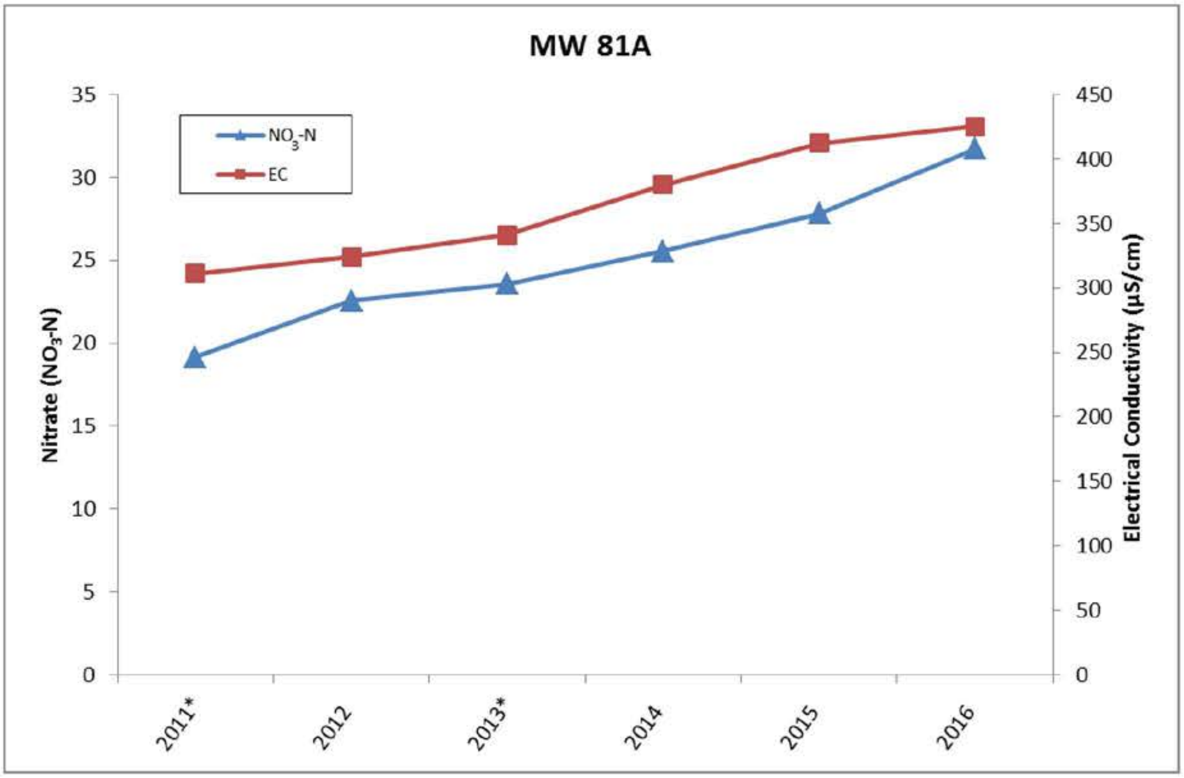

Figure 22. Time-series plot of nitrate-nitrogen (NO_3-N) and electrical conductivity (EC) for MW 81A, Hanor Roberts Ranch, Nursery 8. Years denoted with an asterisk (*) represent mean values for the sampling year.

HITCH ENTERPRISES

MW# 91: Hitch Enterprises Nursery Sites 5-8.

1. Monitoring well #91 of the Hitch Enterprises Nursery 6 facility was added to the Table 7 of the 2011 report and to the 2013 report. ODAFF required Hitch Enterprises to conduct fingerprinting analysis on MW #91 and additional monitoring wells in the area for comparison purposes.
2. In 2013, the N-15 isotope fingerprinting of Hitch Enterprises Nursery 6 MW #91 showed that the increase in nitrate is not from the waste retention structure.

Currently, following repair of a line and current monitoring, ODAFF approved that no further actions were required for monitoring as of October 27, 2015. Any additional actions are pending future annual sampling events.

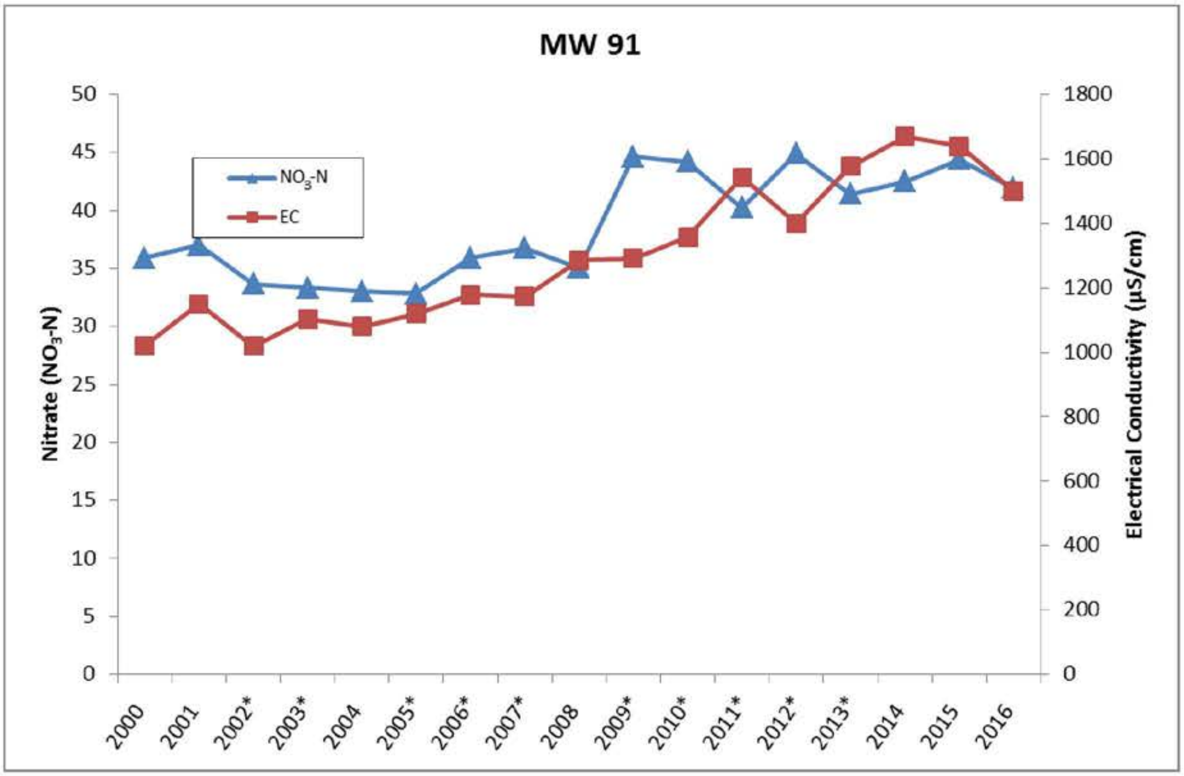

Figure 23. Time-series plot of nitrate-nitrogen (NO_3-N) and electrical conductivity (EC) for MW 91, Hitch Enterprises Nursery Sites #5-8. Years denoted with an asterisk (*) represent mean values for the sampling year.

L&M FARMS TRUST

MW# 3: This well is new to the 2016 Table 12. Letter dated December 30, 2014 requested an action plan be submitted based on groundwater conditions at the facility. An action plan dated April 7, 2015 submitted to ODAFF included a plan that indicates MW 3 and all wells will be sampled over a 5 year time period. Sampling is scheduled on an annual basis with a final report scheduled to be due by 11/30/2018. If any significant increases in nitrate are indicated above historical concentrations, additional investigations may be initiated to determine and trace the source of nitrate. Note that no data was collected for 2001, 2013 or 2015 due to dry well.

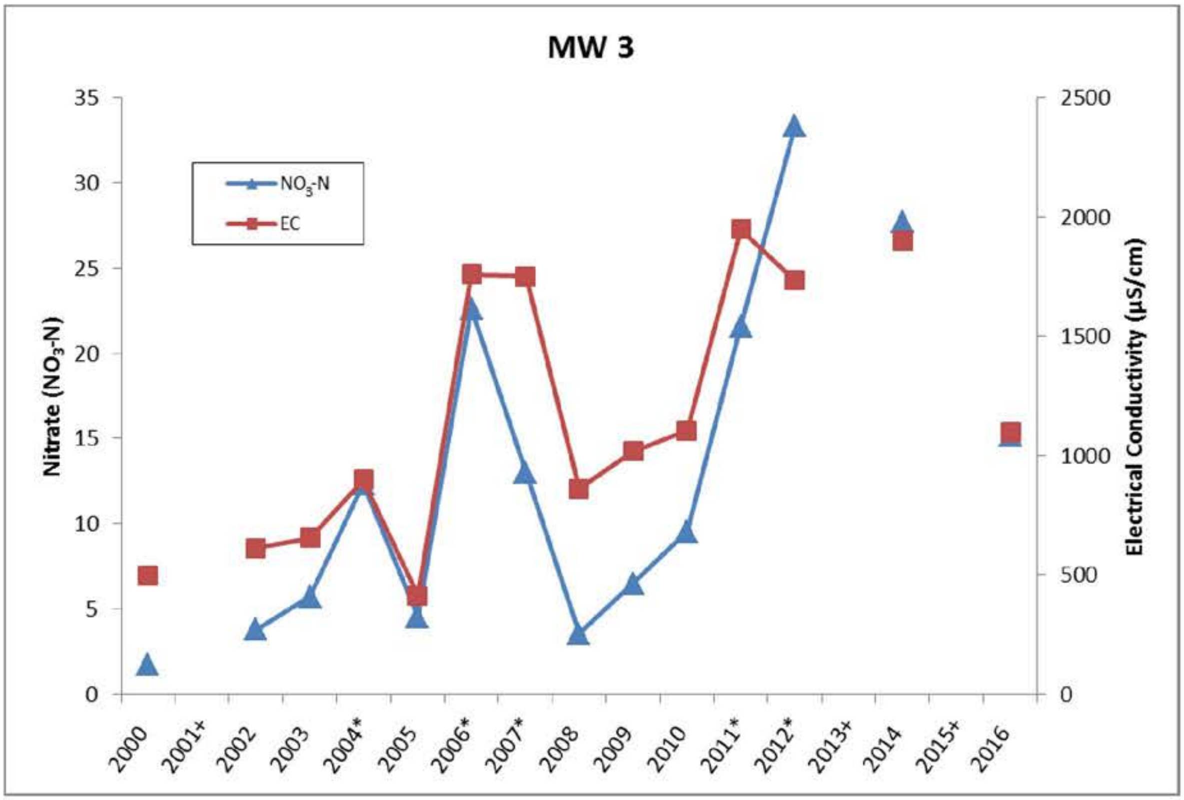

Figure 24. Time-series plot of nitrate-nitrogen (NO_3-N) and electrical conductivity (EC) for MW 3, L&M Farms Trust. Years denoted with an asterisk (*) represent mean values for the sampling year. Years denoted with (+) indicate no sample recorded.

LUTHI FARMS

Luthi Farms has only **MW# 1** on the 2016 Table 12 and was also listed on the 2015 Table 12.

Sampling results in late 2009 and early 2010 displayed an increase in nitrate-N and EC in monitoring wells #1 and #2 at the Luthi Farms facility. The ODAFF required actions be taken in 2010 - 2013. To date Luthi Farms has performed the following actions to address the increase in nitrate-N and EC at this facility:

1. Sampled MW #1, MW #2, MW #3, the office septic system, and the waste retention structure with laboratory analysis of all major ions.
2. Utilized laboratory analysis to conduct fingerprinting via Stiff and Tri-linear diagrams.
3. Located and repaired leaking underground infrastructure associated with land application.
4. Removing approximately 4000 gallons of water per month from MW #1.
5. Quarterly sampling of MW #1 and MW #2 with laboratory analysis of all major ions.

The actions taken by Luthi Farms and their consultant Ensol appear to have been very effective at lowering the nitrate-N and EC levels in MW #1 and MW #2. The nitrate-N concentration of MW #1 has decreased overall from a high of 99.5 mg/L in October 2010 to 37.4 mg/L in March 2012 and 33.5 mg/L on March 18, 2013. This is an overall reduction of approximately 62%. Similarly, EC has decreased approximately 30% from a high of 1573 µmhos/cm in October 2010. Similarly, the actions taken by Luthi have caused the decrease in nitrate-N and EC levels in MW #2 to the point where MW #2 is not listed on Table 7 of the 2012 report and 2013 report. Luthi Farms continued quarterly sampling into 2013.

MW# 1: Liner inspections revealed a 2 inch tear and a broken weld in the secondary lagoon. These two items were required to be corrected by September 1, 2013, and were completed in August 2013. Consultant for Luthi Farms recommended in an April 1, 2013 plan, to continue quarterly sampling for MW# 1 and to continue to monitor for any leakage when pumping effluent through a new above ground connection. This plan was approved by ODAFF on April 8, 2013 and quarterly sampling continues into 2014. The first quarterly sampling was performed in September 2013 and results and recommendations from Luthi Farms were sent to ODAFF on September 20, 2013. ODAFF approved the plan on September 25, 2013 for the monitoring the pumping of MW# 1 into the WRS and quarterly sampling scheduled for December 2013.

On December 13, 2013, Luthi Farms submitted test results and recommendations for MW# 1. They will continue to monitor the pumping from MW# 1 into the WRS and perform quarterly sampling in March 2014. This was approved by ODAFF on December 24, 2013.

Quarterly sampling was conducted in March 2014. The test results for MW# 1 and plan for MW# 1 was received by ODAFF on March 19, 2014. Nitrate levels in MW# 1 were showing a decrease with latest results of 20.4 mg/L from a high of 48.6 mg/L. On March 25, 2014 ODAFF approved the next quarterly sampling scheduled for June 2014. The June sampling event for MW# 1 was 23 mg/L NO_3.

A letter from ODAFF dated August 11, 2014 approved the June 26, 2014 test results for MW #1 and plans to continue monitoring well. In a letter from facility dated July 3, 2014, the facility plans to: 1) purge well #1 into lagoon #2, 2) test it for nitrates; and 3) continue quarterly sampling. A letter report dated October 18, 2014 contained sample results from the October 8, 2014 sampling event and a letter December 24, 2014 included sample results from the December 17, 2014 sampling.

An email from the facility on March 31, 2015 included the sample results from the March 23, 2015 sampling event and plan for MW #1: 1) Install new check valve assemble with leather once the replacement parts arrive; 2) Continue to monitor the pumping from MW #1 into Lagoon #2 as well as pumping of effluent from Lagoon #2; and 3) Continue with quarterly sampling with the next sample to be collected at the end of June, 2015.

An email from the facility on July 20, 2015 explained that the June 2015 sampling event was postponed to July 27, 2015 due to a family emergency. ODAFF responded by email on the same day, approving the new sampling date and established a deadline of August 14, 2015 for a report on sample results. The facility remains on a quarterly sampling schedule and no additional actions have been requested by ODAFF as of July 2016.

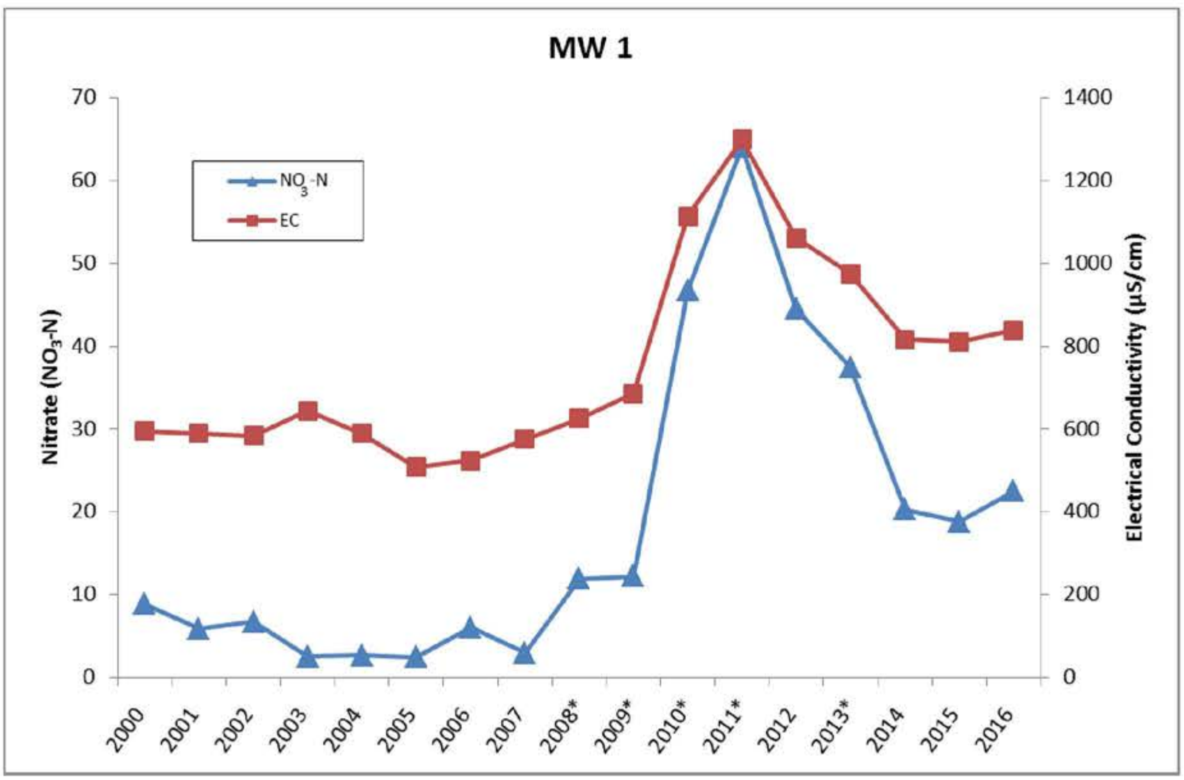

Figure 25. Time-series plot of nitrate-nitrogen (NO_3-N) and electrical conductivity (EC) for MW 1, Luthi Farms, Sow #1. Years denoted with an asterisk (*) represent mean values for the sampling year.

MURPHY BROWN

Murphy Farms submitted a June 8, 2007 Plan to ODAFF to ascertain if ground water resources near monitoring well numbers 1, 29, 37, 38, 57 and 409 were being subject to any degradation as a result of the waste management practices being utilized. For all of the monitoring wells listed above, Murphy Farms have submitted to ODAFF the following:

1. Groundwater gradient information.
2. Land application fields distances from MWs.
3. MW pad conditions and surface seals and settlement status around the MW pads.
4. Additional monitoring well results.
5. Soil sample lab results.
6. Evaluation of fresh water analysis for three years.
7. Evaluation of monitoring well completion records.
8. Comparison of water depth information to nitrate and conductivity levels

Additional actions are noted with each facility and corresponding monitoring well(s).

<u>Plum Thicket Nursery #1:</u>

MW# 29: Was listed on the 2015 Table 12 and continues to be listed on the 2016 Table 12.

ODAFF requested on October 27, 2015 that the facility provide a report that recommends additional actions (if any) that need to address the increased nitrate levels at this well location. A consultant provided a report on December 2, 2015 that recommended no additional action was needed beyond annual sampling based on the 2012 study that was completed that showed no correlation between the groundwater and lagoon. ODAFF approved this plan in July of 2016 and is continuing to assess the annual well results if additional actions are necessary.

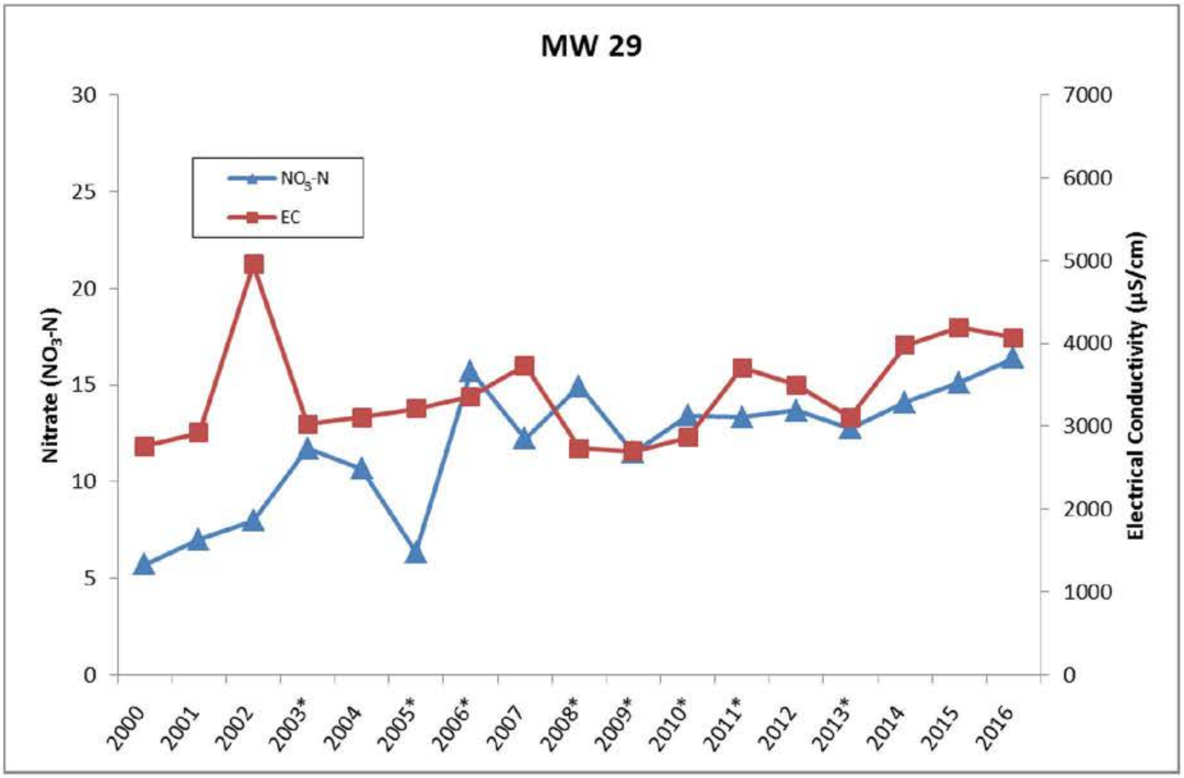

Figure 24. Time-series plot of nitrate-nitrogen (NO_3-N) and electrical conductivity (EC) for MW 29, Murphy Brown Farms, Plum Thicket Nursery #3. Years denoted with an asterisk (*) represent mean values for the sampling year.

Plum Thicket Nursery 4:

MW# 37: This well is new to the 2016 Table 12.

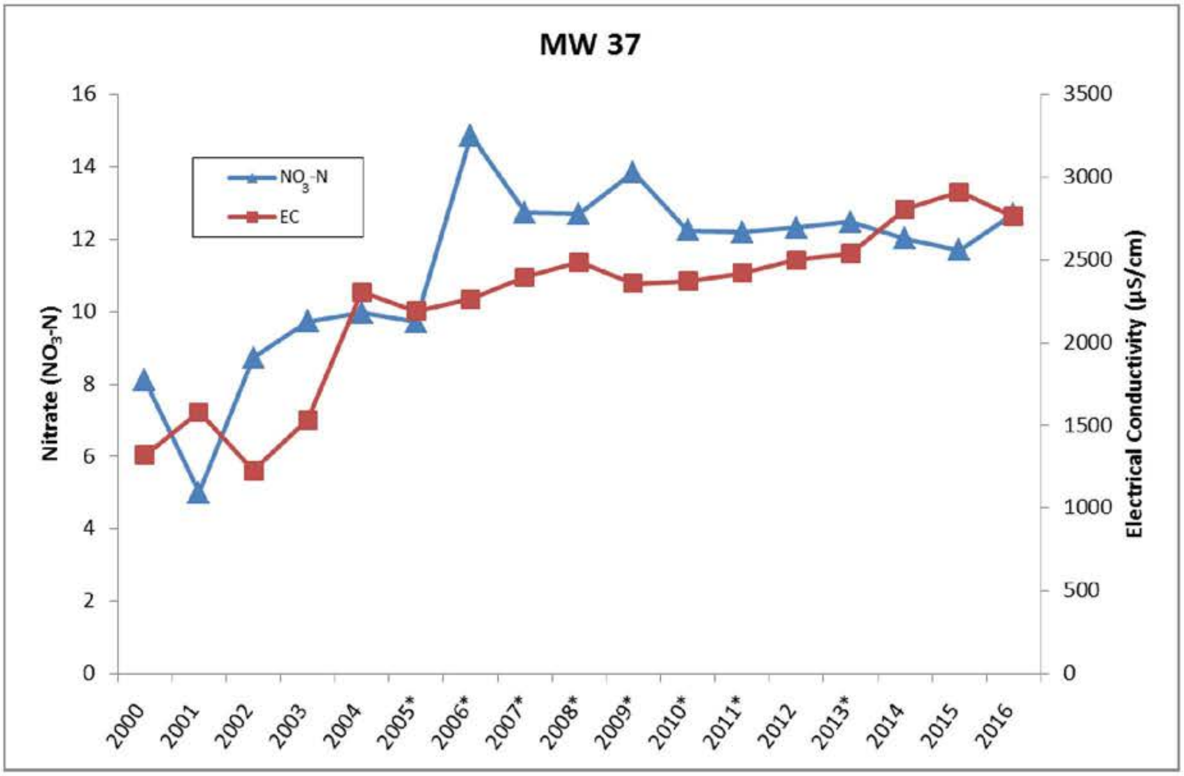

Figure 25. Time-series plot of nitrate-nitrogen (NO_3-N) and electrical conductivity (EC) for MW 37, Murphy Brown Farms, Plum Thicket Nursery #4. Years denoted with an asterisk (*) represent mean values for the sampling year.

Plum Thicket Finisher 2:

1. Bore holes drilled and groundwater samples taken to delineate the vertical and horizontal extent of any possible contamination for MFF Plum Thicket Nurseries and MW#s 34, 37 and 38.
2. Installed three new MW#s 4, 5 and 6 in the locations approved by ODAFF near MW #38.
3. Electronic leak detection method utilized on primary and secondary WRSs.
4. Holes in liner of primary and secondary WRSs repaired.
5. Submitted plan to determine whether or not MNA is appropriate at this facility. Plan involved quarterly sampling for one year to determine whether conditions conducive for MNA exist and to monitor plume migration.

MW# 53: This well (and other wells) was listed as new on the 2013 Table 7. On August 30, 2013, consultants for Murphy Brown sent a plan to address the increasing nitrates in this well and MWs# 37 and 57. For MW#37, sampling data and an evaluation of MNA would be provided in a report by October 4, 2013. For MW# 53, samples would be collected quarterly, to June 2014, with an evaluation of land application of waste, and a report summarizing the sample data and fingerprinting via Stiff and Trilinear diagrams would be submitted to ODAFF within 30 days. There appeared to be no correlation between MW# 57 and the adjacent WRS and they proposed no further action for this well. For MW# 57, nitrate concentrations were decreasing (to 17.41 mg/L from OWRB sampling) and the EC was less than a 25% increase, thus not meeting ODAFF criteria for the 2014 Table 13 and was removed.

On September 16, 2013, ODAFF approved the plan submitted by the consultants. The report for MW# 53 was due July 15, 2014. On March 10, 2014, the consultant reported the results of three consecutive quarters of groundwater and WRS samples for MW# 53. The report concludes that nitrates were trending downward to below 10 mg/L and there is no correlation between the groundwater of MW# 53 and the WRS and proposed no further action at this time unless nitrates again increase. ODAFF agreed with the findings by March 19, 2014 letter.

For MW# 37, the source of nitrates seemed to correlate with commercial fertilizer and the consultant collected samples for ^{15}N isotope analysis (in addition to other wells not subject of this report). ODAFF approved the report and proposed a modified scope of ^{15}N analysis on January 7, 2014, with results to be reported by June 1, 2014. On March 24, 2014, the consultant reported that MW# 37's source of nitrate was commercial fertilizer and not WRS seepage, based on ^{15}N isotope analysis. On April 23, 2014, ODAFF responded and agreed that no further action was required, unless future sampling events result in significant increases in nitrate.

For the 2014 Table 13, MW# 37 at Nursery #4 and MW# 57 at Finisher #4, which were both new to Table 7 in 2013, showed no further action was required and also did not meet the ODAFF criteria for placement on this year's table and were deleted.

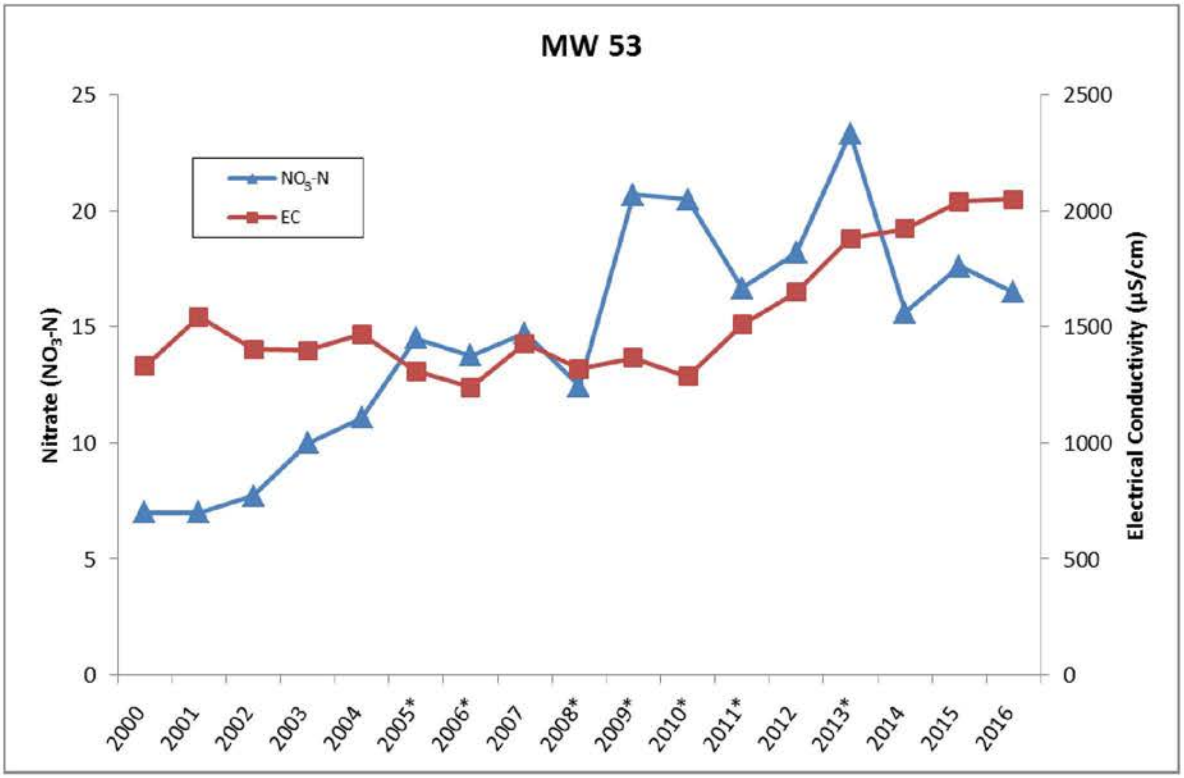

Figure 26. Time-series plot of nitrate-nitrogen (NO_3-N) and electrical conductivity (EC) for MW 53, Murphy Brown Farms, Plum Thicket Finisher #2. Years denoted with an asterisk (*) represent mean values for the sampling year.

Trahern:

MW# 409: This well still meets the ODAFF criteria for placement on the 2016 Table 12 and was previously on the 2015 Table 12.

On February 2, 2015, consultant submitted a groundwater assessment plan to ODAFF. ODAFF approved the plan in a letter dated February 6, 2015 for quarterly sampling in 2015 for the first three quarters and requested the final report be submitted no later than November 13, 2015 and is to include all analytical data, results of quarterly sampling events, diagrams and recommendations for futher action. Quarterly reports have been submitted by the consultant on March 20, 2015 and July 13, 2015. A final report by the consultant on November 30, 2015 proposed that no further sampling of MW-409, other than annual monitoring, was necessary at the present conditions. In addition, the consultant proposed that depth to groundwater measurements be conducted for four quarters to better assess groundwater flow direction. ODAFF agrees with both of these recommendations and no further actions are required at this time.

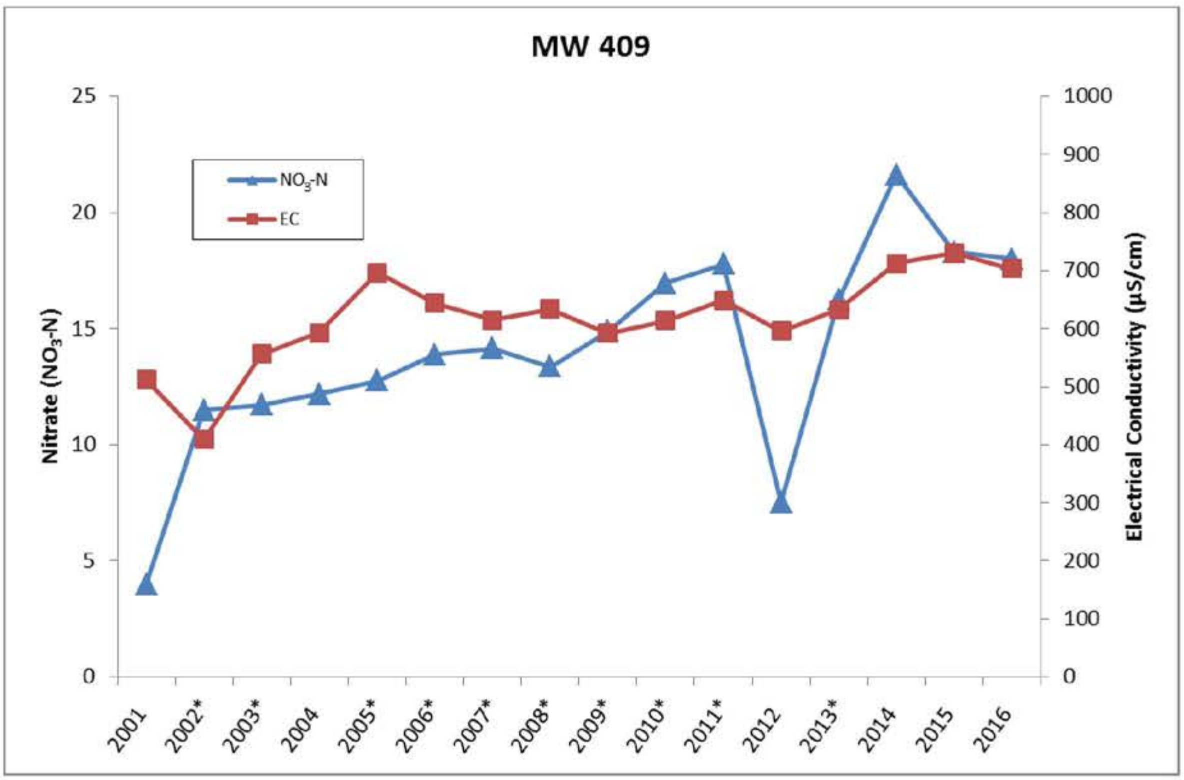

Figure 27. Time-series plot of nitrate-nitrogen (NO_3-N) and electrical conductivity (EC) for MW 409, Murphy Brown Farms, Trahern. Years denoted with an asterisk (*) represent mean values for the sampling year.

Tumbleweed-Sagebrush:

MW# 60: The well was listed on the 2015 Table 12 and still meets the criteria for placement on the 2016 Table 12.

The pump unit that was leaking liquid that may have impacted MW# 60 was repaired in 2012 and is being monitored to ensure there will be no more leaks. The 2013 Table 7 lists new monitoring wells that were not on the 2012 Table 7 list. In May 2013, ODAFF sent letters to these LMFOs. The letters required a plan that included additional sampling, assessments and evaluations of the increasing nitrates. This plan is to be submitted to ODAFF for consideration by September 1, 2013.

Based on recent conditions at the facility further evaluations and an additional investigation are recommended to determine the significant increase nitrate levels downgradient from the lagoon. Further decisions will be made based on upcoming reports and analyses from the facility's consultant(s).

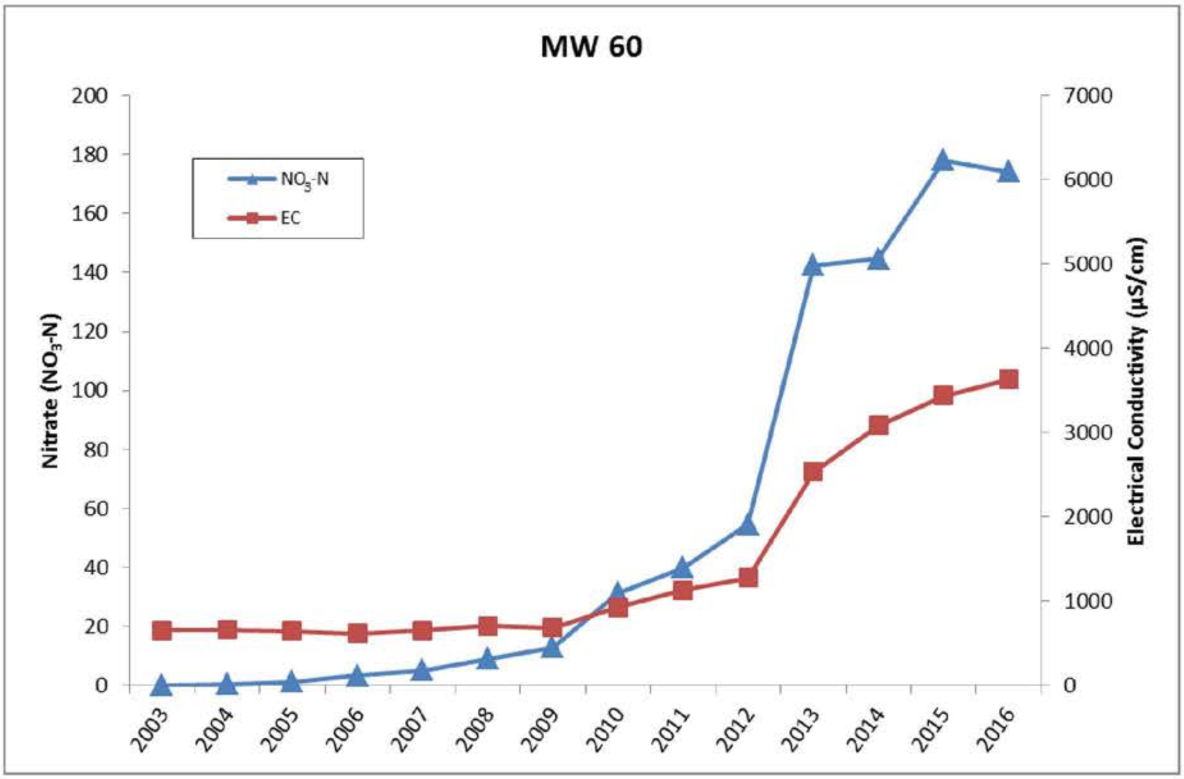

Figure 28. Time-series plot of nitrate-nitrogen (NO_3-N) and electrical conductivity (EC) for MW 60, Tumbleweed-Sagebrush. Years denoted with an asterisk (*) represent mean values for the sampling year.

SEABOARD FOODS, LLC

Seaboard Monitoring Wells on the 2016 Table 12: Fairview Finisher 5-8 – MW #'s 28, 30 and 32 Fairview Sow 2 – MW# 39; Nichols-Radcliff Nursery 137 – MW #254; Stewart and Payne Finisher 1 – MW#'s 19, Finisher 2 – MW #'s 22 and 24, Finisher 3--- MW #'s 10 and 12, and Finisher 4 --- MW #16 and Watson Finisher 242 MW#'s 580-04 and 580-07.

Seaboard Foods, LLC has submitted plans and summaries of actions completed and steps taken for additional investigations to evaluate the source of elevated nitrates and electrical conductivity in the monitoring wells.

Their actions have included the following:

1. Groundwater assessments and gradients.
2. Installation of new additional monitoring wells.
3. Additional groundwater monitoring, sampling and lab analysis for major ions, ammonia- nitrogen, nitrate-nitrogen and fecal coli form.
4. Conducted groundwater elevation assessments.
5. Lab analyses were plotted on Stiff and Tri-linear diagrams to evaluate correlations between lagoons and groundwater and monitoring wells chemistry.
6. Closed a secondary lagoon.
7. N-15 isotope testing.
8. Fingerprinting of lab results from monitoring wells and associated lagoons.
9. Conducted direct push technology (DPT) groundwater investigations.

Seaboard's on-going actions include, but are not limited to, the following:

Seaboard Fairview Finisher 6:

MW# 28 (3500-05): Monitoring Well #28 was listed on 2015 Table 12 and continues to be listed on the 2016 Table 12.

On July 2, 2013, the consultant sent a letter of summary and recommendation to ODAFF for this facility. Seaboard proposed to continue to evaluate the facility over a three year period with sampling conducted on a semi-annual basis. In the last year, samples would be analyzed for major ions to update the Stiff and Trilinear diagrams and for ^{15}N signature. An updated report would be sent to ODAFF at the conclusion of the three year period. If nitrate levels are stable or declining, then normal monitoring practices would resume. ODAFF approved this plan by letter on July 8, 2013.

For MW #28, a letter from the facility to ODAFF, dated February 11, 2015, was in response to a letter from ODAFF dated December 30, 2014, asking for a groundwater investigation plan. The facility letter stated that this well was already under an ODAFF-approved investigation plan which includes a three year semi-annual monitoring schedule. The facility planned to distinguish potential sources with the three years of groundwater sampling and evaluation of groundwater conditions beginning July 2013. In a response letter dated March 3, 2015, ODAFF requested the final report be submitted no later than March 30, 2016. A report dated May 30, 2016 was submitted by the consultants to ODAFF, where the conclusions for the facility indicated that no leakage was detected from the waste retention structure. ODAFF agreed to this recommendation and approved annual monitoring with an annual report letter to review conditions.

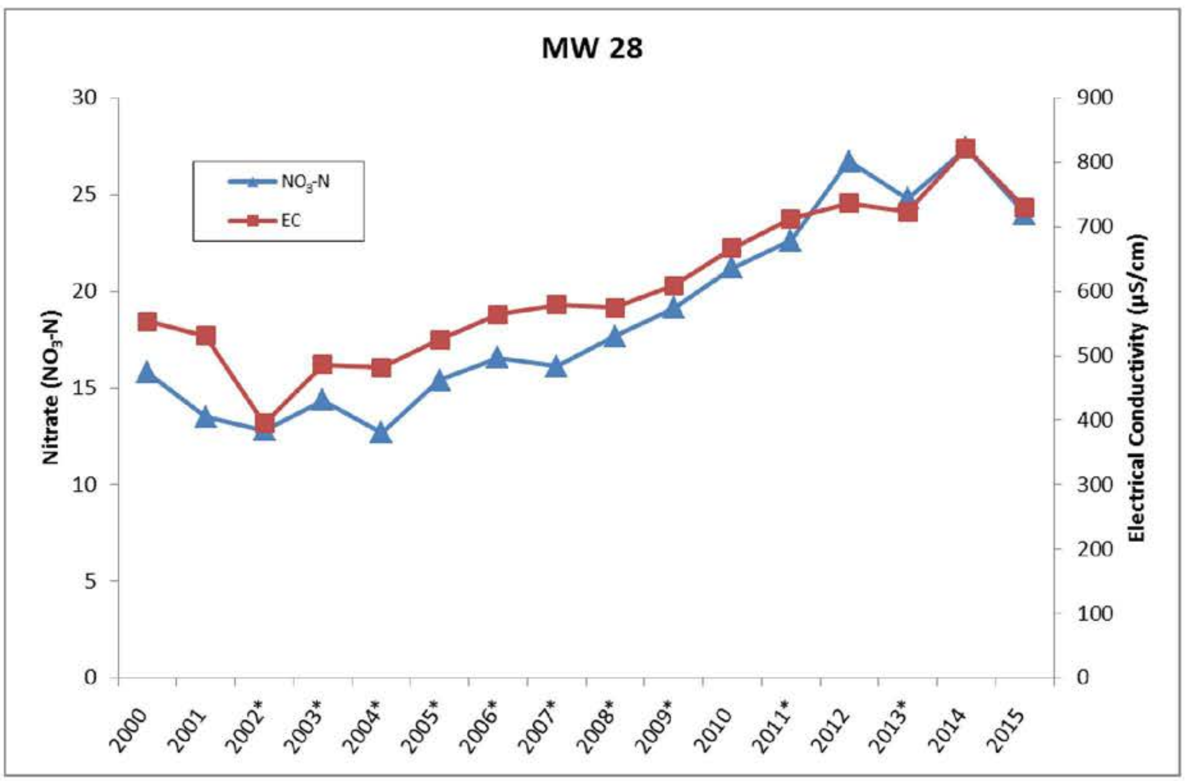

Figure 29. Time-series plot of nitrate-nitrogen (NO_3-N) and electrical conductivity (EC) for MW 28, Seaboard Fairview Finisher #6. Years denoted with an asterisk (*) represent mean values for the sampling year.

Seaboard Fairview Finisher 7:

MWs# 30 and 32: These wells were on the 2015 Table 12 and are still included 2016 Table 12.

A letter from ODAFF on October 27, 2015 was sent to the facility indicating that both wells were included in the 2015 LMFO monitoring well report due to an increase in nitrate concentrations and electrical conductivity readings for the 2014-2015 sampling period. On February 9, 2016 a consultant provided a proposed plan of action that included performing an elevation survey, analyzing groundwater for cations and anions, analyzing WRS effluent, and developing stiff and trilinear diagrams to compare and assess the source of the increased nitrates and EC. ODAFF approved this plan of action on February 18, 2016 with a due date of August 1, 2016. The report dated August 1, 2016 from the consultant indicates that based on groundwater elevation data and isotopic and geochemical analyses, there may be evidence for an effluent source. Therefore, the consultant suggested that a more detailed investigation through use of direct-push sampling is warranted around the retention structure. The results from the additional sampling event are expected to be completed by the end of 2016/early 2017.

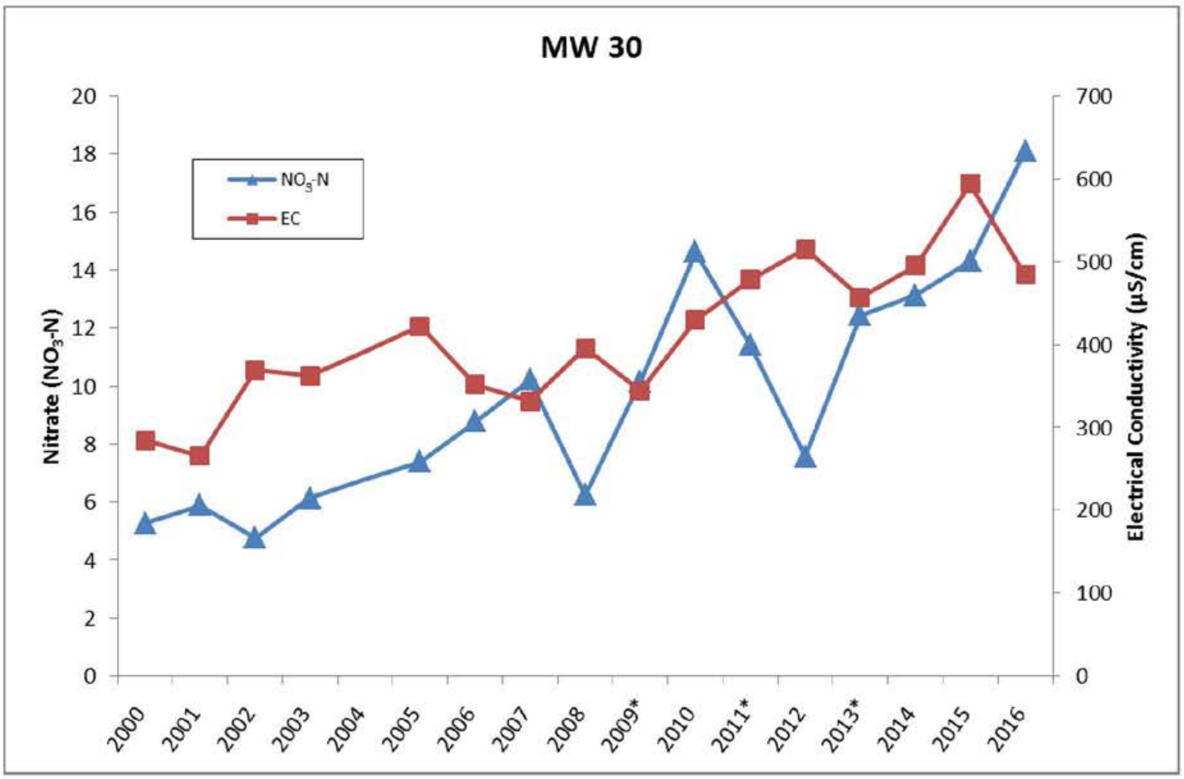

Figure 30. Time-series plot of nitrate-nitrogen (NO_3-N) and electrical conductivity (EC) for MW 30, Seaboard Fairview Finisher #7. Years denoted with an asterisk (*) represent mean values for the sampling year.

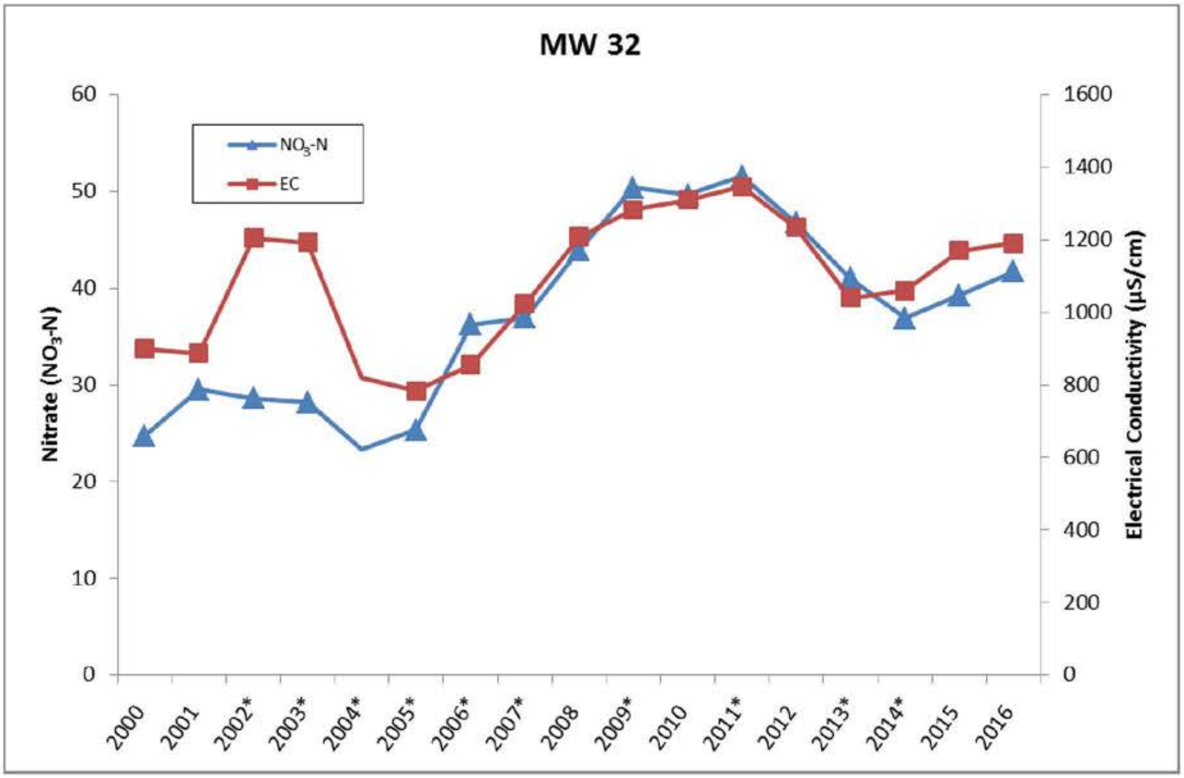

Figure 31. Time-series plot of nitrate-nitrogen (NO_3-N) and electrical conductivity (EC) for MW 32, Seaboard Fairview Finisher #7. Years denoted with an asterisk (*) represent mean values for the sampling year.

Seaboard Fairview Sow #2:

MW# 39: MW# 39 appeared on the 2015 Table 12 because it meets the ODAFF criteria for placement on the table and still has placement on the 2016 Table 12.

On May 21, 2013, ODAFF requested that Seaboard submit a groundwater investigation plan for this well because of high nitrates and EC. The consultant submitted a proposed plan to ODAFF on August 13, 2013. This well is cross-gradient of the WRS and downgradient of the barns and land application area. Test results from ^{15}N isotope analysis were inconclusive and suggest the source of nitrates is not animal source. Seaboard suggested that routine annual monitoring be resumed. ODAFF concurred in a letter dated September 3, 2013 that no additional actions were required and annual routine sampling would continue. ODAFF sent a letter to the facility on October 27, 2015 indicating that based on the historical investigations and trends that no further monitoring was required of the facility beyond annual sampling of the well.

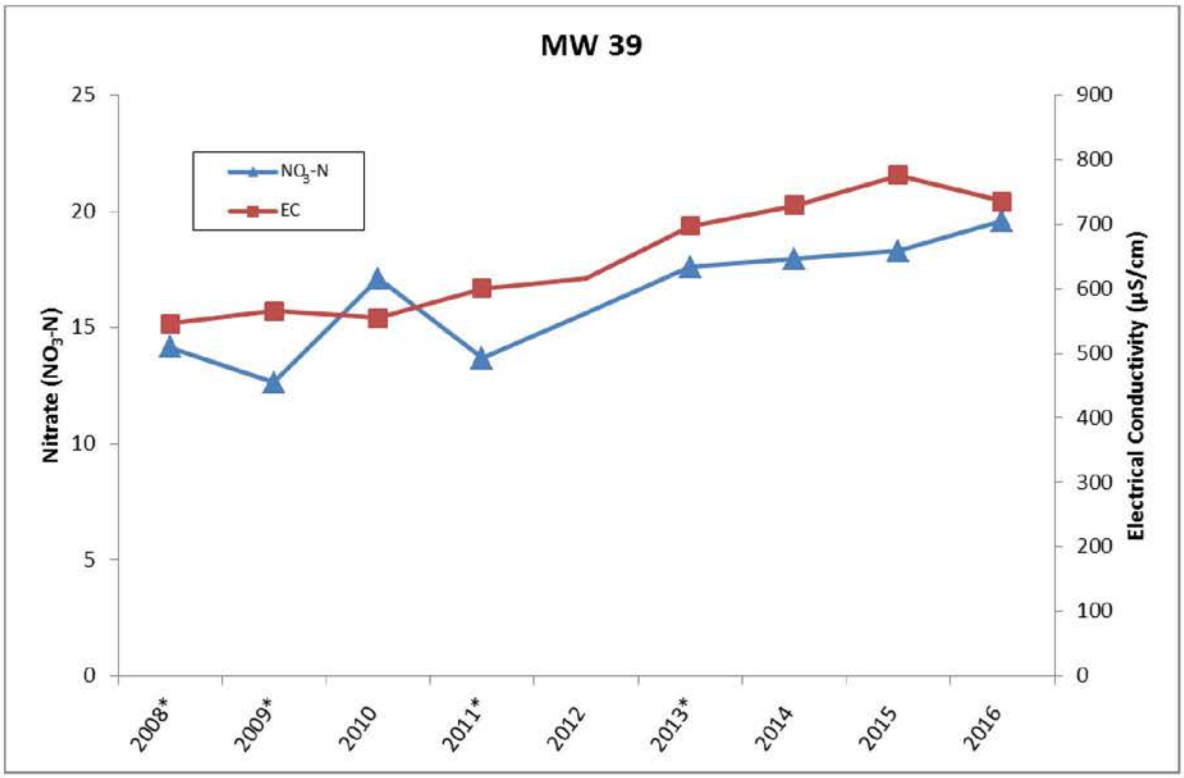

Figure 32. Time-series plot of nitrate-nitrogen (NO_3-N) and electrical conductivity (EC) for MW 39, Seaboard Fairview Sow #2. Years denoted with an asterisk (*) represent mean values for the sampling year.

Seaboard Nichols-Radcliff:

MW# 254: This well is listed as new on the 2015 Table 12 because it meets the ODAFF criteria for placement on the table. It continues to be placed on the 2016 Table 12.

On March 25, 2013, the consultant for this facility submitted a groundwater assessment report to ODAFF. It stated that the local groundwater gradient was to the northwest, and proposed that this gradient was being influenced by nearby high-volume irrigation wells and that it was unlikely that the elevated high nitrates in this well were from the WRS or any other farm operation infrastructure. They recommended a return to normal annual monitoring.

On April 9, 2013 ODAFF approved the recommendation but requested that the irrigation wells be confirmed and to measure the water level in the monitoring wells to establish the groundwater gradient during the next sampling event. On June 12, 2013, Seaboard verified the existence and location of the irrigation wells north and northwest of the facility in a letter to ODAFF.

OWRB provided to Seaboard the latest water level measurements of the monitoring wells on April 23, 2014. The measurements confirmed a groundwater gradient to the northwest. A report dated July 2, 2014 summarized these results from the investigation and Seaboard recommended a return to routine annual monitoring. ODAFF responded by agreeing with the findings and concurring that annual monitoring would be resumed.

ODAFF sent a letter to the facility on October 27, 2015 indicating that based on the historical investigations and trends that no further monitoring was required of the facility beyond annual sampling of the well.

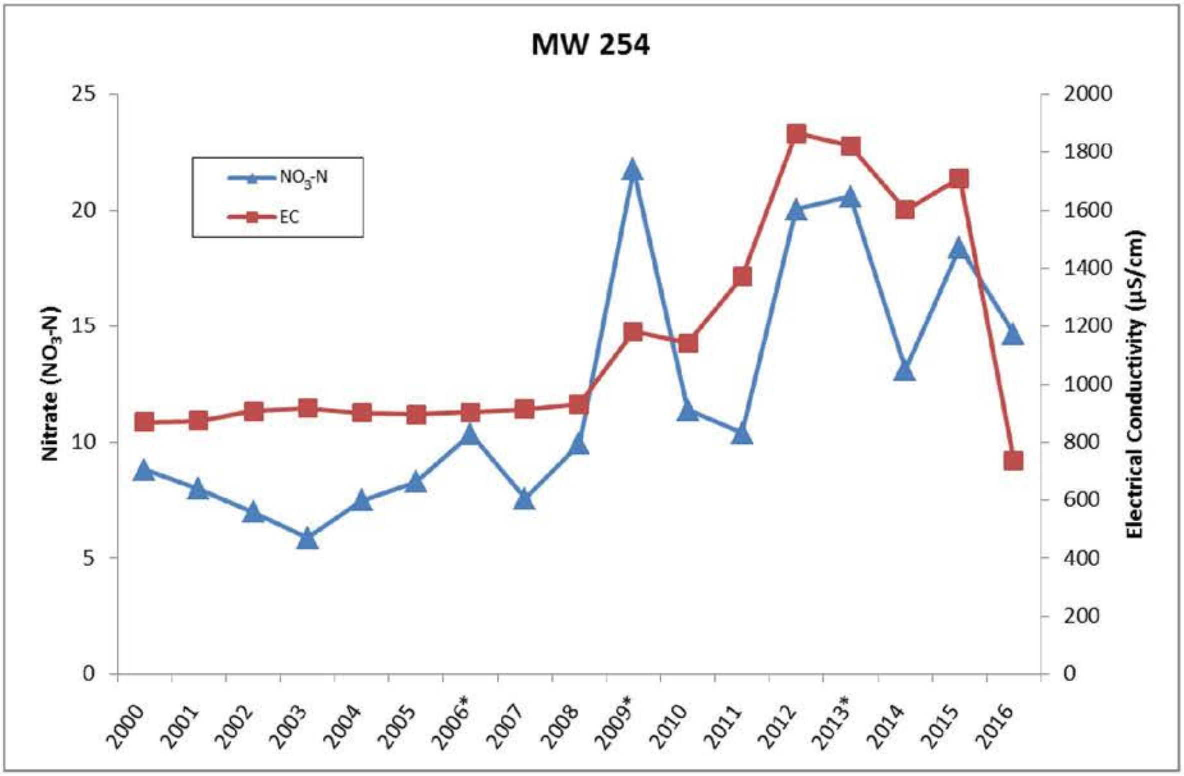

Figure 33. Time-series plot of nitrate-nitrogen (NO_3-N) and electrical conductivity (EC) for MW 254, Seaboard Nichols-Radcliff. Years denoted with an asterisk (*) represent mean values for the sampling year.

Seaboard Stewart and Payne Finisher #1:

MW# 19: This well was listed on the 2015 Table 12 and continues to be listed on the 2016 Table 12 since it meets the ODAFF criteria for placement on the table.

1. Land application practices were changed by using a lower volatilization factor in agronomic rate calculations resulting in less animal waste applied.

Status: On-going evaluation.

A letter from the consultant dated February 11, 2015 included a proposed groundwater investigation that included: 1) completion of a top of casing elevation survey of monitoring wells; 2) measure depth to groundwater; 3) analyze groundwater for Na, Mg, Ca, K, B, Cl, NH_4-N, SO_4, CO_3, HCO_3, TSS, EC, SAR, P and stable isotopes of nitrogen; 4) analyze the waste retention structure effluent for nitrate, Na, Mg, Ca, K, B, Cl, NH_4-N, SO_4, CO_3, HCO_3, TSS, EC, SAR and P; and 5) develop ST diagrams to assess correlation between effluent and groundwater chemistry. ODAFF agreed to this proposal in a letter dated March 3, 2015 and requested that by August 31, 2015, Seaboard will submit a report that includes: 1) a description of groundwater sampling activities; 2) tabulated analytical results and lab reports; 3) ST diagrams; and 4) recommendations of additional actions based on results.

The facility's consultant submitted a report to ODAFF on August 31, 2015 that recommended no additional actions were required due to no evidence of increasing nitrate conditions at the farm. In addition, the consultant indicated that this well was an upgradient well and therefore the increase in nitrate concentrations was due to current or previous waste management practices upland of the farm. ODAFF approved this recommendation on September 25, 2015 with the addition of requesting that the facility install a new monitoring well downgradient of the lagoon since only one well was present directly downgradient. A new well was installed in the first quarter of 2016 and has been established as the new true downgradient well and is included in the upcoming annual sampling events for the facility. Baseline data was collected following completion of the well.

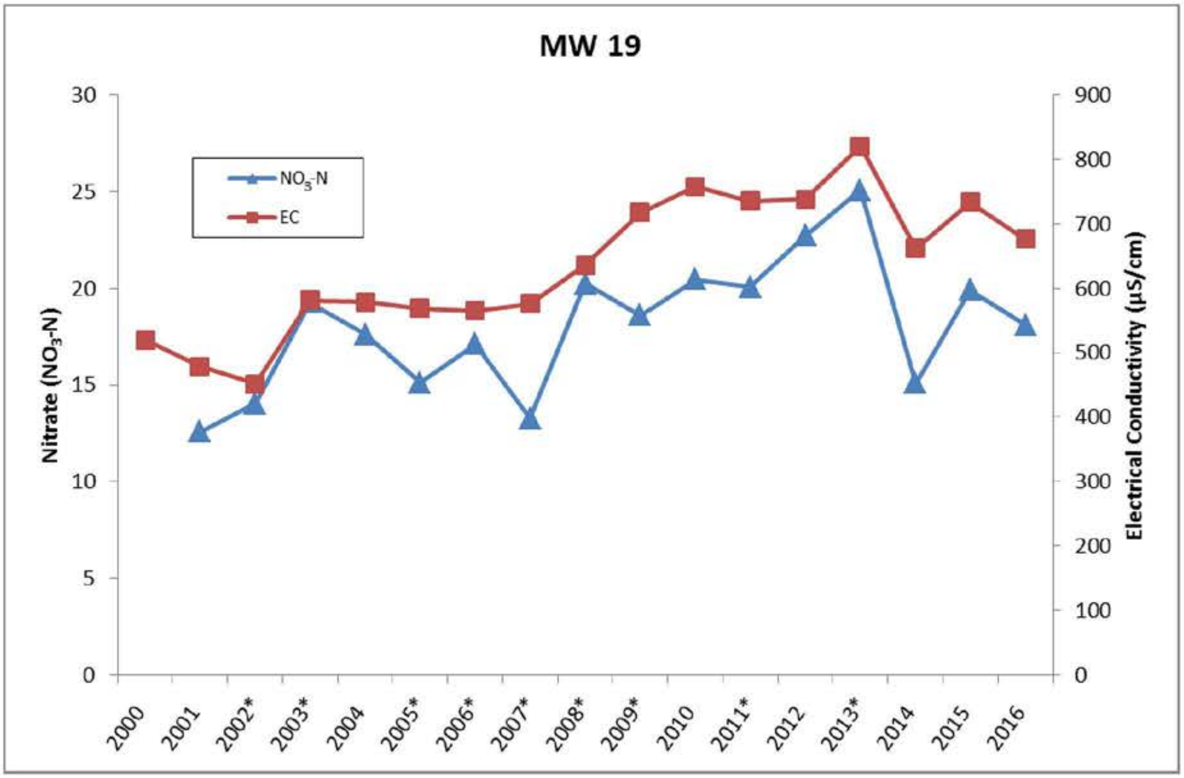

Figure 34. Time-series plot of nitrate-nitrogen (NO_3-N) and electrical conductivity (EC) for MW 19, Seaboard Stewart and Payne Finisher #1. Years denoted with an asterisk (*) represent mean values for the sampling year.

Seaboard Stewart and Payne Finisher #2:

MWs# 22 and 24: These wells were listed on the 2015 Table 12 and continue to be listed on the 2016 Table 12 as they continue to meet the ODAFF criteria for placement on the table.

1. Installation of two new monitoring wells in the fall of 2011 at the NW and SE corners of the WRS.
2. A DPT investigation of the land application area was conducted in Summer 2012.
3. Used a lower volatilization factor in agronomic waste calculation so less animal waste was land applied.

The 2013 Table 7 lists new monitoring wells that were not on the 2012 Table 7 list. In May 2013, ODAFF sent letters to these LMFOs. The letters required a plan that included additional sampling, assessments and evaluations of the increasing nitrates. This plan was submitted to ODAFF for consideration by September 1, 2013.

These wells are already subject of an active groundwater investigation and evaluation dating back to 2012. Well #23 was listed as new on the 2013 Table 7. A report dated October 2, 2012 from the consultant summarized the assessment that utilized drilling 19 boreholes using Direct Push technology in the land application areas. Sources of high nitrate may be from land application area, as there is a similarity between the Trilinear and Stiff diagrams between monitoring wells and land application area samples. A plume of elevated nitrates from the land application area is migrating toward the barn and WRS and the leading edge of the plume is moving through the well system.

It is hoped that the wells will stabilize in its nitrate content. Groundwater conditions seem to be improving and Seaboard will continue to monitor groundwater quality and submit annual reports by October 1 of each year until further notice. In a letter dated September 9, 2013, ODAFF agreed that no additional investigation is required at this time.

A letter dated September 23, 2014 from the consultant discussed the latest findings for MW #'s 22, 23 and 24. MW #23 is upgradient of the waste retention structure and MW #'s 22 and 24 are downgradient. Nitrate levels in MW #23 have declined significantly and levels in MW #'s 22 and 24 have fluctuated but no definite trend has been indicated. They believe a nitrate plume is migrating southward through the barn and waste retention structure from the land application areas. The monitoring well field will likely experience peak concentrations until the plume has moved through the monitoring well system. Based on the data evaluated, no change in the evaluation process is recommended and the next annual report will be submitted to ODAFF by October 1, 2015.

A September 24, 2015 letter from the consultant was received and reviewed by ODAFF, and the recommendation indicated no additional monitoring was needed beyond annual sampling due to no correlation between the lagoon and groundwater. A letter dated October 27, 2015 from ODAFF indicated to the facility that this well was above the threshold for nitrate and EC levels; however, no additional monitoring beyond annual monitoring is required based on historical trends and analyses. Further investigations will be determined following future sampling events.

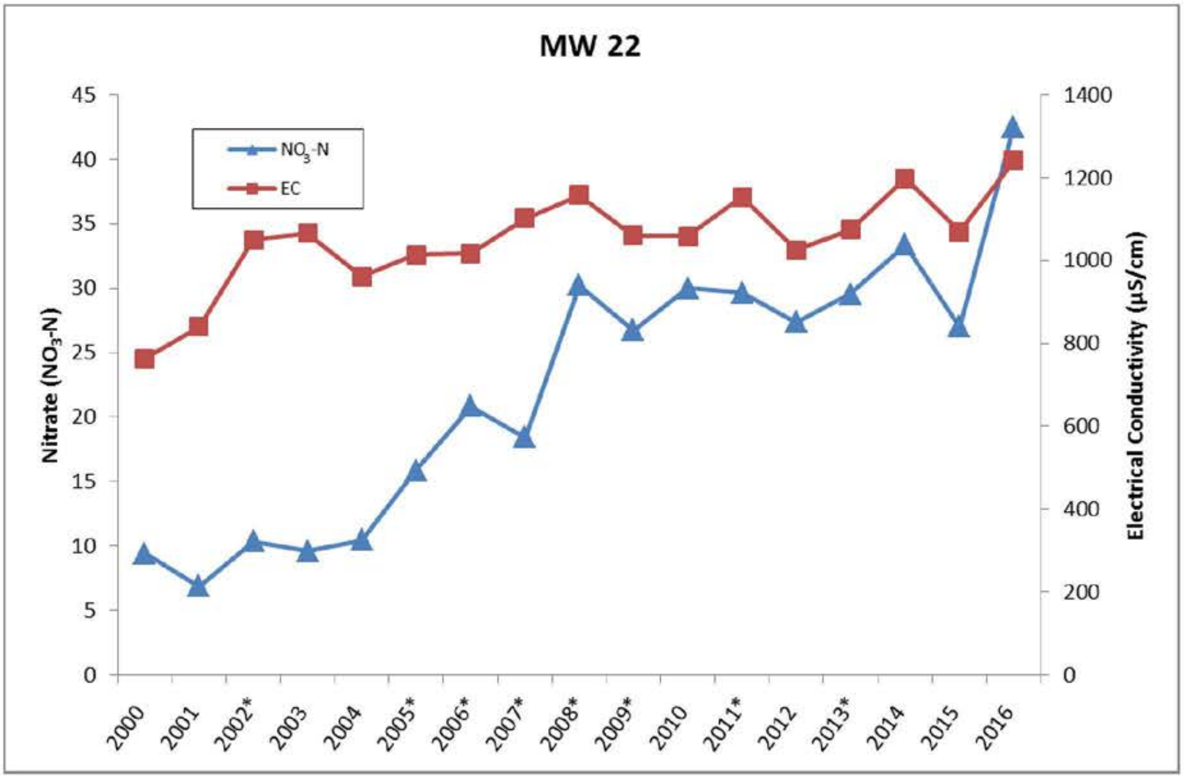

Figure 35. Time-series plot of nitrate-nitrogen (NO_3-N) and electrical conductivity (EC) for MW 22, Seaboard Stewart and Payne Finisher #2. Years denoted with an asterisk (*) represent mean values for the sampling year.

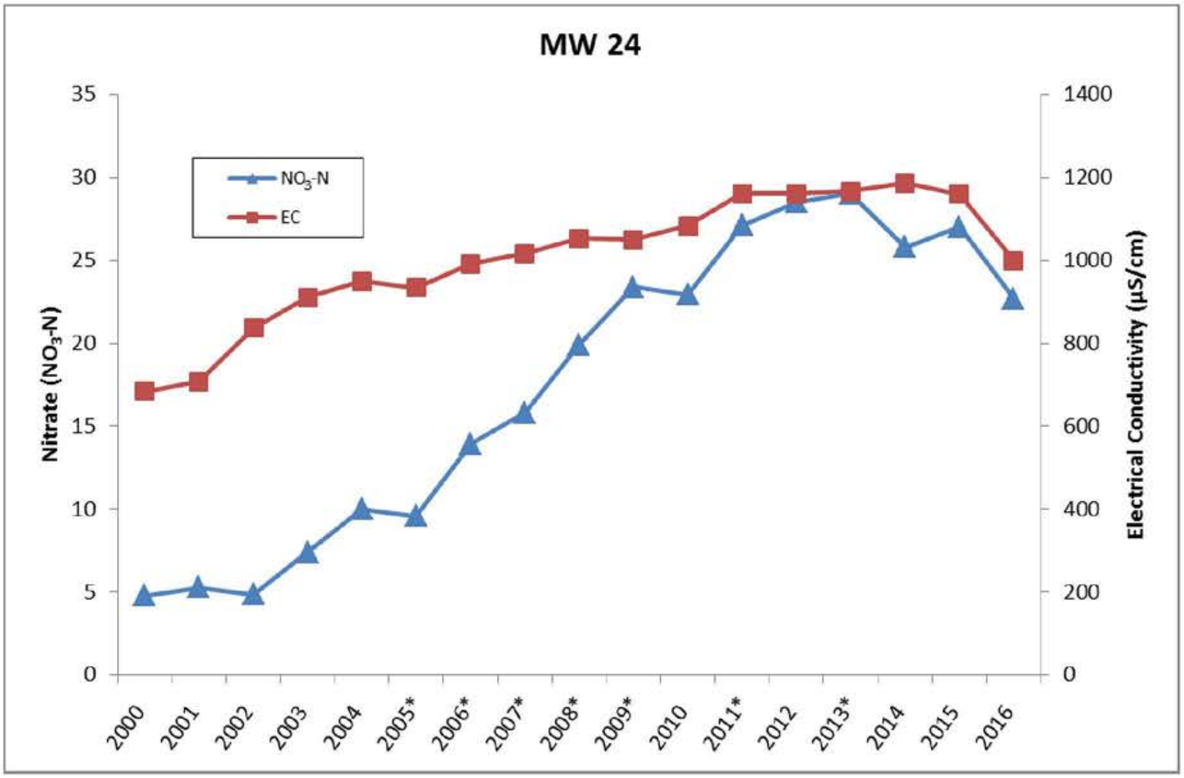

Figure 36. Time-series plot of nitrate-nitrogen (NO_3-N) and electrical conductivity (EC) for MW 24, Seaboard Stewart and Payne Finisher #2. Years denoted with an asterisk (*) represent mean values for the sampling year.

Seaboard Stewart and Payne Finisher #3:

MW# 10: This well was on the 2015 Table 12 and continues to be listed on the 2016 Table 12 as it meets the ODAFF criteria for continued placement on the table.

In an August 27, 2013 letter, Seaboard temporarily suspended use of the upgradient land application area so that nitrate levels in monitoring wells could decline and proposed that no new groundwater investigation was merited and annual monitoring be reinstated. ODAFF concurred by letter on September 3, 2013. A letter dated October 27, 2015 from ODAFF indicated to the facility that this well was above the threshold for nitrate and EC levels; however, no additional monitoring beyond annual monitoring is required based on historical trends and analyses. Further investigations will be determined following future annual sampling events.

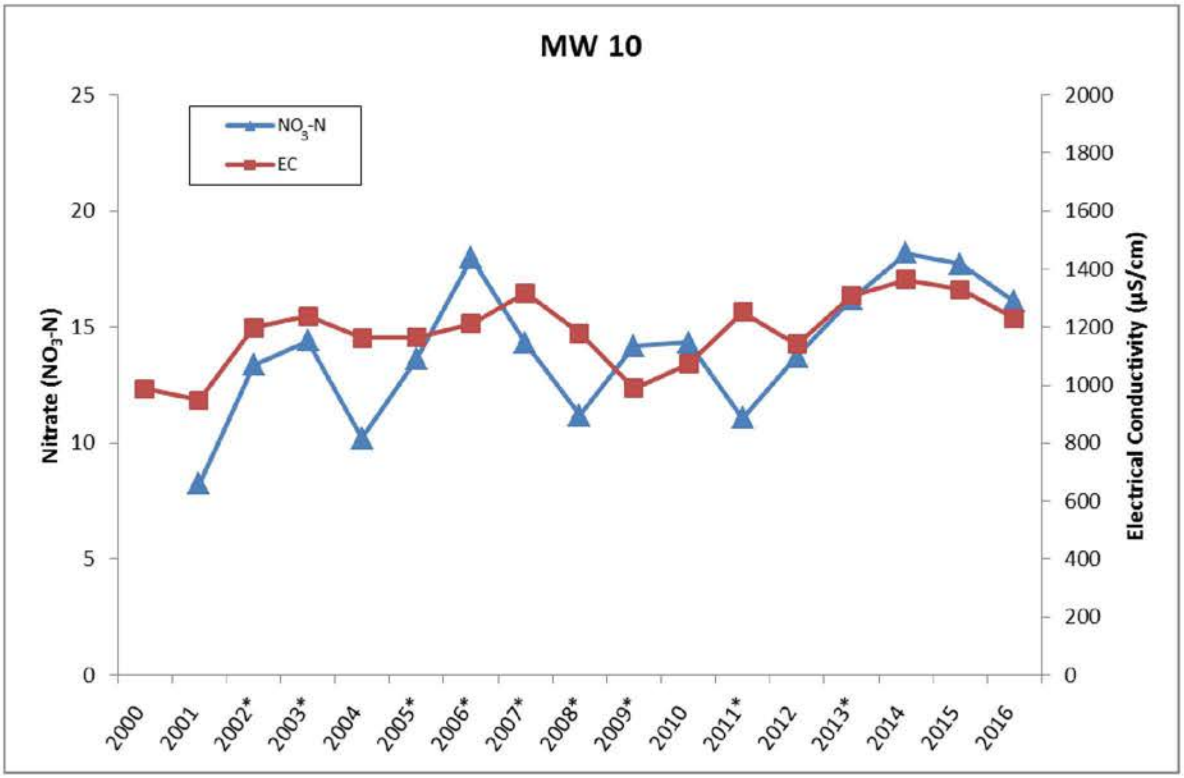

Figure 37. Time-series plot of nitrate-nitrogen (NO_3-N) and electrical conductivity (EC) for MW 10, Seaboard Stewart and Payne Finisher #3. Years denoted with an asterisk (*) represent mean values for the sampling year.

Seaboard Watson Finisher:

MW# 580-04 and 580-07: This well was listed on the 2015 Table 12 and also on the 2016 Table 12.

The consultant sent an annual evaluation of groundwater for this farm on August 13, 2013. It was concluded that a plume of elevated nitrates is moving slowly through the monitoring well network. Site conditions seem to be stable. Seaboard will continue to monitor site conditions and submit the next data evaluation by September 1, 2014.

A letter dated August 25, 2014 from the consultant states that this well is upgradient from the waste retention structure. The peak nitrate level was in 2012 and has begun to decline. They concluded a plume of elevated nitrates is moving slowly through the monitoring well network, moving southeast with the groundwater flow. Site conditions appear to be stable and not a risk in the foreseeable future. Seaboard will continue to monitor site conditions and submit the next data evaluation by September 1, 2015. Based on the August 31, 2015 submittal, ODAFF approved an annual monitoring schedule on September 25, 2015 with bi-annual reporting. Further evaluations will be determined after September 2017 report is submitted.

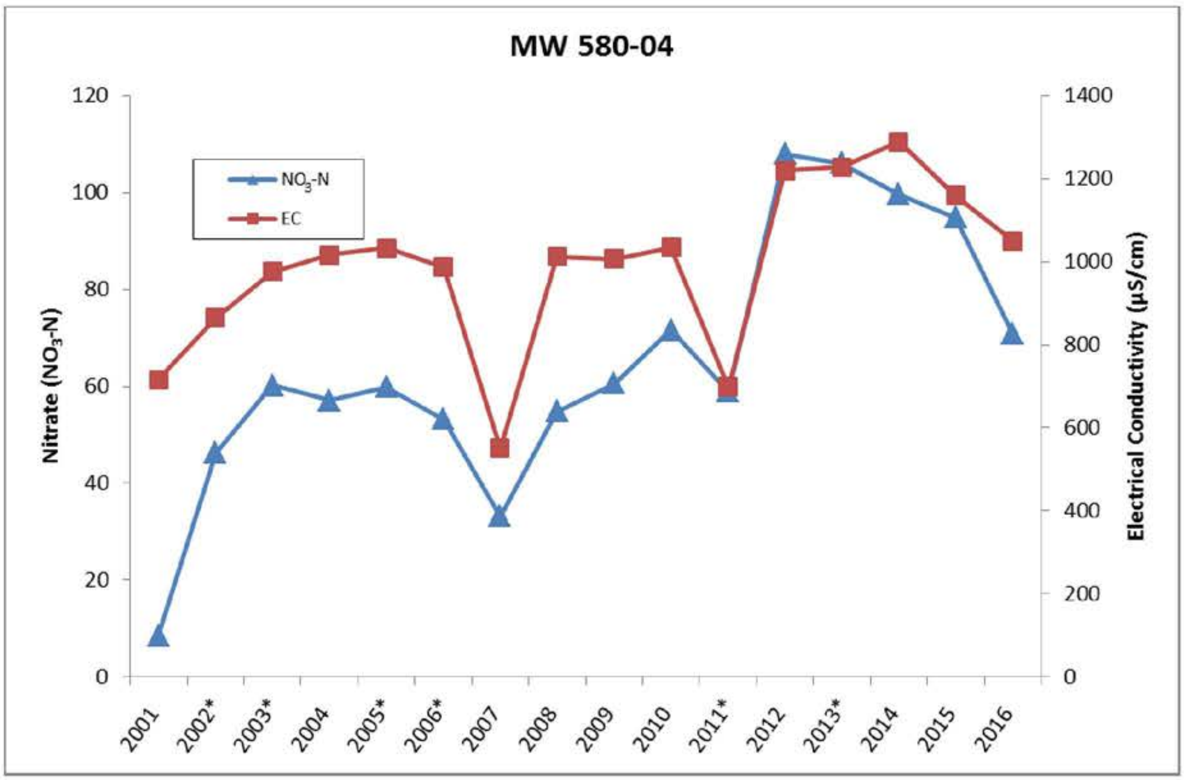

Figure 38. Time-series plot of nitrate-nitrogen (NO_3-N) and electrical conductivity (EC) for MW 580-04, Seaboard Watson Finisher. Years denoted with an asterisk (*) represent mean values for the sampling year.

MW# 580-07: This well was on the 2015 Table 12 and is listed on the 2016 Table 12.

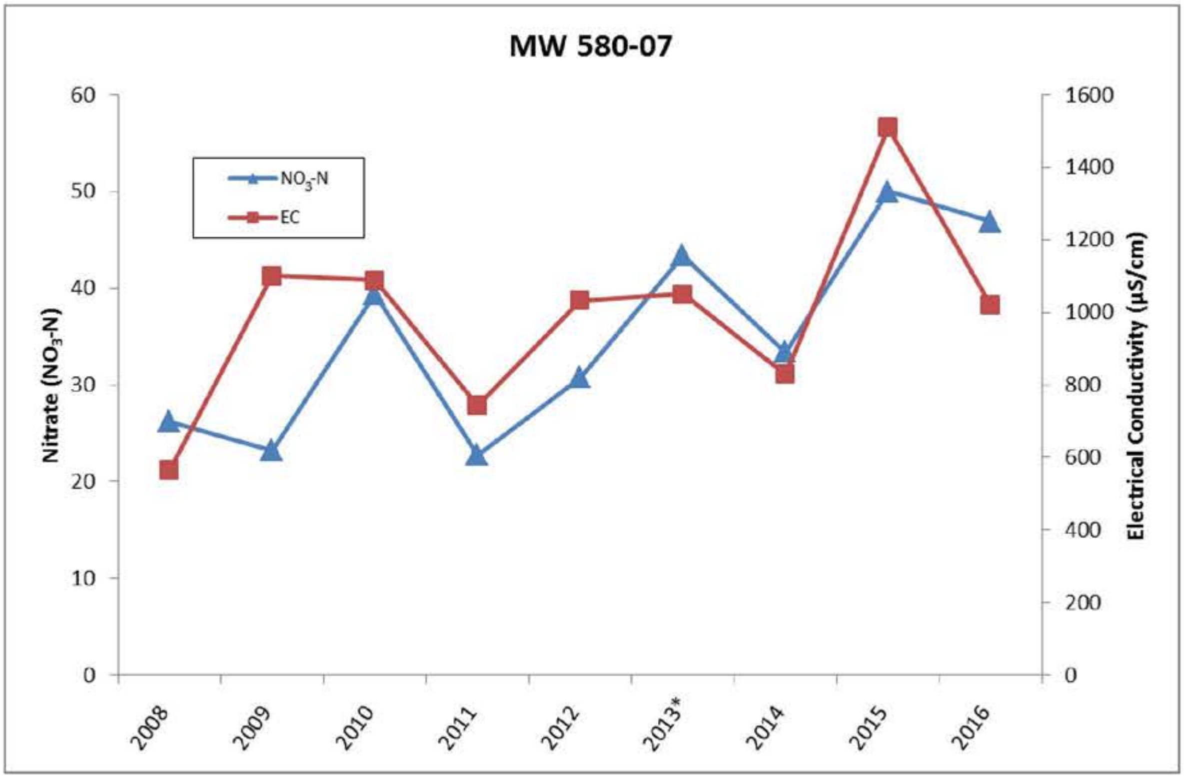

Figure 39. Time-series plot of nitrate-nitrogen (NO_3-N) and electrical conductivity (EC) for MW 580-07, Seaboard Watson Finisher. Years denoted with an asterisk (*) represent mean values for the sampling year.

TUMBLEWEED, LLC

Tumbleweed LLC, Farm 6 BG

MW# 20: Monitoring Well #20 was on Table 13 in 2015 and remains on the 2016 Table 12.

After receiving a letter from ODAFF dated July 9, 2013, requesting a groundwater investigation plan due September 1, 2013, Tumbleweed asked for a 30-day extension from the September 1, 2013 due date, to October 1, 2013, to submit the report on remediation actions for Farm 6 BG, Monitoring Well #20 due to change of ownership. Permission was granted by ODAFF on August 17, 2013.

On October 1, 2013, the report was received by ODAFF and approved October 2, 2013. Their recommendations were as follows:

> Discontinue the use of the drying bed
> Perform shallow soil investigation by trenching suspect areas within the vicinity of MW #20 and repair broken piping, if encountered
> Perform semi-annual monitoring of groundwater and lagoon effluent through 2014 and
> Report the lab results of semi-annual monitoring within six (6) weeks of collecting samples.

These findings were to be reported to ODAFF by December 1, 2013. The first semi-annual monitoring report for MW#20 was received on November 8, 2013 and nitrates were 87.1 mg/L. The trenching investigation results were received December 6, 2013. Based on the soil sample results of 2.42 mg/Kg and 4.43 mg/Kg, there appears to be no impact to the soil from the adjacent swine structure, including the plumbing. ODAFF accepted the findings by letter on December 17, 2013. Additional sampling has ceased as a result of findings.

On May 21, 2015, the consultant sent a letter to ODAFF, summarizing the semi-annual sampling. Since the drying beds have been decommissioned, the nitrate concentrations have decreased but recommend semi-annual sampling through 2016, at which time the need for additional actions can be evaluated. ODAFF agreed by letter on July 2, 2015 that the groundwater quality has improved since the drying bed removal but further monitoring is needed through bi-annual sampling through 2016. This report is to be submitted no later than February 15, 2017.

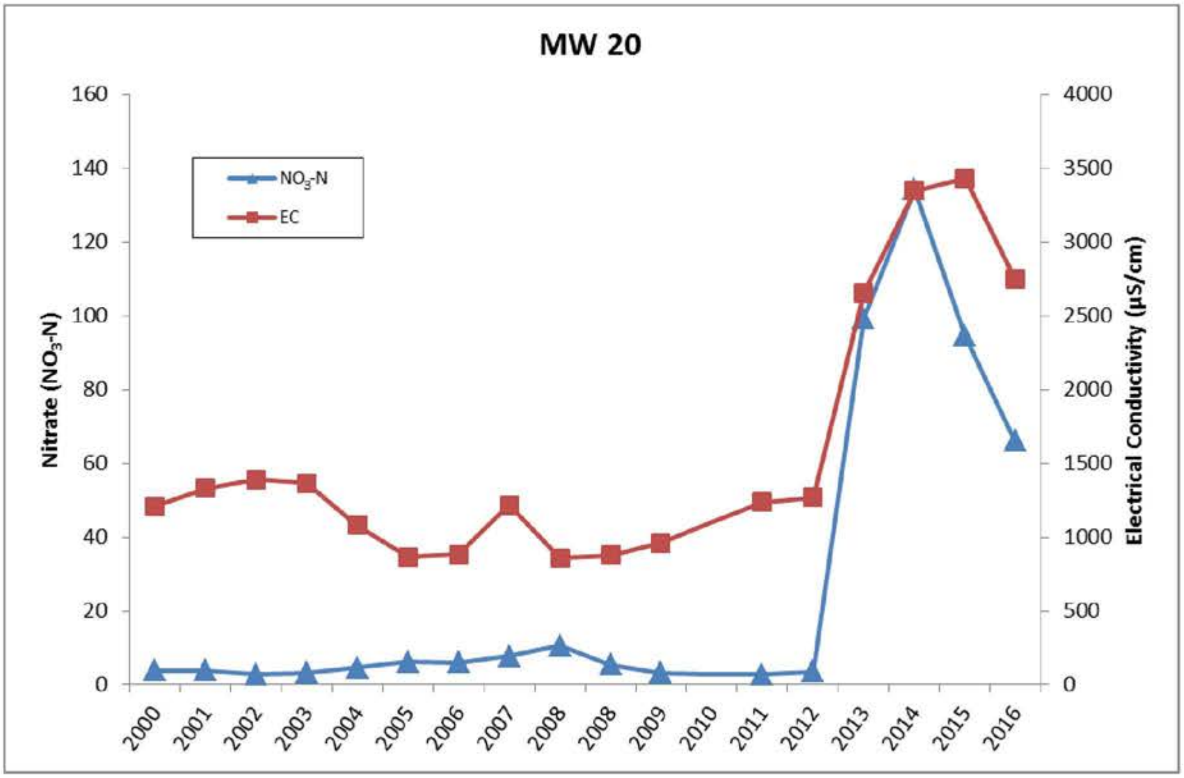

Figure 40. Time-series plot of nitrate-nitrogen (NO_3-N) and electrical conductivity (EC) for MW 20, Tumbleweed Farms, Farm 6 BG. Years denoted with an asterisk (*) represent mean values for the sampling year.

ODAFF Historic and On-going Actions

ODAFF has required some geophysical survey investigations utilizing a resistivity imaging system to be performed at some LMFO swine feeding operations sites.

Lagoons and evaporative basins at some LMFOs have closed, groundwater remediation completed and/or new lagoons constructed.

ODAFF has collaborated with U.S. Geological Survey (USGS) in a study to identify NO_3-N in specific monitoring wells. This project included using nitrogen isotope (N-15) ratios of dissolved major ions, dissolved trace elements, wastewater organic compounds and fecal coliform.

ODAFF, through a cooperative study, has conducted bacteria ribotyping to identify E-coli bacteria isolates in monitoring wells (2005, 2006, 2007, 2008 and 2009).

ODAFF through a cooperative study with the Bio-Environmental Engineering Lab at O.U. has conducted microbial strain tracing using phenotype micro-array technology to assess the groundwater quality in both annual sampling and re-sampling. Annual sampling and lab testing for electrical conductivity, pH, ammonium-nitrogen, total phosphorus and fecal coliform bacteria is in place. Re-sampling of monitoring wells that have lab results indicating Nitrate-N exceeding 10 mg/L and ammonium-N exceeding 1 mg/L.

Detailed sample analysis involving a full suite of cations and anions to conduct fingerprinting between the lagoon and the monitoring well analyses using Tri-linear and Stiff diagrams.

Practices related to land applications of swine waste were required to be modified or changed at certain specific LMFOs.

Evaluation of antecedent land use that existed near LMFO monitoring wells prior to their construction was conducted by USGS.

ODAFF has conducted a special study of a nine-section area around monitoring wells at two LMFOs to evaluate the effect of surrounding land uses and their impact on groundwater quality.

ODAFF looked into the increase in nitrate-nitrogen (NO_3-N) with concurrent increase in total salinity by examining the electrical conductivity (EC) of the samples because the ECs of the lagoons are significantly higher. In many cases, EC did not increase and in some cases actually decreased indicating that the lagoons are not the primary source of contamination.

ODAFF approved the use of direct push technique (DPT) groundwater investigations.

ODAFF has retrofitted specific monitoring wells by making structural changes in the casing design or casing length with some positive results being realized.

ODAFF has taken a "mid-course correction" in some cases where the well screens were not placed against the appropriate geological aquifer material. In some instances, the cement located behind the casing was inadequate and wells were re-drilled to specifications to solve the problem.

ODAFF has required specific LMFO licensees to retrofit certain monitoring wells by reinstallation of metal protective casing with extensions two feet above the concrete apron to prevent surface runoff impact to the groundwater.

Requirement by ODAFF of a remediation system (on-going in 2013) that includes groundwater remediation by carbon substrate injection.

Appendix I

Below is a cost expenditures worksheet for 106 LMFO Monitoring for FY 16. Information was provided by the Oklahoma Water Resources Board.

Project code(s):	02918 16	Department:	2002041		Name:	106 LMFO Monitoring (ODAFF)			
Purchase Order:	I-00640015	Contract %:	100.00%		Start date:		7/1/2015	Balance due:	$ 14,179.81
Division:	Water Quality	OWRB %:	0.00%		End date:		6/30/2015	CFDA	66.419
Contact:	Mark Belden	Contract $:	$ 170,000.00		2nd Party		$ 170,000.00	2nd Party Bal.:	$ -
Date submitted :	7/13/2016	OWRB $:	$ -		OWRB Share:		$ -	OWRB Bal.:	$ -
Report date:	5/31/2016	Total $:	$ 170,000.00		Total project cost to date:		$170,000.00	Total balance:	$ -
Funds requested this report:		$ 877.76							
	Personnel	Fringes	Travel	Equipment	Supplies	Contractual	Other	Indirect	Totals
Contract Award:							$ 170,000.00		$ 170,000.00
Prior FY's:									
7/31/2015									
8/31/2015									
9/30/2015	$ 1,771.89	$ 1,250.09			$ 5,524.26			$ 1,748.53	$ 10,294.77
10/31/2015									
11/30/2015	$ 12,438.04	$ 8,775.28	$ 2,730.13		$ 560.44	$ 983.80		$ 12,274.00	$ 37,761.69
12/31/2015	$ 8,431.97	$ 5,948.74	$ 3,399.35		$ 1,861.35	$ 571.91		$ 8,320.64	$ 28,533.96
1/31/2016	$ 6,878.88	$ 4,852.97	$ 63.75		$ 111.18	$ 215.95		$ 6,788.07	$ 18,910.80
2/28/2016	$ 8,092.33	$ 5,709.26	$ 1,619.06					$ 7,985.51	$ 23,406.16
3/31/2016	$ 12,648.17	$ 8,923.22	$ 2,859.84					$ 12,481.58	$ 36,912.81
4/30/2016	$ 4,208.90	$ 2,969.36	$ 354.66			$ 1,615.80		$ 4,153.33	$ 13,302.05
5/31/2016	$ -		$ 439.00			$ 438.76			$ 877.76
6/30/2016									
7/31/2016									
8/31/2016									
9/30/2016									
10/31/2016									
11/30/2016									
12/31/2016									
1/31/2017									
2/28/2017									
3/31/2017									
4/30/2017									
5/31/2017									
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10/31/2017									
11/30/2017									
12/31/2017									
1/31/2018									
2/28/2018									
3/31/2018									
4/30/2018									
5/31/2018									
6/30/2018									
Total project	$ 54,470.18	$ 38,428.92	$ 11,465.79		$ 8,057.23	$ 3,826.22		$ 53,751.66	$ 170,000.00
Balances:	$ (54,470.18)	$ (38,428.92)	$ (11,465.79)		$ (8,057.23)	$ (3,826.22)	$ 170,000.00	$ (53,751.66)	$ -

Appendix II

Facility Name	MW No.	Fiscal Year	License Number	Date Sampled	Field Conductivity (uS/cm)	Lab Conductivity (uS/cm)	NH4-N (ppm)	NO3-N (ppm)	Total P	Fecal Coliform	County	Sample
3 L Farms LLC	1	2016	980014								Texas	Dry
3 L Farms LLC	2	2016	980014								Texas	Dry
3 L Farms LLC	3	2016	980014								Texas	Dry
5-D Swine, Inc.	1	2016	990003	11/24/15	3972	3750	< 0.11	29.4	0.53	0.0001	Custer	Wet
5-D Swine, Inc.	2	2016	990003	11/24/15	6866	6990	< 0.11	65.7	0.75	0.0001	Custer	Wet
5-D Swine, Inc.	3	2016	990003	11/24/15	6174	6410	0.17	0.58	2.71	0.0001	Custer	Wet
5-D Swine, Inc.	30	2016	990003			< 23	< 0.11	< 0.02	< 0.02	0.0001	Custer	QA
Bolin Hog Facility	1	2016	1244	12/16/15	791	765	< 0.11	16.4	0.56	0.0001	Pontotoc	Wet
Bolin Hog Facility	2	2016	1244	12/16/15	7230	6970	< 0.11	< 0.02	0.34	0.0001	Pontotoc	Wet
Bolin Hog Facility	3	2016	1244	12/16/15	2310	2180	< 0.11	0.5	0.15	0.0001	Pontotoc	Wet
Bolin Hog Facility	4	2016	1244	12/16/15	10.56	983	0.54	9.28	1.16	4	Pontotoc	Wet
Bolin Hog Facility	5	2016	1244	12/16/15	1920	1860	< 0.11	0.21	0.32	0.0001	Pontotoc	Wet
Bolin Hog Facility	7	2016	1244							0	Pontotoc	Dry
Bolin Hog Facility	8	2016	1244							0	Pontotoc	Dry
Bolin Hog Facility	9	2016	1244							0	Pontotoc	Dry
Bolin Hog Facility	10	2016	1244	12/16/15	842	745	< 0.11	13	0.1	0.0001	Pontotoc	Wet
Bolin Hog Facility	11	2016	1244								Pontotoc	Dry
Bolin Hog Facility	12	2016	1244	12/16/15	1530	1490	< 0.11	4.78	0.39	0.0001	Pontotoc	Wet
Bolin Hog Facility	40	2016	1244	12/16/15		1040	0.43	9.49	0.3	5	Pontotoc	QA
Bolin Hog Facility	250	2016	980006	12/9/15		470	< 0.11	2.52	0.9	0.0001	Pontotoc	QA
Bolin Hog Facility	6A	2016	1244	12/16/15	2420	2330	< 0.11	< 0.02	0.02	0.0001	Pontotoc	Wet
Bridenstine Farms, Inc.	35	2016	1376	2/24/15		664	< 0.11	7.74	0.76	0	Beaver	Wet
Bridenstine Farms, Inc.	36	2016	1376							0	Beaver	Dry
Bridenstine Farms, Inc.	37	2016	1376							0	Beaver	Dry
Hanor Huffman G/F Sites 25-28	1	2016	990015	11/18/15						0	Woodward	Dry

Facility Name	MW No.	Fiscal Year	License Number	Date Sampled	Field Conductivity (uS/cm)	Lab Conductivity (uS/cm)	NH4-N (ppm)	NO3-N (ppm)	Total P	Fecal Coliform	County	Sample
Hanor Huffman G/F Sites 25-28	2	2016	990015	11/18/15	514	561	< 0.11	5.47	0.04	0.0001	Woodward	Wet
Hanor Huffman G/F Sites 25-28	3	2016	990015	11/18/15	679	693	< 0.11	0.37	0.19	0.0001	Woodward	Wet
Hanor Huffman G/F Sites 25-28	4	2016	990015							0	Woodward	Dry
Hanor Huffman G/F Sites 25-28	5	2016	990015	11/18/15	550	557	< 0.11	2.12	0.89	0.0001	Woodward	Wet
Hanor Huffman G/F Sites 25-28	6	2016	990015	11/18/15	311	311	< 0.11	0.26	0.13	0.0001	Woodward	Wet
Hanor Huffman G/F Sites 25-28	7	2016	990015	11/18/15	466	476	< 0.11	9.24	0.02	0.0001	Woodward	Wet
Hanor Huffman G/F Sites 25-28	8	2016	990015	11/17/15	389	393	< 0.11	4.81	0.32	0.0001	Woodward	Wet
Hanor Huffman G/F Sites 25-28	9	2016	990015	11/17/15	293	288	< 0.11	4.54	1.18	0.0001	Woodward	Wet
Hanor Huffman G/F Sites 25-28	10	2016	990015	11/17/15	351	356	< 0.11	2.71	0.05	0.0001	Woodward	Wet
Hanor Huffman G/F Sites 25-28	11	2016	990015	11/17/15	289	368	< 0.11	1.75	0.06	0.0001	Woodward	Wet
Hanor Huffman G/F Sites 25-28	12	2016	990015	11/17/15	301	299	< 0.11	0.77	0.32	0.0001	Woodward	Wet
Hanor Huffman G/F Sites 25-28	14	2016	990015	11/18/15	462	473	< 0.11	1.34	0.04	0.0001	Woodward	Wet
Hanor Huffman G/F Sites 25-28	15	2016	990015	11/18/15	405	410	< 0.11	2.72	0.02	0.0001	Woodward	Wet
Hanor Huffman G/F Sites 25-28	16	2016	990015	11/18/15	456	467	< 0.11	15.5	0.04	0.0001	Woodward	Wet
Hanor Huffman G/F Sites 25-28	20	2016	990015	11/18/15		< 23	< 0.11	< 0.02	< 0.02	0.0001	Woodward	QA
Hanor Huffman G/F Sites 25-28	30	2016	990015	11/18/15		< 23	< 0.11	< 0.02	< 0.02	0.0001	Woodward	QA
Hanor Huffman G/F Sites 25-28	70	2016	990015	11/18/15		476	< 0.11	9.43	0.02	0.0001	Woodward	QA
Hanor Huffman G/F Sites 25-28	80	2016	990015							0	Woodward	Dry
Hanor Huffman G/F Sites 25-28	110	2016	990015							0	Woodward	Dry
Hanor Huffman G/F Sites 25-28	130	2016	990015	11/18/15		965	< 0.11	10.2	0.04	0.0001	Woodward	QA
Hanor Huffman G/F Sites 25-28	140	2016	990015	11/18/15		< 23	< 0.11	< 0.02	< 0.02	0.0001	Woodward	QA
Hanor Huffman G/F Sites 25-28	210	2016	1356	10/21/15		< 23	< 0.11	< 0.02	< 0.02	0.0001	Woodward	QA
Hanor Huffman G/F Sites 25-28.	13	2016	990015	11/18/15	953	969	< 0.11	10.2	0.06	0.0001	Woodward	Wet
Hanor Major Farms	1	2016	1311	2/9/16	901	963	< 0.11	14.7	0.29	0.0001	Major	Wet
Hanor Major Farms	2	2016	1311	2/9/16	678	728	< 0.11	28.6	0.12	0.0001	Major	Wet
Hanor Major Farms	3	2016	1311	2/9/16	880	922	< 0.11	32.1	0.08	0.0001	Major	Wet

Facility Name	MW No.	Fiscal Year	License Number	Date Sampled	Field Conductivity (uS/cm)	Lab Conductivity (uS/cm)	NH4-N (ppm)	NO3-N (ppm)	Total P	Fecal Coliform	County	Sample
Hanor Major Farms	4	2016	1311	2/9/16	782	840	< 0.11	8.52	0.47	0.0001	Major	Wet
Hanor Major Farms	5	2016	1311	2/9/16	779	816	< 0.11	6.73	0.17	0.0001	Major	Wet
Hanor Major Farms	6	2016	1311	2/10/16	501	534	< 0.11	42.4	0.26	0.0001	Major	Wet
Hanor Major Farms	19	2016	1311	2/9/16	816	881	< 0.11	2.06	0.05	0.0001	Major	Wet
Hanor Major Farms	20	2016	1311	2/9/16	762	818	< 0.11	0.75	0.05	0.0001	Major	Wet
Hanor Major Farms	21	2016	1311	2/9/16	732	777	< 0.11	12.2	0.12	0.0001	Major	Wet
Hanor Major/Trails End B/G/F #1	7	2016	1311	2/9/16	1258	1360	< 0.11	22.7	0.99	0.0001	Major	Wet
Hanor Major/Trails End B/G/F #1	8	2016	1311	2/9/16	862	939	< 0.11	16.3	0.33	0.0001	Major	Wet
Hanor Major/Trails End B/G/F #1	9	2016	1311	2/9/16	601	644	< 0.11	14.2	0.67	0.0001	Major	Wet
Hanor Major/Trails End B/G/F #1	10	2016	1311	2/9/16	867	922	< 0.11	22.1	0.47	0.0001	Major	Wet
Hanor Major/Trails End B/G/F #1	11	2016	1311	2/9/16	947	1000	< 0.11	24.3	0.46	0.0001	Major	Wet
Hanor Major/Trails End B/G/F #1	12	2016	1311	2/9/16	1010	1070	< 0.11	26.4	0.04	0.0001	Major	Wet
Hanor Major/Trails End B/G/F #1	90	2016	1311	2/9/16		640	< 0.11	13.6	0.91	0.0001	Major	QA
Hanor Major/Trails End B/G/F #1	210	2016	1311							0	Major	Dry
Hanor Roberts Ranch	19	2016	1489	11/2/15	336	347	< 0.11	8.11	0.32	0.0001	Woodward	Wet
Hanor Roberts Ranch	20	2016	1489	11/2/15	248	251	< 0.11	8.04	0.75	0.0001	Woodward	Wet
Hanor Roberts Ranch	21	2016	1489	11/2/15	230	232	< 0.11	7.4	0.51	0.0001	Woodward	Wet
Hanor Roberts Ranch	22	2016	1489	11/2/15	7.34	753	< 0.11	25.6	0.04	0.0001	Woodward	Wet
Hanor Roberts Ranch	23	2016	1489	11/2/15	182	179	< 0.11	9.95	0.11	0.0001	Woodward	Wet
Hanor Roberts Ranch	26	2016	1489	11/2/15	440	457	< 0.11	0.22	0.26	0.0001	Woodward	Wet
Hanor Roberts Ranch	27	2016	1489	11/2/15	247	255	< 0.11	4.78	0.71	0.0001	Woodward	Wet
Hanor Roberts Ranch	31	2016	1489	11/3/15	357	370	< 0.11	16.1	0.42	0.0001	Woodward	Wet
Hanor Roberts Ranch	34	2016	1489	11/3/15						0	Woodward	Dry
Hanor Roberts Ranch	35	2016	1489	11/3/15	403	420	< 0.11	5.65	0.59	0.0001	Woodward	Wet
Hanor Roberts Ranch	36	2016	1489	11/3/15	339	353	< 0.11	7.97	0.55	0.0001	Woodward	Wet
Hanor Roberts Ranch	38	2016	1489	11/3/15	370	385	< 0.11	6.89	0.04	1	Woodward	Wet

Facility Name	MW No.	Fiscal Year	License Number	Date Sampled	Field Conductivity (uS/cm)	Lab Conductivity (uS/cm)	NH4-N (ppm)	NO3-N (ppm)	Total P	Fecal Coliform	County	Sample
Hanor Roberts Ranch	44	2016	1489	11/4/15	376	390	< 0.11	5.87	1.72	0.0001	Woodward	Wet
Hanor Roberts Ranch	45	2016	1489	11/3/15	340	349	< 0.11	3	0.59	0.0001	Woodward	Wet
Hanor Roberts Ranch	46	2016	1489	11/4/15	329	345	< 0.11	7.62	0.52	0.0001	Woodward	Wet
Hanor Roberts Ranch	47	2016	1489	11/4/15	1287	1340	< 0.11	22.2	0.83	0.0001	Woodward	Wet
Hanor Roberts Ranch	50	2016	1489							0	Woodward	Dry
Hanor Roberts Ranch	51	2016	1489	11/4/15						0	Woodward	Dry
Hanor Roberts Ranch	52	2016	1489	11/4/15	378	394	< 0.11	6.19	0.36	0.0001	Woodward	Wet
Hanor Roberts Ranch	54	2016	1489	11/4/15	392	407	< 0.11	3.21	0.08	0.0001	Woodward	Wet
Hanor Roberts Ranch	56	2016	1489	11/4/15	354	362	< 0.11	3.14	0.1	0.0001	Woodward	Wet
Hanor Roberts Ranch	59	2016	1489	11/17/15	450	469	< 0.11	5.75	1.24	0.0001	Woodward	Wet
Hanor Roberts Ranch	60	2016	1489	11/17/15	427	430	< 0.11	19.3	0.64	0.0001	Woodward	Wet
Hanor Roberts Ranch	62	2016	1489	11/17/15	252	248	< 0.11	6.62	0.98	0.0001	Woodward	Wet
Hanor Roberts Ranch	68	2016	1489	11/17/15	3.37	337	< 0.11	9.89	0.71	3	Woodward	Wet
Hanor Roberts Ranch	69	2016	1489	11/17/15	12.87	1300	< 0.11	10.6	1.4	0.0001	Woodward	Wet
Hanor Roberts Ranch	71	2016	1489	11/17/15	378	382	< 0.11	10.1	0.12	0.0001	Woodward	Wet
Hanor Roberts Ranch	76	2016	1489	11/16/15						0	Woodward	Dry
Hanor Roberts Ranch	78	2016	1489							0	Woodward	Dry
Hanor Roberts Ranch	80	2016	1489	11/16/15	483	496	< 0.11	24.1	1.94	0.0001	Woodward	Wet
Hanor Roberts Ranch	81	2016	1489							0	Woodward	Dry
Hanor Roberts Ranch	82	2016	1489	11/16/15						0	Woodward	Dry
Hanor Roberts Ranch	83	2016	1489	11/16/15	530	543	< 0.11	40	0.27	0.0001	Woodward	Wet
Hanor Roberts Ranch	84	2016	1489	11/16/15	343	346	< 0.11	8.83	2.89	0.0001	Woodward	Wet
Hanor Roberts Ranch	85	2016	1489	11/16/15	301	309	< 0.11	3.26	0.53	0.0001	Woodward	Wet
Hanor Roberts Ranch	86	2016	1489	11/16/15	922	950	< 0.11	5.15	0.63	0.0001	Woodard	Wet
Hanor Roberts Ranch	87	2016	1489	11/17/15	290	282	< 0.11	3.5	7.68	0.0001	Woodward	Wet
Hanor Roberts Ranch	88	2016	1489	11/17/15	395	401	< 0.11	9.33	0.15	0.0001	Woodward	Wet

Facility Name	MW No.	Fiscal Year	License Number	Date Sampled	Field Conductivity (uS/cm)	Lab Conductivity (uS/cm)	NH4-N (ppm)	NO3-N (ppm)	Total P	Fecal Coliform	County	Sample
Hanor Roberts Ranch	89	2016	1489	11/17/15	302	304	< 0.11	9.46	0.2	0.0001	Woodward	Wet
Hanor Roberts Ranch	90	2016	1489	11/17/15	518	547	< 0.11	17.2	1.07	0.0001	Woodward	Wet
Hanor Roberts Ranch	91	2016	1489	11/17/15	3.45	339	< 0.11	9.89	0.34	0.0001	Woodward	Wet
Hanor Roberts Ranch	92	2016	1489	11/17/15	572	235	< 0.11	9.08	1.05	0.0001	Woodward	Wet
Hanor Roberts Ranch	93	2016	1489	11/17/15		508	< 0.11	11.2	1.13	0	Woodward	QA
Hanor Roberts Ranch	94	2016	1489	11/17/15	770	759	< 0.11	10.5	2.21	0.0001	Woodward	Wet
Hanor Roberts Ranch	95	2016	1489	11/17/15	325	330	< 0.11	6.33	1.05	0.0001	Woodward	Wet
Hanor Roberts Ranch	96	2016	1489	11/17/15	2.82	281	< 0.11	7.53	1.2	0.0001	Woodward	Wet
Hanor Roberts Ranch	97	2016	1489	11/16/15	529	547	< 0.11	17.4	0.51	0.0001	Woodward	Wet
Hanor Roberts Ranch	98	2016	1489	11/17/15	244	239	< 0.11	9.33	0.85	0.0001	Woodward	Wet
Hanor Roberts Ranch	99	2016	1489	11/17/15	255	240	< 0.11	9.4	1.9	0.0001	Woodward	Wet
Hanor Roberts Ranch	100	2016	1489	11/16/15	363	375	< 0.11	24.1	13.7	0.0001	Woodward	Wet
Hanor Roberts Ranch	101	2016	1489	11/17/15	307	305	< 0.11	5.47	2.92	0.0001	Woodward	Wet
Hanor Roberts Ranch	102	2016	1489	11/16/15	494	506	< 0.11	5.7	1.19	0.0001	Woodward	Wet
Hanor Roberts Ranch	103	2016	1489	11/16/15	547	573	< 0.11	13.7	4.49	0.0001	Woodward	Wet
Hanor Roberts Ranch	105	2016	1489	11/3/15	270	277	< 0.11	13.4	1.66	0.0001	Woodward	Wet
Hanor Roberts Ranch	106	2016	1489	11/2/15	519	535	< 0.11	26.2	0.42	0.0001	Woodward	Wet
Hanor Roberts Ranch	107	2016	1489			668	< 0.11	11.6	0.83	0.0001	Woodward	QA
Hanor Roberts Ranch	108	2016	1489	11/3/15	552	573	< 0.11	15.8	0.84	0.0001	Woodward	Wet
Hanor Roberts Ranch	109	2016	1489	11/4/15						0	Woodward	Dry
Hanor Roberts Ranch	110	2016	1489							0	Woodward	Dry
Hanor Roberts Ranch	110	2016	1489	42312						0	Woodward	Dry
Hanor Roberts Ranch	111	2016	1489	11/3/15						0	Woodward	Dry
Hanor Roberts Ranch	112	2016	1489	11/3/15						0	Woodward	Dry
Hanor Roberts Ranch	113	2016	1489	11/3/15	354	320	< 0.11	13.4	0.89	0.0001	Woodward	Wet
Hanor Roberts Ranch	114	2016	1489	11/3/15	847	885	< 0.11	65.2	1.86	0.0001	Woodward	Wet

Facility Name	MW No.	Fiscal Year	License Number	Date Sampled	Field Conductivity (uS/cm)	Lab Conductivity (uS/cm)	NH4-N (ppm)	NO3-N (ppm)	Total P	Fecal Coliform	County	Sample
Hanor Roberts Ranch	115	2016	1489	11/3/15	886	856	< 0.11	68.2	0.23	0.0001	Woodward	Wet
Hanor Roberts Ranch	116	2016	1489							0	Woodward	Dry
Hanor Roberts Ranch	117	2016	1489	11/3/15	388	404	< 0.11	16.4	0.11	0.0001	Woodward	Wet
Hanor Roberts Ranch	118	2016	1489	11/3/15						0	Woodward	Dry
Hanor Roberts Ranch	119	2016	1489	11/16/15	923	943	< 0.11	52.4	0.56	0.0001	Woodward	Wet
Hanor Roberts Ranch	121	2016	1489	11/16/15	486	507	< 0.11	11.8	1.46	0.0001	Woodward	Wet
Hanor Roberts Ranch	122	2016	1489	11/4/15	382	397	< 0.11	1.33	0.03	0.0001	Woodward	Wet
Hanor Roberts Ranch	123	2016	1489	11/2/15	516	534	< 0.11	46.9	0.06	0.0001	Woodward	Wet
Hanor Roberts Ranch	270	2016	1489	11/2/15		254	< 0.11	4.46	0.87	0.0001	Woodward	QA
Hanor Roberts Ranch	380	2016	1489							0	Woodward	Dry
Hanor Roberts Ranch	440	2016	1489							0	Woodward	Dry
Hanor Roberts Ranch	560	2016	1489	12/8/15		889	< 0.11	6.88	5.91	0.0001	Woodward	QA
Hanor Roberts Ranch	560	2016	1489	11/4/15						0	Woodward	QA
Hanor Roberts Ranch	710	2016	1489	11/17/15		< 23	< 0.11	< 0.02	< 0.02	0.0001	Woodward	QA
Hanor Roberts Ranch	860	2016	1489	11/16/15		948	< 0.11	5.23	0.06	0	Woodward	QA
Hanor Roberts Ranch	870	2016	1489							0	Woodward	Dry
Hanor Roberts Ranch	880	2016	1489							0	Woodward	Dry
Hanor Roberts Ranch	960	2016	1489	11/17/15		277	< 0.11	7.44	1.03	0.0001	Woodward	QA
Hanor Roberts Ranch	1060	2016	1489	11/2/15		< 23	< 0.11	< 0.02	< 0.02	0.0001	Woodward	QA
Hanor Roberts Ranch	1170	2016	1489	11/3/15		404	< 0.11	16.6	0.1	0.0001	Woodward	QA
Hanor Roberts Ranch	1220	2016	1489	11/4/15						0	Woodward	QA
Hanor Roberts Ranch	104A	2016	1489							0	Woodward	Dry
Hanor Roberts Ranch	519-07A0	2016	1489	10/26/15		1880	< 0.11	20.1	0.8	0.0001	Woodward	QA
Hanor Roberts Ranch	81A	2016	1489	11/16/15	413	425	< 0.11	31.7	0.12	0.0001	Woodward	Wet
Hanor Roberts Ranch	81A0	2016	1489	11/16/15		425	< 0.11	32.2	0.11	0.0001	Woodward	QA
Hanor Roberts Ranch	120	2016	1489	11/16/15	370	381	< 0.11	5.01	5.31	0.0001	Woodward	Wet

Facility Name	MW No.	Fiscal Year	License Number	Date Sampled	Field Conductivity (uS/cm)	Lab Conductivity (uS/cm)	NH4-N (ppm)	NO3-N (ppm)	Total P	Fecal Coliform	County	Sample
Hanor Trails End BGF #2	13	2016	1491	2/10/16	694	740	< 0.11	9.962	0.18	0.0001	Kingfisher	Wet
Hanor Trails End BGF #2	14	2016	1491	2/10/16	747	785	< 0.11	2.7	< 0.02	0.0001	Kingfisher	Wet
Hanor Trails End BGF #2	15	2016	1491	2/10/16	701	746	< 0.11	6.58	0.05	0.0001	Kingfisher	Wet
Hanor Trails End BGF #2	16	2016	1491	2/10/16	963	1050	< 0.11	6.69	0.64	0.0001	Kingfisher	Wet
Hanor Trails End BGF #2	17	2016	1491	2/10/16	1040	1100	< 0.11	10.5	0.12	0.0001	Kingfisher	Wet
Hanor Trails End BGF #2	18	2016	1491	2/10/16	861	901	< 0.11	7.18	0.18	0.0001	Kingfisher	Wet
Hanor Trails End BGF #2	130	2016	1491	2/10/16		<23	< 0.11	0.03	<0.02	0.0001	Kingfisher	QA
Hanor Trails End BGF #2	140	2016	1491			< 23	< 0.11	< 0.02	< 0.02	0.0001	Kingfisher	QA
Hanor Trails End BGF #2	150	2016	1491	2/10/16		762	< 0.11	6.83	0.06	0.0001	Kingfisher	QA
Hitch Ent. Finish Site 27-29	50	2016	970006							0	Texas	Dry
Hitch Ent. Finish Site 27-29	51	2016	970006							0	Texas	Dry
Hitch Ent. Finish Site 27-29	52	2016	970006							0	Texas	Dry
Hitch Ent. Finish Site 27-29	53	2016	970006							0	Texas	Dry
Hitch Ent. Finish Site 27-29	54	2016	970006							0	Texas	Dry
Hitch Ent. Finish Site 27-29	55	2016	970006							0	Texas	Dry
Hitch Ent. Finish Site 30-36	56	2016	970030							0	Texas	Dry
Hitch Ent. Finish Site 30-36	57	2016	970030							0	Texas	Dry
Hitch Ent. Finish Site 30-36	58	2016	970030							0	Texas	Dry
Hitch Ent. Finish Site 30-36	59	2016	970030							0	Texas	Dry
Hitch Ent. Finish Site 30-36	60	2016	970030							0	Texas	Dry
Hitch Ent. Finish Site 30-36	61	2016	970030							0	Texas	Dry
Hitch Ent. Finish Site 30-36	62	2016	970030							0	Texas	Dry
Hitch Ent. Finish Site 30-36	63	2016	970030							0	Texas	Dry
Hitch Ent. Finish Site 30-36	64	2016	970030							0	Texas	Dry
Hitch Ent. Nursery Sites #1-#4	76	2016	1485							0	Texas	Dry
Hitch Ent. Nursery Sites #1-#4	77	2016	1485							0	Texas	Dry

Facility Name	MW No.	Fiscal Year	License Number	Date Sampled	Field Conductivity (uS/cm)	Lab Conductivity (uS/cm)	NH4-N (ppm)	NO3-N (ppm)	Total P	Fecal Coliform	County	Sample
Hitch Ent. Nursery Sites #1-#4	78	2016	1485							0	Texas	Dry
Hitch Ent. Nursery Sites #1-#4	79	2016	1485							0	Texas	Dry
Hitch Ent. Nursery Sites #1-#4	80	2016	1485							0	Texas	Dry
Hitch Ent. Nursery Sites #1-#4	81	2016	1485							0	Texas	Dry
Hitch Ent. Nursery Sites #1-#4	82	2016	1485							0	Texas	Dry
Hitch Ent. Nursery Sites #1-#4	83	2016	1485							0	Texas	Dry
Hitch Ent. Nursery Sites #1-#4	84	2016	1485							0	Texas	Dry
Hitch Ent. Nursery Sites #1-#4	85	2016	1485							0	Texas	Dry
Hitch Ent. Nursery Sites #1-#4	86	2016	1485							0	Texas	Dry
Hitch Ent. Nursery Sites 5-8	87	2016	970008							0	Texas	Dry
Hitch Ent. Nursery Sites 5-8	88	2016	970008							0	Texas	Dry
Hitch Ent. Nursery Sites 5-8	89	2016	970008							0	Texas	Dry
Hitch Ent. Nursery Sites 5-8	90	2016	970008							0	Texas	Dry
Hitch Ent. Nursery Sites 5-8	91	2016	970008	4/12/16	1480	1500	< 0.11	41.9	0.04	0.0001	Texas	Wet
Hitch Ent. Nursery Sites 5-8	93	2016	970008							0	Texas	Dry
Hitch Ent. Nursery Sites 5-8	94	2016	970008							0	Texas	Dry
Hitch Ent. Nursery Sites 5-8	95	2016	970008							0	Texas	Dry
Hitch Ent. Nursery Sites 5-8	96	2016	970008							0	Texas	Dry
Hitch Ent. Nursery Sites 5-8	97	2016	970008							0	Texas	Dry
Hitch Ent. Nursery Sites 5-8	98	2016	970008							0	Texas	Dry
Hitch Ent. Nursery Sites 5-8	910	2016	970008	4/12/16						0	Texas	QA
Hitch Ent. Seaboard Lease	103	2016	1305							0	Texas	Dry
Hitch Ent. Seaboard Lease	104	2016	1305							0	Texas	Dry
Hitch Ent. Seaboard Lease	105	2016	1305							0	Texas	Dry
Hitch Ent. Seaboard Lease	106	2016	1305							0	Texas	Dry
Hitch Ent. Seaboard Lease	107	2016	1305							0	Texas	Dry

Facility Name	MW No.	Fiscal Year	License Number	Date Sampled	Field Conductivity (uS/cm)	Lab Conductivity (uS/cm)	NH4-N (ppm)	NO3-N (ppm)	Total P	Fecal Coliform	County	Sample
Hitch Ent. Seaboard Lease	108	2016	1305							0	Texas	Dry
Hitch Finishing Sites 1-26 & 37	1	2016	970001							0	Texas	Dry
Hitch Finishing Sites 1-26 & 37	2	2016	970001							0	Texas	Dry
Hitch Finishing Sites 1-26 & 37	3	2016	970001							0	Texas	Dry
Hitch Finishing Sites 1-26 & 37	4	2016	970001							0	Texas	Dry
Hitch Finishing Sites 1-26 & 37	5	2016	970001							0	Texas	Dry
Hitch Finishing Sites 1-26 & 37	6	2016	970001							0	Texas	Dry
Hitch Finishing Sites 1-26 & 37	8	2016	970001							0	Texas	Dry
Hitch Finishing Sites 1-26 & 37	9	2016	970001							0	Texas	Dry
Hitch Finishing Sites 1-26 & 37	10	2016	970001							0	Texas	Dry
Hitch Finishing Sites 1-26 & 37	11	2016	970001							0	Texas	Dry
Hitch Finishing Sites 1-26 & 37	12	2016	970001							0	Texas	Dry
Hitch Finishing Sites 1-26 & 37	13	2016	970001							0	Texas	Dry
Hitch Finishing Sites 1-26 & 37	14	2016	970001							0	Texas	Dry
Hitch Finishing Sites 1-26 & 37	15	2016	970001							0	Texas	Dry
Hitch Finishing Sites 1-26 & 37	16	2016	970001							0	Texas	Dry
Hitch Finishing Sites 1-26 & 37	17	2016	970001							0	Texas	Dry
Hitch Finishing Sites 1-26 & 37	18	2016	970001							0	Texas	Dry
Hitch Finishing Sites 1-26 & 37	19	2016	970001							0	Texas	Dry
Hitch Finishing Sites 1-26 & 37	20	2016	970001							0	Texas	Dry
Hitch Finishing Sites 1-26 & 37	21	2016	970001							0	Texas	Dry
Hitch Finishing Sites 1-26 & 37	22	2016	970001							0	Texas	Dry
Hitch Finishing Sites 1-26 & 37	23	2016	970001							0	Texas	Dry
Hitch Finishing Sites 1-26 & 37	24	2016	970001							0	Texas	Dry
Hitch Finishing Sites 1-26 & 37	25	2016	970001							0	Texas	Dry
Hitch Finishing Sites 1-26 & 37	26	2016	970001							0	Texas	Dry

Facility Name	MW No.	Fiscal Year	License Number	Date Sampled	Field Conductivity (uS/cm)	Lab Conductivity (uS/cm)	NH4-N (ppm)	NO3-N (ppm)	Total P	Fecal Coliform	County	Sample
Hitch Finishing Sites 1-26 & 37	27	2016	970001							0	Texas	Dry
Hitch Finishing Sites 1-26 & 37	28	2016	970001							0	Texas	Dry
Hitch Finishing Sites 1-26 & 37	29	2016	970001							0	Texas	Dry
Hitch Finishing Sites 1-26 & 37	30	2016	970001							0	Texas	Dry
Hitch Finishing Sites 1-26 & 37	31	2016	970001							0	Texas	Dry
Hitch Finishing Sites 1-26 & 37	32	2016	970001							0	Texas	Dry
Hitch Finishing Sites 1-26 & 37	33	2016	970001							0	Texas	Dry
Hitch Finishing Sites 1-26 & 37	34	2016	970001							0	Texas	Dry
Hitch Finishing Sites 1-26 & 37	35	2016	970001							0	Texas	Dry
Hitch Finishing Sites 1-26 & 37	36	2016	970001							0	Texas	Dry
Hitch Finishing Sites 1-26 & 37	37	2016	970001							0	Texas	Dry
Hitch Finishing Sites 1-26 & 37	38	2016	970001							0	Texas	Dry
Hitch Finishing Sites 1-26 & 37	39	2016	970001							0	Texas	Dry
Hitch Finishing Sites 1-26 & 37	40	2016	970001							0	Texas	Dry
Hitch Finishing Sites 1-26 & 37	41	2016	970001							0	Texas	Dry
Hitch Finishing Sites 1-26 & 37	42	2016	970001							0	Texas	Dry
Hitch Finishing Sites 1-26 & 37	43	2016	970001							0	Texas	Dry
Hitch Finishing Sites 1-26 & 37	44	2016	970001							0	Texas	Dry
Hitch Finishing Sites 1-26 & 37	45	2016	970001							0	Texas	Dry
Hitch Finishing Sites 1-26 & 37	46	2016	970001	4/12/16						0	Texas	Dry
Hitch Finishing Sites 1-26 & 37	47	2016	970001							0	Texas	Dry
Hitch Finishing Sites 1-26 & 37	48	2016	970001							0	Texas	Dry
Hitch Finishing Sites 1-26 & 37	49	2016	970001							0	Texas	Dry
Hitch Finishing Sites 1-26 & 37	99	2016	970001							0	Texas	Dry
Hitch Finishing Sites 1-26 & 37	100	2016	970001							0	Texas	Dry
Hitch Finishing Sites 1-26 & 37	101	2016	970001							0	Texas	Dry

Facility Name	MW No.	Fiscal Year	License Number	Date Sampled	Field Conductivity (uS/cm)	Lab Conductivity (uS/cm)	NH4-N (ppm)	NO3-N (ppm)	Total P	Fecal Coliform	County	Sample
Hitch Sow #1 & Sow Site #2	65	2016	1468	4/12/16	3400	3460	< 0.11	9.35	0.16	0.0001	Texas	Wet
Hitch Sow #1 & Sow Site #2	66	2016	1468							0	Texas	Dry
Hitch Sow #1 & Sow Site #2	67	2016	1468							0	Texas	Dry
Hitch Sow #1 & Sow Site #2	102	2016	1468							0	Texas	Dry
Hitch Sow #1 & Sow Site #2	650	2016	1468							0	Texas	Dry
Hitch Sow 3 thru 6	68	2016	970009							0	Texas	Dry
Hitch Sow 3 thru 6	69	2016	970009							0	Texas	Dry
Hitch Sow 3 thru 6	70	2016	970009							0	Texas	Dry
Hitch Sow 3 thru 6	71	2016	970009							0	Texas	Dry
Hitch Sow 3 thru 6	72	2016	970009							0	Texas	Dry
Hitch Sow 3 thru 6	73	2016	970009							0	Texas	Dry
Hitch Sow 3 thru 6	75	2016	970009							0	Texas	Dry
Hitch Sow 3 thru 6.	74	2016	970009							0	Texas	Dry
Houston Contracting Farms, LTD.	1	2016	990002	12/15/15	8344	8670	0.61	< 0.02	15.8	0.0001	Hughes	Wet
Houston Contracting Farms, LTD.	2	2016	990002	12/15/15	13883	14200	< 0.11	0.29	0.15	0.0001	Hughes	Wet
Houston Contracting Farms, LTD.	3	2016	990002							0	Hughes	Dry
HOUSTON FINISHING FARM, INC.	1	2016	1377	12/15/15	2414	2260	< 0.11	8.79	< 0.02	0.0001	Hughes	Wet
HOUSTON FINISHING FARM, INC.	2	2016	1377	12/15/15	7795	7960	< 0.11	0.21	< 0.02	0.0001	Hughes	Wet
HOUSTON FINISHING FARM, INC.	3	2016	1377	12/15/15	10064	10300	< 0.11	0.08	< 0.02	0.0001	Hughes	Wet
L & M Farms Trust	1	2016	980002	11/9/15	99	100	< 0.11	1.2	18.7	0.0001	Canadian	Wet
L & M Farms Trust	2	2016	980002	11/9/15	1983	2480	< 0.11	6	0.97	0.0001	Canadian	Wet
L & M Farms Trust	3	2016	980002	11/9/15	1208	1100	< 0.11	15.2	2.27	0.0001	Canadian	Wet
Long Hog Feeders, Blackwelder #1	7	2016	990009							0	Texas	Dry
Long Hog Feeders, Blackwelder #1	8	2016	990009							0	Texas	Dry
Long Hog Feeders, Blackwelder #1	9	2016	990009							0	Texas	Dry
Long Hog Feeders, Blackwelder #2	10	2016	990010							0	Texas	Dry

Facility Name	MW No.	Fiscal Year	License Number	Date Sampled	Field Conductivity (uS/cm)	Lab Conductivity (uS/cm)	NH4-N (ppm)	NO3-N (ppm)	Total P	Fecal Coliform	County	Sample
Long Hog Feeders, Blackwelder #2	11	2016	990010							0	Texas	Dry
Long Hog Feeders, Blackwelder #2	12	2016	990010							0	Texas	Dry
Long Hog Feeders, LLC - Straight Site	1	2016	980013							0	Texas	Dry
Long Hog Feeders, LLC - Straight Site	2	2016	980013							0	Texas	Dry
Long Hog Feeders, LLC - Straight Site	3	2016	980013							0	Texas	Dry
Long Hog Feeders, LLC - Straight Site	4	2016	980013							0	Texas	Dry
Long Hog Feeders, LLC - Straight Site	5	2016	980013							0	Texas	Dry
Long Hog Feeders, LLC - Straight Site	6	2016	980013							0	Texas	Dry
Luthi Farms, LLC	1	2016	980026	11/23/15	832	839	< 0.11	22.5	0.17	0.0001	Ellis	Wet
Luthi Farms, LLC	2	2016	980026	11/23/15	854	873	< 0.11	9.89	0.05	0.0001	Ellis	Wet
Luthi Farms, LLC	3	2016	980026	11/23/15	656	573	< 0.11	2.25	0.12	0.0001	Ellis	Wet
MANSION FARMS	1	2016	1295	12/15/15	885	758	< 0.11	0.05	0.15	0.0001	Hughes	Wet
MANSION FARMS	2	2016	1295	12/15/15	1319	1220	0.75	0.03	0.05	0.0001	Hughes	Wet
MANSION FARMS	3	2016	1295	12/15/15	678	672	< 0.11	< 0.02	0.26	0.0001	Hughes	Wet
MANSION FARMS	4	2016	1295	12/15/15	2660	2430	0.36	0.11	0.5	0.0001	Hughes	Wet
MANSION FARMS	5	2016	1295	12/15/15	2560	2380	0.2	0.02	0.1	0.0001	Hughes	Wet
MANSION FARMS	6	2016	1295	12/15/15	1026	982	< 0.11	0.65	0.08	0.0001	Hughes	Wet
Maschhoffs LLC - Randolph Sow & Nursery	432	2016	200102	2/16/16	760	783	< 0.11	6.71	5.82	0.0001	Caddo	Wet
Maschhoffs LLC - Randolph Sow & Nursery	433	2016	200102							0	Caddo	Dry
Maschhoffs LLC - Randolph Sow & Nursery	434	2016	200102	2/16/16	486	522	< 0.11	7.92	2.1	0.0001	Caddo	Wet
Maschhoffs LLC - Randolph Sow & Nursery	435	2016	200102	2/16/16						0	Caddo	Dry
Maschhoffs LLC - Randolph Sow & Nursery	436	2016	200102	2/16/16	456	510	< 0.11	7.81	2.83	0.0001	Caddo	Wet
Maschhoffs LLC - Randolph Sow & Nursery	431A	2016	200102	2/16/16	922	980	< 0.11	16.7	0.5	0.0001	Caddo	Wet
Maschhoffs LLC - Weathers	1W	2016	200208							0	Caddo	Dry
Maschhoffs LLC - Weathers	2W	2016	200208							0	Caddo	Dry
Maschhoffs LLC - Weathers	3W	2016	200208							0	Caddo	Dry

Facility Name	MW No.	Fiscal Year	License Number	Date Sampled	Field Conductivity (uS/cm)	Lab Conductivity (uS/cm)	NH4-N (ppm)	NO3-N (ppm)	Total P	Fecal Coliform	County	Sample
Maschhoffs LLC - Wright Canyon East & West	7	2016	200003	2/17/16	561	479	< 0.11	1.82	0.18	0.0001	Caddo	Wet
Maschhoffs LLC - Wright Canyon East & West	8	2016	200003	2/17/16	561	551	< 0.11	2.74	0.63	0.0001	Caddo	Wet
Maschhoffs LLC - Wright Canyon East & West	1E	2016	200003	2/16/16	597	638	< 0.11	0.42	1.69	0.0001	Caddo	Wet
Maschhoffs LLC - Wright Canyon East & West	2E	2016	200003	2/16/16	6.57	703	< 0.11	5.59	3.29	0.0001	Caddo	Wet
Maschhoffs LLC - Wright Canyon East & West	3E	2016	200003	2/16/16	869	930	< 0.11	3.55	1.81	0.0001	Caddo	Wet
Maschhoffs LLC - Wright Canyon East & West	4W	2016	200003	2/16/16	762	811	< 0.11	2.92	0.54	0.0001	Caddo	Wet
Maschhoffs LLC - Wright Canyon East & West	5W	2016	200003	2/16/16	960	943	< 0.11	8.31	1.66	0.0001	Caddo	Wet
Maschhoffs LLC - Wright Canyon East & West	6W	2016	200003							0	Caddo	Dry
Maschhoffs, LLC - Lone Mound	1LM	2016	200207	2/17/16	557	612	< 0.11	6.04	0.14	0.0001	Caddo	Wet
Maschhoffs, LLC - Lone Mound	2LM	2016	200207	2/17/16	535	571	< 0.11	12.1	0.1	0.0001	Caddo	Wet
Maschhoffs, LLC - Lone Mound	3LM	2016	200207	2/17/16	531	582	< 0.11	8.47	0.06	0.0001	Caddo	Wet
McMullen Farm	1	2016	980005	11/9/15	1127	1090	< 0.11	12	0.98	0.0001	Grady	Wet
McMullen Farm	2	2016	980005	11/9/15	2190	2130	< 0.11	8.19	0.31	0.0001	Grady	Wet
McMullen Farm	4	2016	980005	11/9/15	2580	2450	< 0.11	10.5	4.45	0.0001	Grady	Wet
Murphy Brown Clenney	10	2016	200204							0	Beaver	Dry
Murphy Brown Clenney	11	2016	200204							0	Beaver	Dry
Murphy Brown Clenney	12	2016	200204							0	Beaver	Dry
Murphy Brown Clenney	7NW	2016	200204							0	Beaver	Dry
Murphy Brown Clenney	8E	2016	200204							0	Beaver	Dry
Murphy Brown Clenney	9S	2016	200204							0	Beaver	Dry
Murphy Brown Hall	304	2016	200103							0	Beaver	Dry
Murphy Brown Hall	305	2016	200103							0	Beaver	Dry
Murphy Brown Hall	306	2016	200103							0	Beaver	Dry
Murphy Brown Hall	307	2016	200103							0	Beaver	Dry
Murphy Brown Hall	309	2016	200103							0	Beaver	Dry
Murphy Brown Kern	421	2016	200224	3/8/16	901	794	< 0.11	6.61	0.18	0.0001	Beaver	Wet

Facility Name	MW No.	Fiscal Year	License Number	Date Sampled	Field Conductivity (uS/cm)	Lab Conductivity (uS/cm)	NH4-N (ppm)	NO3-N (ppm)	Total P	Fecal Coliform	County	Sample
Murphy Brown Kerns	422	2016	200224							0	Beaver	Dry
Murphy Brown Kerns	423	2016	200224							0	Beaver	Dry
Murphy Brown Kerns	424	2016	200224							0	Beaver	Dry
Murphy Brown Kerns	425	2016	200224	3/8/16	861	696	< 0.11	5.92	0.02	0.0001	Beaver	Wet
Murphy Brown Kerns	426	2016	200224							0	Beaver	Dry
Murphy Brown Naylor	1	2016	200001							0	Beaver	Dry
Murphy Brown Naylor	2	2016	200001							0	Beaver	Dry
Murphy Brown Naylor	3	2016	200001							0	Beaver	Dry
Murphy Brown Naylor	4	2016	200001							0	Beaver	Dry
Murphy Brown Naylor	5	2016	200001							0	Beaver	Dry
Murphy Brown Naylor	6	2016	200001							0	Beaver	Dry
Murphy Brown Plum Thicket	4	2016	980019	12/8/15	2761	4880	< 0.11	9.15	1.74	0.0001	Harper	Wet
Murphy Brown Plum Thicket	5	2016	980019	12/8/15	3318	3430	< 0.11	11.8	0.04	0.0001	Harper	Wet
Murphy Brown Plum Thicket	6	2016	980019	12/8/15	4952	2840	< 0.11	14.4	0.9	0.0001	Harper	Wet
Murphy Brown Plum Thicket	27	2016	980019							0	Harper	Dry
Murphy Brown Plum Thicket	28	2016	980019	12/8/15	2660	2810	< 0.11	33.6	3.08	0.0001	Harper	Wet
Murphy Brown Plum Thicket	29	2016	980019	12/8/15	3820	4070	< 0.11	16.4	1.15	0.0001	Harper	Wet
Murphy Brown Plum Thicket	30	2016	980019	12/8/15	2820	2940	< 0.11	13	0.46	0.0001	Harper	Wet
Murphy Brown Plum Thicket	31	2016	980019							0	Harper	Dry
Murphy Brown Plum Thicket	32	2016	980019	12/8/15	2330	2390	< 0.11	10	2.54	0.0001	Harper	Wet
Murphy Brown Plum Thicket	33	2016	980019							0	Harper	Dry
Murphy Brown Plum Thicket	34	2016	980019	12/8/15	1913	1940	< 0.11	22.2	1.12	0.0001	Harper	Wet
Murphy Brown Plum Thicket	35	2016	980019	12/8/15	2417	2460	< 0.11	50.1	1.57	0.0001	Harper	Wet
Murphy Brown Plum Thicket	36	2016	980019	12/8/15	1069	1100	< 0.11	35.7	0.24	0.0001	Harper	Wet
Murphy Brown Plum Thicket	37	2016	980019	12/8/15	2681	2760	< 0.11	12.7	0.68	0.0001	Harper	Wet
Murphy Brown Plum Thicket	38	2016	980019	12/8/15	1537	1550	< 0.11	66	1.14	0.0001	Harper	Wet

Facility Name	MW No.	Fiscal Year	License Number	Date Sampled	Field Conductivity (uS/cm)	Lab Conductivity (uS/cm)	NH4-N (ppm)	NO3-N (ppm)	Total P	Fecal Coliform	County	Sample
Murphy Brown Plum Thicket	40	2016	980019	12/8/15	1964	2020	< 0.11	18.8	2.75	0.0001	Harper	Wet
Murphy Brown Plum Thicket	41	2016	980019	12/8/15	3271	3350	< 0.11	47	0.34	0.0001	Harper	Wet
Murphy Brown Plum Thicket	42	2016	980019	12/8/15	640	668	< 0.11	5.64	1.9	0.0001	Harper	Wet
Murphy Brown Plum Thicket	46	2016	980019	12/8/15	1244	1300	< 0.11	57	0.45	0.0001	Harper	Wet
Murphy Brown Plum Thicket	47	2016	980019	12/8/15	8680	2800	2.79	36.6	1.85	0.0001	Harper	Wet
Murphy Brown Plum Thicket	48	2016	980019	12/8/15	1293	1330	< 0.11	7.85	1.45	0.0001	Harper	Wet
Murphy Brown Plum Thicket	49	2016	980019	12/8/15	1019	1060	< 0.11	19.5	1.98	0.0001	Harper	Wet
Murphy Brown Plum Thicket	50	2016	980019	12/8/15	1500	1580	< 0.11	7.91	2.07	0.0001	Harper	Wet
Murphy Brown Plum Thicket	51	2016	980019	12/8/15	882	913	< 0.11	3.01	5.18	0.0001	Harper	Wet
Murphy Brown Plum Thicket	52	2016	980019	12/8/15						0	Harper	Dry
Murphy Brown Plum Thicket	53	2016	980019	12/8/15	2070	2050	< 0.11	16.5	1.83	0.0001	Harper	Wet
Murphy Brown Plum Thicket	54	2016	980019	12/8/15	947	983	< 0.11	22.5	0.46	0.0001	Harper	Wet
Murphy Brown Plum Thicket	55	2016	980019	12/8/15	637	670	< 0.11	5.41	1.66	0.0001	Harper	Wet
Murphy Brown Plum Thicket	56	2016	980019	12/8/15	873	882	< 0.11	6.93	3.6	0.0001	Harper	Wet
Murphy Brown Plum Thicket	57	2016	980019	12/8/15	928	984	< 0.11	26.3	4.69	0.0001	Harper	Wet
Murphy Brown Plum Thicket	290	2016	980019			4220	< 0.11	14.7	1.04	0.0001	Harper	QA
Murphy Brown Plum Thicket	400	2016	980019	12/8/15		2040	< 0.11	18.5	2.21	0.0001	Harper	QA
Murphy Brown Plum Thicket	530	2016	980019	12/8/15		2240	< 0.11	14.8	4.01	0.0001	Harper	QA
Murphy Brown Select 9	1	2016	980012	12/9/15						0	Harper	Dry
Murphy Brown Select 9	2	2016	980012							0	Harper	Dry
Murphy Brown Select 9	3	2016	980012							0	Harper	Dry
Murphy Brown Select 9	4	2016	980012							0	Harper	Dry
Murphy Brown Select 9	5	2016	980012							0	Harper	Dry
Murphy Brown Select 9	6	2016	980012	12/9/15	508	512	< 0.11	8.34	0.56	0.0001	Harper	Wet
Murphy Brown Select 9	7	2016	980012	12/9/15						0	Harper	Dry
Murphy Brown Select 9	8	2016	980012	12/9/15	330	338	< 0.11	0.18	12.7	0.0001	Harper	Wet

Facility Name	MW No.	Fiscal Year	License Number	Date Sampled	Field Conductivity (uS/cm)	Lab Conductivity (uS/cm)	NH4-N (ppm)	NO3-N (ppm)	Total P	Fecal Coliform	County	Sample
Murphy Brown Select 9	12	2016	980012	12/9/15	459	487	< 0.11	5.96	1.44	0.0001	Harper	Wet
Murphy Brown Select 9	13	2016	980012	12/9/15	457	447	< 0.11	4.78	0.59	0.0001	Harper	Wet
Murphy Brown Select 9	14	2016	980012							0	Harper	Dry
Murphy Brown Select 9	18	2016	980012							0	Harper	Dry
Murphy Brown Select 9	19	2016	980012							0	Harper	Dry
Murphy Brown Select 9	20	2016	980012							0	Harper	Dry
Murphy Brown Select 9	60	2016	980012	12/9/15		< 23	< 0.11	< 0.02	0.02	0.0001	Harper	QA
Murphy Brown Select 9	9A	2016	980012	12/9/15	471	500	< 0.11	4.96	1.13	0.0001	Harper	Wet
Murphy Brown Select 9	9AO	2016	980012	12/9/15		< 23	< 0.11	< 0.02	< 0.02	0.0001	Harper	QA
Murphy Brown Trahern	401	2016	200011	3/8/16	5420	5570	2.85	< 0.02	0.08	0.0001	Beaver	Wet
Murphy Brown Trahern	402	2016	200011	3/8/16	720	733	< 0.11	0.91	0.03	0.0001	Beaver	Wet
Murphy Brown Trahern	403	2016	200011	3/10/16	1285	1260	< 0.11	0.86	0.04	0.0001	Beaver	Wet
Murphy Brown Trahern	404	2016	200011	3/8/16	4820	4150	< 0.11	6.9	0.04	0.0001	Beaver	Wet
Murphy Brown Trahern	405	2016	200011	3/10/16	2620	2600	0.36	44.1	0.03	0.0001	Beaver	Wet
Murphy Brown Trahern	406	2016	200011	3/8/16	6135	6360	< 0.11	0.98	0.08	0.0001	Beaver	Wet
Murphy Brown Trahern	407	2016	200011	3/8/16	3341	3460	1.84	< 0.02	0.28	0.0001	Beaver	Wet
Murphy Brown Trahern	408	2016	200011	3/8/16	1735	1780	< 0.11	14.6	0.02	0.0001	Beaver	Wet
Murphy Brown Trahern	409	2016	200011	3/8/16	695	703	< 0.11	18	< 0.02	0.0001	Beaver	Wet
Murphy Brown Trahern	410	2016	200011							0	Beaver	Dry
Murphy Brown Trahern	411	2016	200011							0	Beaver	Dry
Murphy Brown Trahern	412	2016	200011	3/8/16	4240	4270	1.97	< 0.02	0.39	0.0001	Beaver	Wet
Murphy Brown Trahern	414	2016	200011	3/8/16	5540	4840	3.64	< 0.02	0.1	0.0001	Beaver	Wet
Murphy Brown Trahern	4010	2016	200011	3/8/16		< 23	< 0.11	< 0.02	< 0.02	0.0001	Beaver	QA
Murphy Brown Trahern	4030	2016	200011	3/10/16		< 23	< 0.11	< 0.02	< 0.02	0.0001	Beaver	QA
Murphy Brown Trahern	4060	2016	200011	3/8/16		< 23	< 0.11	< 0.02	< 0.02	0.0001	Beaver	QA
Murphy Brown Trahern	4080	2016	200011	3/8/16		1780	< 0.11	14.5	0.02	0.0001	Beaver	QA

Facility Name	MW No.	Fiscal Year	License Number	Date Sampled	Field Conductivity (uS/cm)	Lab Conductivity (uS/cm)	NH4-N (ppm)	NO3-N (ppm)	Total P	Fecal Coliform	County	Sample
Murphy Brown Trahern	4140	2016	200011	3/8/16		4840	3.64	< 0.02	0.09	0.0001	Beaver	QA
Murphy Brown Trahern	40100	2016	200011	3/8/16		< 23	< 0.11	< 0.02	< 0.02	0.0001	Beaver	QA
Murphy Brown Trahern	413A	2016	200011	3/8/16	2280	2320	< 0.11	27.6	0.03	0.0001	Beaver	Wet
Murphy Brown Tumbleweed-Sage Brush	21	2016	980011							0	Harper	Dry
Murphy Brown Tumbleweed-Sage Brush	22	2016	980011							0	Harper	Dry
Murphy Brown Tumbleweed-Sage Brush	23	2016	980011							0	Harper	Dry
Murphy Brown Tumbleweed-Sage Brush	60	2016	980011	12/9/15		3630	< 0.11	174	0.02	0.0001	Harper	Wet
Murphy Brown Tumbleweed-Sage Brush	61	2016	980011	12/9/15		572	< 0.11	7.44	0.02	0.0001	Harper	Wet
Murphy Brown Tumbleweed-Sage Brush	62	2016	980011							0	Harper	Dry
Murphy Brown Tumbleweed-Sage Brush	63	2016	980011	3/8/16	401	408	< 0.11	1.33	0.5	0.0001	Harper	Wet
Murphy Brown Tumbleweed-Sage Brush	64	2016	980011	3/8/16	466	463	< 0.11	1.71	12.5	0.0001	Harper	Wet
Murphy Brown Tumbleweed-Sage Brush	65	2016	980011	3/8/16	408	426	< 0.11	1.28	0.18	0.0001	Harper	Wet
Murphy Brown Tumbleweed-Sage Brush	600	2016	980011			< 23	< 0.11	0.11	< 0.02	0.0001	Harper	QA
Murphy Brown Tumbleweed-Sage Brush	610	2016	980011			566	< 0.11	7.99	< 0.02	0.0001	Harper	QA
Murphy Brown Tumbleweed-Sage Brush	650	2016	980011	3/8/16		427	< 0.11	1.23	0.17	0.0001	Harper	QA
Murphy Brown Tumbleweed-Sage Brush	8V0	2016	990011	3/15/16		941	< 0.11	4.73	< 0.02	0.0001	Harper	QA
Murphy Brown Turkey Flats	24	2016	980006							0	Harper	Dry
Murphy Brown Turkey Flats	25	2016	980006	12/9/15	482	458	< 0.11	2.72	1.67	0.0001	Harper	Wet
Murphy Brown Turkey Flats	63	2016	980006	12/9/15	1292	1350	< 0.11	13.8	1.9	0.0001	Harper	Wet
Murphy Brown Turkey Flats	64	2016	980006	12/9/15	509	532	< 0.11	7.3	0.73	0.0001	Harper	Wet
Prestage Farms of OK, LLC - BGF Site 1	1	2016	1359							0	Texas	Dry
Prestage Farms of OK, LLC - BGF Site 1	2	2016	1359							0	Texas	Dry
Prestage Farms of OK, LLC - BGF Site 1	3	2016	1359							0	Texas	Dry
Prestage Farms of OK, LLC - BGF Site 2	4	2016	1471							0	Texas	Dry
Prestage Farms of OK, LLC - BGF Site 2	5	2016	1471							0	Texas	Dry
Prestage Farms of OK, LLC - BGF Site 2	6	2016	1471							0	Texas	Dry

Facility Name	MW No.	Fiscal Year	License Number	Date Sampled	Field Conductivity (uS/cm)	Lab Conductivity (uS/cm)	NH4-N (ppm)	NO3-N (ppm)	Total P	Fecal Coliform	County	Sample
Prestage Farms of OK, LLC - BGF Site 3	7	2016	1488							0	Texas	Dry
Prestage Farms of OK, LLC - BGF Site 3	8	2016	1488							0	Texas	Dry
Prestage Farms of OK, LLC - BGF Site 3	9	2016	1488							0	Texas	Dry
Prestage Farms of OK, LLC - BGF Site 4	10	2016	970041							0	Texas	Dry
Prestage Farms of OK, LLC - BGF Site 4	11	2016	970041							0	Texas	Dry
Prestage Farms of OK, LLC - BGF Site 4	12	2016	970041							0	Texas	Dry
Prestage Farms of OK, LLC - BGF Site 5	201	2016	200205							0	Texas	Dry
Prestage Farms of OK, LLC - BGF Site 5	202	2016	200205							0	Texas	Dry
Prestage Farms of OK, LLC - BGF Site 5	203	2016	200205							0	Texas	Dry
Prestage Farms of OK, LLC - BGF Site 6	16	2016	980017							0	Texas	Dry
Prestage Farms of OK, LLC - BGF Site 6	17	2016	980017							0	Texas	Dry
Prestage Farms of OK, LLC - BGF Site 6	18	2016	980017							0	Texas	Dry
Prestage Farms of OK, LLC - BGF Site 7	19	2016	980015							0	Texas	Dry
Prestage Farms of OK, LLC - BGF Site 7	20	2016	980015							0	Texas	Dry
Prestage Farms of OK, LLC - BGF Site 7	21	2016	980015							0	Texas	Dry
Prestage Farms of OK, LLC - Finish Site 1 & 2	25	2016	1440							0	Texas	Dry
Prestage Farms of OK, LLC - Finish Site 1 & 2	26	2016	1440							0	Texas	Dry
Prestage Farms of OK, LLC - Finish Site 1 & 2	27	2016	1440							0	Texas	Dry
Prestage Farms of OK, LLC - Finish Site 1 & 2	28	2016	1440							0	Texas	Dry
Prestage Farms of OK, LLC - Finish Site 1 & 2	29	2016	1440							0	Texas	Dry
Prestage Farms of OK, LLC - Finish Site 1 & 2	30	2016	1440							0	Texas	Dry
Prestage Farms of OK, LLC - Finish Site 3 & 4	31	2016	1470							0	Texas	Dry
Prestage Farms of OK, LLC - Finish Site 3 & 4	32	2016	1470							0	Texas	Dry
Prestage Farms of OK, LLC - Finish Site 3 & 4	33	2016	1470							0	Texas	Dry
Prestage Farms of OK, LLC - Finish Site 3 & 4	35	2016	1470							0	Texas	Dry
Prestage Farms of OK, LLC - Finish Site 3 & 4	36	2016	1470							0	Texas	Dry

Facility Name	MW No.	Fiscal Year	License Number	Date Sampled	Field Conductivity (uS/cm)	Lab Conductivity (uS/cm)	NH4-N (ppm)	NO3-N (ppm)	Total P	Fecal Coliform	County	Sample
Prestage Farms of OK, LLC - Finish Site 3 & 4.	34	2016	1470							0	Texas	Dry
Prestage Farms of OK, LLC - Finish Site 5	37	2016	1484							0	Texas	Dry
Prestage Farms of OK, LLC - Finish Site 5	38	2016	1484							0	Texas	Dry
Prestage Farms of OK, LLC - Finish Site 5	39	2016	1484							0	Texas	Dry
Prestage Farms of OK, LLC - Finish Site 6 - 8	40	2016	970040							0	Texas	Dry
Prestage Farms of OK, LLC - Finish Site 6 - 8	41	2016	970040							0	Texas	Dry
Prestage Farms of OK, LLC - Finish Site 6 - 8	42	2016	970040							0	Texas	Dry
Prestage Farms of OK, LLC - Finish Site 6 - 8	43	2016	970040							0	Texas	Dry
Prestage Farms of OK, LLC - Finish Site 6 - 8	44	2016	970040							0	Texas	Dry
Prestage Farms of OK, LLC - Finish Site 6 - 8	45	2016	970040	4/12/16	1204	1200	<0.11	4.79	1.07	<1	Texas	Wet
Prestage Farms of OK, LLC - Finish Site 6 - 8	43A	2016	970040							0	Texas	Dry
Prestage Farms of OK, LLC - Sow Multiplier Site	22	2016	980016							0	Texas	Dry
Prestage Farms of OK, LLC - Sow Multiplier Site	23	2016	980016							0	Texas	Dry
Prestage Farms of OK, LLC - Sow Multiplier Site	24	2016	980016							0	Texas	Dry
Rickey Hog Farm	1	2016	1279	12/14/15	955	1010	< 0.11	< 0.02	< 0.02	0.0001	Pottawatomie	Wet
Rickey Hog Farm	2	2016	1279	12/14/15	817	884	< 0.11	1.7	0.24	0.0001	Pottawatomie	Wet
Rickey Hog Farm	3A	2016	1279	12/14/15	599	1680	< 0.11	28.5	0.27	0.0001	Pottawatomie	Wet
SB Aguirre Finisher (254)	168	2016	970013							0	Texas	Dry
SB Aguirre Finisher (254)	169	2016	970013							0	Texas	Dry
SB Aguirre Finisher (254)	170	2016	970013							0	Texas	Dry
SB Aguirre Finisher (254)	171	2016	970013							0	Texas	Dry
SB Aguirre Finisher (254)	172	2016	970013							0	Texas	Dry
SB Aguirre Finisher (254)	173	2016	970013							0	Texas	Dry
SB Anderson Finisher (317)	153	2016	970042	3/29/16	990	1030	< 0.11	1.38	0.29	0.0001	Texas	Wet
SB Anderson Finisher (317)	1530	2016	970042	3/29/16		<23	<0.11	<0.02	<0.02	0.0001	Texas	QA

Facility Name	MW No.	Fiscal Year	License Number	Date Sampled	Field Conductivity (uS/cm)	Lab Conductivity (uS/cm)	NH4-N (ppm)	NO3-N (ppm)	Total P	Fecal Coliform	County	Sample
SB Barr Finisher (435)	1	2016	12615	10/27/15	292	397	< 0.11	12.7	0.05	0.0001	Kingfisher	Wet
SB Barr Finisher (435)	2	2016	12615	10/27/15	302	332	< 0.11	26.3	0.06	0.0001	Kingfisher	Wet
SB Barr Finisher (435)	3A	2016	12615	10/27/15	528	543	< 0.11	8.16	0.05	3	Kingfisher	Wet
SB Bee (F211,12,13)	100	2016	970043							0	Texas	Dry
SB Bee (F211,12,13)	101	2016	970043							0	Texas	Dry
SB Bee (F211,12,13)	102	2016	970043							0	Texas	Dry
SB Bee (F211,12,13)	103	2016	970043							0	Texas	Dry
SB Bee (F211,12,13)	104	2016	970043							0	Texas	Dry
SB Bee (F211,12,13)	105	2016	970043							0	Texas	Dry
SB Bee (F211,12,13)	106	2016	970043							0	Texas	Dry
SB Bee (F211,12,13)	107	2016	970043							0	Texas	Dry
SB Bee (F211,12,13)	108	2016	970043							0	Texas	Dry
SB Bee (F211,12,13)	112	2016	970043							0	Texas	Dry
SB Bee (F211,12,13)	113	2016	970043							0	Texas	Dry
SB Bee (F211,12,13)	114	2016	970043							0	Texas	Dry
SB Beelman-Frizzell Fin. (278 - 279)	15	2016	970032							0	Texas	Dry
SB Beelman-Frizzell Fin. (278 - 279)	16	2016	970032							0	Texas	Dry
SB Beelman-Frizzell Fin. (278 - 279)	17	2016	970032							0	Texas	Dry
SB Beelman-Frizzell Fin. (278 - 279)	36	2016	970032							0	Texas	Dry
SB Beelman-Frizzell Fin. (278 - 279)	37	2016	970032							0	Texas	Dry
SB Beelman-Frizzell Fin. (278 - 279)	38	2016	970032							0	Texas	Dry
SB Beelman-Frizzell Fin. (278 - 279)	39	2016	970032							0	Texas	Dry
SB Beelman-Frizzell Fin. (278 - 279)	40	2016	970032							0	Texas	Dry
SB Beelman-Frizzell Fin. (278 - 279)	41	2016	970032							0	Texas	Dry
SB Beelman-Frizzell Fin. (278 - 279)	42	2016	970032							0	Texas	Dry
SB Beelman-Frizzell Fin. (278 - 279)	43	2016	970032							0	Texas	Dry

Facility Name	MW No.	Fiscal Year	License Number	Date Sampled	Field Conductivity (uS/cm)	Lab Conductivity (uS/cm)	NH4-N (ppm)	NO3-N (ppm)	Total P	Fecal Coliform	County	Sample
SB Beelman-Frizzell Fin. (278 - 279)	44	2016	970032							0	Texas	Dry
SB Beelman-Frizzell Fin. (278 - 279)	45	2016	970032							0	Texas	Dry
SB Beelman-Frizzell Fin. (278 - 279)	46	2016	970032							0	Texas	Dry
SB Beelman-Frizzell Fin. (278 - 279)	47	2016	970032							0	Texas	Dry
SB Best Nursery (152 - 153)	34	2016	12612	10/27/15	639	663	< 0.11	23.4	0.03	0.0001	Kingfisher	Wet
SB Best Nursery (152 - 153)	35	2016	12612	10/27/15	1538	1580	< 0.11	52.4	0.11	0.0001	Kingfisher	Wet
SB Best Nursery (152- 153)	25	2016	12612	10/27/15	1018	1050	< 0.11	9.45	0.97	0.0001	Kingfisher	Wet
SB Best Nursery (152- 153)	26	2016	12612	10/27/15	870	890	< 0.11	14.9	0.11	0.0001	Kingfisher	Wet
SB Best Nursery (152- 153)	33	2016	12612	10/27/15						0	Kingfisher	Dry
SB Best Nursery (152-153)	260	2016	12612	10/27/15		890	< 0.11	15.3	0.11	0.0001	Kingfisher	QA
SB Brenneman (F330)	33	2016	980022							0	Texas	Dry
SB Brenneman (F330)	34	2016	980022							0	Texas	Dry
SB Brenneman (F330)	35	2016	980022							0	Texas	Dry
SB Brown Sow	36	2016	12621	10/26/15	687	704	< 0.11	2.66	1.19	11	Kingfisher	Wet
SB Brown Sow	37	2016	12621	10/26/15	870	884	< 0.11	6.64	0.12	0.0001	Kingfisher	Wet
SB Brown Sow	38	2016	12621	10/26/15	814	804	< 0.11	7.31	0.28	0.0001	Kingfisher	Wet
SB Brown Sow (S61)	370	2016	12621	10/26/15		884	< 0.11	6.88	0.13	0.0001	Kingfisher	QA
SB Bryan Sow & Norris (62, 436)	20-2011	2016	12611	10/26/15	397	385	< 0.11	10.4	0.42	0.0001	Kingfisher	Wet
SB Bryan Sow & Norris (62, 436)	21-2011	2016	12611	10/26/15	11.84	1150	< 0.11	49.9	0.37	0.0001	Kingfisher	Wet
SB Bryan Sow & Norris (62, 436)	22-2011	2016	12611	10/26/15	617	584	< 0.11	2.71	0.43	0.0001	Kingfisher	Wet
SB Bryan Sow & Norris (62, 436)	519-04	2016	12611	10/27/15	1207	1170	< 0.11	29.6	0.8	0.0001	Kingfisher	Wet
SB Bryan Sow & Norris (62, 436)	519-05	2016	12611	10/27/15	1332	1390	< 0.11	7.64	0.05	0.0001	Kingfisher	Wet
SB Bryan Sow & Norris (62, 436)	519-07A	2016	12611	10/26/15	1910	1910	< 0.11	20.4	0.57	0.0001	Kingfisher	Wet
SB Bryan Sow & Norris (62, 436)	519-08	2016	12611	10/27/15	1570	1540	< 0.11	36	0.56	0.0001	Kingfisher	Wet
SB Bryan Sow & Norris (62, 436)	519-09	2016	12611	10/27/15	1550	1550	< 0.11	46.6	0.18	0.0001	Kingfisher	Wet

Facility Name	MW No.	Fiscal Year	License Number	Date Sampled	Field Conductivity (uS/cm)	Lab Conductivity (uS/cm)	NH4-N (ppm)	NO3-N (ppm)	Total P	Fecal Coliform	County	Sample
SB Bryan Sow & Norris (62, 436)	519-10	2016	12611	10/26/15	1630	1640	< 0.11	4.99	0.55	0.0001	Kingfisher	Wet
SB Bryan Sow & Norris (62, 436)	519-11	2016	12611	10/26/15	8.59	863	< 0.11	15.2	0.38	0.0001	Kingfisher	Wet
SB Bryan Sow & Norris (62, 436)	519-14	2016	12611	10/26/15	749	774	< 0.11	< 0.02	0.58	0.0001	Kingfisher	Wet
SB Bryan Sow & Norris (62, 436)	519-15	2016	12611	10/26/15	1409	1390	< 0.11	0.13	0.36	0.0001	Kingfisher	Wet
SB Bryan Sow & Norris (62, 436)	6540-04	2016	12611	10/26/15						0	Kingfisher	Dry
SB Bryan Sow & Norris (62, 436)	6540-05	2016	12611	10/26/15						0	Kingfisher	Dry
SB Bryan Sow & Norris (62, 436)	6540-06	2016	12611	10/26/15						0	Kingfisher	Dry
SB Bryan Sow & Norris (62, 436)	6540-07	2016	12611	10/26/15	326	329	< 0.11	0.04	0.33	0.0001	Kingfisher	Wet
SB Bryan Sow & Norris (62, 436)	6540-10	2016	12611							0	Kingfisher	Dry
SB Choate Sow (S65)	509-N3 (aka 44)	2016	1225	10/26/15	500	547	< 0.11	17.8	0.97	0.0001	Kingfisher	Wet
SB Choate Sow (S65)	509-N4 (aka 43)	2016	1225							0	Kingfisher	Dry
SB Choate Sow (S65)	509-N5 (aka 45)	2016	1225	10/26/15	663	684	< 0.11	< 0.02	0.2	0.0001	Kingfisher	Wet
SB Choate Sow (S65)	509-N6 (aka 42)	2016	1225	10/26/15	562	585	< 0.11	0.61	0.75	0.0001	Kingfisher	Wet
SB Cliff Sow (43)	1	2016	970014	3/29/16	2020	2090	< 0.11	0.91	0.28	0.0001	Texas	Wet
SB Coppock Finisher (298)	731	2016	200219							0	Texas	Dry
SB Coppock Finisher (298)	732	2016	200219							0	Texas	Dry
SB Coppock Finisher (298)	733	2016	200219							0	Texas	Dry
SB Depuy/Friesen Finishers (323-326)	133	2016	970019	3/22/16	878	902	< 0.11	6.38	0.22	0.0001	Texas	Wet
SB Depuy/Friesen Finishers (323-326)	134	2016	970019							0	Texas	Dry

Facility Name	MW No.	Fiscal Year	License Number	Date Sampled	Field Conductivity (uS/cm)	Lab Conductivity (uS/cm)	NH4-N (ppm)	NO3-N (ppm)	Total P	Fecal Coliform	County	Sample
SB Depuy/Friesen Finishers (323-326)	135	2016	970019							0	Texas	Dry
SB Depuy/Friesen Finishers (323-326)	136	2016	970019							0	Texas	Dry
SB Depuy/Friesen Finishers (323-326)	137	2016	970019	3/22/16	1181	1120	< 0.11	3.1	0.32	0.0001	Texas	Wet
SB Depuy/Friesen Finishers (323-326)	138	2016	970019	3/22/16	714	715	< 0.11	12.8	1.33	0.0001	Texas	Wet
SB Depuy/Friesen Finishers (323-326)	139	2016	970019							0	Texas	Dry
SB Depuy/Friesen Finishers (323-326)	140	2016	970019							0	Texas	Dry
SB Depuy/Friesen Finishers (323-326)	141	2016	970019	3/22/16	6.12	577	< 0.11	2.28	1.53	0.0001	Texas	Wet
SB Depuy/Friesen Finishers (323-326)	142	2016	970019							0	Texas	Dry
SB Depuy/Friesen Finishers (323-326)	143	2016	970019							0	Texas	Dry
SB Depuy/Friesen Finishers (323-326)	179	2016	970019	3/22/16	536	531	< 0.11	2.39	0.68	0.0001	Texas	Wet
SB Depuy/Friesen Finishers (323-326)	180	2016	970019							0	Texas	Dry
SB Depuy/Friesen Finishers (323-326)	181	2016	970019							0	Texas	Dry
SB Depuy/Friesen Finishers (323-326)	182	2016	970019	3/22/16	701	715	< 0.11	6.48	< 0.02	0.0001	Texas	Wet
SB Depuy/Friesen Finishers (323-326)	183	2016	970019	3/22/16	2010	1990	< 0.11	31.4	< 0.02	0.0001	Texas	Wet
SB Depuy/Friesen Finishers (323-326)	184	2016	970019	3/22/16	807	819	< 0.11	6.57	< 0.02	0.0001	Texas	Wet
SB Depuy/Friesen Finishers (323-326)	820	2016	970027	3/22/16						0	Texas	Dry
SB Depuy/Friesen Finishers (323-326)	1790	2016	970019	3/22/16		< 23	< 0.11	< 0.02	< 0.02	0.0001	Texas	QA
SB Depuy/Friesen Finishers (323-326)	1820	2016	970019	3/22/16						0	Texas	QA
SB Depuy/Friesen Finishers (323-326)	1840	2016	970019							0	Texas	Dry
SB Dixon Nursery (124)	245	2016	200005							0	Texas	Dry
SB Dixon Nursery (124)	246	2016	200005							0	Texas	Dry
SB Dixon Nursery (124)	247	2016	200005							0	Texas	Dry
SB Dixon/Jeffus Sow Farm (S37 & S38)	1	2016	200220							0	Texas	Dry
SB Dixon/Jeffus Sow Farm (S37 & S38)	2	2016	200220							0	Texas	Dry
SB Dixon/Jeffus Sow Farm (S37 & S38)	3	2016	200220							0	Texas	Dry
SB Dixon/Jeffus Sow Farm (S37 & S38)	2203	2016	200220							0	Texas	Dry

Facility Name	MW No.	Fiscal Year	License Number	Date Sampled	Field Conductivity (uS/cm)	Lab Conductivity (uS/cm)	NH4-N (ppm)	NO3-N (ppm)	Total P	Fecal Coliform	County	Sample
SB Dixon/Jeffus Sow Farm (S37 & S38)	2204	2016	200220							0	Texas	Dry
SB Dixon/Jeffus Sow Farm (S37 & S38)	2205	2016	200220							0	Texas	Dry
SB Dorman Sow (48-49)	350	2016	1353							0	Beaver	Dry
SB Dorman Sow (48-49)	10V	2016	990011	3/15/16	1190	1170	< 0.11	6.59	0.02	0.0001	Beaver	Wet
SB Dorman Sow (48-49)	11V	2016	990011	3/15/16	975	977	< 0.11	5.74	0.37	0.0001	Beaver	Wet
SB Dorman Sow (48-49)	12V	2016	990011	3/15/16	660	671	< 0.11	4.89	0.15	0.0001	Beaver	Wet
SB Dorman Sow (48-49)	8V	2016	990011	3/15/16	959	948	< 0.11	4.71	< 0.02	0.0001	Beaver	Wet
SB Dorman Sow (48-49)	9V	2016	990011	3/15/16	885	875	< 0.11	3.26	< 0.02	0.0001	Beaver	Wet
SB Fairview Fin 2, 3, 4 (428 - 430)	30	2016	1352	10/20/15		< 23	< 0.11	< 0.02	< 0.02	0.0001	Major	QA
SB Fairview Fin 2, 3, 4 (428 - 430)	180	2016	1352	10/20/15		591	< 0.11	27.7	0.1	0.0001	Major	QA
SB Fairview Fin 2, 3, 4 (428-430)	13	2016	1352	10/20/15	500	496	< 0.11	11.1	0.11	0.0001	Major	Wet
SB Fairview Fin 2, 3, 4 (428-430)	20	2016	1352	10/20/15	580	577	< 0.11	0.26	0.09	0.0001	Major	Wet
SB Fairview Fin 5 - 8 (431 - 434)	25	2016	1356	10/21/15	527	520	< 0.11	10.4	0.09	0.0001	Major	Wet
SB Fairview Fin 5 - 8 (431 - 434)	26	2016	1356	10/21/15	901	899	< 0.11	0.03	0.69	0.0001	Major	Wet
SB Fairview Fin 5-8 (431 - 434)	280	2016	1356	10/21/15	718	< 23	< 0.11	< 0.02	< 0.02	0.0001	Major	Wet
SB Fairview Finisher 1	33	2016	1353	10/19/15	488	490	< 0.11	12.3	0.24	0.0001	Major	Wet
SB Fairview Finisher 1	34	2016	1353	10/19/15	522	520	< 0.11	11.4	0.17	0.0001	Major	Wet
SB Fairview Finisher 1	35	2016	1353	10/19/15	502	501	< 0.11	6.11	0.17	0.0001	Major	Wet
SB Fairview Finisher 2, 3 & 4 (428 -430)	19	2016	1352	10/20/15	606	601	< 0.11	0.7	0.09	0.0001	Major	Wet
SB Fairview Finisher 2, 3 & 4 (428-430)	1	2016	1352	10/20/15	554	552	< 0.11	26.1	0.45	0.0001	Major	Wet
SB Fairview Finisher 2, 3 & 4 (428-430)	2	2016	1352	10/20/15	641	640	< 0.11	23.8	1.26	0.0001	Major	Wet
SB Fairview Finisher 2, 3 & 4 (428-430)	3	2016	1352	10/20/15	614	610	< 0.11	22.9	1.68	0.0001	Major	Wet
SB Fairview Finisher 2, 3 & 4 (428-430)	12	2016	1352	10/20/15	555	549	< 0.11	14.9	0.08	0.0001	Major	Wet
SB Fairview Finisher 2, 3 & 4 (428-430)	14	2016	1352	10/20/15	555	552	< 0.11	19.3	0.11	0.0001	Major	Wet
SB Fairview Finisher 2, 3 & 4 (428-430)	18	2016	1352	10/20/15	593	591	< 0.11	26.8	0.08	0.0001	Major	Wet
SB Fairview Finisher 5 - 8 (431 - 434)	1	2016	1356	10/21/15	534	497	< 0.11	21.2	2.32	0.0001	Major	Wet

Facility Name	MW No.	Fiscal Year	License Number	Date Sampled	Field Conductivity (uS/cm)	Lab Conductivity (uS/cm)	NH4-N (ppm)	NO3-N (ppm)	Total P	Fecal Coliform	County	Sample
SB Fairview Finisher 5 - 8 (431 - 434)	21	2016	1356	10/21/15	731	726	< 0.11	19.3	0.12	0.0001	Major	Wet
SB Fairview Finisher 5 - 8 (431 - 434)	23	2016	1356							0	Major	Dry
SB Fairview Finisher 5 - 8 (431 - 434)	24	2016	1356	10/21/15	507	505	< 0.11	24.1	0.27	0.0001	Major	Wet
SB Fairview Finisher 5 - 8 (431 - 434)	27	2016	1356	10/21/15	743	715	< 0.11	0.07	0.19	0.0001	Major	Wet
SB Fairview Finisher 5 - 8 (431 - 434)	28	2016	1356	10/21/15	718	711	< 0.11	21.4	0.1	0.0001	Major	Wet
SB Fairview Finisher 5 - 8 (431 - 434)	30	2016	1356	10/20/15	488	484	< 0.11	18.1	0.75	0.0001	Major	Wet
SB Fairview Finisher 5 - 8 (431 - 434)	31	2016	1356	10/20/15	345	356	< 0.11	10.7	0.05	0.0001	Major	Wet
SB Fairview Finisher 5 - 8 (431 - 434)	32	2016	1356	10/20/15	1190	1190	< 0.11	41.7	0.78	0.0001	Major	Wet
SB Fairview Finisher 5 - 8 (431 - 434)	33	2016	1356	10/21/15	595	592	< 0.11	19.5	0.38	0.0001	Major	Wet
SB Fairview Finisher 5 - 8 (431 - 434)	23B	2016	1356	10/21/15	851	886	< 0.11	47.9	0.88	0.0001	Major	Wet
SB Fairview Finisher 5 - 8 (431-434)	22	2016	1356	10/21/15	7.31	748	< 0.11	11.5	0.2	0.0001	Major	Wet
SB Fairview Nur 1 - 4	3200-01	2016	1351	10/20/15	552	547	< 0.11	0.65	0.72	0.0001	Major	Wet
SB Fairview Nur 1 - 4	3200-02	2016	1351	10/20/15	593	587	< 0.11	< 0.02	0.14	0.0001	Major	Wet
SB Fairview Nur 1 - 4	3200-05	2016	1351	10/20/15	782	795	< 0.11	7.53	0.39	0.0001	Major	Wet
SB Fairview Nur 1 - 4	3200-08	2016	1351	10/20/15	738	752	< 0.11	4.89	0.19	0.0001	Major	Wet
SB Fairview Nur 1 - 4	3300-01	2016	1351	10/21/15	1189	1130	< 0.11	7.48	3.28	0.0001	Major	Wet
SB Fairview Nur 1 - 4	3300-02	2016	1351	10/21/15	468	462	< 0.11	9.77	0.1	0.0001	Major	Wet
SB Fairview Nur 1 - 4	3300-03	2016	1351	10/20/15	625	597	< 0.11	19.3	0.31	0.0001	Major	Wet
SB Fairview Nur 1 - 4	3300-04	2016	1351	10/21/15	521	512	< 0.11	8.45	0.08	0.0001	Major	Wet
SB Fairview Nur 1 - 4	3300-05	2016	1351	10/21/15	433	404	< 0.11	14	2.07	0.0001	Major	Wet
SB Fairview Nur 1 - 4	6200-03	2016	1351	10/20/15	935	924	< 0.11	20.4	0.44	0.0001	Major	Wet
SB Fairview Nur 1 - 4	6200-06	2016	1351	10/19/15	881	1020	< 0.11	16.4	0.65	0.0001	Major	Wet
SB Fairview Nur 1 - 4	6200-07	2016	1351	10/19/15	812	831	< 0.11	6.13	2.35	0.0001	Major	Wet

Facility Name	MW No.	Fiscal Year	License Number	Date Sampled	Field Conductivity (uS/cm)	Lab Conductivity (uS/cm)	NH4-N (ppm)	NO3-N (ppm)	Total P	Fecal Coliform	County	Sample
SB Fairview Nur 1 - 4	6200-08	2016	1351	10/20/15	875	856	< 0.11	26.6	0.76	0.0001	Major	Wet
SB Fairview Nur 1 - 4	6200-09	2016	1351	10/20/15	826	806	< 0.11	28	0.47	0.0001	Major	Wet
SB Fairview Nur 1 - 4	6300-06	2016	1351	10/20/15	622	617	< 0.11	12.4	0.75	0.0001	Major	Wet
SB Fairview Nur 1 - 4	6300-07	2016	1351	10/20/15						0	Major	Dry
SB Fairview Nur 1 - 4 (155 - 158)	250	2016	1356	10/21/15		520	< 0.11	10.3	0.09	0.0001	Major	QA
SB Fairview Nur 1 - 4 (155 - 158)	3300-020	2016	1351	10/21/15		< 23	< 0.11	< 0.02	< 0.02	0.0001	Major	QA
SB Fairview Nur 1 - 4 (155 - 158)	3300-030	2016	1351	10/20/15		588	< 0.11	20.9	0.42/0.41	0.0001	Major	QA
SB Fairview Nur 1 - 4 (155 - 158)	6300-04	2016	1351	10/20/15	1410	1090	< 0.11	8.39	0.41	0.0001	Major	Wet
SB Fairview Nur 1-4	6300-05	2016	1351	10/20/15	1163	1030	< 0.11	9.57	0.08	0.0001	Major	Wet
SB Fairview Sow 1	36	2016	1350	10/19/15	560	561	< 0.11	3.5	0.06	0.0001	Woodward	Wet
SB Fairview Sow 1	37	2016	1350	10/19/15	560	570	< 0.11	10.8	0.34	0.0001	Woodward	Wet
SB Fairview Sow 1	38	2016	1350	10/19/15	605	603	< 0.11	2.74	0.33	0.0001	Woodward	Wet
SB Fairview Sow 2	1	2016	1354	10/19/15	700	678	< 0.11	13.8	0.08	0.0001	Major	Wet
SB Fairview Sow 2	2	2016	1354	10/19/15	957	925	< 0.11	17	0.08	0.0001	Major	Wet
SB Fairview Sow 2	3	2016	1354	10/19/15	584	564	< 0.11	10.1	0.09	0.0001	Major	Wet
SB Fairview Sow 2 (64)	39	2016	1354	10/19/15	744	736	< 0.11	19.6	0.17	0.0001	Major	Wet
SB Fairview Sow 2 (64)	40	2016	1354	10/19/15	569	577	< 0.11	16.3	0.92	0.0001	Major	Wet
SB Fairview Sow 2 (64)	41	2016	1354	10/19/15	922	863	< 0.11	39	0.75	0.0001	Major	Wet
SB Fairview Sow 2 (64)	400	2016	1354	10/19/15		564	< 0.11	15.7	1.08	0.0001	Major	QA
SB Fariview Nur 1 - 4	3200-06	2016	1351	10/20/15	599	594	< 0.11	5.54	0.28	0.0001	Major	Wet
SB Fisher (F215)	130	2016	990001							0	Texas	Dry
SB Fisher (F215)	131	2016	990001							0	Texas	Dry
SB Fisher (F215)	132	2016	990001							0	Texas	Dry
SB Flanagan Sow (41)	124	2016	980023							0	Texas	Dry

Facility Name	MW No.	Fiscal Year	License Number	Date Sampled	Field Conductivity (uS/cm)	Lab Conductivity (uS/cm)	NH4-N (ppm)	NO3-N (ppm)	Total P	Fecal Coliform	County	Sample
SB Flanagan Sow (41)	125	2016	980023							0	Texas	Dry
SB Flanagan Sow (41)	126	2016	980023							0	Texas	Dry
SB Galloway Nursery (125)	1											
SB Galloway Nursery (125)	2	2016	200104	3/29/16	6.33	670	<0.11	3.36	0.03	0.0001	Texas	Wet
SB Galloway Nursery (125)	20	2016	200104	3/29/16						0	Texas	Dry
SB Garrison Nursery (123)	30	2016	970024							0	Texas	Dry
SB Garrison Nursery (123)	31	2016	970024							0	Texas	Dry
SB Garrison Nursery (123)	32	2016	970024							0	Texas	Dry
SB Gerber/Magnolia Fin. (287 & 295)	2004	2016	990013							0	Texas	Dry
SB Gerber/Magnolia Fin. (287 & 295)	2005	2016	990013							0	Texas	Dry
SB Gerber/Magnolia Fin. (287 & 295)	2006	2016	990013							0	Texas	Dry
SB Gerber/Magnolia Fin. (287 & 295)	2007	2016	990013							0	Texas	Dry
SB Gerber/Magnolia Fin. (287 & 295)	2008	2016	990013							0	Texas	Dry
SB Gerber/Magnolia Fin. (287 & 295)	2009	2016	990013							0	Texas	Dry
SB Green Finisher (316)	162	2016	980007							0	Texas	Dry
SB Green Finisher (316)	163	2016	980007							0	Texas	Dry
SB Green Finisher (316)	164	2016	980007							0	Texas	Dry
SB Haar, Hicks, McCright	901	2016	200009							0	Texas	Dry
SB Haar, Hicks, McCright	902	2016	200009							0	Texas	Dry
SB Haar, Hicks, McCright	903	2016	200009							0	Texas	Dry
SB Haar, Hicks, McCright	904	2016	200009							0	Texas	Dry
SB Haar, Hicks, McCright	905	2016	200009							0	Texas	Dry
SB Haar, Hicks, McCright	906	2016	200009							0	Texas	Dry
SB Haar, Hicks, McCright	907	2016	200009							0	Texas	Dry
SB Haar, Hicks, McCright	908	2016	200009							0	Texas	Dry
SB Haar, Hicks, McCright	909	2016	200009							0	Texas	Dry

Facility Name	MW No.	Fiscal Year	License Number	Date Sampled	Field Conductivity (uS/cm)	Lab Conductivity (uS/cm)	NH4-N (ppm)	NO3-N (ppm)	Total P	Fecal Coliform	County	Sample
SB Haar, Hicks, McCright	910	2016	200009							0	Texas	Dry
SB Haar, Hicks, McCright	911	2016	200009							0	Texas	Dry
SB Haar, Hicks, McCright	912	2016	200009							0	Texas	Dry
SB Haar, Hicks, McCright	913	2016	200009							0	Texas	Dry
SB Haar, Hicks, McCright	914	2016	200009							0	Texas	Dry
SB Haar, Hicks, McCright	915	2016	200009							0	Texas	Dry
SB Haar, Hicks, McCright	916	2016	200009							0	Texas	Dry
SB Haar, Hicks, McCright	917	2016	200009							0	Texas	Dry
SB Haar, Hicks, McCright	918	2016	200009							0	Texas	Dry
SB Haar, Hicks, McCright	919	2016	200009							0	Texas	Dry
SB Haar, Hicks, McCright	920	2016	200009							0	Texas	Dry
SB Haar, Hicks, McCright	921	2016	200009							0	Texas	Dry
SB Haar, Hicks, McCright	922	2016	200009	3/23/16	1261	1310	< 0.11	3.36	3.62	0.0001	Texas	Wet
SB Haar, Hicks, McCright	923	2016	200009							0	Texas	Dry
SB Haar, Hicks, McCright	924	2016	200009							0	Texas	Dry
SB Haar, Hicks, McCright	925	2016	200009							0	Texas	Dry
SB Haar, Hicks, McCright	926	2016	200009							0	Texas	Dry
SB Haar, Hicks, McCright	927	2016	200009							0	Texas	Dry
SB Haar, Hicks, McCright	928	2016	200009							0	Texas	Dry
SB Haar, Hicks, McCright	929	2016	200009							0	Texas	Dry
SB Haar, Hicks, McCright	930	2016	200009							0	Texas	Dry
SB Haar, Hicks, McCright	931	2016	200009							0	Texas	Dry
SB Haar, Hicks, McCright	932	2016	200009							0	Texas	Dry
SB Haar, Hicks, McCright	933	2016	200009							0	Texas	Dry
SB Harmon (F310)	121	2016	980024							0	Texas	Dry
SB Harmon (F310)	122	2016	980024							0	Texas	Dry

Facility Name	MW No.	Fiscal Year	License Number	Date Sampled	Field Conductivity (uS/cm)	Lab Conductivity (uS/cm)	NH4-N (ppm)	NO3-N (ppm)	Total P	Fecal Coliform	County	Sample
SB Harmon (F310)	123	2016	980024							0	Texas	Dry
SB Hill Nursery (122)	165	2016	970025							0	Texas	Dry
SB Hill Nursery (122)	166	2016	970025							0	Texas	Dry
SB Hill Nursery (122)	167	2016	970025							0	Texas	Dry
SB Hixon Sow Farm (42)	174	2016	970015							0	Texas	Dry
SB Hixon Sow Farm (42)	175	2016	970015							0	Texas	Dry
SB Hixon Sow Farm (42)	176	2016	970015							0	Texas	Dry
SB Hixon Sow Farm (42)	177	2016	970015							0	Texas	Dry
SB Hixon Sow Farm (42)	178	2016	970015							0	Texas	Dry
SB Kauffman Sow (33)	242	2016	200004							0	Texas	Dry
SB Kauffman Sow (33)	243	2016	200004							0	Texas	Dry
SB Kauffman Sow (33)	244	2016	200004							0	Texas	Dry
SB Kendra East Sow (44)	4	2016	200311							0	Texas	Dry
SB Kendra East Sow (44)	5	2016	200311							0	Texas	Dry
SB Kendra East Sow (44)	6	2016	200311							0	Texas	Dry
SB KENDRA WEST SOW FARM	2209	2016	200227							0	Texas	Dry
SB KENDRA WEST SOW FARM	2210	2016	200227							0	Texas	Dry
SB KENDRA WEST SOW FARM	2211	2016	200227							0	Texas	Dry
SB Lindsay Finishers (355 - 356)	24	2016	970044	3/29/16	1110	1150	< 0.11	7.44	0.29	0.0001	Texas	Wet
SB Long Sow Farm (40)	156	2016	990005	3/29/16	1480	1550	< 0.11	3.23	0.06	0.0001	Texas	Wet
SB Long Sow Farm (40)	157	2016	990005	3/29/16	747	785	< 0.11	1.4	1.34	0.0001	Texas	Wet
SB Long Sow Farm (40)	1560	2016	990005	3/29/16		1550	< 0.11	3.39	0.06	0.0001	Texas	QA
SB McBride (F342)	127	2016	980025							0	Texas	Dry
SB McBride (F342)	128	2016	980025							0	Texas	Dry
SB McBride (F342)	129	2016	980025							0	Texas	Dry

Facility Name	MW No.	Fiscal Year	License Number	Date Sampled	Field Conductivity (uS/cm)	Lab Conductivity (uS/cm)	NH4-N (ppm)	NO3-N (ppm)	Total P	Fecal Coliform	County	Sample
SB McGarraugh Sow (S34 & S35)	1	2016	200221							0	Texas	Dry
SB McGarraugh Sow (S34 & S35)	2	2016	200221							0	Texas	Dry
SB McGarraugh Sow (S34 & S35)	3	2016	200221							0	Texas	Dry
SB McGarraugh Sow (S34 & S35)	2215	2016	200221							0	Texas	Dry
SB McGarraugh Sow (S34 & S35)	2216	2016	200221							0	Texas	Dry
SB McGarraugh Sow (S34 & S35)	2217	2016	200221							0	Texas	Dry
SB Metcalf/Watkins Nur. Farm (#126)	2212	2016	200225							0	Texas	Dry
SB Metcalf/Watkins Nur. Farm (#126)	2213	2016	200225							0	Texas	Dry
SB Metcalf/Watkins Nur. Farm (#126)	2214	2016	200225							0	Texas	Dry
SB Mitchell Finishers (327-328)	76	2016	970026	3/15/16	1000	973	< 0.11	4.94	0.19	0.0001	Texas	Wet
SB Mitchell Finishers (327-328)	79	2016	970026							0	Texas	Dry
SB Mitchell Finishers (327-328)	80	2016	970026	3/15/16	676	669	< 0.11	5.74	0.08	0.0001	Texas	Wet
SB Mitchell Finishers (327-328)	760	2016	970026	3/15/16		< 23	< 0.11	< 0.02	< 0.02	0.0001	Texas	QA
SB Mitchell Finishers (327-328)	81A	2016	970026							0	Texas	Dry
SB Morris Nursery (N121)	2200	2016	200226							0	Texas	Dry
SB Morris Nursery (N121)	2201	2016	200226							0	Texas	Dry
SB Morris Nursery (N121)	2202	2016	200226							0	Texas	Dry
SB Mouser I Finisher (217)	73	2016	980009							0	Texas	Dry
SB Mouser I Finisher (217)	74	2016	980009							0	Texas	Dry
SB Mouser I Finisher (217)	75	2016	980009							0	Texas	Dry
SB Mouser II Finisher (218)	68	2016	970016							0	Texas	Dry
SB Mouser II Finisher (218)	69	2016	970016	3/22/16	557	569	< 0.11	2.19	0.31	0.0001	Texas	Wet
SB Mouser II Finisher (218)	71	2016	970016							0	Texas	Dry
SB Mouser II Finisher (218)	72	2016	970016							0	Texas	Dry
SB Mullins Finisher (329)	82	2016	970027	3/22/16	1640	1540	< 0.11	15.1	0.39	0.0001	Texas	Wet
SB Mullins Finisher (329)	83	2016	970027							0	Texas	Dry

Facility Name	MW No.	Fiscal Year	License Number	Date Sampled	Field Conductivity (uS/cm)	Lab Conductivity (uS/cm)	NH4-N (ppm)	NO3-N (ppm)	Total P	Fecal Coliform	County	Sample
SB Mullins Finisher (329)	84	2016	970027							0	Texas	Dry
SB Mullins Finisher (329)	85	2016	970027	3/22/16	1115	1150	0.26	12	0.61	0.0001	Texas	Wet
SB Mullins Finisher (329)	86	2016	970027							0	Texas	Dry
SB Mullins Finisher (329)	87	2016	970027							0	Texas	Dry
SB Mullins Finisher (329)	850	2016	970027							0	Texas	Dry
SB Nichols Radcliff Nurseries (131-137)	248	2016	990012	3/1/16	1038	1030	< 0.11	9.49	0.1	0.0001	Beaver	Wet
SB Nichols Radcliff Nurseries (131-137)	249	2016	990012	3/1/16	1104	1100	< 0.11	9.18	0.05	0.0001	Beaver	Wet
SB Nichols Radcliff Nurseries (131-137)	250	2016	990012	3/1/16	1407	1340	< 0.11	7.59	0.06	0.0001	Beaver	Wet
SB Nichols Radcliff Nurseries (131-137)	251	2016	990012	3/1/16	1359	1350	< 0.11	5.04	0.07	0.0001	Beaver	Wet
SB Nichols Radcliff Nurseries (131-137)	252	2016	990012	3/1/16	1810	1820	< 0.11	12.1	0.03	0.0001	Beaver	Wet
SB Nichols Radcliff Nurseries (131-137)	253	2016	990012	3/1/16	836	837	< 0.11	24.2	0.07	0.0001	Beaver	Wet
SB Nichols Radcliff Nurseries (131-137)	254	2016	990012	3/1/16	1171	1120	< 0.11	15.3	0.27	0.0001	Beaver	Wet
SB Nichols Radcliff Nurseries (131-137)	255	2016	990012	3/1/16	3560	3580	< 0.11	5.34	0.03	0.0001	Beaver	Wet
SB Nichols Radcliff Nurseries (131-137)	256	2016	990012	3/1/16	1473	1480	< 0.11	7.95	0.03	0.0001	Beaver	Wet
SB Nichols Radcliff Nurseries (131-137)	2520	2016	990012	3/1/16		1820	< 0.11	12	0.03	0.0001	Beaver	QA
SB Nichols Radcliff Nurseries (131-137)	2540	2016	990012	3/1/16		< 23	< 0.11	< 0.02	< 0.02	0.0001	Beaver	QA
SB Nichols Radcliff Nurseries (131-137)	2550	2016	990012	3/1/16		< 23	< 0.11	< 0.02	< 0.02	0.0001	Beaver	QA
SB Nichols Radcliff Nurseries (131-137)	2560	2016	990012	3/1/16		1470	< 0.11	7.87	0.02	0.0001	Beaver	QA
SB North Finishers	194	2016	200007							0	Texas	Dry
SB North Finishers	195	2016	200007							0	Texas	Dry
SB North Finishers	196	2016	200007							0	Texas	Dry
SB North Finishers	197	2016	200007							0	Texas	Dry
SB North Finishers	198	2016	200007							0	Texas	Dry
SB North Finishers	199	2016	200007							0	Texas	Dry
SB North Finishers	200	2016	200007							0	Texas	Dry
SB North Finishers	201	2016	200007	3/23/16	1443	1500	< 0.11	19.5	< 0.02	0.0001	Texas	Wet

Facility Name	MW No.	Fiscal Year	License Number	Date Sampled	Field Conductivity (uS/cm)	Lab Conductivity (uS/cm)	NH4-N (ppm)	NO3-N (ppm)	Total P	Fecal Coliform	County	Sample
SB North Finishers	202	2016	200007							0	Texas	Dry
SB North Finishers	203	2016	200007							0	Texas	Dry
SB North Finishers	204	2016	200007							0	Texas	Dry
SB North Finishers	205	2016	200007							0	Texas	Dry
SB North Finishers	206	2016	200007							0	Texas	Dry
SB North Finishers	207	2016	200007							0	Texas	Dry
SB North Finishers	208	2016	200007							0	Texas	Dry
SB North Finishers	209	2016	200007							0	Texas	Dry
SB North Finishers	210	2016	200007							0	Texas	Dry
SB North Finishers	211	2016	200007							0	Texas	Dry
SB North Finishers	212	2016	200007							0	Texas	Dry
SB North Finishers	213	2016	200007							0	Texas	Dry
SB North Finishers	214	2016	200007							0	Texas	Dry
SB North Finishers	215	2016	200007							0	Texas	Dry
SB North Finishers	216	2016	200007							0	Texas	Dry
SB North Finishers	217	2016	200007							0	Texas	Dry
SB North Finishers	218	2016	200007							0	Texas	Dry
SB North Finishers	219	2016	200007							0	Texas	Dry
SB North Finishers	220	2016	200007							0	Texas	Dry
SB North Finishers	221	2016	200007							0	Texas	Dry
SB North Finishers	222	2016	200007							0	Texas	Dry
SB North Finishers	223	2016	200007							0	Texas	Dry
SB North Finishers	224	2016	200007							0	Texas	Dry
SB North Finishers	226	2016	200007							0	Texas	Dry
SB North Finishers	227	2016	200007							0	Texas	Dry
SB North Finishers	228	2016	200007							0	Texas	Dry

Facility Name	MW No.	Fiscal Year	License Number	Date Sampled	Field Conductivity (uS/cm)	Lab Conductivity (uS/cm)	NH4-N (ppm)	NO3-N (ppm)	Total P	Fecal Coliform	County	Sample
SB North Finishers	229	2016	200007							0	Texas	Dry
SB Northeast Finishers	88	2016	970028	3/16/16	706	700	< 0.11	4.98	0.35	0.0001	Texas	Wet
SB Northeast Finishers	89	2016	970028							0	Texas	Dry
SB Northeast Finishers	90	2016	970028							0	Texas	Dry
SB Northeast Finishers	91	2016	970028	3/15/16	820	788	< 0.11	8.78	0.98	0.0001	Texas	Wet
SB Northeast Finishers	94	2016	970028	3/16/16	751	744	< 0.11	3.7	0.29	0.0001	Texas	Wet
SB Northeast Finishers	95	2016	970028							0	Texas	Dry
SB Northeast Finishers	96	2016	970028							0	Texas	Dry
SB Northeast Finishers	97	2016	970028	3/16/16	627	625	< 0.11	6.18	0.17	0.0001	Texas	Wet
SB Northeast Finishers	98	2016	970028							0	Texas	Dry
SB Northeast Finishers	99	2016	970028							0	Texas	Dry
SB Northeast Finishers	880	2016	970028	3/16/16		< 23	< 0.11	< 0.02	< 0.02	0.0001	Texas	QA
SB Northeast Finishers	940	2016	970028	3/16/16		702	< 0.11	3.32	0.36	0.0001	Texas	QA
SB Oakes Sow (GS30)	239	2016	200006							0	Texas	Dry
SB Oakes Sow (GS30)	240	2016	200006							0	Texas	Dry
SB Oakes Sow (GS30)	241	2016	200006							0	Texas	Dry
SB Reust Finishers (299-301)	118	2016	970018							0	Texas	Dry
SB Reust Finishers (299-301)	119	2016	970018							0	Texas	Dry
SB Reust Finishers (299-301)	120	2016	970018							0	Texas	Dry
SB Reust Finishers (299-301)	147	2016	970018							0	Texas	Dry
SB Reust Finishers (299-301)	148	2016	970018							0	Texas	Dry
SB Reust Finishers (299-301)	149	2016	970018							0	Texas	Dry
SB Reust Finishers (299-301)	150	2016	970018							0	Texas	Dry
SB Reust Finishers (299-301)	151	2016	970018							0	Texas	Dry
SB Reust Finishers (299-301)	152	2016	970018							0	Texas	Dry
SB Roberts I (South) Finisher (337)	2206	2016	200223							0	Texas	Dry

Facility Name	MW No.	Fiscal Year	License Number	Date Sampled	Field Conductivity (uS/cm)	Lab Conductivity (uS/cm)	NH4-N (ppm)	NO3-N (ppm)	Total P	Fecal Coliform	County	Sample
SB Roberts I (South) Finisher (337)	2207	2016	200223							0	Texas	Dry
SB Roberts I (South) Finisher (337)	2208	2016	200223							0	Texas	Dry
SB Roberts North Finisher (337)	27	2016	980001							0	Texas	Dry
SB Roberts North Finisher (337)	28	2016	980001							0	Texas	Dry
SB Roberts North Finisher (337)	29	2016	980001							0	Texas	Dry
SB Ruckert Fin. (358)	236	2016	200008							0	Texas	Dry
SB Ruckert Fin. (358)	237	2016	200008							0	Texas	Dry
SB Ruckert Fin. (358)	238	2016	200008							0	Texas	Dry
SB Schnackenberg Sow (S36)	900	2016	200228							0	Texas	Dry
SB Schnackenberg Sow (S36)	901	2016	200228							0	Texas	Dry
SB Schnackenberg Sow (S36)	902	2016	200228							0	Texas	Dry
SB Slater Fin. (229-231, 233, 255-257)	4	2016	970020							0	Texas	Dry
SB Slater Fin. (229-231, 233, 255-257)	5	2016	970020							0	Texas	Dry
SB Slater Fin. (229-231, 233, 255-257)	6	2016	970020							0	Texas	Dry
SB Slater Fin. (229-231, 233, 255-257)	7	2016	970020							0	Texas	Dry
SB Slater Fin. (229-231, 233, 255-257)	8	2016	970020							0	Texas	Dry
SB Slater Fin. (229-231, 233, 255-257)	9	2016	970020							0	Texas	Dry
SB Slater Fin. (229-231, 233, 255-257)	10	2016	970020							0	Texas	Dry
SB Slater Fin. (229-231, 233, 255-257)	11	2016	970020							0	Texas	Dry
SB Slater Fin. (229-231, 233, 255-257)	12	2016	970020							0	Texas	Dry
SB Slater Fin. (229-231, 233, 255-257)	13	2016	970020							0	Texas	Dry
SB Slater Fin. (229-231, 233, 255-257)	14	2016	970020							0	Texas	Dry
SB Slater Fin. (229-231, 233, 255-257)	57	2016	970020							0	Texas	Dry
SB Slater Fin. (229-231, 233, 255-257)	58	2016	970020							0	Texas	Dry
SB Slater Fin. (229-231, 233, 255-257)	59	2016	970020							0	Texas	Dry
SB Slater Fin. (229-231, 233, 255-257)	60	2016	970020							0	Texas	Dry

Facility Name	MW No.	Fiscal Year	License Number	Date Sampled	Field Conductivity (uS/cm)	Lab Conductivity (uS/cm)	NH4-N (ppm)	NO3-N (ppm)	Total P	Fecal Coliform	County	Sample
SB Slater Fin. (229-231, 233, 255-257)	61	2016	970020	3/22/16						0	Texas	Dry
SB Slater Fin. (229-231, 233, 255-257)	62	2016	970020							0	Texas	Dry
SB Slater Fin. (229-231, 233, 255-257)	63	2016	970020							0	Texas	Dry
SB Slater Fin. (229-231, 233, 255-257)	64	2016	970020							0	Texas	Dry
SB Slater Fin. (229-231, 233, 255-257)	65	2016	970020							0	Texas	Dry
SB Slater Fin. (229-231, 233, 255-257)	66	2016	970020							0	Texas	Dry
SB Slater Fin. (229-231, 233, 255-257)	67	2016	970020							0	Texas	Dry
SB Slater Fin. (229-231, 233, 255-257)	57A	2016	970020	3/22/16	529	533	< 0.11	5.23	0.4	0.0001	Texas	Wet
SB Slater Fin. (229-231, 233, 255-257)	58A	2016	970020	3/22/16	945	936	< 0.11	15.9	0.23	0.0001	Texas	Wet
SB Slater Fin. (229-231, 233, 255-257)	59A	2016	970020	3/22/16	609	630	< 0.11	22.3	0.56	0.0001	Texas	Wet
SB Slater Fin. (229-231, 233, 255-257)	59A00	2016	970020							0	Texas	Dry
SB Slater Fin. (229-231, 233, 255-257)	59A0-2	2016	970020	3/22/16						0	Texas	QA
SB Slater Fin. (229-231, 233, 255-257)	60A	2016	970020	3/22/16	481	475	< 0.11	4.87	2.25	0.0001	Texas	Wet
SB Slater Fin. (229-231, 233, 255-257)	690-3	2016	970016	3/22/16						0	Texas	QA
SB Steinkogler Finisher (313)	48	2016	970021							0	Texas	Dry
SB Steinkogler Finisher (313)	49	2016	970021							0	Texas	Dry
SB Steinkogler Finisher (313)	50	2016	970021							0	Texas	Dry
SB Steinkogler Finisher (313)	51	2016	970021							0	Texas	Dry
SB Steinkogler Finisher (313)	52	2016	970021							0	Texas	Dry
SB Steinkogler Finisher (313)	53	2016	970021							0	Texas	Dry
SB Stewart & Payne Fin. (420-423)	33	2016	12623	3/28/16						0	Kingfisher	Dry
SB Stewart & Payne Fin. (420-423)	33	2016	12623	2/2/16	1085.3	1160	n.d.	9.1	n.d.	0.0001	Kingfisher	Wet
SB Stewart & Payne Fin. (420-423)	100	2016	12623	10/28/15		1280	< 0.11	16.7	0.41	0.0001	Kingfisher	QA
SB Stewart & Payne Fin. (420-423)	120	2016	12623	10/28/15		< 23	< 0.11	< 0.02	< 0.02	0	Kingfisher	QA
SB Stewart & Payne Fin. (420-423)	160	2016	12623	10/28/15		855	< 0.11	16.6	0.07	0.0001	Kingfisher	QA
SB Stewart & Payne Fin. (420-423)	170	2016	12623	10/28/15		< 23	< 0.11	< 0.02	< 0.02	0.0001	Kingfisher	QA

Facility Name	MW No.	Fiscal Year	License Number	Date Sampled	Field Conductivity (uS/cm)	Lab Conductivity (uS/cm)	NH4-N (ppm)	NO3-N (ppm)	Total P	Fecal Coliform	County	Sample
SB Stewart & Payne Fin. (420-423)	200	2016	12623							0	Kingfisher	Dry
SB Stewart & Payne Fin. (420-423)	210	2016	12623	10/27/15		< 23	< 0.11	< 0.02	< 0.02	0.0001	Kingfisher	QA
SB Stewart & Payne Fin. (420-423)	24A0-2011	2016	12623	10/27/15						0	Kingfisher	QA
SB Stewart and Payne Finisher (420-423)	10	2016	12623	10/28/15	1258	1230	< 0.11	16.1	0.37	0.0001	Kingfisher	Wet
SB Stewart and Payne Finisher (420-423)	11	2016	12623	10/28/15	1169	1210	< 0.11	11.3	0.03	0.0001	Kingfisher	Wet
SB Stewart and Payne Finisher (420-423)	12	2016	12623	10/28/15	1308	1310	< 0.11	31.1	0.45	0.0001	Kingfisher	Wet
SB Stewart and Payne Finisher (420-423)	16	2016	12623	10/28/15	837	852	< 0.11	15.6	0.07	0.0001	Kingfisher	Wet
SB Stewart and Payne Finisher (420-423)	17	2016	12623	10/28/15	1066	1080	< 0.11	22.6	0.08	0.0001	Kingfisher	Wet
SB Stewart and Payne Finisher (420-423)	18	2016	12623	10/28/15	2150	2140	< 0.11	20	0.2	0.0001	Kingfisher	Wet
SB Stewart and Payne Finisher (420-423)	19	2016	12623	10/27/15	693	676	< 0.11	18.1	0.05	0.0001	Kingfisher	Wet
SB Stewart and Payne Finisher (420-423)	20	2016	12623	10/27/15	610	612	< 0.11	16.6	0.05	0.0001	Kingfisher	Wet
SB Stewart and Payne Finisher (420-423)	21	2016	12623	10/27/15	597	600	< 0.11	10.2	0.24	0.0001	Kingfisher	Wet
SB Stewart and Payne Finisher (420-423)	22	2016	12623	10/27/15	1182	1240	< 0.11	42.5	0.19	0.0001	Kingfisher	Wet
SB Stewart and Payne Finisher (420-423)	23	2016	12623	10/27/15	10.3	1030	< 0.11	29.5	0.24	0.0001	Kingfisher	Wet
SB Stewart and Payne Finisher (420-423)	24	2016	12623	10/28/15	10.27	1000	< 0.11	22.7	0.39	0.0001	Kingfisher	Wet
SB Stewart and Payne Finisher (420-423)	23A-2011	2016	12623	10/28/15	1107	1130	< 0.11	45.8	0.48	0.0001	Kingfisher	Wet
SB Stewart and Payne Finisher (420-423)	24A-2011	2016	12623	10/27/15	996	1030	< 0.11	10.1	1.23	0.0001	Kingfisher	Wet
SB Stewart Nur 1 & 2 (150 - 151)	27	2016	12622	10/26/15	386	421	< 0.11	< 0.02	0.04	0.0001	Kingfisher	Wet
SB Stewart Nur 1 & 2 (150 - 151)	29	2016	12622	10/26/15						0	Kingfisher	Dry
SB Stewart Nur 1 & 2 (150 - 151)	30	2016	12622	10/27/15	398	418	< 0.11	8.88	1.34	0.0001	Kingfisher	Wet
SB Stewart Nur 1 & 2 (150 - 151)	31	2016	12622	10/27/15	747	787	< 0.11	8.61	0.08	0.0001	Kingfisher	Wet
SB Stewart Nur 1 & 2 (150 - 151)	32	2016	12622	10/27/15	539	551	< 0.11	9.28	7.25	0.0001	Kingfisher	Wet
SB Stewart Nur 1 & 2 (150 - 151)	310	2016	12622							0	Kingfisher	Dry
SB Stewart Nur 1 & 2 (150 - 151)	28A	2016	12622	10/26/15	276	274	< 0.11	0.08	1.5	0.0001	Kingfisher	Wet
SB Stewart Nur 1 & 2 (150 - 151)	28A0	2016	12622							0	Kingfisher	Dry

Facility Name	MW No.	Fiscal Year	License Number	Date Sampled	Field Conductivity (uS/cm)	Lab Conductivity (uS/cm)	NH4-N (ppm)	NO3-N (ppm)	Total P	Fecal Coliform	County	Sample
SB Tucker Fin. (353-354)	144	2016	980010							0	Texas	Dry
SB Tucker Fin. (353-354)	145	2016	980010							0	Texas	Dry
SB Tucker Fin. (353-354)	146	2016	980010							0	Texas	Dry
SB Tucker Fin. (353-354)	185	2016	980010							0	Texas	Dry
SB Tucker Fin. (353-354)	186	2016	980010							0	Texas	Dry
SB Tucker Fin. (353-354)	187	2016	980010							0	Texas	Dry
SB Wakefield Sow Farms (46-47)	1	2016	200203							0	Beaver	Dry
SB Wakefield Sow Farms (46-47)	2	2016	200203							0	Beaver	Dry
SB Wakefield Sow Farms (46-47)	3	2016	200203							0	Beaver	Dry
SB Wakefield Sow Farms (46-47)	4	2016	200203							0	Beaver	Dry
SB Wakefield Sow Farms (46-47)	5	2016	200203							0	Beaver	Dry
SB Wakefield Sow Farms (46-47)	6	2016	200203							0	Beaver	Dry
SB Wakefield Sow Farms (46-47)	7	2016	200203							0	Beaver	Dry
SB Wakefield Sow Farms (46-47)	8	2016	200203							0	Beaver	Dry
SB Watson Finisher (F424)	580-04	2016	12613	10/27/15	1070	1050	< 0.11	70.8	1.54	0.0001	Kingfisher	Wet
SB Watson Finisher (F424)	580-05	2016	12613	10/27/15						0	Kingfisher	Dry
SB Watson Finisher (F424)	580-06	2016	12613	10/27/15						0	Kingfisher	Dry
SB Watson Finisher (F424)	580-07	2016	12613	10/27/15	991	1020	< 0.11	46.9	0.08	0.0001	Kingfisher	Wet
SB Watson Finisher (F424)	580-08	2016	12613	10/27/15						0	Kingfisher	Dry
SB Watson Finisher (F424)	580-09	2016	12613	10/27/15						0	Kingfisher	Dry
SB Watson Finisher (F424)	580-10	2016	12613	10/27/15						0	Kingfisher	Dry
SB Watson Finisher (F424)	580-11	2016	12613	10/27/15						0	Kingfisher	Dry
SB Watson Finisher (F424)	580-14	2016	12613	10/27/15						0	Kingfisher	Dry
SB Watson Nursery (120)	233	2016	990014							0	Texas	Dry
SB Watson Nursery (120)	234	2016	990014							0	Texas	Dry
SB Watson Nursery (120)	235	2016	990014							0	Texas	Dry

Facility Name	MW No.	Fiscal Year	License Number	Date Sampled	Field Conductivity (uS/cm)	Lab Conductivity (uS/cm)	NH4-N (ppm)	NO3-N (ppm)	Total P	Fecal Coliform	County	Sample
SB Wright Finishers (346-350)	22	2016	970034	3/29/16	1140	1180	< 0.11	0.8	0.17	0.0001	Texas	Wet
SB Wright Finishers (346-350)	182	2016	970034							0	Texas	Dry
TAYLOR, ROBERT	1	2016	200201	4/13/16	516	540	< 0.11	6.25	0.1	0.0001	Beaver	Wet
TAYLOR, ROBERT	2	2016	200201							0	Beaver	Dry
TAYLOR, ROBERT	3	2016	200201							0	Beaver	Dry
TAYLOR, ROBERT	10	2016	200201							0	Beaver	Dry
Trentham Hog Farm, Inc.	1	2016	980020							0	Beaver	Dry
Trentham Hog Farm, Inc.	2	2016	980020							0	Beaver	Dry
Trentham Hog Farm, Inc.	3	2016	980020							0	Beaver	Dry
Tumbleweed LLC, Farm 5 BGF, 6 F	22	2016	1413							0	Texas	Dry
Tumbleweed LLC, Farm 5 BGF, 6 F	23	2016	1413							0	Texas	Dry
Tumbleweed LLC, Farm 5 BGF, 6 F	24	2016	1413							0	Texas	Dry
Tumbleweed LLC, Farm 5 BGF, 6 F	25	2016	1413							0	Beaver	Dry
Tumbleweed LLC, Farm 5 BGF, 6 F	26	2016	1413	2/23/16						0	Beaver	Dry
Tumbleweed LLC, Farm 5 BGF, 6 F	27	2016	1413							0	Beaver	Dry
Tumbleweed, LLC - Farm 6 BG	19	2016	1412							0	Beaver	Dry
Tumbleweed, LLC - Farm 6 BG	20	2016	1412	2/24/15	2430	3430	< 0.11	94.6	0.27	0.0001	Beaver	Wet
Tumbleweed, LLC - Farm 6 BG	21	2016	1412							0	Beaver	Dry
Tumbleweed, LLC - Farm 6 BG	200	2016	1412	2/24/15		< 23	< 0.11	< 0.02	< 0.02	0	Beaver	QA
Tumbleweed, LLC, Farm 1 BGF	1	2016	1157							0	Beaver	Dry
Tumbleweed, LLC, Farm 1 BGF	3	2016	1157							0	Beaver	Dry
Tumbleweed, LLC, Farm 1 BGF	5	2016	1157							0	Beaver	Dry
Tumbleweed, LLC, Farm 1 BGF	35	2016	1376	2/23/16	620	643	< 0.11	7.73	0.53	0.0001	Beaver	Wet
Tumbleweed, LLC, Farm 1 BGF	39	2016	1157	2/24/15	737	763	< 0.11	7.16	< 0.02	0.0001	Beaver	Wet
Tumbleweed, LLC, Farm 1 BGF	40	2016	1157	2/24/15	794	774	< 0.11	6.44	< 0.02	0.0001	Beaver	Wet
Tumbleweed, LLC, Farm 1 BGF	41	2016	1157	2/24/15	616	624	< 0.11	4.3	< 0.02	0.0001	Beaver	Wet

Facility Name	MW No.	Fiscal Year	License Number	Date Sampled	Field Conductivity (uS/cm)	Lab Conductivity (uS/cm)	NH4-N (ppm)	NO3-N (ppm)	Total P	Fecal Coliform	County	Sample
Tumbleweed, LLC, Farm 1 BGF	42	2016	1157	2/24/15	815	870	< 0.11	8.8	< 0.02	0.0001	Beaver	Wet
Tumbleweed, LLC, Farm 1 BGF	390	2016	1157	2/23/16						0	Beaver	QA
Tumbleweed, LLC, Farm 1 BGF	400	2016	1157	2/23/16						0	Beaver	QA
Tumbleweed, LLC, Farm 1 BGF	420	2016	1157	2/24/15		881	< 0.11	8.7	< 0.02	0	Beaver	QA
Tumbleweed, LLC, Farm 2-3 BGF, GDU1, Staging	7	2016	1406							0	Beaver	Dry
Tumbleweed, LLC, Farm 2-3 BGF, GDU1, Staging	9	2016	1406							0	Beaver	Dry
Tumbleweed, LLC, Farm 2-3 BGF, GDU1, Staging	10	2016	1406							0	Beaver	Dry
Tumbleweed, LLC, Farm 2-3 BGF, GDU1, Staging	11	2016	1406	2/25/15	1693	1810	< 0.11	11.8	0.02	0.0001	Beaver	Wet
Tumbleweed, LLC, Farm 2-3 BGF, GDU1, Staging	12	2016	1406							0	Beaver	Dry
Tumbleweed, LLC, Farm 2-3 BGF, GDU1, Staging	29	2016	1406	2/22/16						0.0001	Beaver	Dry
Tumbleweed, LLC, Farm 2-3 BGF, GDU1, Staging	31	2016	1406							0	Beaver	Dry
Tumbleweed, LLC, Farm 2-3 BGF, GDU1, Staging	32	2016	1406							0	Beaver	Dry
Tumbleweed, LLC, Farm 2-3 BGF, GDU1, Staging	33	2016	1406							0	Beaver	Dry
Tumbleweed, LLC, Farm 2-3 BGF, GDU1, Staging	34	2016	1406							0	Beaver	Dry
Tumbleweed, LLC, Farm 2-3 BGF, GDU1, Staging	29A	2016	1406	2/25/15	2381	2340	< 0.11	62.7	< 0.02	0.0001	Beaver	Wet
Tumbleweed, LLC, Farm 2-3 BGF, GDU1, Staging	30A	2016	1406	2/22/16						0	Beaver	Dry
Tumbleweed, LLC, Farm 2-3 BGF, GDU1, Staging	31A	2016	1406	2/22/16						0	Beaver	Dry
Tumbleweed, LLC, Farm 2-3 BGF, GDU1, Staging3	8	2016	1406	2/22/16						0	Beaver	Dry
Tumbleweed, LLC, Farm 2BGF, 3BGF, GDU1&3	110	2016	1406	2/23/16		< 23	< 0.11	< 0.02	< 0.02	0.0001	Beaver	QA
Tumbleweed, LLC, Farm 2BGF, 3BGF, GDU1 & 3	29A0	2016	1406	2/23/16		2480	< 0.11	68.7	0.07	0.0001	Beaver	QA
Tumbleweed, LLC, Farm 4 BGF, GDU 2	14	2016	1410							0	Texas	Dry
Tumbleweed, LLC, Farm 4 BGF, GDU 2	15	2016	1410							0	Texas	Dry
Tumbleweed, LLC, Farm 4 BGF, GDU 2	17	2016	1410							0	Texas	Dry
Tumbleweed, LLC, Farm 4 BGF, GDU 2	18	2016	1410							0	Texas	Dry
Tumbleweed, LLC, Farm 4 BGF, GDU 2	36	2016	1410							0	Beaver	Dry
Tumbleweed, LLC, Farm 4 BGF, GDU 2	37	2016	1410	2/23/16						0	Beaver	Dry

Facility Name	MW No.	Fiscal Year	License Number	Date Sampled	Field Conductivity (uS/cm)	Lab Conductivity (uS/cm)	NH4-N (ppm)	NO3-N (ppm)	Total P	Fecal Coliform	County	Sample
Tumbleweed, LLC, Farm 4 BGF, GDU 2	380	2016	1410	2/25/15		< 23	< 0.11	< 0.02	< 0.02	0.0001	Beaver	QA
Tumbleweed, LLC, Farm 4 BGF, GDU 2.	38	2016	1410	2/25/15	711	719	< 0.11	5.99	0.05	0.0001	Beaver	Wet
TYSON - MCDANIEL MULTIPLIER	1	2016	1465	12/16/15	656	691	< 0.11	13	0.33	0.0001	Hughes	Wet
TYSON - MCDANIEL MULTIPLIER	2	2016	1465	12/16/15	1489	1400	0.58	< 0.02	0.5	0.0001	Hughes	Wet
TYSON - MCDANIEL MULTIPLIER	3	2016	1465	12/16/15	1261	1170	< 0.11	0.04	0.39	0.0001	Hughes	Wet
Van Eaton Farms	1	2016	1368	3/30/16	2950	3140	< 0.11	1.43	< 0.02	0.0001	McIntosh	Wet
Van Eaton Farms	2	2016	1368	3/30/16	936	964	< 0.11	12.6	0.12	0.0001	McIntosh	Wet
Van Eaton Farms	3	2016	1368	3/30/16	3389	3860	< 0.11	0.14	0.03	0.0001	McIntosh	Wet
Van Eaton Farms	4	2016	1368	3/30/16	4484	4900	< 0.11	5.57	< 0.02	0.0001	McIntosh	Wet
Van Eaton Farms	5	2016	1368	3/30/16	1641	1800	0.5	0.03	0.06	0.0001	McIntosh	Wet
Van Eaton Farms	6	2016	1368							0	McIntosh	Dry
W-6 Swine Farm, Inc.	2	2016	1310	11/24/15	3090	2960	< 0.11	5.07	0.3	0.0001	Hughes	Wet
W-6 Swine Farm, Inc.	3	2016	1310	11/24/15	2970	2790	< 0.11	5.09	0.14	0.0001	Hughes	Wet
W-6 Swine Farm, Inc.	1R	2016	1310	11/24/15	19.2	1870	< 0.11	10.3	0.43	0.0001	Hughes	Wet
W-7 Swine Farm	1	2016	1302	11/24/15	5850	5310	< 0.11	6.81	0.04	0.0001	Hughes	Wet
W-7 Swine Farm	2	2016	1302	11/24/15	8970	11700	< 0.11	2.6	0.04	0.0001	Hughes	Wet
W-7 Swine Farm	3	2016	1302	11/24/15	157	127	< 0.11	1.21	0.48	74	Hughes	Wet
W-7 Swine Farm	4	2016	1302	11/24/15	10100	1000	< 0.11	0.13	0.14	0.0001	Hughes	Wet
W-7 Swine Farm	5	2016	1302	11/24/15	8390	8080	< 0.11	0.31	3.27	0.0001	Hughes	Wet
W-7 Swine Farm	20	2016	1302	11/24/15		11800	< 0.11	2.3	0.04	0.0001	Hughes	QA