State of Oregon
Department of Environmental Quality Memorandum

Date: May 22, 2023

To: FILE

Through: Bruce Scherzinger, Lead Worker &
Nancy Sawka, Western Region Cleanup Manager

From: Anthony Chavez, Western Region

Subject: Western Farm Services - Hopmere, ECSI # 4030; Staff Memorandum in Support of a No Further Action Determination

This document presents the basis for the Oregon Department of Environmental Quality's (DEQ's) recommended No Further Action (NFA) determination for the Western Farm Services site in Salem (Hopmere), Oregon. As discussed in this memorandum, contaminant concentrations in soil and groundwater do not pose a threat to human health and the environment.

The proposed NFA determination meets the requirements of Oregon Administrative Rules Chapter 340 Division 122, Sections 010 to 0140 and Oregon Revised Statutes 465.200 through 465.455.

The proposal is based on information documented in the administrative record for this site. A copy of the administrative record index is presented at the end of this report.

1. BACKGROUND

1.1 Site location.
The site is located at 3630 Brooklake Road NE, Salem, Oregon; Marion County Map ID 062W18C, Tax lot 001000; Township 6 South, Range 2 West, Section 18 (Figure 1).

1.2 Site setting.
Nutrien Ag Solutions, Inc. currently owns the property, which covers 5.62 acres in Hopmere, an unincorporated community north of Salem, Oregon. This site is used as an agricultural chemical products distribution and sales facility. Operations on the site include storage and handling of bulk liquids, dry and packaged fertilizers, and pre-packaged pesticides and herbicides. The facility also has vehicles for product application and deliveries to agricultural customers. The material handling areas are paved with asphalt or covered in concrete. Site features and the surrounding area are illustrated on Figure 2.

The site is zoned for industrial and commercial use. The surrounding properties are zoned for industrial, agricultural, residential, and commercial uses. A Union Pacific Railroad (UPRR) rail line and the River Road right-of-way (ROW) are located on the western border of the site.

1.3 Physical setting.

The site is generally flat and located at approximately 180 feet above mean sea level. Soils encountered at the site generally consist of clay and silt to approximately 60 feet below ground surface (bgs). Discontinuous sand lenses containing perched groundwater are present in the upper 40 feet. A sand layer is present in some locations between 60 to 65 feet bgs and is underlain by stiff clay to approximately 75 feet bgs. Sand and cemented sand extends from approximately 75 to a minimum depth of 120 feet bgs.

Based on monitoring well information at the site, depth to the shallow groundwater table is approximately 15 feet bgs, within discontinuous sand lenses. The static depth to water in supply wells installed in the confined potable aquifer is approximately 20 to 50 feet bgs (Rubik, 2021).

Well logs indicate the deeper aquifer used for potable purposes near the site begins at approximately 80 feet bgs. A geologic cross section and line of section with local supply well locations are presented on Figures 3 and 4.

Shallow groundwater in onsite monitoring wells generally flows west and northwest. Regional groundwater flow of the deeper aquifer is also reported to the northwest (USGS, 2005).

1.4 Site history.

The property is the location of an agricultural chemical products distribution and sales facility. It was first developed by Shell Chemical Company in the mid-1960s and operated as Cascade Farm Services, then as Western Farm Services (WFS). In 1995, WFS was acquired by Crop Production Services (CPS), a subsidiary of Agrium. During 2018, Agrium was rebranded as Nutrien Ag Solutions, Inc.

2. BENEFICIAL LAND AND WATER USE DETERMINATIONS

2.1 Land use.

The facility is currently active and located in an area of mixed use. Railroad tracks extend along the western site boundary and the facility. The site is expected to continue as an industrial property in the future. The Locality of Facility (LOF) for soil is located fully within the CPS property boundaries and is generally located near the west end of the former dry fertilizer warehouse, as well as several other less-contaminated areas on the property. The groundwater LOF includes the UPRR ROW west of the site and agricultural land to the south and southwest. Based on the location of this property adjacent to the UPRR ROW, properties within the groundwater LOF are expected to remain agricultural, commercial, or industrial in the future. The properties west and northwest of the site are likely to continue to be used for residential purposes or could be converted to agricultural or commercial use.

2.2 Groundwater use.

Water supply well surveys were conducted in 2010 (ATC, 2010), and 2015 (Rubik, 2015) using the Oregon Water Resources Department (WRD) database. Twenty-three wells were identified within a ¼ mile of the site and are installed within a confined primary aquifer at depths ranging

from 86 to 140 feet bgs. Two onsite water supply wells are used for non-potable, facility operations. Nitrate has not been detected in the onsite production wells.

2.3 Surface water use.

There is no surface water body located on the site and no significant surface water conveyance systems are present that would convey stormwater from the property to a nearby surface water body. However, an historic evaporation pond was located in the southwest corner of the property. Soil and sediment samples collected from the southwest portion of the property did not indicate historic runoff of contaminants.

3. INVESTIGATION AND CLEANUP WORK

Investigations were conducted on and off the site between 1992 and 2020 to assess nitrogen compounds, and pesticide and herbicide contamination in soil and groundwater. Significant nitrate contamination in soil was found beneath the west end of the former dry fertilizer warehouse. This area of soil contamination is believed to be the source for nitrate contamination in shallow groundwater. Pesticides were also found in soil beneath the former evaporation pond, western tank farm, and southeast of the former warehouse. However, the extent of pesticide contamination was limited.

Between 2010 and 2011, the former fertilizer warehouse and shop building were demolished. Approximately 627 tons of nitrate-impacted soil were excavated beneath the dry fertilizer load-in area and confirmation samples were collected at the base of the excavation between 4 and 7 feet bgs. A new fertilizer warehouse was constructed at the location of the former buildings and operational areas were paved (ATC 2011). Residual soils were tested and found below EPA and DEQ allowable levels.

Groundwater monitoring was conducted between 1996 and 2014 from five onsite wells (MW-1 through MW-5) and three offsite wells (MW-6 through MW-8). The monitoring wells were screened in the shallow water-bearing zone and generally possessed nitrate compounds above the Maximum Contaminant Level (MCL) of 10 milligrams per liter (mg/L), known as the federal safe drinking level. Pesticides and/or herbicides have never been detected above the RBCs, RSLs or MCLs in monitoring wells.

The closest, offsite domestic wells are located at three properties to the west and northwest of the facility and across River Road. Each well is approximately 300-350 feet downgradient from the site. The following well locations are illustrated on Figure 2. Nitrate concentrations have never exceeded the MCL in monitoring well MW-8, located between the site and 3510 Brooklake well, or DW-1 and the Star Market Well.

1. Domestic well (DW-1) is located at 8955 River Road, and has been sampled for nitrate, ammonia, herbicides and/or pesticides since 1997 as a part of the facility's groundwater monitoring program. Contaminants of concern (COCs) have not been identified exceeding regulatory levels.

2. Another domestic well is located at the Star Market, 9005 River Road. According to Oregon Health Authority's (OHA) Drinking Water Services, the Star Market Well is a public water supply well (PWS ID: 94623) serving a population of 250. The well is sampled by the landowner and results are reported to the OHA. Nitrate has not been detected above MCLs in the Star Market well since sampling began in 1994 (Rubik 2021).

3. The third domestic well is located at 3510 Brooklake Road NE and installed in the primary aquifer to a total depth of 114 feet bgs. This well was sampled three times between 2019 and 2020 and did not exceed screening levels for any COCs.

During review of project files for possible site closure consideration in 2019, DEQ requested several of the identified, downgradient offsite water supply wells be sampled seasonally to ensure that groundwater quality had not been impacted by migration of site COCs to residential users.

Nitrate was detected up to 0.093 mg/L in one of the offsite wells, far below the MCL of 10mg/L. None of the other offsite wells had reportable detections of nitrate. Additionally, seasonal variation was not observed in results between the spring and fall sampling events.

No other COCs were detected in the offsite supply wells, except for 4-4,DDE (DDE), which was detected at 0.0016 micrograms per liter (µg/L) during the September 2020 sampling at the well located at 3491 Brooklake Rd NE. The concentration detected was an order of magnitude less than the EPA RSL for tap water ingestion and DEQ's residential RBC of 0.046 µg/L. DDE was not detected in any previous samples from the well or in any of the samples collected from upgradient supply wells located closer to the site in 2019 and 2020. See Figure 5 for offsite well sample locations and results.

3.1 Nature and extent of contamination.

Nitrate is the primary COC and affected media are soil and groundwater. In 2011, the source of nitrate contamination was excavated and removed from the site. Pesticides and herbicides are also COCs but have not been detected above regulatory standards.

Residual site nitrate concentrations in soil are below EPA RSLs and applicable DEQ RBCs. Nitrate concentrations in groundwater exceeding the MCL of 10 mg/L have been shown to be limited to the shallow perched water table that is not used for potable purposes. This zone appears separated from the area's primary drinking water aquifer by confining clays and silts.

To address potential migration of site contaminants to nearby offsite supply water wells downgradient from the site, during spring of 2019 and fall of 2020, accessible wells were sampled. Nitrate or other COCs were not detected in any of the wells above their respective screening levels.

4. RISK EVALUATION

4.1 Conceptual site model.

A conceptual site model identifies sources of contamination, pathways by which this contamination could reach human and ecological receptors, the human and ecological receptors currently and reasonably likely affected, and the degree of their exposure. To evaluate human exposure to residual chemical contamination requires an assessment of the type and extent of that exposure. This is based on current and reasonably likely future site use. DEQ publishes RBCs for contaminants commonly encountered, for different types of exposure scenarios. These RBCs are conservative estimates of protective levels of contaminants in soil, groundwater and air. Table 1 shows potential exposure pathways and receptors for this site. Based on this, applicable RBCs are identified and used for risk screening.

Table 1. Identification of applicable RBCs, based on pertinent pathways and receptors

Pathway	Receptor	Applicable RBC?	Basis for selection/exclusion
SOIL			
Ingestion, dermal contact, and inhalation	Residential	No	
	Urban Residential	No	
	Occupational	Yes	
	Construction worker	Yes	
	Excavation worker	Yes	
Volatilization to outdoor air	Residential	No	See Note 1.
	Urban Residential	No	
	Occupational	No	
Vapor intrusion into buildings	Residential	No	See Note 1.
	Urban Residential	No	
	Occupational	No	
Leaching to groundwater	Residential	No	See Note 2.
	Urban Residential	No	
	Occupational	No	
GROUNDWATER			
Ingestion and inhalation from tap water	Residential	Yes	
	Urban Residential	Yes	
	Occupational	Yes	
Volatilization to outdoor air	Residential	No	See Note 1.
	Urban Residential	No	
	Occupational	No	
Vapor intrusion into buildings	Residential	No	See Note 1.
	Urban Residential	No	
	Occupational	No	
Groundwater in excavation	Construction and excavation worker	Yes	

Notes:

1. Site COCs are not volatile and have no vapor concerns.
2. The leaching to groundwater pathway was not considered as the shallow groundwater was already impacted from soil contamination.

4.2 Human health risk.

The concentrations of nitrate contamination remaining in soil are below applicable risk-based concentrations, indicating there are no currently or likely future unacceptable risks from the remaining contamination. Additionally, the area groundwater aquifer does not appear to have been contaminated by site COCs; nor do the nearest offsite and downgradient water supply wells appear effected. The shallow groundwater table on the site has been impacted with nitrates.

Based on evaluation of available site data, remaining contamination on and off the property from historical releases, does not appear to pose an unacceptable risk to current and/or future human receptors at the site.

4.3 Ecological risk.

Based on the site conditions (i.e., paved and highly developed industrial location), the mostly developed nature of the surrounding area, and lack of exposed soil contamination, there does not appear to be ecological risks associated with the site.

5. RECOMMENDATION

Based on DEQ's evaluation of available data, there does not appear to be an unacceptable risk to current or future human and/or ecological receptors at or near the site. As such, a No Further Action determination is recommended.

6. ADMINISTRATIVE RECORD

ATC, 2010. Soil Assessment Prior To Demolition. Crop Production Services Branch No. 0104, Hopmere (Salem), Oregon. December 2010.

ATC, 2011. Remedial Excavation Report, Crop Production Services Branch No. 0104, Hopmere (Salem), Oregon. October 2011.

Rubik Environmental Inc., 2015. No Further Action Request, Crop Production Services, Inc. Hopmere Facility, ODEQ Site ID 4030. July 23, 2015.

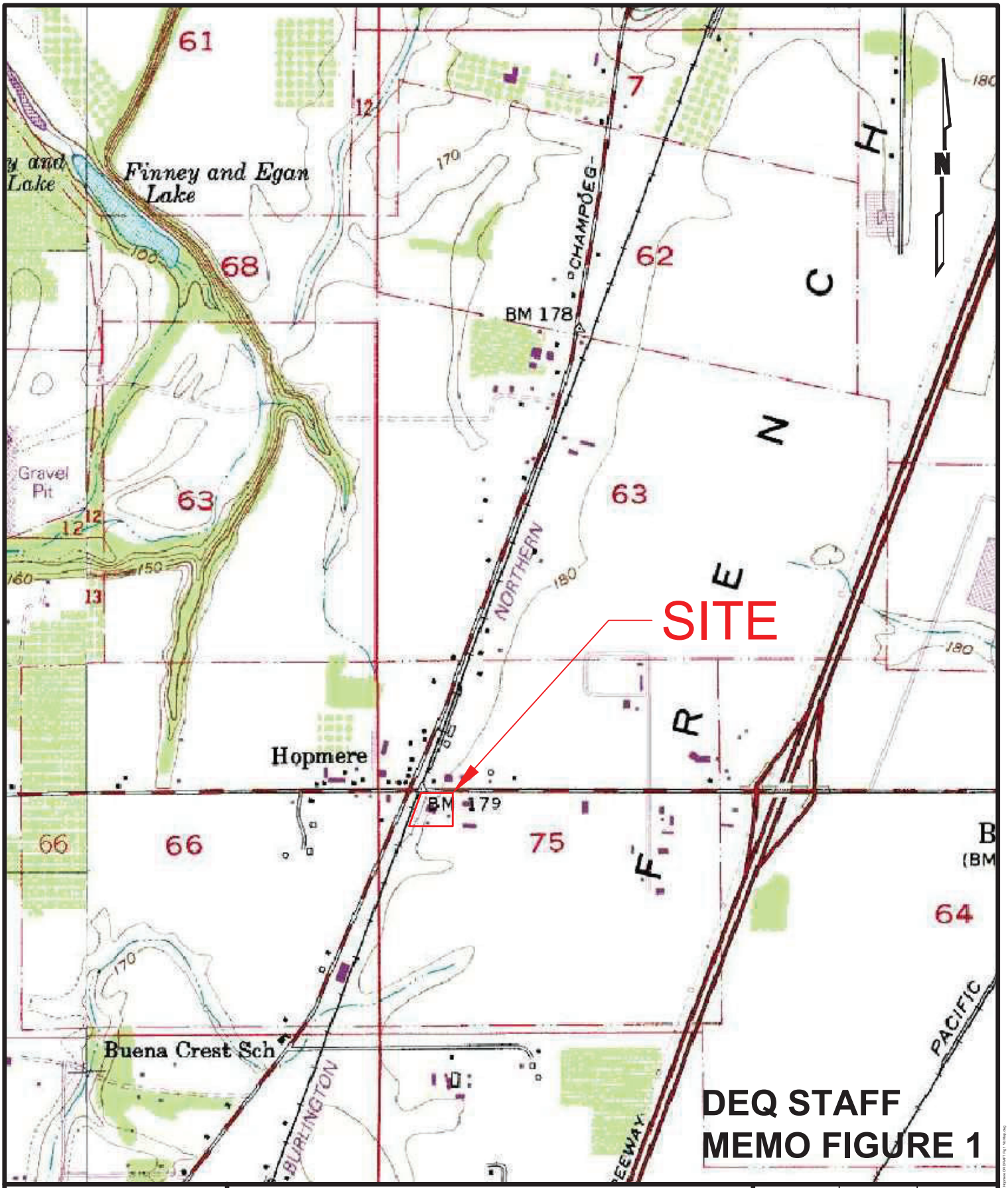
Rubik Environmental Inc., 2021. Amended No Further Action Request, Nutrien Ag Solutions, Inc. Hopmere Facility, ODEQ Site ID 4030. April 29, 2021.

US Geological Survey, 2005. Ground-Water Hydrology of the Willamette Basin, Oregon. Scientific. Investigations Report 2005–5168. 2005.

7. ATTACHMENTS

Figure 1 - Vicinity Map
Figure 2 – Site Layout Map
Figure 3 – Cross Section Location Map
Figure 4 – Geologic Cross Section A-A’
Figure 5 – Domestic Well Sample Map and Results

Table 1 – Offsite Water Supply Sampling Summary



RUBIK ENVIRONMENTAL, INC.

320 Flint Street
Reno, Nevada 89501
(775) 622-0857

VICINITY MAP

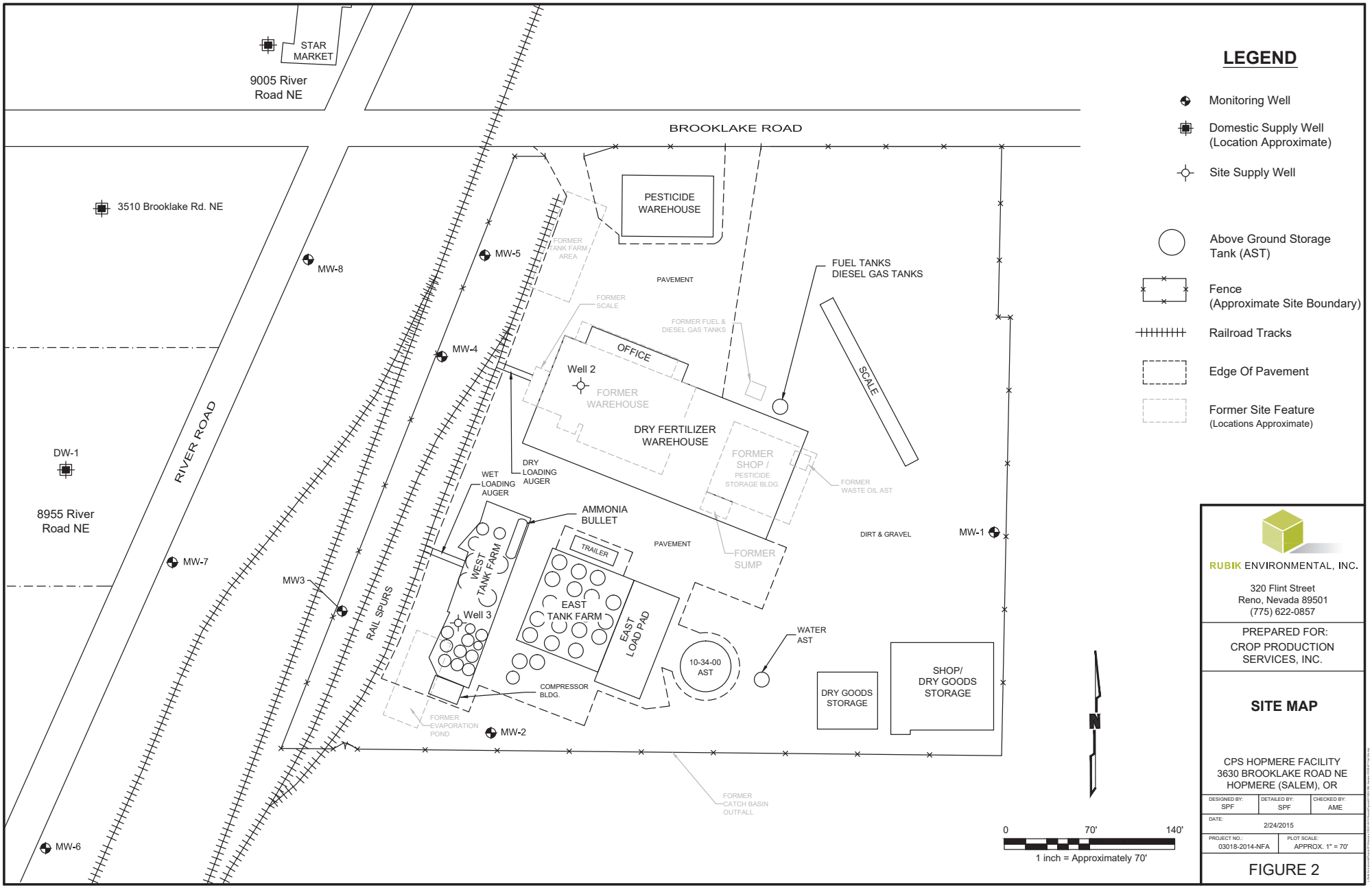
CPS HOPMERE FACILITY
3630 BROOKLAKE ROAD NE
HOPMERE (SALEM), OR

DESIGNED BY:	DETAILED BY:	CHECKED BY:
LR	LR	AME

DATE:	ACAD FILE:
2/24/2015	20150224 RBK Hopmere OR DRAFT Fig 1 Vic Map.dwg

PROJECT NO.: 03018-2014-NFA

FIGURE 1



LEGEND

- Monitoring Well
- Domestic Supply Well (Location Approximate)
- Site Supply Well
- Above Ground Storage Tank (AST)
- Fence (Approximate Site Boundary)
- Railroad Tracks
- Edge Of Pavement
- Former Site Feature (Locations Approximate)

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PREPARED FOR:
CROP PRODUCTION SERVICES, INC.

SITE MAP

CPS HOPMERE FACILITY
3630 BROOKLAKE ROAD NE
HOPMERE (SALEM), OR

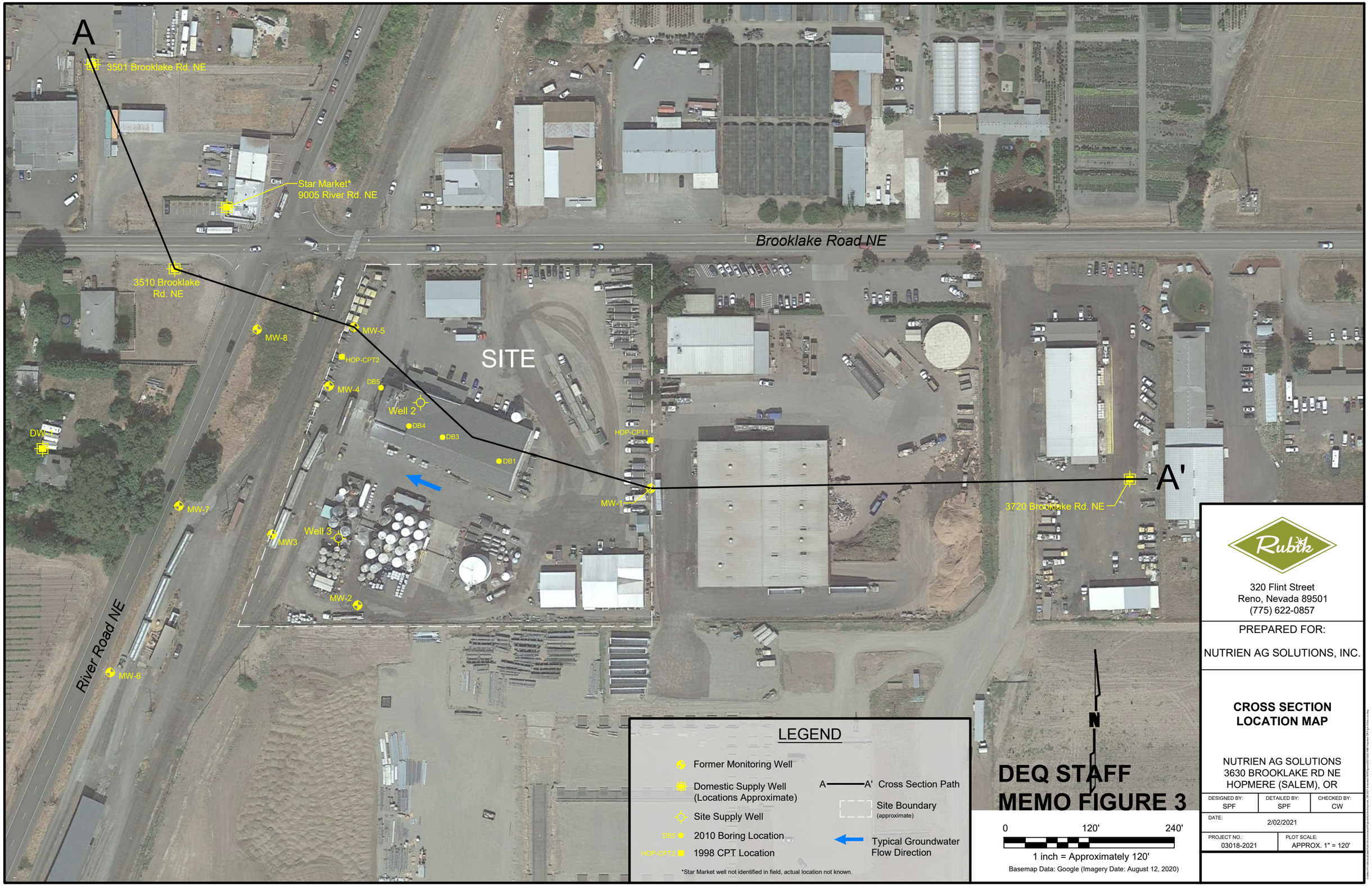
DESIGNED BY:	DETAILED BY:	CHECKED BY:
SPF	SPF	AME

DATE: 2/24/2015

PROJECT NO.:	PLOT SCALE:
03018-2014-NFA	APPROX. 1" = 70'

FIGURE 2

DEQ STAFF MEMO
FIGURE 2



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PREPARED FOR:

NUTRIEN AG SOLUTIONS, INC.

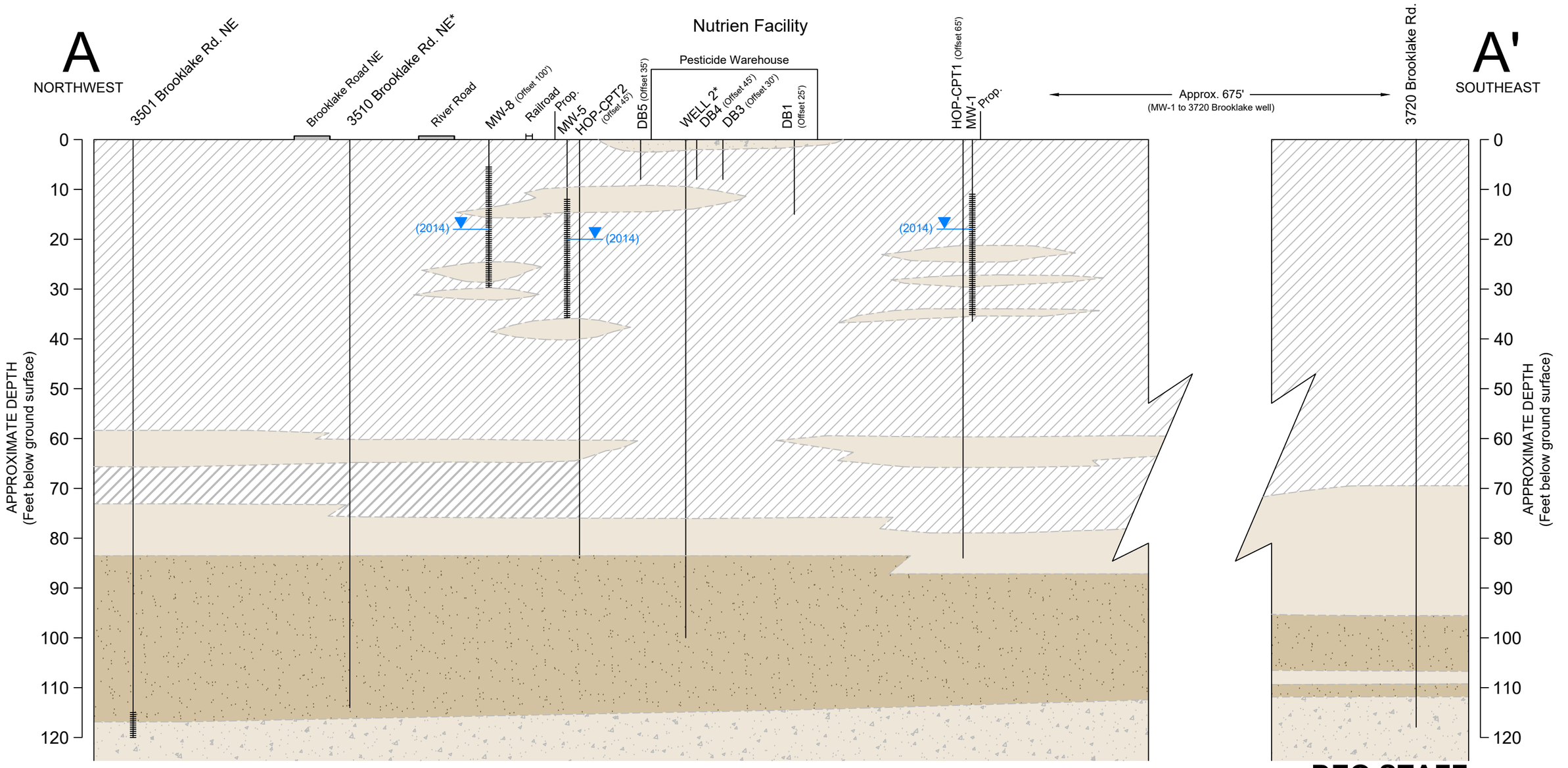
CROSS SECTION LOCATION MAP

NUTRIEN AG SOLUTIONS
3630 BROOKLAKE RD NE
HOPMERE (SALEM), OR

DESIGNED BY:	DETAILED BY:	CHECKED BY:
SPF	SPF	CW

DATE: 2/02/2021

PROJECT NO.:	PLOT SCALE:
03018-2021	APPROX. 1" = 120'



20'
0
0
120'
Vertical Exaggeration = 6x

APPROXIMATE STATIC GROUNDWATER ELEVATION (Year Measured)

Prop. APPROXIMATE SITE PROPERTY BOUNDARY

WELL
BLANK CASING
SCREEN

Clay / Silt
Sand
Cemented Sand
Sand & Gravel

Note: Contacts Dashed Where Assumed
*Boring log not available

DEQ STAFF MEMO FIGURE 4

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Reno, Nevada 89501
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GEOLOGIC CROSS SECTION AA'

NUTRIEN AG SOLUTIONS
3630 BROOKLAKE RD NE
HOPMERE (SALEM), OR

DESIGNED BY:	DETAILED BY:	CHECKED BY:
SPF	SPF	CW

DATE: 3/4/2021

PROJECT NO.:	HORIZONTAL PLOT SCALE:
03018-2021	APPROX. 1" = 120'

20	Nitrate
Mar. 2019	<0.050
May 2019	<0.050
Sep. 2020	<0.050

9	Nitrate
Mar. 2019	<0.050
May 2019	<0.050
Sep. 2020	<0.050

11	Nitrate
Mar. 2019	<0.050
May 2019	<0.050
Sep. 2020	<0.050

3	Nitrate
Mar. 2019	0.093
May 2019	0.056
Sep. 2020	<0.050

6	Nitrate
Mar. 2019	<0.050
May 2019	<0.050
Sep. 2020	NS

5	Nitrate
Mar. 2019	<0.050
May 2019	<0.050
Sep. 2020	<0.050

4 (DW-1)	Nitrate
Mar. 2019	<0.050
May 2019	<0.050
Sep. 2020	<0.050

3509
3491
3495
3501
3511
9005
3481
3510
8955
River Road NE
Brooklake Road NE
SITE

LEGEND

- Domestic Well *(With Map ID)* — Well location field verified
- Domestic Well *(With Map ID)* — Well location not identified. Sample collected from inside sink.
- 3510 — Parcel Boundary With Address

Groundwater Analytical Results

Well Map ID — 3 — Nitrate — Analyte

Sample Dates	Concentration (mg/L)
Mar. 2019	0.093
May 2019	0.056
Sep. 2020	<0.050

Nitrate = Nitrate as nitrogen

<0.050 = Not detected above specified lab reporting limit

NS = Well not sampled

Note: The following well locations were field verified by Rubik: 4, 5, 6, 9, 11, and 20

Typical Groundwater Flow Direction

N

0 200' 400'

1 inch = Approximately 200'

Basemap Data: Google (Imagery Date: August 12, 2020)

DEQ STAFF MEMO FIGURE 5

Rubik
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Reno, Nevada 89501
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PREPARED FOR:

NUTRIEN AG SOLUTIONS, INC.

DOMESTIC WELL SAMPLING ANALYTICAL SUMMARY

NUTRIEN AG SOLUTIONS
3630 BROOKLAKE RD NE
HOPMERE (SALEM), OR

DESIGNED BY:	DETAILED BY:	CHECKED BY:
SPF	SPF	CW

DATE: 2/02/2021

PROJECT NO.:	PLOT SCALE:
03018-2021	APPROX. 1" = 200'

DEQ STAFF MEMO TABLE 1

TABLE 1
WATER SUPPLY SAMPLING SUMMARY
Nutrien Ag Solutions, Inc.
3630 Brooklake Road NE
Salem (Hopmere), Oregon

Map ID	Property Address	Sample Date	Total Ammonia-N (mg/L)	Nitrate-N (mg/L)	Organochlorine Pesticides (µg/L)	Nitrogen-Phosphorous Pesticides (µg/L)	Pesticides and Chlorinated Herbicides			
							Dinoseb (µg/L)	Dicamba (µg/L)	2,4,5-TP (µg/L)	Other Pesticides and Herbicides (µg/L)
Maximum Contaminant Level (MCL)			NE	**10**	**--**	**--**	**7.0**	NE	**50**	**--**
1	8955 River Rd NE	3/20/2019	<0.050	<0.050	ND	ND	<0.21	<0.21	<0.21	ND
		5/10/2019	<0.050	<0.050	ND	ND	<0.19	<0.19	<0.19	ND
		9/28/2020	0.235	<0.050	ND	ND	<0.19	<0.19	<0.19	ND
2	3510 Brooklake Rd NE	3/20/2019	0.298	<0.050	ND	ND	<0.21	<0.21	<0.21	ND
		5/10/2019	0.296	<0.050	ND	ND	<0.20	<0.20	<0.20	ND
		9/28/2020	0.287	<0.050	ND	ND	<0.19	<0.19	<0.19	ND
3	9005 River Rd NE	3/20/2019	0.201	0.093	ND	ND	<0.19	<0.19	<0.19	ND
		5/10/2019	0.148	0.056	ND	ND	<0.19	<0.19	<0.19	ND
		9/28/2020	0.242	<0.050	ND	ND	<0.20	<0.20	<0.20	ND
4	3511 Brooklake Rd NE[1]	NS	NS	NS	NS	NS	NS	NS	NS	NS
5	3501 Brooklake Rd NE	3/20/2019	0.150	<0.050	ND	ND	<0.20	<0.20	<0.20	ND
		5/10/2019	0.138	<0.050	ND	ND	<0.19	<0.19	<0.19	ND
		9/28/2020	<0.050	<0.050	ND	ND	<0.26	<0.19	<0.19	ND
6	3495 Brooklake Rd NE	3/20/2019	0.211	<0.050	ND	ND	<0.21	<0.21	<0.21	ND
		5/10/2019	0.204	<0.050	ND	ND	<0.20	<0.20	<0.20	ND
		9/28/2020	--	--	--	--	--	--	--	--
7	3491 Brooklake Rd NE	3/20/2019	0.265	<0.050	ND	ND	<0.20	<0.20	<0.20	ND
		5/10/2019	0.243	<0.050	ND	ND	<0.21	<0.21	<0.21	ND
		9/28/2020	0.219	<0.050	4,4-DDE 0.0016	ND	<0.19	<0.19	<0.19	ND
8	3481 Brooklake Rd NE	3/20/2019	0.515	<0.050	ND	ND	<0.21	<0.21	<0.21	ND
		5/10/2019	0.472	<0.050	ND	ND	<0.19	<0.19	<0.19	ND
		9/28/2020	0.519	<0.050	ND	ND	<0.19	<0.19	<0.19	ND

TABLE 1
WATER SUPPLY SAMPLING SUMMARY
Nutrien Ag Solutions, Inc.
3630 Brooklake Road NE
Salem (Hopmere), Oregon

Map ID	Property Address	Sample Date	Total Ammonia-N (mg/L)	Nitrate-N (mg/L)	Organochlorine Pesticides (µg/L)	Nitrogen-Phosphorous Pesticides (µg/L)	Pesticides and Chlorinated Herbicides			
							Dinoseb (µg/L)	Dicamba (µg/L)	2,4,5-TP (µg/L)	Other Pesticides and Herbicides (µg/L)
Maximum Contaminant Level (MCL)			NE	**10**	**--**	**--**	**7.0**	NE	**50**	**--**

Notes:
mg/l = Milligrams per kilogram
µg/l = Micrograms per kilogram
-- = Not analyzed
< = Not detected above the specified laboratory reporting limit
ND = Not detected above the compound specific laboratory reporting limit
NS = Not Sampled
NE = MCL not established for this compound
[1] = Water is supplied to 3511 Brooklake Rd by 9005 River Rd

Analytical Methods:
Total Ammonia-N = (Ammonia as nitrogen [-N} + ammonium-N) by SM4500-NH3
Nitrate-N = Nitrate-N + Nitrite-N by EPA 353.2
Organochlorine Pesticides = EPA 8081A
Chlorinated Herbicides = EPA 8151A
Nitrogen-Phosphorous Pesticides = EPA 507