RE: 1512-N

SEQUOYAH FUELS CORPORATION

April 22, 2015

Certified Mail 7011 0110 0000 0858 4787
Return Receipt Requested

U.S. Nuclear Regulatory Commission
ATTN: Mr. Gary Janosko, Chief
Fuel Cycle Facilities Branch
Division of Fuel Cycle Safety and Safeguards
11545 Rockville Pike
Two White Flint
Washington, D.C. 20852-2738

RE: License No. SUB-1010; Docket No. 40-8027
Ammonium Nitrate Fertilizer Program
2014 Completion Report

Dear Mr. Janosko:

Please find enclosed one (1) copy of the 2014 Completion Report for the Ammonium Nitrate Fertilizer Program conducted by Sequoyah Fuels Corporation (SFC).

In accordance with License No. SUB-1010 requirements, the report describes the application of facility produced ammonium nitrate fertilizer on SFC lands near Gore, Oklahoma, and the results obtained from comprehensive soil and vegetation monitoring programs.

Should you require further information, please contact me at 918-489-5511. (Ext. 226)

Sincerely,

John H. Ellis

John H. Ellis
President

Enclosure

cc: Ken Kalman (NRC) ✓
Angie Radcliffe (ODEQ)

Hwy. 10 & I-40 *P.O. Box 610* *Gore, Oklahoma 74435* *Telephone (918) 489-5511* *Facsimile ~~(918) 489-5620~~ (918) 489-2291*

AMMONIUM NITRATE
FERTILIZER APPLICATION PROGRAM

2014 Completion Report

License SUB-1010; Docket 40-8027

April 22, 2015

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ADDENDA

2014 FERTILIZER PROGRAM COMPLETION REPORT

Sequoyah Fuels Corporation
Gore, Oklahoma

1.0 INTRODUCTION

Source Material License SUB-1010, issued to Sequoyah Fuels Corporation (SFC), authorizes the application of fertilizer onto SFC owned or controlled lands for the production of forage, utilized by cattle for grazing, or for growing crops that are not used directly as human food, such as hay or seed production. On July 1, 2005 a new Oklahoma Pollution Discharge Elimination System (OPDES) permit became effective. This new OPDES permit includes additional sampling and application requirements for the fertilizer program. In accordance with license and permit requirements, this completion report describes the 2014 Fertilizer Application Program.

SFC monitors a control plot as specified in the license in order to implement good programmatic control and ensure that the program is being operated in accordance with best agricultural practices. In September 1996, an NRC License Amendment which changed the fertilizer program control plot was approved. This report contains the fertilizer program monitoring results as described in the amended license.

The 2014 Fertilizer Application Program included oversight by Mr. Brian C. Pugh, Area Agronomist, Northeast District, Cooperative Extension Service, Oklahoma State University. Mr. Pugh provided recommendations to ensure maximum plant nutrient utilization and forage production while limiting impact to the environment. Additionally, Mr. Pugh assisted in investigations of anomalous monitoring data.

Fertilizer application began in April 2014 and concluded in October 2014. A total of 9.3 million gallons of ammonium nitrate fertilizer was applied. Application amounts ranged from 34 to 85 lbs-N/acre. The 2015 schedule for the Ammonium Nitrate Fertilizer Program is provided in Table 1.

2.0 APPLICATION AREA

In 2014, SFC's ammonium nitrate fertilizer was applied to the control plot which is located within the facility boundary. This application area is referred to as Agland #1 (Previously identified as Agland XVII) and is comprised of approximately 91 acres of which approximately 60 acres were utilized for application. Fertilizer was also applied to an 8 acre field located immediately south of the Agland #1 site, referred to as Agland #2 (Previously identified as Agland XVII South). In addition, ammonium nitrate fertilizer was applied to a 20 acre portion of the field located immediately east of the Agland #1 site. This area has been identified as Agland #3 (Previously identified as Province 5 of Area160A). Other areas where ammonium nitrate fertilizer was applied included the Pond Area, North Meadow, Timber South #2 and South Meadow. Figure 1 shows the location of the fertilizer application sites.

3.0 AMMONIUM NITRATE APPLICATION

Pre-growing season soil samples were collected early in the year prior to implementation of fertilizer application. Nitrate analysis of these samples provided a basis for application rates and scheduling. Mr. Pugh reviewed this information and provided SFC with application rate recommendations.

Application rates were monitored based upon monthly nitrate analysis of the fertilizer solution. Application began in April and continued until October. A total of 9.3 million gallons was applied utilizing Kifco Ag-Rain A-Series irrigation system. The 2014 fertilizer application summary is presented in Table 2.

Analytical results of a representative composite of the fertilizer solution are provided in Table 3. In addition, samples were also collected from fertilizer sources as they were being transferred to the fertilizer storage ponds. These analytical results for these sources, which include Clarifier Basin 3A, Monitor Well MW095A Collection Trench, Monitor Well MW095A Collection Pit, Catchment No. 3, Pond No. 2 and Ditch West Pond No. 2, are included in Table 4.

4.0 PROGRAM MONITORING RESULTS

4.1 Soil

The 2014 pre-, mid- and post-growing season soil samples for the fertilizer application areas were collected in February, July and November, respectively. The analysis results for these sampling events are provided in Table 5. The top six inches of soil was characterized for nitrate content by collecting and compositing at least twenty samples from different locations in the Agland tract (one-inch diameter cores). In addition, profile samples were collected from one location in the Agland tract at six inch increments from surface to 48". Review of the 2014 pre-season soil profiles, and the top six inch soil composite, provided the basis for recommended application rates for the 2014 Fertilizer Program.

Soil samples were also collected as required by the new OPDES permit that became effective on July 1, 2005. This permit requires that background soil samples be collected from each land application site and be analyzed for soil pH; the nutrients Total Kjeldahl Nitrogen, nitrogen, ammonia, nitrate, potassium and phosphorus; and the metals included in 40 CFR 503, "Standards for the Use or Disposal of Sewage Sludge." The analyses for background sampling are included in Table 6. Figure 1 shows the location of each fertilizer application site. The analyses of post season samples collected on November 20, 2014, from each land application site that received fertilizer solution are included in Table 7.

4.2 Vegetation

Forage samples were collected and analyzed from the Agland area only. Analytical data for the forage cuttings from the Agland is provided in Table 8.

Forage collected during 2014 had elevated molybdenum concentrations. SFC determined that use of the hay should be restricted.

5.0 FORAGE MANAGEMENT PROGRAM

Hay was harvested three times during 2014. Hay yields and harvest were dependent upon the weather and forage growing conditions. A total of approximately 975 round bales were produced from the SFC property. Round hay bales average approximately 1040 pounds.

Brian Pugh and Tony Yates from the Oklahoma State University Extension Service continue to provide oversight of the land application program.

TABLES

Table 1

Sequoyah Fuels Corporation

Projected 2015 Ammonium Nitrate Fertilizer Application

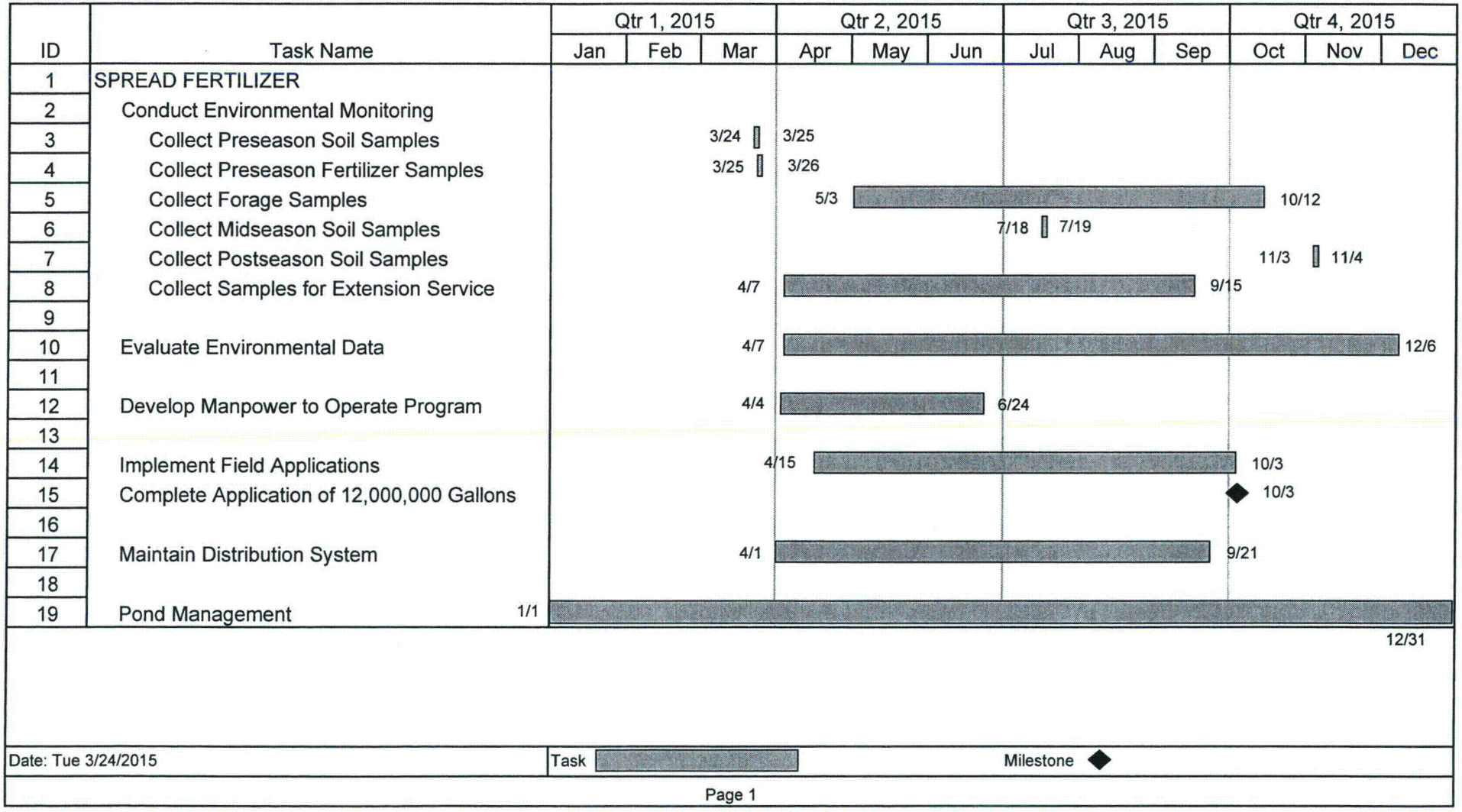

TABLE 2

2014 Fertilizer Application Data

LOCATION	APPL	CONC g/l N	GALS APPLIED	Acres Applied To	LBS/ ACRE
Agland No. 1	1	0.130	2,418,500	57	46
(XVII (AGLAND))	2	0.110	2,404,200	57	38.6
TOTAL			4,822,700		84.6
Agland No. 3	1	0.130	568,200	16.2	38.0
(160A Province 5)					
TOTAL			568,200		38.0
Agland No. 2	1	0.130	256,400	8.2	33.9
(XVII (South))					
TOTAL			256,400		33.9
Pond / Timber /	1	0.130	1,732,800	61.5	30.5
Meadow Areas	2	0.113	1,903,955	61.5	29.0
TOTAL			3,636,755		59.6

Notes: Total Volume Applied to All Areas: 9,284,055 gallons

N = Total Nitrogen

TABLE 3

2014 Fertilizer Composite Analyses

Element		Composite
As	mg/l	0.068
Ba	mg/l	0.056
B	mg/l	0.054
Cd	mg/l	< 0.001
Co	mg/l	0.017
Cr	mg/l	< 0.003
Cu	mg/l	0.007
Fe	mg/l	0.040
Mg	mg/l	24.4
Mn	mg/l	1.32
Mo	mg/l	1.39
Ni	mg/l	0.124
Pb	mg/l	< 0.003
Se	mg/l	0.006
V	mg/l	< 0.002
Zn	mg/l	0.033
Hg	mg/l	< 0.0002
$NO_3(N)$	mg/l	25.1
$NH_3(N)$	mg/l	21.7
U	ug/l	< 1
Ra226	pCi/l	0.157 ± 0.185
Th230	pCi/l	0.535 ± 0.309

Table 4
2014 Fertilzer Source Analyses

Parameter	Clarifier Basin 3A	MW095A Coll. Trench	MW095A Coll. Pit	Catchment No. 3	Pond No. 2	Ditch West Pond No. 2
Inorganic Analyses						
Ammonia (as N), mg/l	0.3	< 0.2	< 0.2	0.6	189	0.3
Nitrate (as N), mg/l	80.7	43.2	1660	7.5	421	9.9
TKN, mg/l	1.5	0.5	< 0.3	1.3	188	1.9
pH, SU	6.85	6.36	6.77	5.28	4.59	6.29
Radiochemical Analyses						
Radium-226 pCi/l	0.184 ± 0.118	0.130 ± 0.100	0.398 ± 0.176	0.136 ± 0.100	0.450 ± 0.149	0.123 ± 0.106
Uranium, µg/l	14.6	< 1	3.27	40.4	3.56	26.2
Metals Analyses						
Arsenic, mg/l	0.151	0.019	0.138	0.009	0.094	0.008
Cadmium, mg/l	< 0.001	< 0.001	< 0.001	0.006	< 0.001	0.0009
Chromium, mg/l	< 0.002	0.017	< 0.002	0.012	< 0.003	0.016
Copper, mg/l	< 0.004	0.030	0.013	0.007	< 0.009	0.007
Lead, mg/l	0.002	< 0.001	0.003	< 0.004	0.005	< 0.004
Mercury, mg/l	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	0.0002
Molybdenum, mg/l	0.278	< 0.001	0.002	0.009	0.002	0.011
Nickel, mg/l	0.015	0.004	0.004	0.008	0.400	0.013
Phosphorus, mg/l	3.79	0.073	0.045	0.118	0.023	0.158
Potassium, mg/l	12.8	2.12	10.1	6.28	18.0	5.84
Selenium, mg/l	0.018	0.044	0.007	< 0.003	< 0.003	< 0.003
Zinc, mg/l	< 0.012	< 0.012	0.213	0.010	0.008	0.026

TABLE 5

Soil Nitrate Analyses (mg/kg)

Sequoyah Acreage

	Pre-Season Results (Collected on 02/20/2014)							
Location	0-6C"	6-12"	12-18"	18-24"	24-30"	30-36"	36-42"	42-48"
Agland	7.5	11.6	9.2	9.1	11.6	11.8	10.1	5.0
	Mid-Season Results (Collected on 07/16/2014)							
Location	0-6C"	6-12"	12-18"	18-24"	24-30"	30-36"	36-42"	42-48"
Agland	13.4	16.2	11.8	13.9	9.3	8.4	8.2	8.8
	Post-Season Results (Collected on 11/20/2014)							
Location	0-6C"	6-12"	12-18"	18-24"	24-30"	30-36"	36-42"	42-48"
Agland	15.6	12.9	9.1	6.6	7.1	9.8	8.0	6.8

Table 6
Background Soil Analyses - Fertilizer Application Sites

Parameter	Agland # 1	Agland # 2	Agland # 3	Agland # 4	North Meadow	South Meadow
Inorganic Analyses						
Ammonia (as N), mg/kg	6.6	3.9	3.6	4.5	3.1	2.2
Nitrate (as N), mg/kg	28.2	33.1	31.6	17.4	15.4	26
TKN, mg/kg	1790	1880	1640	1740	1500	2340
pH	4.34	5.83	6.32	5.18	6.02	6.33
Radiochemical Analyses						
Radium-226 pCi/g	0.779 ± 0.142	1.42 ± 0.221	0.730 ± 0.144	1.07 ± 0.202	1.28 ± 0.197	1.73 ± 0.219
Uranium, µg/g	1.92	1.99	1.93	3.26	9.55	2.47
Metals Analyses						
Arsenic, mg/kg	2.39	1.62	1.53	2.25	2.62	2.2
Cadmium, mg/kg	0.728	0.505	0.612	0.819	0.805	0.838
Chromium, mg/kg	1.14	2.02	3.57	4.09	7.55	5.45
Copper, mg/kg	6.24	3.13	1.02	2.05	2.21	1.36
Lead, mg/kg	8.65	7.09	5.54	7.38	10.7	10.1
Mercury, mg/kg	< 0.24	< 0.24	< 0.24	< 0.24	< 0.24	< 0.24
Molybdenum, mg/kg	21.9	12.7	5.3	< 0.716	2.42	1.57
Nickel, mg/kg	5.72	3.43	5.61	1.33	0.906	1.57
Phosphorus, mg/kg	274	55.9	139	221	207	221
Potassium, mg/kg	731	268	324	453	293	298
Selenium, mg/kg	< 0.520	< 0.505	< 0.510	< 0.512	< 0.503	< 0.524
Zinc, mg/kg	19.8	9.19	7.95	13.9	13.3	11

Parameter	Pond Area	Timber North # 1	Timber North # 2	Timber South # 1	Timber South # 2	Timber South # 3
Inorganic Analyses						
Ammonia (as N), mg/kg	2.1	2.7	3.7	3.0	1.8	1.8
Nitrate (as N), mg/kg	14.2	9.6	22.3	27.4	25.5	13.2
TKN, mg/kg	2020	2470	1850	2290	2090	1740
pH	6.35	5.4	4.9	5.28	5.2	5.5
Radiochemical Analyses						
Radium-226 pCi/g	1.04 ± 0.163	1.57 ± 0.249	1.07 ± 0.188	1.58 ± 0.243	1.29 ± 0.189	1.27 ± 0.201
Uranium, µg/g	2.41	5.24	16.8	12.2	9.78	2.12
Metals Analyses						
Arsenic, mg/kg	2.94	1.2	3.85	1.98	4.33	2.81
Cadmium, mg/kg	1.01	< 0.502	1.77	0.991	1.54	1.35
Chromium, mg/kg	6.9	< 0.703	11.4	4.46	6.8	11.2
Copper, mg/kg	0.913	< 0.602	3.02	2.78	1.54	1.04
Lead, mg/kg	9.66	< 0.390	15.1	14.8	13.6	10.7
Mercury, mg/kg	< 0.24	< 0.24	< 0.23	< 0.24	< 0.24	< 0.24
Molybdenum, mg/kg	< 0.710	< 0.703	1.14	< 0.694	< 0.721	< 0.729
Nickel, mg/kg	< 0.710	< 0.703	8.94	0.892	< 0.721	16.9
Phosphorus, mg/kg	< 10.1	192	282	280	224	168
Potassium, mg/kg	326	17.3	564	574	381	542
Selenium, mg/kg	< 0.507	< 0.502	< 0.520	< 0.496	< 0.515	< 0.521
Zinc, mg/kg	12.4	< 0.703	37.8	23.3	17.1	14.2

Note: Samples collected during August 2005.

Table 7
Annual Post-Season Soil Analyses - Fertilizer Application Sites

Parameter	Agland #1 Composite	Agland #2 Composite	Agland #3 Composite	Pond Area Composite	N. Meadow Composite	Timber S#2 Composite
Inorganic Analyses						
Ammonia (as N), mg/kg	3.2	3.3	< 1.5	2.0	6.9	2.1
Nitrate (as N), mg/kg	15.6	8.9	11.4	10.9	12.8	18.9
TKN, mg/kg	817	936	160	< 65.4	1250	< 85.2
pH	6.09	6.15	6.60	6.48	5.58	6.48
Radiochemical Analyses						
Radium-226 pCi/g	0.407 ± 0.139	0.275 ± 0.134	0.718 ± 0.221	0.552 ± 0.199	0.433 ± 0.159	0.607 ± 0.174
Uranium, µg/g	1.88	2.17	2.27	2.69	8.00	7.41
Metals Analyses						
Arsenic, mg/kg	3.25	3.02	5.48	10.5	4.69	6.63
Cadmium, mg/kg	< 0.062	< 0.062	< 0.062	0.146	0.105	0.125
Chromium, mg/kg	6.29	6.82	12.6	21.4	8.20	11.9
Copper, mg/kg	5.85	4.14	5.83	11.3	5.04	6.13
Lead, mg/kg	2.38	3.69	3.26	6.86	6.09	6.25
Mercury, mg/kg	< 0.081	< 0.082	< 0.082	< 0.082	< 0.083	< 0.082
Molybdenum, mg/kg	14.8	8.17	11.7	13.7	4.57	10.0
Nickel, mg/kg	3.79	3.13	2.68	8.22	2.69	3.00
Phosphorus, mg/kg	210	139	164	347	158	185
Potassium, mg/kg	527	296	397	792	319	286
Selenium, mg/kg	< 0.933	< 0.933	< 0.933	< 0.933	< 0.933	< 0.933
Zinc, mg/kg	11.3	4.47	3.73	22.4	7.61	5.88

Parameter	S. Meadow Composite					
Inorganic Analyses						
Ammonia (as N), mg/kg	5.2					
Nitrate (as N), mg/kg	12.3					
TKN, mg/kg	1420					
pH	6.15					
Radiochemical Analyses						
Radium-226 pCi/g	0.516 ± 0.175					
Uranium, µg/g	3.06					
Metals Analyses						
Arsenic, mg/kg	5.75					
Cadmium, mg/kg	0.100					
Chromium, mg/kg	12.1					
Copper, mg/kg	6.52					
Lead, mg/kg	4.64					
Mercury, mg/kg	< 0.083					
Molybdenum, mg/kg	3.76					
Nickel, mg/kg	2.99					
Phosphorus, mg/kg	210					
Potassium, mg/kg	323					
Selenium, mg/kg	< 0.933					
Zinc, mg/kg	11.30					

TABLE 8

Forage Analyses

Location (Cutting)	Sample Date	As mg/kg	B mg/kg	Co mg/kg	Cu mg/kg	Fe mg/kg	Mn mg/kg	Mo mg/kg	Ni mg/kg	Pb mg/kg	V mg/kg	Zn mg/kg	U mg/kg	Th-230 pCi/g	Ra-226 pCi/g	NO3-N mg/kg
Sequoyah Acreage																
Agland (1st)	7/16/14	0.382	6.68	< 0.082	6.10	129	77.6	93.0	0.668	< 0.398	< 0.230	27.5	0.013	-0.006±0.010	0.020 ± 0.009	870
Agland (2nd)	9/10/14	0.500	15.5	< 0.082	6.43	96.1	83.6	28.8	1.5	< 0.398	< 0.230	25.0	0.009	-0.020±0.008	0.013 ± 0.009	389
Agland (3rd)	10/28/14	0.350	< 4.29	1.08	7.84	106	140	69.7	2.19	0.709	< 0.230	28.4	0.063	0.095±0.026	0.013 ± 0.010	702
Caution Levels[1]		100	150	10	100	1000	1000	20	50	30	50	500	-	-	-	2800

[1] Caution Levels do not mean that forage with higher concentrations cannot be safely fed to livestock, but that certain precautions and additional treatments and supplements may be prudent.

Figure 1

Fertilizer Application Sites
Background Soil Sample Locations
Collected on 04 Aug 2005