Confidential - Ohio Uniform Trade Secret Act

APPLICATION TO OPERATE A FACILITY

OHIO DEPARTMENT OF NATURAL RESOURCES
DIVISION OF OIL AND GAS RESOURCES MANAGEMENT
2045 MORSE ROAD, BUILDING F-2
COLUMBUS, OHIO 43229-6693
(614) 265-6922

RECEIVED
JUL 09 2014
Division of Oil and Gas Resources Management

1. Name of Applicant: Chevron Appalachia, LLC Phone #: 412-604-6659
Address: 800 Mountain View Drive. Smithfield, PA 15478
Date: 7/2/14 eMail Address: ryork@chevron.com
For an Order or a Permit to Operate: ☒ Existing Facility ☐ New Facility

RECEIVED
SEP 24 2014
Division of Oil and Gas Resources Management

2. PURPOSE OF FACILITY: (Check all that Apply) ☒ Storage ☒ Recycling ☒ Treatment ☒ Processing ☐ Disposal

3. TYPE OF MATERIAL:
☒ Brine ☐ Drill Cuttings
☐ Drilling Mud ☐ Other Waste Substance (explain)

4. If a Business Entity, list the statutory agent and include a certified copy of their appointment:
Name:
Address:

5. Engineer of Record:
Name: Randall G. York, P.E., BCEE
Address: 600 Corporate Center Drive, Room 3173, Moon Township, PA 15108
Ohio Professional Engineering License Number: E-66278

6. Address of Facility:
Address: Wagner Well Pad, 29565 Cadiz-Dennison Road, Dennison, OH 44621
County: Harrison
Township: Monroe
Municipal Corporation:
Latitude: 40.388389
Longitude: -81.261169

7. Write a brief description of the facility and operations:
Water will be treated on site for use in drilling and completion operations (see section 2.5 of the attachment for a list of of water types). Water will be stored in onsite tanks. See attachments for additional process detail.

8. Include all information as set forth in the "*Guidelines for Application for Chief's Order*". Attach Additional Documents

I, the undersigned, being first duly sworn, depose and state under penalties of law, that I am authorized to make this application, that this application was prepared by me or under my supervision and direction, and that the facts stated herein are true, correct, and complete, to the best of my knowledge.

I certify that the facility will comply with or is currently in compliance with all provisions of Chapter 1509 ORC, Chapter 1501 OAC, and all terms and conditions of orders and permits issued by the Chief, Division of Oil and Gas Resources Management.

Signature of Authorized Agent

Name (Type or Print) BRANDEN WILMER Title CONSTRUCTION PERMITTING TEAM LEAD

Sworn to and subscribed before me this the 3 day of July, 2014.

COMMONWEALTH OF PENNSYLVANIA
NOTARIAL SEAL
THOMAS BASINGER
Notary Public
CONNELLSVILLE CITY, FAYETTE CNTY
My Commission Expires Sep 24, 2017

Thomas Basinger
(Notary Public)

9/24/2017
(Date Commission Expires)

DNR 1509.22 (12/2013)

9/24/14
~~7/3/14~~

Application to Operate a Facility Ohio
Department of Natural Resources
Chevron Appalachia,LLC
Wagner Well Pad

ATIACHMENTS:

1. Facility Map
2. Detailed Process Description
   - 2.1. General Process Flow Schematic
   - 2.2. Overall and Individual Unit Design Flows and Storage Capacities
   - 2.3. Chemical Reagents
     - 2.3.1.Function of each Reagent
     - 2.3.2.MSDS for each Reagent
   - 2.4. Estimated Volume of Materials to be Managed (Daily, Monthly, Annually)
   - 2.5. Methods of documenting the type and volume of materials...
     - 2.5.1.Received
     - 2.5.2.Reused
     - 2.5.3.Disposition of Materials from the Facility

NOTICE: This application contains proprietary, confidential and trade secret information from which Chevron Appalachia, IIC derives actual and potential independent economic value and, therefore, should be provided all such protections afforded by Ohio's Uniform Trade Secret Act and any other applicable law.

Application to Operate A Facility–Wagner Well Pad
Chevron Appalachia,LLC

Revised 9/24/14

1. Facility Map

See Erosion & Sediment Control Plan Phase II with Aerial,rev. 05/17/2013,Navitus Engineering Inc.

See Wagner Unit Emergency Map Package, 05/24/13

2. Detailed Process Description

Wellpad activities include drilling and completions. The complement of equipment on the pad varies for each of the phases. Chevron Dyna tanks will be installed at the pad for temporary water management during the completions activities. The tanks are used for the storage and treatment of any unused water from the wells on this pad untilsuch water is taken to disposal or transported for reuse to hydraulically fracture subsequent wells on additionallocations. Following completion of all hydraulic fracturing and treatment activities,the tanks are cleaned,dismantled and removed from the well pad.

Tanks are constructed with four bolted rings that consist of six welded panels for each ring. The bottom two rings are 5/16" X 8' epoxy coated carbon steel and the top two rings are *W* X 10' epoxy coated carbon steel built to AWWA 0103-09 specifications. The tanks are designed to store fresh-reuse and flow back fluids having a capacity of one million gallons each. Tanks on active sites are monitored daily and tanks on inactive sites are monitored weekly by trained Comtech personnel who visually inspect for leaks with regards to seams/plumbing or breech of containment on all Chevron locations where Dyna tanks are built. Hydrotesting of the constructed tanks is described in the attached "Triton Tank, Hydro Testing Procedures"

Water treatment will be provided by a contractor's mobile,trailer mounted unit that will be brought to the location and used to treat water for reuse. The tank contents are circulated through the treatment unit untilthe desired chemistry is obtained. The treatment unit is removed from the location when the next pad is assigned and following treatment of the tank contents.

Reuse water will be circulated at rate not to exceed *5,000* gallons per minute using fused and/or bolted/flanged HDPE pipe and dripless fittings. Approximately up to 200ppm of Hydrogen Peroxide will be used in the treatment process.Up to 30 ppm of Hydrochloric Acid or up to 600 ppm of Sodium Hydroxide may be used to adjust the pH. Approximately 0-500ppm of Polyaluminum hydroxychloride coagulant will be added. One or more of the above chemicals may be needed in the process based on testing the day before.

Currently Chevron is using 130 mill New Pig material for all Dyna tank containment with 4' berms around the entire perimeter. Containment volume will meet or exceed the 110% requirement.

For the tank foundation, soil borings were taken in the tank pad area as part of the geotechnical investigation and incorporated into the design recommendations for tank settlement and bearing capacity requirements. Per the recommendations a geotextile fabric was placed on the subgrade and approximately 3.5' of aggregate was placed, in lifts, until finished grade was achieved.

2.1 General Process Flow Schematics:

See Figures 1-2.

2.2 Overall and Individual Unit Design Flows and Storage Capacities

See Figure 1 and Detailed Process Description for design flows and storage capacities for the mobile treatment unit.

2.3 Chemical Reagents and MSDS

Sodium Hydroxide solution, pH adjustment

Hydrochloric Acid, pH adjustment

Hydrogen Peroxide, oxidizer

Polyaluminum hydroxychloride solution, coagulant

See Attachments for MSDS.

2.4 Estimated Volume of Materials to be Managed (Daily, Monthly, Annually)

The current plan is to drill and complete 2 wells on the Wagner pad. Operations are temporary and are dependent upon the drilling schedule. Re-use water will be brought in from other sites and blended with fresh water during the hydraulic fracturing of the wells on the Wagner pad. Typically 5-7 million gallons is required on each well for fracturing. Upon the end of hydraulic fracturing operations, the wells will be flowed back and that flowback water will be stored in onsite tanks. The flowback water will then be treated on site. Treatment at this location, from the initial flowback, will consist of approximately 5%-10% of the volume of water pumped during the hydraulic fracturing of the wells. Treated flowback from this location will be hauled to other sites for reuse or hauled to disposal.

2.5 Methods of documenting the type and volume of materials received and reused as well as the disposition of materials from the Facility

That water is tracked through Chevron's internal invoice and manifest systems which utilize ARIBA and Essential Suites.

Any sludge waste generated from the reuse/treatment operations is sent to landfills that are permitted to accept such wastes. Residual waste is tested for parameters that may be required by Ohio landfills. Parameters are examined and if the NORM levels are above Ohio requirements, waste will be sent to Pennsylvania, or other licensed facilities that can accept these waste-streams.

Water to be treated for reuse under this application includes the following:

- Drilling orTophole Water
- Flowback
- Freshwater
- Surface water e.g.,water collected in secondary containment
- Production Brine

Figure 1. Trailer System Comtech-Chevron P&ID

Figure 1. Trailer System Comtech - Chevron P&ID

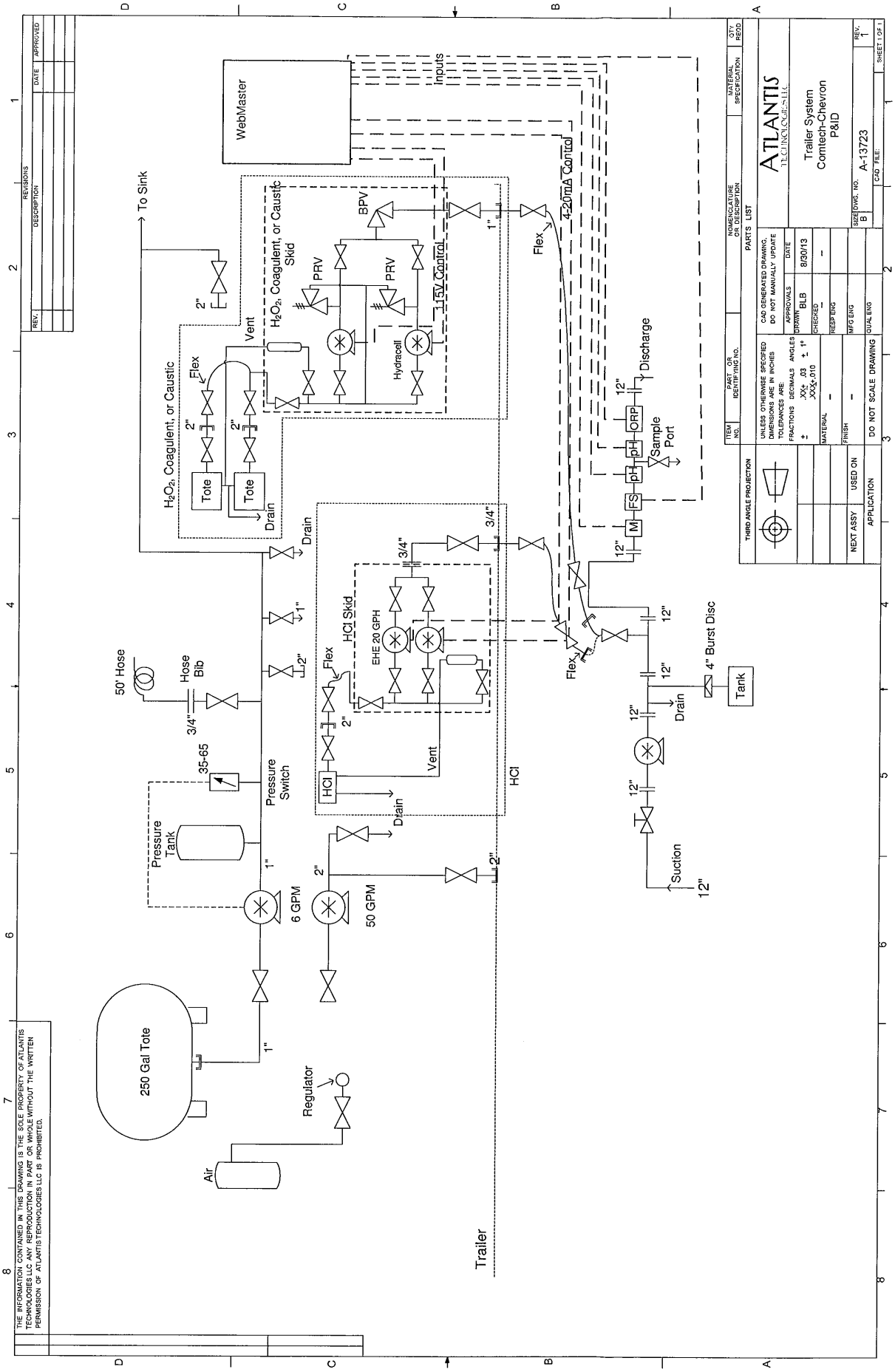
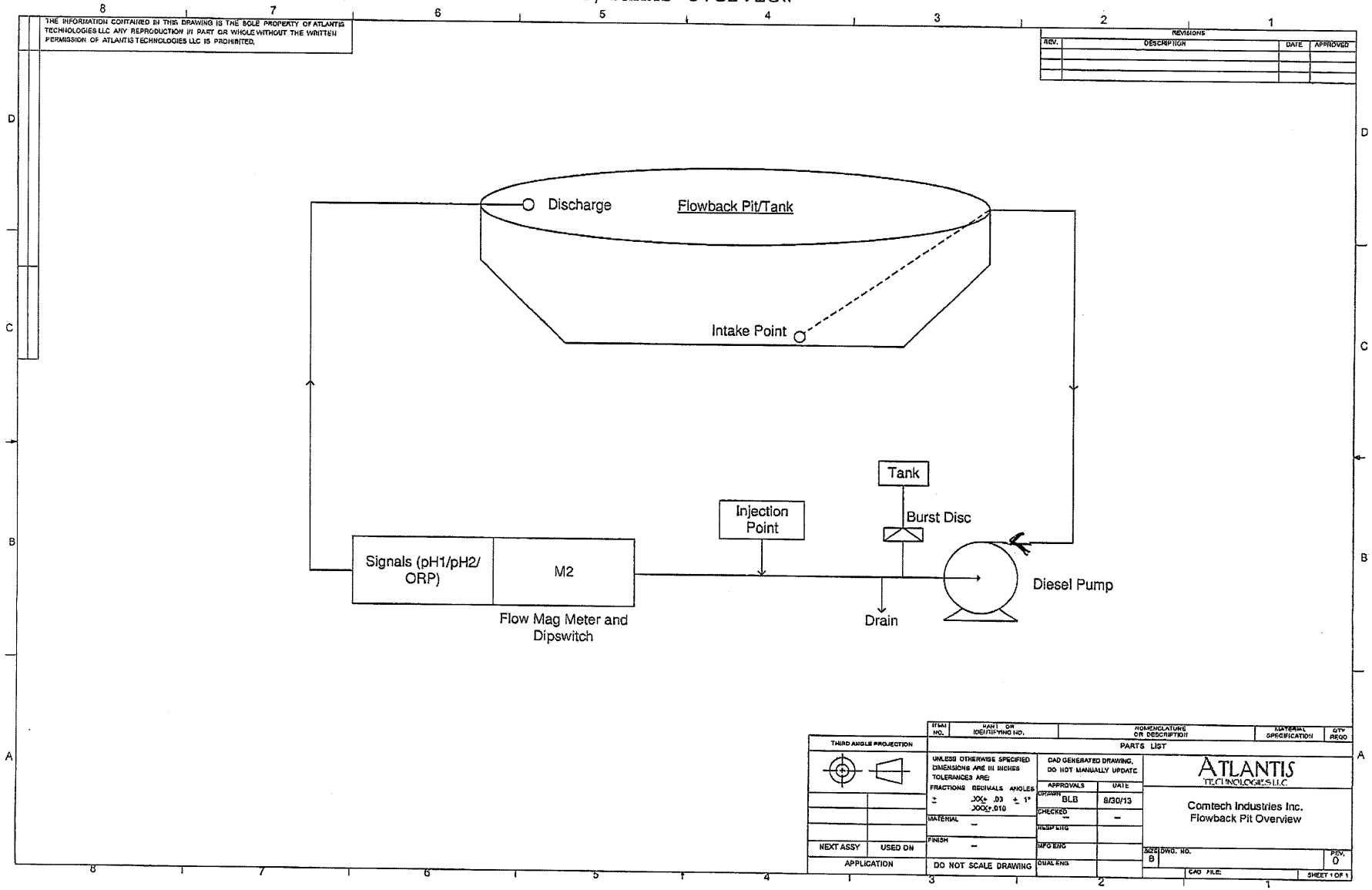


Figure 2. Comtech Industries, Inc. Flowback Pit/Tanks Overview

Figure 2. Comtech Industries, Inc. Flowback Pit/Tanks Overview



REVISIONS

REV.	DESCRIPTION	DATE	APPROVED

PARTS LIST

ITEM NO.	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	MATERIAL SPECIFICATION	QTY REQD

THIRD ANGLE PROJECTION

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ARE:
FRACTIONS ± DECIMALS .XX± .03 ANGLES ± 1°
.XXX± .010
MATERIAL —
FINISH —

NEXT ASSY | USED ON
APPLICATION

DO NOT SCALE DRAWING

CAD GENERATED DRAWING, DO NOT MANUALLY UPDATE

APPROVALS	DATE
DRAWN BLB	8/30/13
CHECKED —	—
ENG APPR.	
MFG ENG	
QUAL ENG	

ATLANTIS TECHNOLOGIES LLC

Comtech Industries Inc.
Flowback Pit Overview

SIZE B | DWG. NO. | REV. 0
CAD FILE:
SHEET 1 OF 1

FACILITY MAP & WAGNER PAD EMERGENCY DIRECTIONS

EMERGENCY DIRECTIONS

FOR

WAGNER UNIT

#1H #2H, #3H
UTCA # 34-067-0000

29565 Cadiz-Dennison Road
MONROE TOWNSHIP, OH

Access Point - [40.388389°N, 81.261169°W]
Well Site - [40.387586°N, 81.262106°W]

FOR ATTACHED MAP & WRITTEN DIRECTIONS:

- The attached map and directions can be used in case of emergency.
- Addresses and coordinates for the well site are given at the top of the written directions.
- Driving directions, longitude and latitude coordinates, addresses and phone numbers for emergency services are listed on Side 1.
- Each colored route on the attached map corresponds to the color of the headings in the written directions.
- Coordinates and directions for local predetermined STAT MedEvac helicopter landing zones are given.
- For Non-Emergencies, contact AXIOM Medical for consultation at 877-502-9466

May 24, 2013

Wagner Unit

#1H, #2H, #3H
UTCA# 34-067-0000
29565 Cadiz-Dennison Road
Monroe Township, Harrison County
(40.387586°N, 81.262106°W)

HARRISON COUNTY 911 CENTER
Phone: 740-942-2197

For EMERGENCIES:

TRINITY HOSPITAL TWIN CITY (5.5 mi)
(40.401458°N, 81.335990°W)
819 North First Street
Dennison, OH 44621
Phone: (740)-922-2800

To Hospital:
1. Head **north** on **US-250 W/** Cadiz-Dennison Rd toward Dempster Rd, Continue to follow US-250 W *(4.6 mi)*
2. Turn right onto **OH-800 N/ US-250 W** *(0.4 mi)*
3. Take the exit toward **Dennison** *(0.1 mi)*
4. Turn left onto **N 2nd Street** Extended SE *(387 ft)*
5. Continue onto **N 2nd St** *(0.1 mi)*
6. Turn right onto **Fuhr St** *(338 ft)*
7. Take the 1st left onto **N 1st St** *(210 ft)*

From Hospital to Well:
1. Head **north** on **N 1st St** toward Fuhr St *(210 ft)*
2. Take the 1st right onto **Fuhr St** *(338 ft)*
3. Take the 1st left onto **N 2nd St** *(0.1 mi)*
4. Turn right to merge onto **OH-800 S/ US-250 E** *(0.5 mi)*
5. Turn left onto **US-250 E** *(4.6 mi)*

HARRISON COUNTY SHERIFF'S OFFICE (17.8 mi)
(40.273010°N, 80.997992°W)
114 Court Street
Cadiz, OH 43907
Phone: (740)-942-2197

From Police Station to Well:
1. Head **southwest** on **Court St** toward S Main St *(308 ft)*
2. Turn right onto **S Main St** *(246 ft)*
3. Take the 1st right onto **W Warren St** *(0.3 mi)*
4. Slight left onto **Deersville Ave** *(0.6 mi)*
5. Turn right onto **US-250 W/ Cadiz-Dennison Rd** *(16.7 mi)*

MEDFLIGHT 8 (11.9 mi)
(40.470190°N, 81.416572°W)
1860 East High Avenue
New Philadelphia, OH 44663
Phone: (877)-633-9825 (TOLL-FREE)

From Well to Heliport:
1. Head **north** on **US-250 W/** Cadiz-Dennison Rd toward Dempster Rd, Continue to follow **US-250 W** *(4.6 mi)*
2. Turn right onto **OH-800 N/ US-250 W** *(1.1 mi)*
3. Slight right onto the **US-250 W/ OH-800 N** ramp to Uhrichsville/ New Philadelphia *(0.2 mi)*
4. Turn right onto **OH-800 N/ US-250 W** *(4.7 mi)*
5. Take the **OH-259** exit toward **US-250/ Schoenbrunn/** New Philadelphia *(0.2 mi)*
6. Turn left onto **OH-259 N/ E High Ave** *(1.1 mi)*

For NON-EMERGENCIES:
First call **AXIOM Medical** for consultation, **877-502-9466**

Mercy Health Care Center of Tuscarawas County-Statcare (16.1 mi)
(40.492807°N, 81.464750°W)
1031 West High Avenue
New Philadelphia, OH 44663
Phone: (330)-365-5100

To Clinic:
1. Head **north** on **US-250 W/Cadiz-Dennison Rd** toward Dempster Rd *(4.7 mi)*
2. Turn right onto **OH-800 N/US-250 W** *(1.1 mi)*
3. Slight right onto the **US-250 W/OH-800 N** ramp to **Uhrichsville/New Philadelphia** *(0.2 mi)*
4. Turn right onto **OH-800 N/US-250 W** *(9.2 mi)*
5. Take the **OH-39 E** exit toward **I-77 S/Marietta/New Philadelphia** *(0.3 mi)*
6. Turn right onto **OH-39 E/W High Ave** *(0.7 mi)*

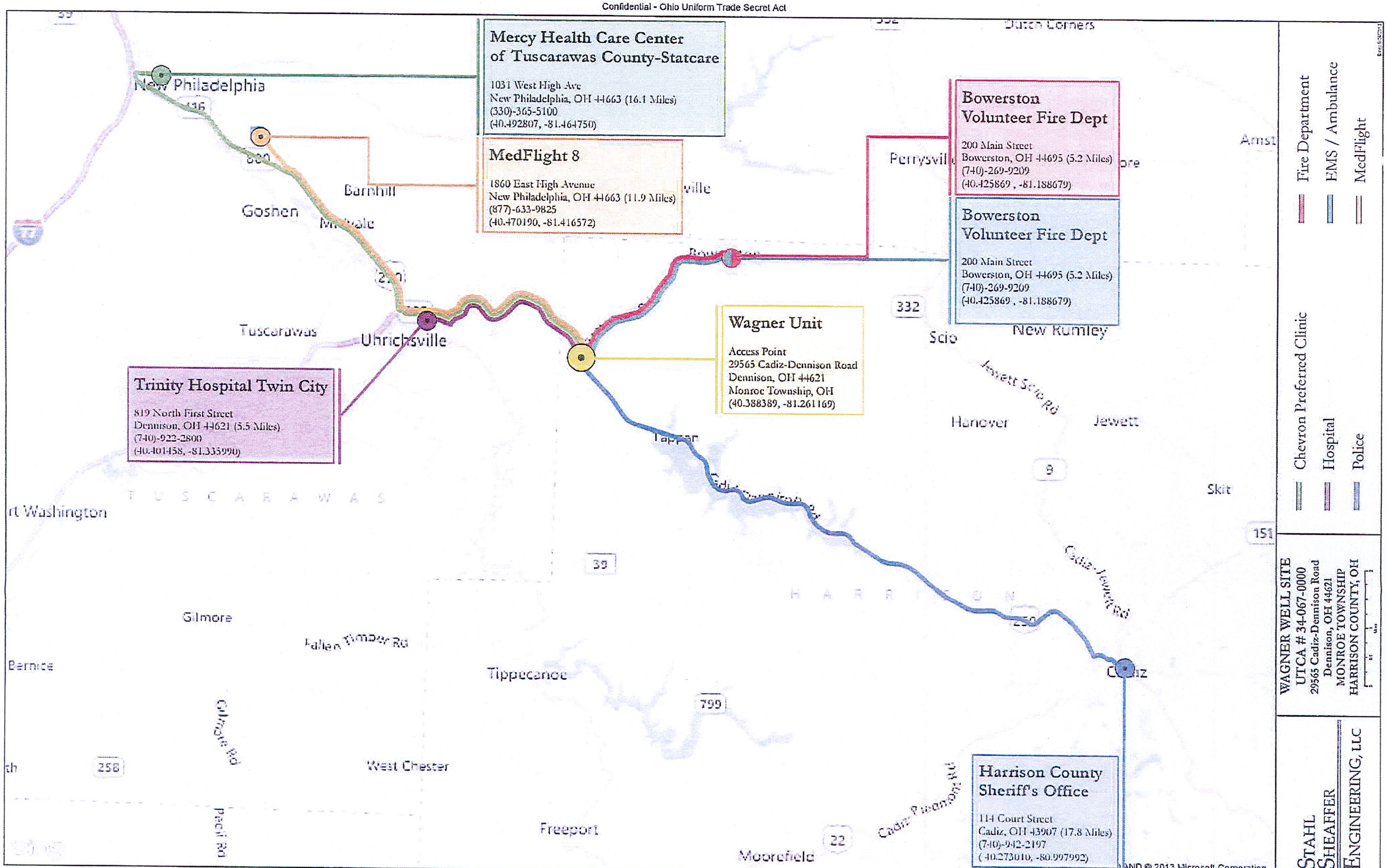
From Clinic to Well:
1. Head **west** on **OH-39 W/W High Ave** toward **11th St NW/Maple Ave NW** *(.8 mi)*
2. Turn left onto the **I-77 S/US-250 E** ramp to **Uhrichsville/Marietta** *(292ft)*
3. Keep left at the fork, follow signs for **US 250 E** and merge onto **US-250 E** *(9.6 mi)*
4. Take the **US-250 E/OH-800 S** exit toward **Cadiz-Dennison** *(0.2mi)*
5. Merge onto **US-36 E** *(289 ft)*
6. Continue onto **OH-800 S/US-250 E** *(1.3 mi)*
7. Turn left onto **US-250 E** *(4.7 mi)*

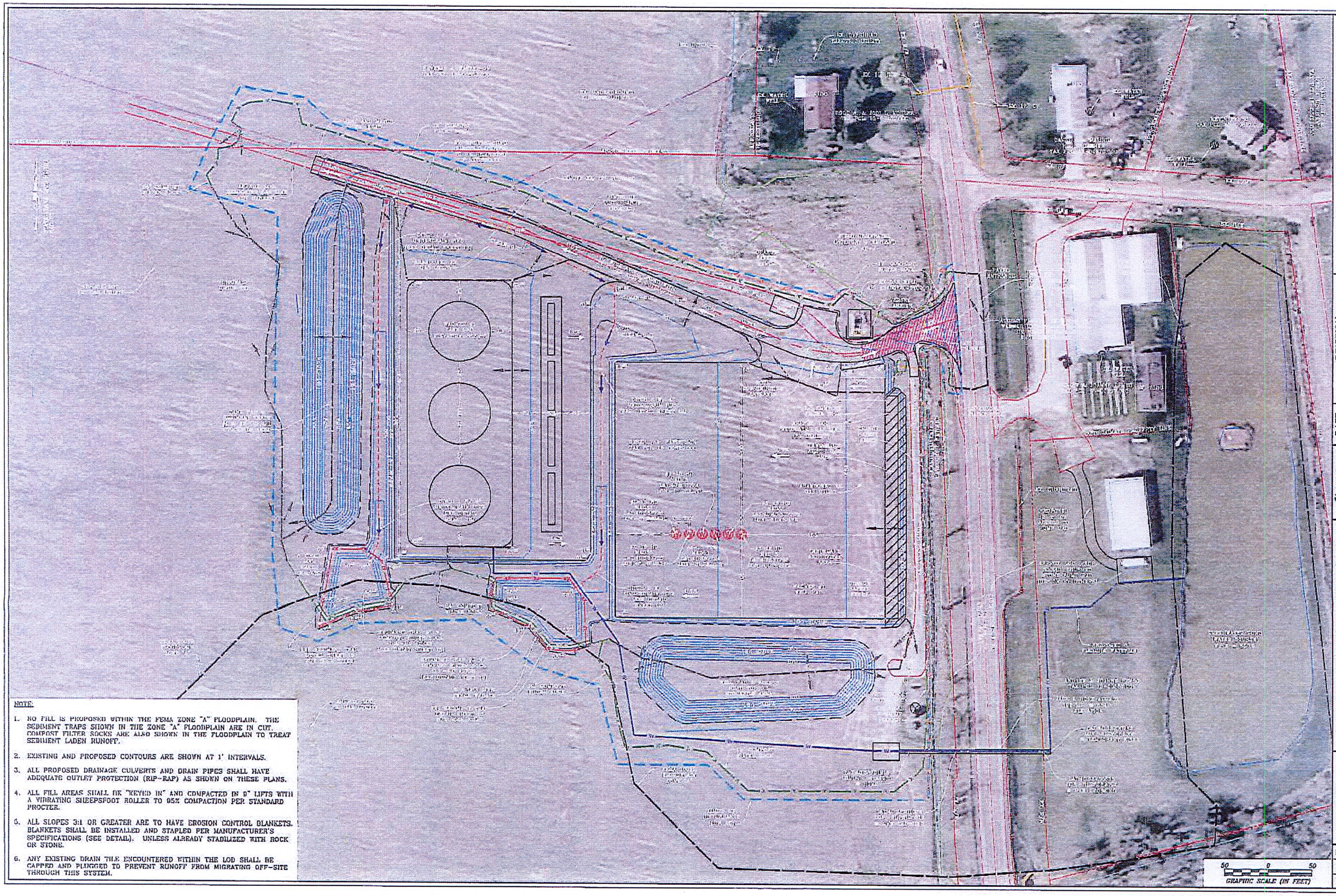
BOWERSTON VOL FIRE DEPT (5.2 mi)
(40.425869 °N, 81.188679 °W)
200 Main Street
Bowerston, OH 44695
Phone: (740)-269-9209

From Fire Department to Well:
1. Head **northwest** on **Main St** toward Grant St *(0.3 mi)*
2. Turn left onto **OH-151 W/** Boyce Dr
   Continue to follow **OH-151 W** *(4.8 mi)*
3. Turn left onto **US-250 E/ Cadiz-Dennison Rd** *(0.2 mi)*

BOWERSTOWN VOL FIRE DEPT – AMBULANCE SERVICE (5.2 mi)
(40.425869 °N, 81.188679 °W)
200 Main Street
Bowerston, OH 44695
Phone: (740)-269-9209

From EMS to Well:
1. Head **northwest** on **Main St** toward Grant St *(0.3 mi)*
2. Turn left onto **OH-151 W/** Boyce Dr
   Continue to follow **OH-151 W** *(4.8 mi)*
3. Turn left onto **US-250 E/ Cadiz-Dennison Rd** *(0.2 mi)*


Mercy Health Care Center of Tuscarawas County-Statcare
1031 West High Ave
New Philadelphia, OH 44663 (16.1 Miles)
(330)-365-5100
(40.492807, -81.464750)
MedFlight 8
1860 East High Avenue
New Philadelphia, OH 44663 (11.9 Miles)
(877)-633-9825
(40.470190, -81.416572)
Bowerston Volunteer Fire Dept
200 Main Street
Bowerston, OH 44695 (5.2 Miles)
(740)-269-9209
(40.425869 , -81.188679)
Bowerston Volunteer Fire Dept
200 Main Street
Bowerston, OH 44695 (5.2 Miles)
(740)-269-9209
(40.425869 , -81.188679)
Wagner Unit
Access Point
29565 Cadiz-Dennison Road
Dennison, OH 44621
Monroe Township, OH
(40.388389, -81.261169)
Trinity Hospital Twin City
819 North First Street
Dennison, OH 44621 (5.5 Miles)
(740)-922-2800
(40.401458, -81.335990)
Harrison County Sheriff's Office
114 Court Street
Cadiz, OH 43907 (17.8 Miles)
(740)-942-2197
(40.273010, -80.997992)
New Philadelphia
Goshen
Barnhill
Tuscarawas
Uhrichsville
Perrysvil
Scio
New Rumley
Jewett Scio Rd
Hanover
Jewett
Skit
Amst
Tappan
Cadiz-Jewett Rd
Cadiz
T U S C A R A W A S
H A R R I S O N
rt Washington
Gilmore
Fallen Timber Rd
Tippecanoe
Bernice
Gilmore Rd
West Chester
Freeport
Moorefield
Cadiz-Piedmont Rd
Pecil Rd
332
39
9
151
799
258
22
Fire Department
EMS / Ambulance
MedFlight
Chevron Preferred Clinic
Hospital
Police
WAGNER WELL SITE
UTCA # 34-067-0000
29565 Cadiz-Dennison Road
Dennison, OH 44621
MONROE TOWNSHIP
HARRISON COUNTY, OH
STAHL SHEAFFER ENGINEERING, LLC
AND © 2013 Microsoft Corporation



NOTE:

1. NO FILL IS PROPOSED WITHIN THE FEMA ZONE "A" FLOODPLAIN. THE SEDIMENT TRAPS SHOWN IN THE ZONE "A" FLOODPLAIN ARE IN CUT. COMPOST FILTER SOCKS ARE ALSO SHOWN IN THE FLOODPLAIN TO TREAT SEDIMENT LADEN RUNOFF.
2. EXISTING AND PROPOSED CONTOURS ARE SHOWN AT 1' INTERVALS.
3. ALL PROPOSED DRAINAGE CULVERTS AND DRAIN PIPES SHALL HAVE ADEQUATE OUTLET PROTECTION (RIP-RAP) AS SHOWN ON THESE PLANS.
4. ALL FILL AREAS SHALL BE "KEYED IN" AND COMPACTED IN 8" LIFTS WITH A VIBRATING SHEEPSFOOT ROLLER TO 95% COMPACTION PER STANDARD PROCTER.
5. ALL SLOPES 3:1 OR GREATER ARE TO HAVE EROSION CONTROL BLANKETS. BLANKETS SHALL BE INSTALLED AND STAPLED PER MANUFACTURER'S SPECIFICATIONS (SEE DETAIL). UNLESS ALREADY STABILIZED WITH ROCK OR STONE.
6. ANY EXISTING DRAIN TILE ENCOUNTERED WITHIN THE LOD SHALL BE CAPPED AND PLUGGED TO PREVENT RUNOFF FROM MIGRATING OFF-SITE THROUGH THIS SYSTEM.

NAVITUS ENGINEERING INC.

Engineering – Survey – Environmental – GIS

DATE	REVISION
04/10/2013	REVISED PER CHEVRON'S COMMENTS
05/16/2013	REVISED PER IMPORTED SOIL
05/17/2013	REVISED PER ATLAS GAS LINE RELOCATION

Chevron

THIS DOCUMENT WAS PREPARED FOR: CHEVRON APPALACHIA LLC

EROSION & SEDIMENT CONTROL PLAN
PHASE II WITH AERIAL

WAGNER PAD

MONROE TOWNSHIP
HARRISON COUNTY, OHIO

STATE OF OHIO — MARK DOUGLAS SMITH — E-78151 — REGISTERED PROFESSIONAL ENGINEER

DATE: 04/05/2013
SCALE: 1"=50'
SHEET 6

MATERIAL SAFETY DATA SHEETS

KA Steel CHEMICALS INC.
15185 Main Street
Lemont, IL 60439

Material Safety Data Sheet
Sodium Hydroxide Solution
(Liquid Caustic Soda – all grades)

1. Product & Company Identification

Product Name: Sodium Hydroxide Solution
Synonym: 50 % Caustic Soda - Liquid
Chemical Formula: NaOh
Distributor: KA Steel Chemicals Inc.
15185 Main Street
Lemont, IL 60439
630-257-3900
Revision Date: April 14, 2009
CAS #: 1310-73-2
Emergency Numbers: CHEMTREC 1-800-424-9300
Product Information: KA Steel Chemicals 800-677-8335

3. Composition / Ingredients

COMPONENT	CAS#	CONCENTRATION
Sodium Hydroxide	1310-73-2	Approx. 50%
Sodium Chloride	7647-14-5	< 1 %
Water	7732-18-5	Balance

2. Hazard Identification

DANGER – VERY CORROSIVE LIQUID

Is chemical listed as a carcinogen or potential carcinogen? NTP- NO IARC – NO OSHA – NO

POTENTIAL HEALTH EFFECTS

Primary routes of exposure: Skin and eyes contact, inhalation, ingestion.

Inhalation: Breathing of mist may cause irritation of upper respiratory tract.

Ingestion: Ingestion of caustic soda liquid can cause perforation of the esophagus and stomach. Abdominal pain, nausea, vomiting and general gastro-intestinal upset can be expected.

Skin Contact: May cause severe chemical burns and tissue destruction.

Eye Contact: May cause severe and possible permanent damage.

4. First Aid Measures

Inhalation: Move person to fresh air. If breathing is difficult, give oxygen. Call a physician.

Eye contact: Immediately flush eyes with plenty of water for at least 15 minutes, while removing contaminated clothing and shoes. Hold eyelids open during this flushing with water. Do not attempt to neutralize with acidic solutions. Seek medical attention immediately, preferably from an Opthamologist.

Ingestion: If swallowed, give at least 3-4 glasses of water or milk. Do not induce vomiting. Do not give anything by mouth to an unconscious or convulsing person. Get medical attention.

Skin Contact: Immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Get medical attention immediately. Do no reuse clothing and shoes until cleaned. If skin feels slippery, caustic may still be present in sufficient quantities to cause rash or burn. Continue washing skin until slick feeling is gone. Do not apply oils or ointment unless ordered by the physician. Discard footwear which cannot be decontaminated. Discard leather articles such as shoes and belt.

K.Steel CHEMICALS INC
15185 Main Street
Lemont, IL 60439

Material Safety Data Sheet
Sodium Hydroxide Solution
(Liquid Caustic Soda – all grades)

5. Fire Fighting Information

Fire: Not Flammable. May react with some metals (ex. Aluminum, zinc, tin) to release flammable Hydrogen Gas.

Fire Extinguishing Media: Use extinguishing agents appropriate for surrounding fire.

6. Accidental Release Measures

Steps to be taken if material is spilled or released: Dike area to contain spill. Only trained and properly protected personnel should be involved in response actions. Reclaim and reuse spilled material if possible. Upon drying, it will leave a white residue if not neutralized and flushed down adequately. See Section 13 for disposal considerations.

7. Handling & Storage

Store and handle above freezing point only in containers suitably lined with or constructed of materials specified for this product. Keep separate from incompatibles. Vent tank away from work areas. Avoid mist or dust formation. Mixing with water will generate significant heat. Label all tanks, pipelines and offload connections.

8. Exposure Controls / Personal Protection

Ventilation Requirements: Local exhaust - to meet the exposure requirements and avoid creating mist or dust formation.

Personal Respirators: (NIOSH Approved) - Dust/mist respirators recommended for all personnel working in or about an area of potential mist exposure.

Exposure Limits -	OSHA PEL	ACGIH ceiling
	2mg / m^3	2mg / m^3

8. Exposure Controls / Personal Protection cont.

PPE Requirement: Should be based upon a hazard assessment. Recommendation for areas with splash potential:

Skin Protection Requirements: Wear impervious protective clothing; including boots; gloves; lab coat; apron or coveralls to prevent skin contact. Preferred Materials: Nitrile, Neoprene, PVC.

Eye Protection Requirements: Use chemical safety goggles and face shield impervious to product.

NOTE: ALL PROTECTIVE EQUIPMENT MUST CONFORM WITH 29 CFR 1910.132.

9. Physical & Chemical Properties

Appearance: Colorless to slightly grey solution

Vapor Pressure: 1.5 mm Hg. @ 68° F (20° C)

Specific Gravity: 1.53 @ 60° F

Density: 12.76 lbs/gal @ 60° F

Heat of Solution: Exothermic

Odor: Virtually Odorless

Boiling Point: 288° F (142° C)

Freeze Point: About 56° F

Solubility: Complete in water

pH of Solutions: Strongly Basic (14)

K.A. Steel CHEMICALS INC.
15185 Main Street
Lemont, IL 60439

Material Safety Data Sheet
Sodium Hydroxide Solution
(Liquid Caustic Soda – all grades)

10. Exposure Controls/ Personal Protection

Stability: Stable under ordinary conditions of use and storage.
Hazardous Decomposition Products: Reaction with various food sugars may form carbon monoxide.
Hazardous Polymerization: This substance does not polymerize.
Incompatibility: (Materials to Avoid): May react violently with water, acids and a number of organic compounds. Reacts rapidly with aluminum, tin and zinc. Also reacts with bronze and brass.

11. Toxicological Information

Sodium Hydroxide – Acute Toxicity
Oral – LD 50:140-340 mg / kg (Rat)
Dermal- LD 50: 1350 mg / kg (Rabbit)

12. Ecological Information

Material is moderately toxic to aquatic organisms on an acute basis. May increase pH of aquatic systems which may be toxic.

13. Disposal Consideration

DO NOT DUMP INTO ANY SEWERS, ON THE GROUND, OR INTO ANY BODY OF WATER. Reuse or reprocess if possible. All disposal practices must be in compliance with all Federal, State/Provincial and local laws and regulations. Regulations may vary in different locations. Waste characterization and compliance with applicable laws are the responsibility solely of the waste generator.

14. Department of Transportation Information

Name: Sodium Hydroxide Solution
Hazard Classification: 8
Identification Number: UN 1824
Packing Group: II
Label Required: CORROSIVE
Reportable Quantity: 2,000 Lbs (50% Caustic solution)

15. Regulatory Information

TSCA: Sodium Hydroxide is on the TSCA inventory under CAS. NO.1310-73-2.
OSHA: Listed as a "Hazardous Chemical" as defined in CFR 1910.1200 (Hazcom).
EUROPE EINECS: This product is listed on EINECS.
CANADA DSL: This product is listed on the Canadian DSL.
AUSTRALIA AIC: This product is listed on AICS
KOREA ECL: This product is listed on KECI.
JAPAN MITI (ENCS): This product is listed on ENCS.
CANADIAN REGULATIONS (WHMIS) – Class E Corrosive material
SARA TITLE III: SARA (311,312) HAZARD CLASS: Acute Health.
SARA (313) CHEMICALS: Not Listed
SARA Section 302: Not listed as an Extremely Hazardous Substance

16. Other Information

NFPA / HMIS Ratings:
Health – 3 Flammability – 0 Reactivity -1

The information contained herein is provided in good faith and is believed to be correct as of the date hereof. However, K.A. Steel Chemicals, Inc. makes no representation as to the comprehensiveness or accuracy of the information. It is expected that individuals receiving information will exercise their independent judgment in determining its appropriateness for a particular purpose. Accordingly, K.A. Steel Chemicals will not be responsible for damages of any kind resulting from the use of or reliance upon such information. No representation, or warranties, either express or implied, of merchantability fitness for a particular purpose or of any nature are made hereunder with respect to the with respect to the product to which the information refers.

SAL CHEMICAL

ISO Registered Company

Material Safety Data Sheet

WST 3481

Prod. #7021

Section 01 · Product and Company Identification

SAL Chemical Company
3036 Birch Drive
Weirton, WV 26062

Date Prepared: 08.24.2011
Revision Date: 03.31.2006
Control Number: 06.0331

For More Information Call:
304-748-8200
800-879-1725

Emergency Phone Number:
ChemTrec: 800-424-9300
24 Hours/Day—7 Days/Week

TRADE NAME:	WST 3481
PRODUCT DESCRIPTION:	Polyaluminum hydroxychloride solution
RECOMMENDED USE:	Water purification chemical

Section 02 · Ingredients

OSHA REGULATED COMPONENTS	PERCENT	CAS #	OSHA(PEL)/ACGIH(TLV)
Polyaluminum hydroxychloride solution	15-40%	1327-41-9	2mg/m3;2mg/m3

Section 03 · Hazards Identification

APPEARANCE & ODOR:	Clear, odorless amber colored liquid
WARNING STATEMENT:	Irritating to eyes, skin, respiratory and digestive tracts
EFFECTS OF EXPOSURE:	Inhalation of the mists can irritate mucous membranes and respiratory tract. Contact with this material may cause severe reddening and swelling. May irritate or burn the eyes. Can irritate the mouth, throat and stomach.

Section 04 · Physical Data

APPEARANCE:	Clear, amber colored liquid
ODOR:	Odorless
BOILING POINT:	234.5°F (112.5°C)
MELTING POINT:	14°F (-10°C)
VAPOR PRESSURE:	Not Applicable
SPECIFIC GRAVITY (WTR=1.0):	-1.3
VAPOR DENSITY(air-1.0):	Not Applicable
pH :	3.0-3.3
SOLUBILITY IN WATER:	100%
FLASH POINT:	None

As the result of our inspection(s), this certifies that the material identified above, blended by SAL Chemical Company, Inc., meets or exceeds all conformance standards listed above, and fully complies with the customer's order. In no way is this certificate intended to alter SAL Chemical's General Terms & Conditions of the parties' contract.

Section 05 · Fire and Explosion Data

EXTINGUISHING MEDIA:	Foam, dry chemical, carbon dioxide, water spray.
PROTECTIVE EQUIPMENT:	Wear self-contained breathing apparatus (SCBA) and full protective equipment.
SPECIAL HAZARDS:	Keep containers cool by spraying with water if exposed to fire. At elevated temperatures, irritating and corrosive hydrogen chloride vapors may be released.

Section 06 · Reactivity Data

STABILITY:	Stable under normal conditions of use and storage.
INCOMPATIBILITY:	Avoid prolonged contact with iron, galvanized iron, steel, aluminum, copper and zinc which are subject to corrosion.
HAZARDOUS DECOMPOSITION:	At high temperatures (e.g. fire conditions), hydrogen chloride vapor may be generated.
HAZARDOUS POLYMERIZATION:	Will not occur

Section 07 · First Aid

SWALLOWING (INGESTION):	DO NOT induce vomiting. Immediately give large quantities of water. Get medical attention immediately.
SKIN (DERMAL):	Flush with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Do not reuse clothing or shoes until cleaned. Seek medical attention.
EYE CONTACT:	Immediately flush eyes for 15 minutes with plenty of water. Seek medical attention immediately.
BREATHING (INHALATION):	Remove to fresh air. If breathing is difficult, administer oxygen. If not breathing, give artificial respiration. Obtain medical attention immediately

Section 08 · Employee Protection

ENGINEERING CONTROLS:	Use local exhaust to keep airborne concentrations below the permissible exposure limits.
RESPIRATORY PROTECTION:	A respiratory protection program that meets OSHA 1910.134 and ANSI Z88.2 or applicable federal/provincial requirements must be followed whenever workplace conditions warrant respirator use. NIOSH's "Respirator Decision Logic" may be useful in determining the suitability of various types of respirators.
EYE/FACE PROTECTION:	Wear chemical safety goggles or face shield to prevent eye contact. Do not wear contact lenses.
SKIN PROTECTION:	Wear appropriate personal protective clothing to prevent skin contact. If prolonged or repeated contact is anticipated, all clothing should be impervious to liquid.
ADDITIONAL ADVICE:	To identify additional Personal Protective Equipment (PPE) requirements, it is recommended that a hazard assessment in accordance with the OSHA PPE Standard (29CFR1910.132) be conducted before using this product. Eyewash and safety showers are recommended.

Section 09 · Spill and Disposal Data

SPILL : (See section 8 for recommended personal protective equipment.) Dike areas to contain spill. Neutralize spilled material with alkali such as soda ash. When using soda ash and other carbonates, carbon dioxide gas may be released. Take precautions to minimize hazards from release of carbon dioxide.
Note: Spills and releases may have to be reported to Federal and/or local authorities.

WASTE DISPOSAL: **RCRA**
Is the unused product a RCRA hazardous waste if discarded? Yes
If yes, the **RCRA ID number is D002**

OTHER DISPOSAL CONSIDERATIONS: None listed
The information offered in this section is for the product as shipped. Use and/or alterations to the product such as mixing with other materials may significantly change the characteristics of the unused material and alter the RCRA classification and the proper disposal method.

ECOLOGICAL INFORMATION: No data available

Section 10 · Storage and Handling Data

HANDLING: (See section 8 for recommended personal protective equipment.) Avoid contact with eyes, skin and clothing. Keep container closed when not in use. Avoid breathing vapor or mist. Remove contaminated clothing and wash thoroughly after handling.

STORAGE: Keep storage container tightly closed. Store in cool, well-ventilated area or cabinet. Isolate from incompatible substances. Store and ship in plastic or rubber-lined containers.

Section 11 · Transportation and Regulatory Information

HAZARD CLASS:	Not Regulated
PACKAGING GROUP:	Not Regulated
UN/ID NUMBER:	
INVENTORY STATUS:	All components of this product are on the TSCA Inventory of Chemical Substances.
SARA SECTION 311/HAZARDS:	Immediate
SARA 313/TOXIC CHEMICALS:	No ingredients listed in this section.

Section 12 · Additional Information

DISCLAIMER: The information contained within this Material Safety Data Sheet is for the specific material described only and may not be valid if the material is used in combination with any other materials or process. The user is responsible to determine the completeness of the information and suitability for the user's own particular use. To the knowledge and belief of Sal Chemical, the information is accurate and reliable as of the date indicated but Sal Chemical makes no express implied warranty of merchantability for the material or for the information.

SAL CHEMICAL

ISO Registered Company

Material Safety Data Sheet

PRODUCT

PROD# 5021-27-275GT
CTI-27%

Section 01 - Product and Company Identification

SAL Chemical Company
3036 Birch Drive
Weirton, WV 26062

Date Prepared: 09.22.11
Revision Date: 09.22.11

For More Information Call:
304-748-8200
800-879-1725

Emergency Phone Number:
ChemTrec: 800-424-9300
24 Hours/Day—7 Days/Week

TRADE NAME: HYDROGEN PEROXIDE 27%

Section 02 - Hazards Identification

EMERGENCY OVERVIEW: Oxidizing properties, irritating to skin and mucous membranes, harmful if swallowed, risk of serious damage to eyes.

ROUTES OF ENTRY: Eyes, Skin, Inhalation, Ingestion

EYE CONTACT: Severe eye irritation, redness, swelling of tissue, lachrymation. Risk of serious damage to eyes, may cause permanent eye damage, blindness.

SKIN CONTACT: Severe skin irritation, redness, swelling of tissue. Causes burns. In case of repeated contact: dry skin.

INHALATION: Inhalation of vapors is irritating to the respiratory system, may cause throat pain and cough. Breathing difficulties, nausea, vomiting. Inhaled corrosive substances can lead to toxic edema of the lungs. Repeated or prolonged exposure risk of sore throat, nose bleeds, and chronic bronchitis.

INGESTION: If ingested, severe burns of the mouth and throat, as well as danger of perforation of the esophagus and the stomach. Paleness, cyanosis of the face, risk of shock. Excessive fluid in the mouth and nose, with risk of suffocation. Risk of throat edema ansd suffocation. Nausea, bloody vomiting, cough, breathing difficulties, bloating of stomach, belching. Risk of chemical pneumonitis and pulmonary edema.

Section 03 - Composition of/Ingredients

INGREDIENT	PERCENT	CAS #
Hydrogen Peroxide	20-60%	7722-84-1
Water	balance	7732-18-5

As the result of our inspection(s), this certifies that the material identified above, blended by SAL Chemical Company, Inc., meets or exceeds all conformance standards listed above, and fully complies with the customer's order. In no way is this certificate intended to alter SAL Chemical's General Terms & Conditions of the parties' contract.

Section 04 · Physical Data

APPEARANCE:	Colorless, Liquid	**FREEZING POINT:**	-33°C(-27°F) (H_2O_2 35%)
ODOR:	Pungent		-52°C(-62°F) (H_2O_2 50%)
pH :	1-4	**RELATIVE DENSITY:**	1.1 (H_2O_2 27.5%)
BOILING POINT/RANGE:	108°C(226°F)-H_2O_2 35%)		1.2 (H_2O_2 50%)
	115°C(239°F)-H_2O_2 50%)		
VAPOR DENSITY:	1 (H_2O_2 50%)		
SOLUBILITY :	Water, polar organic solvents		
FLASH POINT:	This product is not flammable.		

Section 05 · Fire and Explosion Data

EXTINGUISHING MEDIA: Water, water spray.

FIRE FIGHTING METHODS: Evacuate personnel to safe areas. In event of fire, wear self-contained breathing apparatus. When intervention in close proximity wear acid resistant over suit. Clean contaminated surface thoroughly. Keep product and empty container away from heat and sources of ignition. Keep containers and surroundings cool with water spray, approach from upwind.

FIRE/EXPLOSION HAZARDS: Oxidizing agent, oxygen released in thermal decomposition may support combustion. Contact with combustible material may cause fire, contact with flammables may cause fire or explosion. Risk of explosion if heated under confinement.

HAZARDOUS COMBUSTION PRODUCTS: None noted.

Section 06 · Stability and Reactivity Data

STABILITY: Stable under recommended storage conditions with slow gas release, potential for exothermic hazard.

INCOMPATIBILITY: Contamination, to avoid thermal decomposition, do no overheat. Avoid acids, bases, metals, salts of metals, reducing agents, organic materials and flammable materials.

HAZARDOUS DECOMPOSITION: Oxygen, the release of other hazardous decomposition products is possible.

Section 07 · First Aid

EYE CONTACT: Immediately flush eyes for 15 minutes with plenty of water while holding eyelids open. In case of difficulty of opening the lids, administer an analgesic eye wash (oxybuprocaine). Consult with an opthalmolgist immediately in all cases.

SKIN (DERMAL): Take off contaminated clothing and shoes immediately. Remove and wash contaminated clothing before re-use. Wash off immediately with plenty of water. Keep warm . Call a physician immediately.

BREATHING (INHALATION): Remove to fresh air . Oxygen or artificial respiration if needed. Victim to lie down in the recovery position, cover , keep warm. Call a physician immediately.

SWALLOWING (INGESTION): Call a Physician immediately. Take victim to hospital. DO NOT induce vomiting unless directed to do so by a physician. Never give anything by mouth to an unconscious person. If swallowed, rinse mouth with water (only if person is conscious).

Section 08 · Exposure Controls/Employee Protection

ENGINEERING CONTROLS:	Maintain adequate ventilation. Apply technical measures to comply with occupational exposure limits.
EYE/FACE PROTECTION:	Wear chemical safety goggles while handling this product. Wear additional eye protection such as a face shield when the possibility exists for eye contact with splashing or spraying liquid or airborne material.
HAND/SKIN PROTECTION:	Protective gloves-impervious chemical resistant: PVC, rubber gloves. Protective suit, if splashes likely to occur wear apron, boots, suitable material, PVC, rubber products.
RESPIRATORY PROTECTION:	In case of emissions, face mask with appropriate cartridge. Self-contained breathing apparatus in medium confinement/insufficient oxygen/in case of large uncontrolled emissions/ in all circumstances when the mask and cartridge do not give adequate protection. Use only respiratory equipment that conforms to international/national standards.
OTHER PROTECTIVE EQUIPMENT:	Eye wash station, safety shower, protective clothing.
GENERAL HYGEINE CONDITIONS:	When using, do not eat, drink, or smoke. Handle in accordance with good industrial hygiene and safety practice.
PPE STATEMENT:	8.3

EXPOSURE LIMIT VALUES	**TLV®ACGIH®USA**	**OSHA PEL**
Hydrogen Peroxide	1 ppm TWA 1.4 mg/m³TWA	1 ppm TWA 1.4 mg/m³TWA

Section 09 · Accidental Release Measures

The National Transportation Safety Board (NTSB) and Federal Aviation Administration (FAA) have requested the following information be provided:
Combustible materials exposed to hydrogen peroxide should be immediately submerged in or rinsed with large amounts of water to ensure that all hydrogen peroxide is removed.
Residual hydrogen peroxide that is allowed to dry (upon evaporation hydrogen peroxide can concentrate) on organic materials such as paper, fabrics, cotton, leather, wood, or other combustibles can cause the material to ignite and result in fire.

PERSONAL PRECAUTIONS: Isolate the area, keep away from incompatible products, prevent further leakage or spillage if safe to do so, in case of contact with combustible material, keep material wet with plenty of water.

ENVIRONMENTAL PRECAUTIONS: Immediately inform the appropriate authorities, local, state, and/or federal, in case of reportable spill.

METHODS FOR CLEAN UP: Dam up, dilute with plenty of water, do not add chemical products, treat recovered material as described in the Section 10. Never return spills to original containers for re-use.

Section 10 · Disposal Data

WASTE DISPOSAL: Hydrogen Peroxide is not a listed hazardous waste under 40 CFR 261. Spilled product should be disposed of in an EPA approved disposal facility in accordance with applicable national, state and local environmental laws and regulations. To avoid treatment, use dedicated containers where possible. Rinse the empty containers and treat the effluent in the same way as waste. Consult current federal, state, and local regulations regarding the proper disposal of emptied containers.

RCRA HAZARDOUS WASTE: D001 (Ignitable) D002(Corrosive)

Section 11 · Handling and Storage

HANDLING:	Use only in well-ventilated areas. Keep away from heat, incompatible products. May not get in touch with organic materials. Use only equipment and materials which are compatible with the product. Before all operations, passivate the piping circuits and vessels according to the procedure recommended by the producer. Never return unused material to storage receptacle. Use only in area with adequate water supply.
STORAGE:	Store in a cool, well-ventilated area, away from heat and incompatible products. Keep away from combustible material. Store in a receptable that is vented, store in original container, keep container closed. Regularly check the condition and temperature of the containers.

Section 12 · Regulatory Information

TSCA INVENTORY:	Yes
SARA SECTION 302/303 HAZARDS:	Yes, >52% H_2O_2, reportable quantity-1,000 lbs, threshold planning quantity-1,000lbs.
SARA SECTION 311/312 HAZARDS:	Immediate (Acute): YES - Fire: YES , >52% H_2O_2, threshold planning quantity-500 lbs, < 52% H_2O_2, threshold planning quantity-10,000 lbs.
SARA SECTION 313 TOXIC CHEMICAL EMISSIONS REPORTING:	No
WHMIS CLASSIFICATION:	C-Oxidizing material, E-Corrosive, F-Dangerously reactive material
CANADIAN NSN REGISTRATION:	DSL, #6754

Section 13 · Transport Information

	DOT
UN NUMBER:	2014
CLASS:	5.1(8)
PROPER SHIPPING NAME:	Hydrogen Peroxide, aqueous solution
PACKING GROUP:	II
HAZARD LABEL:	Oxidizer(5.1), (Corrosive(8))
PLACARD:	Oxidizer(5.1), (Corrosive(8))
EMERGENCY INFORMATION:	ERG 140

Section 14 · Ecological Data

ACUTE TOXICITY:	Fishes, Pimephales, promelas, LC50,96H,16.4 mg/l;NOEC, 96h, 5 mg/l Crustaceans, EC50, 48h, 2.4 mg/l; NOEC, 48 h, 1 mg/l
CHRONIC TOXICITY:	Mollusks, NOEC, 56 days, 2 mg/l, Algae, Chlorella vulgaris, EC50, growth rate, 72 h, 4.3 mg/l; NOEC, 72 h, 0.1 mg/l
OTHER ADVERSE EFFECTS:	No date available
REMARKS:	Toxic to aquatic organism. Hazard to the environment is limited due to product properties: no toxicity of degradation products (H_2O and O_2), Inherently biodegradable, and does not bioaccumulate.

Section 15 · Toxicological Data

ACUTE ORAL TOXICITY:	LD50, rat, 1,232 mg/kg (H_2O_2 35%)
ACUTE INHALATION TOXICITY:	LC50, 4h, rat, 2.000 mg/m3 (hydrogen peroxide)
ACUTE DERMAL IRRITATION/CORROSION:	LD50, rabbit, > 2.000 mg/kg (H_2O_2 35%)
SKIN IRRITATION:	Rabbit, no skin irritation (H_2O_2 10%)
EYE IRRITATION:	Risk of serious damage to eyes. (H_2O_2 35%)
IRRITATION (other route):	Inhalation, mouse, irritating to respiratory system., RD50=665 mg/m³ (hydrogen peroxide)
SENSITIZATION:	Guinea pig, did not cause sensitization on laboratory animals.
CHRONIC TOXICITY:	**Oral**- prolonged exposure, various species, target organs: gastrointestinal tract, observed effect **Inhalation**– repeated exposure, dog, LOEL: 14.6 mg/m³, irritant effects.
CARCINOGENICITY:	**Oral**– prolonged exposure, mouse, target organs: duodenum, carcinogenic effects. **Dermal**– prolonged exposure, mouse, animal testing did not show any carcinogenic effects.

IARC (International Agency for Research on Cancer): 3-Not classifiable as to carcinogenicity to humans.

Section 16 · Other Data

HMIS RATING SYSTEM:	Health: 3 - Flammability: 0 - Reactivity: 1
NFPA RATING SYSTEM:	Health: 3 - Flammability: 0 - Reactivity: 0 - Special Hazard: OX

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SAL CHEMICAL

ISO Registered Company

Material Safety Data Sheet

Hydrochloric Acid 7-20%

PROD#

SECTION 01: PRODUCT AND COMPANY INFORMATION

SAL Chemical Company
3036 Birch Drive
Weirton, WV 26062

Date Prepared: 04.12.2011
Date Revised: 11.29.2011

For More Information Call:
304-748-8200
800-879-1725

Emergency Phone Number:
ChemTrec: 800-424-9300
24 Hours/Day – 7 Days/Week

Product Name: Hydrochloric Acid 7-20%
Chemical Family: Mineral Acid
Formula: HCL **CAS #:** 7647-01-0

SECTION 02: COMPOSITION

INGREDIENT	PERCENT	CAS NUMBER	PEL
Hydrochloric Acid (HCL)	7-20%	7647-01-0	OSHA 5 ppm
Water	Balance	7732-18-5	N/A

SECTION 03: HAZARDS IDENTIFICATION

APPEARANCE & ODOR: Clear to Yellowish Liquid/Sharp, pungent odor

EMERGENCY OVERVIEW: Hydrogen Chloride, both as a gas and in a solution as Hydrochloric Acid, is a corrosive substance and can cause severe and painful burns on contact with any part of the body or if taken internally. The mucous membranes of the eyes and the upper respiratory tract are especially susceptible to the irritating effects of high atmospheric concentrations of Hydrogen Chloride. The gas or vapor is so penetrating and pungent that when high concentrations do occur those exposed should immediately leave the contaminated area.
INHALATION: Inhalation of excessive concentrations of Hydrogen Chloride vapors immediately produces severe irritation of the upper respiratory tract, resulting coughing, burning of the throat, and a choking sensation. In inhaled in deeply, edema of the lungs may occur. **EYES:** Contact with Hydrogen Chloride, either in gas or in solution, causes severe irritation and painful burns of the eyes and eyelids. The acid MUST be removed quickly with thorough irrigation with water or there may be porolonged or permanent visual impairment or total loss of sight. **SKIN:** Concentrated solutions are destructive to clothing and, on contact with skin, causes severe burns unless promptly washed off. **INGESTION:** Hydrochloric Acid, when swallowed, causes severe burns of the mucous membranes of the mouth, esophagus and stomach.

LISTED CARCINOGEN: **NTP:** No - **IARC MONOGRAPHS:** No

SECTION 04: PHYSICAL DATA

APPEARANCE & ODOR: Clear to yellowish liquid/sharp, pungent odor
BOILING POINT: ~212°F
FREEZING POINT: -63°F
VAPOR PRESSURE: ND
VAPOR DENSITY: >1
SPECIFIC GRAVITY: 1.01-1.05
pH: 1% Solution pH=0.9

SOLUBILITY IN WATER: Complete

SECTION 05: FIRE AND EXPLOSION DATA

FLASH POINT: NA

EXTINGUISHING MEDIA: Water fog or spray, foam, dry powder, carbon dioxide (CO_2)

DECOMP PRODUCTS: Hydrochloric Acid (HCL) is a stable compound and forms an azeotrope that boils at 227°F at one atmosphere and contains 20.22% Hydrogen Chloride. When heated to decomposition, emits toxic hydrogen chloride fumes and will react with water or steam to produce heat and toxic and corrosive fumes and explosive hydrogen gas.

EXPLOSION HAZARDS: Vapor may contain explosive hydrogen. To prevent ignition of vapor, smoking flames and sparks should not be permitted in storage areas. Causes severe burns.

FIRE FIGHTING EQUIP: Fire fighters and others exposed to products of combustion should wear self-contained breathing apparatus. Equipment should be thoroughly decontaminated after use.

SECTION 06: REACTIVITY DATA

STABILITY: Stable

HAZARDOUS POLYMERIZATION: Will not occur

INCOMPATABILITY: The reaction of HCL with most metals will produce Hydrogen, an explosive flammable gas. Violent reactions result with mixed with alkaline materials. Concentrated hydrochloric acid is incompatible with many substances and highly reactive with strong bases,k metals metal oxides, hydroxides, amines, carbonates and other alkaline materials. Incompatible with materials such as cyanides, sulfides, sulfites and formaldehyde.

CONDITIONS TO AVOID: Temperatures above 227°F

SECTION 07: FIRST AID

SKIN CONTACT: Remove contaminated clothing and shoes immediately. Wash affected area with soap or mild detergent and large amounts of water until no evidence of chemical remains (at least 15-20 minutes). Get medical attention immediately.

EYE CONTACT: Flush eyes immediately with large amounts of water or normal saline solution, occasionally lifting upper and lower lids until no evidence of chemical remains (at least 15-20 minutes). Get medical attention immediately.

INGESTION: Give large amounts of fresh water or milk immediately. Do not give anything by mouth if person is unconscious or otherwise unable to swallow. If vomiting occurs, keep head below hips to prevent aspiration. Treat symptomatically and supportively. See medical attention immediately.

INHALATION: Remove from exposure area to fresh air immediately. If breathing has stopped, perform artificial resuscitation. Keep person warm and at rest. Treat symptomatically and supportively. Seek medical attention immediately. Qualified medical personnel should consider administering oxygen.

SECTION 08: EMPLOYEE PROTECTION

GENERAL: Consider the potential hazards of this material (see section 3,) applicable exposure limits, job activities and other substances in the work place when designing engineering controls and selecting personal protective equipment.

EYE PROTECTION: Chemical safety goggles meeting the specification of OSHA 29CFR 1910.133/ANSI Standard Z87.1 should be worn whenever there is the possibility of splashing or other contact with the eyes. Wear safety glasses meeting the specification of OSHA 29CFR 1910.133/ANSI Standard Z87.1 where no contact with the eye is anticipated

RESPIRATORY: The use of a NIOSH approved full face piece cartridge respirator or Scott Air-Pak should be used by all personnel exposed to or handling Hydrochloric Acid. **Use NIOSH/MSHA approved respiratory protection equipment when airborne exposure limits are exceeded (see below). Consult the respirator manufacturer to determine appropriate type of equipment for a given application. Observe respirator use limitations specified by NIOSH/MSHA or the manufacturer. Respiratory protection programs must comply with 29 CFR 1910.134. WARNING: Air-purifying respirators do not protect workers in oxygen-deficient atmospheres.**

PROTECTIVE GLOVES: Wear impervious gloves.

VENTILATION:	A system of local and/or general exhaust is recommended to keep employee exposures below the Airborne Exposure Limits. Local exhaust ventilation is generally preferred because it can control the emissions of the contaminant at its source, preventing dispersion of it into the general work area. Please refer to the ACGIH document, *INDUSTRIAL Ventilation, A Manual of Recommended Practices,* most recent edition , for details.
MECHANICAL EXHAUST:	Desired in closed places.
LOCAL EXHAUST:	Recommended. **VENTILATION NOTES: Provide natural or mechanical ventilation to control exposure levels below airborne exposure limits (see below.) The use of local mechanical exhaust ventilation is preferred at sources of air contamination such as open process equipment. Consult NFPA Standard 91 for design of exhaust systems.**
THRESHOLD LIMIT VALUE:	OSHA 5 ppm
PROTECTIVE EQUIPMENT:	HMIS PERSONAL PROTECTIONS: X – consult your supervisor for specific personal protection. **The user should read and understand all instructions and limitations supplied with the equipment since protection is usually provided for a limited time or under certain circumstances.**

SECTION 09: SPILL AND DISPOSAL DATA

SPILL:	Ventilate area of leak of spill wear appropriate personal protective equipment as specified in Section 8. Isolate hazard area. Keep unnecessary and unprotected personnel from entering. Contain and recover liquid when possible. Neutralize with alkaline material (soda ash, lime), then absorb with an inert material (E.g., vermiculite, dry sand, earth), and place in a chemical waste container. Do not use combustible materials, such as saw dust. Do not flush to sewer!
RCRA STATUS:	9,976#
DISPOSAL DATA:	Treatment, storage, transportation and disposal must be in accordance with Federal, State/Provincial and Local Regulations. Regulations may vary in different locations. Characterization and compliance with applicable laws are the responsibility solely of the generator. Whatever cannot be saved for recovery or recycling should be managed in an appropriate and approved waste disposal facility. Processing, use or contamination of this product may change the waste management options. State and local disposal regulations may differ from federal disposal regulations. Dispose of container and unused contents in accordance with federal, state and local requirements.
TOXICOLOGICAL INFO:	Inhalation - rat/LC50/1h:3124 ppm; Oral - rabbit/LD60:900mg/kg (HCL concentrated) investigated as a tumorigen, mutagen, reproductive effector.
ECOLOGICAL INFO:	When released into the soil, this material is not expected to biodegrade. When released into the soil, this material may leach into groundwater. This material is expected to be toxic to aquatic life.

SECTION 10: STORAGE AND HANDLING DATA

HANDLING:	Handle in accordance with good industrial hygiene and safety practices. These practices include avoiding unnecessary exposure and prompt removal of material from eyes, skin and clothing. Store in a cool dry place away from ignition sources.
PRECAUTIONARY MEAS:	Use chemical safety goggles and full face shield, full face vapor respirator or Scott Air-Pak, impervious gloves and protective clothing. Avoid contact with skin, eyes and clothing. After handling this product wash hands before eating, drinking or smoking. If contact occurs, remove contaminated clothing, if needed, take first aid action shown in Section 7. Do not breathe vapors.

TRITON TANK

HYDRO TESTING PROCEDURES

submitted 9-24-2014

INTRODUCTION

The purpose of this manual is to outline multiple phases of the Hydro Testing procedure. This procedural guide will allow the various tanks allocated to a particular site to undergo water management and leak testing prior to service for the hydraulic fracturing process. The outline below is for a three tank system:

- Fill Tank #3
- Perform manifold pressure test for all phases of operation as water is transferred from Tank #3 to Tank #2
    - Equalization line test
    - Crossover test (manifold valve #202)
    - Fill line test
    - Frac #1 line test
    - Crossover test (manifold valve #205)
    - Frac #2 line test
- Fill Tank #2
- Perform manifold pressure test for all phases of operation as water is transferred from Tank #2 to Tank #1
    - Equalization line test
    - Crossover test (manifold valve #202)
    - Fill line test
    - Frac #1 line test
    - Crossover test (manifold valve #205)
    - Frac #2 line test
- Fill Tank #1

THIS TESTING PROTOCOL CAN BE REVERSED 3-2-1 v. 1-2-3 AS SITE SUPERVISOR DETERMINE APPROPRIATE PLANS FOR ACTION