From: Ken Ebbott <kebbott@fehr-graham.com>
Sent: Friday, April 26, 2019 2:14 PM
To: McKnight, Kevin - DNR
Cc: Don Gallo (dgallo@axley.com); Gary Gunderson (GG@gundersongroup.com); 'Jacqueline K. Draws'; 'Scott Barr'; Ken Ebbott
Subject: Gunderson Neenah (Goodwill Store) Report
Attachments: 14-1123 - Gunderson Neenah 2019 Vapor Assessment Scope.pdf

Kevin,

Attached is the requested reevaluation of the remedial options, with recommendations for two main tasks:

1. Pumping one pore volume (50,000 gallons estimated) of groundwater from Sump D / A to the sanitary sewer as allowed by Neenah

2. Testing subslab and indoor vapor chemistry within the building

Please review the report and let me know if you have any questions or comments.

I've copied Goodwill on the submittal- and can work out the details of the field work with them upon approval. It should be only minimally disruptive, as the majority of the groundwater removal can be staged outside.

I look forward to hearing from you. Have a great weekend!

Ken

KENDRICK EBBOTT, PG | Branch Manager
Fehr Graham | Engineering & Environmental

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FEHR GRAHAM
ENGINEERING & ENVIRONMENTAL

April 26, 2019

Mr. Kevin McKnight
Wisconsin Department of Natural Resources
625 E. County Road Y Ste. 700
Oshkosh, WI 54901-9731

RE: Re-Evaluation of Remedial Action and Project Needs, Gunderson Cleaners, 891 S. Green Bay Road, Neenah, Wisconsin, BRRTS # 02-71-467001

As requested, this letter provides a brief reassessment of the site conditions and project needs at the Former Gunderson Cleaners site in Neenah, Wisconsin (the Property).

Our most recent report dated January 10, 2019 presented the latest groundwater and soil chemistry results from the Property. The results indicate the extent of contamination has been defined, which is a requirement for obtaining case closure.

The results also indicate groundwater contaminant levels have generally been decreasing over time since the completion of the remedial excavations in 2009 and 2013. Charts and tables documenting trends in groundwater chemistry over time were provided in the January 10, 2019 submittal.

OBJECTIVE

The Wisconsin Department of Natural Resources (WDNR) has requested that additional remedial actions be evaluated per NR 722 to evaluate the need for further contaminant reduction. The concern is that the existing vapor mitigation system should not be considered a long-term remedy for protection of human health and the remedial actions at the site should eliminate risks to the extent practical.

In consideration of the WDNR position regarding closure potential, this report presents a proposal for additional groundwater remediation, plus completion of actual chemical monitoring of the subslab vapors, to evaluate whether the perceived vapor risk to building occupants is present.

PROJECT BACKGROUND

The site is in a predominantly commercial area south of Highway 114, west of South Green Bay Road, and east of an exit ramp for U.S. Highway 41.

A former, approximately 70,000 square foot, multi-tenant strip mall building was present on the Property. Gunderson Cleaners was a tenant in the strip mall and operated a drycleaner that utilized tetrachloroethene (PCE) as the drycleaning solvent from approximately 1973 to 1992.

The eight-acre parcel that formerly housed the strip mall and the Gunderson Cleaners operation has been redeveloped. In 2010, the parcels were divided into four lots, with a CVS pharmacy constructed on the northeast corner lot in approximately 2011 (901 South Green Bay Road), a Kwik Trip convenience store and gas station constructed on the

northwest corner lot in approximately 2012 (903 South Green Bay Road, Lot 1 of CSM # 6517), and a Goodwill store constructed in 2013 on the subject property (Lot 2, CSM # 6517, 905 South Green Bay Road). The southern parcel of the original development (Lot 3, CSM # 6517) was developed in 2016 as an Aldi grocery store.

ENVIRONMENTAL INVESTIGATION

An extensive soil and groundwater investigation was completed at the Property. Soil and groundwater results, combined with the additional wells installed in 2018 and documented in the Fehr Graham January 10, 2019 report, document that the extent of contamination in soil and groundwater has been defined (Figure 1).

Chlorinated Volatile Organic Compounds (CVOCs) detected in the soil and groundwater include PCE, trichloroethene (TCE), cis 1,2-dichloroethene (cis 1,2-DCE), and vinyl chloride (VC).

Based on the chemistry results, there were three areas on the property that appear to have had significant releases of PCE. These areas include the former drycleaning machine/storage tank area inside the building, the western rear door of the former building, and the western property fence line. Levels of CVOCs were highly elevated and concentrations in investigation borings and remediation test samples ranged up to 17,000 mg/kg PCE in soil (B-22, 3.5-4') and up to 100,000 ug/l (TW-3, TW-6, TW-35) in groundwater. These locations are shown on previously submitted site investigation reports.

During redevelopment negotiations prior to demolition of the strip mall building, Goodwill entered the voluntary party liability exemption (VPLE) program with the WDNR, with the expectation that prior to construction of the Goodwill building, remediation would take place to address the most contaminated material. Upon demonstration that the site conditions are suitable, the case will be closed with a VPLE Certificate of Completion.

GEOLOGY AND HYDROGEOLOGY

The site is generally flat-lying and most of the property gently slopes to the east toward Green Bay Road. Drainage west of the building slopes gently to the west and south to a small marshy area and a drainage ditch that directs surface water flow to the south.

The geology has been summarized in previous submittals. The excavation extended to a depth of up to 18 feet beneath the building and was backfilled with compacted quarry screenings for construction support purposes.

The native deposits have been mapped as till, described as gray silty clay, deposited by the Green Bay Lobe ice advance. Bedrock consists of sandstone and slopes from west to east, with shallow bedrock at approximately 12 to 18 feet present on the west part of the Property, sloping to approximately 35 feet on the eastern part of the Property.

The depth to water across the site is typically five to ten feet with flow trending to the east. Shallow water table wells typically have a low hydraulic conductivity while the bedrock surface generally displays a weathered surface that has higher yields of water. Deeper

bedrock (sandstone) materials can be permeable or less permeable depending on cementation and fractures.

Results from the new well nest installed on the Property northeast corner in 2018 (PZ-123/PZ-124) indicates a strongly upward vertical hydraulic gradient in the bedrock/contact with bedrock. Nested wells on other parts of the Property display flat or slightly downward hydraulic gradients.

COMPLETED REMEDIAL ACTIONS

Soil remediation activities included removal and recycling/landfill disposal of 5,303 tons of soil contaminated with Volatile Organic Compounds (VOCs). Soil was excavated in two phases, with 2,353 tons removed in September 2009 and an additional 2,950 tons removed in May through July 2013 (Figure 2). Water entered the excavation when the contact with the bedrock was made at approximately 18 feet, and total excavation depths extended up to 24 feet below grade. To allow for backfilling, groundwater was pumped from the excavation so fill could be placed. The pumped water, and additional recovered water from the sumps installed in the excavation, were treated at the site using activated carbon. An estimated 38,000 gallons of water were removed from the 2013 excavation area and Sumps A and D, treated with carbon, and discarded in the sanitary sewer.

Further excavation at the time of the 2009 and 2013 excavations was not possible due to obstructions, depth limitations (limited backhoe reach), infiltrating groundwater, the construction timeframe for the new Goodwill building, and economic limitations.

After the excavation in 2013, the site was backfilled with 1.5-inch diameter clear stone fill and compacted quarry screenings. Compaction to a 95 to 98 percent proctor was documented and the new Goodwill Industries building was immediately constructed over the excavated area.

Remaining contamination following the remedial excavations in 2009 and 2013 indicate saturated soil and groundwater persists beneath and along the edges of the previous excavation. Contamination beneath the Goodwill building in saturated soil from depths of 12 to 24 feet below grade ranges up to 189 mg/kg.

Although not all contamination could be removed, reductions in the groundwater chemistry from site monitoring wells and sumps are dramatic. Post-excavation groundwater results from 2018 indicate the most elevated levels of PCE in the remaining groundwater from Sump A and Sump D contains approximately 1,000 to 2,000 ug/l. Since pre-excavation results ranged up to 100,000 ug/l at several locations and on several sample events, the removal of soil and saturated soil has resulted in up to 99% removal of contaminants.

EXISTING VAPOR MITIGATION SYSTEM

Because of presence of remaining contamination in the groundwater beneath the building, a subslab depressurization system (SSDS) was installed during construction of the roughly 20,000 square foot Goodwill building.

The vapor mitigation system consists of two roof-mounted fans installed on six separate piping systems installed beneath the building floor. Each fan and piping layout is designed to capture vapors from an approximately 3,000 to 6,000 square foot area beneath the building. The subslab system components include approximately eight inches of clear stone overlain by filter fabric and a 20-mil vapor barrier. Piping within the stone consists of 4-inch field perforated Schedule 30 PVC connected to 6-inch diameter Schedule 40 PVC laterals that run to the vertical 6-inch PVC risers (Figure 2).

The vapor mitigation system has two U-tube manometers and seven subslab vapor monitoring probe points consisting of steel pipes installed through the vapor barrier into the gravel. The probes are housed in flush-mounted, water-tight 4-inch PVC sewer covers and are located at various locations throughout the building footprint (Figure 2). The system was monitored for function upon installation on four occasions in 2014 through 2019 by monitoring the induced vacuum at the subfloor monitoring probes using a digital manometer.

Measurements indicate excellent communication beneath the floor of the building. Suction readings displayed by the U-Tube manometers installed on the vertical extraction pipes indicate approximately 1.0 to 1.5 inches of water column is being drawn. Induced vacuum levels of 0.7 to nearly 1.0 inches of water column have been noted in the subfloor when the vapor fans are operating, indicating the SSDS is functioning effectively to eliminate the potential migration of contaminated subslab vapor into the building. The vapor system is frequently checked by Goodwill maintenance staff by observation of the U-tube manometers to verify the fans are operating, and records are retained at the site.

However, no chemical subslab vapor testing has been completed at the Property, only physical communication testing.

VAPOR CHEMISTRY

Based on WDNR procedures specified in RR-800, the observed concentration of PCE and related degradation products TCE and VC in groundwater beneath the building theoretically should not result in the detection of contaminants in the indoor building air.

Calculated Groundwater to Indoor Air Concentrations

The WDNR Guidance entitled "Addressing Vapor Intrusion on Remediation and Redevelopment Sites in Wisconsin" (RR-800, January 2018) includes an equation that provides a method to calculate groundwater contaminant concentration that can be present and not pose a risk to building occupants under various building and use scenarios.

Using the constants provided for the migration of vapor from groundwater at an industrial and large commercial building, the concentration of PCE, TCE, and VC that can be present in groundwater beneath a building and not pose a theoretical risk of vapor migration are 10,112 ug/l for PCE, 746 ug/l for TCE, and 507 ug/l for VC. As shown in previous submittals, the groundwater chemistry beneath the building, as measured at Sump A and Sump D, has never exceeded these levels, and has generally been more than an order of magnitude lower than these calculated threshold values.

However, the WDNR Guidance also indicates that for the compounds PCE and TCE, chemical vapor sampling should be conducted if the levels of these compounds in groundwater exceed NR 140 Enforcement Standards (which is 5.0 ug/l for both PCE and TCE). So, despite the observed theoretically acceptable levels of PCE and TCE in the sub-building groundwater, testing of the actual concentration of PCE, TCE, and VC in the subslab building air should be completed to confirm the findings.

Site Specific Attenuation Factor

The WDNR Guidance on vapor migration (RR-800) includes Table 6a that provides default vapor migration attenuation factors. The default attenuation factor for the migration of subslab vapor to indoor air is 0.01 for a large commercial building, such as the Goodwill Building.

However, the Goodwill Building is new, with a thick vapor barrier, and an engineered subslab vapor mitigation system in place. Assessment of the actual subslab to indoor air attenuation factor may demonstrate that a higher attenuation factor is more appropriate for this structure. Evaluation of the actual building attenuation factor can be calculated using either DCE or radon as a tracer gas. The ratio of these compounds in the indoor air and subslab provides the site-specific attenuation factor.

POTENTIAL REMEDIAL ACTION OPTIONS

Options for further remediation have been considered and include the following:

1) Injection/addition of oxidizers to chemically destroy remaining contamination

2) Injection/addition of chemicals to enhance natural attenuation of PCE via reductive de-chlorination and microbial action

3) Physical removal of contaminated groundwater

Key items related to these approaches for the Gunderson Cleaners situation are provided below.

Oxidizer Addition

This approach requires contact between the oxidizing chemicals, such as permanganate and persulfate, and the contaminant of concern, so that destruction of the contaminant can occur. These short-lived reactions (days to months) typically eliminate the contaminant of concern via oxidation, with complete destruction.

The difficulties associated with use of oxidizers at the site include:

- Cost - both the chemical and the delivery processes are expensive, based on preliminary quotes, running more than $100,000 for proper treatment

- Repeated treatments are often necessary, as the initial treatment may temporarily succeed, but rebound can occur

- Obtaining adequate contact between the chemical and the contaminants. The remaining contamination lies beneath the Goodwill building and contact of the chemical with the contaminant will require installation of a grid of closely spaced direct push borings advanced through the building floor. It is not likely Goodwill will be supportive of this approach, due to building damage, and disruption to store operations (the store is open daily).

- Safety – handling of liquid oxidizing compounds with injection under pressure can be hazardous. Work in the building would need to be limited to after-hours operations, further adding to cost pressure.

Reductive De-chlorination/Microbial Attenuation

This approach requires altering the geochemical conditions in the subsurface to optimize degradation of the contaminant via natural microbial processes. The destruction of PCE occurs via co-metabolism by organisms that require reducing conditions to survive.

The difficulties associated with use of degrading compounds at the site are similar to problems identified under the oxidation approach, as direct contact is important to success. These include:

- Cost - both the chemical and the delivery processes are expensive, based on preliminary quotes, running more than $100,000 for proper treatment

- Repeated treatments are often necessary, as the initial treatment may temporarily succeed, but rebound often occurs

- Obtaining adequate contact between the chemical and the contaminants. The remaining contamination lies beneath the Goodwill building and optimizing the geochemical conditions beneath the building will require injection over a closely-spaced network of geoprobe borings advanced through the building floor. It is not likely Goodwill will be supportive of this approach, due to building damage, and disruption to store operations (the store is open daily)

- Time – demonstration of success using degradation and microbial processes can take a year or longer for success, with follow-up monitoring needed to document contaminants levels will not rebound to pre-injection levels

- Work in the building would need to be limited to after-hours operations, further adding to cost pressure

- Degradation of the organic contaminants and other compounds typically used in reductive dichlorination approaches may result in the generation of methane. Methane gas accumulation is expected to be vented to the outside by the operating subslab vapor mitigation system but creation of high levels of methane gas beneath a structure can be dangerous and may require modification to the vapor mitigation system (explosion-proof fans, back-up of the fan)

Physical Removal of Contaminated Groundwater

This approach involves pumping and disposal of water from areas where high concentrations of residual contamination persist. Removal of contaminated groundwater eliminates residual contaminant mass, and with mass removal, groundwater chemistry results should display declining concentrations over time. Pumping and treatment can be completed on a continuous basis, or on an intermittent, batch basis on an as-needed basis over time. Sump D, installed in the backfill of the 2013 remedial excavation, is a four-inch diameter PVC pipe that extends 20 feet below grade and 20 feet beneath the building, and previous groundwater removal from Sump D indicates it can provide high yields of water when pumped.

The difficulties associated with physical removal include:

- Minimal mass removal
- Can be expensive, depending on duration and requirements for disposal/treatment
- Potentially long-duration approach
- Site disruption that can be minimized to some extent by proper operations

CONCLUSIONS

Based on the site conditions, the following conclusions have been reached:

1) The completed remedial actions have been highly effective in reducing the contaminant levels in groundwater, with up to 99 percent reduction observed, yet PCE concentrations in groundwater beneath the building persist at approximately 1,000 ug/l PCE.

2) The extent of contamination in soil and groundwater appears generally limited to the Property and is defined horizontally and vertically.

3) Contaminant trends in groundwater over time continue to improve as a result of the remedial excavation efforts.

4) The existing vapor mitigation system is highly effective in physical control of subsurface vapor entry to the Goodwill Building.

5) No chemical subslab vapor testing has been completed beneath the Goodwill Building. Theoretical calculations using procedures provided in WDNR guidance indicate the observed levels of remaining PCE, TCE, and VC in groundwater should not result in an elevated concentration in the indoor building air. WDNR guidance also indicates testing should be performed to document actual concentrations when PCE and TCE exceed their NR 140 Enforcement Standard levels in sub-building groundwater.

6) The default vapor attenuation factor used for assessment of subslab vapor to indoor air migration may be overly conservative for this new structure with an engineered vapor barrier system in place.

7) Further reduction of residual soil and groundwater contamination will not be easily addressed in a cost-effective manner. Batch removal of contaminated groundwater from beneath the building via Sump D is proposed as a method for removal of residual contaminants.

RECOMMENDATIONS

The following recommendations are proposed as Tasks, with costs identified on Table A:

Task 1: Groundwater Pumping and Disposal, Testing

Further removal of contaminant mass is proposed via batch removal of contaminated groundwater from beneath the building at Sump D. In addition, some water removal may be completed at Sump A, but yields are anticipated to be significantly lower, based on the 2-inch diameter of Sump A, and the smaller and shallower excavation dimensions.

Assuming a 30 percent porosity in the saturated backfill from the 2013 remedial excavation, one pore volume of water from the excavation dimensions totals roughly 50,000 gallons (35' by 45' excavation volume, 14' thickness of water column) (20' total depth to 6' depth to water). Removal of a targeted volume of 50,000 gallons of water via pumping from the 4-inch diameter Sump D should be completed. The mass of VOCs removed in 50,000 gallons of water containing roughly 1,000 ug/l of VOCs total 0.5 pounds.

Pumping at approximately 30 to 50 gallons per minute will be completed over the course of approximately three to five days, with disposal to an existing sanitary sewer access point off the northeast corner of the Goodwill Building. Most of the recovered groundwater will be from Sump D, located outside. Hoses for discharge will remain outside the building. A low angle ramp and warning cones/signage will be used to safely direct pedestrian traffic over the estimated 2-inch diameter discharge hose, which must be placed across two entries to the building.

Disposal approval has been obtained from the City of Neenah and the wastewater treatment plant, at reasonable rates. Sampling of the groundwater from Sump A and Sump D will be performed both before and after pumping to assess changes in the groundwater chemistry.

Task 2: Sub-Slab Vapor Chemical Sampling

Chemical testing of the subslab vapors of the Goodwill Building should be completed. There is currently no subslab vapor chemistry data, only pressure field extension test data.

Prior to testing, the operating subslab vapor mitigation system should be shut down for 24 to 48 hours so conditions can equilibrate. Four subslab vapor samples are proposed for

retention, from the existing floor penetration sample probes located at VP-1, VP-2, VP-4, and VP-6 (Figure 2). Typical sampling procedures will be used, with shut-in testing of the integrity of the tubing connections and water dam seal of the floor penetration. All four samples will be 30-minute grab samples retained using a 6-liter summa canister. Analysis will be conducted for the short list of CVOCs (PCE, TCE, cis-DCE, trans-DCE, and VC).

Task 3: Indoor Air Vapor Chemical Sampling

Simultaneous with the subslab testing, the indoor air and outdoor air will be sampled for chemical analysis. The indoor air will be sampled from the breathing height at the same four building locations (VP-1, VP-2, VP-4, and VP-6, Figure 2) using a 6-liter summa canister with an 8-hour integrated sampler. For background control purposes, testing of one ambient outside sample will also be obtained, from the upwind direction, using the same methods (6-liter canister, 8-hour sampler). Analysis will be conducted for the short list of CVOCs. After testing is complete, the subslab vapor mitigation system fans will be restarted.

Task 4: Data Evaluation and Interpretation

Upon completion of Tasks 1 through 3 above, the data will be evaluated and interpreted. Comparison of the subslab and indoor air results to the WDNR threshold values will be made using the default attenuation factor of 0.01 for this size and type of structure. If the results allow (*i.e.*, detectable concentrations are present), a site-specific attenuation factor will be calculated for the building using DCE concentrations in the subslab and indoor air.

An email report will be prepared that documents the findings.

POTENTIAL RESULTS AND REMAINING PROJECT ACTIVITIES

1) Following the removal of 50,000 gallons of groundwater from the remedial excavation, it is expected the post-pumping groundwater chemistry will be somewhat improved over pre-pumping concentrations. After six months, we will obtain one final round of groundwater samples from all the site wells, sumps, and piezometers to evaluate the final site groundwater chemistry in anticipation of pursuit of closure. Budget for this task has previously been approved.

2) Following the initial assessment of the subslab and indoor vapor chemistry, we anticipate there will be a need to either continue operation of the subslab venting system indefinitely or complete further chemical assessment of the vapors.

   If the initial results indicate the subslab vapors exceed levels that pose a risk, no further testing will be conducted and continued operation of the highly effective subslab vapor system will be planned.

   If the subslab vapor results indicate no concentrations of elevated vapors are present beneath or inside the building, we will recommend the subslab vapor extraction system continue to be shut down for a month, followed by retesting of the subslab vapors. Further budget will be needed to perform this sampling. After

the second round of testing has been completed, the subslab venting system will be turned back on, pending receipt of the laboratory analytical results.

If the second round of subslab results also display no elevated vapor migration risk, we believe the site conditions (source removal, declining groundwater concentrations, no significant risks to receptors) support pursuit of case closure.

If the testing reveals that subslab vapors pose a theoretical risk of exposure to building occupants, we will discuss with the WDNR whether calculation of a site-specific attenuation factor should be calculated for the building. The Goodwill building is newly constructed and has an excellent subslab vapor mitigation barrier in place, which likely exceeds the level of protection assumed in the WDNR default attenuation factor value of 0.01.

If the actual attenuation factors can be documented to reduce migration of subslab vapors into the building, levels of CVOCs in the subslab vapor may never enter the structure due to the integrity of the floor/vapor barrier.

The initial testing that we have proposed in Tasks 2 and 3 above may provide for determination of a site-specific attenuation factor, as the concentration of DCE in the subslab and indoor air can be used for this purpose. However, DCE often isn't present in indoor air samples at detectable concentrations, making calculations difficult. An alternate approach would be to obtain measurements of radon gas concentrations in the indoor and subslab air, which can then be used to evaluate a site-specific attenuation factor. A radon field meter can be used to evaluate the subslab vapor concentration at the floor penetrations and the indoor air at the breathing height at those same locations, with the subslab vapor mitigation system shut off.

BUDGET

The cost for pumping and removal of one volume of groundwater from Sump D (50,000 gallons) and obtaining one round of indoor and subslab vapor samples, with interpretation, is attached as Table A and Change Order # 5, which totals $12,295, made up of $9,845 in consultant costs and $2,450 in laboratory charges.

These costs might be eligible for reimbursement under DERF, subject to the DERF program maximum reimbursement amount. With this Change Order the total approved funds for the site total $567,770. Approved funds already exceed the program maximum amount of reimbursement of $500,000 ($536,000 in charges less the applicable program deductibles). However, billed and claimed costs have not yet been submitted that exceed the program maximum. In addition, some previously approved charges might not move forward as planned, or other charges might not be considered fully eligible for reimbursement, so approval of the funds per the DERF process is requested as a cautionary measure.

I trust this information meets your needs and look forward to hearing from you regarding this plan of action.

Sincerely,

Kendrick A. Ebbott, P.G.

Attachments: Figure 1: Groundwater Chemistry August 23, 2018
Figure 2: Proposed Groundwater Recovery and Vapor Sampling Locations
Table A: Cost Estimate
DERF Change Order # 5

Cc: Mr. Don Gallo, Axley, Brynelson, via email only
Mr. Gary Gunderson, Gunderson Cleaners, via email only
Ms. Jackie Draws, Goodwill Industries, via email only
Mr. Scott Barr, McCarty Law, via email only

O:\Gunderson Cleaners\14-1123 Neenah\GUN-2008-01 Neenah from F drive\Reports\2019 02 20 Vapor Assessment Recommendation\Gunderson Neenah 2019 Vapor Assessment Scope.docx

Figures and Tables

PZ124
CVOC ND

PZ123
CVOC ND

PZ121
TCE 0.36
cis *20.5+*

PZ108
NOT SAMPLED

11/19/18**
PCE ***7.4++***
TCE *2.4+*
PZ104

PCE ***7.4++***
TCE ***33.4++***
cis *17.1+*
PZ109

PZ110
NOT SAMPLED

PZ120
NOT SAMPLED

PZ118
NOT SAMPLED

MW103
VOC ND

MW115
PCE *1.6+*
TCE ***5.1++***
cis *22.0+*
trans 1.8

MW117
NOT SAMPLED

PZ122
PCE ***11.6++***
TCE ***16.1++***
cis 3.8

MW105
PCE *4.5+*
TCE ***18.7++***
cis *11.2+*

PZ107
PCE ***75.5++***
TCE ***94.1++***
cis *16.5+*
VC ***0.26++***

MW114
PCE *3.4+*
TCE *3.2+*
cis 3.9

SUMP D
PCE ***1,250++***
TCE ***39.4++***
cis 5.0

MW116
PCE ***190++***
TCE ***6.9++***
cis 1.4

SUMP B
PCE ***17.3++***
TCE ***12.6++***
cis 5.2
VC ***0.60++***

SUMP A
PCE ***773++***
TCE ***23.9++***
cis 4.0

SUMP C
PCE ***48.8++***
TCE ***13.1++***
cis 5.2
VC ***1.0++***

MW112
NOT SAMPLED

PZ112
PCE ***32.0++***
TCE ***9.7++***
cis *7.8+*
VC ***1.5++***

PZ125
CVOC ND

MW113
NOT SAMPLED

5
10
100
1000

LEGEND

- MONITORING WELL / PIEZOMETER
- MONITORING SUMP
- GROUNDWATER FLOW DIRECTION

6/11/15	SAMPLE DATE
PCE	TETRACHLOROETHENE (ug/L)
TCE	TRICHLOROETHENE (ug/L)
cis	cis-1,2-DICHLOROETHENE (ug/L)
VC	VINYL CHLORIDE (ug/L)
CVOC	CHLORINATED VOLATILE ORGANIC COMPOUNDS
VOC	VOLATILE ORGANIC COMPOUNDS
ND	NO DETECT

ITALICS+	EXCEEDS NR140 PREVENTIVE ACTION LIMIT (PAL)
BOLD++	EXCEEDS NR140 ENFORCEMENT STANDARD (ES)
ITALICS/BOLD++	EXCEEDS BOTH PAL & ES
	ESTIMATED EXTENT OF PCE CONTAMINATED GROUNDWATER
	ESTIMATED EXTENT OF TCE CONTAMINATED GROUNDWATER

**NOTE: WELL PZ-104 SAMPLED 11/19/18

N W E S

100 0 100
GRAPHIC SCALE IN FEET

FEHR GRAHAM ENGINEERING & ENVIRONMENTAL
ILLINOIS IOWA WISCONSIN

FORMER GUNDERSON CLEANERS
891 S. GREEN BAY RD.
NEENAH, WI 54956

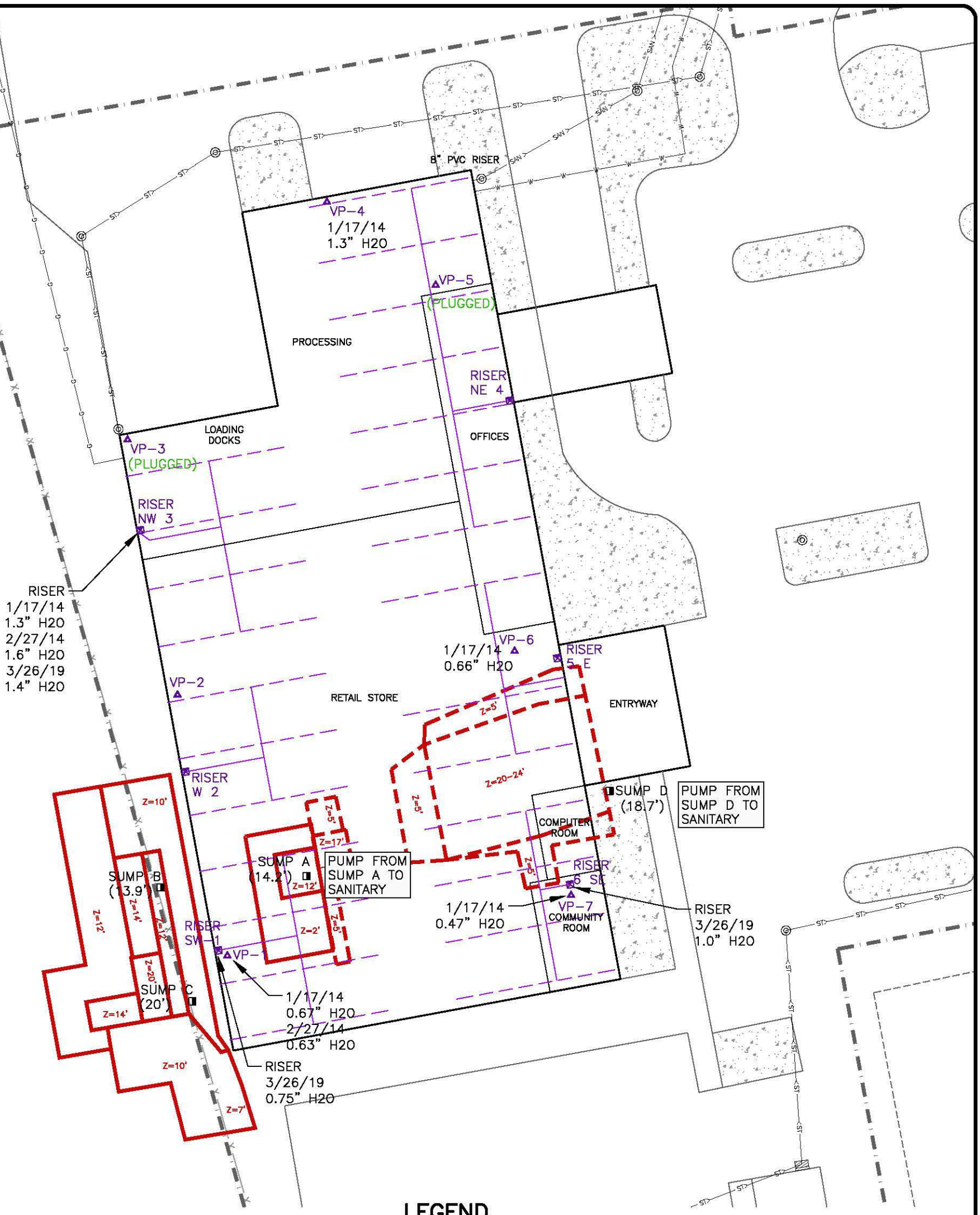
DRWN: MKH DATE: 05/23/17 APPD: KE

TITLE:
GROUNDWATER CHEMISTRY AUGUST 23, 2018

BRRTS: 02-71-467001
JOB NO.: 14-1123
PLOT DATE: 1/3/19

FIGURE: 3

G:\C3D\14\14-1123 Gunderson-Neenah\Exhibits\14-1123_BASE MAP.dwg, GW CHEM_8.23.18



LEGEND

- REMEDIAL EXCAVATION SAMPLING SUMP & DEPTH (FEET)
- SUB-SLAB VAPOR SAMPLING POINT
- EXTRACTION SYSTEM VERTICAL RISER TO ROOF MOUNTED FAN
- 6" SUB-FLOOR LATERAL
- 4" PERFORATED PIPE BEDDED IN STONE
- Z=1' 2009 EXCAVATION OUTLINE & DEPTH
- Z=1' 2013 EXCAVATION OUTLINE & DEPTH
- 3/26/19 READING DATE
- 1.0" H2O RECORDED INDUCED VACUUM

NOTE: READINGS TAKEN ON 1/17/14 WERE TAKEN BY INSTALLATION CONTRACTOR – AMERICAN RADON REDUCTION 2/27/14 & 3/26/19 READINGS WERE TAKEN BY FEHR GRAHAM

N W E S

20 0 20
GRAPHIC SCALE IN FEET

FEHR GRAHAM ENGINEERING & ENVIRONMENTAL
ILLINOIS IOWA WISCONSIN

FORMER GUNDERSON CLEANERS
891 S. GREEN BAY RD.
NEENAH, WI 54956

DRWN: MKH DATE: 05/23/17 APPD: KE

TITLE:
PROPOSED GROUNDWATER RECOVERY & VAPOR SAMPLING LOCATIONS

BRRTS: 02-71-467001
JOB NO.: 14-1123
PLOT DATE: 4/22/19

FIGURE: 2

G:\C3D\14\14-1123 Gunderson-Neenah\Exhibits\14-1123_BASE MAP.dwg, PROP VAPOR SMPL

Table A: Cost Estimate: Gunderson Neenah DERF Site April 22 2019

Consult and Contractor: Groundwater Batch Removal and Subslab / Indoor Vapor Testing, Data Evaluation, Reporting, Project Management

Former Gunderson Cleaners, 891 S Green Bay Road, Neenah, WI
Prepared April 22 2019

ITEM DESCRIPTION	Unit Price	Quantity	Units	Total Cost
CONSULTING SERVICES				
Task 1: Groundwater Pumping and Disposal, Testing				
Rent Pump, Hoses, Pump 50,000 gal to WWTP at 20 to 30 GPM				
Sr. Hydrogeologist	$90.00	8	hour	$720.00
Sr. Tech. Pumping Oversight, Sample	$65.00	50	hour	$3,250.00
Sr. Tech - Sample Ship	$65.00	2	hour	$130.00
Pump Rental, Hoses, Valve	$450.00	1	week	$450.00
Safety Cones and ramping Hose overpass	$100.00	2	lump	$200.00
Water Disposal Approval	$200.00	1	lump	$200.00
Water Disposal per 1000 gal	$3.19	50	1000 gal	$159.50
Field Supplies - Expendables	$15.00	5	days	$75.00
Subtotal Task				***$5,184.50***
Task 5V: Vapor Monitoring Subslab and Indoor: Plan Approval and Field Sampling				
Test Subslab and Indoor Air at 4 existing subslab probes (8 hour indoor air samplers)				
Sr. Hydrogeologist	$90.00	4	hour	$360.00
Sr. Tech. Sample	$65.00	12	hour	$780.00
Sr. Tech - Logs, Forms, Sample Ship	$65.00	4	hour	$260.00
PID	$75.00	1	day	$75.00
Field Supplies - Expendables	$15.00	1	day	$15.00
Subtotal Task				***$1,490.00***
Task 13V: Data Evaluation and Interpretation				
Pumping chemistry and vapor results to DNR, Interpretation, email transmittal. If second phase Field will need additional budget				
Sr. Hydrogeologist/ Engineer	$90.00	16	hour	$1,440.00
Sr. Technician	$65.00	16	hour	$1,040.00
Drafting	$55.00	10	hour	$550.00
Administrative	$35.00	4	hour	$140.00
Subtotal Task				***$3,170.00***
CONTRACTOR COSTS				
Task 1: Vapor Monitoring Subslab and Indoor				
Four Subslab, Four Indoor, One Ambient, lab				
Laboratory				
Vapor Canister and Regulator Rental	$50.00	9	each	$450.00
Laboratory Analysis CVOCs	$200.00	9	each	$1,800.00
Subtotal Lab				**$2,250.00**
Task 1: Groundwater Pumping and Disposal, Testing				
Four Water Samples Before and After Pumping				
Laboratory				
Laboratory Analysis VOCs	$50.00	4	each	$200.00
Subtotal Lab				**$200.00**

TOTAL CONSULTANT	Total Consultant	$9,844.50
TOTAL CONTRACTORS		$2,450.00
TOTAL		**$12,294.50**

CHANGE ORDER # 5 - GW Pumping and Vapor Sampling 2019

Gunderson Cleaners Facility, 891 S. Green Bay Road, Neenah, WI

ITEM DESCRIPTION	Total Addl Cost		Prior Appvd Cost		Total Budget
			SI COST		**SI COST**
Site Investigation Prior Budget Consulting and Contractor					
Subtotal Task	$0		$96,488		$96,488
			RA COST		**RA COST**
Consultant Remedial Action Prior Budget					
Subtotal Task - See Detail Below	$9,845		$121,139		$130,984
Contractor Remedial Action Prior Budget					
Subtotal Task - See Detail Below	$2,450		$337,848		$340,298
			$555,475		

ADDITIONAL REQUESTED SERVICES - REMEDIAL ACTION	Additional Cost
CONSULTANT SERVICES	
Task 1: Groundwater Pump and Disposal, Test (one event)	$5,185
Task 5V Vapor Monitoring Subslab and Indoor	$1,490
Task 13V Data Evaluation and Interpretation, Email Report	$3,170
Total Additional Consulting	**$9,845**
CONTRACTOR SERVICES	
Task 1: Groundwater Pump and Disposal, Test (one event)	
Lab Analysis VOCs GW Before and After	$200
Lab Analysis Vapor 8 locations plus Ambient CVOCs	$2,250
Total Additional Contractor	**$2,450**

TOTAL REQUESTED ADDITIONAL COST	**$12,295**				**TOTAL SI + RA COST**
TOTAL REQUESTED ADDITIONAL FUNDS	**$12,295**		$555,475		**$567,770**

TOTAL REMEDIAL ACTION BUDGET (Excludes SI)		
	Consulting	$130,984
	Commodity	$340,298
	TOTAL	**$471,282**

Gunderson Cleaners Inc. approves of the site remediation costs described above and authorizes Fehr Graham to proceed with these activities. Fehr Graham shall not exceed any of these costs without receiving written authorization. The terms and conditions of the original contract for this project will apply to these services.

Gunderson Cleaners, Inc. Date

This approval does not guarantee the reimbursement of costs. Final determination regarding the eligibility of costs will be determined at the time of claim review.

Mr. Kevin McKnight, WDNR Date

Kendrick A. Ebbott

Mr. Kendrick A. Ebbott, Fehr Graham 4/22/2019 Date