19 WASHINGTON STREET
SHERBORN, MASSACHUSETTS 01770

May 31, 2106

Mr. Stefan C. Sokol, LSP
Senior Project Manager
Groundwater & Environmental Services, Inc.
364 Littleton Road, Suite 4
Westford, MA 01886

RE: Draft Phase III Remedial Action Plan
General Chemical Corporation (GCC)
133 Leland Street, Framingham, MA
RTN 3-19174
ACO-NE-14-3R001

Dear Mr. Sokol:

The Town of Sherborn (Town) Board of Selectmen (BOS) respectfully submits the following comments regarding the GES Draft Phase III Remedial Action Plan Review dated February 15, 2016. GES prepared the Draft Phase III document on behalf of General Chemical Corp. (GCC) and Trinity General Corp. (Trinity) as required by the Massachusetts Contingency Plan (MCP) and the Massachusetts Department of Environmental Protection (MassDEP) pursuant to the existing Administrative Consent Order (ACO) ACO-NE-14-3R001, with an effective date of March 26, 2014.

The BOS is most concerned and focused on the goal of protecting the Sherborn groundwater which serves as the sole source of potable water in our Town. The draft Phase III Remedial Action Plan does not set the necessary protective target goals at GW-1 which would best protect Sherborn groundwater from the contaminated GCC site. The contaminated groundwater from the GCC site is migrating toward Sherborn as potable wells in our town show signs of being impacted by the chemicals of concern found at GCC.

In addition, the MWRA aqueduct should also meet the GW-1 standards. The aqueduct, an emergency drinking water supply and last used in 2010, passes through the heart of the GCC plume. It is a potential pathway for contamination and may very likely place nearby residences at risk of vapor intrusion and/or drinking water contamination.

Furthermore, the cleanup proposal standards do not take into consideration the minimum non-detect of volatile organics requirement of the Sherborn Board of Health Domestic Water Supply Regulation that all residential non-public supply wells must meet.

The ongoing debate about whether or not the bedrock is impacted is frivolous and irresponsible. The current conclusion by GES that the Sherborn bedrock is not impacted by the GCC contamination is much too risky and very likely wrong. Sherborn has no alternative for drinking water. Therefore, it is requested that GCC in GCC install three deeper (perhaps 50 to 75 feet into bedrock) bedrock sentry wells (continuously cored) in the Town of Framingham (Figure 2). The purpose of "sentry" wells would be to act as an early warning detection system, as well as to provide additional characterization of deeper bedrock impacts. This will settle several site issues such as:

a) further clarifying whether or not the fracturing at the top of bedrock is more prevalent than deeper in the rock,
b) providing a better understanding of bedrock vertical gradients,
c) providing an early warning sentry system for Sherborn that will not require entering individual households in Sherborn each time;
d) providing additional information about fracture orientation and fracture aperature.

In summary, the BOS believes that the Draft Phase III document as proposed does not provide the minimum protection that is necessary to ensure that the drinking water remains safe for all residents of Sherborn. We appreciate the opportunity to comment on the Phase III plan and request that these comments are reviewed, considered and incorporated into the final expanded action plan so that an appropriate cleanup for all impacted communities is expedited.

Very truly yours,

Michael Giaimo
Chairman

Paul R. DeRensis
Vice Chairman

Charles Yon
Clerk

Mark Brandon
Selectman

Sean Killeen
Selectman

Board of Selectmen, Town of Sherborn

cc: Sherborn Board of Water Commissioners
Sherborn Board of Health
Sherborn Conservation Commission
Robert Halpin, Town Manager, Town of Framingham
Framingham Board of Health
Natick Board of Health
Steve Johnson, Bureau of Waste Site Cleanup, MassDEP - NERO
Rodene Lamkin, Bureau of Waste Site Cleanup, MassDEP -NERO

EXECUTIVE SUMMARY

All residents, visitors and workers in Sherborn rely solely on the groundwater for potable water (drinking, bathing, washing and recreation). The following comments of Phase III: Identification, Evaluation, and Selection of Comprehensive Remedial Action Alternatives and the Remedial Action Plan are to ensure that the Sherborn groundwater is protected from the contamination emanating from General Chemical Corporation in Framingham. The purpose of Phase III is to assess and select a cleanup plan. Sherborn is working collaboratively with the Town of Framingham and utilizing the same consultant, TRC Environmental, in order to leverage the consultants' long history and knowledge of the GCC site.

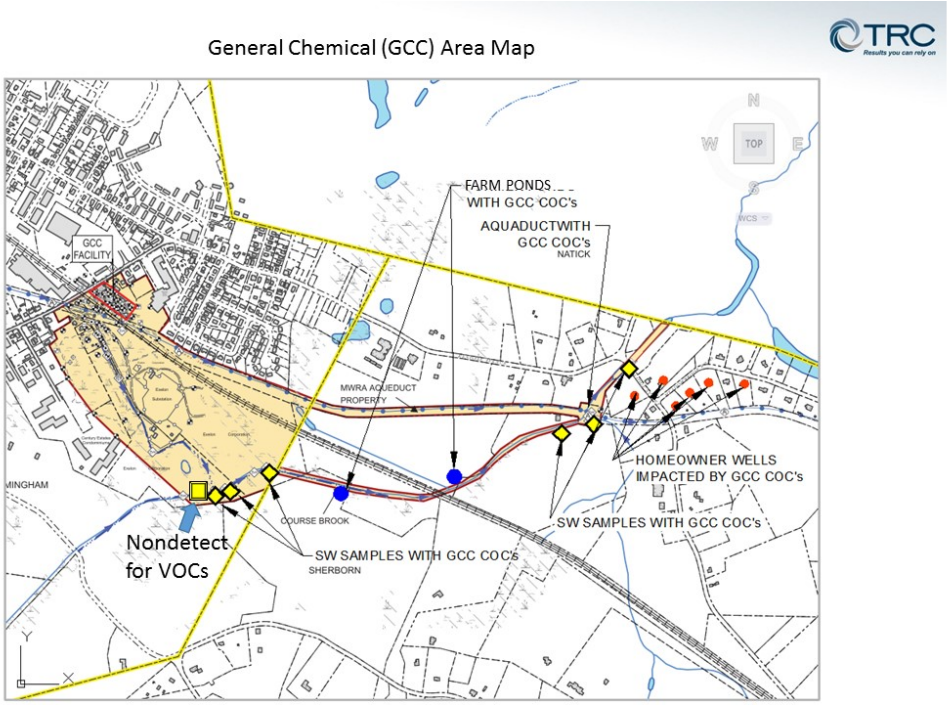
The area of concern in Sherborn downgradient of the GCC Site included: Course Brook, the MWRA aqueduct, Meadowbrook Road, Coolidge Street, Kendall Avenue, Perry Street and Prospect Street. In addition, the downgradient movement includes adjacent areas of Natick. There are approximately 29 homes in the area of concern and an additional 124 proposed units in two developments (The Fields at Sherborn and Coolidge Crossing) in the process of discussion and review by the town. These new developments will very likely have a significant groundwater demand, approximately 500 – 600gpm), which will exert a large cone of influence and promote accelerated contaminant migration. The MWRA aqueduct, a potential pathway of contaminants into Sherborn, runs alongside the project site.

Results from private well samples in the Sherborn area of concern contain a subset of the same contaminants that are found in higher concentrations at the GCC site and downgradient from the GCC area. The current results from the Sherborn samples are below the MA drinking water standards and guidelines. However, the Phase III plan does not provide for any future monitoring and data gathering in Sherborn:

1. The contaminated groundwater at the GCC site contributes to the bedrock groundwater used for drinking water in Sherborn and impacts Natick's surface water downgradient of General Chemical which flows to Lake Cochituate. Lake Cochituate is a resource for the Town of Natick and its public drinking water supply wells are located to the east side of the lake.
2. The proposed groundwater cleanup standards (GW-2 and GW-3) do not provide protection meeting the MassDEP standard of GW-1 which apply to groundwater that is a current drinking water source.
3. The utilization of two separate and distinct sampling events in Sherborn is insufficient to determine the potential existence or magnitude of the contamination. We propose a minimum of eight consecutive quarterly sampling events over two calendar years in accordance with MassDEP recommendations and guidance.
4. The existing funds dedicated by GCC for the cleanup ($1.85M as of 2016) are insufficient to reach the goal of "no significant risk" to Sherborn.
5. The current characterization of the Dense Non-Aqueous Phase Liquid (DNAPL) contamination of the bedrock groundwater is incomplete including the identification and/or removal of the source(s) of the contamination at GCC, the full characterization of the plume and the extent of the impact of the contamination to Course Brook, Fisk Pond and Lake Cochituate. The cleanup remedy can begin while simultaneously conducting further investigations of the extent of the contamination.
6. The MWRA Aqueduct, a potential pathway for contamination, passes through the heart of the GCC plume and may place nearby residences at risk of vapor intrusion and/or drinking water contamination. Frequent sampling of the aqueduct is required.
7. Potable private drinking wells in Sherborn are less than 300 yards downgradient from a bedrock monitoring well that exceeds GW-1 groundwater cleanup standards and the contamination has been rising since installation of the well (Sept., 2014). The proposed remedy does not include a plan to diminish or cutoff the source(s) of the contamination that impact the monitoring well or downgradient areas of Sherborn.
8. The remedial plan is biased to low cost and slow action nor includes any community outreach.

9. The proposed cleanup standards do not meet the minimum non-detect of volatile organics requirement of the Sherborn Board of Health Domestic Water Supply Regulation.

Figure 1. Sherborn Wells Impacted by GCC Chemicals of Concern (COC)

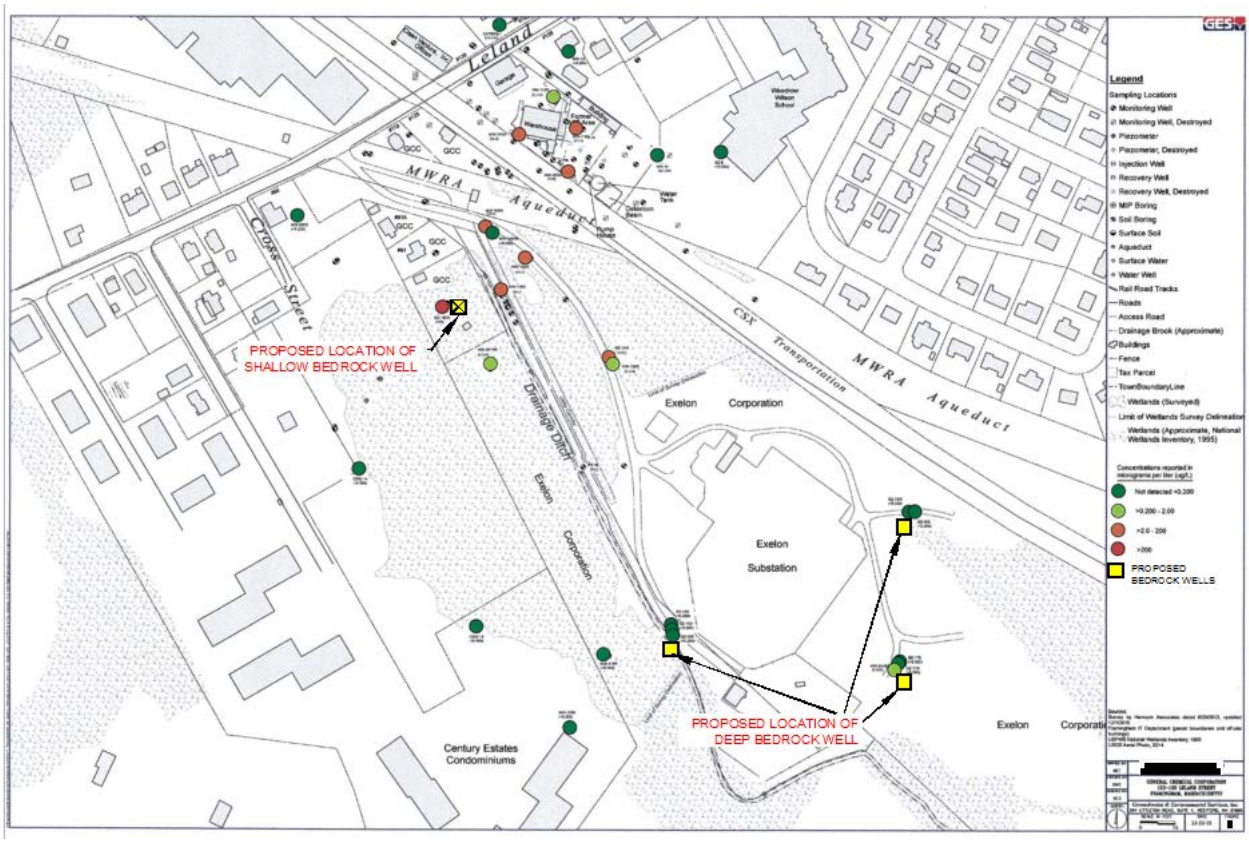


KEY RECOMMENDATIONS

1) Install a bedrock well by GZ-19DD screened in the upper bedrock fractures to determine whether contamination in the lower overburden has impacted the groundwater. This bedrock well would help provide the necessary data connecting the GCC contamination of the bedrock and the contaminants identified in the Sherborn potable wells.
2) Install three deeper (perhaps 50 to 75 feet into bedrock) bedrock sentry wells (continuously cored) in the Town of Framingham (Figure 1) to provide early warning, easy access and characterization of deeper bedrock impacts. Conduct geophysical, hydrologic and chemical testing of these sentry wells to identify fracture networks, high flow zones, chemical properties for assessing partitioning values to determine chemical retardation and diffusion and contaminant concentrations. Install the well screens at the depth of highest contamination and flow rate in the bedrock. The well locations were chosen to be near multiple existing wells so that flow gradients can be determined between the various stratigraphic units.
3) Conduct falling/rising head tests on all bedrock and till wells to determine aquifer properties of hydraulic conductivity, storage coefficient and anisotropy.
4) Place water level transducers in all bedrock wells plus GZ19DD and the car wash well to observe the effect of the car wash pumping well on various monitoring wells and the degree of bedrock and deeper overburden interconnectiveness.
5) Develop a Plan to describe the expected and possible range of effects of their chosen remedy on water levels and gradients and how those might impact the school and the ground water quality that will be discharged to the earthen trench during the remedial activities. The Plan should also include contingencies and action levels that will require them to change their remedial plans and how they will deal with/remedy any potential exceedances of those protective thresholds.
6) Continuously monitor water elevation at the school well (GZ-6) relative to other nearby wells (MW-1, MW-2, MW-3, MW-9 and MW-10) to determine whether gradients are changing during remedial ISCO injection and SVE activities. GCC should also place a continuous monitor probe in the earthen trench stream at SW-10 (create a stilling well at that site) preferably with the ability to monitor pH, water level, oxidation-reduction potential, dissolved oxygen, and chloride. All of these water level probes should be connected to the internet and the water quality and level results should be viewable in real time (or nearly real-time) to the public throughout the period of active ISCO injection and SVE operation.
7) Develop a communication plan with the neighbors and surrounding town BOHs in Framingham, Sherborn and Natick that will allow for frequent communications about upcoming remedial activities and interim results in those activities. There should also be a hot line number for complaints and a mechanism to address those complaints in a timely manner. The complaints and responses should be documented and reported in a monthly status letter along with project milestones, activities and problems encountered.
8) Develop a program document that describes their security and spill protection program to prevent trespassers and to ensure that the remedial system will be properly operated and maintained when GES is not onsite (for example at night or weekends).
9) Extend water quality monitoring of Course Brook into Natick at least as far as the entry to Fisk pond. Samples should be collected every 1,000 feet from the Natick border with Sherborn until Fisk Pond. If contaminants are identified at the discharge to Fisk pond then samples should also be collected at the outlet of Fisk Pond entering Lake Cochituate or as far into that pond as desired by Natick authorities.
10) Install a flow gauging station in the earthen trench near SW-10 and SW-3 and record flow rate at least semiannually during the scheduled monitoring events. A method of calculating flow at AQD-1, AQD-2 and AQD-3 in the aqueduct should also be determined and reported during the semiannual monitoring rounds.
11) Mistakes in the Risk Assessment should be corrected and risks reassessed.

12) The assessment of remedial technologies should be conducted using the AFCEE cost and sustainable technology software or equivalent thereby reducing bias and providing more easily comparable remedial planning input and output data.
13) The groundwater cleanup standards for the site should be more protective than currently planned (i.e., meet GW-1) to adequately protect the MWRA aqueduct, Sherborn nondetect groundwater standards and to protect Natick's large capacity potable water wells located downstream.

Figure 2. Proposed new bedrock well locations



MAJOR COMMENTS

1. Comments on Extent of Disposal Site:

a.) The information and data gathered and presented by GES confirms that some chlorinated compounds have been detected in groundwater within bedrock beneath the Disposal Site area. With only minor exemptions, all residents of our Town rely *solely* on private groundwater supply wells as their source of potable water. For this reason, we note the decreasing head potentials depicted along the A-A' Transect graphic (Figure 14, Phase III) to be especially troubling as we interpret these findings as confirming overburden groundwater is serving as a direct source to bedrock groundwater at the downgradient leading edge of the GCC Disposal Site.

The previous comments on the efficacy of delineation included concerns about the assumptions used by Groundwater & Environmental Services (GES) to fill existing data gaps appears to be warranted given the fact that the nature of the OHM impact is characterized by chlorinated organic compounds whose affinity for persistence and migration in the environment is well documented and such compounds typically exhibit 'downward' trends along their migration routes.

If contaminants are identified at the discharge to Fisk pond then samples should also be collected at the outlet of Fisk Pond entering Lake Cochituate or as far into that pond as desired by Natick authorities.

b.) Define migration pathways along and through MWRA corridor and Course Brook channel. Contaminants have been shown to travel from GCC through the aqueduct, continue to the outside of the conduit and discharge to Course Brook. In addition, the contaminants in the ditch also reach Course Brook and extend at least to Natick. Furthermore, as noted above, there is a connection with the bedrock aquifer. This is critical to protect the sole source of drinking water in Sherborn.

2. Comments on Evaluation of Potential Exposure(s):

a.) The MassDEP has published recommendations and guidance related to characterizing risk(s) from exposures to OHM dissolved in groundwater. In general, these guidance documents encourage entities conducting response actions to use between three (3) and four (4) sampling events in areas that are Potential or Current Drinking Water Source Areas (PDWSAs or CDWSAs), except in cases where they are conducting closure evaluations under the 'early exit' process set forth in 310 CMR 40.0924/40.0926 for petroleum-only releases in CDWSAs. In these instances, MassDEP has codified that eight (8) consecutive quarterly sampling events are required across two (2) calendar years in order to characterize groundwater conditions.

In light of these facts, we find that the utilization of two (2) separate and distinct sampling events for active groundwater supply wells in Sherborn is insufficient by the MassDEP's own guidance for characterizing the potential existence and/or magnitude of potential OHM in bedrock groundwater, especially in the cases where water supply wells are nearly co-located with the expanded boundaries of the GCC Disposal Site along the Course Brook corridor.

b.) The MassDEP has also revised the MCP to provide the means by which 'exposure mitigation' activities should be implemented. The Town of Sherborn is of the opinion that identification and mitigation (e.g., elimination or control) of any exposure to OHM originating from the GCC Disposal Site should be held paramount, and for the same reasons that have been stated above in Paragraph 2(a), we express concern that no further monitoring plans for OHM in any media of Sherborn or Natick residences for potential OHM.

The Phase III states that continued semi-annual monitoring of their site-related well network will continue concurrently with the implementation of the remedy to progress towards the stated goal of "Temporary Solution". The Town of Sherborn feels that the "no substantial hazard" criteria that would serve as a basis for determining if the GCC Disposal Site as a whole meets "Temporary Solution" criteria shifts the remedial objectives away from potential or future exposure mitigation. The use of "in-situ" bioremediation in this instance appears to rely heavily upon certain "attenuation" aspects – aspects which include dilution and dispersion. Dilution and dispersion are two (2) descriptors detailing the means by which concentrations of OHM dissolved in groundwater decrease over time. Accordingly, Sherborn emphasizes that these passive, naturally-occurring processes ***do not*** and ***should not*** qualify as an active remedial process equivalent to detoxification or destruction.

Sherborn therefore contends that if dissolved OHM exists along the MWRA corridor, along the Course Brook channel, or in bedrock beneath residences along Prospect Street, Coolidge Street, or Meadowbrook Road, ***any*** potential hypothetical location where exposure to OHM originating from GCC's Disposal Site could occur should be afforded to the same semi-annual monitoring activities that GES has proposed for the balance of the plume to ensure that – to the degree allowed by current analytical testing techniques – no exposures to OHM originating from the GCC Disposal Site is occurring to residents. We recognize such actions do not necessarily require every single parcel within these areas be subjected to the monitoring, but we feel compelled to advocate for (at minimum) a 'step-out' process that relies upon data from the properties that are most likely to be affected by the GCC Disposal Site than not to incorporate into the semi-annual sampling plan.

Sherborn contends that such actions should also be afforded to the Town of Framingham through the Century Estates Condominium Complex and (potentially) the residences east the Woodrow Wilson School, and to the Town of Natick through the balance of the Course Brook channel, and the neighborhood east of Speen Street.

3. Comments on Financial Assurance Mechanism:

It is our understanding that GCC has dedicated a pre-determined amount of money to the assessment and cleanup of the GCC facility. Comparing the draft Phase III Remedial Action Plan to the Phase IV Remedy Implementation Plan originally filed for this site in September 2011 displays a significant change in the location and footprint of the contemplated remedial strategies. Such changes were brought about by the increased scrutiny placed upon the characterization and evaluation of the GCC Disposal Site since that time.

Sherborn is concerned that the existing funds ($1.85M as of 20014) will more likely than not prove to be insufficient to address this site to the point where "no significant risk" can be demonstrated. Given the massive expansion of the footprint of the sparge well networks selected to eliminate further migration, the more-stringent standards established by MassDEP in recent changes to the MCP and other Guidance Documents, and the likely expansion of disposal site boundaries, Sherborn recommends MassDEP consider implementing/applying an uncertainty factor (e.g., 5%) that would compound for each year the "site" has not achieved Permanent Solution.

As attenuation/biodegradation will invariably play an important role in getting this "site" to Permanent Solution status, and typical half-life decay rates for these recalcitrant, chlorinated compounds are on the order of years and decades - as opposed to weeks and months – such actions is viewed to be warranted to ensure sufficient funding mechanisms exist for as-of-yet unidentified costs such as exposure mitigation actions or other necessary response actions.

4. Comments on Site Characterization:

The General Chemical facility is a site that has been exposed to significant Dense Non-Aqueous Phase Liquid (DNAPL) releases and associated groundwater impacts and contaminant migration in the past. DNAPL has the potential to impact bedrock groundwater as well as the overburden. The bedrock characterization is incomplete and further characterization is needed while still moving forward with a remedial program. We believe that the remedy can begin while simultaneously conducting supplemental investigations to improve the understanding of the nature and extent of contamination and dial in the remedy for maximum impact. In particular supplemental investigation is required in the following three critical areas:

a. ***Historical Presence of DNAPL and Bedrock Contamination Source Area –*** The high concentrations of chlorinated solvents and 1,4-dioxane at the site indicate that DNAPL ganglia, at a minimum, must be present at the site. Monitoring well GZ-19DD has among the highest contaminant concentrations at the site and is at or near bedrock based on the boring log completed for the well. It is necessary that a bedrock well be installed in close proximity to this well to determine whether bedrock impacts are observed. Detailed comments provided below will show that well GZ-19DD is in direct connection with bedrock as shown during a prior pump test and through boring records. A monitoring well should be completed into fractured bedrock nearby. The well should be constructed to minimize the potential for preferential pathways and cross-contamination during construction. The presence of elevated Contaminants of Concern (COCs) in multiple private water supply wells in the downgradient Town of Sherborn (Sherborn) and increasing groundwater concentrations in well MW-201R near the border with Sherborn indicate that there is likely an unmitigated source of contamination impacting fractured bedrock.

b. ***Plume delineation (deficient plume characterization*)) –** The full vertical and horizontal extent of the plume has not been delineated, which as noted above, has a significant bearing on remedial design for a successful permanent solution (e.g., reagent demand) and the evaluation of impacts to sensitive receptors. In particular, bedrock sentry wells monitoring groundwater upgradient of Sherborn are needed. Many of the existing bedrock wells were not installed in fractured bedrock and detailed information is provided in the page specific comments to demonstrate that significant data gap. The downgradient extent of the plume passing by MW-201R has not been determined. Groundwater monitoring wells should be installed further downgradient and at depths to characterize potential bedrock impacts. Deeper wells and wells installed in fractures are likely to find the fracture zones that convey most of the bedrock groundwater and these zones should be screened off for chemical, geophysical, and hydrogeological assessment. The full depth of contamination has not been determined because there are no bedrock wells below the bedrock wells that are already contaminated.

c. ***Impacts to Course Brook*** **(extent of impacts is unknown) –** The extent of GCC contaminant impacts to Course Brook has not been fully determined. However, sampling as far downstream as Natick has been tested and continues to reveal GCC Contaminants of Concern (COCs) to be present. Additional sampling should be conducted in the brook, extending into the Town of Natick (Natick), to determine whether there is a limit to impacts to this surface water receptor. Course Brook flows into Fisk Pond and Lake Cochituate. Lake Cochituate provides drinking water for Natick from shallow wells along the shore. There is a United State Geological Survey (USGS) gauging station (01098340) along Course Brook at the entry to Fisk Pond, which would be a good end point for interim sampling, but samples should also

be collected from the brook between the Sherborn border and the USGS station. Natick may have concerns about the likely GCC COCs entering Lake Cochituate, which serves as a public drinking water supply and their Health Department should be contacted for input on the GCC remedy.

5. Comments on Site Receptors:

Additional characterization and recognition of sensitive receptors impacted or potentially impacted, by the release needs to be accomplished.

a. ***MWRA Sudbury Aqueduct -*** The MWRA's Sudbury aqueduct passes through the heart of the GCC plume. This emergency drinking water supply aqueduct has been used in the recent past as part of the water supply system to the Metropolitan Boston area. Repeated rounds of sampling continue to demonstrate that the GCC site is the major contributor to drinking water aqueduct contamination. In addition, the aqueduct is a potential migration pathway for the contaminants that may place the residences near the aqueduct at risk of vapor intrusion or for drinking water supply contamination. The aqueduct discharges to surface water (e.g., Course Brook) when not in use. Frequent sampling needs to be conducted of the aqueduct to determine the seasonal or range of concentrations of contaminant discharge to the aqueduct. Ultimately the aqueduct discharges in Sherborn. Note that by ordinance, Sherborn has a non-detect limitation for volatile organic compound (VOC) impacts to water supplies. The discharge into Course Brook eventually reaches Lake Cochituate, which is a water supply source for Natick's large capacity drinking water wells.

b. ***Town of Sherborn Private Wells -*** Potable private drinking water wells in the Town of Sherborn are being impacted by the contaminated groundwater from the site. The Town of Sherborn is less than 300 yards downgradient of bedrock well (MW-201R) which *currently* exceeds Massachusetts Contingency Plan (MCP) GW-1 groundwater cleanup standards and it is likely that the contaminants have traveled much further because the monitoring well for the cited results was not situated in the direct path of the plume, but rather off to the side. The concentrations in well MW-201R have been consistently rising since installation. The contaminants released at the GCC site are very persistent and could travel in bedrock a long distance in a short time. As noted above, Sherborn has a non-detect standard for volatiles in groundwater, therefore the remedy at GCC needs to diminish the source in Framingham in such a manner as to completely cutoff the discharge to bedrock groundwater and fully contain the contamination. The contaminants found during the prior sampling of drinking water wells at six Sherborn homes and those found during the recent sampling at 126 Coolidge Street are consistent with those detected at the nearby GCC site that has a long-standing contaminant plume traveling through groundwater towards Sherborn. This observation combined with the new determination by the Massachusetts Department of Environmental Protection (MassDEP) regarding an absence of septic system source signatures points directly to the source of groundwater impacts in Sherborn as being attributable to the GCC facility.

c. **Groundwater Protection District -** Sherborn has been investigating establishing a Groundwater Protection District along the border with Framingham. All risk decisions should be based on a future establishment of a Groundwater Protection District along the areas in Sherborn currently shown as part of the site. In that manner groundwater should meet GW-1 standards or background levels along the edge of Sherborn.

6. Remedial Plan Comments:

The Phase III Remedial Action Plan has various data gaps and does not provide the basis in some cases for selecting the proposed remedy nor are all of the aspects of the chosen remedy considered. Examples include:

d. ***Biased to low cost/slow action.*** The discussion of remedial technologies appear overly biased to favoring less costly, slow acting technologies with no demonstrated ability to clean up the site in a timely manner.

e. ***In evaluating the remedies there is no consideration of the local community.*** This is a RCRA facility and under RCRA cleanups Community Acceptance is one of the seven primary considerations in selecting a remedy.

f. ***The potential for impacts to the wetland, unlined ditch and Course Brook during remediation are not considered.*** It is very likely that concentrated low pH and highly oxidative groundwater will be released to the wetlands as a result of chemical oxidation. There is no explicit consideration of these impacts or proposed monitoring program or thresholds for addressing an unmitigated release to the environment.

g. ***Ranking issues.*** The report does not provide details on how the technologies were ranked and the presentation is biased so we recommend that publically available software such as the Air Force Center for Engineering and the Environment (AFCEE) cost and sustainable remediation selection software be used which provides detailed input and output files and removes bias.

h. ***Management of Collateral Environmental Impacts.*** The report provides no discussion of how the impacts to the environment will be managed from the chosen remedial technologies. The Health Department wants to know how GES is proposing on dealing with the low pH and highly oxidative groundwater that will be seeping into the earthen ditch and wetlands as the result of In-situ Chemical Oxidation (ISCO) injection. Will wetlands replication be pursued if damage to wetlands occurs? Will the earthen ditch water be treated or captured prior to its discharge to Course Brook?

i. ***Thresholds and Action Levels.*** No plan is provided that sets thresholds or actionable levels for odor, noise, and contaminant impacts to aqueduct or earthen ditch and no continuous monitoring program is proposed. The site will be unattended throughout much of the remediation process, for example, at night and weekends and it is unclear how equipment failure or contaminant impacts will be monitored.

j. ***Absence of Community Outreach/Communication.*** No community outreach, communication program or even a plan to address neighbor complaints has been established for the proposed pilot testing and active remediation. The plan also does not provide any emergency contingencies or notification plan.

k. ***Contingency Planning.*** The Remedial Action Plan will include the use of hazardous materials such as butane and strong oxidizers such as sodium persulfate and it is unclear how these chemicals will be protected from spills and secured. Although there is mention of a fence, there is no drawing showing the fence nor is the fence type described.

DETAILED COMMENTS

1. **Page 1, Section 1.1 –** The bedrock wells were purposefully placed into the competent and unfractured bedrock as described in the GES Data Gap Action Plan Report, 2013 "At each bedrock monitoring well location, 4-inch permanent **steel casing was set approximately 10 feet into competent bedrock and grouted in place** to prevent migration of overburden groundwater, if present, into the bedrock aquifer. Each bedrock location was then cored 10 to 15 feet **further into competent** bedrock using a 2-inch coring bit" (Page 12, GES Data Gap Action Plan Report, 2013, bold added). Clearly the intention was to set the wells into the unfractured portion of the bedrock as explicitly described by GES. Unfractured bedrock would be expected to show very little to no contamination because the contaminants cannot directly get to the unfractured bedrock except at a very slow rate through diffusion. The wells should have been ***purposefully*** **installed into fractured bedrock** to determine the actual water quality in bedrock where all the water is flowing. Even GES concedes that the fractured part of the bedrock is the most important zone as they stated "the fracture network provides the only hydraulically conductive features within the upper bedrock zone" (Page 12, GES Data Gap Action Plan Report, 2013) Per the Massachusetts MCP GES is required to determine "permeability" - 310 CMR 40.0835(4)(d)(3)(b). Hydraulic properties for the till and bedrock should be quantitatively determined. GES has decided not to determine these values as reported in their Gap assessment "Hydraulic conductivity values for the till and bedrock have not been determined in the study area." (Page 38, GES Data Gap Action Plan Report, 2013). How can the Phase II assessment be complete when the Phase II requirements explicitly state that permeability must be determined but it wasn't? Also Phase II requirements require that "bedrock type and characteristics, depths and contours" be determined per 310 CMR 40.0835(4)(d)(3)(c) yet no bedrock contour map was provided in the Phase II report. Also the bedrock characteristics description were insufficient (e.g., no FOC data, fracture aperature, flow rate such as heat pulse derived, interconnectiveness investigation, fracture frequency with depth assessment, fracture orientation assessment)

2. **Page 1, Section 1.1 –** GES is required per 310 CMR 40.0835(4)(e) to address the following items in their Phase II report "an evaluation of the environmental fate and transport characteristics of the oil and/or hazardous material identified at the disposal site, including, without limitation, mobility, stability, volatility, persistence and bioaccumulative potential of the oil and/or hazardous material" and "identification and characterization of existing and potential migration pathways of the oil and/or hazardous material at and from the disposal site, including, as appropriate, air, soil, groundwater, soil gas, preferential migration pathways such as subsurface utility lines and other subsurface void spaces, surface water, sediment, and food chain pathways". The Phase II did not contain a food chain pathway assessment and did not include an assessment of mobility, stability, volatility, and persistence of contaminants in bedrock. Mobility cannot be determined without knowing the flow rate and retardation rates in bedrock and without having site specific hydraulic conductivity and partition coefficients these parameters cannot be determined.

3. **Page 1, Section 1.1 –** The vertical extent of bedrock groundwater contamination has not been determined. Most of the shallow bedrock wells show contamination present and there are no medium or deep wells to determine the vertical extent of contamination.

4. **Page 1, Section 1.1 –** The shallow bedrock wells that were recently installed were installed in competent portions of bedrock as clearly visible on the geologic figure accompanying the Phase II report (see Attachment 1). This figure has been marked up to annotate that the well screens are clearly in sections of bedrock that are designated as massive (indicating no fractures) and for example well MW-115R specifically states in the GES prepared boring log "No evidence of fracturing or water transport." Further none of these wells were placed in the uppermost weathered zone as the top 10 feet was sealed off even though there were reported fractures in some of those sections. Groundwater

quality and elevation data cannot be determined based on screening isolated fractureless sections of rock. New wells should be installed by coring bedrock until water-bearing fractured sections of rock are intercepted.

5. **Page 1, Section 1.1 –** A bedrock groundwater monitoring well should be placed by well GZ-19DD (which was drilled by GZA) and was set a few feet above bedrock and has the highest contamination observed onsite. It is especially relevant to consider the results of the pump testing that was conducted as part of the GZA Supplemental Assessment Plan (2001), which found that "The two wells on the Kinnamey property (GZ-19DD and CDW-19), which were monitored using transducers, also showed oscillating water level fluctuations due to the outside pumping well." The well that they were referring to is the pumping of the carwash bedrock well. All the bedrock wells were influenced by the pumping of the car wash bedrock well even wells as far away as the Exellon site (GZ-15R which is 1500 feet away) plus these 2 highly contaminated overburden wells. This conclusion reached by GZA (GCC's contractor) clearly shows that the most contaminated well onsite with the highest 1,4-dioxane concentrations, is in direct connection with bedrock fractures unlike what has repeatedly been stated by GES. There is no thick till layer at that location as noted by GZA. If there were a thick till layer at that location then the well would not have responded to the car wash pumping. Only these 2 overburden wells did respond showing that they are different than the rest of the site and represent a direct conduit of contamination to bedrock.

6. **Page 1, Section 1.1 –** The existing bedrock wells should all be hydraulically characterized by falling/rising head tests or equivalent to determine hydraulic conductivity as that will clearly show that the wells are placed in impermeable strata. There is no hydraulic conductivity data for bedrock which is a requirement of site characterization.

7. **Page 1, Section 1.1 –** The existing bedrock wells should have water levels monitored over the course of a day to see if they fluctuate in response to pumping at the car wash well. A previously closed bedrock well (that was becoming too contaminated) responded in sync to the car wash well pumping showing good connection in the bedrock aquifer. It is suspected that the newer wells will not respond to fluctuations in the car wash well because they are not well connected to the surrounding fracture network.

8. **Page 1, Section 1.1 –** The extent of contamination is not known. The bedrock well at MW-202D monitors just the upper 5 feet of bedrock and there is no groundwater contour maps that show this is the natural centerline of groundwater flow in the area. Groundwater in bedrock at the site is shown dipping deeply (Phase III Figure 14) into bedrock and there is no reason to suspect that a shallow 5 foot bedrock well would intercept the deep groundwater that flows towards Sherborn with the potential to reach home owner wells that are deep screened.

9. **Page 1, Section 1.1 –** The existing groundwater data clearly indicate that contaminants have reached bedrock and are flowing in the direction of Sherborn as noted by the detections of GCC COCs in bedrock wells over the years at MW-15R has detected tetrachloroethene (PCE), trichloroethene (TCE), 1,1-dichloroethene (1,1-DCE), cis-1,2-dichloroethene (cis 1,2-DCE), trans-1,2-dichloroethene (trans 1,2-DCE), 1,1-dichloroethane (1,1-DCA), 1,1,1-trichloroethane (1,1,1-TCA), Freon, chloroform and vinyl chloride (see report) and well MW-201R consistently has 1,4 –dioxane levels above the drinking water standard. These wells are more than 1,000 feet downgradient of the GCC site in the direction of Sherborn. It should be the responsibility of the Licensed Site Professional (LSP) to determine whether there is a connection between the contaminants found at these downgradient wells and those found in a Sherborn neighborhood near the site. The contaminants

found in this Sherborn neighborhood include PCE, 1,4 dioxane and TCE, which are all well-established GCC COCs. It is somewhat remarkable the difference between the MCP Case stories reported by MassDEP and the seriousness with which tracking down the source of the Sherborn groundwater well contamination is being taken for example, from the MassDEP case studies (see Attachment 2),

> *Also, on the same date in January 2005, a water sample was collected from a potable well located on a nearby property. Analysis of this sample revealed concentrations of petroleum-related contaminants but at a concentration below reportable levels. The groundwater release was reported to MassDEP on February 10, 2005. MassDEP issued a Release Tracking Number and authorized an Immediate Response Action (IRA) that included requirements to:*

1. *Immediately identify and sample all private drinking water wells within 500 feet of the site;*
2. *Immediately provide bottled drinking water to all users of the private well located on the site, and to the users of any other private well(s) where analysis indicates the presence of detectable levels of oil and/or hazardous materials; and*
3. *Conduct additional assessment activities to determine the vertical and horizontal extent of contamination.*

Note that the concentrations in question for this case study were below the drinking water limit but were handled much differently than the Sherborn well contamination throughout a neighborhood. It should be the obligation of the LSP to prove that the GCC site and Sherborn well contamination are not related especially considering that MassDEP has established that the Sherborn wells are not impacted by local septic systems through monitoring for septic constituents. This gap in not connecting-the-dots or showing hydrologically that they are distinct is a major gap and inconsistent with how other MCP sites are managed. All this despite the written and vocal concern expressed by the Sherborn Board of Selectmen and repeated comments on the matter from the Framingham Health Department and the Framingham Board of Health.

10. **Bedrock monitoring -** GES is relying on the single shallow bedrock well near the discharge from the aqueduct to Course Brook as their sentry well to show that the 1,4-dioxane and chlorinated VOCs (cVOCs) from the GCC site are not impacting the Sherborn wells. This approach seems unreasonable as the well may not be in the right place or depth. The topography in the area shows that the Meadowbrook area is actually downgradient of Course Brook and is a low point separate from Course Brook. See the stormwater flow map Figure 5 from the Spring 2015 sampling report. According to the Town of Sherborn "Well depths typically vary from 150 feet to 500 feet or more" (Sherborn Open Space and Recreation Plan, 2007). The depth of the well being used by GCC/MassDEP as the sentry well (MW-202D) is screened at 31-36 feet below ground surface (bgs) and only has a 5 foot screen. It is unreasonable to assume that this single shallow well is representative of the hydrology and is sampling from the same zone as the impacted Sherborn wells. In fact, MassDEP guidance documents for 1,4-dioxane specifically state that:

> "*…with respect to investigations in areas with septic systems and potential/known impacts to residential wells, the depth of the initial detection of 1,4-dioxane near the source area should be evaluated relative to the depth of contamination downgradient from the source of 1,4- dioxane. Like chlorinated solvents, 1,4-dioxane may migrate underneath surface water bodies. A thorough evaluation of subsurface characteristics and development of the Conceptual Site Model is*

important to ensure a complete and accurate assessment of the nature and extent of 1,4-dioxane source areas and plume migration." [From MassDEP Guidance on sampling and analysis of 1,4-dioxane dated June 22, 2015]

In addition, the testing to date of the Sherborn residential wells needs to be performed in accordance with standards for residential sampling including taking samples from the wells prior to treatment or holding tanks from freshly pumped water (i.e., purging prior to sampling) and the process needs to be documented on field forms using approved procedures so that the actual concentrations and range of contaminants can be quantified. Likely the concentrations reported to date vastly underestimate the true levels due to the sampling methodology. It is important to know the actual concentrations in these wells so that a source can be identified and the remedy at GCC can be protective of potable wells. Further the relevant drinking water standard for Sherborn should be no detectable VOCs rather than GW-1 standards because Sherborn Health Department requires cleanup of water supply wells if *any detectable* VOCs are present. Prior testing has shown that six household wells exceeded Sherborn's limits.

11. **Page 3, Section 2.2 –** The boundary of the site provided in Figure 3 appears incorrect. The boundary appears to end on town political borders which are unrealistic. Sampling in Course Brook has shown GCC COCs present as far down as sampled to the Sherborn/Natick border. Additional sampling should be conducted, extending into Natick, to determine where there is a limit to impacts. Course Brook flows into Fisk Pond and Lake Cochituate, which provides drinking water for Natick, from shallow wells along the lake shore. There is a USGS station (01098340) along Course Brook at the entry to Fisk pond which would be a good point for sampling but several samples should also be collected between the Sherborn border and the USGS station. Natick may have concerns about the likely GCC COCs entering Lake Cochituate, which serves as a major drinking water supply and their Health Department should be contacted for input on the GCC remedy as they appear to be a potential stakeholder in outcome. Further there is a reasonable probability that the impacted home wells in Sherborn are also within the impacted site boundary.

12. **Page 3, Section 2.2 –** The site boundary should also include the impacted farm ponds in Sherborn along Course Brook.

13. **Page 4, Section 2.3 –** Sherborn has been investigating establishing a Groundwater Protection District along the border with Framingham. All risk decisions should be based on a future establishment of a Groundwater Protection District along the areas in Sherborn currently shown as part of the site.

14. **Page 5, Section 2.3 –** The Natick Springvale and Evergreen public water wells derive at least 20% of their water from Course Brook. Following the water mass balance provided by Gay, 1985 (Attachment 3) it is apparent that the discharge from the earthen ditch at GCC that enters Course Brook which discharges to Lake Cochituate (via Fisk pond) and has the potential to impact the drinking water in Natick. Natick's public wells are very shallow and adjacent to Lake Cochituate and the USGS demonstrated that between 75% to 93% of the public well water is from Lake Cochituate. In order to protect the Natick wells the discharge of contaminants to the earthen ditch and the aqueduct must be eliminated thereby requiring a lower cleanup standard than contemplated for the site.

15. **Page 5, Section 2.3 –** The Sudbury aqueduct is not a backup to a backup water supply. It is the only backup and has been utilized in 2010. The MWRA has made it abundantly clear that they want no contaminants entering the aqueduct per their letter dated January 4, 2016. The only sure way to guarantee this criteria is to fully cleanup the site as any lining of the aqueduct may still allow some

contaminants to enter. To ensure these criteria, the site should be cleaned-up to GW-1 or background levels.

16. **Page 5, Section 2.3 –** Course Brook is really a tributary to a Class A Reservoir per 314 CMR 4.06(1)(d)(1) since it ultimately discharges to Lake Cochituate. The earthen ditch also ultimately discharges to Lake Cochituate per Course Brook. All the standards that apply to tributaries of Class A water bodies should also apply to Course Brook and the earthen ditch. Therefore, the water entering the ditch from GCC should meet GW-1 standards.

17. **Pages 4 and 5, Section 2.3 –** The summary of potential receptors make no mention of any of these receptors being impacted by site contaminants. The impacts should be listed for each of the receptors such as infiltrating contaminants to the aqueduct and site related COCs in the farm ponds. All These receptors are referred to as "Potential Receptors" but they are all *actual* receptors.

18. **Page 10, Section 4.0 –** The 1,4-dioxane levels in 2012 in the Sherborn homes were about one-third of the drinking water standard which is not necessarily "far below drinking water standards." The homeowner samples were not properly purged prior to collection of the samples and no stabilization of water quality parameters was conducted per the EPA standard. These sampling conditions likely biased the sample results low because 1,4-dioxane has a vapor pressure indicative of a VOC and without proper purging the stranded water that was sampled could already have volatized the VOCs in the water line. Also field forms were not completed describing the layout of the potable water system to determine whether there may have been expansion tanks or other treatment systems that may have impacted the water quality pre sampling. The water sampling did however show that the contamination was not due to local septic systems so the defacto source should be the GCC plume considering that there are impacted wells in a direct line from GCC towards these homes. Sentry wells should be provided in bedrock to determine the vertical extent and concentrations in bedrock fractures between the GCC site and the homeowner wells. These sentry wells should be periodically tested as an early warning system. The current GCC wells do not provide an acceptable sentry system as previously noted.

19. **Page 10, Section 4.0 –** The discussion about the aqueduct inaccurately describes the aqueduct as a backup to a backup whereas it is not. It also implies that GCC has agreed to install a liner for the aqueduct at MWRA's request but later the Phase III actually *disagrees* with installing a liner for the aqueduct to protect the water supply.

20. **Page 11, Section 4.0 –** the discussion of the prior remediation should include a discussion of the prior sodium persulfate pilot test and the results of that test which are extremely germane to the Phase III. In fact, it is unclear why a new pilot test is proposed since the prior test determined the radius of influence which is the stated goal for the new test. Further, the observations from that test should be discussed in detail such as described in the Remedy Evaluation Report (RER) "During the day-long injection activities,"

    - "high pressures and effervescence were observed in EWMP1 through EWMP4, CDW6, EW1 and EWP2S."
    - "Groundwater levels in all wells increased from the normal static level of approximately 3' below grade and over the top of the ½'-tall (from grade) casing stickups of the four monitoring points (e.g., over 3½' of rise)."
    - "Chlorine-like odors were encountered from EWPZ2S, while
    - pH concentrations approached 2 pH"

Clearly these results written in the RER are disconcerting as pH 2 groundwater will undoubtedly be discharging to the unlined ditch and a slug of low pH water may then travel towards Natick via Course Brook unless the pH is neutralized. The proposed remediation will entail more than 40 times the amount of ISCO injection as conducted in the pilot test so the effects will be magnified and over a much larger area. There is no discussion in the Phase III of how the trench water will be intercepted and treated prior to discharge to the wetlands nor the effects of rising water levels on the plume position near the school nor how chlorine odors and hissing sounds coming from the treated area will be addressed. Once ISCO is injected the process cannot be stopped because it has already entered the aquifer. There is no emergency plan nor any communication plan provided for immediately answering neighbor concerns during the remediation period. Also the impacts of oxidant discharges on the wetland in terms of wetland vegetation damage and ecosystem impacts such as fish kills are not discussed at all. Attachment 4 (attached) shows the fish species that could be impacted and their tolerance for low pH water. A plan needs to be established that sets limits for site odor, equipment and operations sound at the site and concentration of chemicals in the discharge ditch that leads to Course Brook. There is also no monitoring system proposed for allowing internet access to real time water quality (such as pH) in the drainage ditch during the remediation period and water level monitoring near the school to ensure that remediation is not causing the plume to migrate in that direction. Such a system should be installed. There should also be contingencies for rapidly dewatering the area around the school if migration does occur and for containing water in the earthen ditch if limits cannot be maintained. Without damage assessments and information about how each system is expected to impact the neighbors and the ecosystem it is difficult to assess which treatment is preferred. Each separate system will have different impacts and one may be better than the others on whole considering each of the remedial evaluation criteria already provided in the report plus the impact of the system on the neighbors and ecology which were not included in the evaluation. Whatever system ultimately is used its potential impacts and program for addressing those impacts must be known and addressed in advance of the selection of technology so that an informed selection can be made

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21. **Page 12, Section 5.0 –** The flow rate in the earthen drainage ditch and in the aqueduct needs to be determined through quantified measures such as installing a gauging station. Although the semiannual reports indicate they are recording flow in the aqueduct they are only measuring the height of water (not the flow rate). Flows rates need to be determined and frequently monitored so that mass discharge rates can be determined and dilution effects estimated prior to treatment. The buffering capacity of the earthen ditch water should also be determined so the effects of pH discharges can be determined.

22. **Page 12, Section 5.0 –** The statement that there is "no risk" from the discharges to Course Brook and the earthen ditch is inaccurate there is a risk but it is below a risk threshold calculated by GES. The chemicals added from the GCC site incrementally increase risk levels. As noted previously the MWRA disagrees with this analysis and is requesting that no contamination enter the aqueduct and Framingham, Sherborn and Natick all are concerned about the incremental risk posed by the GCC loading of Course Brook. Sherborn also has a non-detect standard for VOCs rather than the standard being used by GCC.

23. **Page 12 and 13, Section 5.0 –** The water mass balance was crudely estimated whereas GES could have installed a gauging station at the earthen ditch and provided real time flow rates in the aqueduct which would be a better basis for a water mass balance to truly assess the mass migration. More accurate and long term monitoring of flow rates in the aqueduct and earthen ditch should be conducted to assess mass flow rates.

24. **Page 15, Section 7.0 –** Among the evaluation criteria should be the potential impact of the selected remedy on site receptors such as the wetland and surface water ecology and the neighbors and adjacent school. Evaluation should include noise, odors, fish kills, wetland destruction and similar considerations. The period of time for the remedy to be completed should also be a highly weighted aspect. The neighbors have already had to contend with the twenty plus years of site characterization and remediation and a faster remedy should be a priority.

25. **Page 15, Section 7.0 –** Each time GCC classifies the area of remediation, further testing outside that area broadens the impact area. Any remediation approach needs to be robust and have widespread impacts to deal with the unknowns and address uncertainties in the nature and extent of contamination

26. **Page 15, Section 7.0 –** GES indicates that they have developed a scoring matrix consistent with a USEPA guidance document for CERCLA sites. In reviewing that document it does not appear that the formula was derived from that report nor did the GES report follow the format of that referenced report. Further it is unclear why guidance for a CERCLA site is referenced since this is ***not*** a CERCLA site rather it is a RCRA site that is managed by an LSP being overseen by the MassDEP waste site cleanup group. In considering the corrective action goals for this site it cannot be forgotten that this is a RCRA TSDF undergoing RCRA corrective action. Where RCRA rules are more stringent or comprehensive than MCP rules they should apply. The corrective action wastes being managed are RCRA listed wastes. Under RCRA Corrective Measures Study https://www3.epa.gov/reg3wcmd/ca/pdf/RCRA_CorrectiveMeasureStudyATTC.pdf

    The following criteria are relevant for technology selection:

    - Long-term Effectiveness
    - Reduction in the Toxicity, Mobility or Volume of Wastes
    - Short-term Effectiveness
    - Implementability
    - Community Acceptance
    - State Acceptance
    - Cost

    You will note that under RCRA, Community Acceptance is a key aspect of RCRA corrective action technology selection. Community Acceptance criteria as required by RCRA should be a highly weighted aspect in technology selection and any technology selection conducted without a formal Community Acceptance evaluation is not legal for this RCRA site.

27. **Page 26, Section 7.2 –** The report states that "The time estimate for each remedial alternative were used as the basis for assigning the timeliness ranking" but no time estimates were provided other than thermal technology was listed as a best case estimate of 6 months.

28. **Page 31, Section 7.2.2 –** The ISCO section recommends that a feasibility test be conducted prior to full-scale implementation. What happens if the feasibility test shows that the technology is infeasible after being selected? What do you expect to learn from the feasibility test that was not already learned in the prior ISCO test?

29. **All of Sections 7.2 and 7.3 –** The remedial assumptions provided that are the basis for evaluating the remedial technologies seem somewhat arbitrary without any engineering calculations. It is advised that a commercial available remedial scoping software package be used to estimate remedial configurations and costs. In that manner the program input files and output files can be reviewed

based a documented, nonbiased approach. For example, the AMEC Phase III previously referenced used the publically available AFCEE cost and sustainable remediation selection software program. The AMEC representation of costs and sustainability measures are much more comprehensive and lend themselves to apples and apples comparisons in a nonbiased manner.

30. **Page 36, Section 7.2.5 –** Please describe whether butane sparging could buildup butane in the aqueduct and potentially cause an explosion?

31. **Page 37, Section 7.2.5 –** The aqueduct is not a secondary backup.

ATTACHMENT 1

Site Characterization - Bedrock wells are generally not installed in fractured zones

Boring/Well No.	Core Depths	Total Length	Modified Recovery	RQD *	Description
MW-105RR Well > Screen	90-95'	52"	22"	42% (poor)	Gray, crystalline granodiorite. Highly fractured.
	95-100'	53"	23"	43% (poor)	Quartz-rich chlorite schist. Iron staining on parting surfaces. Highly fractured.
MW-107RR	75-80'	55"	43"	78% (good)	Medium gray, aphanitic crystalline granodiorite. Grain deformation evident. Lightly fractured
	80-85'	60"	50"	83% (good)	Gray, banded aphanitic and phaneritic granodiorite. Massive, no secondary mineralization
MW-108R	89-94'	55"	23"	42% (poor)	Light gray, apaenitic granodiorite with minor sandy chlorite schist inclusions. Iron mineralization on parting surfaces at 89.5 and 93 feet, otherwise, massive.
	94-99'	56"	34"	61% (fair)	Banded aphanitic and phaneritic, massive texture
	99-104'	59"	54"	92% (excellent)	Same as above
MW-115R	48-53'	53"	39"	74% (fair)	Alternating bands of gray, quartz-rich phaneritic and aphanitic crystalline granodiorite. Almost gneissic where phaneritic with banding fabric dipping at approx. 30°
	53-58'	59"	49"	94% (excellent)	55.5 ft to 57 ft - Dark gray aphanitic chlorite schist. No evidence of fracturing or water transport. Return to massive granodiorite at 57 ft

Bedrock encountered 15 to 20 feet above screen zone, well not installed in weathered zone

Massive – means not fractured

Background Image from GES Datagap Report

Attachment 2

SUMMARY OF INITIAL BOARD ACTIONS

Updated
October 3, 2013

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This page informs the public of those open disciplinary matters in which the Board has concluded preliminary investigations and initiated formal disciplinary proceedings against an LSP. The Board initiates these proceedings by issuing the LSP an Order To Show Cause. In each instance, this Order summarizes the results of the preliminary investigation and directs the LSP to show cause why sufficient factual grounds do not exist to impose discipline upon the LSP. Upon receipt of an Order, an LSP can request an adjudicatory hearing to contest whether sufficient factual grounds exist to impose discipline against him/her, or, alternatively, can opt not to contest this and can seek to address the Board regarding what, if any, form or level of discipline is appropriate.

As a result of a regulation change in January 2003, when the Board concludes a preliminary investigation, it no longer makes a tentative decision regarding the form or level of discipline to impose. The decision regarding the form or level of discipline is now made at a later stage in the disciplinary process after the Board has finally determined that sufficient factual grounds exist to impose discipline and has reached final conclusions regarding those facts.

- LSP Board Complaint Number 08C-02
- LSP Board Complaint Number 05C-07

LSP Board Complaint No. 08C-02

On September 27, 2010, the Board voted to commence formal disciplinary proceedings against an LSP. In the Order to Show Cause served on the LSP, the Board described the findings of the Board's preliminary investigation and concluded that these findings constituted sufficient grounds to discipline the LSP. This action resulted from a complaint filed by the Massachusetts Department of Environmental Protection ("MassDEP").

Summary of Findings

Based on the preliminary investigation, the Board determined that the LSP had violated the following Board Rules of Professional Conduct:

I. The LSP failed to comply with the Board's Rule of Professional Conduct at 309 CMR 4.02 (1) by failing to act with reasonable care and diligence in regard to the disposal sites

outlined below. Examples of conduct that violated this regulation included, without limitation, the following:

i. At Site A, the LSP field-filtered a groundwater sample that had been collected using a low-flow pump, thereby introducing the potential of a false-negative bias to the sampling result.

ii. The LSP did not collect sufficient data and information to adequately determine the nature and extent of contamination or to adequately demonstrate that a condition of No Significant Risk existed at Site A prior to filing a Class B-1 RAO.

iii. The LSP did not adequately consider potential historical source areas before filing RAO statements for Site B.

iv. The LSP did not adequately determine the lateral extent of contamination in soil before filing the RAO Statements for Site B.

v. The LSP did not adequately assess potential residential contamination in groundwater at Site B.

vi. The LSP did not adequately define the vertical extent of contamination in groundwater at Site C prior to filing Phase II, Phase III and Class C RAO submittals because chlorinated solvents were increasing with depth in several groundwater monitoring wells.

vii. The LSP did not adequately assess the nature and extent of contamination prior to filing the Phase II, Phase III and Class C RAO submittals because a nearby residential well was only sampled once and the LSP had not collected information regarding the well's construction or specifications.

viii. In his initial draft of the Class C RAO Statement, the LSP did not include any plans to monitor the nearby residential well to ensure contamination did not impact it and only added such plans after public comments were submitted.

II. The LSP failed to comply with the Board's Rule of Professional Conduct at 309 CMR 4.03(3)(b) by failing to follow the requirements and procedures set forth in the applicable provisions of M.G.L. c. 21E and 310 CMR 40.0000.

Background of Case

Site A

The Site A property is a residence located on a main traffic artery. The property located across the street from Site A is a commercial property formerly used since the 1920s as a gas station, auto repair facility and auto sales business (the former gas station property). The business closed in 2004 and the pump island and underground storage tanks (USTs) were removed in September 2006. Site A and the surrounding properties are served by private water supply wells and septic systems for sewage disposal.

In January 2005, petroleum-related contaminants at concentrations above reportable levels were discovered in groundwater on the former gas station property. The groundwater monitoring well (MW-102) where the contaminants were detected was located within 500 feet of a private water supply well and, for this reason, the MCP threshold for a 72-hour notification condition was triggered.

Also, on the same date in January 2005, a water sample was collected from a potable well located on a nearby property. Analysis of this sample revealed concentrations of petroleum-related contaminants but at a concentration below reportable levels. The groundwater release was reported to MassDEP on February 10, 2005. MassDEP issued a Release Tracking Number and authorized an Immediate Response Action (IRA) that included requirements to:

1. Immediately identify and sample all private drinking water wells within 500 feet of the site;
2. Immediately provide bottled drinking water to all users of the private well located on the site, and to the users of any other private well(s) where analysis indicates the presence of detectable levels of oil and/or hazardous materials; and
3. Conduct additional assessment activities to determine the vertical and horizontal extent of contamination.

After the release was reported, the LSP's firm was retained by the owner of the former gas station property. The LSP was not the LSP-of-Record for the release at the former gas station property but served as the project manager.

The residential supply well at Site A was being actively assessed as part of IRA activities associated with the former gas station property. Data collected during the IRA investigation revealed MTBE at a level of 8.4 µg/L in a drinking water sample collected in March 2005 from the residential supply well at Site A. Both the reportable concentration for groundwater classified as GW-1 ("the RCGW-1") and the GW-1 Massachusetts Contingency Plan (MCP) Method 1 GW-1 standard for MTBE was 70 µg/L. MTBE was present at 6.64 µg/L when the well was resampled in March 2005 and MTBE was present at 3.7 µg/L when the well was sampled a third time in January 2006.

As part of IRA activities, a groundwater sample was collected in January 2006 from a groundwater monitoring well located downgradient of the former gas station property and within approximately ten feet of the occupied residence at Site A. Groundwater at this location is less than 15 feet below grade. Analysis of the sample revealed exceedances of MCP Method 1 GW-2 standards for several petroleum-related contaminants. The analytical results of the sample indicated the presence of Extractable Petroleum Hydrocarbons (EPH) C_9-C_{18} aliphatics at 31,000 µg/L (the GW-2 standard for that contaminant is 1,000 µg/L); Volatile Petroleum Hydrocarbon (VPH) C_5-C_8 aliphatics at 2,600 µg/L (the GW-2 standard for that contaminant is 1,000 µg/L) and VPH C_9-C_{10} aromatics at 12,000 µg/L (the GW-2 standard for that contaminant is 5,000 µg/L). The residence had a stone foundation.

In February 2006, the LSP for the former gas station property release filed a submittal entitled "Phase I Initial Site Investigation/ Tier 1B Classification and Phase II Scope of Work." On page

14 of the submittal, the LSP wrote that contamination from the former gas station property had migrated offsite to the Site A property, and that a condition of Substantial Release Migration must be assumed.

In early March 2006, when MassDEP noted the groundwater concentrations found in the monitoring well located within ten feet of the Site A residence, the Department determined that the concentrations constituted a Condition of Substantial Release Migration (i.e., potential indoor air impacts to the Site A residence) that required reporting within 72 hours. MassDEP required the owner of the former gasoline station to report this condition.

The LSP became LSP-of-Record for this release only. On March 6, 2006, the LSP collected indoor air samples from the basement and first floors of the Site A residence with a SUMMA canister and had them analyzed for Air-Phase Petroleum Hydrocarbons (APH). Sampling results indicated no APH target analytes at or above method detection limits. On March 22, 2006, the LSP collected additional groundwater samples from the well where contamination had been detected to be analyzed for Extractable Petroleum Hydrocarbons (EPH), Volatile Petroleum Hydrocarbons (VPH) and Volatile Organic Compounds (VOCs). When collecting the groundwater sampled to be analyzed for EPH, the LSP used a low flow pump and field filtered the sample to remove any sediments that may have been disturbed during sampling. When collecting the samples for VPH and VOC analysis, s/he did not use the low flow pump or field filtering.

MassDEP guidance documents state that samples collected using a low flow pump should not be field-filtered because the field-filtering may introduce a false-negative bias. MassDEP guidance also states that groundwater samples collected outside a source area should not be filtered. See *Characterizing Risks Posed by Petroleum Contaminated Sites: Implementation of MADEP VPH/EPH Approach*, Final Policy, October 31, 2002, Policy #WSC-02-411, pp. 45-46; and Master Q&A, Special Edition 4, February 1995.

Laboratory analysis of the EPH sample collected from the well on March 22, 2006 indicated the presence of C_9-C_{18} aliphatics at 240 µg/L, which was a significant reduction from the previous January 2006 sampling result of 31,000 µg/L. None of the EPH concentrations detected in the March 2006 sample exceeded Method 1 GW-2 standards. Analytical results of the VPH sample collected from the well on March 22, 2002 indicated the presence of C_5-C_8 aliphatics of 2,100 µg/L and C_9-C_{10} aromatics of 9,100 µg/L which exceeded the GW-2 standards of 1,000 µg/L and 5,000 µg/L.

On April 6, 2006, the LSP filed an Immediate Response Action Completion/ Class B-1 Response Action Outcome Statement (IRAC/RAO submittal). The LSP stated in the submittal that the January 2006 sampling result from the groundwater monitoring well indicating the presence of C_9-C_{18} aliphatics at 31,000 µg/L was more representative of contaminants adhered to sediments/silts rather than actual dissolved groundwater conditions. In the IRAC/RAO submittal, the LSP wrote that a condition of No Significant Risk had been achieved and that no further IRA activities were necessary.

The site figure included in the RAO submittal identifies the disposal site boundary for the release as a circle encompassing a limited area around the groundwater monitoring well and the Site A

residence. Prior to filing the RAO submittal, the LSP did not collect any soil samples within the disposal site boundary and only collected groundwater samples from the monitoring well where contamination had been detected.

On December 17, 2007, MassDEP issued a Notice of Noncompliance/Notice of Audit Findings (NON/NOAF) regarding the RAO Submittal. The NON/NOAF stated that the submittal was invalid because the contamination that had come to be located in the groundwater monitoring well resulted from migration from the upgradient release at the former gas station property. MassDEP further stated that the source of the contamination at the former gas station property that had given rise to the indoor air notification condition at Site A had not been eliminated or controlled as required for Class B RAO submittals pursuant to 310 CMR 40.1003. As a result, MassDEP determined the Class B-1 RAO Statement was invalid.

On January 16, 2008, the LSP submitted a letter to MassDEP retracting the IRAC/RAO. In the letter, the LSP stated that s/he was combining the RTN for Site A into the RTN for the former gas station and that conditions at Site A would continue to be assessed as part of the IRA activities regarding the former gas station release.

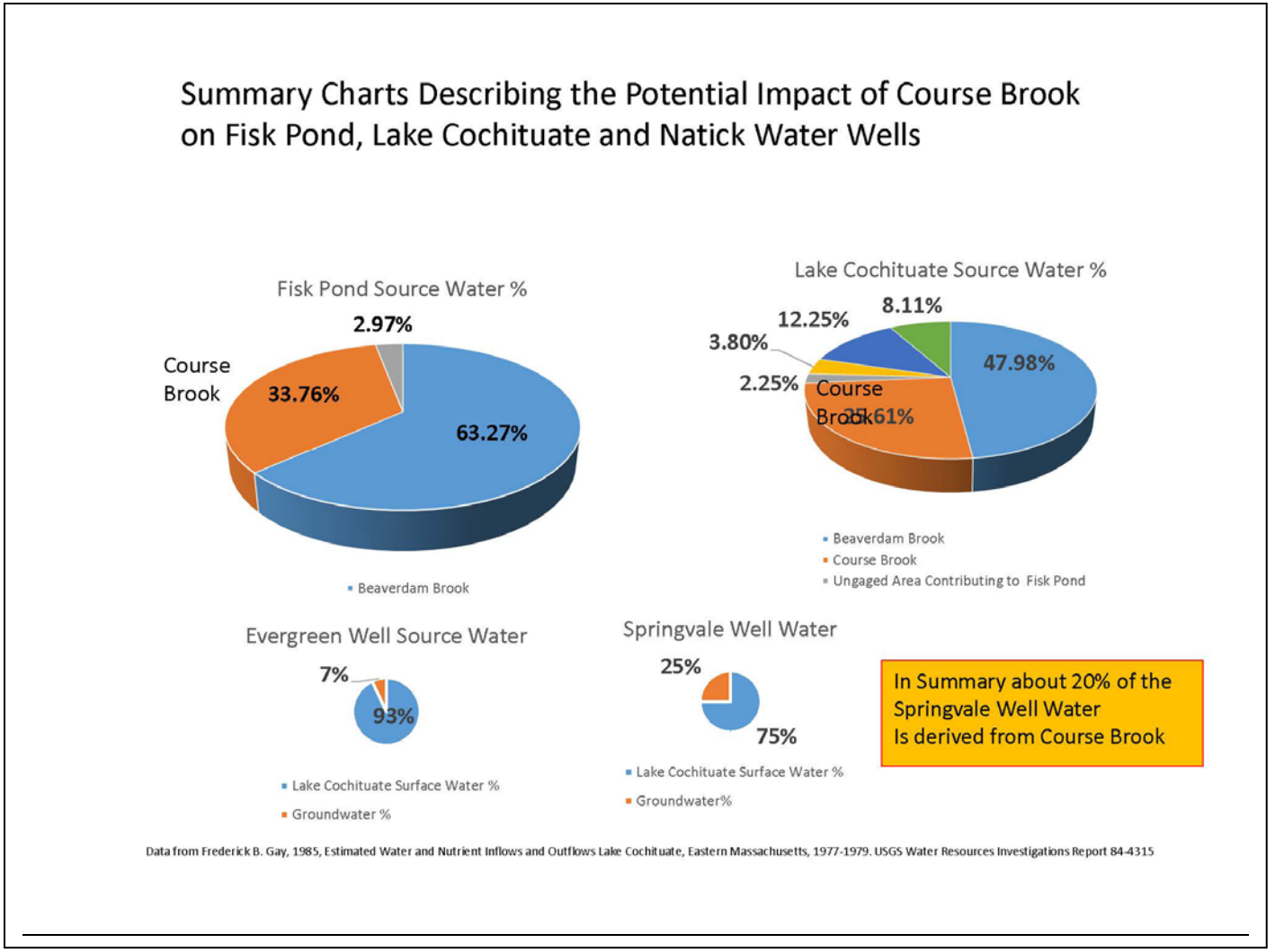
At an August 11, 2009 interview with the Complaint Review Team investigating the complaint**,** the LSP stated that groundwater contamination at the downgradient monitoring well did not appear to be related to the release at the former gas station. The LSP also stated that further evaluations were to be conducted at Site A as part of on-going assessment activities at the former gas station and that filing the RAO submittal was an administrative action to close out the RTN regarding Site A.

The Board's Conclusions regarding Site A

The Board concluded that the LSP's decision to filter the groundwater sample collected with a low-flow pump that was analyzed for EPH had the potential to introduce a false-negative bias to the sampling result, was against MassDEP policy and violated the Board's standard of care at 309 CMR 4.02(1).

The Board also concluded that it was inappropriate for the LSP to file an RAO submittal to close the RTN related to Site A because the standards for an RAO had not been met. The Board concluded that the LSP did not adequately demonstrate that a condition of No Significant Risk had been achieved as required by 310 CMR 40.1056 because VPH concentrations at a monitoring well in the disposal site area exceeded applicable GW-2 standards. The Board also concluded that the LSP did not adequately define the nature and extent of the release because s/he collected no groundwater sample from within the disposal area other than at one monitoring well and collected no soil samples within the disposal area. In addition, the Board concluded that the LSP failed to define the source(s) of the contamination as required by 310 CMR 40.1004 and 40.0904(2). The Board concluded that the Respondent's decision to file the April 2006 Class B-1 RAO submittal violated 309 CMR 4.02(1) and 309 CMR 4.03(3) (b).

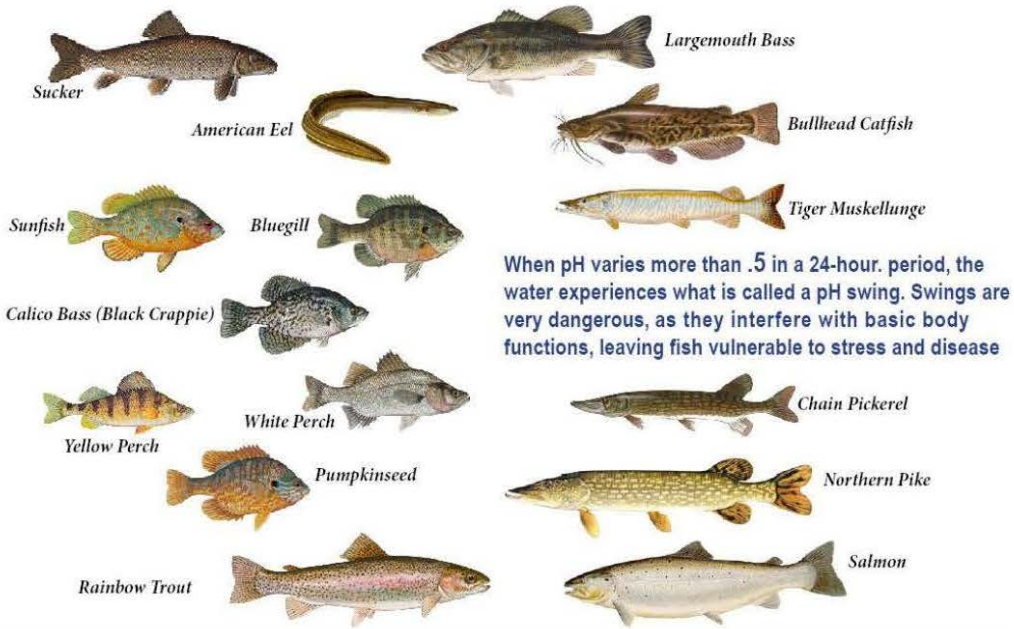
Attachment 3



Attachment 4

Fish that are likely present in Course Brook, Fisk Pond and Lake Cochituate

Freshwater Fish generally live in water with pH around 7.4 in the wild.



When pH varies more than .5 in a 24-hour. period, the water experiences what is called a pH swing. Swings are very dangerous, as they interfere with basic body functions, leaving fish vulnerable to stress and disease

pH	Response
6.4-8.4	Healthy Environment
5.4-6.0	Fish Avoid the water
4.5-5.0	No viable fishery can be maintained.
4.0-4.5	Fish populations limited; only a few species survive.
3.5-4.0	Lethal to salmonids and bluegills, Limit of tolerance of pumpkinseed (Lepomis gibbosus), perch, pike and some coarse fish. All flora and fauna severely restricted in number of species.
3.0-3.5	Unlikely that any fish can survive for more than a few hours