The AgChoice Site (Site) is located at 3205 Boyd Street, Parsons, Labette County, Kansas (Figure 1). The Site has been used as an agricultural storage and distribution facility since initial development around 1975. AgChoice, a subsidiary of MFA Enterprises, Inc. (MEI), has owned and operated the facility since 2001. The facility, occupying approximately 6.9 acres, consists of multiple agricultural structures on a gravel lot, including a fertilizer storage warehouse, bulk feed storage building, agricultural liquid storage building, anhydrous ammonia tanks, and an office building (see Figure 2 for the facility layout). Property to the west is used for pasture land. Properties to the north, east, and south are vacant.

The Kansas Department of Agriculture (KDA) performed an inspection in February 2013 and issued a notice of non-compliance for improper discharge of pesticides and improper handling of dry fertilizer materials. Laboratory data for soil and surface water samples collected by KDA indicated that both were impacted by nitrates, atrazine, and 2,4-dichlorophenoxyacetic acid (2,4-D) above regulatory limits. MEI entered into an Environment Agreement (# 13-E-43 BER) with KDHE-Bureau of Environmental Remediation on December 6, 2013, to conduct a Comprehensive Investigation (CI) and Corrective Action Study (CAS).

MEI contracted Terracon to conduct the CI and CAS. Terracon implemented field activities for the CI in June 2014 and completed supplemental investigations in 2018. Boring logs indicated the general stratigraphy is primarily a lean clay over weathered shale with auger refusal in shale bedrock at approximately 20 to 22 feet below ground surface (bgs). The uppermost water-bearing zone within the lean clay appears to be under unconfined to semi-confined conditions. Groundwater flows northeast (Figure 3) with an estimated hydraulic gradient of 0.0056 foot/foot.

Soil: The CI identified nitrate concentrations in excess of the Tier 2 Risk-Based Standard for Kansas (RSK) for the soil pathway. Most exceedances were noted in the central-northeast portion (main operating area) of the facility. Concentrations were higher in shallow soils (top two feet) and tended to decrease with depth between 2 to 6 feet bgs. Ammonia was detected as high as 1600 milligrams per kilogram (mg/kg) (but no Tier 2 RSK has been established). Atrazine and 2,4-D were identified at concentrations in excess of the Tier 2 RSKs for the soil-to-groundwater pathway at a location upgradient of the operating area. Soil samples collected from surrounding
locations to delineate the extent showed no detections. Alachlor was detected at the same location but the concentration was below the Tier 2 RSK for the soil-to-
groundwater pathway. Table 1 displays the Tier 2 RSK and the maximum concentration detected for each contaminant of concern (COC).

**Groundwater:** Nineteen of 22 groundwater samples (12 monitoring wells, 10 boring locations) exceeded the Tier 2 standard for nitrate. Analytical results for groundwater samples indicated that nitrate concentrations were higher in the northeast portion of the operating area and decreased moving away to the northwest, southwest, and southeast. The furthest downgradient sample location at the facility boundary to the northwest showed nitrate at 16.6 milligrams per Liter (mg/L) in a boring and at 9.67 mg/L in MW-1. Atrazine was detected above the Tier 2 RSK of 0.003 mg/L at two locations in the operating area with the maximum concentration of 0.063 mg/L. 2,4-D was detected but below the Tier 2 RSK. Table 2 displays the Tier 2 RSK and the maximum concentration detected for each COC. Figure 4 shows the sample locations and results for nitrate and atrazine in groundwater.

No water wells have been identified within one mile of the Site. The nearest residential property is more than 400 feet to the southwest (upgradient). The primary water supply for the facility and surrounding area is the City of Parsons, located approximately 1.5 miles southeast of the facility (upgradient).

**Sediment:** Sediment and surface water sample results indicated nitrate impacts in the drainage ditch to the north and east of the operating area. Seven of 13 sediment samples showed nitrate concentrations above the Tier 2 RSK for the soil pathway. The highest nitrate impacts in sediment were located in the ditch northeast of the operating area at 259 mg/kg. The furthest downgradient location to the northwest showed a concentration of 31 mg/kg, below the Tier 2 RSK. Alachlor and 2,4-D were detected in one and two sediment samples, respectively, above the Tier 2 RSK for the soil-to-groundwater pathway. Atrazine was detected at 6 of 13 locations, five of which were above the Tier 2 RSK for only the soil-to-groundwater pathway, and one of which was above the Tier 2 RSK for the soil pathway. Herbicides were not detected in sediments at concentrations above the Tier 2 RSK at the sample location furthest downgradient and northwest of the facility property. Table 3 displays the Tier 2 RSK and the maximum concentration detected for each COC.

**Surface water:** Nitrate and ammonia were detected in surface water samples in the ditch above the Kansas Surface Water Quality Standards at 8 locations for nitrate and 2 locations for ammonia. The highest concentration of nitrate, 460 mg/L, was located in the ditch to the east of the fertilizer building. Atrazine concentrations were above the standard at 7 of 8 locations, with the highest concentration at the southeast corner of the property boundary at 420 mg/L. 2,4-D was also detected at this location, and while no surface KSWQS has been established, it is above the Tier 2 RSK for groundwater. The surface water sample furthest downgradient and off-property to the northwest showed nitrate at 52 mg/L, atrazine at 10 mg/L (above the standard), and 2,4-D was detected at 2.1 mg/L (below the standard). A pond adjoins the facility property to the northeast. Labette Creek is approximately 2,000 feet northeast. Table
4 displays the standards and the maximum concentration detected for each COC. Figure 5 shows the sample locations and results for nitrate and atrazine in surface water.

**CORRECTIVE ACTION GOALS:**

The primary COCs are nitrate, atrazine, and 2,4-D in soil, groundwater, surface water, and sediment. Corrective action goals for the Site are as follows:

- Reduce existing COC’s in groundwater to below Tier 2 levels.
- Prevent off-site migration of COC’s in groundwater and surface water.
- Prevent exposure to contaminated groundwater for drinking.
- Reduce potential risk for workers to be exposed to impacted media through ingestion or dermal contact.

The CAS documents the evaluation of alternatives, including no further action, excavation, construction of a retention basin, phytoremediation with trees, phytoremediation with shallow-rooted vegetation, long-term monitoring, and institutional controls.

**RECOMMENDATION:**

Groundwater and surface water are the primary impacted media. Based on the data collected, KDHE recommends phytoremediation with a combination of trees and shallow-rooted vegetation, long-term monitoring, and institutional controls. Other actions that were considered included excavation and a retention basin, but the active operation of the facility is not conducive to either action. Groundwater migration off facility property could be controlled with tree plantings adjacent to the northeastern drainage ditch to provide hydraulic control, degrade contaminants in the rhizosphere, and sequester various contaminants into the woody materials of the trees. The trees may also capture impacted water and process it through the roots and transpire it into the atmosphere. Surface water runoff could be controlled by planting grasses along and within the northeastern drainage ditch to mitigate impacts. Long-term groundwater monitoring will be conducted annually for nitrate, alachlor, and 2,4-D to assess migration of contaminants and evaluate effectiveness of phytoremediation.

An Environmental Use Control Agreement (EUCA) will be implemented to restrict use of the facility property in order to protect human health and the environment from risks posed by remaining contaminants in soil, sediment, and groundwater. The EUCA runs with the property and is binding on the landowner and any other subsequent owners, lessees, and other users of the property.

If long-term groundwater monitoring fails to show decreasing trends of COC concentrations to below the target levels, KDHE may consider contingency remedial options.

**COMMUNITY INVOLVEMENT:**

KDHE encouraged public input and comment. Public notice of the availability of the draft Agency Decision Statement (ADS) was published in the *Parsons Sun* on July 22, 2021. The ADS and associated site documents were available for review at the KDHE offices in Topeka and at the Parsons Public Library. In addition, KDHE
established a webpage dedicated to the Site, which was available online during the
Comments were to be submitted to KDHE during the 15-day comment period (July
22 thru August 6, 2021), in writing by electronic mail to pamela.green@ks.gov or
postmarked by mail to:

Kansas Department of Health and Environment
Bureau of Environmental Remediation
Attention: Pamela Green, Environmental Specialist
1000 SW Jackson Street, Suite 410
Topeka, Kansas 66612-1367

No comments were received. No changes were made to the document.

**TABLES:**
- Table 1 – Maximum Concentrations Detected in Soil
- Table 2 – Maximum Concentrations Detected in Groundwater
- Table 3 – Maximum Concentrations Detected in Sediment
- Table 4 – Maximum Concentrations Detected in Surface Water

**FIGURES:**
- Figure 1 – Site Location Map
- Figure 2 – Site Diagram
- Figure 3 – Monitoring Well Locations and Groundwater Elevation Map
- Figure 4 – Nitrate and Atrazine Concentrations in Groundwater
  with Phytoremediation Plantings
- Figure 5 – Nitrate and Atrazine Concentrations in Surface Water
  with Phytoremediation Plantings

**REFERENCES:**


Final Agency Decision Statement
AgChoice Site
August 2021

**FINAL AGENCY APPROVAL:**

Bob Jurgens  
Director, Bureau of Environmental Remediation  
8/12/21

Randy Carlson  
Remedial Section Chief  
8/11/2021

Ken Diediker  
Site Remediation Unit Chief  
8/9/2021

Pamela Green  
Site Project Manager  
8/9/2021
**TABLE 1: TIER 2 RSK LEVELS AND MAXIMUM CONCENTRATIONS IN GROUNDWATER**

<table>
<thead>
<tr>
<th>Contaminants of Concern</th>
<th>Tier 2 RSK Groundwater Levels (mg/L)</th>
<th>Maximum Concentration Detected (mg/L)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nitrate</td>
<td>10</td>
<td><strong>270</strong></td>
</tr>
<tr>
<td>Ammonia</td>
<td>--</td>
<td>19.7</td>
</tr>
<tr>
<td>Nitrite</td>
<td>1</td>
<td><strong>4.7</strong></td>
</tr>
<tr>
<td>Atrazine</td>
<td>0.003</td>
<td><strong>0.063</strong></td>
</tr>
<tr>
<td>2,4-D</td>
<td>0.07</td>
<td>0.003</td>
</tr>
</tbody>
</table>

*Red Bold Font* = result exceeds Tier 2 RSK

mg/L = milligrams per Liter

**--** = Not Established

**TABLE 2: SURFACE WATER QUALITY STANDARDS AND MAXIMUM CONCENTRATIONS IN SURFACE WATER**

<table>
<thead>
<tr>
<th>Contaminants of Concern</th>
<th>Surface Water Quality Standards (mg/L)</th>
<th>Maximum Concentration Detected (mg/L)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nitrate</td>
<td>10</td>
<td><strong>460</strong></td>
</tr>
<tr>
<td>Ammonia</td>
<td>36.1*</td>
<td>55.5</td>
</tr>
<tr>
<td>Atrazine</td>
<td>0.003</td>
<td><strong>0.420</strong></td>
</tr>
<tr>
<td>2,4-D</td>
<td>0.07**</td>
<td><strong>0.121</strong></td>
</tr>
</tbody>
</table>

*Red Bold Font* = result exceeds the standard

mg/L = milligrams per Liter

ND = Not detected above the laboratory reporting limit

*Acute Aquatic Criteria, assuming neutral pH of 7.0

**Not established for surface water; Tier 2 RSK for groundwater
### TABLE 3: TIER 2 RSK LEVELS AND MAXIMUM CONCENTRATIONS IN SOIL

<table>
<thead>
<tr>
<th>Contaminants of Concern</th>
<th>Tier 2 RSK Soil Levels (mg/kg)</th>
<th>Tier 2 RSK Soil-to-Groundwater Levels (mg/kg)</th>
<th>Maximum Concentration Detected (mg/kg)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nitrate (shallow)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Vegetated: 0-24 inches</td>
<td>200</td>
<td>--</td>
<td>760</td>
</tr>
<tr>
<td>Non-vegetated: 0-8 inches</td>
<td>85</td>
<td>--</td>
<td></td>
</tr>
<tr>
<td>Nitrate (deep)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Vegetated: &gt;24 inches</td>
<td>40</td>
<td>--</td>
<td>630</td>
</tr>
<tr>
<td>Non-Vegetated: &gt;8 inches</td>
<td>40</td>
<td>--</td>
<td></td>
</tr>
<tr>
<td>Ammonia</td>
<td>--</td>
<td>--</td>
<td>1600</td>
</tr>
<tr>
<td>Atrazine</td>
<td>34.6/107</td>
<td>0.147</td>
<td>0.5</td>
</tr>
<tr>
<td>2,4-D</td>
<td>611/8810</td>
<td>0.695</td>
<td>2.0</td>
</tr>
<tr>
<td>Alachlor</td>
<td>142/440</td>
<td>0.133</td>
<td>0.10</td>
</tr>
</tbody>
</table>

**Red Font** = result exceeds Tier 2 RSK value for soil-to-groundwater pathway  
**Red Bold Font** = result exceeds Tier 2 RSK value for soil pathway  
mg/kg = milligrams per kilogram  
-- = Not Established

### TABLE 4: TIER 2 RSK LEVELS AND MAXIMUM CONCENTRATIONS IN SEDIMENT

<table>
<thead>
<tr>
<th>Contaminants of Concern</th>
<th>Tier 2 RSK Levels Soil Pathway (mg/kg)</th>
<th>Maximum Concentration Detected (mg/kg)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nitrate</td>
<td>85 (non-vegetated) 200 (vegetated)</td>
<td>259</td>
</tr>
<tr>
<td>Ammonia</td>
<td>--</td>
<td>1500</td>
</tr>
<tr>
<td>Atrazine</td>
<td>34.6</td>
<td>200</td>
</tr>
<tr>
<td>2,4-D</td>
<td>611</td>
<td>2.8</td>
</tr>
<tr>
<td>Alachlor</td>
<td>142</td>
<td>0.4</td>
</tr>
</tbody>
</table>

**Red Bold Font** = result exceeds Tier 2 RSK value  
mg/kg = milligrams per kilogram  
-- = Not Established
FIGURE 1: SITE LOCATION MAP

SITE:
Ag Choice Site
C3-050-73024
Parsons, Kansas

TITLE:
Site Location

PROJECT PHASE:
Agency Decision Statement

DRAWN BY:
AR 6/16/2021
BASEMAP DATE: 2013

CHECKED BY:
PG 6/16/2021

Kansas Department of Health and Environment

Basemap: Copyright © 2013 National Geographic Society
FIGURE 2: SITE DIAGRAM

Figure prepared by Terracon on behalf of MFA
Revised Corrective Action Study, May 2021
FIGURE 3: MONITORING WELL LOCATIONS AND GROUNDWATER ELEVATION MAP

Figure prepared by Terracon on behalf of MFA
Revised Corrective Action Study, May 2021
FIGURE 4: NITRATE AND ATRAZINE CONCENTRATIONS IN GROUNDWATER WITH PHYTOREMEDIATION PLANTINGS

Figure prepared by Terracon on behalf of MFA
Revised Corrective Action Study, May 2021
FIGURE 5: NITRATE AND ATRAZINE CONCENTRATIONS IN SURFACE WATER WITH PHYTOREMEDIATION PLANTINGS

Figure prepared by Terracon on behalf of MFA
Revised Corrective Action Study, May 2021
SAMPLE LOCATION
NITRATE CONCENTRATION (mg/L)
NITRATE EXCEEDS KANSAS SURFACE WATER STANDARD FOR NITROGEN
ATRAZINE CONCENTRATION (ug/L)
ATRAZINE EXCEEDS KDHE TIER 2 RSK
APPROXIMATE PLACEMENT OF BLACK WILLOWS IN 15' SPACING SURFACE WATER FLOW WITHIN DITCH
APPROXIMATE SEATING AREA FOR SHALLOW-ROOTED VEGETATION