

INVESTIGATION REPORT

SUBJECT: ALTEN LLC
Mead, Nebraska
NDEE FACILITY - 84069
NDEE Spill Number – 021221-NH-0845

LOCATION: 1344 County Road 10, Mead, Nebraska

INVESTIGATION DATE: 13 FEB 2021 **FINAL REPORT DATE:** 17 MAR 2021
INVESTIGATOR: Kirk Morrow **REPORT BY:** Kirk Morrow 

BACKGROUND

On **February 12, 2021** (0254 hours) the National Response Center forwarded report 1297838 (Attachment 1), via e-mail, of a spill of an unknown amount of manure and stillage at the AltEn facility in Mead, Nebraska. The cause of the release was a frozen pipe. The report stated that a berm was being constructed and that the spilled material would be diverted to an onsite lagoon.

The NDEE Emergency Response (NDEE ER) Program was not aware of the report until 0700 hours when we began reviewing e-mails. The manure/thin stillage mixture was three (3) years old. The spill had migrated to a nearby road ditch.

By 0900 hours, NDEE had been in contact with the facility (021221-NH-0845 (Attachment 2)) and learned that the leaking pipe was attached to a digester that held four (4) million gallons of material. This information was forwarded to the Nebraska Game and Parks Commission and programs / managers within NDEE that would have regulatory authority. NDEE ER assumed that the spill was confined to the ditch immediately south of the digesters.

NDEE was informed of the facility's plan to pump the spilled material back to the facility lagoon. NDEE (Water Division) could not provide prior approval for this action; rather NDEE required a follow-up report and justification for anything similar that occurred.

At 1645 hours, Emergency Response Program Coordinator (Morrow) was tasked with coordination of weekend activities. The directive was to track and report on NDEE activities and findings. A request for immediate federal assistance to USEPA was to be initiated.

At 1655 hours, Morrow contacted USEPA, OSC Curry, to request that a USEPA OSC be tasked with providing on-site assistance. There was some discussion / clarification necessary regarding authorities based on the likely contaminants (manure) and the site history. There were ongoing discussions between NDEE and USEPA for the next 1.5 hours regarding how this should take place.

At 1700 hours, Mark Pomajzl reported from the site that the spill volume was significant. It had migrated to the adjacent properties owned and operated by the Mead Cattle Company and the University of Nebraska (UN). There was a "dam" constructed of hay bales at the culvert on the Mead Cattle Company property that appeared to be having some effect at slowing the spill's migration. Pomajzl planned to re-visit the area the following day.

At 1727 hours, Neal Heil (NDEE ER) was tasked with joining Pomajzl the next day (Saturday, February 13, 2021).

At 1739 hours, Dave Schumacher, and Greg Michl, NDEE Monitoring Section, reported from the area of the spill. The spill was found to have migrated 1+ miles southeast of the facility. They were going to collect a representative water sample from this location as well (Attachment 3) as



measure field parameters (water temperature, dissolved oxygen, specific conductance, pH, turbidity).

1800 - 1810 hours, Steve Goans and Tom Buell, NDEE Monitoring Division, informed Morrow that they would investigate and address a media story regarding alleged contaminated drinking water in the area. It was suggested that USEPA be asked to sample private water wells in the area.

At 1910 hours, Schumacher and Michl report from the "dam" Pomajzl had witnessed earlier. Samples were to be collected downstream of this structure (Attachment 3). It was now dark and cold. They would de-mobilize from the area following this sampling event.

At 0900 hours on **February 13, 2021**, Morrow was contacted by Doug Ferguson, USEPA Region 7 OSC. He was planning to travel to the site to begin an investigation. I would join him.

At 1000 hours, both Pomajzl and Heil were at the facility.

At 1330 hours, Pomajzl and Heil reported their findings. The "dam" near Road 9 & J has been ineffective. The extent of the spill is now at least 2.5 miles southeast of the facility, visible on Road H between Roads 7 & 8.

A second digester is still full. The facility has fitted the lower valves with insulation and a heated lamp; this is to prevent the same failure as the other digester. There is liquid flowing from the top "vent" of the tank.

The facility has "a pump" (contractor?) coming from Kansas to assist.

Pomajzl plans to return to the site tomorrow.

INVESTIGATION

FEBRUARY 13, 2021 - I arrived at the site at 1520 hours. Weather was sunny; temperature was approximately zero degrees Fahrenheit.

I met Doug Ferguson, USEPA Region 7 On-Scene Coordinator in the offices. Also present were representatives of AltEn, LLC:

- Scott Tingelhoff, General Manager
- Mary Tingelhoff, Environmental Health & Safety Director
- Ken Peterson, Plant Manager



For the next 40 minutes, we discussed the events of the previous days. My notes reflect the following:

The plant has two (2) digesters, each contains four (4) million gallons of a mixture of manure and thin stillage.

On February 12, at approximately 0025 hours the release began. The plant confirmed the release at approximately 0115 hours. The south digester experienced a pipe break that initiated a release of 5000-7000 gallons per minute (600 PSI pressure coming out of the pipe).

The facility immediately began efforts to stop the release; this was unsuccessful. The facility attempted to divert the material to an on-site six (6) million-gallon lagoon; this did not work.

The facility placed "biochar" approximately 300 feet beyond the spill origin site. This slowed the spill's migration and the facility sampled the outfall at this location (0730 hours).

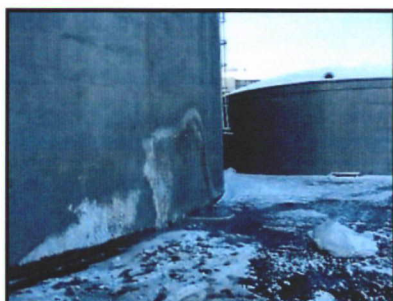
UN-L used hay bales on the culvert to attempt to stop the spill migration onto the UN-L property. There is a plan to add absorbent “socks” and biochar to this “dam.” There is a plan to pump spilled material back to facility lagoons. The lines to the effluent tank are currently frozen.

The second (north) digester tank needs to be drained. Currently, the facility has insulated the valve “window well” and placed a light inside to generate heat. This may prevent this valve from freezing/failing.

From 1600 – 1640 hours, the facility personnel, OSC Ferguson began reconnaissance of the three nearby spill observation locations (Digesters, Biochar/Outfall Location, UN-L dam site). At 1640 hours, we were joined by Eric Deselich, USEPA START Contractor, and returned to the same locations as well as travelling southeast to one additional location. The following observations are a summary of all the times we visited the various locations on February 13 (see Attachment 4).

DIGESTERS (1600 hours & 1731 hours)

The two (2) large tanks in the photo to the right are the AltEn, LLC facility digesters. Both tanks have valving located on the east side of the tank, at the bottom of the tank, protected by a galvanized “window well.”

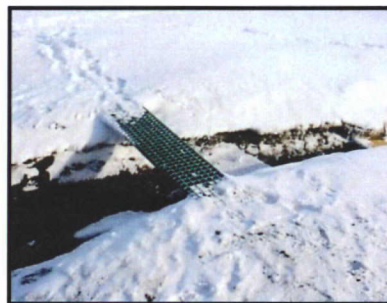


The south digester tank (photo to left) experienced a catastrophic release of its contents beginning on February 12 and was effectively emptied by the time of our arrival on February 13. The initial pressure of the release is reflected in the height of the frozen discharge on the side of the tank. Facility personnel also indicated that the spray from the release extended thirty (30) feet to the east. The “window well” that contained the valving is visible in the lower half of the photo (looking north). Spilled material was frozen to the ground throughout this area of the facility.

This area is USEPA Sample Location 2 – It was sampled at approximately 1731 hours on February 13. Two containers (one preserved) of contaminant fluid and 1 container of contaminant solid were collected. The initial summary report (March 5th E-Mail from OSC Ferguson) of the results include:

• Dissolved Ammonium	-	1550 mg/L
• Fludioxonil (fungicide)	-	340 ug/L
• Mefenoxam (fungicide)	-	110 ug/L
• Abamectin (insecticide)	-	800 ug/L
• Chlorantraniliprole (insecticide)	-	53 ug/L
• Clothianidin (insecticide)	-	Not Detected
• Difenconazole (fungicide)	-	50 ug/L
• Fluoxastrobin (fungicide)	-	40 ug/L
• Prothioconazole (fungicide)	-	4700 ug/L
• Tebuconazole (fungicide)	-	1300 ug/L
• Thiabendazole (fungicide)	-	9000 ug/L
• Thiamethoxam (insecticide)	-	Not Detected

The photograph to the right (looking down and to the southeast from the southeast corner of the south digester) depicts a walkway over a drainageway from the “berm” immediately southeast of the south digester tank. It appeared that there was always drainage at this location. According to AltEn personnel, a portion of the spilled material flowed through/under this walkway and scoured the trench wider than it was previously.



The photograph to the left (facing northwest) depicts the north digester. Visible in the photo is the insulation placed around the window well/valving. A power cord is visible that we were told powered a 75W light bulb. The intent is to produce heat and keep the valves from freezing.

The photograph to the right is the south side of the north digester (looking up to the northwest). Visible is an ongoing “low volume” discharge from near the top of the tank.



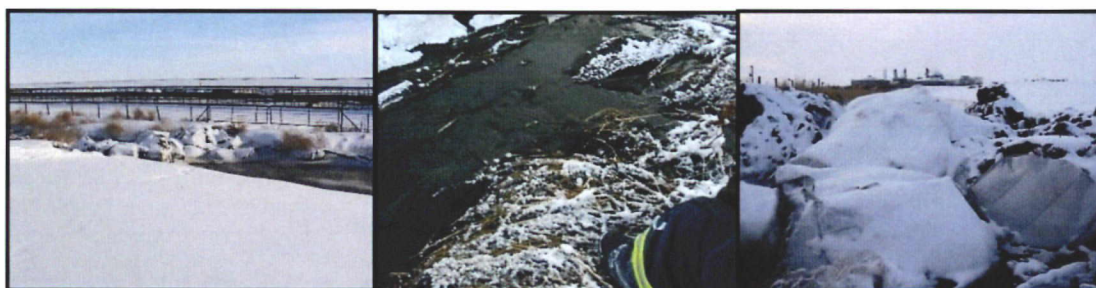
The photograph at left is facing east at the fence gate/road south of the digesters. It depicts the flow path of the spill as it exits the area of the digesters and flows east in the ditch toward the Mead Cattle property.

**BIOCHAR SACK DAM (1610
and 1700 hours)**



The photos below depict the area where the facility attempted to contain/divert the spill by damming the ditch with sacks of "biochar."

- The photo on the left is looking southeast at the now snow-covered sacks.
- The center photo depicts the ditch just east of the sacks. Several of the sacks were broken and the black in the photo is the biochar that leaked from the sacks (the pantleg, lower right, is that of Eric Deselich).
- The photo on the right depicts the dam looking west at it from the east (sample) side.



This area is USEPA Sample Location 1 – It was sampled at approximately 1708 hours on February 13. Two containers (one preserved) of contaminant fluid and 1 container of contaminant (not intended to be the biochar) solid were collected. The initial summary report (March 5th E-Mail from OSC Ferguson) of the results include:

• Dissolved Ammonium	-	Not Available
• Fludioxonil (fungicide)	-	210 ug/L
• Mefenoxam (fungicide)	-	99 ug/L
• Abamectin (insecticide)	-	710 ug/L
• Chlorantraniliprole (insecticide)	-	55 ug/L
• Clothianidin (insecticide)	-	540 ug/L
• Difenoconazole (fungicide)	-	37 ug/L
• Fluoxastrobin (fungicide)	-	47 ug/L
• Prothioconazole (fungicide)	-	2200 ug/L
• Tebuconazole (fungicide)	-	1000 ug/L
• Thiabendazole (fungicide)	-	7000 ug/L
• Thiamethoxam (insecticide)	-	55 ug/L

MEAD CATTLE COMPANY (near UN-L) HAY BALE & DIRT DAM SITE (1625 & 1755 hours)

This is the site mentioned in the background portion of this report. The Schumacher / Michl team observed the “bale berm” on February 12. Surface water parameters were measured physical parameters just southeast of this structure, near Road 9.

The Pomajzl / Heil team had been to this location earlier on February 13. They had reported the dam as being constructed of a variety of items, including hay bales.



It appears that prior to our arrival the dam had been fortified with loose dirt. The photograph to the left is taken from Road 9, the “top of the dam.” The photo is looking west and depicts the general area of USEPA sample 3.

The photo to the right is again taken from Road 9, facing east and

downward. Water/contaminants continue to flow past this point at the time of our visit.



This area is USEPA Sample Location 3 – It was sampled at approximately 1755 hours on February 13. Two containers (one preserved) of contaminant fluid were collected. The initial summary report (March 5th E-Mail from OSC Ferguson) of the results include:

• Dissolved Ammonium	-	1150 mg/L
• Fludioxonil (fungicide)	-	110 ug/L
• Mefenoxam (fungicide)	-	78 ug/L
• Abamectin (insecticide)	-	260 ug/L
• Chlorantraniliprole (insecticide)	-	38 ug/L
• Clothianidin (insecticide)	-	370 ug/L
• Difenoconazole (fungicide)	-	21 ug/L
• Fluoxastrobin (fungicide)	-	27 ug/L
• Prothioconazole (fungicide)	-	2000 ug/L
• Tebuconazole (fungicide)	-	690 ug/L
• Thiabendazole (fungicide)	-	4900 ug/L
• Thiamethoxam (insecticide)	-	47 ug/L

COUNTY ROAD 8 (North of County Road H) (1750 hours)

The darkness and weather were now limiting what could be completed. USEPA & NDEE agreed to attempt to observe and sample one more location. The location chosen was on County Road 8, approximately .43 miles north of County road H. This location is approximately 3.25 miles from the origin of the spill by flow path (see USEPA chart).



Even in darkness, contamination in this drainageway was apparent. Everything was frozen except for the areas where the waterway was thawed by the spilled material. These areas appeared as a black color from a distance.



The photograph on the left is START contractor Eric Deselich as he prepares to collect a representative sample from the east side of County Road 8. The photo is taken from the east shoulder of the road, looking east.

NDEE and USEPA/START demobilized from the area at 1830 hours.

This area is USEPA Sample Location 5 – It was sampled at approximately 1825 hours on February 13. Two containers (one preserved) of contaminant fluid were collected. The initial summary report (March 5th E-Mail from OSC Ferguson) of the results include:

• Dissolved Ammonium	-	1080 mg/L
• Fludioxonil (fungicide)	-	94 ug/L
• Mefenoxam (fungicide)	-	73 ug/L
• Abamectin (insecticide)	-	300 ug/L
• Chlorantraniliprole (insecticide)	-	37 ug/L
• Clothianidin (insecticide)	-	370 ug/L
• Difenconazole (fungicide)	-	20 ug/L
• Fluoxastrobin (fungicide)	-	24 ug/L
• Prothioconazole (fungicide)	-	1700 ug/L
• Tebuconazole (fungicide)	-	650 ug/L
• Thiabendazole (fungicide)	-	4300 ug/L
• Thiamethoxam (insecticide)	-	46 ug/L

END OF NDEE INVESTIGATION

USEPA / START Additional Data

On **February 14**, USEPA and START returned to the area. Two additional samples were collected for analysis:

- Near Highway 66 / Road 7 (Sample 4)
- Near Highway 66 / Road G (Sample 6)

USEPA reported that visual evidence of the spill appeared at, and immediately southeast of, the sample 6 location.



The USEPA preliminary reports of their February 14 sampling are as follows:

	SAMPLE LOCATION 6	SAMPLE LOCATION 4
• Dissolved Ammonium	- 637 mg/L	2 mg/L
• Fludioxonil (fungicide)	- 30 ug/L	Not Detected
• Mefenoxam (fungicide)	- 45 ug/L	Not Detected
• Abamectin (insecticide)	- 280 ug/L	Not Detected
• Chlorantraniliprole (insecticide)	- 21 ug/L	Not Detected
• Clothianidin (insecticide)	- 240 ug/L	90 ug/L
• Difenconazole (fungicide)	- Not Detected	Not Detected
• Fluoxastrobin (fungicide)	- Not Detected	Not Detected
• Prothioconazole (fungicide)	- 440 ug/L	Not Detected
• Tebuconazole (fungicide)	- 300 ug/L	Not Detected
• Thiabendazole (fungicide)	- 1700 ug/L	Not Detected
• Thiamethoxam (insecticide)	- 34 ug/L	20 ug/L

COMMENTS/CONCLUSIONS

Based on the observations made on February 13 and those reported by USEPA, it is concluded that a spill of approximately four (4) million gallons of a manure and thin stillage mixture occurred over the course of February 12th through the 13th. By the end of the day on the 13th the spill had migrated more than three (3) miles downgradient. USEPA's observations, on February 14th, confirmed that the spill had migrated, at a minimum, downgradient 4.5 - 5 miles.

At the time of the release, no chemical characterization was available for the spilled material. Based on the facility history, there was suspicion that the spill would contain pesticides used in seed corn and their by-products. The types of pesticides suspected, required an extended time for laboratory analysis and could not be directly detected in the field.

USEPA's data demonstrated that a more common analyte, ammonia, could be used as an indicator of the presence of this spill due to the manure content producing the

ammonium ion. USEPA's results confirm a significant pesticide content in the samples, including neonicotinoids.

The level of contaminants found in the samples and the distribution confirm that the most likely source for this contamination is the spilled manure/stillage. The level of pesticides found in the samples indicates that the spill poses a risk to human health and the environment.

It is recommended that all necessary efforts be made to:

- Contain the release and prevent further migration downstream.
- Recover, transport, treat and/or dispose of the spilled contaminants and affected areas as soon as possible.
- Further testing to determine the legal and available treatment and disposal options is likely necessary.
- Continue to prevent a second potential release (from the north digester)

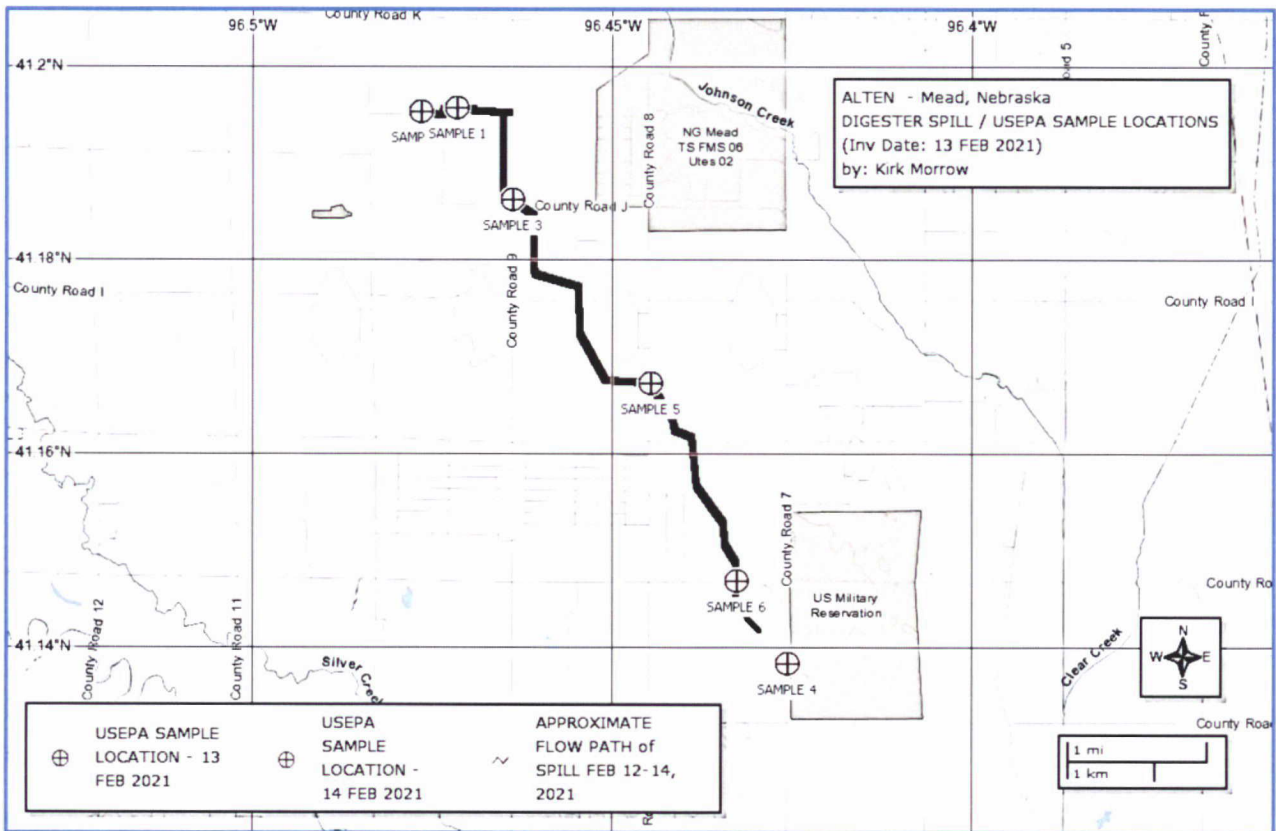
As mentioned earlier in the background portion of this report, there was some concern expressed by residents in the area regarding their respective water supplies being affected. I did have a brief conversation with USEPA on February 13th regarding this issue. I presented a map (Attachment 7) that was intended to indicate the potential scope of this effort should the assessment of surrounding water supplies become necessary. NDEE ER determined that the assessment of this issue was beyond the scope of what could be accomplished in this initial response.

NDEE ER participated in an internal briefing on February 16th. I recommended that this incident be treated like a disaster response in that it would require oversight and management beyond the capabilities of the NDEE ER Program. An organizational structure and operational period planning, similar to that conducted during the department's Stafford Act ESF-10 activities, was recommended.

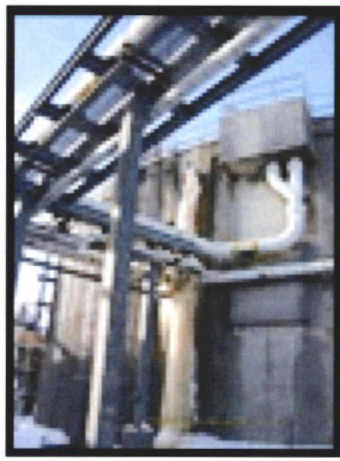
ATTACHMENTS:

- 1 - National Response Center Flashfax for Report 1297838 (12 FEB 2021)
- 2 - NDEE Spill Report Record (12 FEB 2021)
- 3 - Map of Schumacher & Michl (12 FEB 2021)
- 4 - Map (13 & 14 FEB 2021)
- 5 - Photos Used in This Report (13 FEB 2021)
- 6 - Table of Initial Laboratory Results (USEPA – 5 MAR 2021)
- 7 - Figure with Surrounding Water Wells (NDEE – 13 FEB 2021)
- 8 - Copy of Field Notes (13 FEB 2021)

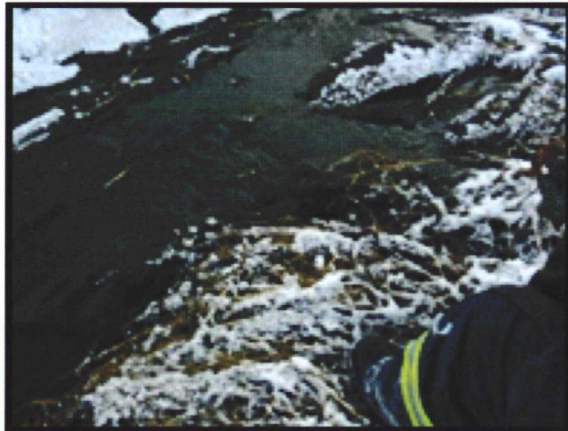




PHOTOS USED IN REPORT
AltEn LLC – Mead, Nebraska
13 FEBRUARY 2021



PHOTOS USED IN REPORT
AltEn LLC – Mead, Nebraska
13 FEBRUARY 2021



USEPA INITIAL SAMPLING RESULTS – as reported March 5, 2021 (D. Ferguson)

Sam ple Num ber	Flow Dist. Est. (mile)	Locati on Descri ption	NH4+ Dis. (mg/L)	Fludio xonil (ug/L)	Mefeno xam (ug/L)	Abam ectin (ug/L)	Chlora ntranili prole (ug/L)	Clothi anidin (ug/L)	Difen ocona zole (ug/L)	Fluoxas trobin (ug/L)	Prothi ocona zole (ug/L)	Tebuc onazol e (ug/L)	Thiabe ndazol e (ug/L)	Thiam ethoxa m (ug/L)
2	0	Tank	1550	340	110	800	53	ND	50	40	4700	1300	9000	ND
1	0.3	Sack Dam	NA	210	99	710	55	540	37	47	2200	1000	7000	55
3	1.26	Soil Dam	1150	110	78	260	38	370	21	27	2000	690	4900	47
5	3.25 off site	CR 8	1080	94	73	300	37	370	20	24	1700	650	4300	46
6	4.86 off site	CRG	637	30	45	280	21	240	ND	ND	440	300	1700	34
4	5.63 off site	CR 7	2	ND	ND	ND	ND	90	ND	ND	ND	ND	ND	20

FIGURE DEPICTING WATER WELLS THAT SURROUND ALTEN FACILITY

P – Privately Registered Well (Drinking or Irrigation) W – Municipal Supply Well

(NOTE THAT THE SCALE HERE IS APPROXIMATELY .7 inches /mile)



34

Blank

35

ALT EN - MEAD, NE
FAC 84069
1344 County Road 10

(NOTIFICATION 07221-NH-0845)

Saturday - February 13, 2021
(Sun. & O.F.)

ARRIVED @ 1520 hrs
Fergusso meeting w/
Plant Manager

2 - 4 M Gal Digesters
2/12 12:25 No Process heat to Digesters
1:15 AM South Digester Pipe Broke
5-7 K gal / min
600 PSI
MANURE & TRINK STALLAGE

Can't stop tried to
Divert to 6 M gal lagoon
Not working....

USED BIOCHAR DAMAGED
at 300' → SLOWED → SAMPLER
OUTLINE @ 0730

36

UN-L - USED 214T BAGS ON
CONVERT ... PLAN TO ADD
SOCKS w/ BIOCHAR ...

TRYING TO PUMP BACK TO
LAGOONS

LINGS TO EFFLUENT TANK
ARE FROZEN

SECOND TANK NEEDS
TO BE DRAINED

WINDOW WGBL / INSULATION
(WG WILL SOB THIS)

Considered dropping in a
plug... too late....

1600 HRS RECON BEGINS

@ DIGESTERS

@ OUTFALL

@ UN-L Property

1640 HRS Back @ ALLEN
offices

met Eric Deshlich

START
Back to field.

37

1700 hrs @ "DAM SITE" (photo)
Sample location 1

1708 hrs - SAMPLE COLLECTED @

DOWN GRADIENT OF
BIOCHAR DAM

2 water PRESERVED / NON-Pres
1 "sediment"

1731 Sample location 2

@ Leak Site

2 water - One Preserved
1 sediment.

1755 Sample location 3

UN-L DAM SITE
2 water samples

1825 LOCATION 5

2 WATER
HRT

1830 hrs De Mobilize

X-Z