ALL CONSULTING
GOVERNMENT RELATIONS · ENERGY · PLANNING · TECHNOLOGY
ENGINEERING · ENVIRONMENTAL

December 19, 2014

PN 1403.ND.00

United States Environmental Protection Agency
Region 8 Ground Water Program
999 18th Street, Suite 300
Denver, CO 80202-8917

Subject: Newalta Corporation New Town SWD #1 UIC Class II Disposal Permit Application
continued subject

Dear Sirs,

Enclosed please find the completed EPA application that we have prepared on behalf of our client, Newalta Corporation, for the New Town SWD #1 proposed Class II Commercial Disposal well in Mountrail County, North Dakota. The well is located on private lands within the Fort Berthold Indian Reservation. A separate application has been prepared and submitted to the North Dakota Industrial Commission.

Please let me know if you have any questions or need additional information.

Sincerely,
ALL Consulting

J. Daniel Arthur
President/Chief Engineer

DEC 23 2014

ALL Consulting 1718 South Cheyenne Ave. Tulsa, OK 74119
Phone 918.382.7581 Fax 918.382.7582 www.ALL-LLC.com

OMB No. 2040-0042 Approval Expires 11/30/2014

United States Environmental Protection Agency

EPA

Underground Injection Control Permit Application

(Collected under the authority of the Safe Drinking Water Act. Sections 1421, 1422, 40 CFR 144)

I. EPA ID Number		T/A	C
U			

Read Attached Instructions Before Starting

For Official Use Only

Application approved mo day year	Date received mo day year	Permit Number	Well ID	FINDS Number

II. Owner Name and Address

Owner Name: NEWALTA CORPORATION

Street Address: 211-11 AVENUE SW

Phone Number: (403) 806-7059

City: CALGARY

State: AB

ZIP CODE: T3G 5V1

III. Operator Name and Address

Owner Name:

Street Address:

Phone Number:

City:

State:

ZIP CODE:

IV. Commercial Facility

[x] Yes
[ ] No

V. Ownership

[x] Private
[ ] Federal
[ ] Other

VI. Legal Contact

[x] Owner
[ ] Operator

VII. SIC Codes

1381

VIII. Well Status *(Mark "x")*

[ ] A. Operating — Date Started mo day year:

[ ] B. Modification/Conversion

[x] C. Proposed

IX. Type of Permit Requested *(Mark "x" and specify if required)*

[x] A. Individual [ ] B. Area

Number of Existing Wells	Number of Proposed Wells	Name(s) of field(s) or project(s)
0	1	VAN HOOK FIELD, NORTH DAKOTA

X. Class and Type of Well *(see reverse)*

A. Class(es) (enter code(s))	B. Type(s) (enter code(s))	C. If class is "other" or type is code 'x,' explain	D. Number of wells per type (if area permit)
II	D		

XI. Location of Well(s) or Approximate Center of Field or Project

Latitude Deg	Min	Sec	Longitude Deg	Min	Sec	Township and Range Sec	Twp	Range	1/4 Sec	Feet From	Line	Feet From	Line
47	59	9.7	-102	20	53.4	17	152N	91W	NE	2296	N	1140	E

XII. Indian Lands (Mark 'x')

[x] Yes
[ ] No

XIII. Attachments

(Complete the following questions on a separate sheet(s) and number accordingly; see instructions)

For Classes I, II, III, (and other classes) complete and submit on a separate sheet(s) Attachments A--U (pp 2-6) as appropriate. Attach maps where required. List attachments by letter which are applicable and are included with your application.

XIV. Certification

I certify under the penalty of law that I have personally examined and am familiar with the information submitted in this document and all attachments and that, based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment. (Ref. 40 CFR 144.32)

A. Name and Title *(Type or Print)*	B. Phone No. *(Area Code and No.)*
DENNIS J HU - DIRECTOR EHS	303-312-5208
C. Signature	D. Date Signed
	12/18/14

EPA Form 7520-6 (Rev. 12-11)

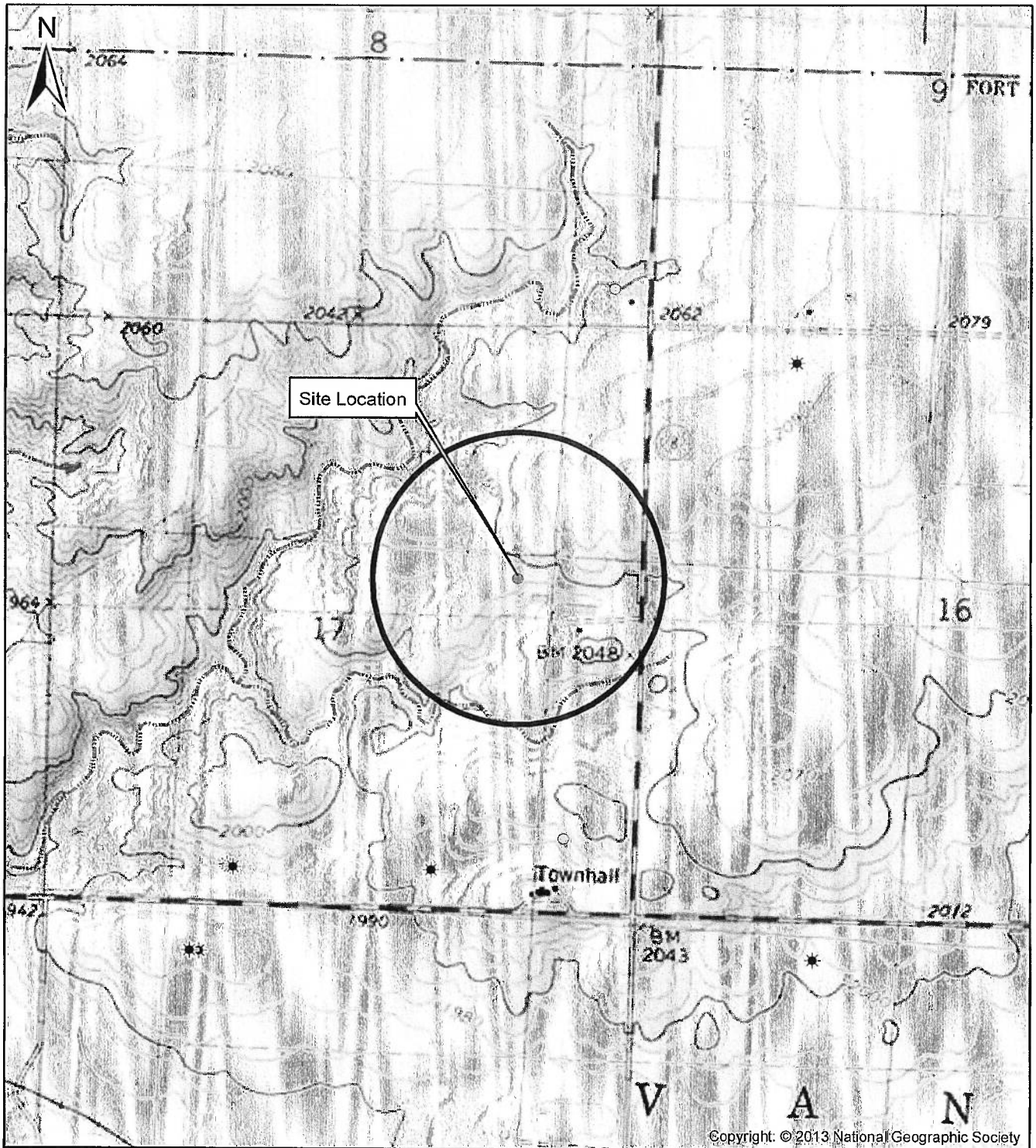
ATTACHMENT A: AREA OF REVIEW METHODS

New Town SWD #1
2296' FNL & 1140' FEL
SENE Sec 17-Tl52N-R91W
Mountrail County, ND

A fixed area of review of ¼ mile radius from the proposed New Town SWD #1 well was used for this application.

ATTACHMENT B: AREA OF REVIEW MAP

New Town SWD #1
2296' FNL & 1140' FEL
SENE Sec 17-Tl52N-R91W
Mountrail County, ND



Prepared for:

Newalta

Site Location Map

47.98602883 / -102.34818150

Project Manager: Dan Arthur	December 18, 2014	Map Created by: Scott Hall

Prepared by:

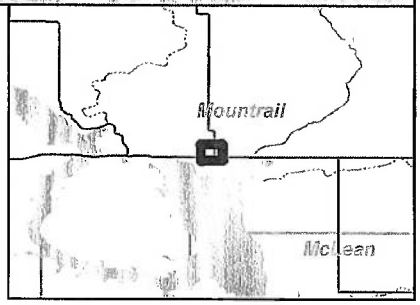
ALL CONSULTING

Legend

- Site Location
- Water Site
- Oil/Gas Wells
- 1/4-mile Buffer
- Perennial Streams/Rivers (NHD)
- Intermittent Streams (NHD)
- Surface Water Body (NHD)

0 0.15 0.3 0.6

Miles



ATTACHMENT C: CORRECTIVE ACTION PLAN AND WELL DATA

New Town SWD #1
2296' FNL & 1140' FEL
SENE Sec 17-Tl52N-R91W
Mountrail County, ND

Well Name	Operator	API #	Location	Depth	Well Type	Status	Spud Date	Surface Casing	Production Casing	Liner
Nightcrawler 1-17H	Slawson Exploration Company, Inc.	33-061-00589	SWSE Sec 17-T152N-R91W 350' FSL, 1855' FEL	13952	Producing	Active	11/14/2008	9-5/8" surface casing set at 1856'. Cemented with 700 sacks to surface	7" production casing set at 9,907 ft. Cemented with 765 sacks of cement with TOC at 2,150'.	4-1/2" Liner set from 9,383' to 13,943'.

The proposed disposal zone in the New Town SWD #1 is the Inyan Kara (Dakota Group) formation. There is one well within the ¼ mile area of review for the New Town SWD #1. Geological information for the Nightcrawler 1-17H well identifies the top of the Inyan Kara (Dakota Group) at 4,853 ft. The estimated top of cement in the Nightcrawler 1-17H well is at 2,150'. No corrective action is needed on the Nightcrawler 1-17H well. Cement isolates the proposed injection formation from potential sources of groundwater.

ATTACHMENT E: NAME AND DEPTH OF USDWS

New Town SWD #1
2296' FNL & 1140' FEL
SENE Sec 17-Tl52N-R91W
Mountrail County, ND

The principal USDWs in the Forth Berthold Reservation area are the New Town Aquifer and the Sanish Aquifer. The list below shows the approximate depth and TDS of other common water sources that are available.

NAME	DEPTH	TDS (mg/L)
Colebarhor Formation	0	
Bullion Creek Formation	23'	2,110
Hell Creek Formation	1,043'	1,530
Fox Hills Formation	1,413'	1,530

The nearest USDW to the proposed injection zone is the Fox Hills formation. In this area, the Fox Hills formation is approximately 290 feet thick with base of the formation located at approximately 1,780 feet as identified in the Nightcrawler 1-17H well, which is the only well within the ¼ mile area of review for the proposed New Town SWD #1 location. The amount of separation between the injection zone and the Fox Hills Formation is approximately 3,070 feet. The Hell Creek and Fox Hills formations are connected hydrologically and are therefore considered to be a single aquifer. This combined aquifer underlies the entire Fort Berthold formation and ranges from approximately 100 to 350 feet in thickness.

ATTACHMENT G: GEOLOGICAL DATA ON INJECTION AND CONFINING ZONES

New Town SWD #1
2296' FNL & 1140' FEL
SENE Sec 17-Tl52N-R91W
Mountrail County, ND

Injection Zone:

Formation:	The Creataceous Inyan Kara (Dakota) Formation
Lithology:	A sandstone, white clear to semi-translucent, fine to medium grained, some coarsely grained, subangular to well rounded quartzose grains, very friable, poorly cemented with clay and calcite cement, inter-bedded with gray, dark gray shale. It has fair to good porosity.
Gross interval:	4777-5762'(985 feet total) as shown on adjacent well Phoenix 1-18H attached well log

Top Confining Zone:

Formation:	Cretaceous Greenhorn, Mowry Shale
Lithology:	Gray to dark gray with some bentonite, tight.
Gross interval:	4058-4777 (719' total) as shown on adjacent well Phoenix 1-18H attached well log.

Bottom Confining Zone:

Formation:	Jurassic Swift/Reirdon Shale
Lithology:	It is gray green, brown, tight with occasional thin beds of sandstone, gray, gray-green, very fine to fine grained, glauconitic, quartzose sandstone, streaked zones poor to fair intergranular porosity.
Gross interval:	5762-6150 (388' feet total) as shown on adjacent well Phoenix 1-18H attached well log.

ATTACHMENT H: OPERATING DATA

New Town SWD #1
2296' FNL & 1140' FEL
SENE Sec 17-T152N-R91W
Mountrail County, ND

Newalta Corporation, proposes to drill the New Town SWD #1 well for use as a saltwater disposal well into the Cretaceous Inyan Kara (Dakota) Formation.

The proposed wellbore will be drilled to approximately 5300' MD and TVD. A 9-5/8" surface casing string will be set at 1,825' and cement will be circulated to the surface.

The production string will be set at approximately 5300' MD-TVD, and cemented to inside the surface casing.

Upon completion of drilling and setting casing the well will have a MIT test performed and witnessed by an NDIC official.

need top of injection zone

A fracture gradient of 0.80 at a depth of 4058' (top of upper confining zone) in the Greenhorn/Mowry.

where does this sample come from

This facility and well will handle and dispose by injection, produced water, flowback water and drilling fluids from local area Oil and Gas Operators in the Mountrail County area. A sample of the injectate fluid was analyzed and the results are found on the following page.

need a range of sample analyses

Water storage tanks and injection pumps located on the New Town SWD #1 site will provide injection into the subject well.

While it is anticipated that the facility may dispose an average of 3,500 to 4,500 barrels of water daily, the facility will be designed for and can handle over 10,000 barrels of water daily based on pressure limitations set by the NDIC. The proposed estimated average injection rate is 10,000 barrels of water per day at a pressure of 1,000 psi. The maximum proposed injection rate is 15,000 barrels of water per day at a maximum pressure of 1,400 psi.

Water will be trucked into the facility and offloaded to the produced water tanks. The transfer pumps will take the water through filter pots to catch any solids or trash prior to moving the water into the gun barrel tanks. Skim oil will be transferred into the skim oil tanks and oil bound with water will be moved to the bad oil tank. Water then settles in the storage tanks, before entering to down hole tank. The water is pumped from the down hole tank by the down hole pumps for injection into the disposal well.

ASTRO-CHEM LAB, INC.

4102 2nd Ave. West
Williston, North Dakota 58802-0972
P.O Box 972
Phone: (701) 572-7355

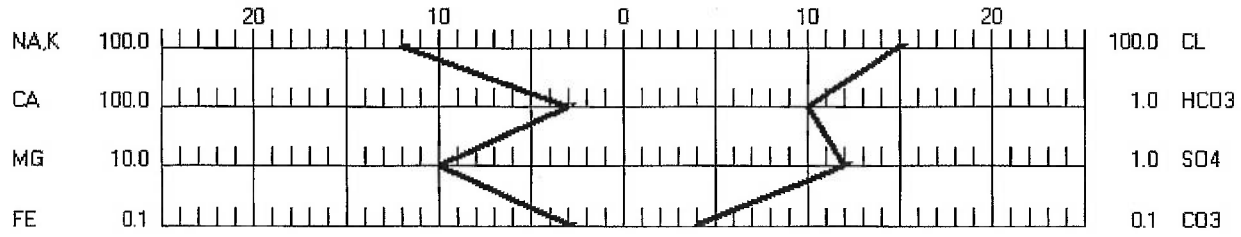
WATER ANALYSIS REPORT

Sample Number: W-14-0555
Date of Analysis: 02/05/2014
Company: Newalta
City: Williston
State: ND
Well Number: Newtown Facility
Date Received: 01/31/2014
DST Number:
Sample Source:
Location: Section: Township: Range: County:
Formation: Depth:
Distribution: Distribution List

Resistivity @ 77 °F	0.084 Ohm-Meters		pH	8.65
Specific Gravity @ 77 °F	1.065		H2S	Negative
Total Dissolved Solids (Calculated)	90437 mg/L	(	84918	ppm)
Sodium Chloride (Calculated)	89024 mg/L	(	83591	ppm)

CATION	MEQ/L	mg/L	ANION	MEQ/L	mg/L
CALCIUM	300.0	6012	CHLORIDE	1522.8	53988
MAGNESIUM	100.0	1215	CARBONATE	0.4	12
SODIUM	1144.0	26300	BICARBONATE	10.0	610
IRON	0.3	6.5	SULFATE	12.3	589
CHROMIUM	0.0	0.0	NITRATE-N	0.0	0
BARIUM	0.1	5.5			
POTASSIUM	43.5	1700			

WATER ANALYSIS PATTERN



Remarks: Sampled 1-31-14

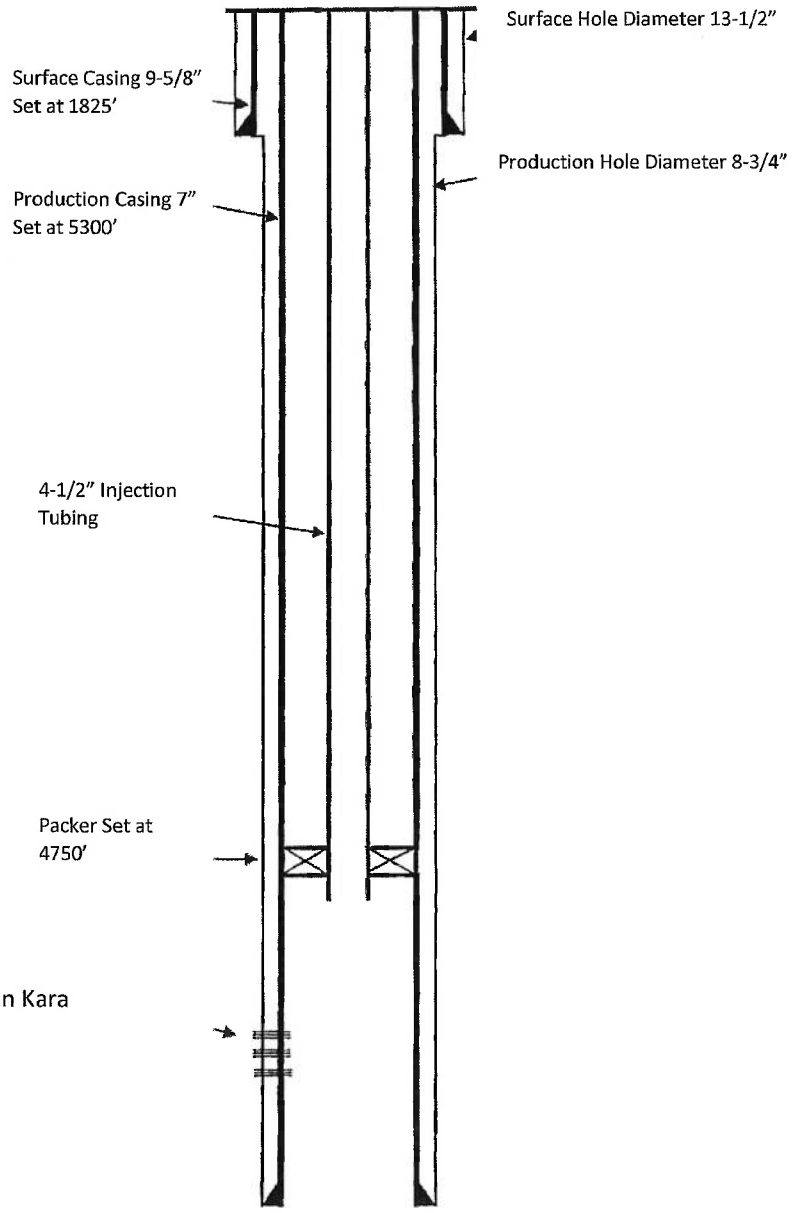
Analyzed By: C. Jungels

ATTACHMENT M: CONSTRUCTION DETAILS

New Town SWD #1
2296' FNL & 1140' FEL
SENE Sec 17-T152N-R91W
Mountrail County, ND

NEW TOWN SWD #1

SENE Section 17, Township 152 North, Range 91 West



ATTACHMENT Q: PLUGGING AND ABANDONMENT PLAN

New Town SWD #1
2296' FNL & 1140' FEL
SENE Sec 17-Tl52N-R91W
Mountrail County, ND

OMB No. 2040-0042 Approval Expires 11/30/2014

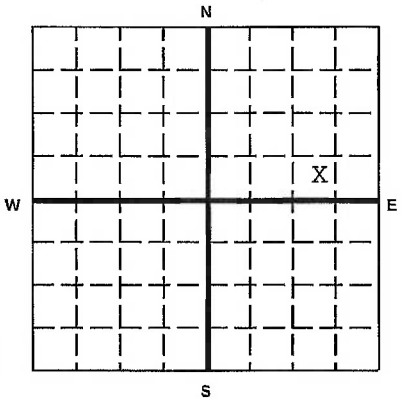
EPA

United States Environmental Protection Agency
Washington, DC 20460

PLUGGING AND ABANDONMENT PLAN

Name and Address of Facility	Name and Address of Owner/Operator
NEW TOWN SWD #1 2296' FNL, 1140' FEL Section 17, T152N, R91W	NEWALTA CORPORATION 211-11 Avenue SW Calgary, AB T3G 5V1

Locate Well and Outline Unit on Section Plat - 640 Acres



State	County	Permit Number
NORTH DAKOTA	MOUNTRAIL	PENDING

Surface Location Description

SE 1/4 of NE 1/4 of ___ 1/4 of ___ 1/4 of Section 17 Township 152 Range 91

Locate well in two directions from nearest lines of quarter section and drilling unit

Surface Location ___ ft. frm (N/S) ___ Line of quarter section and ___ ft. from (E/W) ___ Line of quarter section.

TYPE OF AUTHORIZATION

- [x] Individual Permit
- [ ] Area Permit
- [ ] Rule

Number of Wells 1

Lease Name NEW TOWN

WELL ACTIVITY

- [ ] CLASS I
- [x] CLASS II
  - [x] Brine Disposal
  - [ ] Enhanced Recovery
  - [ ] Hydrocarbon Storage
- [ ] CLASS III

Well Number SWD #1

CASING AND TUBING RECORD AFTER PLUGGING

SIZE	WT (LB/FT)	TO BE PUT IN WELL (FT)	TO BE LEFT IN WELL (FT)	HOLE SIZE
9-5/8	36	1825	1825	13-3/8
7	26	5300	5300	8-3/4

METHOD OF EMPLACEMENT OF CEMENT PLUGS

- [ ] The Balance Method
- [ ] The Dump Bailer Method
- [x] The Two-Plug Method
- [ ] Other

CEMENTING TO PLUG AND ABANDON DATA:	PLUG #1	PLUG #2	PLUG #3	PLUG #4	PLUG #5	PLUG #6	PLUG #7
Size of Hole or Pipe in which Plug Will Be Placed (inche:	7	7	7				
Depth to Bottom of Tubing or Drill Pipe (ft	5300	1550	100				
Sacks of Cement To Be Used (each plug)	70	42	10				
Slurry Volume To Be Pumped (cu. ft.)	18.7	11.3	2.7				
Calculated Top of Plug (ft.)	4500	1000	0				
Measured Top of Plug (if tagged ft.)	4500	1000	0				
Slurry Wt. (Lb./Gal.)	15.8	15.8	15.8				
Type Cement or Other Material (Class III)	C	C	C				

LIST ALL OPEN HOLE AND/OR PERFORATED INTERVALS AND INTERVALS WHERE CASING WILL BE VARIED (if any)

From	To	From	To

Estimated Cost to Plug Wells

Total estimated cost to plug this well is $50,000

Certification

I certify under the penalty of law that I have personally examined and am familiar with the information submitted in this document and all attachments and that, based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment. (Ref. 40 CFR 144.32)

Name and Official Title *(Please type or print)*	Signature	Date Signed
DENNIS J. HJ - DIRECTOR EHS		12/18/14

EPA Form 7520-14 (Rev. 12-11)

ATTACHMENT R: NECESSARY RESOURCES

New Town SWD #1
2296' FNL & 1140' FEL
SENE Sec 17-Tl52N-R91W
Mountrail County, ND

NEWALTA IS IN THE PROCESS OF OBTAINING A SURETY BOND AND WILL SUBMIT SAME SEPERATELY AS SOON AS IT IS RECEIVED.

ATTACHMENT S: AQUIFER EXEMPTION REQUEST

New Town SWD #1
2296' FNL & 1140' FEL
SENE Sec 17-T152N-R91W
Mountrail County, ND

Newalta Corporation (Newalta) has jointly applied to the North Dakota Industrial Commission and the Environmental Protection Agency for a Class II Underground Injection Control permit for the injection of oilfield brine into the Inyan Kara formation of the Dakota Group (Lower Cretaceous) in the proposed New Town SWD #1, located 2296' FNL, 1140' FEL (SENE) Sec 17, Township 152 North, Range 91 West in Mountrail County, North Dakota. The well is located on private property within the boundary of the Fort Berthold Reservation.

The New Town SWD #1 well will dispose of produced Bakken and Three Forks formation waters from Mountrail County and surrounding counties. The majority of the water will be pipelined to the SWD, with the remaining water trucked. This SWD is necessary to remove as many trucks as possible from the roads to prevent pollution and simultaneously increase road safety. Newalta's goal is to pipe as much water as possible to the New Town SWD #1 well, minimizing water trucks and hauling traffic.

Newalta is requesting an aquifer exemption for the Inyan Kara formation (Dakota Group) in this area for the following reasons:

1. The exempted aquifer does not currently serve as a source of drinking water.
2. The exempted aquifer has a total dissolved solids content more than 3,000 and less than 10,000 milligrams per liter (PPM) total dissolved solids (TDS) and is not expected to supply a public water supply system, and
3. The exempted aquifer cannot now, and will not in the future, serve as a source of drinking water because it is situated at a depth or location which makes recovery of water for drinking purposes economically or technologically impractical.

Exemption Justification

North Dakota Industrial Commission Order #3062 (Attached) granted an exempted aquifer status for the Inyan Kara formation (Dakota Group), as provided under Section 43-02-05-03 of the North Dakota Administrative code for areas surrounding and adjacent to the proposed New Town SWD #1, but excluded areas beneath the Fort Berthold Indian Reservation.

The Inyan Kara formation (Dakota Group) is not currently being used as a source of drinking water and is not expected to supply a public water system, because higher water quality and shallower depth of the glacial drift and aquifers of Tertiary and Upper Cretacious age. Current primary sources of drinking water in the vicinity of the New Town SWD #1 well include the New Town Aquifer and Lake Sakakawea. Water quality of the Inyan Kara (Dakota Group) aquifer in

the proposed area ranges from 4,000 to 10,000 mg/l, making it unsuitable for human consumption.

The Cretaceous Inyan Kara is commonly utilized in North Dakota as an injection interval for Class II fluids, including produced water from the Bakken and Three Forks formations and has been used successfully in the state since the 1950s. Water quality of the Inyan Kara (Dakota Group) aquifer ranges from 4,000 to 10,000 mg/l, falling within the regulatory range of 3,000 to 10,000 mg/l for an aquifer exemption.

The Inyan Kara formation in the area of the New Town SWD #1 occurs at a depth of approximately 4,777-5,762', making it economically impractical for the recovery of drinking water.

BEFORE THE INDUSTRIAL COMMISSION

OF THE STATE OF NORTH DAKOTA

Mountrail county not included

CASE NO. 2717
ORDER NO. 3062

IN THE MATTER OF A HEARING CALLED ON A MOTION OF THE COMMISSION TO CONSIDER THE DAKOTA FORMATION FOR "EXEMPTED AQUIFER STATUS" IN RENVILLE COUNTY AND PARTS OF BOTTINEAU, WARD, MCHENRY, MERCER, MCLEAN, OLIVER, STARK, MORTON, HETTINGER, GRANT, AND ADAMS COUNTIES, NORTH DAKOTA, AS PROVIDED IN THE SAFE DRINKING WATER ACT.

ORDER OF THE COMMISSION

BY THE COMMISSION:

Pursuant to legal notice this cause came on for hearing at 2:00 p.m. on the 2nd day of February, 1983, in Bismarck, North Dakota, before an examiner appointed by the Industrial Commission of North Dakota, hereinafter referred to as the "Commission."

NOW, on this 23rd day of February, 1983, the Commission, a quorum being present, having considered the testimony adduced and the exhibits received at said hearing, and being fully advised in the premises,

FINDS:

(1) That due public notice having been given as required by law, the Commission has jurisdiction of this cause and the subject matter thereof.

(2) That the Commission is requesting an exempted aquifer status for the Dakota aquifer under lands defined in this order, as provided in the Safe Drinking Water Act and Section 43-02-05-03 of the North Dakota Administrative Code.

(3) That the Dakota aquifer does not currently serve as a source of drinking water in the proposed exempted area.

(4) That the Dakota aquifer ranges from a depth of 2,000 feet to 5,000 feet in the proposed exempted area, economically impractical for the recovery of drinking water.

TOWNSHIP 132 NORTH, RANGE 91-94 WEST, TOWNSHIP 131 NORTH, RANGE 91-94 WEST,

TOWNSHIP 130 NORTH, RANGE 91-94 WEST, TOWNSHIP 129 NORTH, RANGE 91-94 WEST,

(2) That this order shall remain in full force and effect until further order of the Commission.

Dated this 23rd day of February, 1983.

INDUSTRIAL COMMISSION
STATE OF NORTH DAKOTA

/s/ Allen I. Olson, Governor

/s/ , Attorney General

/s/ Kent Jones, Commissioner of Agriculture

table with samples that match up this map location

the proposed area ranges from 4,000 to 10,000 mg/l, making it unsuitable for human consumption.

The Cretaceous Inyan Kara is commonly utilized in North Dakota as an injection interval for Class II fluids, including produced water from the Bakken and Three Forks formations and has been used successfully in the state since the 1950s. Water quality of the Inyan Kara (Dakota Group) aquifer ranges from 4,000 to 10,000 mg/l, falling within the regulatory range of 3,000 to 10,000 mg/l for an aquifer exemption.

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The Inyan Kara formation in the area of the New Town SWD #1 occurs at a depth of approximately 4,777-5,762', making it economically impractical for the recovery of drinking water.