Stoltz, Carrie R - DNR

From: Dave Larsen <dlarsen@reiengineering.com>
Sent: Friday, September 21, 2018 4:55 PM
To: Stoltz, Carrie R - DNR; Snowbank, Sheri A - DNR
Subject: Lou John - Amery (Injection Permit and WPDES Permit)
Attachments: 6190 WPDES NOI.pdf; 6190 Permit Request.pdf; 6190al2signed.pdf; GR-320-IRC SDS.pdf; GR-320-IRC-R Specification Sheet.pdf; GR-320-IRC-V Specification Sheet.pdf; 6190 Injection Map.pdf; GR18-006.pdf

Carrie and Sheri, attached should be the notification to WDNR program assistant (with fee attached), injection permit application, WPDES permit application and proposed injection scope prepared by Geologic Restoration.

Carrie, I believe REI has mailed the letter and $700 fee to Antigo WDNR. Work is tentatively scheduled for mid October start. We do have issues on water supply as the site building does not have an outside spigot, but we should have access to a inside tap and will have to run a hose out the door or window.

Please let me know if you have any questions or concerns.

Thank you,

David N. Larsen P.G
Senior Hydrogeologist / Professional Geologist

REI
CIVIL & ENVIRONMENTAL ENGINEERING, SURVEYING
4080 N. 20th Avenue
Wausau, WI 54401
REIengineering.com

David N. Larsen, P.G.
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Connect with us :

State of Wisconsin
Department of Natural Resources
Bureau of Water Quality
PO Box 7921, Madison WI 53707-7921
dnr.wi.gov

Notice of Intent (NOI)
Contaminated Groundwater from Remedial Action Operations
WPDES Permit No. WI-0046566-07-0
Rev. 06/2018

Notice: Pursuant to chs. NR 200 and 205, Wis. Adm. Code, this notice of intent (NOI) is required to request coverage under the Wisconsin Pollutant Discharge Elimination System (WPDES) Permit No. WI-0046566-07-0 for discharges of contaminated groundwater to waters of the state of Wisconsin. Failure to complete this form in its entirety may result in a returned NOI or a denied NOI. Personal information collected will be used for administrative purposes and may be provided to requestors to the extent required by Wisconsin Open Records law [ss. 19.31-19.39, Wis. Stats.].

SECTION I: FACILITY/PROJECT LOCATION INFORMATION			
Facility/Project Name Lou John Appraisal Site		Facility Mailing Address (i.e. PO Box, Street, or Route) 300 North Keller Avenue	
Facility/Project Physical Address (i.e. Street or Route) 300 North Keller Avenue		City, State, Zip Code Amery, WI 54001	
County Polk	Facility Phone No.	Facility Fax No.	Facility Email Address
SECTION II: FACILITY CONTACT INFORMATION			
Facility Operator/Plant Manager Patrick Haley		Title Owner	
Company Haley Appraisal, LLC		Contact Mailing Address (i.e. PO Box, Street, or Route) 333 30th Avenue	
City, State, Zip Code Clear Lake, WI 54005		Contact Phone No.	Alternative Phone No.
Contact Fax No.		Contact Email Address	
Discharge Monitoring Contact Name David Larsen		Title Senior Hydrogeologist	
Company REI Engineering, Inc.		Contact Mailing Address (i.e. PO Box, Street, or Route) 4080 N. 20th Avenue	
City, State, Zip Code Wausau, WI 54401		Contact Phone No. 715-675-9784	Alternative Phone No. 715-675-4060
Contact Fax No.		Contact Email Address dlarsen@reiengineering.com	
Authorized Representative Name **Patrick Haley**		Title Owner	
Company Haley Appraisal, LLC		AR Mailing Address (i.e. PO Box, Street, or Route) 333 30th Avenue	
City, State, Zip Code Clear Lake, WI 54405		AR Phone No.	Alternative Phone No.
AR Fax No.		AR Email Address	

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SECTION III: FACILITY OWNER MAILING ADDRESS (if different from Authorized Representative)		
Facility Owner Name **Same as Authorized Representative**	Title	
Parent Company	Owner Mailing Address (i.e. PO Box, Street, or Route)	
City, State, Zip Code	Owner Phone No.	Alternative Phone No.
Contact Fax No.	Contact Email Address	

SECTION IV: DISCHARGE CHARACTERIZATION

Type of Wastewater (check all that apply):	**Discharge Frequency** (e.g. Annual, Monthly, Daily)	**Average Daily Flow** (gallons of water discharged per day)	**Type of Wastewater** (check all that apply):	**Discharge Frequency** (e.g. Annual, Monthly, Daily)	**Average Daily Flow** (gallons of water discharged per day)
☐ Treated wastewater from groundwater remediation project			☐ Cleaning or decontamination wastewaters from the cleaning of treatment equipment for a remediation project		
☒ Infiltration or injection of a substance or remedial material for remediation of soil or groundwater			☐ Other (describe type)		
☐ Treated wastewater from dewatering of construction trenches or pits			☐ Other (describe type)		
☐ Landspreading or spray irrigation of agricultural chemical contaminated wastewater			☐ Other (describe type)		

SECTION V: ELIGIBILITY CHECKLIST

1. Is the wastewater discharged from and/or to properties within tribal lands (i.e. land owned by or held in trust for the tribes and land within recognized reservation boundaries)?

☐ Yes. **Your discharge is not eligible for this General Permit.** *If all discharges from your facility go to or come from properties in tribal lands, you do not require regulation under a WPDES discharge permit. Therefore, skip the rest of the NOI and sign the last page. We will remove you from our tracking system. The Tribe or United States*

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Environmental Protection Agency (EPA) regulates discharges within tribal lands.

☒ No. **Proceed to question 2.**

2. Is the wastewater discharged to a Publicly Owned Treatment Works (i.e. sanitary sewer)? A septic system is not considered a sanitary sewer.

☐ Yes. **Your discharge is not eligible for this General Permit.** *If all discharges from your facility go to a sanitary sewer, you do not require regulation under a WPDES discharge permit. Therefore, skip the rest of the NOI and sign the last page. We will remove you from our tracking system. If at some point in the future operations at your facility result in a discharge, you will need to inform the Department. If only some or no discharges from your facility go to the sanitary sewer, please proceed to question 3.*

☒ No. **Proceed to question 3.**

3. Are any of the following wastewaters discharged or mixed with the above wastewaters to surface water or groundwater: Contact or noncontact cooling water, water from boiler cleaning operations, air compressor condensate contaminated with oil and grease, softener regeneration backwash, municipal wastewater, domestic wastewater, or process wastewaters from the production of any material or product, or other wastewater not otherwise cover by this general permit?

☐ Yes. **Your discharge is not eligible for this General Permit.** *Skip the rest of the NOI and complete the certification on last page. Contact the Department to obtain application for an individual WPDES discharge permit.*

☒ No. **Proceed to question 4.**

4. What is the receiving water for your discharge? If your facility has more than one outfall, indicate in the space provided which outfalls go to groundwater and which go to surface waters. *(check all that apply)*

☐ **Groundwater Discharge** (*any wastewater that is allowed to infiltrate or seep into the soil from a permeable surface including but not limited to any drain field, agricultural field, ditch, swale, depression, trench or pit, adsorption pond, infiltration pond, rain garden, prairie, or vegetative area that may impact groundwater quality*). **If you will only be discharging to groundwater, please proceed to question 5.**

Outfall #(s):

☐ **Wetland Discharge** (*any discernible, confined and discrete conveyance system including but not limited to any pipe, ditch, channel, tunnel, conduit, swale, or storm sewer that will carry wastewater to a wetland. Wetlands mean an area where water is at, near or above the land surface long enough to be capable of supporting aquatic or hydrophytic vegetation and which has soils indicative of wet conditions*). **If you will only be discharging to wetlands, please proceed to question 5.**

Outfall #(s):

Note: *The Department will need to determine if your discharge would cause significant adverse impacts to wetlands*

☐ **Surface Water Discharge** *(any discernible, confined and discrete conveyance system including but not limited to any pipe, ditch, channel, tunnel, conduit, swale, or storm sewer that will carry wastewater to a creek, stream, pond, marsh, bay, reservoir, river, lake, or other surface water within the state of Wisconsin*). **Proceed to question 4A.**

Outfall #(s):

A. What is the name(s) of the surface water your discharge enters?

Proceed to question 4B.

B. What is the Water Body Identification Code (WBIC) of the surface water your discharge enters?

Proceed to question 4C.

Note: The WBIC for a specific surface water can be found at: http://dnr.wi.gov/water/waterSearch.aspx.

C. Is the discharge directly to a surface water classified as an outstanding or exceptional resource waters as defined in ch. NR 102, Wis. Adm. Code.?

☐ Yes. **Your discharge is not eligible for this General Permit.** *Skip the rest of the NOI and complete the certification on last page. Contact the Department to obtain application for an individual WPDES discharge permit.*

☐ No. **Proceed to question 4D.**

D. Is the discharge directly to a surface water classified as a public water supply (i.e. Lake Superior, Lake Michigan and Lake Winnebago) in ch. NR 104, Wis. Adm. Code?

☐ Yes. **Your discharge is not eligible for this General Permit.** *Skip the rest of the NOI and complete the certification on last page. Contact the Department to obtain application for an individual WPDES discharge permit.*

☐ No. **Proceed to question 5.**

5. Does the discharge contain water treatment additives (i.e. biocides such as microbicides, fungicides, molluscicdes, chlorine, etc.) or water quality conditioners (i.e. scale and corrosion inhibitors, pH adjustment chemicals, oxygen scavengers, conditioning agents, water softening compounds, etc.) that may enter surface water or groundwater without receiving wastewater treatment or that are used in a treatment process but are not expected to be removed by wastewater treatment?

☐ Yes. **For each additive used, please fill out and attach an Additive Review Worksheet.** *Additive Review Worksheets must be completed to receive coverage under this general permit. The Additive Review Worksheet is not required for additives with active ingredients consisting of chlorine, hypochlorite, sulfuric acid, hydrochloric acid or sodium hydroxide. Also, chemicals used in an industrial process generating wastewater that eventually receives treatment or chemicals added as part of wastewater treatment process (such as ferric chloride, alum or pickle liquor) are not considered water treatment additives and need not require an additive review.* **Proceed to question 6.**

☒ No. **Proceed to question 6.**

6. Will chlorine-based compounds be used to control the growth of micro-organisms in the treatment system or used to decontaminate the treatment system after completion of the remediation project?

☐ Yes. **Proceed to question 6A.**

☒ No. **Proceed to question 7.**

A. Will chemicals be used to dechlorinate the wastewater prior to discharge to surface water?

☐ Yes. **The wastewater will be dechlorinated with chemicals. Proceed to question 7.**

☐ No. **The wastewater will not be dechlorinated with chemicals. Proceed to question 7.**

7. Is a discharge management plan attached to this NOI that includes all the information necessary from Section 3 of the permit?

☐ Yes. **Proceed to question 8.**

☐ No. **This form will be considered incomplete and returned to you.**

8. Has the groundwater at the site been analyzed for contaminants and are the results attach to the discharge management plan?

☐ Yes. **Proceed to question 9.**

☐ No. **This form will be considered incomplete and returned to you.**

9. If a treatment facility is required for the treatment of contaminated groundwater, have the plans and specifications been submitted to or approved by the department under s. 281.41, Wis. Stats., and ch. NR 108, Wis. Adm. Code?

☐ Yes. **Proceed to Section VI.**

☐ No. **Please contact wastewater plan review staff to find out how to get the plans approved. Proceed to Section VI.**

Note: Department wastewater plan review staff can be found here: http://dnr.wi.gov/topic/wastewater/planreviewers.html.

Additionally, department plan submittal requirements can be found here: http://dnr.wi.gov/topic/wastewater/AdequateSubmittal.html.

SECTION VI: CERTIFICATION

This form must be signed by a responsible executive or municipal officer, manager, partner or proprietor as specified in s. 283.37(3), Wis. Stats., or a duly authorized representative of the officer, manager, partner or proprietor that has been delegated signature authority pursuant to s. NR 205.07(1)(g)2., Wis. Adm. Code. To delegate signatory authority to a duly authorized representative, please submit a Delegation of Signature Authority (DSA) form (Form 3400-220).

I certify under penalty of law that these documents and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Authorized Representative Name	Title
Patrick Haley	Owner
Authorized Representative Signature	Date Signed
	9/13/18
Submitter Name (If different from Authorized Representative)	Title
David Larsen	Hydrogeologist
Submitter Signature	Date Signed
	9/21/18

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Notice of Intent (NOI)
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Please print and sign this certification page. Scan and email the completed form, certification page and any other supporting information to the department regional general permit reviewer at least thirty (30) business days before the expected start date of discharge. A listing of the general permit reviewers for each region with mailing addresses and phone numbers can be found at http://dnr.wi.gov/topic/wastewater/GeneralPermits.html. Please scroll to the "How to Apply" section and click the department region that the discharge is located in.

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September 21, 2018

Wisconsin Department of Natural Resources
Attn: Ms. Carrie Stoltz
107 Sutliff Avenue
Rhinelander, WI 54501

Subject:

Lou John Appraisal Site
Injection/Infiltration Permit
BRRTS #03-49-514936
PECFA #54001-1026-00

Dear Ms. Stoltz:

The purpose of this correspondence is to provide information for the approval of an injection/infiltration request for the Lou John Appraisal site in Clear Lake, Wisconsin. A request documenting injection intent along with the required fee has previously been forwarded to the Northern Region RR EPA.

Cover Sheet Components

BRRTS Activity Number:
03-49-514936

Site Name: Lou John Appraisal
300 North Keller Avenue
Amery, Wisconsin 54001

Responsible Party:
Haley Appraisal
Attention: Mr. Pat Haley
333 30th Avenue
Clear Lake, Wisconsin 54005

Environmental Consultant:
REI Engineering, Inc.
4080 N 20th Avenue
Wausau, WI 54401
715-675-9784
Attn: David Larsen
dlarsen@reiengineering.com

Request Type: Technical Review

Fee: $700.00

Infiltration/Injection Components

Infiltration / Injection:
Injection

Injectate: Granulated Carbon Slurry (Virgin Carbon GR-320-IRC using the CleanInject ™ process)

Contaminants Being Treated:
Dissolved phase petroleum compounds

Implementation Plan:
Proposed 9 injection points.
9 injection locations, 7 injection intervals with an injection depth of 6-18 feet and an injectate rate of 80# per injection interval (5,040 pounds of injectate).

Actual injection location, depth, intervals and injection rate may vary based site specific circumstances.

Constraints on Injection System:
Constraints include private utility lines and proximity to intersection corner, which limits potential injection locations.

Time Frame for Approval:
Site work is proposed for October 2018, site time to completion is anticipated at four (4) days.

Location of Proposed Injection Wells:
See attached Figure 1 (Proposed Injection Locations) which documents proposed injection locations and injection rates.

Injection Specific Monitoring Plan:
Groundwater sampling frequency will be at the direction of the WDNR Project Manager. Quarterly groundwater sampling, PVOC/N parameters, will commence no later than 90 days after injection completion.

Pre-Injection Vapor Screening:
Vapor Screening was addressed in the January 2018 Update Report

Additional Information Needed for Injection of Reactive Materials

Granulated Carbon GR-320-IRC using the CleanInject ™ process excludes the use of reactive materials. GR-320-IRC is a mixture of both coal and coconut activated carbon with 90% of particle sizes less than 44 microns. Concentrations of the injectate range from 20-40 pounds GR-320-IRC per interval for this proposed application. No additional groundwater monitoring

wells are anticipated for this proposed scope. Post injection groundwater monitoring has been approved and any modifications to the approved plan will need to be authorized by the WDNR Project Manager.

If you have any questions or comments, please contact our office at (715) 675-9784 or electronically at dlarsen@reiengineering.com.

Sincerely,
REI Engineering, Inc.

David N. Larsen P.G.
Senior Hydrogeologist / Project Manager

cc: Mr. Pat Haley, Haley Appraisal, LLC, 333 30th Avenue, Clear Lake, Wisconsin 54005

Attachments:
Figure 1 – Proposed Injection Locations
Attachments:
GR-320-IRC-V Specification Sheet
GR-320-IRC-R Specification Sheet
GR-320-IRC Safety Data Sheet

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September 21, 2018

Wisconsin Department of Natural Resources
Attn: Ms. Kathleen Shafel
223 E Steinfest Road
Antigo, Wisconsin 54409

Subject:

Lou John Appraisal Site
Injection/Infiltration Permit
BRRTS #03-49-514936
PECFA #54001-1026-00

Dear Ms. Shafel:

The purpose of this correspondence is to provide information for the approval of an injection/infiltration request for the Lou John Appraisal site in Clear Lake, Wisconsin. Below is the information specific to the WDNR RR-935 requirement for notification of injection as an approved option for groundwater remediation.

Cover Sheet Components

BRRTS Activity Number:
03-49-514936

Site Name: Lou John Appraisal
300 North Keller Avenue
Amery, Wisconsin 54001

Responsible Party:
Haley Appraisal
Attention: Mr. Pat Haley
333 30th Avenue
Clear Lake, Wisconsin 54005

Environmental Consultant:
REI Engineering, Inc.
4080 N 20th Avenue
Wausau, WI 54401
715-675-9784
Attn: David Larsen
dlarsen@reiengineering.com

Request Type: Technical Review

Fee: $700.00

If you have any questions or comments, please contact our office at (715) 675-9784 or electronically at dlarsen@reiengineering.com.

Sincerely,
REI Engineering, Inc.

David N. Larsen P.G.
Senior Hydrogeologist / Project Manager

Attachments:
$700.00 Technical Assistance Fee Payment

SAFETY DATA SHEET

Prepared in accordance with the United States Hazard Communication Standard: 29 CFR 1910.1200 (2012) **Revision date:** 1/6/2015

1. IDENTIFICATION OF THE SUBSTANCE/PREPARATION AND OF THE COMPANY/UNDERTAKING

Product name: **GR-320 IRC**

Synonyms: Activated carbon

Recommended use: Liquid and vapor applications (purification, decolorization, separation, catalyst and deodorization)

Restrictions on use: No information available.

Supplier:

Geologic Restoration, PLLC
11160 Downs Road
Pineville, NC 28134
Tel: 704-413-3311
Fax: 980-237-7622

Emergency Telephone Number: US: CHEMTREC 1-800-424-9300 or 1-703-527-3887
International CHEMTREC: +1 703-741-5970 or +1-703-527-3887

2. HAZARDS IDENTIFICATION

Classification

OSHA Regulatory Status: This chemical is not considered hazardous by the United States 2012 OSHA Hazard Communication Standard (29 CFR 1910.1200).

Label Elements

Pictogram: None
Signal Word: None

Hazard statements: None

Hazards not otherwise classified (HNOC)

Odorless black granules or powder. Avoid contact with skin and eyes. Avoid breathing dust. Activated carbon (especially when wet) can deplete oxygen from air in enclosed spaces, and dangerously low levels of oxygen may result. Prior to entering a confined space that contains or previously contained activated carbon, the space should be evaluated for oxygen and carbon monoxide concentrations, and any other hazards, by a qualified person.

Workers should also take appropriate precautions when dealing with spent (used) activated carbons which may exhibit hazardous properties associated with the adsorbed materials.

Avoid dust formation. Powdered material may form an explosible dust-air mixture. If transferring product under pressure, avoid generation of dust if an ignition source is present.

Activated carbons have high surface area which may cause self-heating during oxidation. See Section 5.

Do not generate dust because airborne respirable crystalline silica may be generated.

Potential health effects

Principle Routes of Exposure: Inhalation, Eye contact, Skin Contact

Eye Contact: May cause mechanical irritation. Avoid contact with eyes.

Skin Contact: May cause mechanical irritation. Avoid contact with skin.

Inhalation: Dust may be irritating to respiratory tract. Provide appropriate local exhaust ventilation at machinery and at places where dust can be generated. See also Section 8.

Ingestion: Adverse health effects are not known or expected under normal use.

Carcinogenicity: See Section 11.

Target Organ Effects: Lungs, Eyes, Skin

Medical Conditions Aggravated by Exposure: Asthma, Respiratory disorder, Skin disorders

Potential Environmental Effects: No special environmental precautions required. See also Section 12.

3. COMPOSITION/INFORMATION ON INGREDIENTS

Synonyms: Activated carbon.

Chemical name	CAS No	weight-%	Trade secret
Activated Carbon	7440-44-0	100	

This product, which is manufactured from a naturally occurring raw material(s), contains <10% total crystalline silica (quartz, CASRN 14808-60-7).

4. FIRST AID MEASURES

FIRST AID MEASURES

Skin Contact Wash thoroughly with soap and water. Seek medical attention if symptoms develop.

Eye contact Flush eyes immediately with large amounts of water for 15 minutes. Seek medical attention if symptoms develop.

Inhalation If cough, shortness of breath or other breathing problems occur, move to fresh air. Seek medical attention if symptoms persist. If necessary, restore normal breathing through standard first aid measures.

Ingestion Do not induce vomiting. If conscious, give several glasses of water. Never give anything by mouth to an unconscious person.

Most important symptoms and effects, both acute and delayed

Symptoms: The most important known symptoms and effects are described in Section 2 and/or in Section 11.

Indication of any immediate medical attention and special treatment needed

Note to physicians: Treat symptomatically.

5. FIRE-FIGHTING MEASURES

Suitable Extinguishing Media: Use foam, carbon dioxide (CO2), dry chemical or water spray. A fog is recommended if water is used.

Unsuitable Extinguishing Media: DO NOT USE a solid water stream as it may scatter and spread fire. In the event of a fire, spreading large amounts of activated carbon is not recommended due to the risk of creating uncontrolled dust emissions.

Specific hazards arising from the chemical: Burning produces irritant fumes. If transferring product under pressure, avoid generation of dust if an ignition source is present.

Activated carbons have high surface area which may cause self-heating during oxidation. An adequate air gap between packages of activated carbon is recommended to reduce risk of propagation of the event. Activated carbon is difficult to ignite and tends to burn slowly (smolder) without producing smoke or flame.

Hazardous combustion products: Used activated carbon may produce additional combustion products which are based on the substance(s) adsorbed. Materials allowed to smolder for long periods in enclosed spaces may produce amounts of carbon monoxide which reach the lower explosive limit (carbon monoxide LEL = 12.5% in air). Carbon monoxide (CO). Carbon dioxide (CO2).

Protective equipment and precautions for firefighters: In the event of fire, wear self-contained breathing apparatus. Wear suitable protective equipment.

6. ACCIDENTAL RELEASE MEASURES

Personal precautions, protective equipment and emergency procedures

Personal precautions: Avoid dust formation. Ensure adequate ventilation. Use personal protective equipment. See also Section 8.

Environmental Precautions:

Environmental Precautions: No special environmental precautions required. Local authorities should be advised if significant spillages cannot be contained.

Methods and material for containment and cleaning up

Methods for containment: Prevent further leakage or spillage if safe to do so.

Methods for cleaning up: Avoid dry sweeping and use water spraying or vacuum cleaning systems to prevent airborne dust generation. Use of a vacuum with high efficiency particulate air (HEPA) filtration is recommended. Do not create a dust cloud by using a brush or compressed air. Pick up and transfer to properly labelled containers. Spent granular activated carbon may be recyclable. Dispose of virgin (unused) carbon (surplus or spillage) in a facility permitted for non-hazardous wastes. Spent (used) carbon should be disposed of in accordance with applicable laws. Do not reuse empty bags: dispose of in a facility permitted for non-hazardous wastes. See Section 13.

7. HANDLING AND STORAGE

Precautions for safe handling

Advice on safe handling: Avoid contact with skin and eyes. Avoid dust formation. Do not breathe dust. Provide appropriate local exhaust ventilation at machinery and at places where dust can be generated. Do not create a dust cloud by using a brush or compressed air. Dust may form explosible mixture in air.

Activated carbons have high surface area which may cause self-heating during oxidation. Take precautionary measures against static discharges. All metal parts of the mixing and processing equipment must be earthed/grounded. Ensure all equipment is electrically earthed/grounded before beginning transfer operations. Fine dust is capable of penetrating electrical equipment and may cause electrical shorts. If hot work (welding, torch cutting, etc.) is required the immediate work area must be cleared of product and dust.

Conditions for safe storage, including any incompatibilities

Storage Conditions: Keep in a dry, cool and well-ventilated place. Keep away from heat and sources of ignition. Do not store together with strong oxidizing agents. Keep in properly labeled containers. Activated carbon is difficult to ignite and tends to burn slowly (smolder) without producing smoke or flame. Dust deposits should not be allowed to accumulate on surfaces, as these may form an explosible mixture if they are released in the atmosphere in sufficient concentrations. Prior to entering a confined space that contains or previously contained activated carbon, the space should be evaluated for oxygen and carbon monoxide concentrations, and any other hazards, by a qualified person.

Incompatible materials: Strong oxidizing agents. Strong acids.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Exposure guidelines: .

Exposure limits for components or similar components are stated below.

Dust, or Particulates Not Otherwise Specified:	Austria MAK:	10 mg/m³, STEL 2x30 min, Inhalable dust 5 mg/m³, TWA, Inhalable dust
	Belgium:	10 mg/m³, TWA, Inhalable 3 mg/m³ TWA, Respirable
	Canada (Saskatchewan):	10 mg/m³, TWA, Inhalable 3 mg/m³ TWA, Respirable
	China:	8 mg/m³, TWA 10 mg/m³, STEL
	France:	10 mg/m³, TWA Inhalable dust 5 mg/m³, TWA Respirable dust
	Germany - TRGS 900:	10 mg/m³, TWA, Inhalable 3 mg/m³, Respirable fraction
	Hong Kong:	10 mg/m³, TWA
	Ireland:	10 mg/m³, TWA, Total inhalable 4 mg/m³, TWA, Respirable
	Italy:	10 mg/m³, TWA, Inhalable 3 mg/m³, TWA, Respirable
	Japan:	3 mg/m³ TWA, Respirable
	Malaysia:	10 mg/m³, TWA, Inhalable 3 mg/m³, TWA, Respirable
	The Netherlands:	3.5 mg/m³, Inhalable
	Spain:	10 mg/m³, VLA, Inhalable 3 mg/m³, VLA, Respirable
	Sweden:	10 mg/m³, NGV, Total inhalable 5 mg/m³, NGV, Respirable
	United Kingdom - WEL:	10 mg/m³, TWA, Total Inhalable dust 4 mg/m³, TWA, Respirable dust
	US ACGIH - PNOS:	10 mg/m³, TWA, Inhalable 3 mg/m³, TWA, Respirable
	US OSHA - PEL:	15 mg/m³, TWA, Total dust 5 mg/m³, TWA, Respirable

Silica, Crystalline (Quartz) CAS RN 14808-60-7:	Austria MAK:	0.15 mg/m³, TWA (Respirable)
	Belgium:	0.1 mg/m³, TWA (Alveolar fraction)
	Denmark:	0.1 mg/m³, TWA (Respirable)
	Finland:	0.05 mg/m³, TWA (Respirable)
	France:	0.1 mg/m³, VME (Alveolar fraction)
	Ireland:	0.1 mg/m³, TWA (Respirable)
	Italy:	0.025 mg/m³, TWA (Respirable)
	Japan:	(3 mg/m³)/(1.19%SiO2 + 1) (Respirable)
	Switzerland:	0.15 mg/m³, TWA (Respirable)
	UK WEL:	0.1 mg/m³, TWA (Respirable)
	US OSHA PEL:	(10 mg/m³) /(%SiO2 + 2) (Respirable)
		(30 mg/m³)/(%SiO2 + 2) (Total)
	US ACGIH TLV:	0.025mg/m³ (Respirable)

MAK: Maximale Arbeitsplatzkonzentration (Maximum Workplace Concentration)
NGV: Nivå Gräns Värde (Level Limit Value)
PEL: Permissible Exposure Limit
STEL: Short Term Exposure Limit
TLV: Threshold Limit Value
TRGS: Technische Regeln für Gefahrstoffe (Technical Rule for Hazardous Materials)
TWA: Time Weighted Average
US ACGIH: United States American Conference of Governmental Industrial Hygienists
US OSHA: United States Occupational Safety and Health Administration
VLA: Valore Límite Ambientales (Environmental Limit Value)
WEL: Workplace Exposure Limit

Engineering Controls: Ensure adequate ventilation to maintain exposures below occupational limits. Provide appropriate local exhaust ventilation at machinery and at places where dust can be generated.

Personal protective equipment [PPE]

Respiratory Protection: Approved respirator may be necessary if local exhaust ventilation is not adequate.

Hand Protection: Wear suitable gloves.

Eye/face Protection: Wear eye/face protection. Wear safety glasses with side shields (or goggles).

Skin and Body Protection: Wear suitable protective clothing. Wash clothing daily. Work clothing should not be allowed out of the workplace.

Other: Handle in accordance with good industrial hygiene and safety practice. Emergency eyewash and safety shower should be located nearby.

9. PHYSICAL AND CHEMICAL PROPERTIES

Information given is based on data obtained from this substance or from similar substances.

Physical State:	Solid	**Odor:**	Generally odorless. May produce slight sulfur smell when wet.
Appearance:	Granular	**Odor threshold:**	Not Applicable
Color:	Black		

Property	Values	Remarks • Method
pH:		Not Applicable
Melting point/freezing point:		Not Applicable
Boiling point / boiling range:		Not Applicable
Evaporation Rate:		Not Applicable
Vapor pressure:		Not Applicable
Vapor Density:		Not Applicable
Density:		No information available
Bulk Density:	28 - 34 lbs/ft^3	
Specific Gravity at 20°C:		No information available
Water solubility:		Insoluble
Solubility(ies):		No information available
Partition Coefficient (n-octanol/water):		No information available
Decomposition temperature:		No information available
Viscosity:		No information available
Kinematic viscosity:		No information available
Dynamic viscosity:		No information available
Oxidizing Properties:		Not Applicable
Softening point:		No information available
VOC content (%):		Not Applicable
% Volatile (by Volume):		No information available
% Volatile (by Weight):		No information available
Surface Tension:		No information available
Explosive properties:		No information available
Flash Point:		Not Applicable
Flammability (solid, gas):		No information available
Flammability Limit in Air:		No information available
Explosion Limits in Air - Upper (g/m^3):		No information available
Explosion Limits in Air - Lower (g/m^3):		No information available
Autoignition Temperature:		No information available
Minimum Ignition Temperature:		No information available
		No information available
Minimum Ignition Energy:		No information available
Ignition Energy:		No information available
Maximum Absolute Explosion Pressure:		No information available
Maximum Rate of Pressure Rise:		No information available
Burn Velocity:		No information available
Kst Value:		No information available
Dust Explosion Classification:		No information available

10. STABILITY AND REACTIVITY

Reactivity: May react exothermically upon contact with strong oxidizers.

Stability: Stable under recommended handling and storage conditions.

Possibility of hazardous reactions: None under normal processing.

Hazardous polymerization: Hazardous polymerization does not occur.

Conditions to avoid: Keep away from heat and sources of ignition. Avoid dust formation. Activated carbon (especially when wet) can deplete oxygen from air in enclosed spaces, and dangerously low levels of oxygen may result.

Activated carbons have high surface area which may cause self-heating during oxidation.

Incompatible materials: Strong oxidizing agents. Strong acids.

Explosion data See also Section 9.

Sensitivity to Mechanical Impact: None.

Sensitivity to Static Discharge: Dust may form explosible mixture in air. Do not create a dust cloud by using a brush or compressed air.

Hazardous decomposition products: Used activated carbon may produce additional combustion products which are based on the substance(s) adsorbed. Materials allowed to smolder for long periods in enclosed spaces may produce amounts of carbon monoxide which reach the lower explosive limit (carbon monoxide LEL = 12.5% in air). Carbon oxides.

11. TOXICOLOGICAL INFORMATION

Information given is based on data obtained from this substance or from similar substances.

Acute toxicity

Not classified.

Oral LD50: LD50/oral/rat = >2000 mg/kg. (OECD 423).

Inhalation LC50: LC50/inhalation/1h/rat = >8.5 mg/L (OECD 403)

Dermal LD50: Absorption highly unlikely, no health effects known.

Skin corrosion/irritation: Not classified
Skin irritation test, rabbit (OECD 404): Not irritating

Serious eye damage/eye irritation: Not classified. Eye irritation test, rabbit (OECD 405): Not irritating.

Sensitization: Not classified. Not sensitizing based on Local Lymph Node Assay (OECD 429).

Mutagenicity: Not classified.
- Gene mutation in bacteria (Bacterial Reverse Mutation Assay/Ames) (OECD 471): not mutagenic.
- In vitro Mammalian Chromosome Aberration Test (OECD 473): not clastogenic.
- In vitro Mammalian Cell Gene Mutation Test (OECD 476).: non-mutagenic.

Carcinogenicity: Not classified.

Contains a component (crystalline silica) that is listed by IARC as group 1, by ACGIH as group A2, and by NTP as a known human carcinogen.

Reproductive Toxicity: Not classified. Repeated dose inhalation toxicity test showed no reproductive target organ effects, and a toxicokinetic study showed no product migration to reproductive organs.

STOT - single exposure: Not classified.

STOT - repeated exposure: Not classified. Repeated dose toxicity study, inhalation (rat) 90 days (OECD 413): NOAEC 7.29 mg/m^3 (respirable). This test was conducted on activated carbon containing negligible crystalline silica; therefore activated carbon itself is not classified for STOT-RE. Although respirable crystalline silica is classified as STOT-RE1, this product contains <1% respirable crystalline silica, therefore it is not classified for STOT-RE.

Aspiration Hazard: Based on industrial experience and available data, no aspiration hazard is expected.

12. ECOLOGICAL INFORMATION

Information given is based on data obtained from this substance or from similar substances.

Aquatic Toxicity: Non toxic. The substance is highly insoluble in water and the substance is unlikely to cross biological membranes. No adverse ecological effects are known.

Terrestrial Toxicity: Earthworm reproduction study (OECD 222), NOAEC for body weight reduction 1000 mg/kg soil; NOAEC for reproduction 3200 mg/kg soil. Non toxic in soil.

ENVIRONMENTAL FATE

Persistence and degradability Not expected to degrade

Bioaccumulation Not expected due to physicochemical properties of the substance.

Mobility: Not expected to migrate. Insoluble.

Distribution to Environmental Compartments: Insoluble. Expected to remain on soil surface.

Other adverse effects: No information available.

13. DISPOSAL CONSIDERATIONS

Disclaimer: Information in this section pertains to the product as shipped in its intended composition as described in Section 3 of this MSDS. Contamination or processing may change waste characteristics and requirements. Regulations may also apply to empty containers, liners or rinsate. State/provincial and local regulations may be different from federal regulations.

RCRA: Unused product is not a hazardous waste under U.S. RCRA, 40 CFR 261. Spent (used) product may be hazardous based on the substance adsorbed.

Disposal of wastes

Activated carbon, in its original state, is not a hazardous material or hazardous waste. Follow applicable regulations for waste disposal.

Spent (used) activated carbon may be classified as a hazardous waste depending upon its use, the substance(s) adsorbed, and how it is ultimately managed. Follow applicable regulations for disposal.

Recycling (reactivation) may be a viable alternative to disposal. Dust formation from residues in packaging should be avoided and suitable worker protection assured. Store used packaging in enclosed receptacles.

14. TRANSPORT INFORMATION

Not classified as dangerous in the meaning of transport regulations.

DOT

UN/ID no	Not regulated
Proper Shipping Name	Not regulated
Hazard Class	Not regulated
Packing group	Not regulated

ICAO (air)

UN/ID no	Not regulated
Proper Shipping Name	Not regulated
Hazard Class	Not regulated
Packing group	Not regulated

IATA

UN/ID no	Not regulated
Proper Shipping Name	Not regulated
Hazard Class	Not regulated
Packing group	Not regulated

IMDG

UN/ID no	Not regulated
Proper Shipping Name	Not regulated
Hazard Class	Not regulated
Packing group	Not regulated

RID

UN/ID no	Not regulated
Proper Shipping Name	Not regulated
Hazard Class	Not regulated
Packing group	Not regulated

ADR

UN/ID no	Not regulated
Proper Shipping Name	Not regulated
Hazard Class	Not regulated
Packing group	Not regulated

15. REGULATORY INFORMATION

Hazard Classification

United States - OSHA (29 CFR 1910.1200): Not Hazardous
Canada - WHMIS Classification (CPR, SOR/88-66): Not controlled
This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the M/SDS contains all the information required by the Controlled Products Regulations.

Chemical name	WHMIS - Ingredient Disclosure
Quartz (respirable) 14808-60-7	1

International Inventories

TSCA - United States Toxic Substances Control Act Section 8(b) Inventory	Complies
DSL/NDSL - Canadian Domestic Substances List/Non-Domestic Substances List	Complies
EINECS/ELINCS - European Inventory of Existing Chemical Substances/European List of Notified Chemical Substances	Complies
ENCS - Japan Existing and New Chemical Substances	Complies
IECSC - China Inventory of Existing Chemical Substances	Complies
KECL - Korean Existing and Evaluated Chemical Substances	Complies
PICCS - Philippines Inventory of Chemicals and Chemical Substances	Complies
AICS - Australian Inventory of Chemical Substances	Complies
NZIoC - New Zealand Inventory of Chemicals	Complies
TCSI - Taiwan Chemical Substance Inventory	Complies

US Federal Regulations

TSCA Section 12(b) Export Regulations:
This product does not contain any components that are subject to TSCA 12(b) Export Notification

SARA 311/312 Hazard Categories

Acute Health Hazard	NO
Chronic Health Hazard	NO
Fire hazard	NO
Sudden release of pressure hazard	NO
Reactive Hazard	NO

Clean Air Act Amendments of 1990
(CAA, Section 112, 40 CFR 82):
This product does not contain any components listed as a Hazardous Air Pollutant, Flammable Substance, Toxic Substance, or Class 1 or 2 Ozone Depletor

CWA (Clean Water Act)
This product does not contain any substances regulated as pollutants pursuant to the Clean Water Act (40 CFR 122.21 and 40 CFR 122.42).

CERCLA
This material, as supplied, does not contain any substances regulated as hazardous substances under the Comprehensive Environmental Response Compensation and Liability Act (CERCLA) (40 CFR 302) or the Superfund Amendments and Reauthorization Act (SARA) (40 CFR 355). There may be specific reporting requirements at the local, regional, or state level pertaining to releases of this material.

US State Regulations

California Proposition 65
This product contains the following Proposition 65 chemicals.

Chemical name	California Proposition 65
Quartz (respirable) 14808-60-7 (<10)	Carcinogen

U.S. State Right-to-Know Regulations

Chemical name	New Jersey	Massachusetts	Pennsylvania	Louisiana:
Quartz (respirable) 14808-60-7	X	X	X	

16. OTHER INFORMATION

Disclaimer:
The information set forth is based on information that Geologic Restoration, PLLC believes to be accurate. No warranty, expressed or implied, is intended. The information is provided solely for your information and consideration and Geologic Restoration, PLLC assumes no legal responsibility for use or reliance thereon.

Prepared by: Geologic Restoration, PLLC
Revision date: 1-June-2015

End of Safety Data Sheet

GR-320-IRC REACTIVATED
POWDERED ACTIVATED CARBON
SPECIFICATION SHEET

TYPICAL PROPERTIES

Parameter	Unit	Value	Method
Type		Reactivated	
Surface Area	m^2/gm	850-900	
Iodine Number	$mg\ g^{-1}$	>800	ASTM D4607
Bulk Density	gl^{-1}	450-500	
Moisture As Packed	% wt	5	ASTM D2867
Mesh Size US Sieve			
-100 Mesh	% wt	99	
-200 Mesh	% wt	95	
-325 Mesh	% wt	90	

PACKAGING OPTIONS

- 50 / 55 lbs. Polypropylene bags
- 1000 / 1100 lbs. Super Sacks

NOTES

GR-320-IRC Reactivated is manufactured from select grades of spent activated carbons. The material is manufactured under stringently controlled conditions by indirect heat to produce a porous adsorbent with highly developed internal surface area.

DISCLAIMER

This information is offered solely for your consideration and verification. It has been gathered from reference materials and / or test procedures and is believed to be true and accurate. None of this information shall constitute a warranty or representation expressed or implied, for which we assume legal responsibility or that the information or good described is fit for any particular use either alone or in combination with other goods or processes.

GEOLOGIC RESTORATION, PLLC

11160 Downs Road, Pineville, NC 28134
Tel: (704) 413-3311
Web: www.geologicrestoration.com

GR-320-IRC VIRGIN
POWDERED ACTIVATED CARBON
SPECIFICATION SHEET

TYPICAL PROPERTIES

Parameter	Unit	Value	Method
Type		Coconut Shell	
Surface Area	m^2/gm	1150-1250	BET
Iodine Number	$mg\ g^{-1}$	1100	ASTM D4607
Apparent Density	gms/cc	0.47-0.52	ASTM D2854
Moisture As Packed	% wt	5	ASTM D2867
Mesh Size US Sieve			
-100 Mesh	% wt	99	
-200 Mesh	% wt	95	
-325 Mesh	% wt	90	

PACKAGING OPTIONS

- 50 / 55 lbs. Polypropylene bags
- 1000 / 1100 lbs. Super Sacks

NOTES

GR-320-IRC Virgin is manufactured from high quality coconut shells. The material is manufactured under stringently controlled conditions by steam activation to produce a porous adsorbent with highly developed internal surface area and pore structure.

GR-320-IRC Virgin is NSF-61 and ISO 9001:2008 certified and manufactured to AWWA standards.

DISCLAIMER

This information is offered solely for your consideration and verification. It has been gathered from reference materials and / or test procedures and is believed to be true and accurate. None of this information shall constitute a warranty or representation expressed or implied, for which we assume legal responsibility or that the information or good described is fit for any particular use either alone or in combination with other goods or processes.

GEOLOGIC RESTORATION, PLLC

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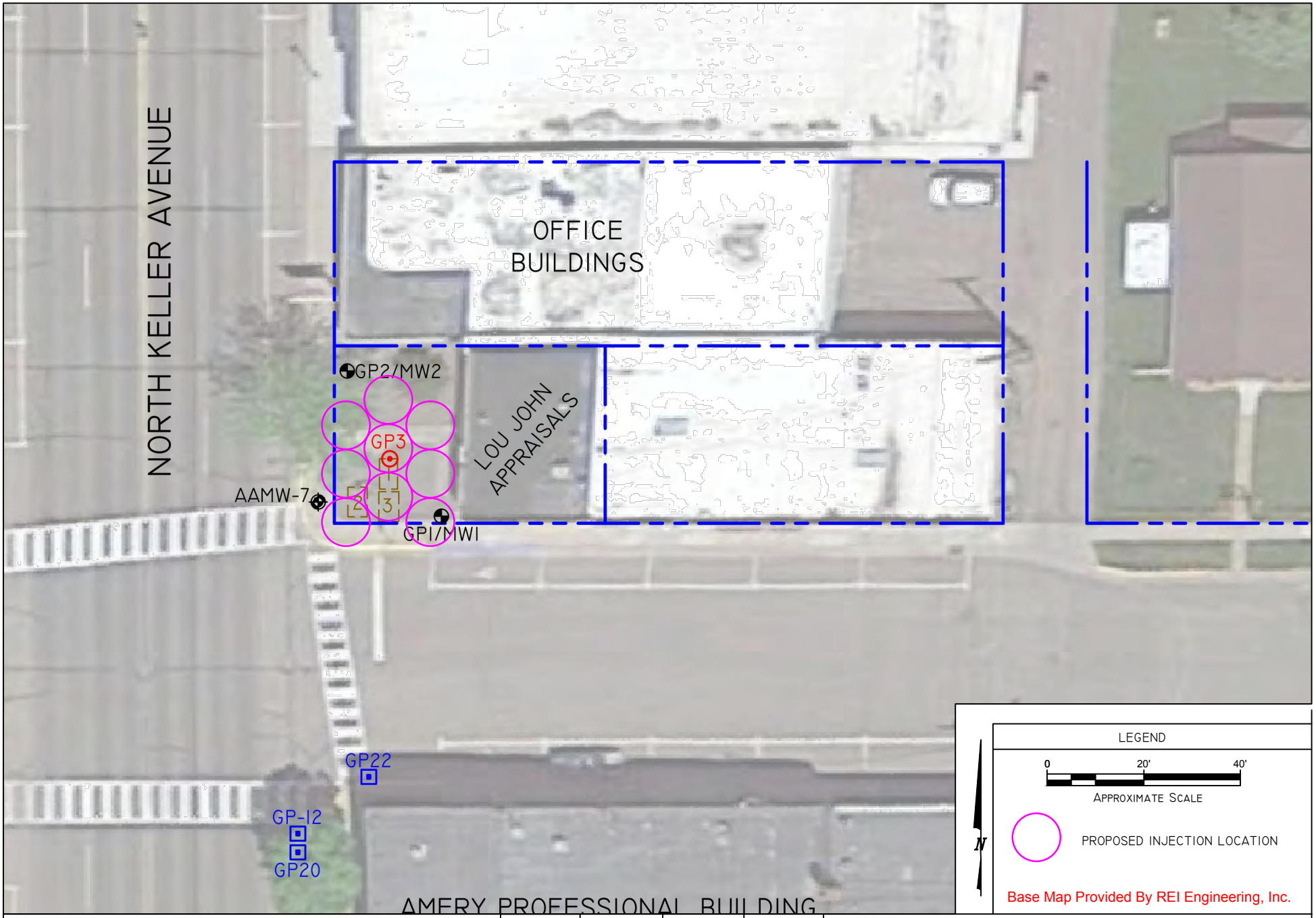


GEOLOGIC RESTORATION, PLLC

DRAWN	REVISED	CHECKED	PROJECT#
EAC		BEC	GR18-006
DATE	DATE	DATE	FIGURE#
06/26/18		06/26/18	1

PROPOSED INJECTION LOCATIONS

LOU JOHN APPRAISAL
300 N. KELLER AVENUE
AVERY, WISCONSIN 54001

GEOLOGIC RESTORATION, PLLC

Remediation Consulting Services

June 26, 2018

David N. Larsen, P.G.
REI Engineering
4080 N. 20th Avenue
Wausau, WI 54401

Re: Proposal for Carbon Based Injectate (CBI) Injection Services
Lou John Appraisal
300 N Keller Avenue
Amery, WI 54001
BRTTS #03-49-514936
PECFA #54001-1026-00
GR Proposal # GR18-006

Dear Mr. Larsen:

Geologic Restoration, PLLC (GR) appreciates the opportunity to provide our proposal for CBI injection services to REI Engineering, Inc. (REI). Our proposal includes our understanding of the project information, our proposed scope of services, GR-320-IRC™ Carbon summary, CleanInject® process summary, fee estimate, schedule, assumptions and authorization information.

Project Information

The following project information is based on reports and emails provided by REI.

The former Lou John Appraisal site is located at 300 North Keller Avenue in Amery, Wisconsin. Petroleum contamination was discovered originating from the subject property during an environmental site assessment performed for the Amery Amoco site on the opposite side of the street. The Wisconsin Department of Natural Resources (WDNR) was notified of the release on April 1, 2003.

The subject site had three leaded gasoline underground storage tanks (UST's) that were reportedly removed in August 1998. The formation materials at the site consist of fine to medium sands of glacial origin. Groundwater was encountered at the site at depths ranging from 8 to 13 feet below ground surface (BGS). A total of 14 borings\monitoring wells were installed during the assessment of the Amery Amoco property and the former Lou John site. Eleven of those wells were installed during the Amoco assessment that discovered the plume from the former Lou John site.

Free product was observed in monitoring well AAMW7 which is located within 30 feet of the subject site. Gasoline constituents were detected in soil samples collected from boring GP3 (June 2015), located within the former tank hold. Detected concentrations ranged from 2740 micrograms per kilogram (ug\kg) to 120,000 ug\kg in a sample obtained between 11 feet and 12 feet BGS.

Benzene was detected in well MW3 at a concentration of 10.9 micrograms per liter (ug\l) during a groundwater sampling event on October 12, 2015. This concentration exceeded the WDNR NR140.10 enforcement standard (ES) and the preventative action limit (PAL). No ES or PAL exceedances have occurred in groundwater from onsite wells MW1, MW2 or MW3 during more recent sampling events. However, free product is present in well AAMW7 located on the southwest corner of the former Lou John Site. It appears this product was released from the tank hold area for the three UST's removed in 1998.

REI is considering carbon injection in groundwater and soil to reduce contaminant concentrations in the outlined source area (see Figure 1) and to inhibit offsite plume migration.

Proposed Scope of Services

We will mobilize a CleanInject® injection trailer and crew to the site for performance of carbon based Injectate injection. Based on our discussion, the following specifications will apply:

Approximately 9 Injection locations are proposed for the project (see Figure 1). Injections should be spaced approximately 10 feet apart from one another. Injections should be performed every 2 feet in depth with a total of approximately 7 injection intervals at each location. The injection depths should be between approximately 6 to 18 feet below ground surface.

Approximately 5,040 pounds of Carbon GR-320-IRC™ CBI should be injected at the subject site. Injection intervals should be alternated between odd and even depths at adjacent boring locations, if deemed necessary, to maximize the CBI distribution in the formation. The CBI load per injection interval was determined based on the proximity to the contamination source. GR will conduct the work using 40 hour HAZWOPER trained personnel in level D personal protective equipment. GR equipment operators are also third-party certified to operate heavy equipment onsite.

A Safety-Vac vacuum recovery system (or equivalent if provided by REI) will be used to recover CBI that surfaces. The recovered material will be reused, if possible, by pumping the slurry into available injection points. The injection point locations are selected to avoid monitoring wells; however, the CBI distribution is dictated by the formation materials and structure. Preferential pathways to monitoring wells or ground surface may exist causing CBI to flow beyond predicted radiuses of influence and enter wells or surface.

Locations*	Injection Points	Injection Depth	Intervals	Carbon per Interval	Total Carbon
1	9	6 - 18 ft.	7	80 lbs.	5,040 lbs.
				TOTAL CARBON	**5,040 lbs.**

* See Figure 1 for injection point locations.

ESTIMATED TOTAL CARBON: ~ 5,040 lbs.
ESTIMATED WATER USAGE: ~ 5,500 gal.
ESTIMATED INJECTION POINTS: ~ 9
ESTIMATED INJECTION INTERVALS: ~ 7

GR-320-IRC CBI

GR-320-IRC CBI is a mixture of coal and coconut activated carbon. The carbon can be either virgin or reactivated, depending upon the requirements for the site. The particle size is that of a powdered activated carbon, with 90% of the particles passing the 320 sieve (44 microns or smaller). The particle size of the carbon facilitates the mixing with potable water into a slurry and the injection into the subsurface using the CleanInject system.

CleanInject Process

The CleanInject system was designed to safely, efficiently, and accurately transfer, mix, and inject CBI into the subsurface.

The GR-320-IRC carbon slurry is mixed within the CleanInject trailer by utilizing multiple components, including a graduated water tank, water transfer pump, mixing tank, carbon dust collection unit, and weighing scales. A regenerative blower\filtration unit is connected to the mixing tank to provide dust collection. The mixing tank is equipped with a mixer motor to keep the carbon slurry evenly distributed.

The water tank is filled by connecting a water source to the water spigot on the outside of the trailer. Water is pumped into the mixing tank via the transfer pump; the dust collection unit and mixer are activated and 50 pound carbon bags are emptied into the mixing tank via the powder addition hatch. The mixture ratio is controlled by monitoring the carbon slurry weight via the scales, the water volume within the graduated tank and the fluid level indicator on the side of the mixing tank. The carbon slurry is actively recirculated by the injection pump which is described below.

The CleanInject injection trailer is equipped with two injection pumps that are controlled by variable frequency drives (VFD). The pumps are capable of flow rates up to approximately 45 gallons per minute (GPM) without any backpressure. To minimize daylighting, the pumps are typically operated at a minimum frequency of 30 Hertz, which reduces the maximum flow rate to approximately 20 GPM. The actual flow rate during injection is dictated by the formation materials being injected into. Only one injection pump is operated at a time.

The injection pump inlet port pulls carbon slurry from the mixing tank via a high pressure hose. The pump outlet port connects to the injection line assembly in-between two high pressure ball valves and a pressure relief valve. One ball valve controls flow to the

injection hose leading to the Geoprobe rig, the other valve controls flow to the recirculation line leading back to the mixing tank. The pressure relief valve has a hose that also leads back to the mixing tank.

The injection pump actively recirculates the carbon slurry while the system is running but not injecting. During the recirculation process, the recirculation valve is open and the injection valve is closed. The carbon slurry is pumped from the mixing tank to the injection line assembly and back into the mixing tank through the recirculation line. When it is time to inject, the injection valve is first opened, and then the recirculation valve is closed. The injection pressure is monitored on a pressure gauge attached to the injection line assembly. If the pressure exceeds 1000 PSI, the pressure relief valve automatically opens and carbon is directed back to the mixing tank. The amount of carbon slurry injected is weighed by the mixing tank scale. Once the current injection interval is complete, the recirculation valve is first opened, and then the injection valve is closed.

During injection, the starting pressure averages between roughly 50 to 150 PSI in order to open the check valve present within the injection tip connected to the Geoprobe rods. The maximum injection pressure is 1100 PSI; pressures exceeding 1000 PSI will open the pressure relief valve on the injection line. The injection/recirculation valves must be fully open or fully closed to prevent damage to internal components; therefore the actual pressure during injection is dictated by the formation materials and structure. In cases where low pressure injection is required, the recirculation valve can be left open during injection, causing excess pressure to flow through the recirculation line back to the mixing tank.

Fee Estimate

ITEM	AMOUNT	UNIT	UNIT RATE	COST
Reactivated Carbon GR-320-IRC™ and CleanInject® System	5,040	Pounds	$4.25	$21,420.00
ITEM	**AMOUNT**	**UNIT**	**UNIT RATE**	**COST**
Mobilization / Demobilization	2,320	Miles	$3.75	$8,700.00
Per Diem (2 Man Crew)	10	Nights	$400.00	$4,000.00
Dust Supression Filter Elements	3	Each	$50.00	$150.00
Geoprobe 2.25" Injection Tips	1	Tips	$500.00	$500.00
PPE (2 Man Crew)	4	Days	$30.00	$120.00
Truck Charge	10	Days	$50.00	$500.00
ESTIMATED TOTAL		**REACTIVATED CARBON**		**$35,390.00**

Virgin carbon is available upon request. Pricing is shown in the Fee Schedule section.

Schedule

We expect to schedule the work within approximately two to three weeks of authorization, and we estimate the project will require 4 working days to complete. Due to the geographic location of the site, we anticipate performing the work when ambient temperatures are generally above 40 ºF and more favorable for CBI injection.

Assumptions

GR assumes the following regarding the proposed CBI injection project:

- REI assures GR will have clear access to the site during daylight hours and that the site area will be cleared of any obstructions that could limit access to injection locations or equipment deployment.
- REI assures GR's injection equipment can remain on-site for the duration of the project.
- Probe\injection locations will be the responsibility of REI, including assurance that locations will be accessible to the probe rig, underground and above ground utilities will not interfere with the drilling process, and GR and REI have legal authorization to drill in the chosen locations. REI will provide necessary traffic control and safety equipment, personnel and permits for injection points located in sidewalks, streets, highways and other high traffic areas.
- REI will provide for private and/or public underground utility locators, as appropriate, and potential damage to utilities will not be the responsibility of GR.
- REI will provide a Geoprobe rig with 2.25" rods and tips capable of penetrating surface and formation materials to the desired injection depths. REI will also be responsible for sealing the completed injection locations and any surface repair required by State regulations or the property owner.
- REI will provide a 4000lb forklift for unloading palletized carbon bags from a commercial carrier and for placing the carbon bags near the injection trailer.
- REI will provide a potable water source onsite capable of producing at least 8 to 10 gallons per minute.
- REI will provide a trailer-mounted, 480volt, 100kVA, diesel generator and necessary fuel to power the generator during the injection project.
- Inclement weather will not interfere with drilling for more than three hours in each work day.
- Crew per-diem will be charge for weekends, in lieu of return travel, at our discretion. These charges will be incurred if the drill crew, prime consultant, property owner or inclement weather restricts our access to the site or in any way prevents us from working. Crew per-diem charges will be invoiced in accordance with the unit rates listed in the attached Fee Schedule.
- Additional or lesser amounts of injectate will result in a change to the fees charged for the project.
- The subsurface contains no impenetrable material that would prevent the specified equipment from penetrating to the desired drilling depths.
- An upgrade to Level C personal protective equipment will result in a $50 per person per day equipment/supplies surcharge and a 10% surcharge on unit rates.
- Drilling surfaces will be thin (<3") asphalt. An additional fee will apply for pavement cutting, if concrete or thick asphalt is present. If ground is too soft to support injection and support equipment, additional charges may apply, or locations may be deemed unsuitable for injection.
- Unforeseen conditions, such as – but not limited to – asphalt pavement greater than 3 inches in thickness, location of pads in concrete areas, or overhead power, may require additional effort on a time and materials basis to complete the work. GR will contact you for authorization before conducting additional work.
- We assume that carbon that surfaces (day-lighting) can be collected (Safety-Vac Vacuum) and disposed on-site without drumming or other environmental considerations or pressure washed off paved surfaces. If we need to provide

drums for other material collection, they will be charged at $65 each, and the fees for disposal of contents are not included.

- REI will be responsible for removing CBI that enters any onsite monitoring wells or remediation wells.
- REI will be responsible for any and all site cleanup required including disposal of carbon bags and pallets.
- REI will provide a dry storage space onsite or waterproof tarps for the palletized bags of Carbon GR-320-IRC™ which will be shipped to the site by a commercial carrier.
- Standby time or additional effort will be charged at a crew rate of $150 per hour.
- REI will hand clear probe locations prior to our arrival to minimize standby time.

Authorization

To authorize us to proceed, please sign and return one copy of our proposal. The work will be performed in accordance with the attached Master Client Services Agreement which is incorporated herein by reference.

Geologic Restoration, PLLC sincerely appreciates the opportunity to provide REI with our proposal for CBI injection services. Please contact us if you have any questions or when we can be of further service.

Respectfully,

Geologic Restoration, PLLC

Eric A Chew

Eric A Chew, GIT
Project Geologist

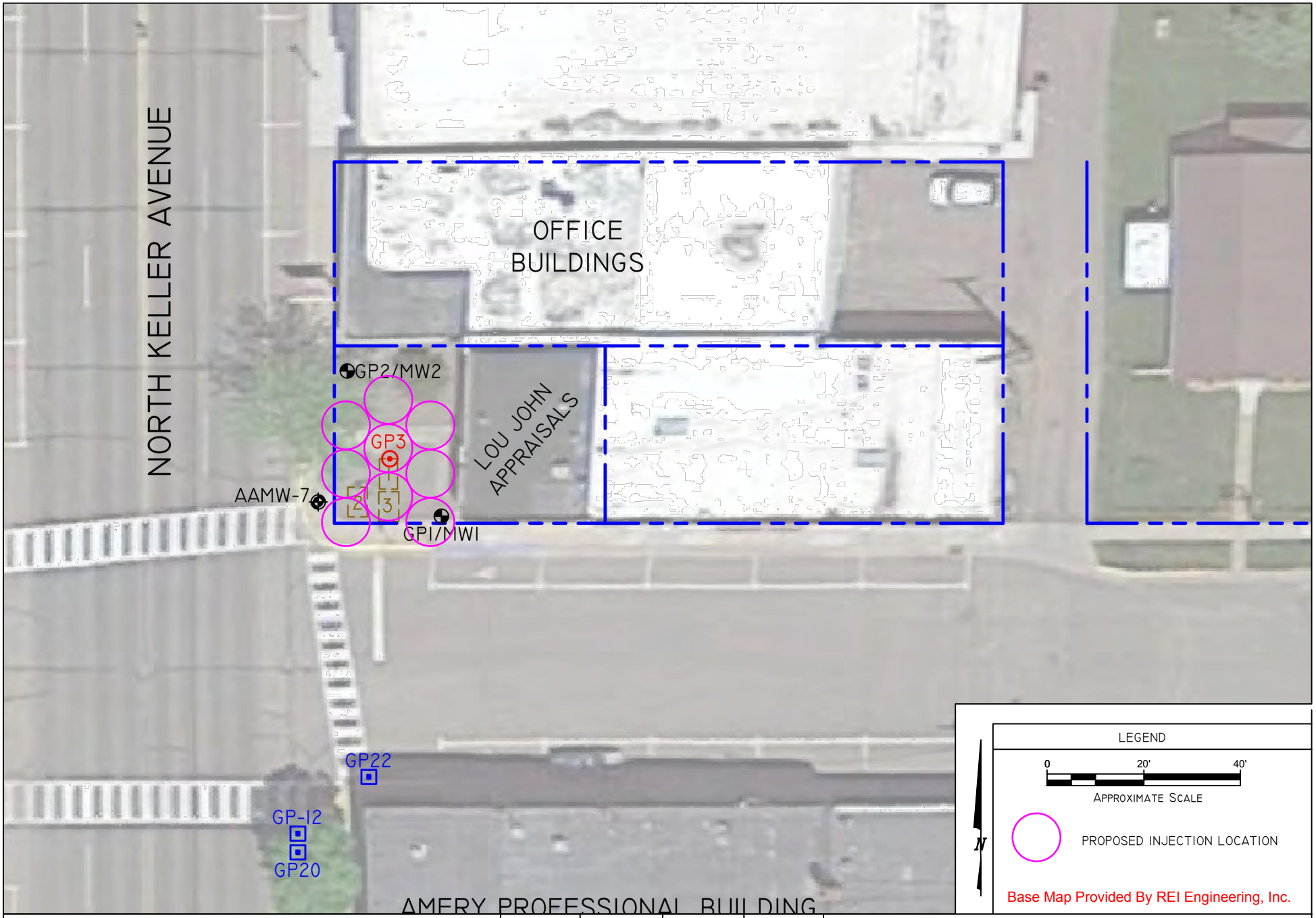
Brian E Chew Sr.

Brian E Chew, Sr. P.G.
Principal Hydrogeologist

Accepted By:

X_____ Date: _____
Signature, Title and Printed Name

Attachments:



GEOLOGIC RESTORATION, PLLC

DRAWN	REVISED	CHECKED	PROJECT#
EAC		BEC	GR18-006
DATE	DATE	DATE	FIGURE#
06/26/18		06/26/18	1

PROPOSED INJECTION LOCATIONS

LOU JOHN APPRAISAL
300 N. KELLER AVENUE
AVERY, WISCONSIN 54001