



U.S. Environmental Protection Agency (EPA) A Proposed Remedy Change for the South Municipal Water Supply Well Superfund Site Peterborough, New Hampshire

EPA Superfund Community Involvement

Proposed Plan

You are Invited to Attend!

A Public Information Meeting to learn about and openly discuss the proposed remedy change presented in this Proposed Plan will be held May 18, 2010. A Public Hearing with a formal comment session that provides attendees the opportunity to offer comments on this Proposed Plan directly into the public record will be held June 16, 2010.

Public Information Meeting

May 18, 2010

6:00 p.m.

Peterborough Town Hall
1 Grove Street
Peterborough, NH

Public Hearing

June 16, 2010

7:00 p.m.

Peterborough Town Hall
1 Grove Street
Peterborough, NH

Your Opinion Counts!!

EPA will be accepting public comment on this Proposed Plan from May 19 through June 18, 2010. You do not have to be a technical expert to comment. If you have a concern, suggestion, or preference regarding EPA's Proposed Plan, EPA wants to hear from you before making a final decision on how to protect your community.

To provide your opinion you may:

- Offer oral comments during the June 16, 2010 Public Hearing, or
- Send written comments postmarked or emailed no later than June 18, 2010 to:

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For further information about these public events, contact the EPA Community Involvement Coordinator, Kelsey O'Neil, at 617 918-1799 or 888 372-7341 ext. 81799

Based on new information collected at the South Municipal Water Supply Well Superfund Site (the Site) over the past several years, the U.S. Environmental Protection Agency (EPA) is proposing a change to the existing potentially responsible party (PRP) lead remedy. Remedial actions commenced at the Site in 1994, as specified in the 1989 Record of Decision (ROD). This document is a Proposed Plan for an amendment to the ROD that will address existing soil and groundwater contamination. Site sediments and wetlands were successfully remediated in 1994.

EPA's proposed remedy change is a remedial alternative, identified as Comprehensive Treatment Scenario 4 (CTS 4), which applies a combination of remedial technologies on and adjacent to the New Hampshire Ball Bearing (NHBB) property. The CTS 4 remedial technologies include:

- in-situ thermal treatment of contaminated soil and groundwater in source areas identified on and off the NHBB property; together with
- in-situ bioremediation of contaminated soil and groundwater on the NHBB property; and
- permeable reactive barrier (PRB) installation to treat contaminated groundwater before it flows under Route 202.

The expected implementation period for each component is 6-12 months. Likely performance periods are up to 1 year for thermal treatment, 3-5 years for bioremediation, and 15-30 years for the PRB. Long-term monitoring and maintenance will evaluate the effectiveness of each component throughout and after the performance periods. Existing institutional controls (ICs) that prohibit the use of groundwater in and around the Site will remain in place. EPA will also review the effectiveness and adequacy of the implemented remedy every 5 years.

A Closer Look at EPA's Proposed Remedy Change

Scope and Role of this Proposal

The proposed remedy presented in this Proposed Plan will change the existing remedy for a portion of the South Municipal Water Supply Well Superfund Site within and adjacent to the NHBB property. It does not affect the Technically Impracticable (TI) Waiver EPA issued in a 1997 Explanation of Significant Differences (ESD) or the size of the TI Waiver Area, which includes substantially all of the NHBB property surrounding and downgradient of the NHBB building.

From 1994 to 1997, groundwater pump and treat and soil vapor extraction (SVE) systems were fully operational at the Site in an attempt to achieve the remedial action objectives (RAOs) identified in the 1989 Record of Decision (ROD). In response to the 1997 ESD, the Site remedy was revised to hydraulically contain instead of extract and treat contaminated groundwater. The Third Five-Year Review Report prepared by the EPA in 2008 concluded the remedy is not functioning as intended by the ROD and subsequent ESDs. EPA determined the remedy is not protective of human health or the environment in part because it could not capture all portions of the contaminated groundwater while the South Municipal Well was operating and because groundwater outside of the TI Waiver Area is above drinking water standards. There was insufficient data to evaluate whether the remedy was protective of the vapor intrusion (VI) pathway.

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In accordance with Section 117 of the Comprehensive Environmental Response, Compensation, and Liability Act, 42 U.S.C. §9601 et seq (CERCLA) the law that established the Superfund Program, this document summarizes EPA's cleanup proposal change for the South Municipal Water Supply Well Superfund Site. For more detailed information on the remedial alternatives evaluated for use at the Site, please refer to the September 2009 Focused Feasibility Study (FFS), which is available for review at the Site information repositories or online at www.epa.gov/nr/southmuni. The Site information repositories are located at the Peterborough Town Library, 2 Concord St., Peterborough, NH and the EPA Records and Information Center, 5 Post Office Square, Boston, MA.

Due to the declining performance of the existing extraction/containment remedy and the conclusions reached in the Third Five-Year Review, additional investigations were performed between 2006 and 2009 and a Focused Feasibility Study (FFS) was prepared in 2009. The FFS identifies and evaluates new remedial alternatives for source mass reduction and dissolved phase contaminant plume management that will protect human health and the environment.

EPA's Proposal

After careful study of the South Municipal Water Supply Well Superfund Site, and after weighing the pros and cons of the different remedial alternatives evaluated in the FFS, EPA proposes the following comprehensive treatment scenario, or CTS, to address the elevated VOCs remaining within the Site source areas and reduce the risks presented by the Site source areas and groundwater.

CTS 4: In-Situ Thermal Treatment (>100,000 ug/L zone modified & >1,000 ug/L at VP-17 zone), In-Situ Bioremediation (NHBB property >1,000 ug/L zone outside of thermal treatment zone), and Permeable Reactive Barrier

Individual components of CTS 4 are summarized below and presented in detail in the FFS. Based on currently available information and assumptions, approximately 15,000 pounds of VOC contaminant source mass are expected to be treated via CTS 4 within an estimated 73,000 cubic yard section of the aquifer.

In-Situ Thermal Treatment

Heat will be applied to in-situ, or in-place, soil and groundwater within the source areas identified on the NHBB property and at the VP-17 area to mobilize the VOC contaminants of concern for collection and treatment. In-situ thermal treatment of areas with the highest dissolved phase VOC concentrations and dense non-aqueous phase liquids (DNAPL) will reduce contaminant mass, diminish VOC loading into groundwater, and reduce probable contaminant source areas from contributing to vapor intrusion issues. For costing purposes, the FFS identifies electrical resistance heating (ERH) as the in-situ thermal treatment method associated with CTS 4. The actual in-situ thermal treatment method implemented at the Site will be determined using pre-design findings.

In-Situ Bioremediation

In-situ bioremediation will be applied to enhance the microorganisms in the subsurface at the Site to physically and chemically break down contaminants in place. The FFS identifies the application of a proprietary product (AquaBupH™) to the subsurface to chemically reduce contaminants. The actual in-situ bioremediation product(s) and biodegradation mechanisms implemented at the Site will be determined using pre-design findings. Furthermore, the actual in-situ bioremediation treatment area may be extended to include non-NHBB property with total selected VOCs >1,000 ug/L that are outside of the VP-17 thermal treatment zone, depending on pre-design findings.

Permeable Reactive Barrier (PRB)

A PRB will be installed along the western edge of U.S. Route 202 from a depth just below the ground surface and extending into the glacial till overlying the bedrock in this area, approximately 50 feet deep. The PRB will provide passive treatment of contaminated groundwater leaving the NHBB property. The FFS considered PRBs of varying lengths (400 to 600 feet) containing (for costing purposes) a sand/iron backfill – actual length and location of the PRB and backfill material(s) will be determined using pre-design findings.

No change to the original cleanup approach for the contaminated groundwater present in the most distal areas of the plume (east of Route 202) is being proposed by EPA at this time. Contaminated groundwater east of Route 202 is downgradient of the proposed PRB and would not be treated by any of the CTS remedial technologies. However, groundwater contaminants in this area of the Site are expected to naturally attenuate, provided there is sufficient reduction in VOC loading to groundwater from upgradient source areas and sufficient PRB treatment of the contaminant plume to achieve Remedial Action Objectives (RAOs)

Institutional Controls

Existing institutional controls (ICs) regulate the pumping or use of groundwater within a groundwater protection overlay district that includes the Site. The ICs would continue to be implemented to: 1) prevent disturbance of the PRB and, 2) maintain the groundwater protection overlay district that restricts groundwater use on and near the Site.

The overlay district was reinstated into the

Town of Peterborough's zoning code on May 12, 2009 via Article III, Chapter 245-14.

Long-Term Operation, Maintenance, and Monitoring

Since this is a PRP-lead remedy, it is expected that PRP funds will be used to implement, operate, maintain, and monitor the remedy, both in the short and long-term. Examples of long-term activities include, but are not limited to, maintenance of the PRB and repair/replacement of damaged monitoring wells.

Monitoring of the individual components of CTS 4 will be required and a long-term, Site-wide monitoring plan will be developed and implemented to evaluate the success of all proposed cleanup actions. The monitoring plan will include groundwater sampling and any additional efforts necessary to support future Five-Year Reviews. Inspections of the Site and Town records will also be performed to verify that ICs remain in place and have not been removed or violated.

Five-Year Reviews

CERCLA requires any remedial action that results in contaminants remaining on-site at concentrations above those allowing unlimited exposure and unrestricted use to be reviewed by the EPA at least once every five years. During Five-Year Reviews, an assessment is made as to whether the implemented remedy continues to be protective of human health and the environment, or whether additional remedial action is appropriate. The most recent review of the Site was the Third Five-Year Review Report completed in August 2008. In this report the EPA determined the existing remedy is not protective of human health or the environment and the remedy is not functioning as intended by the 1989 ROD and subsequent ESDs.

A key Remedial Action Objective identified in the 1989 ROD was the remediation of groundwater to target levels that would allow for the reactivation of the South Municipal Well and reuse of the aquifer as a drinking water source by the Town of Peterborough. In order to restore the use of the aquifer for water supply purposes, the Third Five-Year Review Report recommended additional remedial technologies focused on DNAPL source reduction, or combination of remedial technologies with containment, be evaluated for future implementation at the Site. This Proposed Plan highlights the proposed

remedy change that would be implemented. An amended ROD that documents the remedy change will follow the end of the public comment period.

Impacts on the Local Community from the Cleanup

Given the close proximity of the proposed permeable reactive barrier to U.S. Route 202, periodic impacts to traffic flow may occur during construction. Any activities that may impact Route 202 will be closely coordinated with the Town and State prior to construction to mitigate impacts on the local community.

Additionally, NHBB workers may be inconvenienced during the implementation of the proposed remedy due to limited or changed parking options on the property.

Site Description

The South Municipal Water Supply Well Superfund Site is located in the Town of Peterborough in Hillsborough County, New Hampshire. It is located in the Contoocook River Valley approximately 2 miles south-southwest of the town center and 26 miles west-northwest of Nashua.

The Site encompasses approximately 250 acres that includes the South Municipal Well; portions of the Contoocook River and U.S. Route 202; the NHBB property and adjacent wetlands, and other properties, including commercial and residential properties located north of the South Well along Sharon Road. The site plan is shown in Figure 1. Groundwater flow beneath the NHBB property under static and pumping conditions is predominantly to the east, northeast, and a dissolved phase contaminant plume is present in groundwater. As shown in Figure 2, the contaminant plume is elongated parallel to the direction of groundwater flow and extends from the NHBB property to the Contoocook River.

Site Investigations

The 1989 Remedial Investigation (RI) collected and analyzed data to define the physical characteristics of the Site and evaluate the nature, extent, and source of the South Municipal Well contamination.

The RI primarily concluded:

- Soil in the area of NHBB contains volatile organic compounds (VOCs) due to historic releases from the NHBB facility.

- Subsurface soil in the area of the northeast corner of the NHBB manufacturing facility contains the highest concentrations of VOCs and contributes to groundwater contamination.
- Groundwater at the Site is primarily impacted by chlorinated hydrocarbons, including tetrachloroethene (PCE), trichloroethene (TCE), and 1,1,1-trichloroethene (1,1,1-TCA).
- The highest VOC concentrations in groundwater were present at the northeast corner of the NHBB manufacturing facility.
- Wetlands located east and northeast of NHBB were impacted by historic releases from the facility.
- Sediments in the wetlands and at several former NHBB drainage outfalls contained PCBs, PAHs, and elevated chrome, copper, and zinc concentrations.

Site sediments and wetlands were addressed during a 1994 remedial action. 1,996 tons of sediments containing PCB or PAH concentrations above cleanup levels were removed from wetland areas and 3,136 cubic yards of approved backfill materials and plants were placed in the excavation areas to restore original grades and wetlands.

South Municipal Water Supply Well Superfund Site History

- 1952: South Municipal Well is drilled and reportedly yields up to 500,000 gallons/day.
- 1956: NHBB completes construction of a plant upgradient of the South Well and begins producing ball bearings; chlorinated solvents are used in the manufacturing process.
- 1952-1982: The South Well supplies potable water to the Town of Peterborough until it is taken offline on December 2, 1982, after sample results indicated the presence of volatile organic compounds (VOCs) in the well water.
- 1983-1984: The Site is proposed and added to the final National Priorities List (NPL).
- 1986: NHBB agrees to an Administrative Order by Consent with the U.S. EPA and begins a Remedial Investigation and Feasibility Study (RI/FS).
- 1989: EPA issues a ROD specifying the remedial actions.
- 1990: EPA issues NHBB a Unilateral Administrative Order to design, construct, operate, and maintain the selected remedies.
- 1990-1993: NHBB performs the remedial design.
- 1993: EPA issues an Explanation of Significant Differences (ESD) that allows natural attenuation of the leading edge of contaminated groundwater and specifies excavation of contaminated sediments.
- 1994: Groundwater pump and treat and soil vapor extraction (SVE) systems commence operation as part of the Site remedy to restore contaminated groundwater and remediate contaminated soils. Contaminated sediments are excavated and Site wetlands restored.
- 1997: Remedy revised via a second ESD that states it is technically impracticable (TI) to restore contaminated groundwater located within a TI Waiver Area established on a portion of the Site to drinking water standards. Remedy requirements are modified to 1) hydraulically contain instead of extract and treat contaminated groundwater; and 2) no longer require remediation of subsurface contaminated soils located within the TI Waiver Area. SVE operation discontinued.
- 2005: Long-term pumping test on the South Municipal Well ends after 16 months when VOCs are detected above cleanup standards in nearby monitoring wells.
- 2006-2008: NHBB performs additional source area investigations on and off NHBB property.
- 2008: EPA determines the remedy is not protective nor is it functioning as intended; recommends new remedial alternatives be identified, evaluated, and implemented.
- 2009: Focused FS (FFS) presents new remedial alternatives for the Site. Indoor air samples collected from within NHBB and a downgradient commercial building indicate VOC concentrations greater than the NHDES Commercial Indoor Air Screening Levels. Additional studies are ongoing in 2010.

Investigations subsequent to the RI include pre-design activities in 1991 (for construction of the initial Site remedy); a source area investigation from 2006-2007; supplemental soil/groundwater sampling with vertical groundwater profiling in 2008, and an indoor air sampling event in 2009.

With the exception of the air sampling event, recent investigations have focused on assessing the degree and distribution of the residual VOC impacts to groundwater. The investigations revealed:

- Elevated concentrations of dissolved and separate phase VOCs are still present at the northeast corner of the NHBB manufacturing facility;
- Elevated VOCs still exist in groundwater between the NHBB manufacturing facility and Route 202;
- Elevated concentrations of dissolved and separate phase VOCs are present along and north of the NHBB property boundary, in an area approximately 250 feet east-northeast of the manufacturing facility's northeast corner, and,
- Low VOC concentrations in groundwater are still present east of Route 202 and the Contoocock River.

Results for the 2009 indoor air sampling event indicate concentrations of PCE and TCE detected in the NHBB and a downgradient commercial structure are greater than the New Hampshire Department of Environmental Services (NHDES) Commercial Indoor Air Screening Levels. Additional indoor air sampling is planned to verify these results and provide data in a downgradient residential structure not sampled in 2009.

Why is Cleanup Needed?

From 1956 to 1991, NHBB used chlorinated solvents, including PCE, TCE, and 1,1,1-TCA, as pure products or mixtures for parts washing and degreasing operations.

The presence of chemicals in groundwater at the South Municipal Well has been attributed to releases of solvents used by NHBB to the environment via:

- former drainage outfalls;
- maintenance activities such as floor washing, and
- historic trailer tank disposal practices.

A baseline risk assessment was completed as part of the 1989 remedial investigation and is

presented in the RI report. The risk assessment evaluated potential health risks associated with multiple potential exposure routes and identified several contaminants of concern (COCs) at the Site. The proposed remedy change and ROD amendment will address applicable Site soil and groundwater with COC concentrations above levels that allow unlimited exposure and unrestricted use, outside the TI Waiver Area.

Contaminants of Concern

Site investigation data indicates that PCE is the primary contaminant of concern at the Site. TCE and 1,1,1-TCA are also major constituents of soil and groundwater contamination. Additional PCE breakdown products including cis-1,2-dichloroethene; trans-1,2-dichloroethene; 1,1-dichloroethene (1,1-DCE); and vinyl chloride may also be present in portions of the groundwater plume

The highest concentrations of these contaminants are at the northeast corner of the NHBB building and extend east. A second area of elevated contaminants are present in an area approximately 250 feet east-northeast of the NHBB building's northeast corner, along and north of the NHBB northern property boundary.

Exposure Pathways

The 1989 baseline risk assessment, the most recent risk assessment conducted for the Site, considered the potential exposure pathways (or routes a chemical could take to harm human health) for six media: groundwater; soil, sediments, surface water, air; and fish. Completed pathways, which present possible risks to human health, were identified as ingestion of groundwater or fish, direct contact with soil, sediments, or surface water; and inhalation of air from surface water or soils. Negligible risks were estimated to be posed by the ingestion of fish and the inhalation of air from surface water or soils; incremental lifetime cancer risks were identified for direct contact with soil, sediments, or surface water.

Sediments that had contamination greater than action levels were removed from the wetlands adjacent to the NHBB property in 1994. While surface water remediation was not specifically addressed in the 1989 ROD or selected remedy, the sediment removal and subsequent wetland restoration remedial actions have directly promoted surface water restoration. Therefore, potential risks are no longer present in sediment or surface water media at the Site.

The 2009 Focused Feasibility Study (FFS) presents a conceptual Site exposure model for the

following source areas identified at the Site:

- the GZH-4 well cluster located at the northwest corner of the NHBB building, and
- the VP-17 area located approximately 250 feet east-northeast of the NHBB building's northeast corner, along and north of the NHBB northern property boundary (and outside the TI Waiver Area).

Results from the 2009 indoor air sampling event, when used to update the conceptual Site exposure model presented in the FFS, indicate potentially unacceptable present and future risks to the following receptors may exist via the exposure scenarios described below:

- Residents and Commercial Workers – inhalation of indoor air impacted by volatilization of groundwater contaminants;
- Plant Workers – inhalation of indoor air impacted by volatilization of groundwater or soil contaminants;
- Residents and Workers – ingestion of untreated groundwater distributed for potable use
- Site Workers, Trespassers, or Residents – incidental ingestion or contact with groundwater or soil.

Cleanup Alternatives Considered for the South Municipal Water Supply Well Superfund Site

The 2009 Focused Feasibility Study (FFS) summarizes the findings of the remedial alternative evaluation process for treatment of the source areas (i.e., GZH-4 and VP-17 areas) identified on and off the NHBB property, and the groundwater flowing from the NHBB property to other areas of the Site.

Five comprehensive treatment scenarios (CTSs) representing a range of remedial technologies and process options were developed for the Site. Each of the CTSs evaluated in the FFS and summarized below would require extensive operational and performance monitoring to ensure their effectiveness in achieving the following RAOs for the Site:

- Restore all groundwater outside of the TI Waiver Area to drinking water quality (Maximum Contaminant Levels) in as short a time as practicable in order to return the South Municipal Well to reuse as a drinking water supply.
- Prevent migration of contaminated

groundwater from within the TI Waiver Area into uncontaminated portions of the aquifer and areas located outside of the TI Waiver Area.

- Reduce soil and groundwater contaminant concentrations within the TI Waiver Area.
- Reduce soil contaminant concentrations outside of the TI Waiver Area to the NHDES Method I Category S-I Soil Standards.
- Prevent exposure to contaminated soil and groundwater within and outside of the TI Waiver Area.

CTS 1: Maintain Institutional Controls, No Further Action

Under CTS 1, no further action would be taken to remove, control, mitigate, or minimize exposure to contaminated source materials or groundwater, other than continued operation of the current groundwater extraction/containment system and continued implementation of institutional controls. The remedial timeframe to achieve RAOs is indefinite, as RAOs will not be met using this CTS. The present worth of CTS 1 is \$3,577,000.

The No Further Action alternative provides a baseline against which other CTSs are compared.

CTS 2: In-Situ Thermal Treatment (>10,000 ug/L zone & >1,000 ug/L at VP-17 zone), Permeable Reactive Barrier, and Institutional Controls

CTS 2 consists of in-situ thermal treatment of both the GZH-4 source area (located within the TI Waiver Area) with total select VOCs >10,000 ug/L and the VP-17 source area (located outside the TI Waiver Area) with total select VOCs >1,000 ug/L. A PRB would be installed to provide passive containment and treatment of contaminated groundwater, and institutional controls would continue to be implemented. The estimated remedial timeframe to achieve RAOs is greater than 2 years for soil and greater than 10 years for groundwater. The present worth of CTS 2 is \$13,810,000.

CTS 3: In-Situ Thermal Treatment (>10,000 ug/L zone), In-Situ Bioremediation (>1,000 ug/L at VP-17 zone), Permeable Reactive Barrier, and Institutional Controls

CTS 3 includes in-situ thermal treatment of the GZH-4 source area with total select

EPA's Nine Criteria for Choosing a Cleanup Plan

EPA uses nine criteria to evaluate alternatives and select a final cleanup plan (called a remedial action) that meet the statutory goals of protecting human health and the environment, maintaining protection over time, and minimizing contamination. These nine criteria make up the assessment process used for all Superfund sites.

The nine individual criteria are further described below:

Threshold Criteria

1. Overall Protection of Human Health and the Environment. Will the alternative protect human health and plant and animal life from the contamination released by the Site? The chosen cleanup plan must meet this criterion.

2. Compliance with applicable or relevant and appropriate requirements (ARARs). Does the alternative meet all pertinent federal and state environmental statutes, regulations, and requirements? Is a waiver required? The chosen cleanup plan must meet this criterion.

Balancing Criteria

3. Long-term Effectiveness and Permanence. How reliable will the alternative be at long-term protection of human health and the environment? Is contamination likely to present a potential risk again?

4. Reduction of Toxicity, Mobility, or Volume through Treatment. Does the alternative incorporate treatment to reduce the harmful effects of the contaminants, their ability to spread, and the amount of contaminated material present?

5. Short-term Effectiveness. How soon will the risks be adequately reduced? Are there short-term hazards to workers, the community, or the environment that could occur during the cleanup process?

6. Implementability. Is the alternative technically and administratively feasible? Are the materials and services needed to implement the cleanup alternative (e.g. treatment machinery, space at an approved disposal facility) readily available?

7. Cost. What is the cost of constructing and maintaining the cleanup alternative? Capital costs and the present value of all costs over the anticipated life of the cleanup alternative are presented.

Modifying Criteria

8. State Acceptance. Do state environmental agencies agree with the recommendations? This criterion considers the state's preferences among or concerns about the alternatives, including comments on ARARs or the proposed use of waivers. This criterion is addressed following state input on the FS and Proposed Plan. Comments received on the Proposed Plan are an important indicator of community acceptance.

9. Community Acceptance. Does the local community agree with EPA's analysis and preferred alternative? What are their preferences and concerns about the alternatives? This criterion is addressed following community input on the FS and Proposed Plan.

As part of the Feasibility Study, each alternative is evaluated using two threshold and five balancing criteria. These criteria are also used to compare the alternatives against each other in a process known as a comparative analysis.

VOCs >10,000 ug/L and in-situ bioremediation of the VP-17 source area with total select VOCs >1,000 ug/L. A PRB would be installed to provide passive containment and treatment of contaminated groundwater; and institutional controls would continue to be implemented. The remedial timeframe to achieve RAOs is unknown, as soil RAOs are unlikely to be met outside of the TI Waiver Area due to the likelihood that residual DNAPL remains at VP-17 after in-situ bioremediation is completed. The present worth of CTS 3 is \$13,406,000.

CTS 4: In-Situ Thermal Treatment (>100,000 ug/L zone modified & >1,000 ug/L at VP-17 zone), In-Situ Bioremediation (NHBB property >1,000 ug/L zone outside of thermal treatment zone), Permeable Reactive Barrier, and Institutional Controls

The locations where individual components of CTS 4 will be implemented are identified in Figure 3. CTS 4 would apply in-situ thermal treatment to both the GZH-4 source area with total select VOCs >100,000 ug/L, modified as shown in Figure 3, and the VP-17 source area with total select VOCs >1,000 ug/L. The NHBB property would be further treated under CTS 4 via in-situ bioremediation of areas with total select VOCs >1,000 ug/L that are outside of the GZH-4 thermal treatment zone. A PRB would be installed to provide passive containment and treatment of contaminated groundwater; and institutional controls would continue to be implemented. The estimated remedial timeframe to achieve RAOs is greater than 2 years for soil and greater than 10 years for groundwater. The present worth of CTS 4 is \$12,924,000.

CTS 5: In-Situ Thermal Treatment (>100,000 ug/L zone modified), In-Situ Bioremediation (>1,000 ug/L at VP-17 zone and NHBB property >1,000 ug/L zone outside of thermal treatment zone), Permeable Reactive Barrier, and Institutional Controls

CTS 5 would combine in-situ thermal treatment to the GZH-4 source area with total select VOCs >100,000 ug/L, modified as shown in Figure 3; with in-situ bioremediation of the VP-17 source area with total select VOCs >1,000 ug/L and in-situ bioremediation of the NHBB property with total select VOCs >1,000 ug/L that are outside of the GZH-4 thermal treatment zone. A PRB would be installed to

Why EPA Recommends This Cleanup Proposal Change

CTS 4 as the preferred remedial alternative in this Proposed Plan. It provides the best balance of the criteria used to evaluate the various remedial alternatives. EPA recommends CTS 4 because it is protective of human health and the environment, utilizes proven remedial technologies in a cost-effective way, and is more likely to achieve the Remedial Action Objectives in a shorter amount of time than alternatives.

By applying in-situ thermal treatment to both the GZH-4 source area with total select VOCs >100,000 ug/L (modified to include an additional thermal treatment area east of GZH-4 with total select VOCs below 100,000 ug/L, as shown in Figure 3) and the VP-17 source area with total select VOCs >1,000 ug/L, combined with in-situ bioremediation of areas with total select VOCs >1,000 ug/L that are outside of the GZH-4 thermal treatment zone, CTS 4 provides increased certainty of contaminant destruction in identified source areas while balancing the increased cost of applying thermal treatment to all areas with VOCs >10,000 ug/L (CTS 2).

CTS 4 provides both short-term and long-term protection of human health and the environment; meets Federal and State applicable or relevant and appropriate requirements (or justifies the basis for a waiver); utilizes permanent solutions to the maximum extent practicable by eliminating the identified Site source areas; and aggressively treats contaminated groundwater leaving the NHBB property and adjacent areas, thereby limiting the extent of the distal groundwater plume and leading to the successful remediation of groundwater in the area of the South Municipal Well.

provide passive containment and treatment of contaminated groundwater; and institutional controls would continue to be implemented. The remedial timeframe to achieve RAOs is unknown, as soil RAOs are unlikely to be met outside of the TI Waiver Area due to the likelihood that residual DNAPL remains at VP-17 after in-situ bioremediation is completed. The present worth of CTS 5 is \$12,520,000.

Alternatives Comparison

After completion of the detailed evaluation of the comprehensive treatment scenarios, a comparative analysis of the CTSs was performed to identify those that meet or exceed the two threshold criteria. The CTSs that satisfy the threshold criteria are then assessed to determine which meet or exceed the five balancing criteria.

Comprehensive treatment scenarios 2 and 4 are protective of human health and the environment and are expected to comply with ARARs. It is important to note that VOC concentrations in the VP-17 area must reach ARARs after remedial action is completed in order for each CTS to meet the RAOs outside the TI Waiver Area. CTS 3 and CTS

5 do not fully protect human health and the environment in the VP-17 area and are unlikely to comply with ARARs. This is due to the likelihood that residual DNAPL may still exist in the VP-17 area after in-situ bioremediation.

Each CTS, except for CTS 1, provides a means to reduce source mass within the NHBB property, which will lessen the source of VOCs entering groundwater and improve long-term effectiveness. Aggressive source treatment options such as in-situ thermal treatment, coupled with the less aggressive in-situ bioremediation treatment, provide destruction of VOCs, while the PRB provides additional contaminant treatment downgradient of the source areas. However, applying the less aggressive treatment options alone will result in longer remedial timeframes and greater uncertainty as to the degree and rate of contaminant reductions when compared to the more aggressive treatment options.

Therefore, CTS 2 and CTS 4 are expected to more substantially reduce the toxicity, mobility, and volume of source area contamination than CTS 1 (no action) or CTS 3 and CTS 5, which apply in-situ bioremediation instead of in-situ thermal treatment to the VP-17 area. The total amount of hazardous material that can

be destroyed using in-situ bioremediation is likely less and will take longer to achieve than the total amount that can be destroyed using in-situ thermal treatment.

CTS 2 and CTS 4 also provide increased short and long-term effectiveness when compared to CTS 1, CTS 3, and CTS 5. In-situ thermal treatment, compared to in-situ bioremediation, can in most cases achieve RAOs in one year following installation, instead of the multiple years required for bioremediation alone. While the presence of construction equipment on and near the NHBB property primarily increases the risk to NHBB employees, these risks may be managed through the implementation of a comprehensive Site Health and Safety Plan.

All CTS alternatives are implementable, both technically and administratively. Total capital, operation, and maintenance costs range from a low of \$3.6 million for CTS 1 to \$12.5 to \$13.4 million for CTS 5 and CTS 3. CTS 4 and CTS 2 are \$13.0 and \$13.8 million, respectively.

A comparison of each CTS against the NCP criteria is presented in Table 1 and Section 6.0 of the FFS presents a detailed analysis.

The side by side comparison presented in Table 1 shows CTS 4, with a present worth estimate of \$13 million, more fully meets or exceeds a greater number of criteria than all other alternatives except CTS 2, which has an estimated cost of \$13.8 million. CTS 2 is more expensive because it would apply in-situ thermal treatment over a larger area of the Site instead of applying thermal treatment over a smaller area in combination with the in-situ bioremediation component included in CTS 4.

EPA and the NHDES have had substantive discussions regarding the Site and its cleanup. NHDES has indicated it is supportive of the CTS 4 remedial alternative as presented in this Proposed Plan.

Community acceptance will be evaluated based on the feedback received during the public comment period. Both state and community acceptance of the proposed remedy change will be considered and will influence the final remedy decision made by EPA.

How You Can Comment On EPA's Cleanup Proposal?

Two types of public meetings will occur with respect to the Proposed Plan. The first will

be a Public Information Meeting to explain the proposed remedy change and answer any questions that may arise. This meeting will focus on a discussion of the Proposed Plan and is considered informational only. Comments that are made during this meeting will not be part of the official record.

The second type of meeting, a Public Hearing, will occur during the official comment period. At this meeting, EPA will provide a brief summary of the cleanup proposal and then the floor will be open for spoken comments. A stenographer will be present to record all of the comments offered during the hearing. Comments made must be limited in duration in order to allow all individuals present to have an opportunity to speak their comments into the official record. EPA does not respond to any of the comments made at the Public Hearing other than to indicate time limits or to request clarification. At the close of the formal comment session, if time permits, EPA will be available to answer questions.

To provide an opportunity for public input on this Proposed Plan, EPA will hold a 31-day public comment period from May 19, 2010 to June 18, 2010. EPA will hold a Public Information Meeting on May 18, 2010, the day before the public comment period begins, as well as a Public Hearing on June 16, 2010, just prior to the end of the comment period.

EPA welcomes input provided during the public comment period and uses comments to improve the remedy selection decision. There are three different ways for individuals to express their comments on this Proposed Plan:

- Written comments may be mailed to the EPA RPM identified on page 1 of this plan by June 18, 2010.
- Written comments may be emailed to the EPA RPM at heine.kevin@epa.gov by June 18, 2010.
- Oral comments may be spoken into the official record during the Public Hearing on June 16, 2010.

Whether you have concerns or support the Proposed Plan, EPA encourages you to express your opinion during the public comment period. Any of the three mechanisms above are acceptable for providing comments and all comments are welcome and given equal consideration.

The public comment period lasts for a minimum of 30-days. If requested, EPA will typically grant a 30 day comment period extension.

Once the public comment period has ended, EPA will assemble and evaluate all of the submitted comments. EPA will then select and document the remedy selection decision in an amended ROD. The amended ROD and a summary of responses to comments received will be made available to the public at the Peterborough Public Library and the EPA Records and Information Center in Boston.

For More Detailed Information:

Select technical and public information prepared for the Site are available for public review at the following locations:

Online

www.epa.gov/ne/southmuni

EPA Records and Information Center
5 Post Office Square
Boston, Massachusetts
(617) 918-1440

Peterborough Town Library
2 Concord St.
Peterborough, New Hampshire
603 924-8040

Other Contact Information:

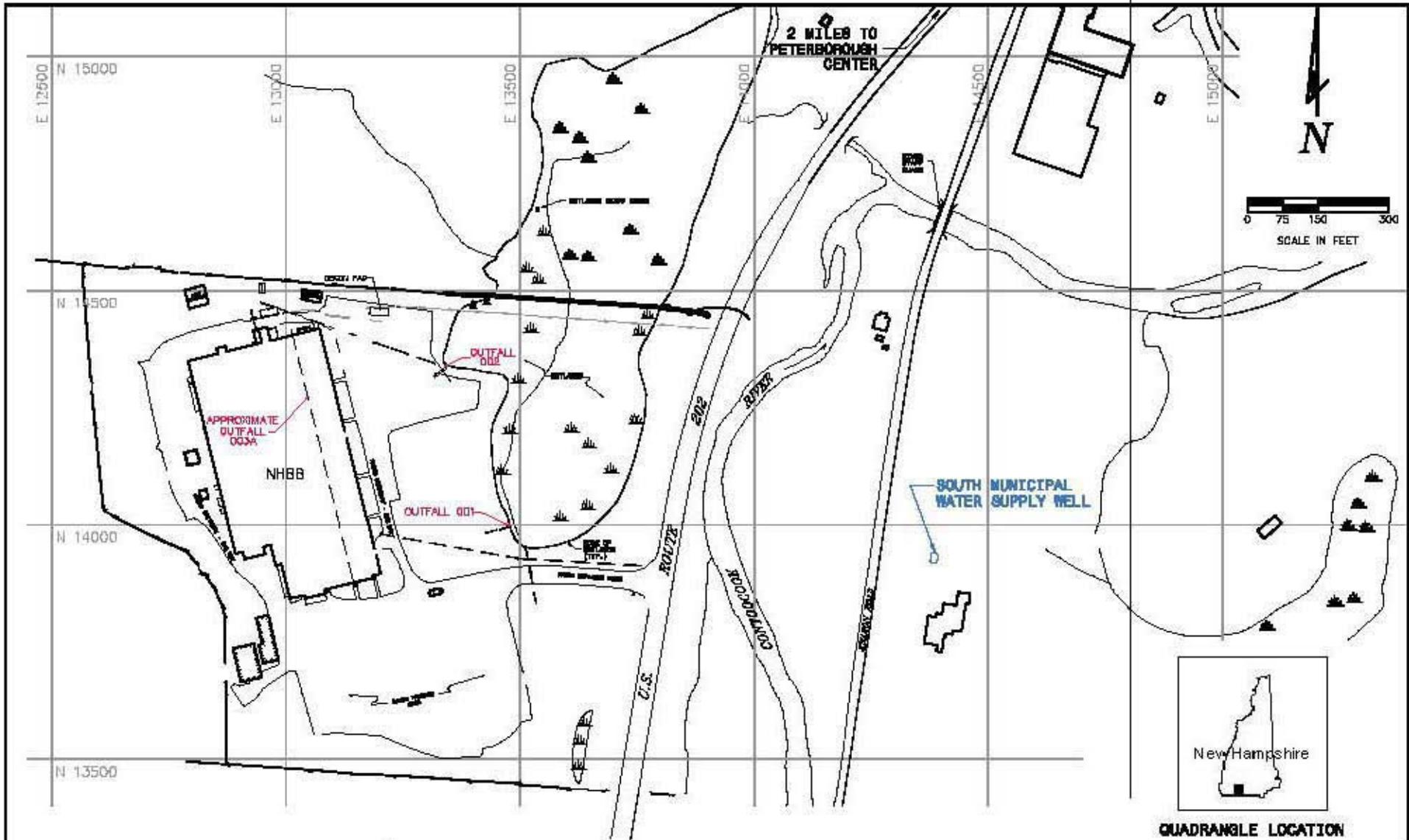
Kevin Heine
U.S. EPA Remedial Project Manager
(617) 918-1321
heine.kevin@epa.gov

Tom Andrews
Project Manager
New Hampshire Department of
Environmental Services
(603) 271-2910
thomas.andrews@des.nh.gov

Kelsey O'Neil
U.S. EPA Community Involvement
Coordinator
(617) 918-1799
toll-free: 888 372-7341 ext. 81799

Table 1
Alternatives Comparison
South Municipal Water Supply Well Superfund Site, Peterborough, New Hampshire

<p> <input checked="" type="checkbox"/> Meets or Exceeds <input type="checkbox"/> Does Not Fully Meet CTS Comprehensive Treatment Scenario ISTT In-Situ Thermal Treatment ISBR In-Situ Bioremediation Comparison Criteria </p>	<p align="center"><u>CTS 1</u> Inst. Controls No Further Action Beyond Continued Operation of Existing GW Extraction/ Containment System (alternative 0)</p>	<p align="center"><u>CTS 2</u> Inst. Controls ISTT of >10,000 Zone (alt 6) ISTT of Select VP-17 Zone (alt 15A) PRB (alt 2A)</p>	<p align="center"><u>CTS 3</u> Inst. Controls ISTT of >10,000 Zone (alt 6) ISBR of VP-17 (alt 19C) PRB (alt 2A)</p>	<p align="center"><u>CTS 4</u> Inst. Controls ISTT of >100,000 Modified (alt 3A) ISTT of Select VP-17 Zone (alt 15A) ISBR on Property >1,000 omitting 3A (alt 19D) PRB (alt 2B)</p>	<p align="center"><u>CTS 5</u> Inst. Controls ISTT of >100,000 Modified (alt 3A) ISBR of VP-17 (alt 19C) ISBR on Property >1,000 omitting 3A (alt 19D) PRB (alt 2B)</p>
Protection of Human Health and the Environment	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Meets Federal & State Requirements	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Provides Long Term Protection	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Reduces Toxicity, Mobility & Volume through Treatment	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Provides Short Term Protection	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Implementability	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Total Capital and O&M Costs (Millions)	\$3.6	\$13.8	\$13.4	\$13.0	\$12.5
State Acceptance	To Be Considered After Public Comment Period				
Community Acceptance	To Be Considered After Public Comment Period				



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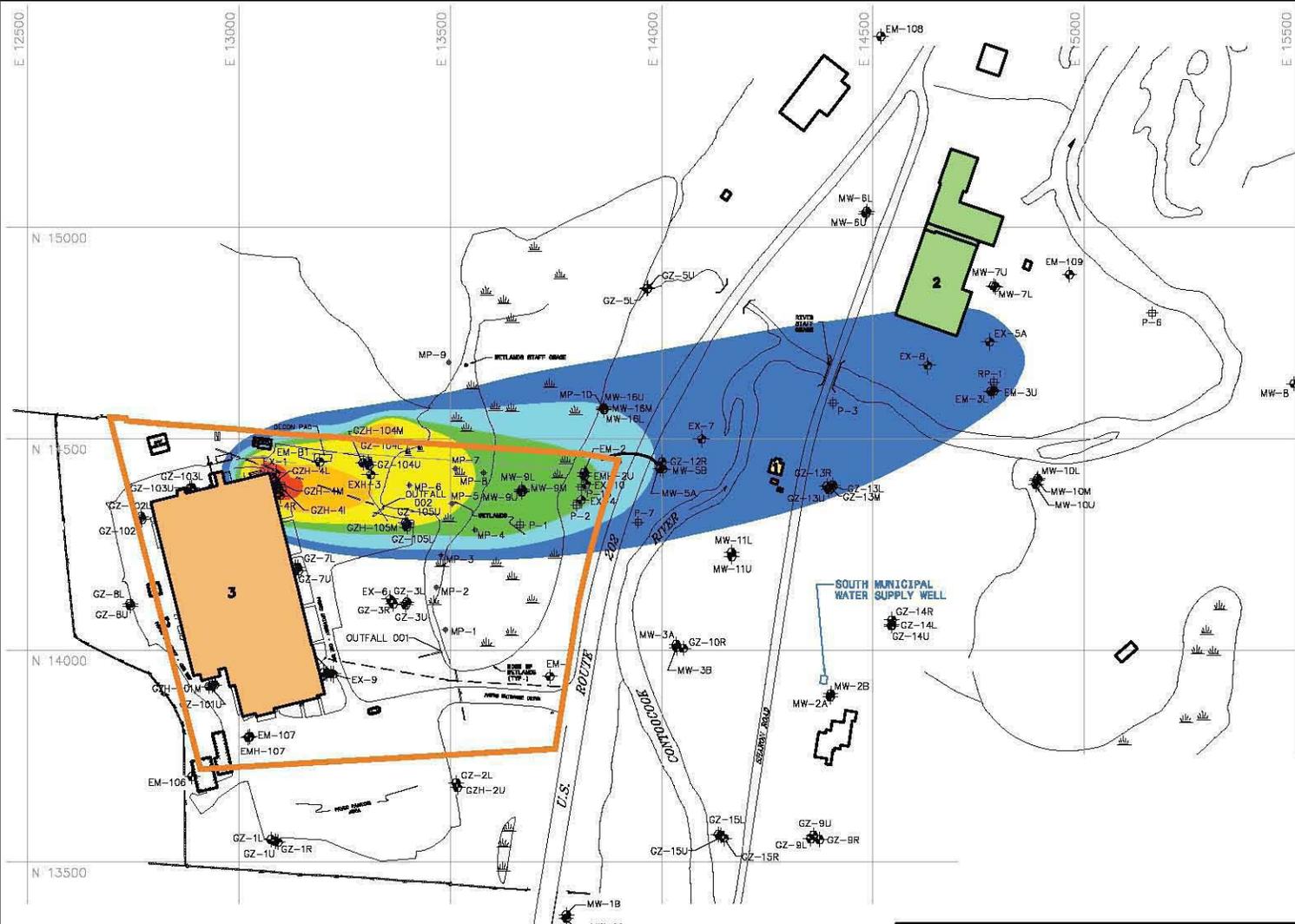
SOUTH MUNICIPAL WATER SUPPLY WELL SUPERFUND SITE

FIGURE 1
SITE PLAN

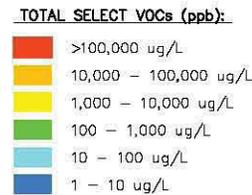
PETERBOROUGH, NEW HAMPSHIRE

PROJECT NO.: NHB084	SUBMITTAL DATE: FEBRUARY 2010
CAD DWG FILE: NHB084.200.0087	PLOT DATE: 2/18/10

SOURCE: THIS DRAWING WAS RE-DRAFTED FROM T.P. MORAN, INC. 'BOUNDARY PLAN OF LAND FOR NEW HAMPSHIRE BALL BEARINGS, INC.', DATED JANUARY 19, 1990.



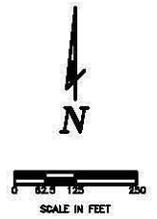
- LEGEND:**
- GROUNDWATER EXTRACTION WELL
 - GROUNDWATER MONITORING WELL
 - PIEZOMETER
 - MINI-PIEZOMETER
 - RESIDENTIAL STRUCTURE DILUTE PLUME
 - COMMERCIAL STRUCTURE DILUTE PLUME (STAFF DEVELOPMENT FOR EDUCATORS BUILDING)
 - COMMERCIAL STRUCTURE SOURCE AREA (NEW HAMPSHIRE BALL BEARINGS FACILITY)
 - TECHNICAL IMPRACTICABILITY WAIVER AREA



NOTES:
 THE TI WAIVER IS INFERRED FROM THE VERBIAGE OF THE 1987 EXPLANATION OF SIGNIFICANT DIFFERENCES AND AS DEPICTED IN THE SECOND 5-YEAR REVIEW.

APPROXIMATED PLUME AS INTERPRETED FROM OCTOBER 2007 AND APRIL 2008 GROUNDWATER ANALYTICAL DATA.

SELECT VOCs INCLUDE: PCE, TCE, 1,1,1-TCA, 1,1-DCA, 1,1-DCE, CIS, TRANS AND VC.



SOURCE: THIS DRAWING WAS RE-DRAFTED FROM T.F. MORAN, INC. "BOUNDARY PLAN OF LAND FOR NEW HAMPSHIRE BALL BEARINGS, INC.", DATED JANUARY 19, 1980.

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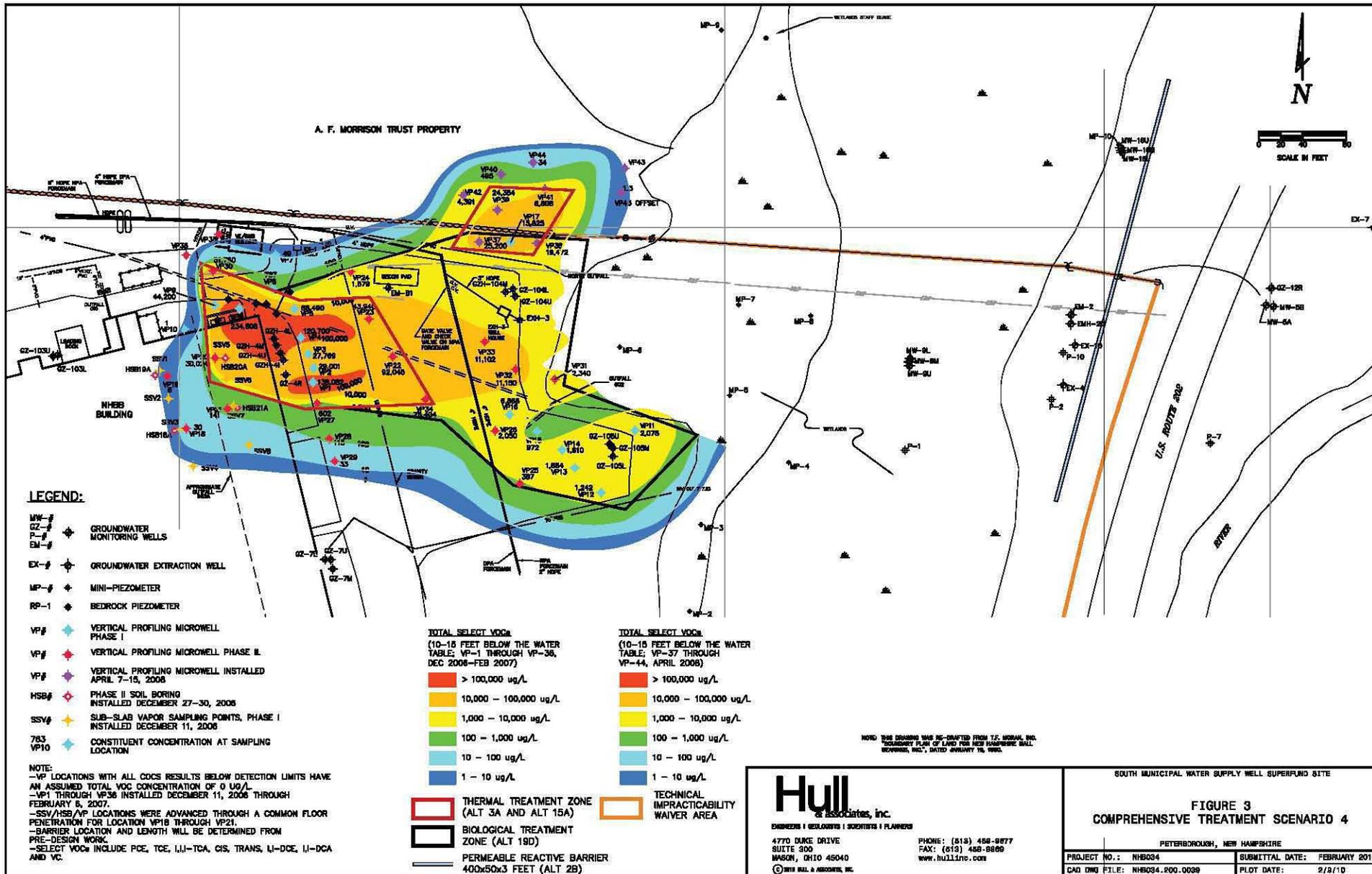
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SOUTH MUNICIPAL WATER SUPPLY WELL SUPERFUND SITE

**FIGURE 2
 GROUNDWATER VOC PLUME**

PETERBOROUGH, NEW HAMPSHIRE

PROJECT NO.: NHB094	SUBMITTAL DATE: FEBRUARY 2010
CAD DWG FILE: NHB094.200.0098	PLOT DATE: 2/16/10



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Agency

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Boston, MA 02109

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You are Invited to Attend!

Public Information Meeting
May 18, 2010
6:00 p.m.

Peterborough Town Hall
1 Grove Street
Peterborough, NH

Public Hearing
June 16, 2010
7:00 p.m.

Peterborough Town Hall
1 Grove Street
Peterborough, NH