NEVADA DIVISION OF ENVIRONMENTAL PROTECTION
UNDERGROUND INJECTION CONTROL PERMIT No. UNEV2024201

CLASS V SUBCLASS 5X26 INJECTION WELLS FOR GROUNDWATER REMEDIATION

AUTHORIZATION TO INJECT

In compliance with the provisions of the Nevada Revised Statutes (NRS) and the Nevada Underground Injection Control (UIC) Regulations, Nevada Administrative Code (NAC) 445A.810 through 445A.925, eligible applicants are authorized to inject the following substances and/or water from a treatment facility or other project derived water operated in conjunction with a corrective action (CA) project overseen by the Nevada Division of Environmental Protection Bureau of Corrective Actions or other CA agency into Class V injection wells in accordance with limitations, requirements and other conditions set forth in Parts I and II hereof.

This permit is for a corrective action (remediation) project, allowing injection of materials identified in the work plan referenced below and in attachments to this permit.

Facility/Site Name: Former Wells Bloomfield Manufacturing Facility

Facility Address: 2 Erik Circle | Verdi, NV 89439

Legal Description: PLSS (MDB&M): T 19N | R 18E | Sec 8 ($SE/_4$ of $SW/_4$)

APN: 038-060-09

Geodetic Location: 39°31'15.4488" N, 119°58'48.0354" W

Well Owner Name/Address: Carrier Corporation Inc. | Attn: Don Sorbello, Bldg 7 | PO Box 4808, Syracuse, NY 13221

Well Operator Name/Address: AECOM Technical Services (for Carrier) | Attn: Holly Holbrook | 999 Town & Country Rd., Orange, CA 92868

Authorized Wells (see Attachment 1): Injection Wells (x4): FIB-7, FIB-8, FIB-9, FIB-10

Monitoring Wells (x3): MW-12, MW-15A, MW-13

Authorized Additives: see Attachment 2

Authorized Rates/Volumes: see Attachment 3

Sampling Requirements*: see Attachment 4

*Per approved state or county corrective action work plan: *In Situ Bioremediation Workplan*, submitted to NDEP on April 26, 2022 and approved on June 15, 2022.

Corrective Action Facility No.: D-000561

Effective Date: April 24, 2024

Expiration Date*: April 24, 2029

*Permit will remain active until the Permittee submits and receives approval for the Notice of Termination (UIC form U310) or Expiration Date – whichever is sooner.

Signed this 23rd day of April 2024

Andrew Kowler, Ph.D. | Environmental Scientist
Underground Injection Control Program
Bureau of Water Pollution Control

PART I

A. LIMITATIONS, MONITORING AND OTHER REQUIREMENTS

Subject to the Nevada Administrative Code (NAC) 445A.894, the director may require any person authorized to inject by a general permit to apply for and obtain an individual permit. **Upon review of the facts, if the Underground Injection Control (UIC) Program staff is concerned about any aspects of the project (such as a public water system supply well or domestic well), the applicant may be required to apply for a modification of this permit.** The Permittee is only authorized to inject what is listed on page 1 of this permit; any actions other than the discharges listed will require a permit modification.

1. During the period beginning on the effective date of this permit for a specific project and lasting until the permit is terminated, the Permittee is authorized to inject substances which are injected into a well for remediation purposes per approved rates specified and authorized on page 1; and

2. The injectate shall be limited and groundwater monitored by the Permittee, pursuant to the criteria listed below.
    a. Only the approved substances shall be injected, and only in the volumes and at the injection rates authorized following appropriate treatment to meet groundwater quality criteria. Other water generated as part of the facility's CA project may also be authorized under this permit.
    b. Injection practices shall not cause injectate and/or groundwater to surface at or near the injection points, nor cause any physical, biological, or chemical degradation of groundwater pursuant to the UIC regulations.
    c. Monitoring and reporting shall be conducted pursuant to the following: 1) the approved corrective action Workplan; 2) the corresponding category sampling required in Part I.A.6.; and 3) any additional UIC monitoring requirements identified on page 1 of this permit.
    d. If, during operation of this facility, the Permittee or their representatives become aware of any condition which degrades the quality of the aquifer (outside of the treatment zone for injection), injection shall cease immediately and the UIC Program shall be notified pursuant to Part II.B.2.
    e. Surface discharges are not authorized by this permit.

3. **Monitoring and Reporting Requirements:**

    The Permittee shall submit semi-annual reports (August 15th and February 15th) in accordance with Part I.A.7. for UIC activities in a UIC Summary Report submitted to the UIC Program on a continuous basis, whether actively injecting or not.

    The required sampling type, frequency and location are shown in Attachment 4.

    a. The UIC Summary Report shall at a minimum contain the following:

        1. UIC General Permit and unique ID number.
        2. Reporting period: semi-annual period and year; and date submitted.
        3. Individual/company reporting.
        4. Project name and address.
        5. Corrective Action Case Officer name and Facility ID #.
        6. Identify which wells were used for injection, which wells were used for extraction (if applicable) and injection rate, volume, date, time and concentration of the substance injected. If no injection occurred, state so in report.
        7. The results of the sampling analyses and monitoring as required by the tables above.
        8. Is free product present on-site? If free product is encountered, indicate free product type(s) and date(s) observed.
        9. Brief summary detailing normal and any unusual activities.
        10. Statement that all required CA Reports have been provided to the appropriate regulatory agency.
        11. Name, title and signature of authorized reporting individual.
        12. Quarterly Injection Monitoring Reports with laboratory analytical results and chain-of-custody documentation must be sent to the UIC Program and included in corrective action monitoring

reports. A copy of each corrective action monitoring report must be provided to the UIC Program.

4. Monitoring results and other requirements obtained during the previous reporting period, whether injection has occurred or not, shall be summarized for each month and reported **no later than 45 days** following the end of the reporting period (January-March, April-June, July-September, October-December).

   Signed copies of the aforementioned monitoring reports shall be submitted to the UIC program at the following address:

   Nevada Division of Environmental Protection
   Bureau of Water Pollution Control
   Attn: UIC Program | Injection Monitoring Report
   901 South Stewart Street, Suite 4001
   Carson City, Nevada 89701

5. Monitoring and system management shall continue for a period of not less than one year following remedial system shutdown approval. **Decisions regarding terminating Corrective Actions (remediation) per NAC 445A.22745 and decisions regarding no further action for the Site per NAC 445A.22725 will be made by the BCA after monitoring groundwater conditions for a minimum of one (1) year per NAC 445A.22745 (2).**

   A request may be submitted to the UIC program to cease reporting during the one-year monitoring period, or to cancel the UIC permit. Permittee must notify the UIC Program in writing of this request; and for cancellation, must indicate their understanding of the consequences of cancellation prior to receiving final closure approval. Following an evaluation by the UIC Program, the Permittee will be notified in writing granting cancellation or denial of cancellation with rational for such action. **Requests for cancellation must contain: 1) Either certification of well abandonment OR written confirmation from a regulatory agency for continued use as monitoring wells on a well by well basis; 2) final UIC monitoring report; and 3) Notice of Termination U310 Form 4) any affidavits not already on file in UIC permit. Any wells that are not needed for monitoring are required to be properly abandoned prior to UIC permit cancellation.**

6. The Permittee shall operate and maintain the system per established procedures and as approved by the Division. Any modification to the injection practices which is not approved on page 1 of this permit requires submission of changes and re-issuance of this permit by the UIC Program prior to implementation.

7. Nothing in this authorization shall be construed to eliminate the responsibility for remediation of this site. Remediation shall be accomplished in accordance with plans approved by the BCA, or other State-approved corrective action program.

8. The Permittee shall submit the annual review and services fee in accordance with NAC 445A.872 starting **July 1st** of the year immediately following permit issuance and every year thereafter while the Permittee is authorized to inject under the general permit.

9. Upon completion of the remediation project, all wells shall be abandoned pursuant to current Division of Water Resources (DWR) regulations (NAC 534) and by UIC regulations by filling them with cement grout from total depth to land surface. A driller licensed in the state of Nevada shall perform all abandonment work.

B. SCHEDULE OF COMPLIANCE

1. The Permittee shall implement and comply with the provisions of the schedule of compliance after approval by the Administrator, including in said implementation and compliance, any additions or modifications which the Administrator may make in approving the schedule of compliance.

   a. The Permittee shall achieve compliance with the conditions, limitations and requirements of the

permit at the commencement of relevant activity.

b. The Permittee shall submit any items listed in this General Permit issuance letter as required.

PART II

A. RECORDKEEPING AND OTHER MONITORING REQUIREMENTS

1. **Minimum Requirements for Sampling and Monitoring**

   a. Definition: "grab" sample means either a single discrete sample or individual samples collected over a period of time not to exceed 15 minutes. Samples and measurements taken as required herein shall be representative of the volume and/or nature of the subject of interest.
   b. A laboratory certified by the State of Nevada must perform analyses. Testing methods for constituents must be EPA or Division approved and meet drinking water analysis requirements.
   c. The analytical method detection/reporting limits for the constituents listed above must be at least as low as primary or secondary drinking water standards when applicable.
   d. **The UIC Program requires inorganic analyses of metals for "Total Metals"** in which samples are not filtered and are preserved with a weak acid in the field. Any exceptions to this policy must be requested and pre-approved by the UIC program prior to the sampling event. It must be clearly stated on all reports which analyses were performed.
   e. All gauges and/or flow meters used for compliance with this permit shall be calibrated pursuant to O&M manual (or standard industry specifications), and documented in the monitoring reports.
   f. Water samples shall be 1) collected by grab method, and 2) unfiltered for metals analysis; unless otherwise approved by the Division in writing.
   g. Annual, semi-annual and quarterly samples shall be collected during the same month(s) each year.
   h. All UIC water samples shall be collected using UIC Form U230, and the completed U230 forms submitted for each water sample with the UIC report.
   i. Test procedures for the analyses of required constituents shall comply with applicable analytical methods cited in 40 CFR 141 and under state of Nevada Drinking Water Program approved analytical methods, under which such procedures may be required, unless other procedures are approved by the Administrator.
   j. When sampling for radioactive constituents, ensure the laboratory reports only the adjusted gross alpha, as the drinking water standard of 15 pCi/L is an adjusted standard that subtracts radon and uranium from the total activity. Uranium is added in List 2 to verify value and additional activity.
   k. Monitoring points or constituents may be increased or decreased by the Division for good cause.

2. **Recording of Results** - For each measurement or sample taken pursuant to the requirements of this permit, the Permittee shall record the following information:

   a. Chain-of-custody sheets with the exact place, date, and time of sampling;
   b. The dates the analyses were performed;
   c. The person(s) who performed the analyses;
   d. The analytical techniques or methods used;
   e. The results of all required analyses;
   f. The precision and accuracy of the analytical data; and
   g. Raw laboratory data result sheets.

3. **Additional Monitoring by Permittee** – If the Permittee monitors any constituent at the location(s) designated herein more frequently than required by this permit, or monitors additional constituents other than those required by this permit, using approved analytical methods as specified above, the results of such monitoring shall be made available to the Division.

4. **Records Retention –** All records and information resulting from the monitoring activities required by this permit, including all records and analyses performed, calibration and maintenance of instrumentation, and recordings from continuous monitoring instrumentation, **shall be retained for a minimum of three (3) years**, or longer if required by the Administrator.

5. **Modification of Monitoring Frequency, Location and Sample Type** – After considering monitoring data, discharge flow or receiving water conditions, the Division may, for just cause, modify the monitoring frequency, location and/or sample type by issuing a Notice or an Administrative Order to the Permittee.

B. MANAGEMENT REQUIREMENTS

1. **Change in Injection or Discharge** – All injection or discharges authorized herein shall be consistent with the terms and conditions of this permit. The discharge of any constituent identified in this permit more frequently than or at a level in excess of that authorized shall constitute a violation of the permit. Any anticipated facility expansions, or treatment modifications which will result in new, different, or increased injection or discharges must be reported by submission of a new application or, if such changes will not violate the limitations specified in this permit, by notice to the permit issuing authority of such changes. Following such notice, the permit may be modified to specify and limit any constituents not previously limited.

2. **Noncompliance Notification** – If, for any reason, the Permittee does not comply with or will be unable to comply with the conditions, requirements and limitations specified in this permit, the Permittee shall provide the Administrator with the following information, in writing, within five (5) days of becoming aware of such conditions:
    a. A description of the noncompliance or violation.
    b. The period of noncompliance, including exact dates and times, or if not corrected, the time the noncompliance is expected to continue, and steps being taken to reduce, eliminate and prevent recurrence of the noncompliance.
    c. Notification shall be provided verbally as soon as possible but not later than the end of the first working day after learning of the violation.

3. **Facilities Operation** – The Permittee shall at all times maintain in good working order and operate as efficiently as possible, all treatment or control facilities, devices or systems installed or used by the Permittee to achieve compliance with the terms and conditions of this permit.

4. **Adverse Impact** – The Permittee shall take all reasonable steps, including such accelerated or additional monitoring as necessary to determine the nature and impact of the non-complying injection or discharge, to minimize any adverse impact to waters of the State resulting from noncompliance with any limitations specified in this permit.

5. **Bypass** – Any diversion from or bypass of facilities necessary to maintain compliance with the terms and conditions of this permit is prohibited except where unavoidable to prevent loss of life or severe property damage. The Division will have the final authority in the determination of whether a discharge is deemed unavoidable. The Permittee shall promptly notify the Administrator in writing of each such diversion or bypass, in accordance with the procedure specified in Part II.B.2 above.

C. RESPONSIBILITIES

1. **Right of Entry** – Pursuant to NRS 445A.655, the Permittee shall allow the Administrator and/or his authorized representatives, upon the presentation of credentials:
    a. To enter upon the Permittee's premises where a source is located or in which any records are required to be kept under the terms and conditions of this permit;
    b. To have access to and copy any records required to be kept under the terms and conditions of this permit;
    c. To inspect any monitoring equipment or monitoring method required in this permit; and
    d. To perform any necessary sampling to determine compliance with this permit or to sample any injection or discharge.

2. **Transfer of Ownership or Control** – In the event of any change in ownership or control, the Permittee shall notify the succeeding owner of the existence of this permit, in writing, at the earliest possible date to allow sufficient time for the succeeding owner to demonstrate financial responsibility to the Division within 30 days prior to transfer of ownership. The letter shall include the date agreed upon by both parties for the transfer of ownership. A copy of the letter shall be forwarded to the Administrator. The Administrator of the Division of Environmental Protection shall approve all transfers of permits. The Administrator may require modification, or revocation with subsequent reissuance of the permit, to change the name of the new Permittee and incorporate additional requirements as deemed necessary due to any changes made to the injection wells or system by the new Permittee.

3. **Availability of Reports** – Except for data determined to be confidential under NRS 445A.665, all reports prepared in accordance with the terms of this permit shall be available for public inspection. Knowingly making any false statement on any such report may result in the imposition of criminal penalties as provided for in NRS 445A.710.

4. **Permit Modification, Suspension or Revocation** – After notice and opportunity for a hearing, this permit may be modified, suspended, or revoked in whole or in part during its term for cause including, but not limited to, the following:
    a. Violation of any terms or conditions of this permit;
    b. Obtaining this permit by misrepresentation or failure to disclose fully all relevant facts; or
    c. A change in any condition that requires either a temporary or permanent reduction or elimination of the injection or discharge.

5. **Civil and Criminal Liability**
    a. Nothing in this permit shall be construed to relieve the Permittee from civil or criminal penalties for noncompliance.
    b. Nothing in this permit shall be construed to preclude the institution of any legal action or relieve the Permittee from any responsibilities, liabilities, or penalties established pursuant to any applicable State law or regulation.
    c. The issuance of this permit does not convey any property rights, in either real or personal property, or any exclusive privileges, nor does it authorize any injury to private property or any invasion of personal rights, nor any infringement of federal, State or local laws or regulations.

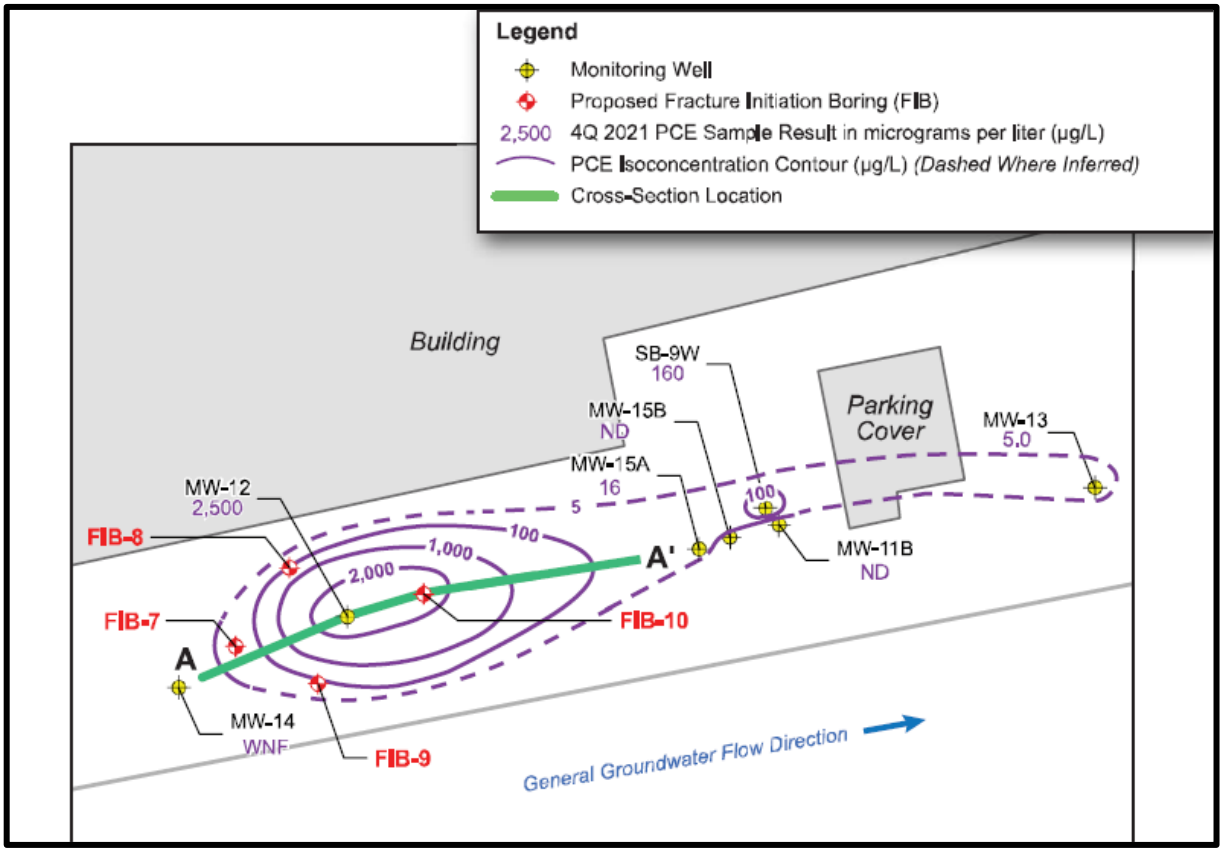
6. **Compliance with Regulations –** The Permittee shall comply with all provisions of the UIC regulations, NAC 445A.810 through 445A.925, and all pertinent laws and regulations. Nothing in this permit relieves the Permittee from responsibilities, liabilities or penalties established by any other state, federal or local jurisdiction.

ATTACHMENT 1

Table 1. Well Information.

Well Name	Well Type	Latitude °N (WGS84)	Longitude °W (WGS84)	Elevation (ft amsl)	Screening/Fracture Intervals (ft bgs)
FIB-7	Injection	39.520917	119.980139	4,840	30-35
"		"	"	"	35-40
FIB-8		39.520917	119.980139	4,840	21-26
"		"	"	"	35-41
FIB-9		39.520917	119.980139	4,840	20-25
"		"	"	"	32-37
"		"	"	"	38-43
"		"	"	"	43-48
FIB-10		39.520917	119.980139	4,840	24-29
"		"	"	"	30-35
MW-12	Monitoring	39.520917	119.980139	4,840	17-32
MW-15A		39.521000	119.979722	4,840	18-28
MW-13		39.520972	119.980167	4,840	16-31

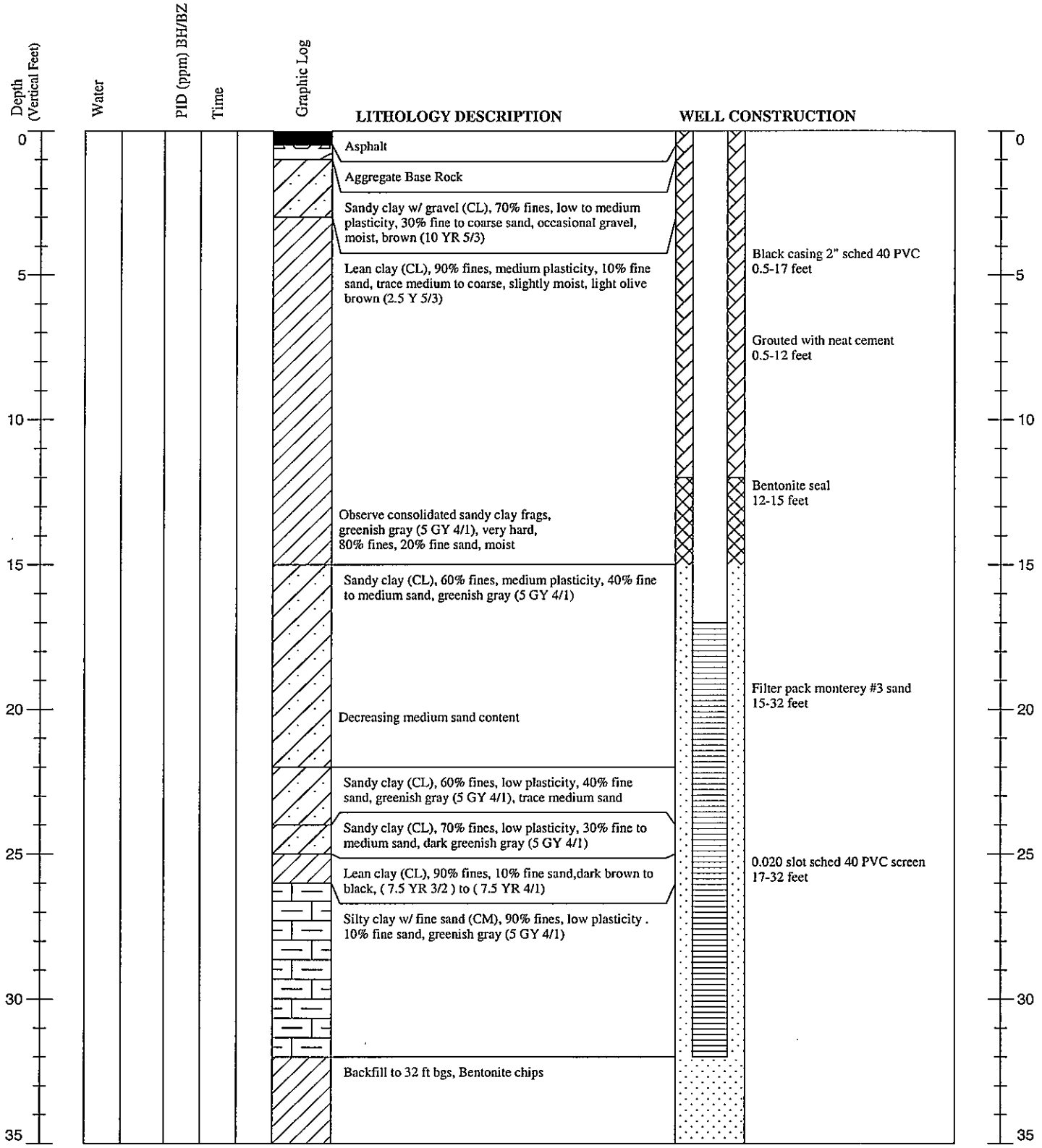
Figure 1. Well location map



Project: UTC	Wells MFG.	Log of Monitoring Well:
Location: Verdi, NV	Project Number: 17326196.30001	MW-12

Dates Drilled: 7/7/2009	Total Depth: 35 Ft. Bgs.		Borehole Name:
Drilling Contractor: WDC	Well Construction Date: 7/7/2009		Logged By: Mike Desmet
Borehole Diameter: 7 5/8-inch	Casing Diameter: 2 inches	Casing Type: Sch. 40 PVC	Checked By:
Drilling Method: Vibratory Sonic	Screen Interval: 17-32	Slot Size: 2 inches	Sampling Method:

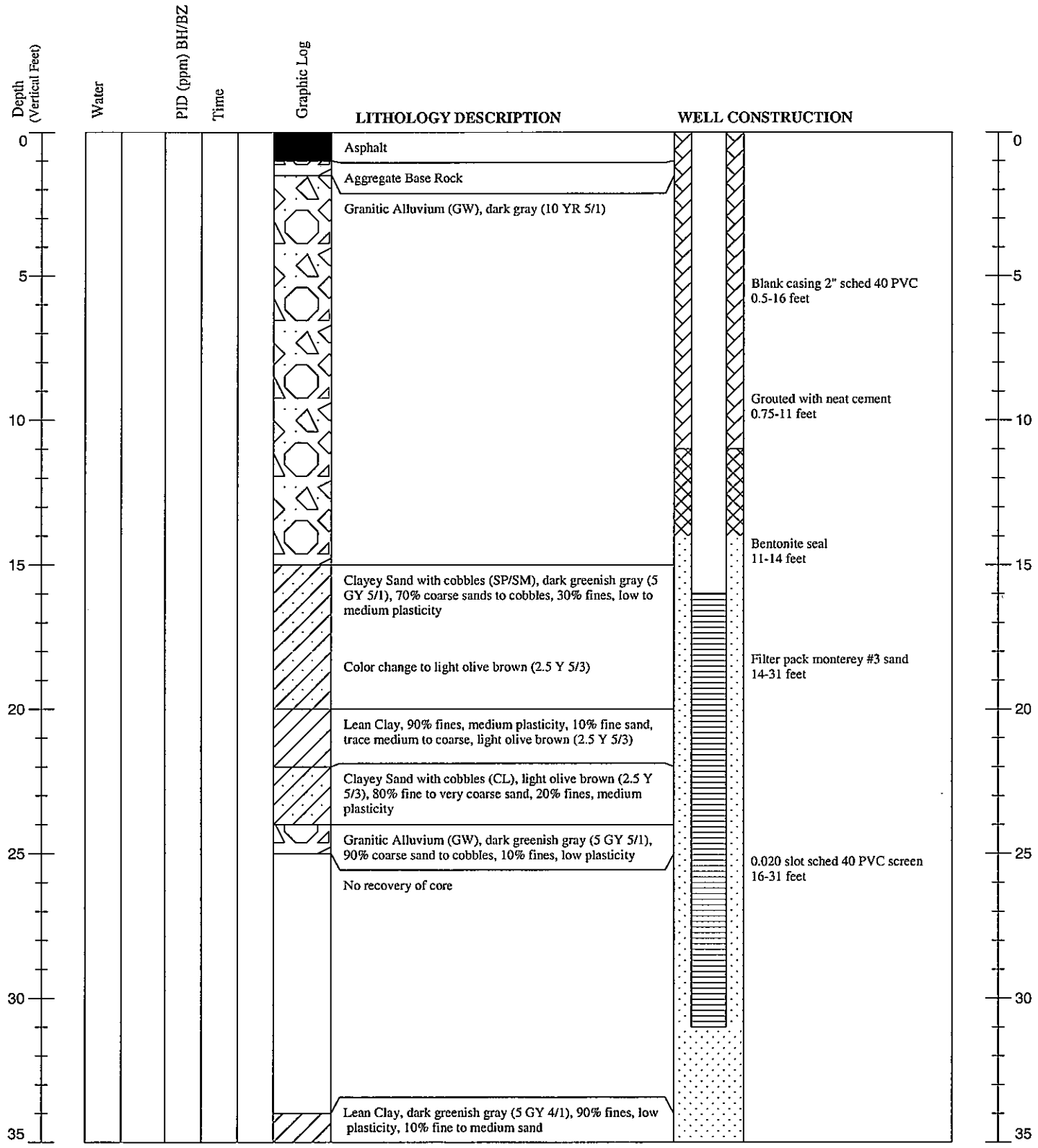
Comments:	Northing:	Easting:	Ground Surface Elevation:	TOC Elevation:
	14866311.2	2231098.8	4840.5 ft msl	4840.2 ft msl



Project: UTC	Wells MFG.	Log of Monitoring Well:
Location: Verdi, NV	Project Number: 17326196.30001	MW-13

Dates Drilled: 7/7/2009	Total Depth: 35 Ft. Bgs.		Borehole Name:
Drilling Contractor: WDC	Well Construction Date: 7/7/2009		Logged By: Mike Desmet
Borehole Diameter: 7 5/8-inch	Casing Diameter: 2 inches	Casing Type: Sch. 40 PVC	Checked By:
Drilling Method: Vibratory Sonic	Screen Interval: 16-31	Slot Size: 2 inches	Sampling Method:

Comments:	Northing: 14866328.6	Easting: 2231218.9	Ground Surface Elevation: 4840.2 ft msl	TOC Elevation: 4839.9 ft msl



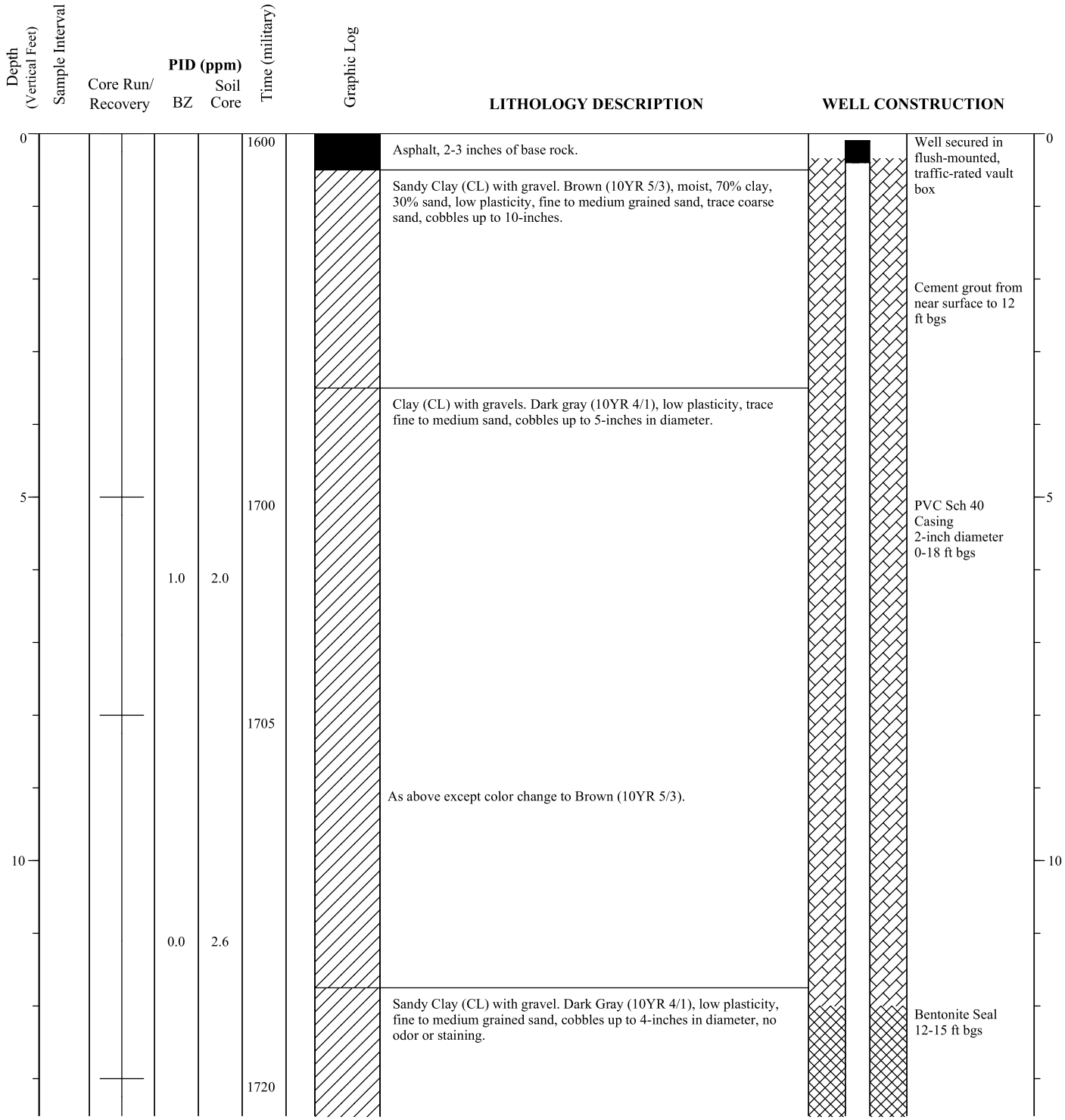
Project: UTC Pilot Test, Verdi, Nevada

Location: 2 Erik Circle, Verdi, Nevada **Project: 17326592**

Log of Monitoring Well: MW-15A

Drilling Contractor: Cascade	Drilled by: Amador	Borehole Name: MW-15A	Logged By: Chani Leimbach
Drilling Method: Sonic	Dates Drilled: 6/21/2011	Well Construction: 6/22/2011	Checked By:
Borehole Diameter: 6-inch	Casing Diameter: 2-inch	Casing Type: PVC Sch 40	QC Initial:
Total Depth Drilled: 30-feet	Screen Interval: 18-28 feet bgs	Slot Size: 0.020-inch	

Comments: East of MW-12

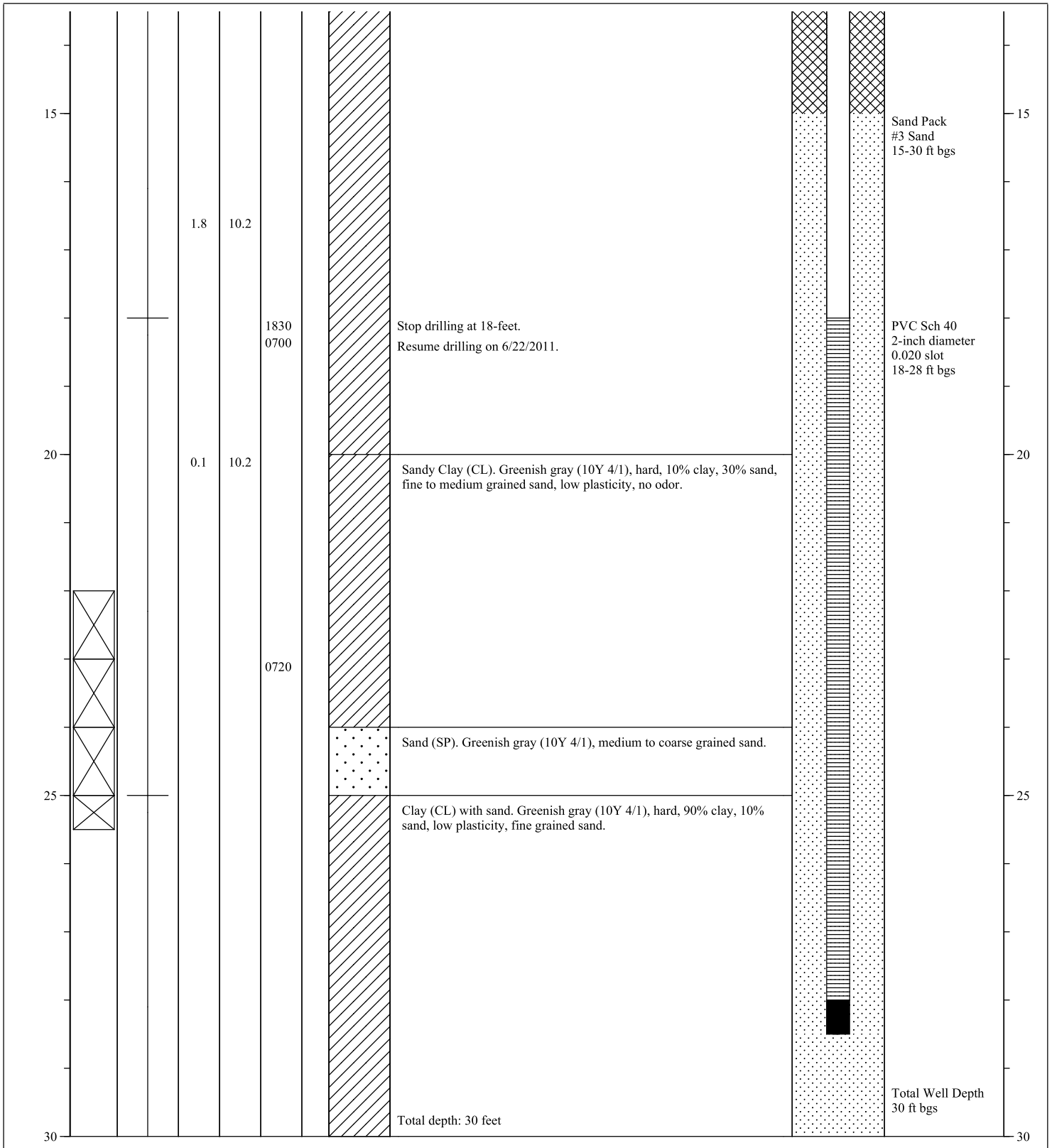


URS
2870 Gateway Oaks Dr., Ste 300
Sacramento, CA 95833
916-679-2000

Project: UTC Pilot Test, Verdi, Nevada

Location: 2 Erik Circle, Verdi, Nevada **Project: 17326592**

Log of Monitoring Well: MW-15A



URS
2870 Gateway Oaks Dr., Ste 300
Sacramento, CA 95833
916-679-2000

ATTACHMENT 2

Nevada Division of Environmental Protection
Bureau of Water Pollution Control - Underground Injection Control Program
901 S. Stewart St Ste 4001 Carson City Nevada 89701

UIC Form U240 | Chemical Use Request

FACILITY AND PERMIT INFORMATION	
1) UIC Permit No.: UNEV2024201	3) City/Valley: Verdi
2) Project/Facility Name: Former Wells Bloomfield Manufacturing Facility	4) County: Washoe County
5) The water this chemical will come in contact with is: ☐ Cooling tower water ☑ Well water ☐ other:	
6) Discuss where the water (in Item #5) will be discharged: aquifer	
7) List other chemicals used in this water: KB-1	

CHEMICAL INFORMATION – Note: Chemical information shall be submitted to the Division that clearly states the chemical composition (what's in it and at what concentration/mass). If the information is not provided, the Division will not approve this chemical. Proprietary information may be submitted confidentially.

8) Chemical Name: ABC+™ (Anaerobic BioChem Plus): [ZVI (Zero Valent Iron)] + [ABC®]	
9) Chemical formula: see SDS's	10) CAS No.: see SDS's (Attachment)
11) Manufacturer's name, phone and address: Redox Tech, LLC, 200 Quade Drive, Cary, NC 27513 | ph: 919-678-0140	
12) Is the chemical radioactive? ☐ YES ☑ NO Describe: chemical & microbial reducing agents	
13) Is a MSDS sheet available for this chemical? ☑ YES ☐ NO If YES, attach Is an Environmental Data Sheet (EDS) available? ☐ YES ☑ NO If YES, attach	
14) At working concentration[1], is the chemical hazardous or toxic to humans, livestock, fish, wildlife? If Yes, what entity and at what concentrations?:	☐ YES ☑ NO
15) If water is discharged to surface at any time, has the NV Division of Wildlife been consulted?	☐ YES ☑ NO

CHEMICAL FEED INFORMATION	
16) Estimated use start date: spring 2024	
17) Describe where the chemical is applied to the water: Chemical and Biological Reduction for Soil and Groundwater Treatment.	
18) Describe how the chemical is applied: The chemical (ABC+) is injected into the groundwater	
19) Purpose of chemical: ☐ scale inhibitor ☐ corrosions inhibitor ☐ biocide ☐ algaecide ☐ dispersant ☐ surfactant ☒ Other: Remediation	
20) Describe the frequency of application: One-time application	
21) What is the feed rate of the chemical as it is fed into the water: 30 gallons per minute **Estimated use per month:** 11,200 pounds of ABC+	
22) What is the final, effective concentration of chemical mixture immediately prior to application: 60% ABC-OLE + 40% ZVI (by mass)	
23) What is the "working" concentration of chemical after mixing with the water in the cooling tower/well/etc.: Not applicable	
24) Is the bulk storage container properly marked with the chemical name and information?	☒ YES ☐ NO
25) Describe the chemical monitoring before and after application: See approved work plan	
26) Discuss the interaction between the proposed chemicals/additives and chemicals already in use, and the by-products of their interaction: none known	

FORM COMPLETION	
Print Name of Person Completing Form: Scott Parsons	
Signature: Scott Parsons	Date: 8/16/2022

1. Working concentration is the chemical concentration within the final water system (e.g. cooling tower system), found under Item 23 above.

Signature	Name	Title	Date
Andrew L. Kowler	Andrew Kowler, Ph.D.	Environmental Scientist	4/11/2024

DO NOT WRITE IN THIS SPACE

SAFETY DATA SHEET
ABC+™

1. PRODUCT AND COMPANY IDENTIFICATION

PRODUCT NAME: ABC+, Anaerobic BioChem (ABC®) Plus Zero Valent Iron (ZVI)
GENERAL USE: Chemical and Biological Reduction for Soil and Groundwater Treatment

MANUFACTURER:

Redox Tech, LLC
200 Quade Drive
Cary, NC 27513
919-678-0140

EMERGENCY TELEPHONE:

Within USA and Canada: 1-800-424-9300
+1 703-527-3887 (collect calls accepted)

2. HAZARDS IDENTIFICATION

EMERGENCY OVERVIEW: Product is generally recognized as safe. May cause irritation exposure to eyes. Long term contact to skin may cause some drying and minor irritation.

3. COMPOSITION INFORMATION ON INGREDIENTS

Proprietary mixture of:

ABC: Fatty Acids, Glycerol, Phosphate Salts, Emulsifying Agents, Lactates,

Zero Valent Iron (ZVI): Iron with impurities (Carbon, Sulfur, & other metals)

4. FIRST AID MEASURES

EYES: Immediately flush with water for up to 15 minutes. If irritation persists, seek medical attention.

SKIN: Rinse with water. Irritation is unlikely, but if irritation occurs or persists, seek medical attention.

INGESTION: Generally safe to ingest but not recommended.

INHALATION: No first aid required.

5. FIRE FIGHTING MEASURES

EXTINGUISHING MEDIA: Deluge with water

FIRE/EXPLOSION HAZARDS: Product is combustible only at temperatures above 600C. ZVI should not be mixed with oxidants

FIRE FIGHTING PROCEDURES: Use flooding with plenty of water, carbon dioxide or other inert gasses. Wear full protective clothing and self-contained breathing apparatus. Deluging with water is the best method to control combustion of the product.

FLAMMABILITY LIMITS: non-combustible

SENSITIVITY TO IMPACT: non-sensitive

SENSITIVITY TO STATIC DISCHARGE: non-sensitive

6. ACCIDENTAL RELEASE MEASURES

Confine and collect spill. Transfer to an approved DOT container and properly dispose. Do not dispose of or rinse material into sewer, stormwater or surface water. Discharge of product to surface water could result in depressed dissolved oxygen levels and subsequent biological impacts.

7. HANDLING AND STORAGE

HANDLING: Protective gloves and safety glasses are recommended.

STORAGE: Keep dry. Use first in, first out storage system. Keep container tightly closed when not in use. Avoid contamination of opened product. Avoid contact and storage with oxidizing agents.

8. EXPOSURE CONTROLS – PERSONAL PROTECTION

EXPOSURE LIMITS

Chemical Name	ACGIH	OSHA	Supplier
ABC+	**NA**	**NA**	**NA**

ENGINEERING CONTROLS: None are required

PERSONAL PROTECTIVE EQUIPMENT

EYES and FACE: Safety glasses recommended
RESPIRATOR: none necessary
PROTECTIVE CLOTHING: None necessary
GLOVES: rubber, latex or neoprene recommended but not required

9. PHYSICAL AND CHEMICAL PROPERTIES

Odor:	none to mild pleasant organic odor
Appearance:	clear to light amber
Auto-ignition Temperature	Non-combustible

Boiling Point	>600 C
Melting Point	NA
Density	varies – 0.75 to 1.2 grams per ml
Solubility	infinite
pH	7-9

10. STABILITY AND REACTIVITY

CONDITIONS TO AVOID: Do not contact with strong oxidizers
STABILITY: product is stable
POLYMERIZATION: will not occur
INCOMPATIBLE MATERIALS: strong oxidizers
HAZARDOUS DECOMPOSITION PRODUCTS:

11. TOXICOLOGICAL INFORMATION

Acute Toxicity
A: General Product Information
Acute exposure may cause mild skin and eye irritation.
B: Component Analysis - LD50/LC50

No information available.

B: Component Analysis - TDLo/LDLo
TDLo (Oral-Man) none

Carcinogenicity
A: General Product Information
No information available.
B: Component Carcinogenicity
Product is not listed by ACGIH, IARC, OSHA, NIOSH, or NTP.

Epidemiology
No information available.

Neurotoxicity
No information available.

12. ECOLOGICAL INFORMATION

Ecotoxicity
Discharge to water may cause depressed dissolved oxygen and subsequent ecological stresses
Environmental Fate
No potential for food chain concentration

13. DISPOSAL CONSIDERATIONS

DISPOSAL METHOD: Material is not considered hazardous, but consult with local, state and federal agencies prior to disposal to ensure all applicable laws are met.

14. TRANSPORT INFORMATION

NOTE: The shipping classification information in this section (Section 14) is meant as a guide to the overall classification of the product. However, transportation classifications may be subject to change with changes in package size. Consult shipper requirements under I.M.O., I.C.A.O. (I.A.T.A.) and 49 CFR to assure regulatory compliance.

US DOT Information
Shipping Name: Not Regulated
Hazard Class: Not Classified
UN/NA #: Not Classified
Packing Group: None
Required Label(s):None

50th Edition International Air Transport Association (IATA):
Not hazardous and not regulated

INTERNATIONAL MARITIME DANGEROUS GOODS (IMDG)

Material is not regulated under IMDG

15. REGULATORY INFORMATION

UNITED STATES

SARA TITLE III

SECTION 311 No Hazard for Immediate health Hazard
SECTION 312 No Threshold Quantity
SECTION 313 Not listed

CERCLA NOT REGULATED UNDER CERCLA

TSCA NOT REGULATED UNDER TSCA

CANADA (WHIMS): NOT REGULATED

16. OTHER INFORMATION

HMIS:

Health	1
Flammability	0
Physical Hazard	0
Personal Protection	E

E: Safety Glasses, gloves

SAFETY DATA SHEET
Zero Valent Iron (ZVI)

Section 1. PRODUCT AND COMPANY IDENTIFICATION

PRODUCT NAME: **ZVI**
GENERAL USE: Chemical reduction of halogenated organics and-or metals

MANUFACTURER: **EMERGENCY TELEPHONE:**

Redox Tech, LLC
200 Quade Drive
Cary, NC 27513
919-678-0140

Within USA and Canada: 1-800-424-9300
+1 703-527-3887 (collect calls accepted)

Section 2. HAZARDS IDENTIFICATION

Physical state : Solid (Powder)
Emergency Overview : Potential dust explosion. Avoid contact with oxidizing agents. USE WITH CARE. Follow good industrial hygiene practice

Routes of entry : Demal contact. Eye contact. Inhalation. Ingestion.

Potential acute health effects
- Eyes : May cause eye irritation.
- Skin : No known significant effects or critical hazards
- Inhalation : May cause respiratory tract irritation.
- Ingestion : No known significant effects or critical hazards.

Potential Chronic Effects: : Carcinogenic effects: Not classified or listed by IARC, NTP, OSHA, EU AND ACGIH.
Mutagenic effects: Not available
: Teratogenic effects: Not Available
Medical conditions : Repeated exposure of the eyes to a low level of dust can produce eye irritation

Section 3. COMPOSITION INFORMATION ON INGREDIENTS

Greater than 98% Iron CAS# 7439-89-6
Contains carbon, sulfur and other metal impurities.

Section 4. FIRST AID MEASURES

Eye contact : Check for and remove any contact lenses. In case of contact, immediately flush eyes with plenty of water for at least 20 minutes. Seek medical attention if irritation occurs
Skin contact : Wash with soap and water. Get medical attention if irritation occurs.
Inhalation : Move person to fresh air. Get medical attention if breathing difficulty persists

Ingestion	:	Do not induce vomiting. Never give anything by mouth to an unconscious person. Get medical attention if symptoms appear.
Notes to physician:		No specific antidote. Material is used as an iron supplement in food and vitamins. Treatment would be the same as for iron overdose.

Section 5. FIRE FIGHTING MEASURES

Flammability of the product	Generally non-flammable but susceptible to dust explosion.
Fire-fighting media	Use a fog nozzle to spray water.
Special protective Equipment for fire-fighters	Fire-fighters should wear appropriate protective equipment.
Special remarks on fire	As with any finely granulated product, a risk of dust explosion is present should the material be dispersed in air and exposed to a source of ignition. Fine powder can form flammable and explosive mixtures in air.

Section 6. ACCIDENTAL RELEASE MEASURES

In case of a significant release, take immediate efforts to minimize discharge to surface water (storm drains, streams, lakes, rivers, etc). If the release occurs in a closed area, take steps to improve ventilation. If improvement of ventilation is not possible, call the fire department. The material can be swept up and placed into approved storage containers. Do not use a vacuum to gather the material because this may result in dispersion of dust particles and increase the risk for a dust explosion.

Section 7. HANDLING AND STORAGE

The material should be stored in a cool, dry, environment. It is not recommended to store the material in the proximity of oxidants. When handling the product, wear a dusk mask, eye protection and gloves. The product should always be handled in a well ventilated environment.

Section 8. EXPOSURE CONTROLS – PERSONAL PROTECTION

Engineering controls	:	Use process enclosures, local exhaust ventilation or other engineering controls to keep airborne levels below recommended exposure limits. If user operations generate dust, fumes or mist, use ventilation to keep exposure to airborne contaminants below the exposure limit.
Personal protection		
Eyes	:	Safety eyewear complying with an approved standard should be used and selected based on the t ask being performed and the risks involved (avoid exposure to liquid splashed, mists, gases or dusts). Where there is a risk of exposure to high velocity particles safety glasses or face shield complying with an approved standard should be used to protect against impact. Where there is a risk of exposure to dusts, goggles should be used. Recommended: Safety glasses.
Respiratory	:	Dusk mask or respirator is recommended.
Hands	:	Gloves are recommended

Skin/Body	:	Personal protective equipment for the body should be selected based on the task being performed and the risks involved. Risk from dermal contact is minimal.

Section 9. PHYSICAL AND CHEMICAL PROPERTIES

Physical State	:	Solid (Powder)
Color	:	Gray
Melting/freezing point	:	1535ºC (2795ºF)
Specific gravity	:	7.88
Bulk density	:	2.4 to 3.2 g/cm³
Solubility	:	Insoluble in water

Section 10. STABILITY AND REACTIVITY

The product is reactive with oxidizers. Precautions should be taken not to store or contact the product with oxidizers.

Fine particles of this product (not widely found in this grade) have a potential for a dust explosion. The product should be handled in a well ventilated area where dust generation is minimized.

Section 11. TOXICOLOGICAL INFORMATION

Acute Effects

Eyes	May cause eye irritation.
Skin	No known significant effects or critical hazards.
Inhalation	May cause respiratory tract irritation.
Ingestion	No known significant effects or critical hazards.

Chronic Health Effects:	Carcinogenic effects: Not classified or listed by IARC, NTP, OSHA, EU and ACGIH

Section 12. ECOLOGICAL INFORMATION

Will reduce dissolved oxygen levels in aquatic ecosystems. Direct discharge to surface water should be avoided.

Section 13. DISPOSAL CONSIDERATIONS

The generation of waste should be avoided or minimized to the extent practical. Disposal of this product, solutions and any by-products should be completed in an environmentally responsible manner that complies with all local, state and federal laws.

Section 14. TRANSPORT INFORMATION

Classification:

AND/ADR/TDG/DOT/IMDG/IATA:	Not regulated.

Section 15. REGULATORY INFORMATION

This product is not regulated in the United States and Canada. The user should ensure this product is not regulated where used.

Section 16. OTHER INFORMATION

Health	0
Fire Hazard	1
Reactivity	1
Personal Protection	C

Nevada Division of Environmental Protection
Bureau of Water Pollution Control - Underground Injection Control Program
901 S. Stewart St Ste 4001 Carson City Nevada 89701

UIC Form U240 | Chemical Use Request

FACILITY AND PERMIT INFORMATION	
1) UIC Permit No.: UNEV2024201	3) City/Valley: Verdi
2) Project/Facility Name: Former Wells Bloomfield Manufacturing Facility	4) County: Washoe County
5) The water this chemical will come in contact with is: ☐ Cooling tower water ☑ Well water ☐ other: _____	
6) Discuss where the water (in Item #5) will be discharged: aquifer	
7) List other chemicals used in this water: ABC+™	

CHEMICAL INFORMATION – Note: Chemical information shall be submitted to the Division that clearly states the chemical composition (what's in it and at what concentration/mass). If the information is not provided, the Division will not approve this chemical. Proprietary information may be submitted confidentially.

8) Chemical Name: KB-1	
9) Chemical formula: see SDS's	10) CAS No.: see SDS's
11) Manufacturer's name, phone and address: Redox Tech, LLC, 200 Quade Drive, Cary, NC 27513 | ph: 919-678-0140	
12) Is the chemical radioactive? ☐ YES ☑ NO Describe: chemical & microbial reducing agents	
13) Is a MSDS sheet available for this chemical? ☑ YES ☐ NO If YES, attach — Is an Environmental Data Sheet (EDS) available? ☐ YES ☑ NO If YES, attach	
14) At working concentration[1], is the chemical hazardous or toxic to humans, livestock, fish, wildlife? If Yes, what entity and at what concentrations?:	☐ YES ☑ NO
15) If water is discharged to surface at any time, has the NV Division of Wildlife been consulted?	☐ YES ☑ NO

CHEMICAL FEED INFORMATION
16) Estimated use start date: spring 2024
17) Describe where the chemical is applied to the water: Chemical and Biological Reduction for Soil and Groundwater Treatment.
18) Describe how the chemical is applied: Additive (KB-1) is injected into the groundwater
19) Purpose of chemical: ☐ scale inhibitor ☐ corrosions inhibitor ☐ biocide ☐ algaecide ☐ dispersant ☐ surfactant ☒ Other: Remediation
20) Describe the frequency of application: Once
21) What is the feed rate of the chemical as it is fed into the water: 30 gallons per minute **Estimated use per month:** 6L total (negligible feed rate)
22) What is the final, effective concentration of chemical mixture immediately prior to application: 100% KB-1
23) What is the "working" concentration of chemical after mixing with the water in the cooling tower/well/etc.: 100% KB-1
24) Is the bulk storage container properly marked with the chemical name and information? ☒ YES ☐ NO
25) Describe the chemical monitoring before and after application: See approved work plan
26) Discuss the interaction between the proposed chemicals/additives and chemicals already in use, and the by-products of their interaction: none known KB-1 facilitates full degradation of chlorinated solvents in the presence of C substrate (e.g., ABC+)

FORM COMPLETION	
Print Name of Person Completing Form: Scott Parsons	
Signature: Scott Parsons	Date: 8/16/2022

1. Working concentration is the chemical concentration within the final water system (e.g. cooling tower system), found under Item 23 above.

Signature	Name	Title	Date
Andrew L. Kowler	Andrew Kowler, Ph.D.	Environmental Scientist	4/11/2024

DO NOT WRITE IN THIS SPACE

130 Research Lane, Ste 2
Guelph ON N1G 5G3
(519) 822-2265

KB-1® Material Safety Data Sheet

Section 1: Material Identification

Trade Name: KB-1®
Chemical Family: bacterial mixture
Chemical name: No IUC name for mixture is known to exist
Manufacturer/Supplier: SiREM
130 Research Lane, Suite 2,
Guelph, Ontario,
Canada N1G 5G3

For Information call: 519-822-2265 / 1-866-251-1747 x236
Emergency Number: 519-822-2265
Description: Microbial inoculum (non-pathogenic, non-hazardous)
Trade Name: KB-1®
Product Use: Bioremediation of contaminated groundwater.
Date Prepared: 2 February 2005

Section 2: Composition, Information on Ingredients

KB-1® is a microbial culture grown in an aqueous dilute mineral salt solution media containing no hazardous ingredients.

The microbial composition of KB-1® (as determined by phylogenetic analysis) is listed in the table immediately below. Identification of organisms was obtained by matching 16S rRNA gene sequence of organisms in KB-1® to other known organisms. The characteristics of related organisms can be used to identify potential or likely characteristics of organisms in KB-1®.

Genus' Identified in KB-1® Microbial Inoculum

Genus
Dehalococcoides sp.
Geobacter sp.
Methanomethlovorans sp.

Section 3: Hazards Identification:

A review of the available data does not indicate any known health effects related to normal use of this product.

Section 4: First Aid Measures:

Avoid direct contact with skin and eyes. In any case of any exposure which elicits a response, a physician should be consulted immediately.

Eye Contact: Flush eyes with water for at least 15 minutes, occasionally lift upper and lower eyelids, if undue irritation or redness occurs seek medical attention.

Skin Contact: Remove contaminated clothing and wash skin thoroughly with water and antibacterial soap. Seek medical attention if irritation develops or open wounds are present.

Ingestion: Do not induce vomiting, drink several cups of water, seek medical attention.

Inhalation: Remove to fresh air. If not breathing give artificial respiration. In case of labored breathing give oxygen. Call a physician.

Section 5 - Fire Fighting Measures:

Non-flammable
Flash Point: not applicable
Upper flammable limit: not applicable
Lower flammable limit: not applicable

Section 6 – Accidental Release Procedures

Spilled KB-1® should be soaked up with sorbant and saturated with a 10% bleach solution (prepared by making a one in ten dilution of diluted standard bleach [normally sold at a strength of 5.25% sodium hypochlorite] to disinfect affected surfaces. Sorbant should be double bagged and disposed of as indicated in section 12. After removal of sorbant, area should be washed with 10% bleach solution to disinfect. If liquid from the culture vessel is present on the fittings, non-designated tubing or exterior of the stainless steel pressure vessel liquid should be wiped off and the area washed with 10% bleach solution.

Section 7 - Handling and Storage

KB-1® is shipped in stainless steel pressure vessels and connected to injection lines and inert gas is used to pressurize the vessel to displace the contents. KB-1® should be handled with care to avoid any spillage. Vessels are shipped with 1 pound per square inch (psi) pressure; valves should not be opened until connections to appropriate lines for subsurface injection are in place.

Storage Requirements: Avoid exposing stainless steel pressure vessels to undue temperature extremes (i.e., temperatures less than 0°C or greater than 30°C may result in harm to the microbial cultures and damage to the vessels). All valves should be in the closed position when the vessel is not pressurized or not in use to prevent the escape of gases and to maintain anaerobic conditions in the vessel. Avoid exposure of the culture to air as the presence of oxygen will kill dechlorinating microorganisms.

Section 8 - Exposure Controls/Personal Protection

Personal protective equipment:

Skin: Protective gloves (latex, vinyl or nitrile) should be worn.
Eye Protection: Wear appropriate protective eyeglasses or goggles when opening pressure vessels, valves, or when pressurizing vessels to inject contents into the subsurface.
Respiratory: No respiratory protection is required.
Engineering Controls: Good general room ventilation is expected to be adequate.

Section 9: Physical and Chemical Properties:

Physical State: liquid
Odour: skunky odour
Appearance: dark grey, slightly turbid liquid under anaerobic conditions, pink if exposed to air (oxygen).
Specific gravity: not determined
Vapor pressure: not applicable
Vapor density: not applicable
Evaporation rate: not determined
Boiling point: ~100° C
Freezing point/melting point: ~ 0°C

pH: 6.5-7.5
Solubility: fully soluble in water

Section 10 – Stability and Reactivity Data

Stable and non-reactive.
Maintain under anaerobic conditions to preserve product integrity.
Materials to avoid: none known

Section 11 - Toxicological Information

Potential for Pathogenicity:

KB-1® has tested negative (i.e., the organisms are not present) for a variety of pathogenic organisms listed in the table immediately below. While there is no evidence that virulent pathogenic organisms are present in KB-1®, there is potential that certain organisms in KB-1® may have the potential to act as opportunistic (mild) pathogens, particularly in individuals with open wounds and/or compromised immune systems. For this reason standard hygienic procedures such as hand washing after use should be observed.

Results of Human Pathogen Screening of KB-1® Dechlorinator

Organism	**Disease(s) Caused**	***Test result***
Salmonella sp.	Typhoid fever, gastroenteritis	Not Detected
Listeria monocytogenes	Listerioses	Not Detected
Vibrio sp.,	Cholera, gastroenteritis	Not Detected
Campylobacter sp.,	Bacterial diarrhea	Not Detected
Clostridia sp.,	Food poisoning, Botulism, tetanus, gas gangrene	Not Detected
Bacillus anthracis	Anthrax	Not Detected
Pseudomonas aeruginosa	Wound infection	Not Detected
Yersinia sp.,	Bubonic Plague, intestinal infection	Not Detected
Yeast and Mold	Candidiasis, Yeast infection etc.	Not Detected
Fecal coliforms	Indicator organisms for many human pathogens diarrhea, urinary tract infections	Not Detected
Enterococci	Various opportunistic infections	Not Detected

Section 12. Disposal Considerations

Material must be disinfected or sterilized prior to disposal. Consult local regulations prior to disposal.

Section 13 – Transport Information

Non-hazardous, non-pathogenic microbial inoculum – Biosafety Risk Group 1.

Chemicals, Not Otherwise Indexed (NOI), Non-hazardous

Not subject to TDG or DOT guidelines.

Disclaimer:

The information provided on this MSDS sheet is based on current data and represents our opinion based on the current standard of practice as to the proper use and handling of this product under normal, reasonably foreseeable conditions.

Last revised: 2 August 2011

SiREM
Leading Science · Lasting Solutions

130 Research Lane, Ste 2
Guelph ON N1G 5G3
(519) 822-2265

Chemical Components in KB-1® Growth Media

KB-1® consists of a microbial culture grown in a growth media comprised mostly of inorganic mineral salts (see ingredients listed in table immediately below).

Chemical Ingredients of KB-1® growth media

Chemical Name	Formula	CAS#	Concentration grams/Liter
Potassium Phosphate Dibasic	KH_2PO_4	7758-11-4	0.27
Potassium Phosphate Monobasic	K_2HPO_4	7778-77-0	0.34
Ammonium Chloride	NH_4Cl	12125-02-9	0.535
Calcium Chloride	$CaCl_2$	10035-04-8	0.07
Magnesium Sulfate	$MgSO_4$	10034-99-8	0.125
Ferrous Chloride	$FeCl_2$	13478	0.02
Sodium bicarbonate	$NaHCO_3$	144-55-8	2.0
Ferrous Ammonium Sulfate	$(NH_4)_2Fe(SO_4)_2$	7783-85-9	0.4
Sodium sulfide	Na_2S	1313-84-4	0.12
Resazurin	$C_{12}H_6NNaO_4$	62758-13-8	0.001
Boric Acid	H_3BO_3	10043-35-3	0.0006
Zinc Chloride	$ZnCl$	7646-85-7	0.0002
Sodium Molybdate	Na_2MoO_4	10102-40-6	0.0002
Nickel II Chloride	$NiCl_2$	7791-20-0	0.0015
Manganese Chloride	$MnCl_2$	13446-34-9	0.002
Copper II Chloride	$CuCl_2$	10125-13-0	0.0002
Cobalt Chloride	$CoCl_2$	7791-13-1	0.003
Disodium Selenite	Na_2SeO_3	10102-18-8	0.00004
Aluminum Trisulfate	$Al_2(SO_4)_3$	10043-01-3	0.0002
Vitamins	Various	Various	0.01 maximum

KB-1® and KB-1® Plus for Remediation of Chlorinated Solvents

1. Phil Dennis, SiREM
2. Anaerobic bioaugmentation cultures containing the dechlorinating bacteria *Dehalococcoides*, *Dehalobacter*, *Dehalogenimonas and Geobacter*
3. MSDS/technical information attached
4. Number of field scale applications to date: hundreds of sites
5. Case studies attached

KB-1® and KB-1® Plus are natural, non-pathogenic, anaerobic microbial consortiums (mixed cultures) proven to rapidly and completely degrade chlorinated solvents such as tetrachloroethene (PCE), trichloroethene, cis-1,2-dichloroethene, 1,1-dichloroethene and vinyl chloride, 1,1,1-trichloroethane, 1,1-dichloroethane 1,2-dichloroethane, 1,1,2,2-tetrachloroethane, 1,1,2-trichloroethane, chloroform, and dichloromethane to non-toxic, environmentally acceptable, end products such as ethane, ethane and acetate. These cultures and were derived from naturally occurring bacterial populations found in soil and groundwater at chlorinated solvent sites located in North America and are not genetically modified.

The KB-1® and KB-1 Plus cultures are produced in SiREM's facility in Guelph, Ontario, under sterile conditions following stringent quality assurance/quality control (QA/QC) procedures. The cultures are routinely screened for pathogens and pathogens have not been detected since large scale production commenced in 2002. The cultures are shipped to the application site in stainless steel vessels by express courier and are applied under anaerobic conditions to prevent the exposure of oxygen sensitive microbes to air.

KB-1® and KB-1® Plus have been applied at more than 60 sites in California including several sites in the Los Angeles region. The cultures have received waste discharge requirement (WDR) approval from California Regional Water Quality Boards in 7 of 9 regions. KB-1® has also been approved for injection in other jurisdictions, KB-1® was added to Environment Canada's Domestic Substances List in 2008 (DSL) for use in groundwater remediation in Canada. KB-1®and selected KB-1® Plus cultures are approved as groundwater injectants by the North Carolina Department of Water Quality. KB-1® and KB-1® Plus were approved in 2012 for import into Australia and have a history of safe use in and in 39 US states, Canada, 5 European countries and Malaysia.

ATTACHMENT 3

Table 2. High-Pressure Injection of Municipal Hydrant Water

Injection Well (direct-push boreholes)	Injection Zone (ft bgs)	Injection Limits		
		Total Vol (gal)	Pressure (psig)	
			Initial Jet	Lateral Propagation
FIB-7	30-35	25	400	250
	35-40	25	400	250
FIB-8	21-26	25	400	250
	35-41	25	400	250
FIB-9	20-25	25	400	250
	32-37	25	400	250
	38-43	25	400	250
	43-48	25	400	250
FIB-10	24-35	25	400	250
	30-35	25	400	250

TABLE 3. Injection of ABC+™ (Bioremediation Amendment Phase I)

Injection Well (borehole)	Injection Limits at Wellhead			
	Volume (gal)	Mass (lbs)	Flow (gpm)	Pressure (psig)
FIB-7	7,775	2,245	50	400
FIB-8	7,775	2,245	50	400
FIB-9	15,545	4,490	50	400
FIB-10	7,775	2,245	50	400

TABLE 4. Injection of KB-1® (Bioremediation Amendment Phase 2)

Injection Well (borehole)	Injection Limits at Wellhead			
	Volume (L)	Mass (lbs)	Flow (gpm)	Pressure (psig)
FIB-7	1.5	NA	NA	0
FIB-8	1.5	NA	NA	0
FIB-9	1.5	NA	NA	0
FIB-10	1.5	NA	NA	0

ATTACHMENT 4

Table 5. Monitoring well sampling locations, schedule, & laboratory analytes.

Well Name	Relative Hydraulic Position	Sampling Frequency	UIC Analyte List 2 (Table 7)	Performance Monitoring Analytes (Table 6)	Dissolved Organic Carbon
MW-12	Central	7th day & Quarterly	X	X	X
MW-15A	Transition	7th day & Quarterly	X	X	X
MW-13	Downgradient	7th day & Quarterly	X	X	X

Table 6. Performance monitoring analytes and schedule in work plan.

Monitoring Well	Purpose	Frequency of Sampling	Analytes to be Sampled	Field Parameters
MW-12	Treatment	Post-injection; then Quarterly in accordance with UIC Permit	• VOCs by SW8260B • Nitrate and Sulfate by E300.0 • Total and Dissolved Metals by SW6020 • TDS by SM2540C • TOC by SM5310B • qPCR analysis (*Dhc*, BVC, TCE, and VCr)*	• DTW • DO • ORP • EC • pH • Temperature • Ferrous iron (HACH)
MW-15A	Transition	Post-injection; then Quarterly in accordance with UIC Permit	• VOCs by SW8260B • Nitrate and Sulfate by E300.0 • Total and Dissolved Metals by SW6020 • TDS by SM2540C • TOC by SM5310B	• DTW • DO • ORP • EC • pH • Temperature • Ferrous iron (HACH)
MW-13	Downgradient	Post-injection; then Quarterly in accordance with UIC Permit	• Total and Dissolved Metals by SW6020 • TDS by SM2540C	• DTW • DO • ORP • EC • pH • Temperature • Ferrous iron (HACH)

Notes:

* qPCR analysis will be performed during three rounds of sampling events, including baseline sampling.

BVC = BAV1 Vinyl Chloride Reductase

Dhc = *Dehalococcoides*

DO = dissolved oxygen

DTW = depth to water

EC = electrical conductivity

MW = monitoring well

ORP = oxidation-reduction potential

TCE = tceA Reductase

TDS = total dissolved solids

TOC = total organic carbon

VCr = vinyl chloride reductase

Table 7. Inorganic analytes.

Nevada Division of Environmental Protection - Underground Injection Control Program
Baseline & Monitoring Report Form

Facility Name :	**Sampled-water origin (ft bgs TVD) :**
Facility Owner:	**County:**
NDEP UIC Permit # :	**Loc:** *Proj* *Lat* *Long*
Well No.:	**Sampler :**
Type of Well: Mon Obs Prod Inj	**Date Sampled :**

UIC Sample List 2 (Inorganic Extended) **Lab Name:**

Parameter	Units	DWS	Results	Method
total dissolved solids	mg/L	500 - 1000		Approved analytical methods can be found at the Bureau of Safe Drinking Water website https://ndep.nv.gov/water
pH	standard units	6.5 - 8.5		
chloride	mg/L	250 - 400		
fluoride	mg/L	4		
sulfate	mg/L	250 - 500		
nitrate (as nitrogen)	mg/L	10		
nitrite (as nitrogen)	mg/L	1		
aluminum	mg/L	0.05-0.2		
antimony	mg/L	0.006		
arsenic	mg/L	0.01		
barium	mg/L	2		
beryllium	mg/L	0.004		
cadmium	mg/L	0.005		
chromium	mg/L	0.1		
copper	mg/L	1.0-1.3		
lead	mg/L	0.015		
iron	mg/L	0.3 - 0.6		
magnesium	mg/L	125 - 150		
manganese	mg/L	0.1		
mercury	mg/L	0.002		
nickel	mg/L	--		
selenium	mg/L	0.05		
silver	mg/L	0.05		
thallium	mg/L	0.002		
zinc	mg/L	5		
total uranium	ug/L	30		
adjusted gross alpha*	pci/L	15		
gross beta	mrem	4		
alkalinity (CaCO3)	mg/L	-		
bicarbonate	mg/L	-		
boron	mg/L	-		
calcium	mg/L	-		
carbonate	mg/L	-		
Electrical Conductivity	umhos/cm	at 25 degC		
lithium	mg/L	-		
molybdenum	mg/L	-		
phosphorus (total)	mg/L	-		
potassium	mg/L	-		
silica	mg/L	-		
sodium	mg/L	-		
total suspended solids	mg/L	-		
turbidity	NTU	-		

Comments:

Rev 4/2019

Note: A completed UIC U230 Form is required for all UIC-related samples (produced, injected, & monitoring point waters)
Detection limits must be at least as low as primary or secondary drinking water standards where applicable.
Nevada Certified Laboratory must be used for all UIC samples, lab must be certified the method being used.
Metals shall be sampled and analyzed as total metals. Please indicate detection limit instead of stating "Non-Detect" or "ND".
When TDS is high, 200.8 can't be used. See EPA's Approved
Methods for Inorganic Chemicals and Other Contaminants at https://www.epa.gov/dwanalyticalmethods
*Adjusted gross alpha particle activity doesn't include radon and uranium activity.