FOCUSED FEASIBILITY STUDY
MOTTOLO PIG FARM SUPERFUND SITE
BLUEBERRY HILL ROAD
RAYMOND, NEW HAMPSHIRE

NHDES SITE # 198704094
PROJECT RSN # 2032

PREPARED FOR:
New Hampshire Department of Environmental Services
Hazardous Waste Remediation Bureau
Concord, New Hampshire

and

United States Environmental Protection Agency
Region I - New England
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TABLE OF CONTENTS

TABLE OF CONTENTS (Continued)

TABLE OF CONTENTS (Continued)

TABLES

FIGURES

APPENDICES

LIST OF ACRONYMS

ARARs	applicable or relevant and appropriate requirements
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
D.I.	ductile iron
DO	dissolved oxygen
EPA	United States Environmental Protection Agency
FFS	Focused Feasibility Study Report
GZA	GZA GeoEnvironmental, Inc.
HI	Hazard Index
NA	Natural attenuation
NCP	National Contingency Plan
NHDES	New Hampshire Department of Environmental Services
NPL	National Priorities List
O&M	Operation and maintenance
ppb	parts per billion
PRGs	Preliminary Remediation Goals
Quinn	Quinn & Company, Inc.
RAOs	Remedial Action Objectives
RI/FS	Remedial Investigation/Feasibility Study
ROD	Record of Decision
SAP	Sampling and Analysis Plan
SARA	Superfund Amendments and Reauthorization Act
SPDC	Service Pumping and Drain Company, Inc.
TCE	trichloroethylene
Town	Town of Raymond, New Hampshire
VES	vacuum extraction system
VOC	volatile organic compound

EXECUTIVE SUMMARY

SITE BACKGROUND

Site-related groundwater contamination has recently (2009) been detected in several residential water supply wells near the Mottolo Pig Farm Superfund Site (Site, Mottolo Property). The Site was initially a pig farm. From 1975 through 1979, over 1,600 drums and pails of chemical manufacturing wastes from two companies were disposed in a one quarter-acre depression referred to as the former disposal area. Evidence of leaking drums was reported to the State in 1979, and it was initially concluded that soil and groundwater beneath the Site were contaminated with primarily volatile organic compounds (VOCs) and aromatics and that the contaminants were seeping into a brook that discharges to the Exeter River, located approximately one half mile to the north. Arsenic was also found in groundwater.

Between November 1980 and January 1982, the United States Environmental Protection Agency (EPA) performed a removal action including excavation, staging, testing, on-site storage, and off-site disposal of 1,600 containers of waste, and an estimated 160 tons of contaminated soil from the former disposal area. The Site was subsequently added to the National Priorities List in July 1987.

A Remedial Investigation/Feasibility Study (RI/FS) was completed in March 1991. A number of different contaminants were identified in groundwater, surface water, sediment, and soil. The RI/FS found that exposure to on-site soils, air, sediments, and surface waters did not pose an unacceptable environmental or human health risk. However, a potential risk from drinking on-site groundwater was determined to be above acceptable risk levels. Although soil did not present a direct risk to human health, contaminants in soil did present a risk to groundwater should contaminants migrate from the soil into groundwater. Based on the removal action and RI/FS, the components of the remedy selected by EPA (and concurred in by New Hampshire Department of Environmental Services [NHDES]), as described in the Record of Decision (ROD, March 1991), included the following:

- Implementation of institutional controls, including land use restrictions to limit site access and future groundwater use/exposure, at the Site and in close proximity to the Site;
- Installation of a groundwater interceptor trench to dewater the former disposal area soils, two temporary soil caps over the former disposal area, and installation of a soil-vapor extraction system to remove VOC contaminants from the soils;
- Natural attenuation (NA) of groundwater; and
- Long-term sampling and evaluation of groundwater to assess compliance with cleanup levels through NA.

An in-situ vacuum extraction system (VES) was designed and built in 1993 to treat soil contamination within the former disposal area. After three years of operation, the VES system was shut down in the fall of 1996, and the soil cleanup deemed complete by EPA (in consultation with NHDES). In the spring of 1997, the VES cap was removed and the area was graded and seeded. The final VES closeout report was completed in 1997.

In 2000, EPA decommissioned a number of wells, removed the chain link fence surrounding the Site, installed a new entry gate and modified the remaining wells. In the fall of 2001, the final components of the vacuum extraction system were removed, including the vacuum extraction wells and groundwater interceptor trench.

Natural attenuation sampling began in 1993. Between 1993 and 1998 sampling varied from quarterly, to three times a year, and then to semi-annual monitoring events. Annual sampling began in 1999 and consisted of sampling groundwater from the network of on-site monitoring wells. The residential well sampling program was initiated in 2003 by NHDES based upon concerns regarding the development on Strawberry Lane.

An expanded residential well sampling program began in 2009 based upon a recommendation by EPA in 2008. The spring 2009 expanded residential well sampling identified trichloroethylene (TCE) contamination and elevated arsenic levels in a number of residential wells located west of the Mottolo Property on Windmere Drive and Blueberry Hill Road. Following the residential well sampling in March 2009, NHDES requested Cooperative Agreement funding from EPA to evaluate the potential off-site migration issues and to determine if modifications to the Site remedy were required to assure that the Site remedy remains protective of human health and the environment.

In 2009, NHDES contracted with GZA GeoEnvironmental, Inc. (GZA) to perform supplemental groundwater investigations both on and surrounding the Site which would lead to the evaluation of remedial alternatives to address contaminated drinking water. GZA conducted or managed groundwater sampling studies, geophysical logging of bedrock wells, surficial geophysical surveys, bedrock well installations, and an aquifer pumping test during the 2009 and 2010 timeframe. The outcome of these studies resulted in the identification and evaluation of the remedial alternatives that are discussed in this report.

FOCUSED FEASIBILITY STUDY

This Focused Feasibility Study Report (FFS) identifies and evaluates remedial alternatives for contaminated drinking water in residential wells located near the Mottolo Pig Farm Superfund Site (the Site) in Raymond, New Hampshire. The remedial alternatives evaluated in this FFS considered data collected during the 2009 and 2010 investigation studies that documented the nature and extent of drinking water contamination surrounding the Site (Preliminary Interpretation of VOC, Arsenic, and Uranium 2009 Data In Residential and Monitoring Wells, Mottolo Superfund Site, Raymond, New Hampshire, GZA, March 2010; May 2010 Site Sampling Data Report, GZA, July 2010 located in **Appendix D** of this FFS; and the 2009 and 2010 Residential Well Sampling Data Technical Memorandum, GZA, July 2010 located in **Appendix E** of this FFS). The remedial alternatives evaluated also relied upon the results of subsurface geophysical work (Surface Geophysical Survey, Hager-Richter, May 5, 2010; and 3D Geophysical Conceptual Model, Hager-Richter, July 2, 2010 located in **Appendix B** of this FFS). This FFS evaluates remedial alternatives to reduce or mitigate the risks to human health and the environment that result from exposure to Site-related contaminants in drinking water.

REMEDIAL ALTERNATIVES FOR DRINKING WATER

Three comprehensive remedial alternatives were carried through the detailed analysis of alternatives to address risks from exposure to contaminated drinking water. These alternatives are described below.

Alternative GW-1: No Action

The No Action Alternative is required to be considered throughout the FFS process as a baseline for comparison with the other alternatives. The No Action Alternative does not require any additional actions be taken to address the residential wells that have been impacted by contamination from the Site. Future sampling of selected residential wells to monitor off-site groundwater contamination will be performed (in addition to the onsite monitoring required in the 1991 ROD). The No Action Alternative represents the minimal proposed remedial action for addressing the contamination in residential wells.

Alternative GW-2: Expansion of Public Water Supply

The GW-2 Alternative would prevent direct exposure to contaminated drinking water by requiring the extension of the existing 12-inch public water supply main in Raymond, New Hampshire approximately two miles to provide safe drinking water to approximately 25 residents in Area 1 (as shown on **Figure 1**). The residences will be completely disconnected from their existing private wells and the wells will be either converted to monitoring wells or decommissioned following NHDES guidelines.

Institutional controls will be required in limited areas surrounding the Site to prevent the installation of any new groundwater wells where such use has the potential to hydraulically influence the movement of groundwater contamination from the Site. Additional groundwater use in some areas near the Site has the potential of drawing Site contamination into new bedrock wells and/or into other existing residential wells due to the interconnections of the bedrock fractures and the hydraulic connection to the contamination on the Site.

Groundwater monitoring of selected residential wells (especially in Areas 2 and 3) would be performed (in addition to the onsite monitoring required by the 1991 ROD) to confirm that contamination has not migrated to other residential wells. If Site-related contamination is detected in residential wells outside of Area 1, this alternative would require these homes to be connected to the public water supply system.

The GW-2 remedial alternative will also use the 5-Year Review Study process to track the progress of meeting the remedial action objectives and to determine when remediation has been completed.

Alternative GW-3: Whole House Treatment

This alternative involves the installation and maintenance of whole house treatment systems to treat all water pumped from each of the residential wells located in Area 1, as depicted on **Figure 1**. Each treatment system will be designed with redundant treatment units to address both the VOC contamination and arsenic contamination above drinking water standards due to Site-related conditions. The treatment systems will require periodic maintenance in order for them to remain effective in providing clean water to each residence. The influent and effluent of the treatment systems will need to be sampled at least twice annually for the first five years and annually thereafter. It is anticipated that certain components of the treatment equipment may need to be replaced approximately every ten years. Some residences may also require radon treatment and/or water softener systems and/or backwash filters (depending on influent characteristics of their well water) in order for the treatment units to operate effectively.

Institutional controls will be required in limited areas surrounding the Site to prevent the installation of any new wells where such use has the potential to hydraulically influence the movement of groundwater contamination from the Site. Additional new groundwater use in some areas near the Site has the potential of drawing Site contamination into new bedrock wells and/or into other existing residential wells due to the interconnections of the bedrock fractures and the hydraulic connection to the contamination on the Site.

Groundwater monitoring of selected residential wells (especially in Areas 2 and 3) would be performed (in addition to the onsite monitoring required in the 1991 ROD) to confirm that contamination has not migrated to other residential wells. If Site-related contamination is detected in residential wells outside of Area 1, these homes would be provided with whole house treatment systems.

The GW-3 remedial alternative will also use the 5-Year Review Study process to track the progress of meeting the remedial action objectives and to determine when remediation has been completed.

1.0 INTRODUCTION

1.1 PURPOSE AND ORGANIZATION OF REPORT

The purpose of this Focused Feasibility Study Report (the FFS) is to identify and evaluate remedial alternatives to address contamination found in nearby residential drinking water wells due to the migration of contaminated groundwater from the Mottolo Pig Farm Superfund Site (the Site, Mottolo Property) in Raymond, New Hampshire. The evaluation includes an assessment of the relative strengths and weaknesses of the potential remedial alternatives, the availability of materials and specialists to construct the remedies, the ability for each remedial technology and process option to meet regulatory requirements as well as other criteria. Potential remedial alternatives were identified in part on the basis of: (1) prior experience at similar sites, (2) applicable or relevant and appropriate requirements (ARARs), and (3) engineering judgment.

The FFS was conducted in accordance with the United States Environmental Protection Agency (EPA) "Guidance for Conducting Remedial Investigations and Feasibility Studies under CERCLA" (EPA, 1988). The FFS report is organized as follows:

- **Section 1.0** summarizes the Site background information, including Site history and the current nature and extent of contamination;
- **Section 2.0** provides a basis for Site remediation by identifying ARARs and remedial action objectives and goals;
- **Section 3.0** identifies and screens potentially applicable remedial technologies;
- **Section 4.0** develops remedial alternatives to address the residential well contamination;
- **Section 5.0** presents a screening of remedial alternatives to address the residential well contamination;
- **Section 6.0** provides a detailed analysis of remedial alternatives to address the residential well contamination; and
- **Section 7.0** provides a comparative analysis of remedial alternatives for addressing the residential well contamination.

1.2 BACKGROUND INFORMATION

A Record of Decision (ROD) for the Site was issued in March 1991. The components of the remedy selected by EPA (with New Hampshire Department of Environmental Services [NHDES] concurrence), as described in the ROD, included the following:

- Institutional controls, including land use restrictions to limit site access and future groundwater use/exposure;
- Installation of security fences in and around the former disposal area;
- Installation of a groundwater interceptor trench to dewater the former disposal area soils, placement of two temporary soil caps over the former disposal area and the southern boundary area, and installation of an in-situ vacuum extraction system to remove volatile organic compound (VOC) contaminants from the soils;
- Natural attenuation (NA) of contaminated groundwater; and

- Long-term environmental sampling and evaluation of groundwater and surface water to assess compliance with cleanup levels through NA.

The groundwater interceptor trench was designed and installed in 1992 to lower the groundwater table within the former disposal area. The in-situ vacuum extraction system (VES) was designed and built in 1993 to treat soil contamination within the former disposal area. After three years of operation, the VES system was shut down in the fall of 1996, and the soil cleanup deemed complete by EPA (in consultation with NHDES). In the spring of 1997, the VES cap was removed and the area was graded and seeded. The final VES closeout report was completed in 1997 and the entire soil remedial action was considered complete by EPA on June 28, 1998.

In 2000, EPA decommissioned a number of groundwater monitoring wells, removed the chain link fence surrounding the former disposal area, installed a new entry gate, and modified the remaining monitoring wells. In the fall of 2001, the final components of the VES were removed, including the vacuum extraction wells and groundwater interceptor trench.

Natural attenuation sampling on the Mottolo Property began in 1993. Between 1993 and 1998 sampling varied from quarterly, to three times a year, and then to semi-annual monitoring events. Annual sampling began in 1999 and consisted of sampling groundwater from the network of on-site monitoring wells. A residential well sampling program was initiated in 2003, prompted by a new residential development south of the Mottolo Property on Strawberry Lane. Shortly after this sampling began, EPA issued its second 5-Year Review Report which evaluated the performance and protectiveness of the remedy implemented at the Site. This 2003 5-Year Review Report noted that, although sampling indicated no exceedances of drinking water standards in residential wells, the potential existed for problems in the future from increased residential development coupled with the use of private wells around the Mottolo Property. In August 2008, EPA issued its third 5-Year Review Report. In this report, EPA expressed concern regarding the completion of an additional residential development west of the Site and the possible potential impacts on drinking water in the area. As a result of the findings and recommendations in EPA's third 5-Year Review Report, NHDES expanded the residential well sampling program in 2009.

The results from the Spring 2009 expanded residential well sampling program identified trichloroethylene (TCE), a VOC, and elevated arsenic levels in a number of residential wells located west of the Site. After the residential well sampling in March 2009, NHDES requested Cooperative Agreement funding from EPA to evaluate the extent of off-site migration issues and to determine if modifications to the Site remedy were required to assure that the Site remedy remained protective of human health and the environment.

To address the complex issues associated with the observed off-site migration of contaminates from the Site into residential bedrock wells, NHDES also formed an inter-agency team of environmental experts (NHDES, EPA Region I, United States Geological Survey, and the New Hampshire Geological Survey), plus contracted with GZA GeoEnvironmental, Inc. (GZA) to perform further investigations and analyze the collected data.

The results from these investigations are included in the following reports:

- March 2010 report titled "Preliminary Interpretation of VOC, Arsenic, and Uranium 2009 Data In Residential and Monitoring Wells, Mottolo Superfund Site, Raymond, New Hampshire, NHDES NO. 198704094";

- "Remedial Investigation Report," Volumes 1 – 8, Balsam Environmental Consultants, Inc., September 28, 1990, SPMS Doc ID 279140;
- Project Operations Plan – Remedial Investigation / Feasibility Study," Balsam Environmental Consultants, Inc., Volume 1- 2, October 4, 1988;
- "Record of Decision (ROD)," EPA Region I, March 29, 1991;
- "Potential Hazardous Waste Site: Identification and Preliminary Assessment," EPA Region I and State of New Hampshire, February 19,1980;
- "Potential Hazardous Waste Site: Identification and Preliminary Assessment," EPA Region I, April 14,1980; and
- Other Reports as Listed in the Mottolo NPL Site Administrative Record Index, EPA Region I, Compiled December 11, 1990.

1.2.1 Property Description

The Mottolo Pig Farm Superfund Site (Site) is located on Blueberry Hill Road in southeastern Raymond, New Hampshire, approximately 2 1/2 miles from the intersection of state routes 102 and 107 (See **Figure 2** below). The Mottolo Property is currently bounded on all sides by rural residential neighborhoods. The nearest residence is approximately 600 feet to the west, and all residences surrounding the Site are serviced by individual water supply wells.

Figure 2

The Site is located within the Exeter River drainage basin. The Exeter River is located approximately 2,000 feet northwest of the Site at its closest point. Based upon topographic and hydrologic information, regional surface water and groundwater are ultimately expected to discharge to the Exeter River. The Mottolo Property includes approximately 50 acres of primarily undeveloped, wooded land, divided roughly in half by a brook (Brook A) which originates beyond the southern property boundary and flows north through the property, discharging to the Exeter River approximately ½ mile north of the Site. Brook A is a perennial stream that flows across the Site, draining approximately 285 acres at its confluence with the Exeter River. The headwaters of Brook A originate in wetlands located immediately south and

southeast of the Site. A total of three acres of wetlands were identified in the Brook A valley with approximately 50 percent of these wetlands found on the Mottolo Property. The brook and associated wetland areas are the discharge zone for local overburden groundwater and for local bedrock groundwater, as well.

Approximately two acres in the southwest portion of the Mottolo Property remains cleared due to the former piggery operations and cleanup activities that have occurred on-site. The cleared area is divided by an ephemeral stream located in a drainage swale which flows from west to east, discharging to Brook A.

Overburden deposits in the upland areas of the Site consist primarily of fine to coarse sand with pockets of gravel and generally range from 0 to 15 feet in thickness with the thickest deposits found at the base of the former disposal area south of the drainage swale. These deposits are underlain by metamorphic and igneous bedrock of the Merrimack Group. The shallow bedrock appears to be only slightly weathered. The first 5 feet of bedrock are typically more fractured than the next 5 feet. However, some significant fracture zones may exist at depth.

1.2.2 Property History

1.2.2.1 Land Use and Response History

Prior to disposal of hazardous substances, the Site was the location of a piggery operation. From 1975 through 1979, the owner of the property disposed of approximately 1,600 55-gallon drums and 5-gallon pails containing wastes into an approximately ¼-acre depression located immediately north of the main piggery buildings (former drum disposal area). After dumping the containers from the back of a truck, a bulldozer was used to cover them with fill. The potential for contamination at the Site was a concern, and studies were commenced in 1979 by the New Hampshire Water Supply and Pollution Control Commission (now the NHDES) which brought the Site to the attention of EPA.

Based upon EPA's review of the conditions at the Site, EPA determined that a time critical removal action was appropriate to address the imminent threat to human health and the environment presented by the drums and containers found on-site. Beginning in September 1980, EPA prepared the drum disposal area for exhumation, staging, and removal of the buried drums. The area north of the drainage swale was cleared and graded to construct temporary staging areas for the excavated wastes and a berm was constructed along the toe of the disposal area. As the containers of waste were excavated, they were staged on site for characterization. Most of the drums appeared to be dented or partially crushed and eighty-three 55-gallon drums and seven 5-gallon pails were completely empty when exhumed. Analyses for numerous compounds were conducted on samples from each container. Toluene, xylene, and other hydrocarbons, methyl ethyl ketone, alcohols, acetates, chromates, lead, zinc, lacquers, turpentine, animal fats, chlorinated compounds, and packaged laboratory chemicals were identified in the drums and pails removed from the Site. No evidence of pesticides, herbicides, PCBs, or oils was detected. Drum removal began on December 14, 1981, and was completed on February 4, 1982. Many of the containers were repacked into 80-gallon recovery drums prior to transportation off site. Approximately 160 cubic yards of contaminated soil, drum parts, and plastic sheeting used in the staging areas were also transported off site for disposal. The former drum disposal area was regraded and seeded.

In January 1985, the Site was reviewed by the EPA field investigation team contractor and evaluated using the hazard ranking system for possible listing on the National Priorities List (NPL) of sites eligible for cleanup under the Superfund Program. EPA proposed to add the Site to the NPL on April 10, 1985 (50 FR 14115), and the Site was finally added to the NPL on July 22, 1987 (52 FR 27620).

1.2.2.2 Enforcement History

Enforcement activities were commenced shortly after discovery of the Site. The New Hampshire Attorney General filed suit in Rockingham Superior Court (no. E-952-79) on May 31, 1979, against Richard A. Mottolo, K.J. Quinn & Company, Inc. (Quinn), and Lewis Chemical Company (Lewis Chemical) for costs related to Site responses. The US Department of Justice filed a complaint on September 8, 1983, against those same three defendants, as well as Service Pumping and Drain Company, Inc. (SPDC), the transporter owned by Mr. Mottolo, and Carl Sutera who also owned Lewis Chemical, to recover EPA's response costs. In 1985, the original complaints were amended to request a declaratory judgment that the parties named in the complaints would be liable for future costs of response actions taken at the Site. On August 28, 1988, the Court ruled that Mottolo, Quinn, and SPDC were liable for both past and future response costs. The United States and the State of New Hampshire's subsequent negotiations with Quinn have resulted in settlements that addressed liability for costs associated with the 1980-1982 removal action, as well as certain other response costs incurred prior to May 1, 1990 and future response costs. Mottolo and SPDC filed for Chapter 7 and Chapter 11 bankruptcy protection and the United States settled its claims in stipulations issued as part of the bankruptcy proceedings.

With respect to the Remedial Investigation/Feasibility Study (RI/FS) for the Site, an Administrative Order by Consent was negotiated whereby Quinn agreed to conduct the RI/FS under EPA oversight. The RI/FS was completed in February 1991 and in March 1991, EPA issued a ROD (1991 ROD) for cleanup of the Site.

1.2.3 Residential Water Supply Wells

Bedrock wells are used by all residents living near the Site for drinking water purposes. The March 2010 report titled "Preliminary Interpretation of VOC, Arsenic, and Uranium 2009 Data In Residential and Monitoring Wells, Mottolo Superfund Site, Raymond, New Hampshire, NHDES NO. 198704094" identified groundwater contamination in a number of residential wells located to the west and south of the Site. See **Figure 3**.

NHDES has been sampling various residential wells surrounding the Site since 2003. In 2003, TCE contamination was detected in a few selected Strawberry Lane residential wells located closest to the southern boundary of the Mottolo Property. This area was being developed as residential housing at the time. Concentrations were below federal and State drinking water standards.

In the spring of 2009, NHDES conducted expanded residential well sampling and confirmation sampling in response to concerns raised in EPA's third 5-Year Review Report about increased residential development around the Mottolo Property. The results of this sampling indicated that TCE contamination and elevated arsenic levels were found in a number of residential wells located west of the Mottolo Property. Groundwater concentrations of TCE and arsenic varied; some residential wells had no detectable contamination, while other residential wells contained TCE and arsenic concentrations above drinking water standards.

Subsequent sampling of residential wells in September and December 2009, and April 2010 helped define the extent of Site-related contamination in select residential wells west of the Mottolo Property. In addition, geochemical analysis performed on residential well samples beginning in December 2009 also provided information that generally links the higher arsenic occurrence observed west of the Mottolo Property with historical disposal activities at the Site.

1.3 NATURE AND EXTENT OF CONTAMINATION

The following sections provide a brief description of the nature and extent of contamination that currently exists on the Site.

1.3.1 Soil

Soil screening analysis of numerous soil boring samples obtained by EPA from above the bedrock within the former drum disposal area in 2009 showed that the in-situ vacuum extraction treatment system successfully treated the soil contamination in this area of the Site. A limited amount of contamination in one soil boring location (mostly semi-volatile petroleum chemicals but also some TCE above the 1991 ROD cleanup level/goal) was detected that will either ultimately degrade through natural attenuation processes over time or be the subject of another decision document.

1.3.2 Groundwater

In August 2009 and May 2010, GZA performed on-site field sampling activities in accordance with the August 6, 2009 approved Sampling and Analysis Plan (SAP) and May 20, 2010 approved SAP, respectively. Multi-media sampling at the Site included sampling of Site overburden and shallow bedrock (less than 45-foot depth) groundwater monitoring wells. Prior to sampling, GZA conducted a comprehensive round of groundwater level measurements from on-site overburden and shallow bedrock monitoring wells to assess groundwater flow direction. The results of the May 2010 on-site sampling effort are included in **Appendix D** while the results from the August 2009 sampling are provided in the March 2010 Preliminary Data Report.

1.3.2.1 Site Monitoring Wells

Figure 4 shows the monitoring locations in the Site area. Prior to 2010, there were 11 overburden wells (ten overburden wells are on the Mottolo Property; one overburden well is on Strawberry Lane) and 12 shallow bedrock wells (ten shallow bedrock wells are on the Mottolo Property; two shallow bedrock wells are on Strawberry Lane). During 2010, one additional overburden well (MOT_MW-101S) was installed and four additional deep bedrock wells were installed (MOT_MW100D; MOT_MW-101D; MOT_MW-102D; and MOT_MW-103D). The groundwater samples collected in 2009-2010 were analyzed for VOCs (including TCE), 1,4-Dioxane, arsenic, iron, ammonia, alkalinity, chloride, sulfate, total organic carbon, carbon dioxide, methane, ethane, ethane, volatile fatty acids, ferrous iron, and nitrate. Groundwater quality parameters such as turbidity, pH, dissolved oxygen (DO), temperature, specific conductance, and oxidation / reduction potential were measured in the field.

VOCs

Overburden groundwater flows toward Brook A from the former drum disposal area. Overburden and shallow bedrock TCE groundwater concentrations near the former disposal area and former piggery operation area are currently below detection limits (less

than 2 parts per billion [ppb]). In addition, TCE concentrations detected in all other on-site overburden and shallow bedrock groundwater monitoring wells in August 2009 have decreased since the remedial investigation was performed indicating that past TCE source mass removal activities were successful in decreasing contaminant mass beneath the Mottolo Property. It is anticipated that TCE concentrations in groundwater will continue to decrease over time to acceptable levels; however, TCE concentrations are expected to remain above the drinking water standard in the foreseeable future.

Investigations have also confirmed that deep bedrock groundwater is currently being drawn through bedrock fractures to the west by the pumping of residential wells. The current TCE contamination in the deep bedrock groundwater (maximum 42 ppb in well MOT_MW-102D) appears to be responsible for the TCE contamination observed in the residential wells (see discussion below).

Arsenic

Overburden and shallow bedrock arsenic groundwater concentrations near the former drum disposal area and former piggery operation area are below detection limits (less than 1 ppb). In addition, the August 2009 data for all other overburden and shallow bedrock on-site monitoring wells shows a continuing general decreasing concentration trend for arsenic in groundwater. It is anticipated that arsenic concentrations in groundwater will continue to decrease over time to acceptable levels; however, arsenic concentrations are expected to remain above the drinking water standard in the foreseeable future. As confirmed in the October 2009 soil screening effort by EPA, arsenic observed in the Site groundwater is not likely directly from disposal activities on the Mottolo Property, but rather from naturally occurring arsenic deposits in the bedrock that are released due to altered geochemical conditions caused by historical waste disposal practices.

1.3.2.2 Residential Area Wells

Figure 1 shows the residential properties surrounding the Site. NHDES has been sampling residential wells on a quarterly basis since 2008. The sampling program was considerably expanded in 2009 to determine the extent of impacts off of the Mottolo Property. NHDES has sampled 52 residential wells in April 2010. The results of the residential well sampling performed by NHDES is located in **Appendix E**.

VOCs

TCE and cis-DCE (a breakdown product from the biodegradation of TCE) are observed in a few of the residential wells in the Windmere Drive and the upper end of Blueberry Hill Road residential areas. Observed concentrations of TCE have been either below the drinking water standard of 5 ppb or just above the drinking water standard (11 ppb of TCE is the maximum concentration detected). In those wells where TCE has been detected, TCE concentrations have fluctuated with some samples above the drinking water standards while other samples were below these standards. In the Strawberry Lane area, previous low levels (< 5 ppb) of TCE that were detected back in 2003 are now below detection limits (<0.5 ppb).

Arsenic

The elevated concentrations of arsenic in some residential wells west of the Site appear to be the result of arsenic that is naturally occurring in the bedrock formation, but which is being liberated from the bedrock into the groundwater due to altered geochemical conditions in the groundwater as a result of past waste disposal practices on the Mottolo Property. The detection of TCE in some residential wells west of the Mottolo Property strongly suggests that Site groundwater that has migrated into this area has influenced the groundwater geochemistry, thereby enhancing the release of arsenic from the bedrock formation into the groundwater in this area.

1.3.2.3 Changes in VOC Concentrations Since 2003

Figure 5 and **Table 1** shows the historical changes in residential well groundwater concentrations over time. In 2003, TCE was detected in residential wells located on Strawberry Lane (to the south of the Site) at very low levels (below drinking water samples). The Windmere Drive residential wells were installed in the 2005 – 2006 timeframe. Once the Windmere Drive residential wells were in full operation, it appears that the TCE concentrations on Strawberry Lane dramatically decreased and TCE contamination was subsequently detected to the west of the Mottolo Property. Based upon these changes observed over time, the conclusion reached is that pumping of the residential wells have influenced where the TCE-contaminated bedrock groundwater migrates in the area surrounding the Mottolo Property.

1.3.3 Surface Water / Sediment

Multi-media sampling at the Site included sampling of surface water and sediment in Brook A. The brook surface water samples were analyzed for VOCs, arsenic, hardness, and iron. The brook sediment samples were analyzed for arsenic and iron. Surface water quality parameters such as turbidity, pH, DO, temperature, specific conductance, and oxidation / reduction potential were measured in the field. Site contamination was not detected in the surface water or sediment of Brook A.

The results of the May 2010 surface water sampling effort are located in **Appendix D**.

1.4 CONCLUSIONS OF THE HUMAN HEALTH RISK ASSESSMENT

1.4.1 Groundwater

1.4.1.1 Human Health Risks from Exposure to Groundwater

Changes in land use have resulted in a change in the potential for current exposures to Site-related contaminants at levels that pose a health concern. A baseline human health risk assessment was conducted as part of the 1991 Remedial Investigation which included an evaluation of potential cancer risks and non-cancer health effects as a result of future exposure to site contaminants in groundwater. Exposure to contaminants in groundwater via residential use includes ingestion, dermal absorption, and inhalation. No exposure to groundwater was known to be occurring at the time of the 1991 risk assessment.

However, the 1991 baseline risk assessment also concluded that the risk posed by future potential residential use of groundwater from wells installed within the former drum disposal area exceeded the acceptable cancer risk range. That is, the incremental increase in the probability that an individual will develop cancer during his or her lifetime due to site-specific exposure, exceeded the range of 1 in ten thousand (1 in 10,000) to 1 in a million (1 in 1,000,000). "Incremental" refers to the risk from exposure site-specific exposure above the background cancer risk for the general population. The principal contributors to this risk included arsenic, vinyl chloride and TCE. Cleanup goals were established in the 1991 ROD for these contaminants based upon federal and State drinking water standards established at that time. [Note: The drinking water standard for arsenic in 1991 was 50 ppb; this standard was subsequently revised downward to 10 ppb.]

The 1991 baseline risk assessment also included an assessment of non-cancer health effects. Potential average daily exposures from residential water use were compared to established Reference Doses available at that time. This comparison is referred to as the Hazard Index (HI). A HI of unity (HI=1) is defined as the level below which adverse health effects are not expected. The HI exceeded 1 for 1,2 dichloroethylene and tetrahydrofuran. Cleanup goals were established in the 1991 ROD for these contaminants based on federal and State drinking water standards and risk-based calculations, respectively. There are no exceedances of these non-cancer cleanup goals in recent residential well sampling.

As discussed above, changes in land use have occurred since the 1991 Remedial Investigation. Specifically, land use surrounding portions of the Site has changed from undeveloped to residential use. Residential use of contaminated groundwater is now occurring and residents may be exposed to contaminants through ingestion, dermal absorption, and inhalation at levels that exceed drinking water standards which may pose a potential health concern. Contaminants that exceed drinking water standards/cleanup goals include arsenic and TCE.

2.0 BASIS FOR REMEDIATION

This section presents a summary of the regulatory requirements and remedial objectives for developing remedial alternatives for the Mottolo Superfund Site. **Section 2.1** identifies chemical, location, and action-specific ARARs (applicable or relevant and appropriate requirements) and **Section 2.2** provides information on the development of Remedial Action Objectives (RAOs).

2.1 APPLICABLE OR RELEVANT AND APPROPRIATE REQUIREMENTS

This section provides a summary of the regulatory requirements to be used in the FFS for the Site. **Subsection 2.1.1** discusses the definition of ARARs; **Subsection 2.1.2** identifies the categories of ARARs; **Subsection 2.1.3** identifies chemical-specific ARARs; **Subsection 2.1.4** identifies location-specific ARARs; and **Subsection 2.1.5** identifies potential action-specific ARARs.

2.1.1 Definition of ARARs

The Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) of 1980, as amended by the 1986 Superfund Amendments and Reauthorization Act (SARA), and the National Contingency Plan (NCP) require that potential ARARs be identified during the RI/FS process. ARARs are federal and State human health and environmental requirements and guidelines that will be used to: (1) evaluate the appropriate extent of site cleanup, (2) define and formulate remedial action alternatives; and (3) govern implementation and operation of the selected remedial action.

To properly consider ARARs and to clarify their function in the RI/FS and remedial response processes, the NCP defines two ARAR components: (1) "applicable requirements" or (2) "relevant and appropriate requirements." In addition, while not mentioned in CERCLA, EPA's Guidance for Conducting Remedial Investigations and Feasibility Studies Under CERCLA (USEPA, 1988) provides that other information, not meeting the definition of an ARAR, may also be considered. Such other information is referred to as a "TBC" or "to be considered." These terms are discussed in more detail in the following paragraphs.

Applicable requirements are those cleanup standards, standards of control, and other substantive environmental protection requirements, criteria, or limitations promulgated under federal or state law that specifically address a hazardous substance, pollutant, contaminant, remedial action, location, or other circumstance at a site. These include federal requirements that are directly applicable, as well as those incorporated by a federally authorized state program. Only those state standards identified by the state in a timely manner that are more stringent than federal requirements may be applicable.

Relevant and appropriate requirements are those cleanup standards, standards of control, or other substantive environmental protection requirements, criteria, or limitations promulgated under federal or state law that, while not "applicable" to a hazardous substance, pollutant, contaminant, remedial action, location, or other circumstance at a site, address problems or situations sufficiently similar to those encountered at the site that their use is well-suited to the particular site. There is more discretion in this determination in that it is possible for only part of a requirement to be considered relevant and appropriate, the rest being dismissed if judged not to be relevant and appropriate in a given case. Only those state standards identified by the state in a timely manner that are more stringent than the applicable federal standard may be relevant and appropriate.

TBCs are other "available information that is not an ARAR (e.g., advisories, criteria, and guidance)." Such TBCs "may be considered in the analysis if it helps to ensure protectiveness or is otherwise appropriate for use in a specific alternative."

Development of a comprehensive inventory of ARARs and TBCs involves a 2-tiered analysis: (1) establishing the applicability of an environmental regulation; and (2) evaluating relevancy and appropriateness if the regulation is not applicable. A requirement may be either "applicable" or "relevant and appropriate," but not both.

2.1.2 Identification of Potential ARARs

Because of their site-specific nature, identification of ARARs requires evaluation of the body of federal and state environmental and health regulations with respect to chemicals of concern, site characteristics, and the proposed remedial alternatives. Requirements that pertain to the remedial response at a CERCLA site can be placed into three categories:

- Chemical-specific requirements generally involve health- or risk-based numerical values or methodologies that establish site-specific acceptable chemical concentrations or amounts of a chemical that may be found in, or discharged to, the environment;
- Location-specific requirements involve restrictions established for specific substances or activities based on their location; or
- Action-specific requirements involve performance, design, or other action-specific requirements and are generally technology- or activity-based.

The following subsections identify the ARARs and TBCs for the Site as it relates to the impacts found in nearby residential wells.

2.1.3 Identification of Potential Chemical-Specific ARARs

Chemical-specific ARARs are numerical values or procedures that, when applied to a specific site or areas within a site, establish numerical limits for individual chemicals or groups of chemicals in one or more media. These ARARs are generally health- or risk-based standards limiting the concentration of a chemical found in or discharged to the environment. They govern the extent of site remediation by providing either actual cleanup levels, or the basis for calculating such levels. **Table 2.1** presents potential chemical-specific ARARs and TBCs which may apply at the Site.

2.1.4 Identification of Potential Location-Specific ARARs

Location-specific ARARs represent restrictions placed on the conduct of activities relative to natural site features (e.g., wetlands, water bodies, floodplains, sensitive ecosystems). There are no location-specific ARARs or TCBs identified for the Site.

2.1.5 Identification of Potential Action-Specific ARARs

Action-specific ARARs, unlike chemical-specific and location-specific ARARs, are technology- or activity-based requirements that direct how remedial actions are conducted. The applicability of this set of requirements is directly related to the particular remedial activities considered for a site. **Table 2.2** identifies those ARARs and TBCs that pertain to possible

components of each of the remedial alternatives developed as part of this FFS. The applicability of the action-specific ARARs pertinent to each specific remedial alternative will be discussed during the detailed analysis of remedial alternatives.

2.2 DEVELOPMENT OF REMEDIAL ACTION OBJECTIVES

Remedial Action Objectives consist of medium-specific or unit-specific goals for protecting human health and the environment. The RAOs for the Site were developed to assist in identifying a range of alternatives that may achieve protection of human health by preventing exposure to contaminated groundwater used as drinking water. This media was identified based on the area where there are or could be exceedances of the cleanup goals identified in the 1991 ROD and/or federal and State drinking water standards where residential wells are located and used for drinking water purposes. **Section 2.2.1** develops the RAOs, Preliminary Remediation Goals (PRGs), and general response actions to be considered in this FFS.

2.2.1 Remedial Action Objectives

The RAOs for contamination at the Site are designed to provide adequate protection to human health from direct contact, ingestion, or inhalation of hazardous constituents that exist from use of residential wells for drinking water. As summarized in **Section 1.4.1**, a potential exists at the Site for current and future human health risks based upon exceedances of the cleanup goals identified in the 1991 ROD and/or federal and State drinking water standards where residential wells are used for drinking water purposes. As a result of this potential risk, long-term response actions to address those impacted residential wells are necessary to protect human health at the Site.

The groundwater RAOs for protection of human health are:

- Prevent exposure to contaminates from residential wells used as drinking water wells where contaminates exceed cleanup goals identified in the 1991 ROD/Federal and State drinking water standards; and
- Prevent the use of groundwater in the future where such use has the potential to hydraulically influence the movement of groundwater contamination until cleanup goals established in the 1991 ROD and Federal and State drinking water standards are met.

2.2.2 Preliminary Remediation Goals

Groundwater used for drinking water purposes is the medium of concern at this Site The PRGs for drinking water are based on the minimum concentrations allowed under federal and State drinking water standards (ARARs).

2.2.3 General Response Actions

Based on field investigations performed at and around the Site from 2009-2010, groundwater contamination exceeding the TCE drinking water standard of 5 ppb currently extends over an area of approximately 30 acres (which is generally bounded by Brook A on the east, the Motollo Property boundary to the north and south, and the residential properties to the west) (see **Figure 3**). TCE has been identified in groundwater in the shallow and deep unconsolidated deposits and in the underlying bedrock to depths of more than 100 feet on the Mottolo Property. In addition, arsenic exceedances of the drinking water standard of 10 ppb have

also been found on site and in several residential wells generally west of the Site due to geochemical changes resulting from biologic processes that naturally degrade the TCE migrating from the Site (see **Figure 6**).

Potential general response actions that may address this contaminated groundwater that is currently used for drinking water purposes include:

- No Action;
- Institutional controls;
- Natural Attenuation; (the current groundwater response action at the Site);
- Monitoring;
- Extension of the public water supply pipeline;
- Installation of community public water supply well(s) and a water delivery pipeline; and
- Installation of whole house treatment systems at each residence of concern.

TABLE 2-1 POTENTIAL CHEMICAL-SPECIFIC APPLICABLE OR RELEVANT AND APPROPRIATE REQUIREMENTS AND TBCS
Mottolo Pig Farm Superfund Site
Raymond, New Hampshire

STATUTE/ REGULATION	STATUS	REQUIREMENT SYNOPSIS	CONSIDERATION IN THE FEASIBILITY STUDY PROCESS	ACTION TAKEN TO ATTAIN ARAR
Safe Drinking Water Act National Primary Drinking Water Regulations Maximum Contaminant Levels, 40 CFR 141.11-141.16, 141.60-141.62	Applicable GW-1, GW-2 and GW-3	Maximum Contaminant Levels (MCLs) have been promulgated for several common organic and inorganic contaminants. These levels regulate the concentration of contaminants in public drinking water supplies, but may also be considered relevant and appropriate for groundwater aquifers used for drinking water.	MCLs must be met for water used as drinking water.	Alternative GW-1 would not meet these requirements. Alternatives GW-2 and GW-3 would provide drinking water that meets these requirements.
New Hampshire Water Quality Standards; Env-Dw700	Applicable GW-1, GW-2 and GW-3	These regulations set forth New Hampshire drinking water quality standards based on health and technical practicability, for water supply systems. The aquifer at the site is used as drinking water. When Ambient Groundwater Quality Standard (AGQS) standards are more stringent than federal levels, the state levels must be met.	AGQS must be met for water used as drinking water.	Alternative GW-1 would not meet these requirements. Alternatives GW-2 and GW-3 would provide drinking water that meets these requirements.

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TABLE 2-2 POTENTIAL ACTION-SPECIFIC APPLICABLE OR RELEVANT AND APPROPRIATE REQUIREMENTS AND TBCS
Mottolo Pig Farm Superfund Site
Raymond, New Hampshire

STATUTE/ REGULATION	STATUS	REQUIREMENT SYNOPSIS	CONSIDERATION IN THE FEASIBILITY STUDY PROCESS	ACTION TAKEN TO ATTAIN ARAR
New Hampshire Ambient Air Quality Standards, Env-A 300	Applicable GW-2	These regulations set requirements on the control of fugitive emissions and dust.	Compliance with these requirements will be required for any construction activities that might result in the generation of fugitive dust.	Construction under GW-2 will be conducted in accordance with these requirements.
New Hampshire Administrative Rules - GENERAL DESIGN STANDARDS: SYSTEMS SERVING 1, 000 OR MORE PEOPLE Env-Ws 370	R and A GW-2	Provides design standards for municipal water supply systems.	These regulations would need to be followed in constructing a municipal water line extension.	Construction under GW-2 will be conducted in accordance with these requirements.
New Hampshire Administrative Rules- DESIGN STANDARDS FOR SMALL COMMUNITY WATER SYSTEMS Env-Ws 372	Applicable	Provides designs standards for small community water systems	These regulations would need to be followed in constructing a new community water system.	Community water system has been screened out.
New Hampshire Public Water Systems Guidelines, Env-Wq 400	TBC	Env-Wq 400 provides guidance in establishment of a protection radius around wellheads and limitations on activities and land uses near wellheads. It also gives guidelines on large groundwater withdrawals.	This Guidelines would be considered to the extent that remedial action alternatives requires establishing a new public water system.	Community water system has been screened out.

3.0 IDENTIFICATION AND SCREENING OF APPLICABLE TECHNOLOGIES

Potentially applicable technology types and process options for drinking water at the Site are identified in this section. The potentially applicable technology types and process options for drinking water listed in **Table 3-1** were derived from those identified in other RODs, experience with similar types of contaminants, and other databases. The following on-line databases were accessed to identify potentially relevant technology types and process options:

(1) The Federal Remediation Technologies Roundtable, a venture between various federal government agencies (www.frtr.gov); and

(2) The EPA Remediation and Characterization of Innovative Technologies - REACH IT (www.epareachit.org).

As defined in the USEPA RI/FS guidance document (USEPA, 1988), the term "technology type" refers to general categories of technologies, such as biological treatment, physical treatment, capping, and extraction. The term "process options" refers to specific processes within each remedial technology type.

The identification of remedial technologies for the Site was derived from the previously mentioned sources. Several steps of screening were conducted prior to selecting the most promising technologies to be assembled into remedial alternatives for the Site. The initial evaluation or initial screening of technologies was done to reduce to a manageable number those technologies that were potentially applicable to the Site prior to performing a more stringent screening. During the initial screening step, process options and entire technology types were evaluated on the basis of technical implementability. Those process options and technology types that could not be implemented effectively were eliminated from further consideration. Site-specific information was also used to screen out technology types and process options that could not be effectively implemented at the Site. **Table 3-1** summarizes the initial technology screening process for drinking water.

TABLE 3-1 INITIAL SCREENING OF POTENTIALLY APPLICABLE REMEDIAL TECHNOLOGIES AND PROCESS OPTIONS FOR GROUNDWATER
Mottolo Pig Farm Superfund Site
Raymond, New Hampshire

GENERAL RESPONSE ACTION	POTENTIAL REMEDIAL TECHNOLOGY	PROCESS OPTIONS	DESCRIPTION	INITIAL SCREENING
No Action	No Action	No Action	Groundwater remains with its current natural hydrologic processes.	Required by NCP as a baseline for comparison.
Institutional Controls	Use Restriction	Deed Restriction/Ordinance	Legal restrictions on use of groundwater.	Potentially implementable.
Natural Attenuation	Scheduled Monitoring	Monitoring of natural attenuation parameters	Part of the remedial approach might involve natural attenuation to remediate the groundwater contamination over time.	Potentially implementable.
Extension of Public Water Supply Line	Standard public water supply	Municipal water system.	Public water piped from current Raymond water supply system located at junction of Routes 102 and 107.	Potentially implementable.
Installation of Community Well Public Water Supply System	Standard public water supply	Association managed water system.	Two community water supply wells installed to the north and piped to the residential homes affected by the contamination.	Potentially implementable.
Installation of Whole House Treatment Systems	Standard water treatment technology	Individual house treatment system.	Whole house treatment system tailored for the contamination issues at each residence.	Potentially implementable.
Monitoring	Sampling/monitoring	Monitoring well, residential well, whole house treatment system monitoring, etc.	Variety of monitoring activities could be used to confirm contaminate concentrations, movement of groundwater, efficiency of treatment systems, etc.	Potentially implementable

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4.0 DEVELOPMENT OF REMEDIAL ALTERNATIVES

Section 3.0 presented the initial screening of potential technologies to address drinking water contamination at the Site on the basis of technical implementability. This section further reviews those technologies that have moved forward in the FFS process and then assembles the remaining technologies and process options into remedial alternatives.

4.1 ADDITIONAL GROUNDWATER/DRINKING WATER SCREENING EVALUATION

Table 4-1 presents a further screening evaluation of the groundwater/drinking water process options (and related technologies) on the basis of effectiveness, implementability, and cost. Process options that were retained from this additional screening step are assembled into groundwater/drinking water remedial alternatives in **Section 4.2**.

4.2 GROUNDWATER/DRINKING WATER REMEDIAL ALTERNATIVE DEVELOPMENT

Groundwater/drinking water remedial alternatives are developed based upon those technologies and process options that were carried forward from the previous section. In assembling groundwater/drinking water alternatives, the general response actions and the process options chosen to represent the various technology types are combined to form remedial alternatives.

The following groundwater/drinking water alternatives have been assembled and will be discussed further in **Section 5.0**:

GROUNDWATER/DRINKING WATER REMEDIAL ALTERNATIVES			
Potential Components	GW-1: No Action	GW-2: Extension of Public Water Supply	GW-3: Whole House Treatment Systems
No Action	X		
Monitoring	X	X	X
Institutional Controls/Restrict Groundwater Use		X	X
Extension of Public Water Supply Pipeline		X	
Install Whole House Treatment Systems			X
5-Year Review Studies		X	X

Additional information regarding the key components of these three groundwater/drinking water remedial alternatives is included in **Table 4-2** and are defined below:

- **Alternative GW-1: "No Action"** – The "No Action" alternative is provided for a comparison purposes only. Only routine water level/residential well monitoring would occur under this alternative.
- **Alternative GW-2: "Extension of Public Water Supply"** – This alternative involves the extension of the existing, 12-inch water supply main in Raymond approximately two miles to provide alternate water to approximately 25 residents generally in Area 1 as depicted on **Figure 1**. The residences will be completely disconnected from their existing private wells and the wells will be either converted to monitoring wells or decommissioned in accordance with NHDES guidelines. Institutional controls will be

required in limited areas surrounding the Site to prevent the installation of any new wells where such use has the potential to hydraulically influence the movement of groundwater contamination from the Site. Significant new groundwater use in some areas near the Site has a high likelihood of drawing Site contamination into new bedrock wells and/or into other existing residential wells due to a strong hydraulic connection to the contamination on the Site. Other residential areas that surround the Site indicate only limited or no hydraulic connection to the contamination on the Site based upon the results of the recent pumping test and, therefore, no groundwater use restrictions would be imposed unless new information is received by EPA or NHDES. Groundwater monitoring of several residential wells (especially in Areas 2 and 3) would be performed to confirm that contamination has not spread to additional residential wells in the area. Although unlikely, should monitoring indicate that contaminated groundwater has migrated into additional residential wells, these homes would be connected to the public water supply. This remedial alternative will also include the 5-Year Review Study process to track the progress of meeting the remedial action objectives and to evaluate the protectiveness of the remedy.

- **Alternative GW-3: Whole House Treatment Systems** – This alternative involves the installation and maintenance of treatment systems to treat all the water pumped from each of the residential wells located generally in Area 1, as depicted on **Figure 1**. Each treatment system will be designed with redundant treatment units to address both the VOC and arsenic contamination above drinking water standards due to Site-related conditions. The treatment systems will require periodic maintenance in order for them to remain effective in providing clean water to each residence. The influent and effluent of the treatment systems will need to be sampled at least twice annually for the first five years and annually thereafter. It is anticipated that certain components of the treatment equipment may need to be replaced approximately every ten years. Some residences may also require radon treatment and/or water softener systems and/or backwash filters (depending on influent characteristics of their well water) in order for the treatment units to operate effectively. Institutional controls will be required in limited areas surrounding the Site to prevent the installation of new wells where such use has the potential to hydraulically influence the movement of groundwater contamination. Significant new groundwater use in some areas near the Site has a high likelihood of drawing Site contamination into new bedrock wells and/or into other existing residential wells due to a strong hydraulic connection to the contamination on the Site. As a result, use restrictions would be required in these limited areas. Other residential areas that surround the Site indicate only limited or no hydraulic connection to the contamination on the Site based upon the results of the recent pumping test and, therefore, no groundwater use restrictions would be imposed unless new information is received by EPA or NHDES. Groundwater monitoring of several residential wells (especially in Areas 2 and 3) would also be performed to confirm that contamination has not spread to additional residential wells in the area. Although unlikely, should monitoring indicate that contaminated groundwater has migrated into additional residential wells, these homes would be connected to whole house treatment systems. This remedial alternative will also include the 5-Year Review Study process to track the progress of meeting the remedial action objectives and to evaluate the protectiveness of the remedy.

TABLE 4-1 SECONDARY SCREENING OF POTENTIALLY APPLICABLE REMEDIAL TECHNOLOGIES AND PROCESS OPTIONS FOR DRINKING WATER
Mottolo Pig Farm Superfund Site
Raymond, New Hampshire

(Shaded Areas Have Been Screened Out During the Secondary Evaluation)

General Response Action	Potential Remedial Technology	Process Options	Effectiveness	Implementability	Cost	Comment
No Action	No Action	No Action	Not applicable	Not applicable	Low	Retain.
Institutional Controls	Restrict Groundwater Use	Local ordinance/other forms of use restrictions	100%	100%	Low	Retain. Effective as part of a more comprehensive approach.
Natural Attenuation	Natural biological processes to cleanup groundwater	Monitoring of natural attenuation parameters		100%	Low	Not effective to address immediate drinking water needs.
Extension of Public Water Supply Line	Standard public water supply.	Municipal water system	100%	100%	Moderate	Retain.
Installation of Community Well Public Water Supply System	Standard public water supply	Association managed community water system	100%		High	Effective, but significantly higher cost and potentially significant implementability issues with sitting of production wells. Other effective options are available at lower cost.
Installation of Whole Housc Trcatmcnt System	Standard water treatment technology	Individual house treatment system	100%	100%	Modcratc	Retain. Implementability depends on whether home owner or State does O&M.
Monitoring	Sampling/ Monitoring	Water Level Monitoring and Residential well sampling, and (if appropriate) Whole house treatment system monitoring	100%	100%	Low	Retain. Effective as part of a more comprehensive approach.

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TABLE 4-2 COMPONENTS OF GROUNDWATER/DRINKING WATER REMEDIAL ALTERNATIVES
Mottolo Pig Farm Superfund Site
Raymond, New Hampshire

ALTERNATIVE	KEY COMPONENTS
GW-1: No Action	• Monitoring (Water Level Monitoring and Residential Well Sampling) • Five-year site reviews
GW-2: Extension of Public Water Supply	• Extend Existing Municipal Water Supply Line • Institutional Controls • Monitoring (Water Level Monitoring and Residential Well Sampling) • Five-year site reviews
GW-3: Whole House Treatment Systems	• Install Whole House Treatment Systems • Institutional Controls • Monitoring (Water Level Monitoring, Residential Well Sampling, and Whole House Treatment System Monitoring) • Five-year site reviews

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5.0 GROUNDWATER/DRINKING WATER REMEDIAL ALTERNATIVES SCREENING

The remedial alternatives for groundwater/drinking water that were developed in Section 4.2 are as follows:

- Alternative GW-1: No Action;
- Alternative GW-2: Extension of Public Water Supply; and
- Alternative GW-3: Whole House Treatment Systems.

These alternatives are evaluated in more detail below in **Sections 5.1** through **5.3**, respectively.

5.1 ALTERNATIVE GW-1: NO ACTION

Consistent with EPA guidance and legal requirements, the No Action Alternative serves as a baseline by which all other alternatives are compared. Under this alternative, the groundwater at the Site would continue to undergo natural hydrologic/biologic processes. As required by the 1991 ROD, natural attenuation, including dilution, natural biological and chemical degradation, adsorption, and precipitation would continue reducing the concentrations of groundwater contamination on the Site at slow rates that likely will exceed 30 years. However, those using residential wells for drinking water purposes near the Mottolo Property would continue to be exposed to groundwater contamination. Under this scenario, residential well monitoring (water level measurements and sampling) would be done to evaluate Site conditions and for preparation of the required 5-Year Review Report for the Site.

The effectiveness, implementability, and cost associated with the No Action Alternative for the entire Site are evaluated in **Table 5-1**. The conclusion of the evaluation is that the No Action Alternative would not be protective of human health and the environment. The No Action Alternative, however, is retained for detailed analysis in **Section 6.0**, as required by the NCP, as a baseline for evaluating the remaining alternatives.

5.2 ALTERNATIVE GW-2: EXTENSION OF PUBLIC WATER SUPPLY

This alternative would restrict/prevent exposure to contaminated drinking water by supplying approximately 25 residents generally in Area 1 with drinking water through extension of the existing public water supply main located in Raymond along Route 102 and continuing to monitor residential wells. Residential wells in Area 1 will be completely disconnected from the residential homes and either decommissioned or used as future monitoring wells for the Site. Institutional controls will be required in a limited area surrounding the Site to prevent the installation of any new wells in those areas where such use has the potential to hydraulically influence the movement of contaminated groundwater on the Site. Groundwater monitoring would be periodically conducted within existing residential wells (water level measurements and sampling) to determine whether the plume has moved to other monitoring locations. If Site-related contaminants are detected in additional monitoring locations outside of Area 1, this alternative would require these homes to be connected to the public water supply system. In addition, current onsite groundwater monitoring would continue to occur (in accordance with the 1991 ROD) in order to determine when groundwater has been restored and achieved the remedial action objectives identified in the 1991 ROD for the Site.

The effectiveness, implementability, and cost associated with the Extension of Public Water Supply Alternative to Area 1 residents near the Site are shown in **Table 5-2**. The conclusion of the evaluation is that the Extension of Public Water Supply Alternative to Area 1 with ongoing monitoring would be protective of human health and the environment by preventing human exposure to contaminated drinking water. As required by the 1991 ROD, contaminated groundwater will continue to undergo natural attenuation processes and concentrations will continue to decrease over time. This alternative is retained for detailed analysis in **Section 6.0**.

5.3 ALTERNATIVE GW-3: WHOLE HOUSE TREATMENT SYSTEMS

This alternative would restrict/prevent exposure to contaminated drinking water by installing a combination of water treatment systems in each of the Area 1 residential homes. Periodic sampling of the treatment system's influent and effluent would be needed to confirm that the treatment systems were operating correctly. Maintenance of the treatment systems would be periodically needed to insure their effectiveness. Institutional controls will be required in a limited area surrounding the Site to prevent the installation of any new wells in those areas where such use has the potential to hydraulically influence the movement of contaminated groundwater on the Site. Groundwater monitoring would be periodically conducted within existing residential wells (water level measurements and sampling) to determine whether the plume has moved to other locations. If Site-related contaminants are detected in additional monitoring locations outside of Area 1, this alternative would require that these homes be connected to whole house treatment systems. In addition, current onsite groundwater monitoring would continue to occur (in accordance with the 1991 ROD) in order to determine when groundwater has been restored and achieved the remedial action objectives identified in the 1991 ROD for the Site.

The effectiveness, implementability, and cost associated with the Whole House Treatment Systems Alternative, consisting of installing whole house groundwater treatment systems for each of the Area 1 residential homes, are shown in **Table 5-3**. The conclusion of the evaluation is that the Whole House Treatment Systems Alternative would be protective of human health and the environment by actively treating and limiting exposure to contaminated groundwater as well as preventing the further spread of contamination to other residential wells. This alternative is retained for detailed analysis in **Section 6.0**.

TABLE 5-1 SUPPLEMENTAL EVALUATION OF REMEDIAL ALTERNATIVE GW-1: NO ACTION
Mottolo Pig Farm Superfund Site
Raymond, New Hampshire

Synopsis: This alternative assumes that no action would be taken to address groundwater contamination.

EFFECTIVENESS	IMPLEMENTABILITY	COST
ADVANTAGES		
Natural attenuation processes would reduce groundwater contaminant concentrations and achieve remedial goals in likely over 30 years, but would not address immediate need for safe drinking water.	Easily implemented.	Costs would only be required for monitoring/5-Year Review report preparation. Cost estimated to be $1,854,000 (30-year present value cost).
DISADVANTAGES		
Would not reduce the mobility of groundwater contamination. Risk to human health exists during time groundwater is above federal and State drinking water standards if used as potable water supply. No controls would be implemented to restrict exposure to contaminated groundwater or to prevent the further migration of contamination. No protective actions would be taken to prevent exposure from contaminants.	May require future remedial action.	Potential for increased costs if remedial actions are required in the future.

Conclusion: The No Action Alternative would not be protective, but is retained as a baseline for evaluating the remaining alternatives as required by the NCP.

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TABLE 5-2 SUPPLEMENTAL EVALUATION OF REMEDIAL ALTERNATIVE GW-2: EXTENSION OF PUBLIC WATER SUPPLY
Mottolo Pig Farm Superfund Site
Raymond, New Hampshire

Synopsis: This alternative, involves the extension of the current Raymond public water supply system to the Area 1 residents near the Mottolo property. Under this alternative, institutional controls would be required. Without the institutional controls, contaminated groundwater may be drawn to areas where significant groundwater is being pumped from the bedrock. Groundwater monitoring would be done to verify the effectiveness and protectiveness of the remedy.

EFFECTIVENESS	IMPLEMENTABILITY	COST
ADVANTAGES		
Residents would be protected from exposure to contaminated groundwater by supplying each residence with municipal water. Institutional controls would restrict/prevent groundwater use in limited areas. Monitoring would be done to confirm concentrations reducing over time and to confirm that contamination has not spread to other residential wells in the area.	Implementable. No technical uncertainties. Residential wells would be completely disconnected from residential homes and either decommissioned or used as monitoring wells.	Cost estimated to be $4,623,000 (30-year present value cost)
DISADVANTAGES		
No reduction in toxicity or mobility or volume of contaminants through treatment.	Restrictions on groundwater use will require coordination with State/Town/Landowners.	Residents would be required to pay annual Town water usage fee of approximately $440 per year.

Conclusion: This alternative would be protective of human health and the environment by preventing use of contaminated drinking water. This alternative is retained for detailed analysis.

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TABLE 5-3 SUPPLEMENTAL EVALUATION OF REMEDIAL ALTERNATIVE GW-3: WHOLE HOUSE TREATMENT SYSTEMS
Mottolo Pig Farm Superfund Site
Raymond, New Hampshire

Synopsis: This alternative involves the installation of whole house water treatment systems in each home within Area 1 near the Mottolo Site. Under this alternative, institutional controls would be required. Without the institutional controls, contaminated groundwater may be drawn to areas where significant groundwater is being pumped from the bedrock. Groundwater monitoring would be done to verify the effectiveness of the remedy.

EFFECTIVENESS	IMPLEMENTABILITY	COST
ADVANTAGES		
Groundwater for potable water use would be treated to meet Federal and State drinking water standards prior to any residential use. Institutional controls would restrict/prevent groundwater use in limited areas. Monitoring would be done to confirm concentrations reducing over time and to confirm that contamination has not spread to other residential wells in the area. Monitoring of each whole house treatment system also required under this alternative.	Implementable.	Costs estimated to be $3,744,000 (30-year present value cost).
DISADVANTAGES		
	Treatment system O&M required to maintain treatment system effectiveness. Restrictions on groundwater use require coordination with State/Town/Landowners. Town officials have indicated support for a water line and may be reluctant to agree to the use of whole house treatment systems for long term groundwater use. Institutional controls on some properties may be more difficult to implement under Alternative GW-3 as there may be limited or no viable options for alternative water, thereby preventing development of some properties.	

Conclusion: This alternative would be protective of human health and the environment by preventing use of contaminated drinking water. This alternative is retained for detailed analysis.

6.0 DETAILED ANALYSIS OF ALTERNATIVES

The purpose of this detailed analysis is to allow for comparisons among the groundwater/drinking water remedial alternatives based on the standard criteria specified in the NCP. Nine evaluation criteria were developed by EPA to serve as the basis for the detailed analysis of alternatives. These criteria are set forth in the NCP, at 40 CFR § 300.430(e)(9). Further detail is provided in EPA's "Guidance for Conducting Remedial Investigations and Feasibility Studies Under CERCLA" (US EPA, 1988). The nine criteria are summarized below.

1. Overall protection of human health and the environment: This criterion focuses on whether a specific alternative achieves adequate protection and how site risks for each migration pathway being addressed by the FS are eliminated, reduced, or controlled through treatment, engineering, or institutional controls. Also considered are whether an alternative poses any unacceptable short-term or cross-media impacts.

2. Compliance with ARARs: Assessment against this criterion describes how the remedial alternative complies with chemical-, location-, and action-specific ARARs, or if a waiver is required and how the waiver is justified.

3. Long-term effectiveness and permanence: This criterion pertains to the risks remaining after response objectives have been met. Three factors to be considered are the magnitude of the residual risk, the adequacy and reliability of any controls used to manage treatment residuals or untreated wastes that remain at the site, and the permanence of the remedy.

4. Reduction of toxicity, mobility, or volume: This criterion reflects the statutory preference for treatment alternatives that permanently and significantly reduce toxicity, mobility, or volume of the hazardous substances. Preferred alternatives destroy toxic contaminants, reduce the total mass of toxic contaminants, irreversibly reduce contaminant mobility, or reduce the total volume of contaminated media.

5. Short-term effectiveness: This criterion refers to the protection an alternative offers to workers and the community during the construction and implementation of a remedy as well as the time required to reach the response objectives.

6. Implementability: This criterion considers technical feasibility, administrative feasibility, and the availability of required materials and services. Technical feasibility is evaluated on the basis of four parameters: (1) ability to construct the alternative, (2) the reliability of the technologies proposed, (3) the ease of undertaking additional remedial actions, and (4) the ability to monitor the effectiveness of the remedy. Administrative feasibility considers activities needed to coordinate with other agencies, such as permits and rights-of-way.

7. Cost: This criterion evaluates the capital and operation and maintenance (O&M) costs of each alternative. Costs are present worth cost estimates.

8. State acceptance: This criterion evaluates the technical and administrative issues and concerns the state may have regarding each alternative. This criterion is not addressed in this report. It will be addressed in the ROD after comments on the FS and proposed plan have been received.

9. Community acceptance: This criterion evaluates the issues and concerns the public may have regarding each alternative. This criterion is not addressed in this report. It will be addressed in the ROD after comments on the FS and proposed plan have been received.

The detailed analysis for each alternative includes a detailed description of each remedial alternative followed by a detailed evaluation of each remedial alternative in accordance with criteria 1 through 7. Criteria 1 and 2 are considered to be "threshold factors", criteria 3 through 7 are considered to be the primary "balancing factors" and criteria 8 and 9 are considered to be "modifying considerations."

The descriptions of each remedial alternative are conceptual and are used for costing purposes. The specific design details and costs for the selected remedy will be re-evaluated during the remedial design. As specified in the RI/FS guidance (USEPA, 1988), the costs are intended to be within the target accuracy range of -30 to +50 percent of the actual cost. **Section 6.1** presents the detailed analysis of the groundwater/drinking water alternatives that were retained in **Section 5.0**.

6.1 DETAILED ANALYSIS OF REMEDIAL ALTERNATIVES

Three drinking water remedial alternatives have been retained for detailed analysis and will be evaluated in **Sections 6.1.1, 6.1.2,** and **6.1.3**. They are:

- Alternative GW-1: No Action;
- Alternative GW-2: Extension of Public Water Supply; and
- Alternative GW-3: Whole House Treatment Systems.

6.1.1 Alternative GW-1: No Action

The No Action Alternative is included as a baseline against which the other remedial alternatives can be compared.

6.1.1.1 Description

Under this alternative, natural attenuation processes, such as dilution, dispersion, natural biological and chemical degradation, adsorption, and precipitation would eventually reduce the concentrations of groundwater contamination over time to remedial goals but no active remedial measures would be taken to address the contamination currently found in nearby residential wells. However, monitoring will be conducted within existing residential wells (in addition to the onsite monitoring required in the 1991 ROD).

6.1.1.2 Evaluation

The detailed analysis of the No Action Alternative against the seven of the nine NCP evaluation criteria is presented in **Table 6-1**.

6.1.1.3 Cost

The No Action Alternative consists of:

- Long-term groundwater monitoring in residential wells; and
- 5-Year Review Studies to evaluate Site conditions.

Monitoring costs consist of groundwater sampling, sample analysis, and report preparation.

The 30-year estimated present worth cost of Alternative GW-1, resulting from long-term monitoring, is $1,854,000. This cost assumes a 7-percent discount rate. Detailed cost information is included in **Appendix A**.

6.1.2 Alternative GW-2: Extension of Public Water Supply

The detailed analysis for the Extension of Public Water Supply Alternative is presented below.

6.1.2.1 Description

This alternative involves the extension of the existing, 12-inch public water supply main in Raymond approximately 2 miles to provide drinking water to approximately 25 residents in Area 1, as depicted on **Figure 1**. The residences will be completely disconnected from their existing private wells and the wells will be either converted to monitoring wells or decommissioned following NHDES guidelines.

Institutional controls will be required in limited areas surrounding the Site to prevent the installation of any new wells where such use has the potential to hydraulically influence the movement of groundwater contamination from the Site. Significant new groundwater use in some areas near the Site has a potential of drawing Site contamination into new bedrock wells and/or into other existing residential wells due to the interconnections of the bedrock fractures and the hydraulic connection to the contamination on the Site.

Groundwater monitoring of selected residential wells (especially in Areas 2 and 3) would be performed to monitor for contaminant migration to additional residential wells. If Site-related contaminated groundwater is detected in residential wells outside of Area 1, this alternative would require these homes to be connected to the public water supply system.

The remedial alternative will use the 5-Year Review Study process to track the progress of meeting the remedial objectives and to determine when remediation has been completed.

6.1.2.2 Long-Term Monitoring

A long-term groundwater monitoring program would be developed during the remedial design (after the Amended ROD is signed). The objectives of the monitoring program would be to monitor groundwater levels and groundwater quality in residential areas to assess how migration of the contaminated groundwater will change once the homes in Area 1 are placed on the public water supply system and to confirm that other residential wells are not at risk given the changes to groundwater hydrology.

In addition, in accordance with the 1991 ROD requirements, monitoring of Site groundwater quality would continue to track overburden and bedrock contamination migration and to monitor the progress of natural attenuation of groundwater contamination toward reaching remedial goals.

6.1.2.3 Institutional Controls

Institutional controls will be required in limited areas surrounding the Site to prevent the installation of any new wells where such use has the potential to hydraulically influence the movement of groundwater contamination from the Site. Significant new groundwater use in

some areas near the Site has the potential of altering the groundwater and contaminant migration in the Site area and the potential of drawing Site contamination into new bedrock wells and/or into other existing residential wells. In the areas where new wells are prohibited, parties must connect to the public water supply. Institutional controls could be in the form of local ordinances or any other form of institutional controls (e.g., deed restrictions, groundwater management zone) that is effective and protective.

6.1.2.4 Evaluation

The detailed analysis of the Extension of Public Water Supply Alternative against seven of the nine NCP evaluation criteria is presented in **Table 6-2**.

6.1.2.5 Cost

The Extension of Public Water Supply Alternative consists of:

- Installation of a public water line providing water service to Area 1;
- Long-term groundwater monitoring;
- Institutional controls; and
- 5-Year Review Studies to evaluate Site conditions.

Costs are broken down into capital costs and monitoring (periodic) costs. Capital costs are assumed to be the direct and indirect costs incurred to develop, construct, and implement the remedial alternative. Monitoring costs are incurred to do sampling and reporting. Annual water usage fees (estimated at approximately $440 per year) would be billed directly to the residences by the Town of Raymond, New Hampshire (Town) and are not part of the costs paid for by the government under this Alternative.

The cost estimate for the Extension of Public Water Supply Alternative assumes the following:

- Installation of a new 12-inch ductile iron (D.I.) water main from the existing 12-inch water main tie in point in Raymond on Route 102 along Blueberry Hill Road to the intersection with Windmere Drive;
- Installation of 8-inch D.I. pipe with copper service connections to each residence, built to Town and NHDES Standards, to allow for ownership by the Town;
- Installation of interior plumbing modifications to allow for connection from residential well plumbing to municipal water piping;
- Installation of water meters for individual metering of water usage to each residence;
- Monitoring of groundwater in residential areas.

The 30-year estimated present worth cost of Alternative GW-2 is $4,623,000. The estimated capital costs are $2,769,734. The present worth for long-term monitoring, periodic costs, and annual O&M is approximately $1,853,266. These costs assume a 7-percent discount rate. Detailed cost information is included in **Appendix A**.

6.1.3 Alternative GW-3: Whole House Treatment Systems

The detailed analysis for the Whole House Treatment Systems Alternative is presented below.

6.1.3.1 Description

This alternative involves the installation and maintenance of whole treatment systems to treat all the water pumped from each of the residential wells located in Area 1, as depicted on **Figure 1**. Each treatment system will be designed with redundant treatment units to address both the VOC contamination and arsenic contamination above drinking water standards due to Site-related conditions. The treatment systems will require periodic maintenance in order for them to remain effective in providing clean water to each residence. The influent and effluent of the treatment systems will need to be sampled at least twice annually for the first five years and annually thereafter. It is anticipated that certain components of the treatment equipment may need to be replaced approximately every ten years. Some residences may also require radon treatment and/or water softener systems and/or backwash filters (depending on influent characteristics of their well water) in order for the treatment units to operate effectively.

Institutional controls will be required in limited areas surrounding the Site to prevent the installation of any new wells where such use has the potential to hydraulically influence the movement of groundwater contamination from the Site. Significant new groundwater use in some areas near the Site has a potential of drawing Site contamination into new bedrock wells and/or into other existing residential wells due to the interconnections of the bedrock fractures and the hydraulic connection to the contamination on the Site.

Groundwater monitoring of selected residential wells (especially in Areas 2 and 3) would be performed to monitor for contaminant migration to additional residential wells. If Site-related contaminated groundwater migrates into residential wells outside of Area 1, these homes would be connected to whole house treatment systems.

The remedial alternative will use the 5-Year Review Study process to track the progress of meeting the remedial objectives and to determine when remediation has been completed.

6.1.3.2 Long-Term Monitoring

A long-term groundwater monitoring program would be developed during the remedial design (after the Amended ROD is signed). The objectives of the monitoring program would be to:

- Monitor groundwater levels and groundwater quality in residential areas to confirm that other residential wells are not at risk; and
- Monitoring whole house treatment systems to confirm that systems are operating as required.

In addition, in accordance with the 1991 ROD requirements, monitoring of Site groundwater quality would continue to track overburden and bedrock contamination migration and to monitor the progress of natural attenuation of groundwater contamination toward reaching remedial goals.

6.1.3.3 Institution Controls

Institutional controls will be required in limited areas surrounding the Site to prevent the installation of any new wells where such use has the potential to hydraulically influence the movement of groundwater contamination from the Site. Significant new groundwater use in some areas near the Site has the potential of influencing the groundwater and contaminant migration in the Site area and drawing Site contamination into new bedrock wells and/or into other existing residential. As a result, use restrictions would be required in these limited areas. Institutional controls could be in the form of local ordinances or any other form of institutional controls (e.g., deed restrictions, groundwater management zone) that is effective and protective.

6.1.3.4 Evaluation

The detailed analysis of the Whole House Treatment Systems Alternative against seven of the NCP evaluation criteria is presented in **Table 6-3**.

6.1.3.5 Cost

The Whole House Treatment Systems Alternative consists of:

- Installation of whole house treatment systems in Area 1;
- Periodic sampling of influent and effluent treatment system waters;
- O&M of whole house treatment systems;
- Long-term groundwater monitoring;
- Institutional controls; and
- 5-Year Review Studies to evaluate Site conditions.

Costs are broken down into capital costs, monitoring (periodic) costs, and annual O&M costs. Capital costs are assumed to be the direct and indirect costs incurred to develop, construct, and implement the remedial alternative. Monitoring (periodic) costs include groundwater sampling and reporting, and treatment system monitoring. Annual O&M costs are costs incurred to maintain the effectiveness of the whole house treatment systems (including VOC and arsenic treatment units and, if appropriate, radon, water softener, and backwash system replacement and removal).

The cost estimate for the Whole House Treatment Systems Alternative assumes the following:

- Installation of twenty-five residential whole house treatment systems, three ferric iron removal systems, three radon treatment systems, and thirteen water softener systems within Area 1;
- O&M of carbon and arsenic filtration systems, and (if appropriate) water softener and radon treatment systems, and backwash filter systems;
- Monitoring for VOCs and total arsenic analyses of the whole house treatment systems' influent and effluent waters; and
- Monitoring of groundwater in residential areas.

The 30-year estimated present worth cost of Alternative GW-3 is $3,744,000. The estimated capital costs are $386,608. The present worth for long-term monitoring, and annual O&M is approximately $3,357,392. These costs assume a 7-percent discount rate. Detailed cost information is included in **Appendix A**.

TABLE 6-1 DETAILED ANALYSIS OF ALTERNATIVE GW-1: NO ACTION
Mottolo Pig Farm Superfund Site
Raymond, New Hampshire

EVALUATION CRITERIA	ALTERNATIVE GW-1: NO ACTION
OVERALL PROTECTION OF HUMAN HEALTH AND THE ENVIRONMENT	
Human Health Protection	Groundwater used for drinking that exceeds acceptable levels is currently treated or bottled water is supplied but no measures are in place to ensure this will continue in the long term. Risks to human health exist if groundwater above federal and State standards is used as potable water supply. No controls would be in place to limit the potential for exposure to contaminated groundwater or to prevent further migration to other residential wells.
COMPLIANCE WITH ARARS	
Chemical-Specific	Does not comply with ARARs, as MCLs/AGQS are currently being exceeded in drinking water.
Location-Specific	No location-specific ARARs would apply to this alternative.
Action-Specific	No action-specific ARARs would apply to this alternative.
LONG-TERM EFFECTIVENESS AND PERMANENCE	
Magnitude of Residual Risk	Residual risk remains high as contaminant concentrations in drinking water are not addressed.
Adequacy and Reliability of Controls	There would be no institutional controls to limit access to contaminated groundwater or to prevent further migration of contamination to other residential wells.
REDUCTION OF TOXICITY, MOBILITY, OR VOLUME THROUGH TREATMENT	
Treatment Process Used and Materials Treated	None proposed for this alternative.
Amount Destroyed or Treated	None
Degree of Expected Reductions of Toxicity, Mobility, or Volume Through Treatment	This alternative does not reduce toxicity, mobility, or volume through treatment.
Degree to Which Treatment is Irreversible	Not applicable.
Type and Quantity of Residuals Remaining After Treatment	Since there is no active treatment, there are no treatment residuals.
SHORT-TERM EFFECTIVENESS	
Protection of Community During Remedial Action	Not applicable as no remedial actions are proposed for this alternative.
Protection of Workers During Remedial Action	Not applicable as no remedial actions are proposed for this alternative.
Environmental Impacts	Not applicable as no remedial actions are proposed for this alternative.
Time Until Remedial Action Objectives are Achieved	This alternative does not meet RAOs in a reasonable timeframe.

TABLE 6-1 DETAILED ANALYSIS OF ALTERNATIVE GW-1: NO ACTION
Mottolo Pig Farm Superfund Site
Raymond, New Hampshire

EVALUATION CRITERIA	ALTERNATIVE GW-1: NO ACTION
IMPLEMENTABILITY	
Ability to Construct and Operate the Technology	Not applicable as no remedial technology is proposed as part of this alternative.
Reliability of the Technology	Not applicable as no remedial technology is proposed as part of this alternative.
Ease of Undertaking Additional Remedial Actions, If Necessary	This alternative would not interfere with the ability to implement future remedial actions.
Ability to Monitor the Effectiveness of Remedy	Long-term monitoring would be done to evaluate contamination in residential wells. 5-year review studies would still be needed to evaluate Site conditions.
Ability to Obtain Approvals and Coordinate with Other Agencies	Not applicable for this alternative
Availability of Off-Site Treatment, Storage, and Disposal Services and Capacity	Not applicable for this alternative.
Availability of Necessary Equipment and Specialists	Field and laboratory equipment and personnel used to monitor groundwater are readily available.
Availability of Technology	Groundwater monitoring technology is readily available.
COST	
Capital Cost	$0
Present Worth of Cost of Operations and Maintenance	$0
Present Worth of Long-term Monitoring	$1,854,000
Total Present Worth Cost	$1,854,000

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TABLE 6-2 DETAILED ANALYSIS OF ALTERNATIVE GW-2: EXTENSION OF PUBLIC WATER SUPPLY
Mottolo Pig Farm Superfund Site
Raymond, New Hampshire

EVALUATION CRITERIA	ALTERNATIVE GW-2: EXTENSION OF PUBLIC WATER SUPPLY
OVERALL PROTECTION OF HUMAN HEALTH AND THE ENVIRONMENT	
Human Health Protection	Protection of human health would be achieved by connecting homes to the public water supply system thereby providing safe drinking water to these homes. Institutional controls would be used to restrict/prevent installation of any new wells in a limited area to prevent contamination from moving to other residential wells outside the area connected to the public water supply system. Monitoring would be done to confirm that contamination has not spread to other residential wells in the area.
COMPLIANCE WITH ARARS	
Chemical-Specific	Complies with MCLs/AGQS as drinking water provided by public water supply meets these standards.
Location-Specific	No location-specific ARARs would apply to this alternative.
Action-Specific	Action-specific ARARs would be met under this alternative.
LONG-TERM EFFECTIVENESS AND PERMANENCE	
Magnitude of Residual Risk	The residual risk would be very low as drinking water provided under this alternative would meet all Federal and State drinking water standards.
Adequacy and Reliability of Controls	Institutional controls would be used to restrict/prevent installation of any new wells in a limited area to prevent contamination from moving to other residential wells outside the area connected to the public water supply system until cleanup goals achieved. These controls are reliable if adequately monitored, maintained and, if necessary, enforced. Monitoring would be done to confirm that contamination has not spread to other residential wells in the area. Monitoring is a very reliable means to track changes in groundwater and residential wells. A 5-year review program would assess the extent to which human health and the environment are protected.
REDUCTION OF TOXICITY, MOBILITY, OR VOLUME THROUGH TREATMENT	
Treatment Process Used and Materials Treated	None proposed for this alternative.
Amount Destroyed or Treated	None.
Degree of Expected Reductions of Toxicity, Mobility, or Volume Through Treatment	This alternative does not reduce toxicity, mobility, or volume through treatment. However, the mobility of contamination would be reduced under this alternative (although not by treatment) as residential wells would no longer be in use thereby reducing movement of contamination from the Site.

TABLE 6-2 DETAILED ANALYSIS OF ALTERNATIVE GW-2: EXTENSION OF PUBLIC WATER SUPPLY
Mottolo Pig Farm Superfund Site
Raymond, New Hampshire

EVALUATION CRITERIA	ALTERNATIVE GW-2: EXTENSION OF PUBLIC WATER SUPPLY
Degree to Which Treatment is Irreversible	Not applicable.
Type and Quantity of Residuals Remaining After Treatment	Since there is no active treatment, there are no treatment residuals.
SHORT-TERM EFFECTIVENESS	
Protection of Community During Remedial Action	Safe water will be provided by the State to residents until the water line extension is installed and municipal water provided to residents of Area 1. There will be some temporary disruption to the community along roads where the municipal water line extension will have to be laid as well as minor disruption to Area 1 residents from well decommissioning and individual connections to the waterline.
Protection of Workers During Remedial Action	Workers will be required to follow standard health and safety procedures.
Environmental Impacts	There may be some minor short-term environmental impacts associated with shutting down existing residential wells.
Time Until Remedial Action Objectives are Achieved	It is estimated that it will take 18 to 24 months to extend the water line and hook up all homes within Area 1.
IMPLEMENTABILITY	
Ability to Construct and Operate the Technology	Installation of municipal water lines and residential hook up to the waterline is a standard practice and would pose no special problems. Abandonment of existing wells is common and would pose no special problems. Would require homeowners to agree to pay an annual fee for public water (estimated approximately $440 per year).
Reliability of the Technology	Provision of public water is highly reliable means of providing safe drinking water.
Ease of Undertaking Additional Remedial Actions, If Necessary	If monitoring indicates that additional measures need to be taken, further extension of the waterline can be easily taken,
Ability to Monitor the Effectiveness of Remedy	Long-term groundwater monitoring would be easily implemented and would verify the continued protection of human health and the environment and the distribution of contamination. Once put in place, institutional controls can be fairly easily monitored. Effectiveness is dependent on enforcement. A 5-year Review Study process will track the progress of meeting the remedial objectives and will be used to determine when remediation has been completed.
Ability to Obtain Approvals and Coordinate with Other Agencies	Coordination with adjacent property owners and appropriate federal, state, and local agencies would be required to implement institutional controls.

TABLE 6-2 DETAILED ANALYSIS OF ALTERNATIVE GW-2: EXTENSION OF PUBLIC WATER SUPPLY
Mottolo Pig Farm Superfund Site
Raymond, New Hampshire

EVALUATION CRITERIA	ALTERNATIVE GW-2: EXTENSION OF PUBLIC WATER SUPPLY
Availability of Off-Site Treatment, Storage, and Disposal Services and Capacity	Not applicable for this alternative.
Availability of Necessary Equipment and Specialists	Drillers necessary for well abandonment are readily available. Construction and plumbing crews for installation of municipal water hook up to each residence are readily available. Field and laboratory equipment and personnel used to monitor groundwater/residential wells are readily available.
Availability of Technology	Not applicable for this alternative.
COST	
Capital Cost	$2,769,734
Present Worth of Cost of Operations and Maintenance	$0
Present Worth of Long-Term Monitoring	$1,853,266
Total Present Worth Cost	$4,623,000

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TABLE 6-3 DETAILED ANALYSIS OF ALTERNATIVE GW-3: WHOLE HOUSE TREATMENT SYSTEMS
Mottolo Pig Farm Superfund Site
Raymond, New Hampshire

EVALUATION CRITERIA	ALTERNATIVE GW-3: WHOLE HOUSE TREATMENT SYSTEM
OVERALL PROTECTION OF HUMAN HEALTH AND THE ENVIRONMENT	
Human Health Protection	Groundwater currently used for drinking that exceeds acceptable levels is treated or bottled water is provided. Protection of human health would be achieved by connecting homes to whole house treatment systems thereby providing safe drinking water to these homes. Institutional controls would be used to restrict/prevent groundwater use in a limited area to prevent contamination from moving to other residential wells outside the area serviced by whole house systems. Monitoring would be done to confirm that contamination has not spread to other residential wells in the area. In addition, monitoring of influent and effluent waters in/from each whole house treatment system would be frequently performed to monitor the efficacy of the treatment systems, and the need for equipment repair and/or replacement.
COMPLIANCE WITH ARARS	
Chemical-Specific	Complies with MCLs/AGQS as drinking water to be provided meets these standards.
Location-Specific	No location-specific ARARs would apply to this alternative.
Action-Specific	Action-specific ARARs would be met under this alternative.
LONG-TERM EFFECTIVENESS AND PERMANENCE	
Magnitude of Residual Risk	The residual risk would be low as drinking water provided under this alternative would meet all Federal and State drinking water standards.
Adequacy and Reliability of Controls	Institutional controls would be used to restrict/prevent installation of any new wells in a limited area to prevent contamination from moving to other residential wells outside the area connected to the whole house systems until cleanup goals were achieved. These controls are reliable if adequately monitored, maintained and, if necessary, enforced. While whole house treatment systems have the potential for incidental exposure to contaminated groundwater through problems with treatment components, this is considered unlikely given that contaminate concentrations in residential wells are relatively low, each treatment system has multiple filters to capture contamination, routine maintenance of the systems is expected to occur, annual treatment component replacement is planned, and monitoring is a very reliable means to track issues with whole house treatment systems. Monitoring would also be done to confirm that contamination has not spread to other residential wells in the area. A 5-year review program would assess the extent to which human health and the environment are protected.

TABLE 6-3 DETAILED ANALYSIS OF ALTERNATIVE GW-3: WHOLE HOUSE TREATMENT SYSTEMS
Mottolo Pig Farm Superfund Site
Raymond, New Hampshire

EVALUATION CRITERIA	ALTERNATIVE GW-3: WHOLE HOUSE TREATMENT SYSTEM
REDUCTION OF TOXICITY, MOBILITY, OR VOLUME THROUGH TREATMENT	
Treatment Process Used and Materials Treated	Extracted groundwater at each residence in Area 1 would be treated using filtration systems to remove VOC and arsenic contamination. Treatment residuals, including spent filters/media, would be disposed of off-Site and regenerated, respectively.
Amount Destroyed or Treated	This alternative would treat all drinking water to remove VOCs and arsenic prior to use. An estimate of contaminant mass removal has not been performed.
Degree of Expected Reductions of Toxicity, Mobility, or Volume Through Treatment	Active treatment of drinking water will reduce the toxicity and volume of contaminants; however, the reductions would be very small.
Degree to Which Treatment is Irreversible	Treatment of drinking water would permanently remove contaminants from residential wells that receive treatment systems.
Type and Quantity of Residuals Remaining After Treatment	Treatment residuals, including spent filters, would be disposed of off Site and/or regenerated.
SHORT-TERM EFFECTIVENESS	
Protection of Community During Remedial Action	Installation of residential groundwater treatment systems would not have any significant impacts on the local community. Minor homeowner disruptions to Area 1 residents will occur due to the installation of the individual whole house treatment systems in homes.
Protection of Workers During Remedial Action	The workers would perform all work in accordance with a site-specific health and safety plan.
Environmental Impacts	Construction and operation of the whole house treatment systems should not pose any environmental impacts.
Time Until Remedial Action Objectives are Achieved	It is estimated that it will take approximately 12 months to install whole house systems in all homes within Area 1.
IMPLEMENTABILITY	
Ability to Construct and Operate the Technology	Construction and operation of whole house treatment systems is standard practice and would pose no special problems.
Reliability of the Technology	Whole house treatment systems are frequently used and has been proven effective at removing contaminants. While whole house treatment systems have the potential for incidental exposure to contaminated groundwater through problems with treatment components, this is considered unlikely given that contaminate concentrations are relatively low, each system has multiple filters to capture contamination, routine maintenance of the systems is expected to occur, replacement of treatment components is expected to occur annually, and monitoring is a very reliable means to track issues with whole house treatment systems.
Ease of Undertaking Additional Remedial Actions, If Necessary	This alternative would not interfere with the ability to implement future remedial actions.

TABLE 6-3 DETAILED ANALYSIS OF ALTERNATIVE GW-3: WHOLE HOUSE TREATMENT SYSTEMS
Mottolo Pig Farm Superfund Site
Raymond, New Hampshire

EVALUATION CRITERIA	ALTERNATIVE GW-3: WHOLE HOUSE TREATMENT SYSTEM
Ability to Monitor the Effectiveness of Remedy	Monitoring would be easily implemented and would verify the continued protection of human health and the environment, the distribution of contamination, as well as the effectiveness of the whole house systems in removing contaminants. Once put in place, institutional controls can be fairly and easily monitored. Effectiveness is dependent on enforcement.
Ability to Obtain Approvals and Coordinate with Other Agencies	Coordination with adjacent property owners and appropriate federal, state, and local agencies would be required to implement institutional controls. Institutional controls on some properties may be more difficult to implement under Alternative GW-3 as there may be limited or no viable options for alternative water in some cases thereby preventing development of some properties. This is expected to be a significant implementation issue for some areas surrounding the Site.
Availability of Off-Site Treatment, Storage, and Disposal Services and Capacity	Implementation of this alternative would require off-Site disposal of spend filters/media. These services are readily available.
Availability of Necessary Equipment and Specialists	All materials, equipment, personnel, and services required to construct and operate this alternative are readily available.
Availability of Technology	Groundwater treatment is readily available.
COST	
Capital Cost	$386,608
Present Worth of Cost of Operations and Maintenance	$1,163,592
Present Worth of Long-Term Monitoring	$2,193,800
Total Present Worth Cost	$3,744,000

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7.0 COMPARATIVE ANALYSIS OF ALTERNATIVES

The comparative analysis of alternatives compares the three groundwater/drinking water remedial action alternatives evaluated in **Section 6.0** relative to seven of the nine NCP criteria used for the detailed analysis of alternatives. The purpose of the comparative analysis is to identify the advantages and disadvantages of each of the alternatives relative to one another and to aid in the selection of remedial alternative(s) for the impacted residential wells near the Site.

As set forth in the NCP, specific CERCLA requirements are considered in comparing alternatives. The NCP requires that the selected alternative(s) should:

- Be protective of human health and the environment;
- Comply with ARARs;
- Offer short- and long-term effectiveness and permanence;
- Be implementable;
- Reduce toxicity, mobility, or volume through treatment as a principal element; and
- Be cost effective.

In accordance with the NCP for performing the comparative analysis of alternatives, the remedy selected for a site must reflect the scope and purpose of the actions being undertaken and how these actions relate to other remedial actions and the long-term response at a site. The identification of the preferred alternative and the final remedy selection are based on consideration of the major trade-offs among the alternatives in terms of the nine evaluation criteria. EPA has categorized the nine NCP evaluation criteria into three groups:

- Threshold criteria;
- Balancing criteria; and
- Modifying criteria.

A discussion of these three criteria groups follows.

THRESHOLD CRITERIA

The selected remedy must be protective of human health and the environment and comply with ARARs. Therefore, EPA has designated overall protection of human health and the environment and compliance with ARARs as threshold criteria. Absent an appropriate case for a waiver of some ARAR, an alternative must meet both criteria in order to be eligible for selection.

PRIMARY BALANCING CRITERIA

The five primary balancing criteria are:

- Long-term effectiveness and permanence;
- Reduction of toxicity, mobility, or volume through treatment;
- Short-term effectiveness;
- Implementability; and
- Cost.

This balancing provides a preliminary assessment of the maximum extent to which permanent solutions and treatment can be used practicably in a cost-effective manner. The alternative that is protective of human health and the environment, complies with ARARs, and affords the most favorable tradeoffs among the balancing criteria is identified as the preferred alternative.

MODIFYING CRITERIA

State and community acceptance are factored into a final evaluation that determines which remedial alternative(s) are acceptable for a site. As stated at the beginning of **Section 6.0** of this FFS report, state and community acceptance will be addressed in the Amended ROD after public comments on the Administrative Record (including the FFS and the Proposed Plan) have been received and considered in the final remedy selection.

Section 7.1 below presents the comparative analysis of the remedial alternatives considered for groundwater/drinking water at the Mottolo Pig Farm Superfund Site.

7.1 COMPARATIVE ANALYSIS OF REMEDIAL ALTERNATIVES FOR GROUNDWATER/DRINKING WATER

Table 7-1 presents the comparative analysis for the three remedial alternatives considered for groundwater/drinking water that were evaluated in **Section 6.0**. The comparative analysis highlights the results of the detailed analysis and is summarized below.

7.1.1 Overall Protection of Human Health and the Environment

Alternative GW-1 (No Action) would be the least protective of the three alternatives. It would offer no protection to human health and the environment. Potential risks from exposure to contaminated groundwater/drinking water would remain.

Alternative GW-2 (Extension of Public Water Supply) would provide significantly greater protection than Alternative GW-1 because Raymond Town water will be provided to the approximately 25 residents located in Area 1 (see **Figure 1**). Institutional controls would also be implemented to restrict/prevent the installation of any new groundwater wells in a limited area to reduce the risk of new residential users being impacted by Site-related contamination. In addition, long-term groundwater monitoring would be performed to monitor Site-related contaminants in groundwater. In accordance with the 1991 ROD, groundwater monitoring of on-site monitoring wells will be performed to monitor contaminant attenuation and document the progress toward reaching the original remedial goals. The combination of implementing institutional controls to reduce the risk of potential exposure to contamination from the Site, providing municipal water to residents within Area 1, and continued monitoring of residential wells beyond Area 1 to insure no additional residential water supply wells beyond Area 1 are impacted under Alternative GW-2 results in this alternative being highly protective of human health and the environment.

Alternative GW-3 (Whole House Treatment Systems) would also be highly protective of human health and the environment. Similar to Alternative GW-2, each home within Area 1 would be provided safe drinking water; however under this Alternative, safe drinking water is provided to each residence by installation and maintenance of individual whole house treatment systems. As with Alternative GW-2, institutional controls would be implemented to restrict/prevent the installation of any new groundwater wells in a limited area to reduce the risk of new residential users being impacted by Site-related contamination. In addition, long-term

groundwater monitoring would be performed to monitor Site-related contaminants in groundwater in selected residential water supply wells. In accordance with the 1991 ROD, groundwater monitoring of on-site monitoring wells will be performed to monitor contaminant attenuation and document the progress toward reaching the original remedial goals. The combination of implementing institutional controls to reduce the risk of potential exposure to Site-related contaminants, providing treated water to residents within Area 1 and continued monitoring of selected residential wells beyond Area 1 under Alternative GW-3 results in this alternative being highly protective of human health and the environment.

7.1.2 Compliance with ARARs

Alternative GW-1 will not meet federal and State drinking water requirements. Alternative GW-2 and Alternative GW-3 will meet all ARARs.

7.1.3 Long-Term Effectiveness and Permanence

The residual risk remains high under Alternative GW-1 as there would be continued exposures to contaminated drinking water above both federal and State standards. The magnitude of the residual risk is low under Alternatives GW-2 and GW-3 as safe drinking water is being provided by either supplying public water or by treating the groundwater to Federal and State standards at each home prior to consumption.

Both Alternatives GW-2 and GW-3 rely on institutional controls to restrict/prevent the installation of any new groundwater wells in a limited area to reduce the risk of potential exposure to Site-related contaminants. These controls are reliable if adequately monitored, maintained and, if necessary, enforced.

Both Alternatives GW-2 and GW-3 rely on monitoring to confirm contaminant concentrations are reducing over time and to monitor that contamination has not spread to other residential wells in the area. In addition, Alternative GW-3 relies on frequent monitoring of influent and effluent waters in/from each whole house treatment system to confirm that there is no incidental exposure to contaminants and to evaluate the need for equipment repair and/or replacement. While Alternative GW-3 has the potential for incidental exposure to contaminated groundwater through problems with treatment components, this is considered unlikely given that contaminate concentrations in residential wells are relatively low, each treatment system has multiple filters to capture contamination, routine maintenance of the systems is expected to occur, annual treatment component replacement is planned, and monitoring is a very reliable means to track issues with whole house treatment systems.

7.1.4 Reduction of Toxicity, Mobility, or Volume Through Treatment

Neither Alternative GW-1 nor GW-2 use treatment to reduce toxicity, mobility, or volume. There is some change in mobility under Alternative GW-2 as residential wells in Area 1 will be completely decommissioned and no longer used thereby limiting further migration of contamination towards Area 1 from the Site. Alternative GW-3 uses treatment to reduce contaminant toxicity, mobility, and volume; however, the reductions are very small.

7.1.5 Short-Term Effectiveness

As no active remedial action is taken under Alternative GW-1, there are no short-term impacts to the community, workers, or the environment. No risk reduction would occur in the short term.

For Alternatives GW-2 and GW-3, safe drinking water will be provided to those residents currently impacted by Site-related contamination by the State until construction/implementation of Alternatives GW-2 and GW-3 is complete.

Construction/implementation of Alternatives GW-2 and GW-3 would not have any significant impacts on the local community and the environment. There will be some temporary disruption to the community along roads where the municipal water line extension will have to be laid as well as minor disruption to Area 1 residents from well decommissioning under Alternative GW-2. Under GW-3, minor homeowner disruptions to Area 1 residents will occur due to the installation of the individual whole house treatment systems in each home. All workers would perform all work in accordance with a site-specific health and safety plan.

It is anticipated that the time required to design/construct/implement Alternative GW-2 will be approximately 18 to 24 months, while the time required for Alternative GW-3 will be 12 months. These estimates are approximate depending on field conditions encountered during the water line extension work and the installation of each particular whole house treatment system.

7.1.6 Implementability

Alternative GW-1 is the easiest to implement as no activities must be undertaken.

Both Alternatives GW-2 and GW-3 are easily constructed and operated. Both Alternatives will require long-term groundwater monitoring but Alternative GW-3 will require additional monitoring of each whole house treatment system. Both the use of public water (Alternative GW-2) and whole house treatment systems (Alternative GW-3) are highly reliable technologies to address contaminants in drinking water. While Alternative GW-3 has the potential for incidental exposure to contaminated groundwater through problems with treatment components, this is considered unlikely given that contaminate concentrations in residential wells are relatively low, each system has multiple filters to capture contamination, routine maintenance of the systems is expected to occur, annual replacement of treatment components is planned, and monitoring is a very reliable means to track issues with whole house treatment systems.

Town officials have indicated support for a water line and may be reluctant to agree to the use of whole house treatment systems for long-term groundwater use, thereby making Alternative GW-3 more difficult to implement than Alternative GW-2. On the other hand, Alternative GW-2 would require homeowners to agree to pay an annual fee for public water (estimated approximately $440 per year).

Both Alternatives GW-2 and GW-3 will require coordination and access agreements for monitoring with adjacent property owners and appropriate federal, state, and local agencies to implement institutional controls. Once put in place, institutional controls can be fairly easily monitored. Effectiveness is dependent on enforcement. Institutional controls on some properties may be more difficult to implement under Alternative GW-3 as there may be limited or no viable options for alternative water in some cases thereby preventing development of some properties. This is expected to be a significant implementation issue for some areas surrounding the Site.

7.1.7 COST

Alternative GW-1 (No Action) 30-year present value cost (with a 7-percent discount rate) is estimated to be $ 1,854,000.

Alternative GW-2 (Expansion of Public Water Supply) 30-year present value cost (with a 7-percent discount rate) is estimated to be $4,623,000 (Area 1 residents only).

Alternative GW-3 (Whole House Treatment Systems) 30-year present value cost (with a 7-percent discount rate) is estimated to be $3,744,000 (Area 1 residents only).

TABLE 7.1 COMPARATIVE ANALYSIS OF GROUNDWATER/DRINKING WATER REMEDIAL ALTERNATIVES
Mottolo Pig Farm Superfund Site
Raymond, New Hampshire

THRESHOLD CRITERIA							
ALTERNATIVE	**OVERALL PROTECTION OF HUMAN HEALTH AND THE ENVIRONMENT**	**COMPLIANCE WITH ARARS**	**LONG-TERM EFFECTIVENESS AND PERMANENCE**	**REDUCTION OF TOXICITY, MOBILITY, OR VOLUME THROUGH TREATMENT**	**SHORT-TERM EFFECTIVENESS**	**IMPLEMENTABILITY**	**COST**
Alternative GW-1: No Action	Alternative GW-1, No Action, would be the least protective of the three alternatives. It would offer no protection to human health and the environment. Potential risks from exposure to contaminated groundwater/drinking water would remain.	Does not meet ARARs.	The residual risk remains high under Alternative GW-1 as there would be continued exposures to contaminated drinking water above both Federal and State standards and no controls to prevent future exposure.	No reduction in toxicity, mobility or volume or treatment under Alternative GW-1.	As no active remedial action is taken under this alternative, there are no short term effectiveness impacts to the community, workers, or the environment.	Easily implemented. Long-term groundwater/residential well monitoring would be required.	Least costly of the alternatives. Only cost is for monitoring and reporting. Present Value Cost = $1,854,000
Alternative GW-2: Extension of Public Water Supply	This alternative is highly protective of human health and the environment. Alternative GW-2, Extension of Public Water Supply, would provide significantly greater protection than Alternative GW-1 because public water will be provided to residents located in Area 1. Institutional controls would be implemented to prevent the installation of any new groundwater wells in a limited area to prevent contamination from moving to other residential wells outside the area connected to the public water supply. Long-term monitoring would be performed to verify the continued protection of human health.	.Meets ARARs. See Tables 2-1 and 2-2.	The magnitude of the residual risk is low under Alternatives GW-2 as safe drinking water is being provided by supplying public water. Alternatives GW-2 relies on institutional controls to prevent contamination from moving to other residential wells outside the area being addressed. These controls are reliable if adequately monitored, maintained and, if necessary, enforced. Alternative GW-2 relies on monitoring to confirm contamination has not spread to other residential wells. Monitoring is a very reliable means to track changes in groundwater and residential wells.	No reduction in toxicity, mobility or volume through treatment. However, there will be some reduction in mobility as all Area 1 residential wells will no longer be in use.	Construction/implementation of Alternative GW-2 would not have any significant impacts. There will be some temporary disruption to the community along roads where the municipal water line extension will have to be laid as well as minor disruption to Area 1 residents from well decommissioning and hook ups to the water line. All workers would perform all work in accordance with a site-specific health and safety plan. Time required to design/construct/implement Alternative GW-2 is approximately 18-24 months.	Easily implemented. Long-term monitoring would be required. Use of public water is a highly reliable technology to address contaminants in drinking water. Requires coordination with adjacent property owners and appropriate federal, state, and local agencies to implement institutional controls. Once put in place, institutional controls can be fairly easily monitored. Effectiveness is dependent on enforcement. Homeowners must agree to pay an annual fee for public water (estimated approximately $440 per year)	Higher in cost compared to Alternatives GW-1 and GW-3. Present Value Cost = $4,623,000

TABLE 7.1 COMPARATIVE ANALYSIS OF GROUNDWATER/DRINKING WATER REMEDIAL ALTERNATIVES
Mottolo Pig Farm Superfund Site
Raymond, New Hampshire

THRESHOLD CRITERIA							
ALTERNATIVE	**OVERALL PROTECTION OF HUMAN HEALTH AND THE ENVIRONMENT**	**COMPLIANCE WITH ARARS**	**LONG-TERM EFFECTIVENESS AND PERMANENCE**	**REDUCTION OF TOXICITY, MOBILITY, OR VOLUME THROUGH TREATMENT**	**SHORT-TERM EFFECTIVENESS**	**IMPLEMENTABILITY**	**COST**
Alternative GW-3: Whole House Treatment Systems	This alternative is highly protective of human health and the environment. Each home within Area 1 would be provided safe drinking water by installation and maintenance of individual whole house treatment systems. As with Alternative GW-2, institutional controls would be implemented to prevent the installation of any new groundwater wells in a limited area to prevent contamination from moving to other residential wells outside the area connected to whole house treatment systems until cleanup goals are achieved. In addition, long-term groundwater monitoring would be done to verify protection of human health.	Meets ARARs. See Tables 2-1 and 2-2.	The magnitude of the residual risk is low under Alternative GW-3 as safe drinking water is provided by treating the groundwater prior to consumption. Alternative GW-3 relies on institutional controls to prevent contamination from moving to other residential wells outside the area being addressed. These controls are reliable if adequately monitored, maintained and, if necessary, enforced. Alternative GW-3 relies on monitoring to confirm contamination has not spread to other residential wells in the area.. Monitoring is very reliable means to track changes in groundwater and residential wells. Alternative GW-3 relies on frequent monitoring of influent and effluent waters in/from each whole house treatment system. Incidental exposure to contaminated groundwater is unlikely given that contaminate concentrations in residential wells are relatively low, each treatment system has multiple filters to capture contamination, routine maintenance of the systems is expected to occur, annual treatment component replacement is planned, and monitoring is a very reliable means to track issues with whole house treatment systems.	Reduction in toxicity, mobility and volume, through treatment, is very small.	Construction/implementation of Alternative GW-3 would not have any significant impacts. Minor homeowner disruptions to Area 1 residents will occur due to the installation of the individual whole house treatment systems in each home. All workers would perform all work in accordance with a site-specific health and safety plan. Time required to design/construct/implement Alternative GW-3 is approximately 12 months.	Easily implemented. Long-term monitoring would be required as well as additional monitoring of each whole house treatment system. Whole house treatment systems are highly reliable technologies to address contaminants in drinking water. Requires coordination with adjacent property owners and appropriate federal, state, and local agencies to implement institutional controls. Once put in place, institutional controls can be fairly easily monitored. Effectiveness is dependent on enforcement. Institutional controls on some properties may be more difficult to implement under Alternative GW-3 as there may be limited or no viable options for alternative water in some cases thereby preventing development of some properties. While Alternative GW-3 has potential for incidental exposure this is very unlikely given contaminate concentrations in residential wells are relatively low, each system has multiple filters to capture contamination, routine maintenance of the systems is expected to occur, and monitoring is a very reliable means to track issues with whole house treatment systems Town officials have indicated support for a water line and may be reluctant to agree to the use of whole house treatment systems for long term groundwater use, thereby making Alternative GW-3 more difficult to implement than Alternative GW-2.	Lower in cost compared to Alternative GW-2. Present Value Cost = $3,744,000

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8.0 REFERENCES

- March 2010 report titled "Preliminary Interpretation of VOC, Arsenic, and Uranium 2009 Data In Residential and Monitoring Wells, Mottolo Superfund Site, Raymond, New Hampshire, NHDES NO. 198704094";
- "Remedial Investigation Report," Volumes 1 – 8, Balsam Environmental Consultants, Inc., September 28, 1990, SPMS Doc ID 279140;
- Project Operations Plan – Remedial Investigation / Feasibility Study," Balsam Environmental Consultants, Inc., Volume 1- 2, October 4, 1988;
- "Record of Decision (ROD)," EPA Region I, March 29, 1991;
- "Potential Hazardous Waste Site: Identification and Preliminary Assessment," EPA Region I and State of New Hampshire, February 19,1980;
- "Potential Hazardous Waste Site: Identification and Preliminary Assessment," EPA Region I, April 14,1980; and
- Other Reports as Listed in the Mottolo NPL Site Administrative Record Index, EPA Region I, Compiled December 11, 1990.

TABLE

TABLE 1 - SUMMARY OF RESIDENTIAL DRINKING WATER SAMPLING RESULTS AT MOTTOLO PIG FARM SUPERFUND SITE
Raymond, New Hampshire

Date Sampled	Ambient Groundwater Quality Standards	5	30	13	70	100	-	-	10	30	6	1000	140	-	-	-	-	-	-	-	-	-	-		-	10	1	35	-	500
	Well ID #	TCE	Chloromethane	MtBE	Cis-1,2-DCE	Trans-1,2-DCE	As (III)	As (V)	Total As	Uranium	Chloroform	Toluene	TAME	Temp	SpC	DO	pH	ORP	Fe (II)	Alkalinity / Carbonate as CaCO3	Calcium	Total Organic Carbon	Chloride	Iron	Manganese	Magnesium	Nitrate	Nitrite	Potassium	Sodium	Sulfate
		(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(ug/L)	(µg/L)	(µg/L)	(µg/L)	(deg C)	(uS/cm)	(mg/L)		(mV)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)
12/3/2009	MOT_DW-47	<0.5	<2.0	<0.5	<0.5	<0.5	<1.0	<1.0	<1.0	<1.0	<0.5	<0.5	<0.5	10.31	269	2.00	6.62	113.0	0.29	49.0	17.0	2.3	36	0.492	0.094	2.31	0.17	<0.05	7.37	27.1	13
12/3/2009	MOT_DW-48	<0.5	<2.0	<0.5	<0.5	<0.5	<1.0	<1.0	<1.0	9	<0.5	<0.5	<0.5	10.75	483	1.18	7.54	-75.9	0.36	87.7	65.3	0.86	80	0.355	0.265	8.13	<0.50	<0.05	4.25	12.0	14
12/3/2009	MOT_DW-66	<0.5	<2.0	<0.5	<0.5	<0.5	<1.0	<1.0	<1.0	26	<0.5	<0.5	<0.5	10.13	500	1.57	7.43	134.3	0.08	64.1	54.9	0.94	100	<0.05	<0.01	5.81	0.14	<0.05	4.75	30.1	12
12/7/2009	MOT_DW-71	<0.5	<2.0	<0.5	<0.5	<0.5	<1.0	<1.0	<1.0	9	<0.5	<0.5	<0.5	10.1	304	1.0	6.6	73	0.38	46.0	34.1	4.6	53	0.642	0.098	6.20	<0.50	<0.05	6.33	8.57	20
6/26/2009	MOT_DW-19	ND	ND	ND	ND	ND	ns	ns	ND	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns
12/3/2009		<0.5	<2.0	<0.5	<0.5	<0.5	<1.0	<1.0	<1.0	40	<0.5	<0.5	<0.5	9.98	305	1.40	7.26	142.4	0.06	82.3	42.1	1.5	32	<0.05	<0.01	3.87	0.33	<0.05	4.70	9.07	11
6/26/2009	MOT_DW-18	ND	1.1	4.1	ND	ND	ns	ns	ND	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns
12/3/2009		<0.5	<2.0	2.3	<0.5	<0.5	<1.0	<1.0	<1.0	981	<0.5	<0.5	<0.5	10.58	316	0.67	7.35	153.0	0.00	116	49.3	1.3	7.4	<0.05	0.182	4.83	0.55	<0.05	5.21	6.47	29
6/26/2009	MOT_DW-16	ND	ND	3.8	ND	ND	ns	ns	ND	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns
12/4/2009	MOT_DW-16A	<0.5	<2.0	2.2	<0.5	<0.5	<1.0	<1.0	<1.0	107	<0.5	<0.5	<0.5	10.20	292	0.63	7.81	-54.2	0.00	115	45.1	0.96	6.5	0.126	0.106	4.44	<0.50	<0.05	5.40	6.24	22
6/26/2009	MOT_DW-15	ND	1.7	0.6	ND	ND	ns	ns	ND	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns
12/3/2009		<0.5	<2.0	0.8	<0.5	<0.5	<1.0	<1.0	<1.0	633	<0.5	<0.5	<0.5	10.05	172	1.39	7.83	107.2	0.17	82.8	34.5	1.2	8.2	<0.05	0.013	3.84	0.22	<0.05	5.08	5.03	20
12/3/2009	MOT_DW-14	<0.5	<2.0	<0.5	<0.5	<0.5	<1.0	<1.0	<1.0	7	<0.5	<0.5	<0.5	10.29	237	1.40	7.64	140.6	0.00	69.1	<1.00	4.9	<3.0	<0.05	<0.01	<0.100	<0.05	<0.05	0.589	37.9	14
12/7/2009	MOT_DW-55	<0.5	<2.0	<0.5	<0.5	<0.5	<1.0	<1.0	<1.0	36	<0.5	<0.5	<0.5	9.3	705	0.5	7.1	4	0.50	114	96.3	3.0	140	0.867	0.322	6.66	<0.05	<0.05	6.34	24.3	20
12/3/2009	MOT_DW-49	<0.5	<2.0	<0.5	<0.5	<0.5	2.0	26.4	28.4	5	<0.5	<0.5	<0.5	10	333	3.3	7.3	155	0.00	65.7	42.9	1.4	47	<0.05	0.031	5.36	<0.05	<0.05	2.23	12.7	15
4/6/2010		ND	ND	ND	ND	ND	ns	ns	17.7	ns	ns	ns	ns	9.8	391	6.16	7.08	115.4	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns
12/3/2009	MOT_DW-50	<0.5	<2.0	<0.5	<0.5	<0.5	<1.0	<1.0	<1.0	2	<0.5	<0.5	<0.5	12.1	429	8.5	6.1	217	0.00	32.9	16.4	3.1	82	<0.05	<0.01	1.58	0.75	<0.05	3.48	59.3	28
4/6/2010		ND	ND	ND	ND	ND	ns	ns	ND	ns	ns	ns	ns	9.9	523	9.83	5.9	176.3	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns
12/3/2009	MOT_DW-52	<0.5	<2.0	<0.5	<0.5	<0.5	<1.0	3.7	3.7	2	<0.5	<0.5	<0.5	11	511	1.6	6.3	146	0.28	34.6	30.5	1.0	110	0.826	0.104	3.87	<0.05	<0.05	4.55	55.2	22
4/6/2010		ND	ND	ND	ND	ND	ns	ns	2.5	ns	ns	ns	ns	10.8	316	5.5	6.85	74.5	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns
6/25/2009	MOT_DW-25	ND	1.8	ND	ND	ND	ns	ns	2.5	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns
12/3/2009	MOT_DW-25A	<0.5	<2.0	<0.5	<0.5	<0.5	6.2	1.1	7.3	7	<0.5	<0.5	<0.5	10	363	7.7	6.5	189	0.04	28.1	11.2	1.8	59	<0.05	0.475	1.13	0.12	<0.05	2.51	54.4	38
4/6/2010		ND	ND	ND	ND	ND	ns	ns	1.1	ns	ns	ns	ns	9.3	723	11.63	6.1	169.3	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns
6/25/2009	MOT_DW-26	ND	ND	ND	ND	ND	ns	ns	1	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns
4/6/2010		ND	ND	ND	ND	ND	ns	ns	13.1	ns	ns	ns	ns	8.9	103.9	9.62	6.62	144.8	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns
6/25/2009	MOT_DW-27	ND	1.2	ND	ND	ND	ns	ns	1.2	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns
12/3/2009		<0.5	<2.0	<0.5	<0.5	<0.5	<1.0	1.5	1.5	13	<0.5	<0.5	<0.5	9.6	900	5.2	6.0	193	0.09	29.9	34.4	1.7	220	0.062	0.029	3.41	1.1	<0.05	6.44	123	37
3/2/2005	MOT_DW-13	ND	ND	6.1	ND	ND	ns	ns	ns	ns	ND	ND	ND	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns
6/25/2009		4.9	ND	1.6	2.1	0.6	ns	ns	7.8	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns
7/16/2009		5.9	ND	1.1	2.6	0.7	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns
9/23/2009		3.7	ND	1.3	1.7	0.5	ns	ns	18.6	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns
9/23/2009		2.8	ND	1.3	1.3	ND	ns	ns	30.2	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns
12/2/2009		6.4	<2	1.1	3.0	0.9	5.6	3.9	9.5	1	<0.5	<0.5	<0.5	9.7	425	1.4	7.3	-75	0.31	106	58.1	1.3	56	0.440	0.243	8.60	<0.05	<0.05	4.47	10.8	19
12/2/2009	MOT_DW-13B	ns	ns	ns	ns	ns	<1.0	6.6	6.6	<1.0	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns
4/6/2010	MOT_DW-13C	7.8	ND	1	4.2	ND	ns	ns	13.4	ns	ns	ns	ns	9.3	367	0.3	7.6	-135	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns
6/28/2010		3.7	ND	0.9	2.2	0.6	ns	ns	17.1	1	ND	ND	ND	11	369	1.7	6.8	-69	ns	99.2	47.7	ND	38	0.36	0.194	6.96	ND	ND	ns	9.99	19
6/28/2010 DUP		3.7	ND	0.9	2.3	0.6	ns	ns	15.7	1	ND	ND	ND	11	369	1.7	6.8	-69	ns	117	47.6	ND	38	0.359	0.193	7	ND	ND	ns	10	19
6/25/2009	MOT_DW-34	ND	1.5	0.7	ND	ND	ns	ns	ND	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns
12/4/2009		<0.5	<2.0	2	<0.5	<0.5	<1.0	3.4	3.4	28	ns	ns	ns	10.5	762	1.4	6.8	98	0.19	124	77	5.4	140	4.13	0.896	10.9	0.098	<0.05	5.76	51.2	30
4/6/2010		ND	ND	1.4	ND	ND	ns	ns	1.2	ns	ns	ns	ns	9.7	828	1.4	6.2	242	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns
6/28/2010		ND	ns	ns	ND	ND	ns	ns	1.6	21	ns	ns	ns	13	889	1	7	130	ns	117	68.6	0.93	180	1.77	0.435	12	ND	ND	ns	74.1	28
6/25/2009	MOT_DW-28	1.3	ND	2.2	0.6	ND	ns	ns	11.1	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns
7/17/2009	MOT_DW-28A	ND	ND	2.9	ND	ND	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns
9/23/2009		3.3	ND	1.9	1.4	ND	ns	ns	12.4	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns
12/3/2009		1.4	<2.0	1.9	0.6	<0.5	9.3	0.5	9.8	2	<0.5	<0.5	<0.5	10.6	746	2.4	6.8	-39	2.89	142	94.8	<0.5	130	4.00	0.764	13.4	<0.05	<0.05	5.50	28.5	26
4/7/2010		2.3	ND	1.4	1.2	ND	ns	ns	9.5	ns	ns	ns	ns	10.4	361	0.9	6.4	-27	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns
6/25/2010		1.4	ND	1.3	0.8	ND	ns	ns	12.7	2	ND	ND	ND	11	607	0.7	7.9	-111	ns	101	71.9	ND	100	2.55	0.532	10.3	ND	ND	ns	17.6	23
12/4/2009	MOT_DW-53	<0.5	<2.0	0.7	<0.5	<0.5	38	17.8	55.8	13	<0.5	<0.5	<0.5	9.7	529	4.3	7.1	-23	1.33	119	82.1	<0.5	80	1.41	0.673	6.82	<0.05	<0.05	5.32	17.5	36
4/7/2010		ND	ND	1	ND	ND			48.1					9.6	677	4.11	6.94	-36.4	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns
12/4/2009	MOT_DW-54	<0.5	<2.0	<0.5	<0.5	<0.5	2.6	2.3	4.9	50	<0.5	<0.5	<0.5	9.6	430	0.4	7.3	5.0	0.15	116	64.8	2.6	51	0.264	0.192	5.35	0.062	<0.05	5.3	10.6	18
4/6/2010		ND	ND	ND	ND	ND	ns	ns	4.7	ns	ns	ns	ns	9.6	428	0.4	7	55.0	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns
12/3/2009	MOT_DW-43	<0.5	<2.0	0.5	<0.5	<0.5	<1.0	<1.0	<1.0	4	<0.5	<0.5	<0.5	11.19	504	0.53	7.20	-6.4	0.67	95.1	59.4	1.2	80	0.800	0.550	10.5	<0.05	<0.05	4.82	20.5	20
12/2/2009	MOT_DW-44	<0.5	<2.0	<0.5	<0.5	<0.5	<1.0	<1.0	<1.0	15	<0.5	<0.5	<0.5	10.82	661	7.39	6.57	168.4	0.00	62.6	30.4	1.9	150	0.075	0.019	2.95	0.21	<0.05	4.27	89.4	24
12/2/2009	MOT_DW-69	<0.5	<2.0	<0.5	<0.5	<0.5	<1.0	<1.0	<1.0	67	<0.5	<0.5	<0.5	10.50	335	5.32	6.03	182.5	0.05	69.9	37.7	3.6	36	<0.05	0.596	4.44	1.9	<0.05	9.85	12.5	24

TABLE 1 - SUMMARY OF RESIDENTIAL DRINKING WATER SAMPLING RESULTS AT MOTTOLO PIG FARM SUPERFUND SITE
Raymond, New Hampshire

Date Sampled	Ambient Groundwater Quality Standards	5	30	13	70	100	-	-	10	30	6	1000	140	-	-	-	-	-	-	-	-	-	-	-	-	-	10	1	35	-	500
	Well ID #	TCE	Chloromethane	MtBE	Cis-1,2-DCE	Trans-1,2-DCE	As (III)	As (V)	Total As	Uranium	Chloroform	Toluene	TAME	Temp	SpC	DO	pH	ORP	Fe (II)	Alkalinity / Carbonate as CaCO3	Calcium	Total Organic Carbon	Chloride	Iron	Manganese	Magnesium	Nitrate	Nitrite	Potassium	Sodium	Sulfate
		(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(ug/L)	(µg/L)	(µg/L)	(µg/L)	(deg C)	(uS/cm)	(mg/L)		(mV)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)
12/4/2009	MOT_DW-45	<0.5	<2.0	<0.5	<0.5	<0.5	<1.0	1.3	1.3	2	<0.5	<0.5	<0.5	10.05	838	0.70	6.95	3.8	2.39	63.0	52.3	1.8	190	7.23	ns	10.1	<0.05	<0.05	4.79	78.1	12
4/7/2010		ND	ND	ND	ND	ND	ns	ns	1	ns	ns	ns	ns	10.3	683	0.34	6.56	4.2	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns
6/26/2009	MOT_DW-23	ND	2.2	ND	ND	ND	ns	ns	2.1	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns
12/2/2009		<0.5	<2.0	<0.5	<0.5	<0.5	<1.0	2.8	2.8	4	<0.5	<0.5	<0.5	9.96	173	5.68	7.41	148.8	0.02	72.7	28.7	0.51	<3	0.066	<0.01	1.52	<0.05	<0.05	3.30	2.73	12
4/7/2010		ND	ND	ND	ND	ND	ns	ns	1.5	ns	ns	ns	ns	10.1	164	5.47	7.29	135.9	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns
6/26/2009	MOT_DW-22	ND	ND	ND	ND	ND	ns	ns	1.0	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns
4/7/2010		ND	ND	ND	ND	ND	ns	ns	ND	ns	ns	ns	ns	9.44	407	2.61	7.6	59.6	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns
12/3/2009	MOT_DW-64	<0.5	<2.0	<0.5	<0.5	<0.5	10.0	3.7	13.7	1	<0.5	<0.5	<0.5	10.10	333	0.96	7.81	-80.6	0.10	72.7	41.5	1.3	42	0.108	0.109	7.30	<0.05	<0.05	2.94	10.2	14
4/6/2010		ND	ND	ND	ND	ND	ns	ns	13.1	ns	ns	ns	ns	10.10	347	0.42	7.4	-73.4	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns
12/4/2009	MOT_DW-68	<0.5	<2.0	<0.5	<0.5	<0.5	<1.0	<1.0	<1.0	1	<0.5	<0.5	<0.5	10.41	257	0.36	7.68	-65.4	0.05	75.7	27.2	1.9	21	0.184	0.079	7.20	<0.05	<0.05	2.79	12.1	14
12/4/2009	MOT_DW-70	<0.5	<2.0	<0.5	<0.5	<0.5	<1.0	<1.0	<1.0	1	<0.5	<0.5	<0.5	10.68	334	1.82	7.24	-32.2	0.82	66.9	37.3	1.5	43	0.919	0.305	7.26	<0.05	<0.05	3.90	11.8	20
12/3/2009	MOT_DW-65	<0.5	<2.0	<0.5	<0.5	<0.5	<1.0	<1.0	<1.0	21	<0.5	<0.5	<0.5	9.51	222	0.90	7.32	82.0	0.16	54.0	30.5	0.95	13	0.321	0.046	4.02	<0.05	<0.05	4.11	4.69	23
12/4/2009	MOT_DW-67	<0.5	<2.0	<0.5	<0.5	<0.5	<1.0	<1.0	<1.0	12	<0.5	<0.5	<0.5	10.60	259	3.72	6.76	130.2	0.05	41.4	24.3	0.96	28	<0.05	0.020	4.29	4.0	<0.05	4.15	16.5	17
6/25/2009	MOT_DW-24	ND	1.4	0.7	ND	ND	ns	ns	4.8	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns
12/4/2009		<0.5	<2.0	0.8	<0.5	<0.5	4.5	0.2	4.7	1	<0.5	<0.5	<0.5	9.52	290	3.12	7.38	-70.9	1.02	71.9	36.1	1.2	29	1.01	0.238	5.88	<0.05	<0.05	3.86	8.58	18
4/6/2010		ND	ND	0.8	ND	ND	ns	ns	4.3	ns	ns	ns	ns	9.1	286	0.31	6.57	-14	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns
12/4/2009	MOT_DW-60	<0.5	<2.0	<0.5	<0.5	<0.5	6.3	54.6	60.9	3	<0.5	<0.5	<0.5	10.05	255	4.91	7.44	-47.7	0.10	74.5	33.4	<0.5	19	23.0	7.89	5.07	<0.05	<0.05	3.15	8.07	17
6/4/2010		ND	ND	ND	ND	ND	ns	ns	3.5	ns	ns	ns	ns	9.8	240	6.33	6.92	43.1	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns
12/7/2009	MOT_DW-61	<0.5	<2.0	0.7	<0.5	<0.5	<1	1.3	1.3	1	<0.5	<0.5	<0.5	9.6	199	0.6	7.7	158	0.02	75.0	26.3	1.4	7.0	<0.05	0.034	3.91	<0.05	<0.05	2.48	7.58	15
4/7/2010		ND	ND	0.7	ND	ND	ns	ns	1.2	ns	ns	ns	ns	10.1	202	0.89	7.43	103.9	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns
12/4/2009	MOT_DW-62	<0.5	<2.0	<0.5	<0.5	<0.5	1.2	0.6	1.8	1	<0.5	<0.5	<0.5	10.60	255	0.26	8.02	-122.0	0.13	78.0	31.5	<0.5	18	0.126	0.097	5.26	<0.05	<0.05	2.72	9.53	17
4/6/2010		ND	ND	ND	ND	ND	1.9	ns	1.9	ns	ns	ns	ns	11.50	255	0.36	8.01	88.3	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns
12/3/2009	MOT_DW-63	<0.5	<2.0	<0.5	<0.5	<0.5	<1.0	<1.0	<1.0	4	<0.5	<0.5	<0.5	10.18	265	3.99	6.97	133.1	0.00	59.0	30.4	1.6	26	<0.05	0.028	4.78	0.32	<0.05	2.69	12.4	17
12/2/2009	MOT_DW-56	<0.5	<2.0	<0.5	<0.5	<0.5	<1.0	<1.0	<1.0	46	<0.5	<0.5	<0.5	11.89	559	0.56	7.94	125.9	0.01	130	69.3	2.6	79	<0.05	0.163	6.95	<0.05	<0.05	4.46	28.9	26
6/25/2009	MOT_DW-21	ND	1.7	ND	ND	ND	ns	ns	ND	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns
12/2/2009	MOT_DW-21A	<0.5	<2.0	<0.5	<0.5	<0.5	<1.0	<1.0	<1.0	10	<0.5	<0.5	<0.5	11.07	451	2.24	7.33	126.8	0.05	137	53.8	4.2	42	<0.05	<0.01	2.42	0.23	<0.05	5.23	32.6	24
12/2/2009	MOT_DW-57	<0.5	<2.0	<0.5	<0.5	<0.5	<1.0	<1.0	<1.0	47	<0.5	<0.5	<0.5	10.46	545	1.78	7.71	80.0	0.00	150	62.7	2.5	64	0.065	0.083	6.05	<0.05	<0.05	5.39	37.3	28
6/25/2009	MOT_DW-20	ND	ND	ND	ND	ND	ns	ns	ND	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns
12/2/2009		<0.5	<2.0	<0.5	<0.5	<0.5	<1.0	<1.0	<1.0	70	<0.5	<0.5	<0.5	38.0	436	1.85	7.68	118.9	0.07	119	65.0	1.4	23	<0.05	<0.01	3.08	7.5	<0.05	6.36	11.1	24
12/2/2009	MOT_DW-20A	<0.5	<2.0	<0.5	<0.5	<0.5	ns	ns	ns	ns	<0.5	<0.5	<0.5	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns
12/3/2009	MOT_DW-58	<0.5	<2.0	<0.5	<0.5	<0.5	<1.0	<1.0	<1.0	78	<0.5	<0.5	<0.5	10.56	522	2.12	7.67	137.3	0.05	141	64.3	0.99	62	<0.05	0.019	6.03	<0.05	<0.05	5.61	32.4	22
12/2/2009	MOT_DW-59	<0.5	<2.0	<0.5	<0.5	<0.5	<1.0	<1.0	<1.0	20	<0.5	<0.5	<0.5	10.75	341	1.93	8.05	124.3	0.00	74.4	47.7	0.78	45	<0.05	<0.01	4.48	<0.05	<0.05	4.33	7.72	19
3/3/2004	MOT_DW-1	ns	ND	4.0	ns	ns	ns	ns	ns	ns	ns	ND	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns
6/2/2004		ns	ND	3.5	ns	ns	ns	ns	ns	ns	ns	ND	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns
9/7/2004		ns	ND	2.5	ns	ns	ns	ns	ns	ns	ns	ND	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns
12/2/2004		ns	ND	1.8	ns	ns	ns	ns	ns	ns	ns	ND	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns
6/13/2007		ns	ND	15	ns	ns	ns	ns	ns	ns	ns	ND	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns
10/4/2007	MOT_DW-1A	ns	ND	21	ns	ns	ns	ns	ns	ns	ns	ND	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns
4/30/2008		ns	ND	3.1	ns	ns	ns	ns	ns	ns	ns	ND	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns
3/26/2009		ns	ND	3.3	ns	ns	ns	ns	ns	ns	ns	ND	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns
6/25/2009		ND	1.5	0.6	ND	ND	ns	ns	29	ns	ns	ND	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns
9/23/2009		ND	ND	0.5	ND	ND	ns	ns	25	ns	ns	ND	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns
12/3/2009		<0.5	<2.0	<0.5	<0.5	<0.5	30.0	<1.0	30.0	3	<0.5	<0.5	<0.5	10.7	243	1.9	6.3	-17	3.3	56.6	29.3	5.5	24	7.14	0.678	2.30	<0.05	<0.05	2.12	8.36	11
4/6/2010		ND	ND	ND	ND	ND	52.9		52.9	ns	ns	ns	ns	10.2	229	2.2	6.4	-34	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns

TABLE 1 - SUMMARY OF RESIDENTIAL DRINKING WATER SAMPLING RESULTS AT MOTTOLO PIG FARM SUPERFUND SITE
Raymond, New Hampshire

Date Sampled	Ambient Groundwater Quality Standards	5	30	13	70	100	-	-	10	30	6	1000	140	-	-	-	-	-	-	-	-	-	-	-	-	-	10	1	35	-	500
	Well ID #	TCE	Chloromethane	MtBE	Cis-1,2-DCE	Trans-1,2-DCE	As (III)	As (V)	Total As	Uranium	Chloroform	Toluene	TAME	Temp	SpC	DO	pH	ORP	Fe (II)	Alkalinity / Carbonate as CaCO3	Calcium	Total Organic Carbon	Chloride	Iron	Manganese	Magnesium	Nitrate	Nitrite	Potassium	Sodium	Sulfate
		(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(ug/L)	(µg/L)	(µg/L)	(µg/L)	(deg C)	(uS/cm)	(mg/L)		(mV)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)
3/2/2005	MOT_DW-1C	ns	ND	1.8	ns	ns	ns	ns	ns	ns	ns	ND	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns
6/9/2005		ns	ND	0.7	ns	ns	ns	ns	ns	ns	ns	ND	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns
9/13/2005		ns	ND	1.1	ns	ns	ns	ns	ns	ns	ns	ND	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns
12/6/2005		ns	ND	0.9	ns	ns	ns	ns	ns	ns	ns	ND	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns
3/10/2006		ns	ND	0.5	ns	ns	ns	ns	ns	ns	ns	ND	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns
6/20/2006		ns	ND	0.5	ns	ns	ns	ns	ns	ns	ns	ND	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns
9/11/2006		ns	ND	5.6	ns	ns	ns	ns	ns	ns	ns	ND	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns
12/8/2006		ns	ND	71	ns	ns	ns	ns	ns	ns	ns	0.5	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns
1/9/2007		ns	ND	66	ns	ns	ns	ns	ns	ns	ns	ND	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns
3/9/2007		ns	ND	31	ns	ns	ns	ns	ns	ns	ns	ND	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns
1/10/2008		ns	ND	7.2	ns	ns	ns	ns	ns	ns	ns	ND	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns
8/31/2003	MOT_DW-1D	ns	ND	5.5	ns	ns	ns	ns	ns	ns	ns	ND	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns
2/7/2007	DW06	ns	ND	45	ns	ns	ns	ns	ns	ns	ns	ND	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns
3/9/2007		ns	ND	35	ns	ns	ns	ns	ns	ns	ns	ND	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns
4/25/2007		ns	ND	19	ns	ns	ns	ns	ns	ns	ns	ND	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns
6/5/2007		ns	ND	15	ns	ns	ns	ns	ns	ns	ns	ND	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns
12/2/2009	MOT_DW-6B	<0.5	<2.0	<0.5	<0.5	<0.5	15.4	1.8	17.2	1	<0.5	<0.5	<0.5	10	155	10	6.6	66	2.35	29.1	18.1	<0.5	22	3.45	0.326	1.60	<0.05	<0.05	1.82	8.72	13
4/6/2010		ND	ND	ND	ND	ND	15.6		15.6	ns	ns	ns	ns	9.5	88	11	6.3	107	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns
6/2/2004	MOT_DW-2B	ND	ND	ns	ND	ns	ns	ns	ns	ns	0.7	ND	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns
9/7/2004		ND	ND	ns	ND	ns	ns	ns	ns	ns	1.4	ND	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns
12/2/2004		0.6	ND	ns	ND	ns	ns	ns	ns	ns	ND	ND	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns
12/30/2004		0.5	ND	ns	ND	ns	ns	ns	ns	ns	0.6	ND	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns
3/2/2005		1.0	ND	ns	ND	ns	ns	ns	ns	ns	0.6	ND	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns
6/9/2005		ND	ND	ns	ND	ns	ns	ns	ns	ns	ND	ND	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns
9/13/2005		ND	ND	ns	ND	ns	ns	ns	ns	ns	ND	ND	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns
6/19/2008		ND	ND	ns	ND	ns	ns	ns	ns	ns	ND	ND	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns
9/10/2008		ND	ND	ns	ND	ns	ns	ns	ns	ns	ND	ND	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns
12/18/2008		ND	ND	ns	ND	ns	ns	ns	ns	ns	ND	ND	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns
3/26/2009		ND	ND	ns	ND	ns	ns	ns	ns	ns	ND	ND	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns
6/25/2009		ND	1.4	ND	ND	ND	ns	ns	ND	ns	ND	ND	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns
6/25/2009		ND	1.3	ND	ND	ND	ns	ns	1	ns	ND	ND	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns
9/23/2009		ND	ND	ND	ND	ND	ns	ns	2.4	ns	ns	ND	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns
12/2/2009		<0.5	<2.0	<0.5	<0.5	<0.5	<1.0	<1.0	<1.0	78	<0.5	<0.5	<0.5	10	1773	0.90	6.5	119	0.07	109	163	2.8	490	0.066	1.501	14.5	0.93	<0.05	10.2	150	31
4/7/2010		ND	ND	ND	ND	ND	ns	ns	1.5	ns	ns	ns	ns	10.1	865	1.72	6.81	104.5	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns
8/31/2003	MOT_DW-2C	ND	ND	ns	ND	ns	ns	ns	ns	ns	5.1	15	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns
12/6/2005	MOT_DW-2D	1.2	ND	ns	0.5	ns	ns	ns	ns	ns	ND	ND	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns
3/10/2006		0.6	ND	ns	ND	ns	ns	ns	ns	ns	ND	ND	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns
6/20/2006		0.5	ND	ns	ND	ns	ns	ns	ns	ns	ND	ND	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns
9/11/2006		ND	ND	ns	ND	ns	ns	ns	ns	ns	ND	ND	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns
12/8/2006		0.9	ND	ns	ND	ns	ns	ns	ns	ns	ND	ND	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns
3/9/2007		ND	ND	ns	ND	ns	ns	ns	ns	ns	ND	0.8	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns
10/4/2007		ND	ND	ns	ND	ns	ns	ns	ns	ns	ND	ND	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns
1/10/2008		ND	ND	ns	ND	ns	ns	ns	ns	ns	ND	ND	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns
4/2/2008		ND	ND	ns	ND	ns	ns	ns	ns	ns	ND	ND	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns
12/2/2009	MOT_DW-7C	<0.5	<2.0	<0.5	<0.5	<0.5	<1.0	1.2	1.2	10	<0.5	<0.5	<0.5	9.4	320	7.7	7.4	125	0.0	61.7	43.8	<0.5	47	0.054	<0.01	4.11	1.4	<0.05	3.87	9.34	14
4/6/2010		ND	ND	ND	ND	ND	ns	ns	1.4	ns	ns	ns	ns	8.9	305	2.4	7	107	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns

TABLE 1 - SUMMARY OF RESIDENTIAL DRINKING WATER SAMPLING RESULTS AT MOTTOLO PIG FARM SUPERFUND SITE
Raymond, New Hampshire

Date Sampled	Ambient Groundwater Quality Standards	5	30	13	70	100	-	-	10	30	6	1000	140	-	-	-	-	-	-	-	-	-	-	-	-	-	10	1	35	-	500
	Well ID #	TCE	Chloromethane	MtBE	Cis-1,2-DCE	Trans-1,2-DCE	As (III)	As (V)	Total As	Uranium	Chloroform	Toluene	TAME	Temp	SpC	DO	pH	ORP	Fe (II)	Alkalinity / Carbonate as CaCO3	Calcium	Total Organic Carbon	Chloride	Iron	Manganese	Magnesium	Nitrate	Nitrite	Potassium	Sodium	Sulfate
		(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(ug/L)	(µg/L)	(µg/L)	(µg/L)	(deg C)	(uS/cm)	(mg/L)		(mV)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)
12/4/2003	MOT_DW-3	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	1.4	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns
1/12/2004		ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	0.9	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns
3/3/2004		ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	1.0	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns
6/2/2004		ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ND	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns
9/5/2003	MOT_DW-3A	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ND	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns
9/7/2004		ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ND	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns
9/13/2005		ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ND	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns
12/6/2005		ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ND	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns
3/10/2006		ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ND	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns
6/20/2006		ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ND	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns
9/11/2006		ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ND	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns
12/8/2006		ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ND	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns
3/9/2007		ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ND	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns
6/13/2007		ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ND	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns
10/4/2007		ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ND	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns
1/10/2008		ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ND	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns
4/2/2008		ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ND	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns
3/26/2009		ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ND	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns
6/25/2009		ND	ND	ND	ND	ND	ns	ns	9.0	ns	ns	ND	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns
9/23/2009		ND	ND	ND	ND	ND	ns	ns	5	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns
12/3/2009		<0.5	<2.0	<0.5	<0.5	<0.5	40.0	6.8	46.8	9	<0.5	<0.5	<0.5	10	219	0.5	7.3	-67	0.00	69.9	30.6	2.4	13	0.300	0.080	3.00	<0.05	<0.05	3.65	7.62	11
6/24/2003	MOT_DW-3C	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	9.9	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns
12/4/2009	MOT_DW-8	<0.5	<2.0	<0.5	<0.5	<0.5	<1.0	<1.0	<1.0	5	<0.5	<0.5	<0.5	9.9	276	5.1	7.3	145	0.00	49.6	34.8	0.79	45	0.162	<0.01	4.27	0.44	<0.05	4.3	7.59	7.9
4/6/2010		ND	ND	ND	ND	ND	ns	ns	ND	ns	ns	ns	ns	9.6	290	4	6.9	145	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns
6/6/2003	MOT_DW-4	1.0	ns	ns	0.8	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns
6/19/2003		1.3	ns	ns	1.1	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns
9/5/2003		0.9	ns	ns	0.6	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns
12/5/2003		1.3	ns	ns	0.8	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns
3/3/2004		1.2	ns	ns	0.9	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns
6/2/2004		0.8	ns	ns	0.5	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns
9/7/2004		0.8	ns	ns	0.5	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns
3/2/2005		0.8	ns	ns	ND	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns
6/9/2005		0.7	ns	ns	ND	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns
9/13/2005		0.5	ns	ns	ND	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns
12/6/2005		0.7	ns	ns	ND	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns
3/10/2006		0.7	ns	ns	ND	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns
6/20/2006		0.8	ns	ns	ND	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns
9/11/2006		0.7	ns	ns	ND	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns
10/4/2007		ND	ns	ns	ND	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns
1/10/2008		ND	ns	ns	ND	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns
4/2/2008		0.6	ns	ns	ND	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns
6/19/2008		ND	ns	ns	ND	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns
9/10/2008		ND	ns	ns	ND	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns
12/18/2008		0.5	ns	ns	ND	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns
3/26/2009		0.5	ns	ns	ND	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns
6/25/2009		ND	ND	ND	ND	ND	ns	ns	1.2	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns
6/25/2009		ND	ND	ND	ND	ND	ns	ns	1.1	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns
9/23/2009		ND	ND	ND	ND	ND	ns	ns	1	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns
12/3/2009		<0.5	<2.0	<0.5	<0.5	<0.5	<1.0	1.1	1.1	36	<0.5	<0.5	<0.5	10	382	1.8	7.2	145	0.00	60.5	44.9	1.3	62	<0.05	<0.01	8.38	0.49	<0.05	5.04	10.4	13
4/7/2010		ND	ND	ND	ND	ND	ns	ns	1.1	ns	ns	ns	ns	9.5	239	3.7	6.2	283	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns
12/8/2006	MOT_DW-4A	0.7	ns	ns	ND	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns
3/9/2007		0.7	ns	ns	ND	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns
6/13/2007		0.7	ns	ns	ND	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns

TABLE 1 - SUMMARY OF RESIDENTIAL DRINKING WATER SAMPLING RESULTS AT MOTTOLO PIG FARM SUPERFUND SITE
Raymond, New Hampshire

Date Sampled	Ambient Groundwater Quality Standards	5	30	13	70	100	-	-	10	30	6	1000	140	-	-	-	-	-	-	-	-	-	-		-	10	1	35	-	500
	Well ID #	TCE	Chloromethane	MtBE	Cis-1,2-DCE	Trans-1,2-DCE	As (III)	As (V)	Total As	Uranium	Chloroform	Toluene	TAME	Temp	SpC	DO	pH	ORP	Fe (II)	Alkalinity / Carbonate as CaCO3	Calcium	Total Organic Carbon	Chloride	Iron	Manganese	Magnesium	Nitrate	Nitrite	Potassium	Sodium	Sulfate
		(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(ug/L)	(µg/L)	(µg/L)	(µg/L)	(deg C)	(uS/cm)	(mg/L)		(mV)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)
12/4/2009	MOT_DW-9A	<0.5	<2.0	<0.5	<0.5	<0.5	3.9	0.7	4.6	2	<0.5	<0.5	<0.5	11.0	317	0.4	8.1	-140	0.08	78	37.4	1	37	0.069	0.060	7.24	<0.05	<0.05	1.01	14	16
4/6/2010		ND	ND	ND	ND	ND	ns	ns	4.1	ns	ns	ns	ns	10.7	291	0.6	7.9	-113	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns
6/28/2010		ND	ND	ND	ND	ND	ns	ns	4.8	3	ND	ND	ND	13.0	352	0.9	8.6	-134	ns	77.7	40.6	ND	48	0.077	0.067	7.52	0.16	ND	ns	13.8	15
12/4/2009	MOT_DW-10	<0.5	<2.0	<0.5	<0.5	<0.5	<1.0	<1.0	<1.0	7	0.9	<0.5	<0.5	9.9	164	3.3	7.8	108	0.01	48.8	21.7	<0.5	<3	<0.05	<0.01	2.99	0.28	<0.05	3.55	3.83	15
4/6/2010		ND	ND	ND	ND	ND	ND	ns	ns	ns	ns	ns	ns	9.9	160	2.3	7.1	163	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns
6/25/2010		ND	ND	ND	ND	ND	ns	ns	ND	8	ND	ND	ND	12	173	2.3	7.6	196	ns	44.4	22.1	ND	12	0.096	ND	3.01	0.074	ND	ns	3.81	14
12/8/2006	MOT_DW-5	ns	ns	7.2	ns	ns	ns	ns	ns	ns	ns	ns	0.8	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns
1/9/2007		ns	ns	9.3	ns	ns	ns	ns	ns	ns	ns	ns	1	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns
3/9/2007		ns	ns	6.0	ns	ns	ns	ns	ns	ns	ns	ns	1.1	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns
6/13/2007		ns	ns	5.5	ns	ns	ns	ns	ns	ns	ns	ns	0.7	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns
10/4/2007		ns	ns	4.6	ns	ns	ns	ns	ns	ns	ns	ns	0.7	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns
1/10/2008		ns	ns	2.9	ns	ns	ns	ns	ns	ns	ns	ns	ND	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns
4/2/2008		ns	ns	4.5	ns	ns	ns	ns	ns	ns	ns	ns	0.5	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns
3/26/2009		ns	ns	2.4	ns	ns	ns	ns	ns	ns	ns	ns	ND	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns
6/25/2009		ND	ND	0.9	ND	ND	ns	ns	1.0	ns	ns	ns	ND	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns
12/7/2009		<0.5	<2.0	1.4	<0.5	<0.5	<1.0	<1.0	<1.0	9	<0.5	<0.5	<0.5	9.9	268	1.3	6.7	187	0.01	87.1	33.6	<0.5	20	0.325	0.043	5.24	0.53	<0.05	4.69	10.4	15
4/6/2010		ND	ND	2.3	ND	ND	ns	ns	ND	ns	ns	ns	ns	9.6	295	1.2	6.6	167	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns
6/25/2010		ND	ND	1.6	ND	ND	ns	ns	ND	11	ND	ND	ND	11	282	1.4	6.8	114		92.4	34.9	0.56	19	0.206	0.046	5.51	0.33	ND	ns	10.2	15
12/2/2009	MOT_DW-11A	<0.5	<2.0	1.2	<0.5	<0.5	<1.0	<1.0	<1.0	48	<0.5	<0.5	<0.5	11	235	6.3	7.6	131	0.05	106	15.8	<0.5	6.9	<0.05	<0.01	2.84	0.28	<0.05	2.90	21.1	8.0
9/5/2003	MOT_DW-12	ns	ns	0.5	ns	ns	ns	ns	ns	ns	ns	1.2	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns
9/19/2003		ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	0.9	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns
6/26/2009		ND	1.9	1.7	ND	ND	ns	ns	1.5	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns
12/3/2009		<0.5	2.1	1.5	<0.5	<0.5	<1.0	1.5	1.5	36	<0.5	<0.5	<0.5	10	324	0.40	7.40	95	0.07	85.1	46.5	1.0	34	0.055	0.243	4.56	<0.05	<0.05	4.15	7.56	12
5/3/2005	DW01	ns	ns	2.3	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns
6/26/2009	MOT_DW-29	5.1	1.3	0.9	2.2	0.5	ns	ns	15.9	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns
7/17/2009		1.9	ND	0.5	0.8	ND	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns
9/23/2009		3.1	ND	0.6	1.5	ND	ns	ns	14.3	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns
12/2/2009		3.1	<2.0	0.5	1.5	<0.5	13.3	1.8	15.1	3	<0.5	<0.5	<0.5	10	324	0.21	7.8	-136	0.16	101	40.4	<0.5	21	0.194	0.048	4.64	<0.05	<0.05	1.50	15.3	25
4/8/2010		3.1	ND	0.5	1.6	ND	ns	ns	13.3	ns	ns	ns	ns	9	303	0.2	7.5	-65	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns
6/28/2010		0.9	ND	ND	0.5	ND	ns	ns	15.3	1	ND	ND	ND	11	300	0.8	8.4	-133	ns	96.2	37.2	0.68	13	0.087	0.029	4.38	ND	ND	ns	17.2	26
6/28/2010 DUP		0.9	ND	ND	0.5	ND	ns	ns	16.2	1	ND	ND	ND	11	300	0.8	8.4	-133	ns	96.6	37	0.66	13	0.088	0.029	4.37	ND	ND	ns	17	28
6/25/2009	MOT_DW-33	ND	ND	1.5	ND	ND	ns	ns	7.7	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns
9/23/2009		ND	ND	1.5	ND	ND	ns	ns	6	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns
12/2/2009		<0.5	<2.0	1.0	<0.5	<0.5	4.7	2.7	7.4	1	<0.5	<0.5	<0.5	10	657	0.54	6.93	3.0	2.0	90.9	76.8	2.0	130	2.81	0.609	11.9	<0.05	<0.05	5.38	24.3	25
4/6/2010		0.8	ND	1.3	ND	ND	ns	ns	18.8	ns	ns	ns	ns	9.1	670	0.9	6.9	45.0	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns
6/28/2010		ND	ND	0.7	ND	ND	ns	ns	10.6	1	ND	ND	ND	11	677	2.1	6.9	-27.0	ns	89.1	73.7	ND	130	3.04	0.672	11.4	ND	ND	ns	23.5	25
6/25/2009	MOT_DW-30	2.1	ND	1.4	0.8	ND	ns	ns	18.2	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns
7/16/2009		1.5	ND	1.2	0.6	ND	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns
9/23/2009		1.8	ND	0.8	0.7	ND	ns	ns	16.7	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns
12/4/2009		1.6	<2.0	0.8	0.7	<0.5	11.4	3.6	15	2	<0.5	<0.5	<0.5	10.5	438	0.5	7.4	-99	0.34	104	60	0.87	55	0.377	0.221	8.77	<0.05	<0.05	3.6	9.41	22
4/7/2010		2.3	ND	0.9	1	ND	ns	ns	8.6	ns	ns	ns	ns	10.2	525	0.34	7.1	-17	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns
7/2/2010		4	ND	1	1.8	ND	ns	ns	18.6	2	ND	ND	ND	12	391	1.8	7	-105	ns	101	55	ND	51	0.323	0.198	7.99	ND	ND	ns	9.67	20
6/25/2009	MOT_DW-32	ND	ND	0.9	ND	ND	ns	ns	13.5	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns
9/23/2009		ND	ND	1.3	ND	ND	ns	ns	18.5	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns
12/2/2009		<0.5	<2.0	1.2	<0.5	<0.5	18.3	2.4	20.7	<1.0	<0.5	<0.5	<0.5	10.8	783	0.33	7.4	-59	0.22	144	105	<0.5	140	0.299	0.212	14.2	<0.05	<0.05	1.95	26.8	30
4/7/2010		0.6	ND	1.4	ND	ND	ns	ns	18.3	ns	ns	ns	ns	10	816	0.22	6.8	11	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns
6/28/2010		0.9	ND	1	0.5	ND	ns	ns	13.8	1	ND	ND	ND	12	777	0.7	8.2	-63	ns	143	97.7	0.51	130	0.338	0.286	13.1	ND	ND	ns	26.7	28
6/25/2009	MOT_DW-31	ND	1.1	ND	ND	ND	ns	ns	ND	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns
9/23/2009		ND	ND	ND	ND	ND	ns	ns	ND	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns
12/4/2009		<0.5	<2.0	<0.5	<0.5	<0.5	<1.0	<1.0	<1.0	27	<0.5	<0.5	<0.5	10.2	550	0.5	6.7	73	0.46	123	55.9	3.4	47	0.555	0.897	4.68	0.14	<0.05	6.85	15.1	76
4/8/2010		ND	ND	ND	ND	ND	ns	ns	ND	ns	ns	ns	ns	9.6	678	0.57	6.52	50.3	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns

TABLE 1 - SUMMARY OF RESIDENTIAL DRINKING WATER SAMPLING RESULTS AT MOTTOLO PIG FARM SUPERFUND SITE
Raymond, New Hampshire

Date Sampled	Ambient Groundwater Quality Standards	5	30	13	70	100	-	-	10	30	6	1000	140	-	-	-	-	-	-	-	-	-	-	-	-	-	10	1	35	-	500
	Well ID #	TCE	Chloromethane	MtBE	Cis-1,2-DCE	Trans-1,2-DCE	As (III)	As (V)	Total As	Uranium	Chloroform	Toluene	TAME	Temp	SpC	DO	pH	ORP	Fe (II)	Alkalinity / Carbonate as CaCO3	Calcium	Total Organic Carbon	Chloride	Iron	Manganese	Magnesium	Nitrate	Nitrite	Potassium	Sodium	Sulfate
		(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(ug/L)	(µg/L)	(µg/L)	(µg/L)	(deg C)	(uS/cm)	(mg/L)		(mV)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)
7/24/2009	MOT_DW-35	ND	ND	1	ND	ND	ns	ns	10.4	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns
7/24/2009		ND	1.1	1	ND	ND	ns	ns	9.3	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns
12/2/2009		0.7	<2.0	1.6	<0.5	<0.5	2.5	5.3	7.8	2	<0.5	<0.5	<0.5	9.9	333	1.5	7.5	-60	0.13	90.7	47.2	1.1	32	0.454	0.310	6.64	<0.05	<0.05	4.02	5.84	22
4/7/2010		1.2	ND	2	0.5	ND	ns	ns	15.8	ns	ns	ns	ns	9.62	345	0.27	7.67	-119	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns
6/28/2010		0.6	ND	1	ND	ND	ns	ns	4.6	2	ND	ND	ND	11	302	2	8.6	27	ns	81.8	41	ND	25	0.194	0.277	5.72	0.067	ND	ns	6.18	20
7/24/2009	MOT_DW-36	ND	ND	ND	ND	ND	ns	ns	2	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns
12/4/2009		<0.5	<2.0	<0.5	<0.5	<0.5	<1.0	2.6	2.6	20	<0.5	<0.5	<0.5	10.0	440	0.9	7.1	127	0.00	78.9	56.9	1.5	42	0.209	0.039	10.5	1.8	1.8	<0.05	9.07	61
4/7/2010		ND	ND	ND	ND	ND	ns	ns	2.3	ns	ns	ns	ns	9.8	406	0.9	6.4	205		ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns
7/24/2009	MOT_DW-37	ND	1.1	ND	ND	ND	ns	ns	16.4	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns
12/4/2009		<0.5	<2.0	<0.5	<0.5	<0.5	12.4	4.5	16.9	1	<0.5	<0.5	<0.5	10.0	169	0.4	7.7	-80	0.10	57.9	21.9	1.1	6.3	0.227	0.098	3.77	<0.05	<0.05	2.91	5.04	14
4/7/2010		ND	ND	ND	ND	ND	ns	ns	15.3	ns	ns	ns	ns	9.5	172	0.4	7	-24	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns
7/24/2009	MOT_DW-38	ND	ND	ND	ND	ND	ns	ns	91.8	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns
12/4/2009		<0.5	<2.0	<0.5	<0.5	<0.5	8.3	84.8	93.1	3	<0.5	<0.5	<0.5	9.89	172	1.37	7.37	89.7	0.07	52.9	24.8	0.70	5.9	1.13	0.051	2.40	<0.05	<0.05	2.51	4.48	20
4/7/2010		ND	ND	ND	ND	ND	ns	ns	109	ns	ns	ns	ns	9.6	218	2.13	7.18	116.6	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns
6/4/2010		ND	ND	ND	ND	ND	ns	ns	28.3	2	ND	ND	ND							50.4	23.5	ND	5.3	ND	0.031	2.28	ND	ND	ns	4.53	18
6/4/2010 DUP		ND	ND	ND	ND	ND	ns	ns	63	2	ND	ND	ND							50.8	ns	ND	5.3	0.807	0.033	ns	ND	ND	ns	ns	18
7/24/2009	MOT_DW-39	ND	ND	ND	ND	ND	ns	ns	37.6	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns
7/24/2009	MOT_DW-40	ND	ND	ND	ND	ND	ns	ns	30.2	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns
12/2/2009		<0.5	<2.0	<0.5	<0.5	<0.5	26.9	7.3	34.2	2	<0.5	<0.5	<0.5	9.8	281	0.38	6.8	-28.2	3.18	77.9	36.0	0.86	8.7	3.44	0.505	7.19	<0.05	<0.05	3.10	5.25	47
4/7/2010		ND	ND	ND	ND	ND			25.7					9.6	196	0.22	6.98	-36.9	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns
7/24/2009	MOT_DW-41	ND	ND	ND	ND	ND	ns	ns	10.3	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns
12/2/2009		<0.5	<2.0	<0.5	<0.5	<0.5	9.8	0.6	10.4	<1.0	<0.5	<0.5	<0.5	10	163	1.2	7.3	-98	0.13	57.7	18.9	0.69	<3.0	0.143	0.082	4.03	<0.05	<0.05	3.81	5.80	17
4/7/2010		ND	ND	ND	ND	ND			10.2					10.2	158	0.4	7.33	-80	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns
9/23/2009	MOT_DW-42	ND	ND	ND	ND	ND	ns	ns	8.9	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns
12/2/2009		<0.5	<2.0	<0.5	<0.5	<0.5	1.2	15.8	17	2	<0.5	<0.5	<0.5	10	523	1.3	5.9	184	0.02	33.4	46.8	2.9	94	0.635	0.213	4.94	9.5	<0.05	5.10	39.2	29
4/7/2010		ND	ND	ND	ND	ND	ns	ns	4.4	ns	ns	ns	ns	9.46	180	6.32	5.96	239.1	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns
4/6/2010	MOT_DW-73	ND	ND	ND	ND	ND	ns	ns	81.4	ns	ns	ns	ns	10.1	178	6.9	6.3	198	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns
6/28/2010		ND	ND	ND	ND	ND	ns	ns	94.1	1	ND	ND	ND	13	189	5.9	7.7	221	ns	26.9	15.7	ND	21	ND	ND	2.46	1.5	ND	ns	11.5	17
4/6/2010	MOT_DW-74	N/D	N/D	N/D	N/D	N/D	ns	ns	N/D	ns	ns	ns	ns	9.9	222	0.7	7.5	118	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns
4/6/2010	MOT_DW-27A	ND	ND	ND	ND	ND	ns	ns	1.8	ns	ns	ns	ns	8.9	798	5.66	6.3	168.5	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns
4/6/2010	MOT_DW-51	ND	ND	ND	ND	ND	ns	ns	3.5	ns	ns	ns	ns	8.9	625	8.85	6.55	137.9	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns
4/7/2010	MOT_DW-83	ND	ND	ND	ND	ND	ns	ns	1.2	ns	ns	ns	ns	10.5	230	0.33	8.07	-144.1	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns
4/7/2010	MOT_DW-78	ND	ND	ND	ND	ND	ns	ns	6.4	ns	ns	ns	ns	9.87	250	0.49	7.96	-110.9	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns
4/6/2010	MOT_DW-76	ND	ND	ND	ND	ND	ns	ns	ND	ns	ns	ns	ns	8.8	144	7.6	6.3	199	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns
4/6/2010	MOT_DW-75	ND	ND	3.1	ND	ND	ns	ns	ND	ns	ns	ns	ns	9.7	277	2.4	7.1	160	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns
4/6/2010	MOT_DW-81	ND	ND	ND	ND	ND	ns	ns	ND	ns	ns	ns	ns	9.4	576	6.8	7.2	5.7	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns
4/6/2010	MOT_DW-80	ND	ND	ND	ND	ND	ns	ns	ND	ns	ns	ns	ns	10	211	0.6	7.5	34	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns
4/6/2010	MOT_DW-79	ND	ND	ND	ND	ND	ns	ns	ND	ns	ns	ns	ns	7.3	596	9.7	6.4	182	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns
4/6/2010	MOT_DW-77	ND	ND	ND	ND	ND	ns	ns	ND	ns	ns	ns	ns	8.4	262	7.2	5.7	215	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns
4/7/2010	MOT_DW-82	ND	ND	ND	ND	ND	ns	ns	ND	ns	ns	ns	ns	9	327	9.6	6.6	170	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns
6/25/2010	MOT_DW-94	ND	ND	ND	ND	ND	ns	ns	ND	9	ND	ND	ND	14	185	7	7.4	240	ns	16.8	12.8	ND	34	ND	ND	1.8	0.97	ND	ns	15.6	9.1
6/25/2010	MOT_DW-98	ND	ND	ND	ND	ND	ns	ns	ND	18	ND	ND	ND	12	325	3.1	7.6	-20	ns	90.9	42.6	ND	32	0.118	0.239	6.38	ND	ND	ns	9.32	16
6/25/2010	MOT_DW-92	ND	ND	0.7	ND	ND	ns	ns	8.2	45	ND	ND	ND	14	349	2.1	7.4	-4	ns	94.3	50.7	ND	33	0.155	0.09	4.28	0.27	0.05	ns	7.9	21
6/4/2010	MOT_DW-97	ND	ND	ND	ND	ND	ns	ns	ND	2	ND	ND	ND						ns	59.7	113	ND	290	2.95	1.1	20.6	ND	ND	ns	34.7	11
6/25/2010		ND	ND	ND	ND	ND	ns	ns	ND	3	ND	ND	ND	13	1158	2	7	33	ns	57.9	117	ND	310	2.55	1.13	21.4	ND	ND	ns	43	12
6/28/2010	MOT_DW-93	ND	ND	ND	ND	ND	ns	ns	ND	16	ND	ND	ND	14	333	1.6	7.3	-6	ns	75.5	39.9	ND	43	0.091	0.094	7	ND	ND	ns	7.62	16
6/28/2010	MOT_DW-91	ND	ND	ND	ND	ND	ns	ns	ND	4	ND	3.1	ND	15	650	2.1	7.3	107	ns	51.8	50	0.55	150	ND	0.102	8.9	0.35	ND	ns	42.9	14
6/28/2010	MOT_DW-99	ND	ND	ND	ND	ND	ns	ns	ND	126	ND	ND	ND	11	403	2.1	7.3	107	ns	89.1	51.6	ND	43	ND	ND	9.1	1.2	ND	ns	10.1	28
6/28/2010	MOT_DW-100	ND	ND	ND	ND	ND	ns	ns	ND	74	ND	ND	ND	11	286	2.6	7.6	72	ns	85.7	40	ND	9.2	ND	ND	4.77	3.2	ND	ns	6.28	24
7/2/2010	MOT_DW-96	ND	ND	ND	ND	ND	ns	ns	1.1	167	ND	ND	ND	11	437	1	7.2	42	ns	113	64.5	ND	44	ND	0.426	3.87	1.6	ND	ns	16.6	38

ND = Not Detected ns = Not Sampled

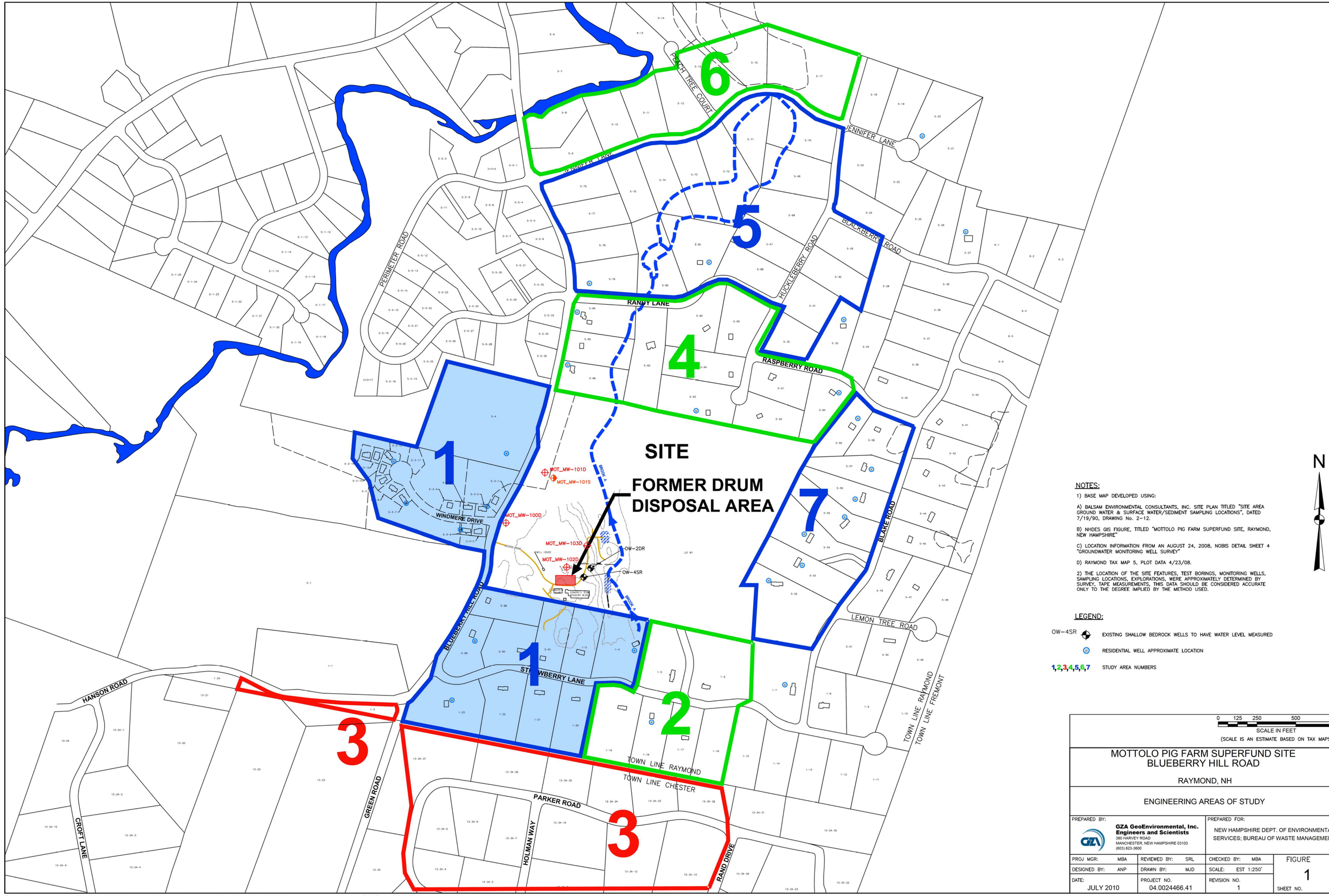
Notes:

1) Duplicate samples were collected at 31-33 Blueberry Hill Rd, 1 Windmere, 19 Windmere, and 4 Strawberry Ln during the December sampling round. The value of the original sample is reported in the table.

2) The concentration of Arsenic V at each residence was determined by subtracting the Arsenic III concentration, or Filtered Arsenic, from the Total Arsenic concentration.

3) Chloromethane was likely introduced via laboratory methods.

FIGURES



NOTES:

1) BASE MAP DEVELOPED USING:

A) BALSAM ENVIRONMENTAL CONSULTANTS, INC. SITE PLAN TITLED "SITE AREA GROUND WATER & SURFACE WATER/SEDIMENT SAMPLING LOCATIONS", DATED 7/19/90, DRAWING No. 2–12.

B) NHDES GIS FIGURE, TITLED "MOTTOLO PIG FARM SUPERFUND SITE, RAYMOND, NEW HAMPSHIRE"

C) LOCATION INFORMATION FROM AN AUGUST 24, 2008, NOBIS DETAIL SHEET 4 "GROUNDWATER MONITORING WELL SURVEY"

D) RAYMOND TAX MAP 5, PLOT DATA 4/23/08.

2) THE LOCATION OF THE SITE FEATURES, TEST BORINGS, MONITORING WELLS, SAMPLING LOCATIONS, EXPLORATIONS, WERE APPROXIMATELY DETERMINED BY SURVEY, TAPE MEASUREMENTS, THIS DATA SHOULD BE CONSIDERED ACCURATE ONLY TO THE DEGREE IMPLIED BY THE METHOD USED.

LEGEND:

OW–4SR — EXISTING SHALLOW BEDROCK WELLS TO HAVE WATER LEVEL MEASURED

W — RESIDENTIAL WELL APPROXIMATE LOCATION

1,2,3,4,5,6,7 — STUDY AREA NUMBERS

0 125 250 500 750
SCALE IN FEET
(SCALE IS AN ESTIMATE BASED ON TAX MAPS)

MOTTOLO PIG FARM SUPERFUND SITE
BLUEBERRY HILL ROAD
RAYMOND, NH

ENGINEERING AREAS OF STUDY

PREPARED BY:
GZA GeoEnvironmental, Inc.
Engineers and Scientists
380 HARVEY ROAD
MANCHESTER, NEW HAMPSHIRE 03103
(603) 623-3600

PREPARED FOR:
NEW HAMPSHIRE DEPT. OF ENVIRONMENTAL SERVICES; BUREAU OF WASTE MANAGEMENT

PROJ MGR: MBA	REVIEWED BY: SRL	CHECKED BY: MBA	FIGURE 1
DESIGNED BY: ANP	DRAWN BY: MJD	SCALE: EST 1:250'	
DATE: JULY 2010	PROJECT NO. 04.0024466.41	REVISION NO. 1	SHEET NO.

SITE

FORMER DRUM DISPOSAL AREA

JUNE 09	JULY 09	SEPT 09	DEC 09	APRIL 10	JUNE 10
4.9	5.9	3.7	6.4	7.4	3.7

JUNE 09	JULY 09	SEPT 09	DEC 09	APRIL 10	JUNE 10
2.1	1.5	1.8	1.6	2.3	4

JUNE 09	JULY 09	SEPT 09	DEC 09	APRIL 10	JUNE 10
5.1	1.9	3.1	3.1	ND	0.9

JULY 10	JUNE 10
0.4	ND

MOT_MW-101D

MOT_MW-101S

SEPT 09	DEC 09	APRIL 10	JUNE 10
3.3	1.4	2.3	1.4

MAY 10	JUNE 10
22	117

MOT_MW-100D

DEC 09	MAY 10
ND	ND

MOT_MW-102S

MOT_MW-102D

JULY 09	DEC 09	APRIL 10	JUNE 10
ND	0.7	1.2	0.6

APRIL 10	JUNE 10
0.6	0.9

APRIL 10	JUNE 10
0.8	ND

DEC 09	JUNE 10
0.2	ND

DEC 09	MAY 10
41	32

AUG 09	MAY 10
119	ND

OW-2DR

MAY 10
ND

OW-4SR

MARCH 09	JUNE 09	SEPT 09	DEC 09	APRIL 10
0.5	0.4	ND	ND	ND

SEPT 09
0.4

PEACH TREE COURT
JENNIFER LANE
PERIMETER ROAD
RANDY LANE
HUCKLEBERRY ROAD
BLACKBERRY ROAD
RASPBERRY ROAD
BLAKE ROAD
LEMON TREE ROAD
BLUEBERRY HILL ROAD
STRAWBERRY LANE
HANSON ROAD
TOWN LINE RAYMOND
TOWN LINE CHESTER
TOWN LINE RAYMOND
TOWN LINE FREMONT
GREEN ROAD
CROFT LANE
HOLMAN WAY
PARKER ROAD
WINDMERE DRIVE
BROOK A
BROOK B
ACCESS ROAD
CONCRETE SLAB
CONCRETE BLOCK

NOTES:

1) BASE MAP DEVELOPED USING:

A) BALSAM ENVIRONMENTAL CONSULTANTS, INC. SITE PLAN TITLED "SITE AREA GROUND WATER & SURFACE WATER/SEDIMENT SAMPLING LOCATIONS", DATED 7/19/90, DRAWING No. 2-12.

B) NHDES GIS FIGURE, TITLED "MOTTOLO PIG FARM SUPERFUND SITE, RAYMOND, NEW HAMPSHIRE"

C) LOCATION INFORMATION FROM AN AUGUST 24, 2008, NOBIS DETAIL SHEET 4 "GROUNDWATER MONITORING WELL SURVEY"

D) RAYMOND TAX MAP 5, PLOT DATA 4/23/08.

2) THE LOCATION OF THE SITE FEATURES, TEST BORINGS, MONITORING WELLS, SAMPLING LOCATIONS, EXPLORATIONS, WERE APPROXIMATELY DETERMINED BY SURVEY, TAPE MEASUREMENTS, THIS DATA SHOULD BE CONSIDERED ACCURATE ONLY TO THE DEGREE IMPLIED BY THE METHOD USED.

N

LEGEND:

- NEW OVERBURDEN ON-SITE WELL
- NEW DEEP BEDROCK ON-SITE WELLS
- OW-4SR — EXISTING SHALLOW BEDROCK WELLS TO HAVE WATER LEVEL MEASURED
- RESIDENTIAL WELL APPROXIMATE LOCATION
- JULY 1.5 — TCE CONCENTRATIONS IN µg/L
- TCE HAS BEEN/IS DETECTED AT THE PROPERTY BUT NOT ABOVE RDL (REPORTING DETECTION LIMIT OF 0.5)
- TCE CONCENTRATION AT THE PROPERTY HAS BEEN/IS ABOVE THE AGQS (5µg/L)
- TCE HAS BEEN/IS DETECTED AT THE PROPERTY BUT NOT ABOVE AGQS, BUT ABOVE RDL (0.5 PPB)
- TCE HAS NOT BEEN DETECTED AT THE PROPERTY. THE DETECTION LIMIT FOR TCE UNDER EPA ANALYTICAL METHOD 524 IS 0.500µG/L

0 125 250 500 750
SCALE IN FEET
(SCALE IS AN ESTIMATE BASED ON TAX MAPS)

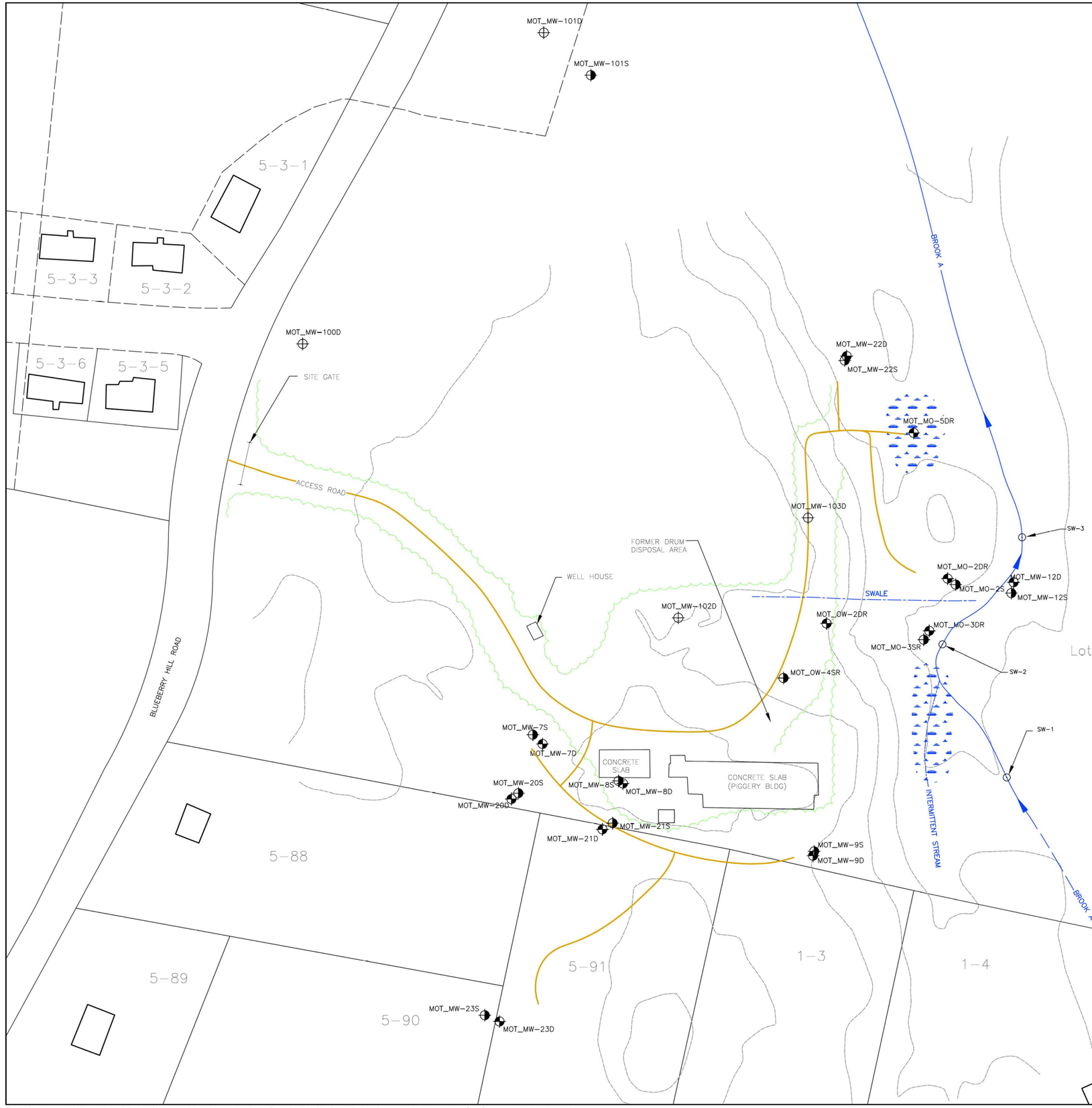
MOTTOLO PIG FARM SUPERFUND SITE
BLUEBERRY HILL ROAD
RAYMOND, NH

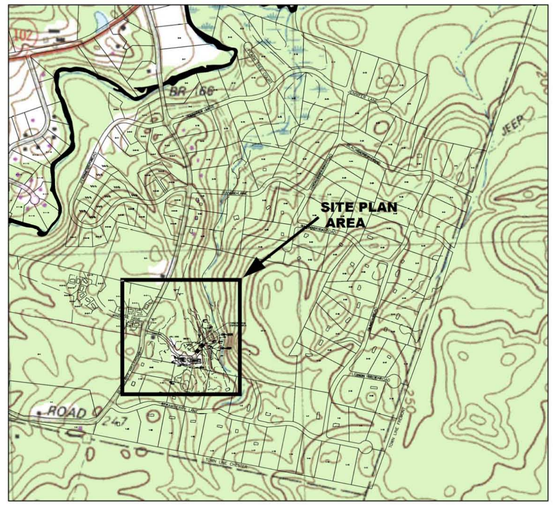
TCE CONCENTRATIONS SUMMARY FOR ALL 2009/2010 SAMPLING EVENTS

PREPARED BY:
GZA GeoEnvironmental, Inc.
Engineers and Scientists
380 HARVEY ROAD
MANCHESTER, NEW HAMPSHIRE 03103
(603) 623-3600

PREPARED FOR:
NEW HAMPSHIRE DEPT. OF ENVIRONMENTAL SERVICES; BUREAU OF WASTE MANAGEMENT

PROJ MGR: MBA	REVIEWED BY: SRL	CHECKED BY: MBA	FIGURE
DESIGNED BY: ANP	DRAWN BY: PJH	SCALE: EST 1:250'	3
DATE: JULY 2010	PROJECT NO. 04.0024466.41	REVISION NO. 2	SHEET NO.





LOCUS PLAN

SCALE: 1" = 800'

NOTES:

1) BASE MAP DEVELOPED USING:

A) BALSAM ENVIRONMENTAL CONSULTANTS, INC. SITE PLAN TITLED "SITE AREA GROUND WATER & SURFACE WATER/SEDIMENT SAMPLING LOCATIONS", DATED 7/19/90, DRAWING No. 2-12.

B) NHDES GIS FIGURE, TITLED "MOTTOLO PIG FARM SUPERFUND SITE, RAYMOND, NEW HAMPSHIRE"

C) LOCATION INFORMATION FROM AN AUGUST 24, 2008, NOBIS DETAIL SHEET 4 "GROUNDWATER MONITORING WELL SURVEY"

D) RAYMOND TAX MAP 5, PLOT DATA 4/23/08.

2) THE LOCATION OF THE SITE FEATURES, TEST BORINGS, MONITORING WELLS, SAMPLING LOCATIONS, EXPLORATIONS, WERE APPROXIMATELY DETERMINED BY SURVEY, TAPE MEASUREMENTS, THIS DATA SHOULD BE CONSIDERED ACCURATE ONLY TO THE DEGREE IMPLIED BY THE METHOD USED.

LEGEND:

- OVERBURDEN MONITORING WELL
- SHALLOW BEDROCK WELL
- DEEP BEDROCK WELL
- SURFACE WATER MONITORING LOCATION
- ESTIMATED TREELINE
- VIABLE WETLAND AREAS
- ACCESS PATHS/ROADS
- SWALE

N

0 25' 50' 100' 150'

SCALE IN FEET

(SCALE IS AN ESTIMATE BASED ON TAX MAPS)

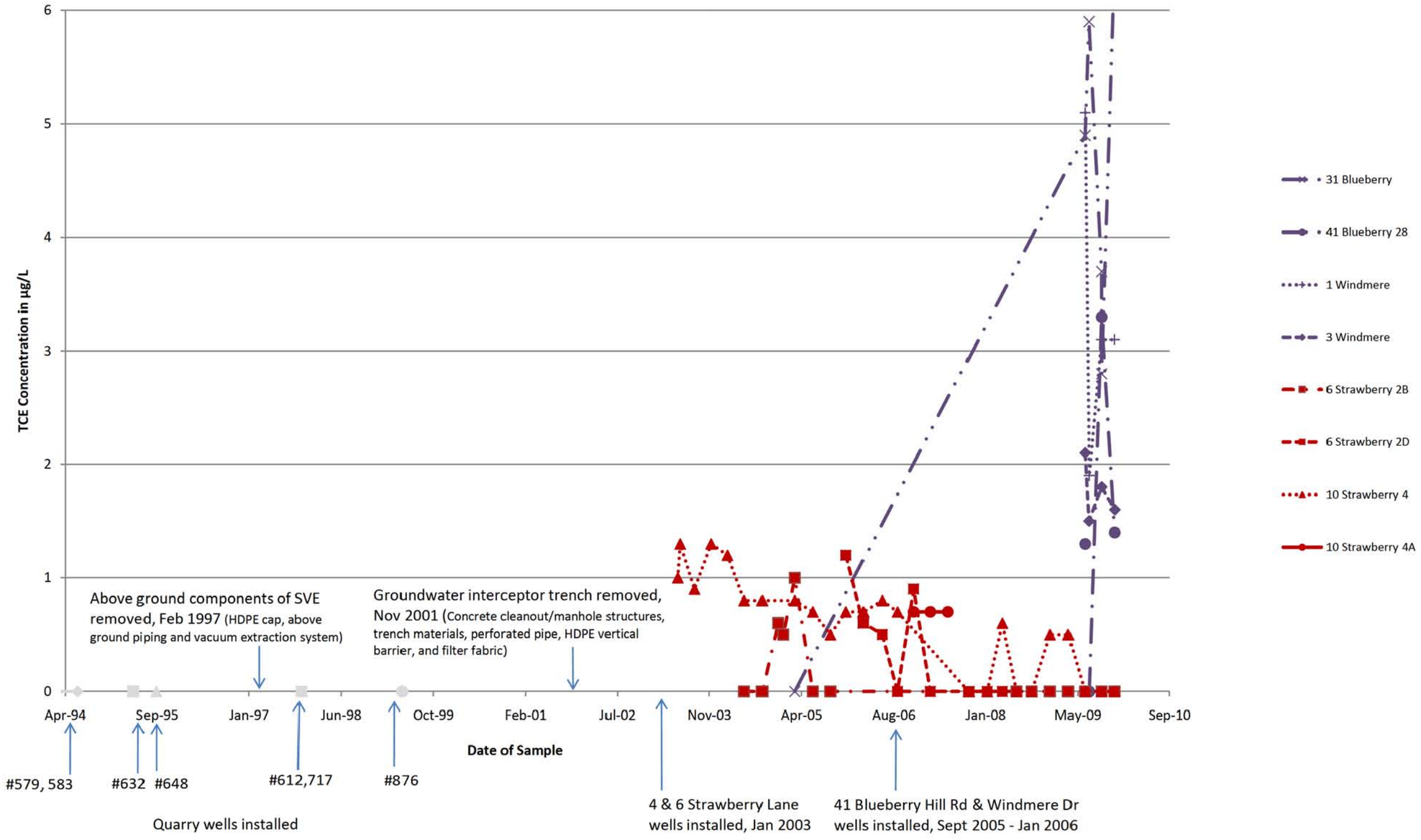
MOTTOLO PIG FARM SUPERFUND SITE
BLUEBERRY HILL ROAD

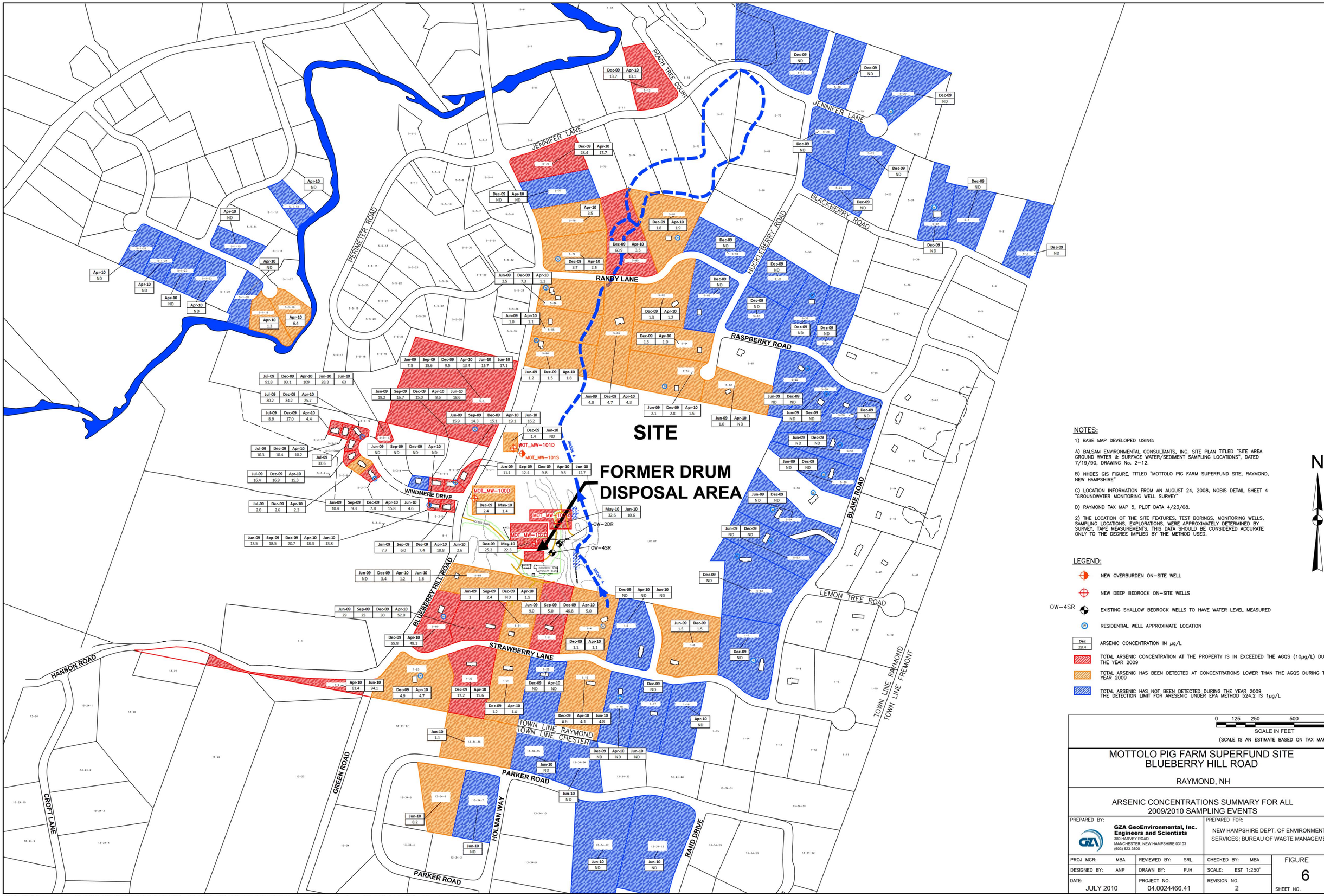
RAYMOND, NH

LOCUS AND SITE PLAN

PREPARED BY: GZA GeoEnvironmental, Inc. Engineers and Scientists, 380 HARVEY ROAD, MANCHESTER, NEW HAMPSHIRE 03103, (603) 623-3600		PREPARED FOR: NEW HAMPSHIRE DEPT. OF ENVIRONMENTAL SERVICES; BUREAU OF WASTE MANAGEMENT	
PROJ MGR: MBA	REVIEWED BY: SRL	CHECKED BY: MBA	FIGURE 4
DESIGNED BY: SGL	DRAWN BY: PJH	SCALE: EST 1:50'	
DATE: JULY 2010	PROJECT NO. 04.0024466.41	REVISION NO. 2	SHEET NO.

FIGURE 5 -- Historical Residential TCE Concentrations
AGQS = 5 µg/L





NOTES:

1) BASE MAP DEVELOPED USING:

A) BALSAM ENVIRONMENTAL CONSULTANTS, INC. SITE PLAN TITLED "SITE AREA GROUND WATER & SURFACE WATER/SEDIMENT SAMPLING LOCATIONS", DATED 7/19/90, DRAWING No. 2-12.

B) NHDES GIS FIGURE, TITLED "MOTTOLO PIG FARM SUPERFUND SITE, RAYMOND, NEW HAMPSHIRE"

C) LOCATION INFORMATION FROM AN AUGUST 24, 2008, NOBIS DETAIL SHEET 4 "GROUNDWATER MONITORING WELL SURVEY"

D) RAYMOND TAX MAP 5, PLOT DATA 4/23/08.

2) THE LOCATION OF THE SITE FEATURES, TEST BORINGS, MONITORING WELLS, SAMPLING LOCATIONS, EXPLORATIONS, WERE APPROXIMATELY DETERMINED BY SURVEY, TAPE MEASUREMENTS, THIS DATA SHOULD BE CONSIDERED ACCURATE ONLY TO THE DEGREE IMPLIED BY THE METHOD USED.

N

LEGEND:

- NEW OVERBURDEN ON-SITE WELL
- NEW DEEP BEDROCK ON-SITE WELLS
- OW-4SR — EXISTING SHALLOW BEDROCK WELLS TO HAVE WATER LEVEL MEASURED
- W — RESIDENTIAL WELL APPROXIMATE LOCATION
- Dec 28.4 — ARSENIC CONCENTRATION IN µg/L
- TOTAL ARSENIC CONCENTRATION AT THE PROPERTY IS IN EXCEEDED THE AGQS (10µg/L) DURING THE YEAR 2009
- TOTAL ARSENIC HAS BEEN DETECTED AT CONCENTRATIONS LOWER THAN THE AGQS DURING THE YEAR 2009
- TOTAL ARSENIC HAS NOT BEEN DETECTED DURING THE YEAR 2009 THE DETECTION LIMIT FOR ARESENIC UNDER EPA METHOD 524.2 IS 1µg/L

0 125 250 500 750
SCALE IN FEET
(SCALE IS AN ESTIMATE BASED ON TAX MAPS)

MOTTOLO PIG FARM SUPERFUND SITE
BLUEBERRY HILL ROAD
RAYMOND, NH

ARSENIC CONCENTRATIONS SUMMARY FOR ALL 2009/2010 SAMPLING EVENTS

PREPARED BY:
GZA GeoEnvironmental, Inc.
Engineers and Scientists
380 HARVEY ROAD
MANCHESTER, NEW HAMPSHIRE 03103
(603) 623-3600

PREPARED FOR:
NEW HAMPSHIRE DEPT. OF ENVIRONMENTAL SERVICES; BUREAU OF WASTE MANAGEMENT

PROJ MGR: MBA	REVIEWED BY: SRL	CHECKED BY: MBA	FIGURE 6
DESIGNED BY: ANP	DRAWN BY: PJH	SCALE: EST 1:250'	
DATE: JULY 2010	PROJECT NO. 04.0024466.41	REVISION NO. 2	SHEET NO.

APPENDIX A

REMEDIAL ALTERNATIVE ENGINEERING COST ANALYSIS

GZA
GeoEnvironmental, Inc.

Engineers and
Scientists

July 23, 2010
File No. 04.0024466.41

Mr. Andrew Hoffman, P.E.
New Hampshire Department of Environmental Services
Waste Management Division
29 Hazen Drive
P.O. Box 95
Concord, New Hampshire 03302-0095

Re: Feasibility Cost Estimates for Four Alternative Remedial Action Scenarios
Mottolo Pig Farm Superfund Site
Blueberry Hill Road; NHDES Site # 198704094
Project RSN # 2032
Raymond, New Hampshire

380 Harvey Road
Manchester
New Hampshire
03103-3347
603-623-3600
FAX 603-624-9463
www.gza.com

Dear Drew:

Below is a brief summary of the basis for the cost estimating relative to providing potable water to the Mottolo Pig Farm Superfund Area which was performed by Wright-Pierce, Inc. (Wright-Pierce). The assumptions used to generate the basis of estimating came from the Scope of Work in the Request for Bid and various meetings between Wright-Pierce, GZA GeoEnvironmental, Inc. (GZA), New Hampshire Department of Environmental Services (NHDES), and United States Environmental Protection Agency (EPA) over several weeks. In general, the unit costs for constructing the project(s) were from actual unit prices Wright-Pierce has received for similar projects and new costs received from vendors. The July 2000 EPA publication entitled: A Guide to Developing and Documenting Cost Estimates During the Feasibility Study was used as the guidance document for the cost estimating. In accordance with this guide, Wright-Pierce used a 7% discount rate. By using a 7% discount rate, alternatives with the majority of their costs occurring during initial construction (as opposed to future costs) show a higher present value. If a lower discount rate had been used projects with future costs would have a relatively higher present value.

- **Alternative GW-1** is the No Action Alternative. It is included as a baseline in the Focused Feasibility Study (FFS) against which the other remedial alternatives can be compared. The No Action Alternative costs consist of performing residential well sampling to monitor the contamination plume off site as part of the previous Record of Decision for the Site.

- **Alternative GW-2** consists of extending the existing municipal water supply distribution system water main from Route 102 to various designated sites affected within the superfund site. The six sites are as outlined by GZA in preparation of these estimates.

  Alternative GW-2 entails a new 12-inch D.I. (ductile iron) water main from the existing 12-inch water main tie in point in Town along Route 102 and Blueberry Hill Road to the intersection with Windmere Drive. The remaining pipes through the service areas are 8-inch D.I. with copper service connections to each residence, built to Town of Raymond (Town), NHDES Standards, to allow for ownership by the Town. Each residence will receive interior plumbing modifications to allow connection from house plumbing to

municipal piping, and the installation of water meters for individual metering of water usage to each residence. According to the Town of Raymond Standards, fire hydrants are installed every 1,000± feet with isolation valves in the mainline at each hydrant.

- **Alternative GW-3** involves installation and maintenance of whole house treatment systems to residences located within the designated site areas 1-4. Treatment consists of units for volatile organic compounds (VOCs), arsenic, radon, and water softeners. All houses will receive VOC and arsenic treatment systems. Radon treatment will be provided to three homes in Area 1, two homes in Area 2, three homes in Area 3, and four homes in Area 4. Water softener systems will be provided to 50% of homes in each Areas 1 through 4, and backwash filter systems to 10% of homes in Areas 1 through 4. Cost data was provided by SecondWind Water Systems in Manchester, New Hampshire.

- **Alternative GW-4** entails the purchase of a 20-acre ± parcel of land to the north of the superfund site and construction of a private community well and water treatment plant, along with a distribution system from the treatment plant to the affected residences, and interior plumbing modifications to allow connection from each residence to the community system. The scope consists of two gravel-packed wells piped to a treatment building. The treatment consists of iron and manganese removal using high filtration, aeration tanks for radon removal and disinfection with sodium hypochlorite (chlorine). Also included is associated piping, instrumentation, pumps, and controls as necessary for a functioning treatment system. Although this alternative was found not to be cost effective, it has been included in the cost documentation.

ANNUAL OPERATION AND MAINTENANCE COSTS

Annual operation and maintenance costs for Alternative GW-2 includes the purchase of water from the Town. To determine the actual expected use of water per residence, Wright-Pierce used 200 gallons per day (GPD). This figure was provided to us by the Town of Raymond Public Works Superintendent. Wright-Pierce used this 200 GPD per residence for figuring the cost of water as compared to NHDES design guidelines which call for 450 GPD for a three bedroom home. Wright-Pierce found 450 GPD to be suitable for design of infrastructure, but feels the 200 GPD is more appropriate for actual water use and associated cost of water per household.

For Alternative GW-3, Wright-Pierce assumed all operation and maintenance work will be performed by a private contractor experienced in this type of operation.

GROUNDWATER MONITORING

Groundwater monitoring of residential wells and reporting costs are included in the alternatives for the anticipated remedial time period of 30 years. Quarterly off-site monitoring of residential wells is anticipated for the first five years, and once yearly for the remaining 25 years. No costs are included in any of the alternatives for monitoring of onsite natural attenuation as it has been initiated as part of the previous Record of Decision for the Site.

GZA greatly appreciates the opportunity to be of service to the NHDES on this project. If you have questions or comments, please do not hesitate to contact Mike Asselin at 232-8739.

Very truly yours,

GZA GEOENVIRONMENTAL, INC.

Michael B. Asselin
Senior Project Manager

Steven R. Lamb, P.G., C.G.W.P.
Principal

MBA/SRL:tmd
p:\04jobs\0024400s\04.0024466.00\04.0024466.27 - mottolo\fs work\ffs document\final ffs\appendix a\final 04.24466.41 cost ltr 072310.docx

Attachment: Wright-Pierce Costing Study

PRESENT VALUE SUMMARY SHEET

Name: Engineering Costing Analysis for Focused Feasibility Study - Mottolo Superfund Site

Location: Raymond, NH
Phase: Feasibility Study
Base Year Date: 2010
Date: 6/22/10

SITE	GW-1-No Action	GW-2-Extend Public Water Supply	GW-3-Provide Whole House Treatment	GW-4-Provide Community Well
1	$1,854,000	$4,623,000	$3,744,000	$6,971,000
2	$1,854,000	_	$2,376,000	_
3	$1,854,000	_	$2,892,000	_
4	$1,854,000	_	$2,777,000	_
1, 2	$1,854,000	$4,719,000	$4,377,000	$7,039,000
1, 4	$1,854,000	$5,020,000	$4,751,000	$7,401,000
1, 2, 3	$1,854,000	$5,738,000	$5,208,000	$7,498,000
1, 2, 4	$1,854,000	$5,225,000	$5,083,000	$7,490,000
1, 2, 3, 4	$1,854,000	$6,314,000	$6,064,000	$8,462,000
1, 2, 4, 5	$1,854,000	$5,786,000	_	$7,889,000
1, 2, 3, 4, 5	$1,854,000	$6,856,000	_	$8,846,000
1, 2, 4, 5, 6	$1,854,000	$5,863,000	_	$7,961,000
1, 2, 3, 4, 5, 6	$1,854,000	$6,907,000	_	$8,919,000

*Cost estimates are rounded up to the nearest thousand
*Exact cost estimates can be found on the area specific present value analysis tables

PRESENT VALUE ANALYSIS

Alternative: GW-1-No Action Alternative

Name: Engineering Costing Analysis for Focused Feasibility Study - Mottolo Superfund Site in Raymond, NH

Site: Area 1 Location: Raymond, NH Phase: Feasibility Study Base Year Date: 2010 Date: 6/17/10	No Action Alternative (consists of residential well sampling)

Year	Capital Cost	Periodic Cost	Total Cost	Discount Factor (7%)	Present Value
0	$0	$0	$0	1.000	$0
1	$0	$300,000	$300,000	0.935	$280,500
2	$0	$300,000	$300,000	0.873	$261,900
3	$0	$300,000	$300,000	0.816	$244,800
4	$0	$300,000	$300,000	0.763	$228,900
5	$0	$300,000	$300,000	0.713	$213,900
6	$0	$75,000	$75,000	0.666	$49,950
7	$0	$75,000	$75,000	0.623	$46,725
8	$0	$75,000	$75,000	0.582	$43,650
9	$0	$75,000	$75,000	0.544	$40,800
10	$0	$75,000	$75,000	0.508	$38,100
11	$0	$75,000	$75,000	0.475	$35,625
12	$0	$75,000	$75,000	0.444	$33,300
13	$0	$75,000	$75,000	0.415	$31,125
14	$0	$75,000	$75,000	0.388	$29,100
15	$0	$75,000	$75,000	0.362	$27,150
16	$0	$75,000	$75,000	0.339	$25,425
17	$0	$75,000	$75,000	0.317	$23,775
18	$0	$75,000	$75,000	0.296	$22,200
19	$0	$75,000	$75,000	0.277	$20,775
20	$0	$75,000	$75,000	0.258	$19,350
21	$0	$75,000	$75,000	0.242	$18,150
22	$0	$75,000	$75,000	0.226	$16,950
23	$0	$75,000	$75,000	0.211	$15,825
24	$0	$75,000	$75,000	0.197	$14,775
25	$0	$75,000	$75,000	0.184	$13,800
26	$0	$75,000	$75,000	0.172	$12,900
27	$0	$75,000	$75,000	0.161	$12,075
28	$0	$75,000	$75,000	0.15	$11,250
29	$0	$75,000	$75,000	0.141	$10,575
30	$0	$75,000	$75,000	0.131	$9,825
TOTAL					**$1,853,175**

PRESENT VALUE ANALYSIS

Alternative: GW-2- Extension of Public Water Supply

Name: Engineering Costing Analysis for Focused Feasibility Study - Mottolo Superfund Site in Raymond, NH

Site: Area 1 **Location: Raymond, NH** **Phase: Feasibility Study** **Base Year Date: 2010** **Date: 6/17/10**	**Description: Extend Public Water Supply**

Year	Capital Cost	Periodic Cost	Total Cost	Discount Factor (7%)	Present Value
0	$2,769,734	$0	$2,769,734	1.000	$2,769,734
1	$0	$300,000	$300,000	0.935	$280,500
2	$0	$300,000	$300,000	0.873	$261,900
3	$0	$300,000	$300,000	0.816	$244,800
4	$0	$300,000	$300,000	0.763	$228,900
5	$0	$300,000	$300,000	0.713	$213,900
6	$0	$75,000	$75,000	0.666	$49,950
7	$0	$75,000	$75,000	0.623	$46,725
8	$0	$75,000	$75,000	0.582	$43,650
9	$0	$75,000	$75,000	0.544	$40,800
10	$0	$75,000	$75,000	0.508	$38,100
11	$0	$75,000	$75,000	0.475	$35,625
12	$0	$75,000	$75,000	0.444	$33,300
13	$0	$75,000	$75,000	0.415	$31,125
14	$0	$75,000	$75,000	0.388	$29,100
15	$0	$75,000	$75,000	0.362	$27,150
16	$0	$75,000	$75,000	0.339	$25,425
17	$0	$75,000	$75,000	0.317	$23,775
18	$0	$75,000	$75,000	0.296	$22,200
19	$0	$75,000	$75,000	0.277	$20,775
20	$0	$75,000	$75,000	0.258	$19,350
21	$0	$75,000	$75,000	0.242	$18,150
22	$0	$75,000	$75,000	0.226	$16,950
23	$0	$75,000	$75,000	0.211	$15,825
24	$0	$75,000	$75,000	0.197	$14,775
25	$0	$75,000	$75,000	0.184	$13,800
26	$0	$75,000	$75,000	0.172	$12,900
27	$0	$75,000	$75,000	0.161	$12,075
28	$0	$75,000	$75,000	0.15	$11,250
29	$0	$75,000	$75,000	0.141	$10,575
30	$0	$75,000	$75,000	0.131	$9,825
TOTAL					**$4,622,909**

PRESENT VALUE ANALYSIS

Alternative: GW-3-Whole House Treatment Systems

Name: Engineering Costing Analysis for Focused Feasibility Study - Mottolo Superfund Site in Raymond, NH

Site: Area 1 **Location: Raymond, NH** **Phase: Feasibility Study** **Base Year Date: 2010** **Date: 6/17/10**	**Description: Provide Whole House Treatment**

Year	Capital Cost	Annual O&M Cost	Periodic Cost	Total Cost	Discount Factor (7%)	Present Value
0	$386,608	-	-	$386,608	1.000	$386,608
1	$0	$93,770	$337,250	$431,020	0.935	$403,004
2	$0	$93,770	$337,250	$431,020	0.873	$376,280
3	$0	$93,770	$337,250	$431,020	0.816	$351,712
4	$0	$93,770	$337,250	$431,020	0.763	$328,868
5	$0	$93,770	$337,250	$431,020	0.713	$307,317
6	$0	$93,770	$93,625	$187,395	0.666	$124,805
7	$0	$93,770	$93,625	$187,395	0.623	$116,747
8	$0	$93,770	$93,625	$187,395	0.582	$109,064
9	$0	$93,770	$93,625	$187,395	0.544	$101,943
10	$0	$93,770	$118,825	$212,595	0.508	$107,998
11	$0	$93,770	$93,625	$187,395	0.475	$89,013
12	$0	$93,770	$93,625	$187,395	0.444	$83,203
13	$0	$93,770	$93,625	$187,395	0.415	$77,769
14	$0	$93,770	$93,625	$187,395	0.388	$72,709
15	$0	$93,770	$93,625	$187,395	0.362	$67,837
16	$0	$93,770	$93,625	$187,395	0.339	$63,527
17	$0	$93,770	$93,625	$187,395	0.317	$59,404
18	$0	$93,770	$93,625	$187,395	0.296	$55,469
19	$0	$93,770	$93,625	$187,395	0.277	$51,908
20	$0	$93,770	$160,425	$254,195	0.258	$65,582
21	$0	$93,770	$93,625	$187,395	0.242	$45,350
22	$0	$93,770	$93,625	$187,395	0.226	$42,351
23	$0	$93,770	$93,625	$187,395	0.211	$39,540
24	$0	$93,770	$93,625	$187,395	0.197	$36,917
25	$0	$93,770	$93,625	$187,395	0.184	$34,481
26	$0	$93,770	$93,625	$187,395	0.172	$32,232
27	$0	$93,770	$93,625	$187,395	0.161	$30,171
28	$0	$93,770	$93,625	$187,395	0.15	$28,109
29	$0	$93,770	$93,625	$187,395	0.141	$26,423
30	$0	$93,770	$110,875	$204,645	0.131	$26,808
TOTAL						**$3,743,151**

PRESENT VALUE ANALYSIS

Alternative: GW-4-Installation of Community Well Public Water Supply

Name: Engineering Costing Analysis for Focused Feasibility Study - Mottolo Superfund Site in Raymond, NH

Site: Area 1
Location: Raymond, NH
Phase: Feasibility Study
Base Year Date: 2010
Date: 6/17/10

Description: Provide Community Well

Year	Capital Cost	Annual O&M Cost	Periodic Cost	Total Cost	Discount Factor (7%)	Present Value
0	$4,106,298	$0	$0	$4,106,298	1.000	$4,106,298
1	$0	$80,000	$300,000	$380,000	0.935	$355,300
2	$0	$80,000	$300,000	$380,000	0.873	$331,740
3	$0	$80,000	$300,000	$380,000	0.816	$310,080
4	$0	$80,000	$300,000	$380,000	0.763	$289,940
5	$0	$80,000	$300,000	$380,000	0.713	$270,940
6	$0	$80,000	$75,000	$155,000	0.666	$103,230
7	$0	$80,000	$75,000	$155,000	0.623	$96,565
8	$0	$80,000	$75,000	$155,000	0.582	$90,210
9	$0	$80,000	$75,000	$155,000	0.544	$84,320
10	$0	$80,000	$75,000	$155,000	0.508	$78,740
11	$0	$80,000	$75,000	$155,000	0.475	$73,625
12	$0	$80,000	$75,000	$155,000	0.444	$68,820
13	$0	$80,000	$75,000	$155,000	0.415	$64,325
14	$0	$80,000	$75,000	$155,000	0.388	$60,140
15	$0	$80,000	$75,000	$155,000	0.362	$56,110
16	$0	$80,000	$75,000	$155,000	0.339	$52,545
17	$0	$80,000	$75,000	$155,000	0.317	$49,135
18	$0	$80,000	$75,000	$155,000	0.296	$45,880
19	$0	$80,000	$75,000	$155,000	0.277	$42,935
20	$0	$80,000	$146,965	$226,965	0.258	$58,557
21	$0	$80,000	$75,000	$155,000	0.242	$37,510
22	$0	$80,000	$75,000	$155,000	0.226	$35,030
23	$0	$80,000	$75,000	$155,000	0.211	$32,705
24	$0	$80,000	$75,000	$155,000	0.197	$30,535
25	$0	$80,000	$75,000	$155,000	0.184	$28,520
26	$0	$80,000	$75,000	$155,000	0.172	$26,660
27	$0	$80,000	$75,000	$155,000	0.161	$24,955
28	$0	$80,000	$75,000	$155,000	0.15	$23,250
29	$0	$80,000	$75,000	$155,000	0.141	$21,855
30	$0	$80,000	$75,000	$155,000	0.131	$20,305
TOTAL						**$6,970,760**

PRESENT VALUE ANALYSIS

Alternative: GW-3-Whole House Treatment Systems

Name: Engineering Costing Analysis for Focused Feasibility Study - Mottolo Superfund Site in Raymond, NH

Site: Area 2 **Location: Raymond, NH** **Phase: Feasibility Study** **Base Year Date: 2010** **Date: 6/17/10**	**Description: Provide Whole House Treatment**

Year	Capital Cost	Annual O&M Cost	Periodic Cost	Total Cost	Discount Factor (7%)	Present Value
0	$126,002	-	-	$126,002	1.000	$126,002
1	$0	$24,705	$308,940	$333,645	0.935	$311,958
2	$0	$24,705	$308,940	$333,645	0.873	$291,272
3	$0	$24,705	$308,940	$333,645	0.816	$272,254
4	$0	$24,705	$308,940	$333,645	0.763	$254,571
5	$0	$24,705	$308,940	$333,645	0.713	$237,889
6	$0	$24,705	$79,470	$104,175	0.666	$69,381
7	$0	$24,705	$79,470	$104,175	0.623	$64,901
8	$0	$24,705	$79,470	$104,175	0.582	$60,630
9	$0	$24,705	$79,470	$104,175	0.544	$56,671
10	$0	$24,705	$96,270	$120,975	0.508	$61,455
11	$0	$24,705	$79,470	$104,175	0.475	$49,483
12	$0	$24,705	$79,470	$104,175	0.444	$46,254
13	$0	$24,705	$79,470	$104,175	0.415	$43,233
14	$0	$24,705	$79,470	$104,175	0.388	$40,420
15	$0	$24,705	$79,470	$104,175	0.362	$37,711
16	$0	$24,705	$79,470	$104,175	0.339	$35,315
17	$0	$24,705	$79,470	$104,175	0.317	$33,023
18	$0	$24,705	$79,470	$104,175	0.296	$30,836
19	$0	$24,705	$79,470	$104,175	0.277	$28,856
20	$0	$24,705	$105,870	$130,575	0.258	$33,688
21	$0	$24,705	$79,470	$104,175	0.242	$25,210
22	$0	$24,705	$79,470	$104,175	0.226	$23,544
23	$0	$24,705	$79,470	$104,175	0.211	$21,981
24	$0	$24,705	$79,470	$104,175	0.197	$20,522
25	$0	$24,705	$79,470	$104,175	0.184	$19,168
26	$0	$24,705	$79,470	$104,175	0.172	$17,918
27	$0	$24,705	$79,470	$104,175	0.161	$16,772
28	$0	$24,705	$79,470	$104,175	0.15	$15,626
29	$0	$24,705	$79,470	$104,175	0.141	$14,689
30	$0	$24,705	$84,220	$108,925	0.131	$14,269
TOTAL						**$2,375,504**

PRESENT VALUE ANALYSIS

Alternative: GW-3-Whole House Treatment Systems

Name: Engineering Costing Analysis for Focused Feasibility Study - Mottolo Superfund Site in Raymond, NH

Site: Area 3 **Location: Raymond, NH** **Phase: Feasibility Study** **Base Year Date: 2010** **Date: 6/17/10**	**Description: Provide Whole House Treatment**

Year	Capital Cost	Annual O&M Cost	Periodic Cost	Total Cost	Discount Factor (7%)	Present Value
0	$228,992	-	-	$228,992	1.000	$228,992
1	$0	$50,240	$319,370	$369,610	0.935	$345,585
2	$0	$50,240	$319,370	$369,610	0.873	$322,670
3	$0	$50,240	$319,370	$369,610	0.816	$301,602
4	$0	$50,240	$319,370	$369,610	0.763	$282,012
5	$0	$50,240	$319,370	$369,610	0.713	$263,532
6	$0	$50,240	$84,685	$134,925	0.666	$89,860
7	$0	$50,240	$84,685	$134,925	0.623	$84,058
8	$0	$50,240	$84,685	$134,925	0.582	$78,526
9	$0	$50,240	$84,685	$134,925	0.544	$73,399
10	$0	$50,240	$109,885	$160,125	0.508	$81,344
11	$0	$50,240	$84,685	$134,925	0.475	$64,089
12	$0	$50,240	$84,685	$134,925	0.444	$59,907
13	$0	$50,240	$84,685	$134,925	0.415	$55,994
14	$0	$50,240	$84,685	$134,925	0.388	$52,351
15	$0	$50,240	$84,685	$134,925	0.362	$48,843
16	$0	$50,240	$84,685	$134,925	0.339	$45,740
17	$0	$50,240	$84,685	$134,925	0.317	$42,771
18	$0	$50,240	$84,685	$134,925	0.296	$39,938
19	$0	$50,240	$84,685	$134,925	0.277	$37,374
20	$0	$50,240	$132,285	$182,525	0.258	$47,091
21	$0	$50,240	$84,685	$134,925	0.242	$32,652
22	$0	$50,240	$84,685	$134,925	0.226	$30,493
23	$0	$50,240	$84,685	$134,925	0.211	$28,469
24	$0	$50,240	$84,685	$134,925	0.197	$26,580
25	$0	$50,240	$84,685	$134,925	0.184	$24,826
26	$0	$50,240	$84,685	$134,925	0.172	$23,207
27	$0	$50,240	$84,685	$134,925	0.161	$21,723
28	$0	$50,240	$84,685	$134,925	0.15	$20,239
29	$0	$50,240	$84,685	$134,925	0.141	$19,024
30	$0	$50,240	$94,435	$144,675	0.131	$18,952
TOTAL						**$2,891,844**

PRESENT VALUE ANALYSIS

Alternative: GW-3-Whole House Treatment Systems

Name: Engineering Costing Analysis for Focused Feasibility Study - Mottolo Superfund Site in Raymond, NH

Site: Area 4 **Location: Raymond, NH** **Phase: Feasibility Study** **Base Year Date: 2010** **Date: 6/17/10**	**Description: Provide Whole House Treatment**

Year	Capital Cost	Annual O&M Cost	Periodic Cost	Total Cost	Discount Factor (7%)	Present Value
0	$211,025	-	-	$211,025	1.000	$211,025
1	$0	$43,965	$316,390	$360,355	0.935	$336,932
2	$0	$43,965	$316,390	$360,355	0.873	$314,590
3	$0	$43,965	$316,390	$360,355	0.816	$294,050
4	$0	$43,965	$316,390	$360,355	0.763	$274,951
5	$0	$43,965	$316,390	$360,355	0.713	$256,933
6	$0	$43,965	$83,195	$127,160	0.666	$84,689
7	$0	$43,965	$83,195	$127,160	0.623	$79,221
8	$0	$43,965	$83,195	$127,160	0.582	$74,007
9	$0	$43,965	$83,195	$127,160	0.544	$69,175
10	$0	$43,965	$116,795	$160,760	0.508	$81,666
11	$0	$43,965	$83,195	$127,160	0.475	$60,401
12	$0	$43,965	$83,195	$127,160	0.444	$56,459
13	$0	$43,965	$83,195	$127,160	0.415	$52,771
14	$0	$43,965	$83,195	$127,160	0.388	$49,338
15	$0	$43,965	$83,195	$127,160	0.362	$46,032
16	$0	$43,965	$83,195	$127,160	0.339	$43,107
17	$0	$43,965	$83,195	$127,160	0.317	$40,310
18	$0	$43,965	$83,195	$127,160	0.296	$37,639
19	$0	$43,965	$83,195	$127,160	0.277	$35,223
20	$0	$43,965	$135,995	$179,960	0.258	$46,430
21	$0	$43,965	$83,195	$127,160	0.242	$30,773
22	$0	$43,965	$83,195	$127,160	0.226	$28,738
23	$0	$43,965	$83,195	$127,160	0.211	$26,831
24	$0	$43,965	$83,195	$127,160	0.197	$25,051
25	$0	$43,965	$83,195	$127,160	0.184	$23,397
26	$0	$43,965	$83,195	$127,160	0.172	$21,872
27	$0	$43,965	$83,195	$127,160	0.161	$20,473
28	$0	$43,965	$83,195	$127,160	0.15	$19,074
29	$0	$43,965	$83,195	$127,160	0.141	$17,930
30	$0	$43,965	$92,195	$136,160	0.131	$17,837
TOTAL						**$2,776,923**

PRESENT VALUE ANALYSIS

Alternative: GW-1-No Action

Name: Engineering Costing Analysis for Focused Feasibility Study - Mottolo Superfund Site in Raymond, NH

Site: Areas 1 and 2 **Location: Raymond, NH** **Phase: Feasibility Study** **Base Year Date: 2010** **Date: 6/17/10**	**Description: No Action Alternative includes residential well sampling**

Year	Capital Cost	Periodic Cost	Total Cost	Discount Factor (7%)	Present Value
0	$0	$0	$0	1.000	$0
1	$0	$300,000	$300,000	0.935	$280,500
2	$0	$300,000	$300,000	0.873	$261,900
3	$0	$300,000	$300,000	0.816	$244,800
4	$0	$300,000	$300,000	0.763	$228,900
5	$0	$300,000	$300,000	0.713	$213,900
6	$0	$75,000	$75,000	0.666	$49,950
7	$0	$75,000	$75,000	0.623	$46,725
8	$0	$75,000	$75,000	0.582	$43,650
9	$0	$75,000	$75,000	0.544	$40,800
10	$0	$75,000	$75,000	0.508	$38,100
11	$0	$75,000	$75,000	0.475	$35,625
12	$0	$75,000	$75,000	0.444	$33,300
13	$0	$75,000	$75,000	0.415	$31,125
14	$0	$75,000	$75,000	0.388	$29,100
15	$0	$75,000	$75,000	0.362	$27,150
16	$0	$75,000	$75,000	0.339	$25,425
17	$0	$75,000	$75,000	0.317	$23,775
18	$0	$75,000	$75,000	0.296	$22,200
19	$0	$75,000	$75,000	0.277	$20,775
20	$0	$75,000	$75,000	0.258	$19,350
21	$0	$75,000	$75,000	0.242	$18,150
22	$0	$75,000	$75,000	0.226	$16,950
23	$0	$75,000	$75,000	0.211	$15,825
24	$0	$75,000	$75,000	0.197	$14,775
25	$0	$75,000	$75,000	0.184	$13,800
26	$0	$75,000	$75,000	0.172	$12,900
27	$0	$75,000	$75,000	0.161	$12,075
28	$0	$75,000	$75,000	0.15	$11,250
29	$0	$75,000	$75,000	0.141	$10,575
30	$0	$75,000	$75,000	0.131	$9,825
TOTAL					**$1,853,175**

PRESENT VALUE ANALYSIS

Alternative: GW-2-Extension of Public Water Supply

Name: Engineering Costing Analysis for Focused Feasibility Study - Mottolo Superfund Site in Raymond, NH

Site: Areas 1 and 2 **Location: Raymond, NH** **Phase: Feasibility Study** **Base Year Date: 2010** **Date: 6/22/10**	**Description: Extended Public Water Supply**

Year	Capital Cost	Periodic Cost	Total Cost	Discount Factor (7%)	Present Value
0	$2,865,142	$0	$2,865,142	1.000	$2,865,142
1	$0	$300,000	$300,000	0.935	$280,500
2	$0	$300,000	$300,000	0.873	$261,900
3	$0	$300,000	$300,000	0.816	$244,800
4	$0	$300,000	$300,000	0.763	$228,900
5	$0	$300,000	$300,000	0.713	$213,900
6	$0	$75,000	$75,000	0.666	$49,950
7	$0	$75,000	$75,000	0.623	$46,725
8	$0	$75,000	$75,000	0.582	$43,650
9	$0	$75,000	$75,000	0.544	$40,800
10	$0	$75,000	$75,000	0.508	$38,100
11	$0	$75,000	$75,000	0.475	$35,625
12	$0	$75,000	$75,000	0.444	$33,300
13	$0	$75,000	$75,000	0.415	$31,125
14	$0	$75,000	$75,000	0.388	$29,100
15	$0	$75,000	$75,000	0.362	$27,150
16	$0	$75,000	$75,000	0.339	$25,425
17	$0	$75,000	$75,000	0.317	$23,775
18	$0	$75,000	$75,000	0.296	$22,200
19	$0	$75,000	$75,000	0.277	$20,775
20	$0	$75,000	$75,000	0.258	$19,350
21	$0	$75,000	$75,000	0.242	$18,150
22	$0	$75,000	$75,000	0.226	$16,950
23	$0	$75,000	$75,000	0.211	$15,825
24	$0	$75,000	$75,000	0.197	$14,775
25	$0	$75,000	$75,000	0.184	$13,800
26	$0	$75,000	$75,000	0.172	$12,900
27	$0	$75,000	$75,000	0.161	$12,075
28	$0	$75,000	$75,000	0.15	$11,250
29	$0	$75,000	$75,000	0.141	$10,575
30	$0	$75,000	$75,000	0.131	$9,825
TOTAL					**$4,718,317**

PRESENT VALUE ANALYSIS

Alternative: GW-3-Whole House Treatment Systems

Name: Engineering Costing Analysis for Focused Feasibility Study - Mottolo Superfund Site in Raymond, NH

Site: Area 1 and 2
Location: Raymond, NH
Phase: Feasibility Study
Base Year Date: 2010
Date: 6/17/10

Description: Provide Whole House Treatment

Year	Capital Cost	Annual O&M Cost	Periodic Cost	Total Cost	Discount Factor (7%)	Present Value
0	$ 480,272	-	-	$480,272	1.000	$480,272
1	$0	$117,205	$346,190	$463,395	0.935	$433,274
2	$0	$117,205	$346,190	$463,395	0.873	$404,544
3	$0	$117,205	$346,190	$463,395	0.816	$378,130
4	$0	$117,205	$346,190	$463,395	0.763	$353,570
5	$0	$117,205	$346,190	$463,395	0.713	$330,401
6	$0	$117,205	$98,095	$215,300	0.666	$143,390
7	$0	$117,205	$98,095	$215,300	0.623	$134,132
8	$0	$117,205	$98,095	$215,300	0.582	$125,305
9	$0	$117,205	$98,095	$215,300	0.544	$117,123
10	$0	$117,205	$136,295	$573,500	0.508	$291,338
11	$0	$117,205	$98,095	$215,300	0.475	$102,268
12	$0	$117,205	$98,095	$215,300	0.444	$95,593
13	$0	$117,205	$98,095	$215,300	0.415	$89,350
14	$0	$117,205	$98,095	$215,300	0.388	$83,536
15	$0	$117,205	$98,095	$215,300	0.362	$77,939
16	$0	$117,205	$98,095	$215,300	0.339	$72,987
17	$0	$117,205	$98,095	$215,300	0.317	$68,250
18	$0	$117,205	$98,095	$215,300	0.296	$63,729
19	$0	$117,205	$98,095	$215,300	0.277	$59,638
20	$0	$117,205	$187,495	$304,700	0.258	$78,613
21	$0	$117,205	$98,095	$215,300	0.242	$52,103
22	$0	$117,205	$98,095	$215,300	0.226	$48,658
23	$0	$117,205	$98,095	$215,300	0.211	$45,428
24	$0	$117,205	$98,095	$215,300	0.197	$42,414
25	$0	$117,205	$98,095	$215,300	0.184	$39,615
26	$0	$117,205	$98,095	$215,300	0.172	$37,032
27	$0	$117,205	$98,095	$215,300	0.161	$34,663
28	$0	$117,205	$98,095	$215,300	0.15	$32,295
29	$0	$117,205	$98,095	$215,300	0.141	$30,357
30	$0	$117,205	$119,595	$236,800	0.131	$31,021
TOTAL						**$4,376,967**

PRESENT VALUE ANALYSIS

Alternative: GW-4-Installation of Community Well Public Water Supply System

Name: Engineering Costing Analysis for Focused Feasibility Study - Mottolo Superfund Site in Raymond, NH

Site: Areas 1 and 2 **Location: Raymond, NH** **Phase: Feasibility Study** **Base Year Date: 2010** **Date: 6/17/10**	**Description: Provide Community Well**

Year	Capital Cost	Annual O&M Cost	Periodic Cost	Total Cost	Discount Factor (7%)	Present Value
0	$4,174,969	$0	$0	$4,174,969	1.000	$4,174,969
1	$0	$80,000	$300,000	$380,000	0.935	$355,300
2	$0	$80,000	$300,000	$380,000	0.873	$331,740
3	$0	$80,000	$300,000	$380,000	0.816	$310,080
4	$0	$80,000	$300,000	$380,000	0.763	$289,940
5	$0	$80,000	$300,000	$380,000	0.713	$270,940
6	$0	$80,000	$75,000	$155,000	0.666	$103,230
7	$0	$80,000	$75,000	$155,000	0.623	$96,565
8	$0	$80,000	$75,000	$155,000	0.582	$90,210
9	$0	$80,000	$75,000	$155,000	0.544	$84,320
10	$0	$80,000	$75,000	$155,000	0.508	$78,740
11	$0	$80,000	$75,000	$155,000	0.475	$73,625
12	$0	$80,000	$75,000	$155,000	0.444	$68,820
13	$0	$80,000	$75,000	$155,000	0.415	$64,325
14	$0	$80,000	$75,000	$155,000	0.388	$60,140
15	$0	$80,000	$75,000	$155,000	0.362	$56,110
16	$0	$80,000	$75,000	$155,000	0.339	$52,545
17	$0	$80,000	$75,000	$155,000	0.317	$49,135
18	$0	$80,000	$75,000	$155,000	0.296	$45,880
19	$0	$80,000	$75,000	$155,000	0.277	$42,935
20	$0	$80,000	$146,965	$226,965	0.258	$58,557
21	$0	$80,000	$75,000	$155,000	0.242	$37,510
22	$0	$80,000	$75,000	$155,000	0.226	$35,030
23	$0	$80,000	$75,000	$155,000	0.211	$32,705
24	$0	$80,000	$75,000	$155,000	0.197	$30,535
25	$0	$80,000	$75,000	$155,000	0.184	$28,520
26	$0	$80,000	$75,000	$155,000	0.172	$26,660
27	$0	$80,000	$75,000	$155,000	0.161	$24,955
28	$0	$80,000	$75,000	$155,000	0.15	$23,250
29	$0	$80,000	$75,000	$155,000	0.141	$21,855
30	$0	$80,000	$75,000	$155,000	0.131	$20,305
TOTAL						**$7,039,431**

PRESENT VALUE ANALYSIS

Alternative: GW-1-No Action

Name: Engineering Costing Analysis for Focused Feasibility Study - Mottolo Superfund Site in Raymond, NH

Site: Areas 1 and 4 **Location: Raymond, NH** **Phase: Feasibility Study** **Base Year Date: 2010** **Date: 6/17/10**	**Description: No Action Alternative includes residential well sampling**

Year	Capital Cost	Periodic Cost	Total Cost	Discount Factor (7%)	Present Value
0	$0	$0	$0	1.000	$0
1	$0	$300,000	$300,000	0.935	$280,500
2	$0	$300,000	$300,000	0.873	$261,900
3	$0	$300,000	$300,000	0.816	$244,800
4	$0	$300,000	$300,000	0.763	$228,900
5	$0	$300,000	$300,000	0.713	$213,900
6	$0	$75,000	$75,000	0.666	$49,950
7	$0	$75,000	$75,000	0.623	$46,725
8	$0	$75,000	$75,000	0.582	$43,650
9	$0	$75,000	$75,000	0.544	$40,800
10	$0	$75,000	$75,000	0.508	$38,100
11	$0	$75,000	$75,000	0.475	$35,625
12	$0	$75,000	$75,000	0.444	$33,300
13	$0	$75,000	$75,000	0.415	$31,125
14	$0	$75,000	$75,000	0.388	$29,100
15	$0	$75,000	$75,000	0.362	$27,150
16	$0	$75,000	$75,000	0.339	$25,425
17	$0	$75,000	$75,000	0.317	$23,775
18	$0	$75,000	$75,000	0.296	$22,200
19	$0	$75,000	$75,000	0.277	$20,775
20	$0	$75,000	$75,000	0.258	$19,350
21	$0	$75,000	$75,000	0.242	$18,150
22	$0	$75,000	$75,000	0.226	$16,950
23	$0	$75,000	$75,000	0.211	$15,825
24	$0	$75,000	$75,000	0.197	$14,775
25	$0	$75,000	$75,000	0.184	$13,800
26	$0	$75,000	$75,000	0.172	$12,900
27	$0	$75,000	$75,000	0.161	$12,075
28	$0	$75,000	$75,000	0.15	$11,250
29	$0	$75,000	$75,000	0.141	$10,575
30	$0	$75,000	$75,000	0.131	$9,825
TOTAL					**$1,853,175**

PRESENT VALUE ANALYSIS

Alternative: GW-2-Extension of Public Water Supply

Name: Engineering Costing Analysis for Focused Feasibility Study - Mottolo Superfund Site in Raymond, NH

Site: Areas 1 and 4 **Location: Raymond, NH** **Phase: Feasibility Study** **Base Year Date: 2010** **Date: 6/17/10**	**Description: Extended Public Water Supply**

Year	Capital Cost	Periodic Cost	Total Cost	Discount Factor (7%)	Present Value
0	$3,166,358	$0	$3,166,358	1.000	$3,166,358
1	$0	$300,000	$300,000	0.935	$280,500
2	$0	$300,000	$300,000	0.873	$261,900
3	$0	$300,000	$300,000	0.816	$244,800
4	$0	$300,000	$300,000	0.763	$228,900
5	$0	$300,000	$300,000	0.713	$213,900
6	$0	$75,000	$75,000	0.666	$49,950
7	$0	$75,000	$75,000	0.623	$46,725
8	$0	$75,000	$75,000	0.582	$43,650
9	$0	$75,000	$75,000	0.544	$40,800
10	$0	$75,000	$75,000	0.508	$38,100
11	$0	$75,000	$75,000	0.475	$35,625
12	$0	$75,000	$75,000	0.444	$33,300
13	$0	$75,000	$75,000	0.415	$31,125
14	$0	$75,000	$75,000	0.388	$29,100
15	$0	$75,000	$75,000	0.362	$27,150
16	$0	$75,000	$75,000	0.339	$25,425
17	$0	$75,000	$75,000	0.317	$23,775
18	$0	$75,000	$75,000	0.296	$22,200
19	$0	$75,000	$75,000	0.277	$20,775
20	$0	$75,000	$75,000	0.258	$19,350
21	$0	$75,000	$75,000	0.242	$18,150
22	$0	$75,000	$75,000	0.226	$16,950
23	$0	$75,000	$75,000	0.211	$15,825
24	$0	$75,000	$75,000	0.197	$14,775
25	$0	$75,000	$75,000	0.184	$13,800
26	$0	$75,000	$75,000	0.172	$12,900
27	$0	$75,000	$75,000	0.161	$12,075
28	$0	$75,000	$75,000	0.15	$11,250
29	$0	$75,000	$75,000	0.141	$10,575
30	$0	$75,000	$75,000	0.131	$9,825
TOTAL					**$5,019,533**

PRESENT VALUE ANALYSIS

Alternative: GW-3-Whole House Treatment Systems

Name: Engineering Costing Analysis for Focused Feasibility Study - Mottolo Superfund Site in Raymond, NH

Site: Area 1 and 4 **Location: Raymond, NH** **Phase: Feasibility Study** **Base Year Date: 2010** **Date: 6/17/10**	**Description: Provide Whole House Treatment**

Year	Capital Cost	Annual O&M Cost	Periodic Cost	Total Cost	Discount Factor (7%)	Present Value
0	$545,370	-	-	$545,370	1.000	$545,370
1	$0	$137,450	$353,640	$491,090	0.935	$459,169
2	$0	$137,450	$353,640	$491,090	0.873	$428,722
3	$0	$137,450	$353,640	$491,090	0.816	$400,729
4	$0	$137,450	$353,640	$491,090	0.763	$374,702
5	$0	$137,450	$353,640	$491,090	0.713	$350,147
6	$0	$137,450	$101,820	$239,270	0.666	$159,354
7	$0	$137,450	$101,820	$239,270	0.623	$149,065
8	$0	$137,450	$101,820	$239,270	0.582	$139,255
9	$0	$137,450	$101,820	$239,270	0.544	$130,163
10	$0	$137,450	$160,620	$573,500	0.508	$291,338
11	$0	$137,450	$101,820	$239,270	0.475	$113,653
12	$0	$137,450	$101,820	$239,270	0.444	$106,236
13	$0	$137,450	$101,820	$239,270	0.415	$99,297
14	$0	$137,450	$101,820	$239,270	0.388	$92,837
15	$0	$137,450	$101,820	$239,270	0.362	$86,616
16	$0	$137,450	$101,820	$239,270	0.339	$81,113
17	$0	$137,450	$101,820	$239,270	0.317	$75,849
18	$0	$137,450	$101,820	$239,270	0.296	$70,824
19	$0	$137,450	$101,820	$239,270	0.277	$66,278
20	$0	$137,450	$218,220	$355,670	0.258	$91,763
21	$0	$137,450	$101,820	$239,270	0.242	$57,903
22	$0	$137,450	$101,820	$239,270	0.226	$54,075
23	$0	$137,450	$101,820	$239,270	0.211	$50,486
24	$0	$137,450	$101,820	$239,270	0.197	$47,136
25	$0	$137,450	$101,820	$239,270	0.184	$44,026
26	$0	$137,450	$101,820	$239,270	0.172	$41,154
27	$0	$137,450	$101,820	$239,270	0.161	$38,522
28	$0	$137,450	$101,820	$239,270	0.15	$35,891
29	$0	$137,450	$101,820	$239,270	0.141	$33,737
30	$0	$137,450	$127,820	$265,270	0.131	$34,750
TOTAL						**$4,750,159**

PRESENT VALUE ANALYSIS

Alternative: GW-4-Installation of Community Well Public Water Supply

Name: Engineering Costing Analysis for Focused Feasibility Study - Mottolo Superfund Site in Raymond, NH

Site: Areas 1 and 4 **Location: Raymond, NH** **Phase: Feasibility Study** **Base Year Date: 2010** **Date: 6/17/10**	**Description: Provide Community Well**

Year	Capital Cost	Annual O&M Cost	Periodic Cost	Total Cost	Discount Factor (7%)	Present Value
0	$4,536,421	$0	$0	$4,536,421	1.000	$4,536,421
1	$0	$80,000	$300,000	$380,000	0.935	$355,300
2	$0	$80,000	$300,000	$380,000	0.873	$331,740
3	$0	$80,000	$300,000	$380,000	0.816	$310,080
4	$0	$80,000	$300,000	$380,000	0.763	$289,940
5	$0	$80,000	$300,000	$380,000	0.713	$270,940
6	$0	$80,000	$75,000	$155,000	0.666	$103,230
7	$0	$80,000	$75,000	$155,000	0.623	$96,565
8	$0	$80,000	$75,000	$155,000	0.582	$90,210
9	$0	$80,000	$75,000	$155,000	0.544	$84,320
10	$0	$80,000	$75,000	$155,000	0.508	$78,740
11	$0	$80,000	$75,000	$155,000	0.475	$73,625
12	$0	$80,000	$75,000	$155,000	0.444	$68,820
13	$0	$80,000	$75,000	$155,000	0.415	$64,325
14	$0	$80,000	$75,000	$155,000	0.388	$60,140
15	$0	$80,000	$75,000	$155,000	0.362	$56,110
16	$0	$80,000	$75,000	$155,000	0.339	$52,545
17	$0	$80,000	$75,000	$155,000	0.317	$49,135
18	$0	$80,000	$75,000	$155,000	0.296	$45,880
19	$0	$80,000	$75,000	$155,000	0.277	$42,935
20	$0	$80,000	$146,965	$226,965	0.258	$58,557
21	$0	$80,000	$75,000	$155,000	0.242	$37,510
22	$0	$80,000	$75,000	$155,000	0.226	$35,030
23	$0	$80,000	$75,000	$155,000	0.211	$32,705
24	$0	$80,000	$75,000	$155,000	0.197	$30,535
25	$0	$80,000	$75,000	$155,000	0.184	$28,520
26	$0	$80,000	$75,000	$155,000	0.172	$26,660
27	$0	$80,000	$75,000	$155,000	0.161	$24,955
28	$0	$80,000	$75,000	$155,000	0.15	$23,250
29	$0	$80,000	$75,000	$155,000	0.141	$21,855
30	$0	$80,000	$75,000	$155,000	0.131	$20,305
TOTAL						**$7,400,883**

PRESENT VALUE ANALYSIS

Alternative: GW-1-No Action

Name: Engineering Costing Analysis for Focused Feasibility Study - Mottolo Superfund Site in Raymond, NH

Site: Areas 1, 2 and 3 **Location: Raymond, NH** **Phase: Feasibility Study** **Base Year Date: 2010** **Date: 6/17/10**	**Description: No Action Alternative included residential well sampling**

Year	Capital Cost	Periodic Cost	Total Cost	Discount Factor (7%)	Present Value
0	$0	$0	$0	1.000	$0
1	$0	$300,000	$300,000	0.935	$280,500
2	$0	$300,000	$300,000	0.873	$261,900
3	$0	$300,000	$300,000	0.816	$244,800
4	$0	$300,000	$300,000	0.763	$228,900
5	$0	$300,000	$300,000	0.713	$213,900
6	$0	$75,000	$75,000	0.666	$49,950
7	$0	$75,000	$75,000	0.623	$46,725
8	$0	$75,000	$75,000	0.582	$43,650
9	$0	$75,000	$75,000	0.544	$40,800
10	$0	$75,000	$75,000	0.508	$38,100
11	$0	$75,000	$75,000	0.475	$35,625
12	$0	$75,000	$75,000	0.444	$33,300
13	$0	$75,000	$75,000	0.415	$31,125
14	$0	$75,000	$75,000	0.388	$29,100
15	$0	$75,000	$75,000	0.362	$27,150
16	$0	$75,000	$75,000	0.339	$25,425
17	$0	$75,000	$75,000	0.317	$23,775
18	$0	$75,000	$75,000	0.296	$22,200
19	$0	$75,000	$75,000	0.277	$20,775
20	$0	$75,000	$75,000	0.258	$19,350
21	$0	$75,000	$75,000	0.242	$18,150
22	$0	$75,000	$75,000	0.226	$16,950
23	$0	$75,000	$75,000	0.211	$15,825
24	$0	$75,000	$75,000	0.197	$14,775
25	$0	$75,000	$75,000	0.184	$13,800
26	$0	$75,000	$75,000	0.172	$12,900
27	$0	$75,000	$75,000	0.161	$12,075
28	$0	$75,000	$75,000	0.15	$11,250
29	$0	$75,000	$75,000	0.141	$10,575
30	$0	$75,000	$75,000	0.131	$9,825
TOTAL					**$1,853,175**

PRESENT VALUE ANALYSIS

Alternative: GW-2-Extension of Public Water Supply

Name: Engineering Costing Analysis for Focused Feasibility Study - Mottolo Superfund Site in Raymond, NH

Site: Areas 1, 2 and 3 **Location: Raymond, NH** **Phase: Feasibility Study** **Base Year Date: 2010** **Date: 6/22/10**	**Description: Extend Public Water Supply**

Year	Capital Cost	Periodic Cost	Total Cost	Discount Factor (7%)	Present Value
1	$3,884,772	$0	$3,884,772	1.000	$3,884,772
1	$0	$300,000	$300,000	0.935	$280,500
2	$0	$300,000	$300,000	0.873	$261,900
3	$0	$300,000	$300,000	0.816	$244,800
4	$0	$300,000	$300,000	0.763	$228,900
5	$0	$300,000	$300,000	0.713	$213,900
6	$0	$75,000	$75,000	0.666	$49,950
7	$0	$75,000	$75,000	0.623	$46,725
8	$0	$75,000	$75,000	0.582	$43,650
9	$0	$75,000	$75,000	0.544	$40,800
10	$0	$75,000	$75,000	0.508	$38,100
11	$0	$75,000	$75,000	0.475	$35,625
12	$0	$75,000	$75,000	0.444	$33,300
13	$0	$75,000	$75,000	0.415	$31,125
14	$0	$75,000	$75,000	0.388	$29,100
15	$0	$75,000	$75,000	0.362	$27,150
16	$0	$75,000	$75,000	0.339	$25,425
17	$0	$75,000	$75,000	0.317	$23,775
18	$0	$75,000	$75,000	0.296	$22,200
19	$0	$75,000	$75,000	0.277	$20,775
20	$0	$75,000	$75,000	0.258	$19,350
21	$0	$75,000	$75,000	0.242	$18,150
22	$0	$75,000	$75,000	0.226	$16,950
23	$0	$75,000	$75,000	0.211	$15,825
24	$0	$75,000	$75,000	0.197	$14,775
25	$0	$75,000	$75,000	0.184	$13,800
26	$0	$75,000	$75,000	0.172	$12,900
27	$0	$75,000	$75,000	0.161	$12,075
28	$0	$75,000	$75,000	0.15	$11,250
29	$0	$75,000	$75,000	0.141	$10,575
30	$0	$75,000	$75,000	0.131	$9,825
TOTAL					**$5,737,947**

PRESENT VALUE ANALYSIS

Alternative: GW-3-Whole House Treatment Systems

Name: Engineering Costing Analysis for Focused Feasibility Study - Mottolo Superfund Site in Raymond, NH

Site: Areas 1, 2 and 3
Location: Raymond, NH
Phase: Feasibility Study
Base Year Date: 2010
Date: 6/17/10

Description: Provide Whole House Treatment

Year	Capital Cost	Annual O&M Cost	Periodic Cost	Total Cost	Discount Factor (7%)	Present Value
0	$675,258	$0	$0	$675,258	1.000	$675,258
1	$0	$166,745	$365,560	$532,305	0.935	$497,705
2	$0	$166,745	$365,560	$532,305	0.873	$464,702
3	$0	$166,745	$365,560	$532,305	0.816	$434,361
4	$0	$166,745	$365,560	$532,305	0.763	$406,149
5	$0	$166,745	$365,560	$532,305	0.713	$379,533
6	$0	$166,745	$107,780	$274,525	0.666	$182,834
7	$0	$166,745	$107,780	$274,525	0.623	$171,029
8	$0	$166,745	$107,780	$274,525	0.582	$159,774
9	$0	$166,745	$107,780	$274,525	0.544	$149,342
10	$0	$166,745	$169,280	$336,025	0.508	$170,701
11	$0	$166,745	$107,780	$274,525	0.475	$130,399
12	$0	$166,745	$107,780	$274,525	0.444	$121,889
13	$0	$166,745	$107,780	$274,525	0.415	$113,928
14	$0	$166,745	$107,780	$274,525	0.388	$106,516
15	$0	$166,745	$107,780	$274,525	0.362	$99,378
16	$0	$166,745	$107,780	$274,525	0.339	$93,064
17	$0	$166,745	$107,780	$274,525	0.317	$87,024
18	$0	$166,745	$107,780	$274,525	0.296	$81,259
19	$0	$166,745	$107,780	$274,525	0.277	$76,043
20	$0	$166,745	$239,680	$406,425	0.258	$104,858
21	$0	$166,745	$107,780	$274,525	0.242	$66,435
22	$0	$166,745	$107,780	$274,525	0.226	$62,043
23	$0	$166,745	$107,780	$274,525	0.211	$57,925
24	$0	$166,745	$107,780	$274,525	0.197	$54,081
25	$0	$166,745	$107,780	$274,525	0.184	$50,513
26	$0	$166,745	$107,780	$274,525	0.172	$47,218
27	$0	$166,745	$107,780	$274,525	0.161	$44,199
28	$0	$166,745	$107,780	$274,525	0.15	$41,179
29	$0	$166,745	$107,780	$274,525	0.141	$38,708
30	$0	$166,745	$138,530	$305,275	0.131	$39,991
TOTAL						**$5,208,037**

PRESENT VALUE ANALYSIS

Alternative: GW-4-Installation of Community Well Public Water Supply System

Name: Engineering Costing Analysis for Focused Feasibility Study - Mottolo Superfund Site in Raymond, NH

Site: Areas 1, 2 and 3
Location: Raymond, NH
Phase: Feasibility Study
Base Year Date: 2010
Date: 6/17/10

Description: Provide Community Well

Year	Capital Cost	Annual O&M Cost	Periodic Cost	Total Cost	Discount Factor (7%)	Present Value
0	$4,633,500	$0	$0	$4,633,500	1.000	$4,633,500
1	$0	$80,000	$300,000	$380,000	0.935	$355,300
2	$0	$80,000	$300,000	$380,000	0.873	$331,740
3	$0	$80,000	$300,000	$380,000	0.816	$310,080
4	$0	$80,000	$300,000	$380,000	0.763	$289,940
5	$0	$80,000	$300,000	$380,000	0.713	$270,940
6	$0	$80,000	$75,000	$155,000	0.666	$103,230
7	$0	$80,000	$75,000	$155,000	0.623	$96,565
8	$0	$80,000	$75,000	$155,000	0.582	$90,210
9	$0	$80,000	$75,000	$155,000	0.544	$84,320
10	$0	$80,000	$75,000	$155,000	0.508	$78,740
11	$0	$80,000	$75,000	$155,000	0.475	$73,625
12	$0	$80,000	$75,000	$155,000	0.444	$68,820
13	$0	$80,000	$75,000	$155,000	0.415	$64,325
14	$0	$80,000	$75,000	$155,000	0.388	$60,140
15	$0	$80,000	$75,000	$155,000	0.362	$56,110
16	$0	$80,000	$75,000	$155,000	0.339	$52,545
17	$0	$80,000	$75,000	$155,000	0.317	$49,135
18	$0	$80,000	$75,000	$155,000	0.296	$45,880
19	$0	$80,000	$75,000	$155,000	0.277	$42,935
20	$0	$80,000	$146,965	$226,965	0.258	$58,557
21	$0	$80,000	$75,000	$155,000	0.242	$37,510
22	$0	$80,000	$75,000	$155,000	0.226	$35,030
23	$0	$80,000	$75,000	$155,000	0.211	$32,705
24	$0	$80,000	$75,000	$155,000	0.197	$30,535
25	$0	$80,000	$75,000	$155,000	0.184	$28,520
26	$0	$80,000	$75,000	$155,000	0.172	$26,660
27	$0	$80,000	$75,000	$155,000	0.161	$24,955
28	$0	$80,000	$75,000	$155,000	0.15	$23,250
29	$0	$80,000	$75,000	$155,000	0.141	$21,855
30	$0	$80,000	$75,000	$155,000	0.131	$20,305
TOTAL						**$7,497,962**

PRESENT VALUE ANALYSIS

Alternative: GW-1-No Action

Name: Engineering Costing Analysis for Focused Feasibility Study - Mottolo Superfund Site in Raymond, NH

Site: Areas 1, 2 and 4 **Location: Raymond, NH** **Phase: Feasibility Study** **Base Year Date: 2010** **Date: 6/17/10**	**Description: No Action Alternative includes residential well sampling**

Year	Capital Cost	Periodic Cost	Total Cost	Discount Factor (7%)	Present Value
0	$0	$0	$0	1.000	$0
1	$0	$300,000	$300,000	0.935	$280,500
2	$0	$300,000	$300,000	0.873	$261,900
3	$0	$300,000	$300,000	0.816	$244,800
4	$0	$300,000	$300,000	0.763	$228,900
5	$0	$300,000	$300,000	0.713	$213,900
6	$0	$75,000	$75,000	0.666	$49,950
7	$0	$75,000	$75,000	0.623	$46,725
8	$0	$75,000	$75,000	0.582	$43,650
9	$0	$75,000	$75,000	0.544	$40,800
10	$0	$75,000	$75,000	0.508	$38,100
11	$0	$75,000	$75,000	0.475	$35,625
12	$0	$75,000	$75,000	0.444	$33,300
13	$0	$75,000	$75,000	0.415	$31,125
14	$0	$75,000	$75,000	0.388	$29,100
15	$0	$75,000	$75,000	0.362	$27,150
16	$0	$75,000	$75,000	0.339	$25,425
17	$0	$75,000	$75,000	0.317	$23,775
18	$0	$75,000	$75,000	0.296	$22,200
19	$0	$75,000	$75,000	0.277	$20,775
20	$0	$75,000	$75,000	0.258	$19,350
21	$0	$75,000	$75,000	0.242	$18,150
22	$0	$75,000	$75,000	0.226	$16,950
23	$0	$75,000	$75,000	0.211	$15,825
24	$0	$75,000	$75,000	0.197	$14,775
25	$0	$75,000	$75,000	0.184	$13,800
26	$0	$75,000	$75,000	0.172	$12,900
27	$0	$75,000	$75,000	0.161	$12,075
28	$0	$75,000	$75,000	0.15	$11,250
29	$0	$75,000	$75,000	0.141	$10,575
30	$0	$75,000	$75,000	0.131	$9,825
TOTAL					**$1,853,175**

PRESENT VALUE ANALYSIS

Alternative: GW-2-Extension of Public Water Supply

Name: Engineering Costing Analysis for Focused Feasibility Study - Mottolo Superfund Site in Raymond, NH

Site: Areas 1, 2 and 4 **Location: Raymond, NH** **Phase: Feasibility Study** **Base Year Date: 2010** **Date:6/22/10**	**Description: Extend Public Water Supply**

Year	Capital Cost	Periodic Cost	Total Cost	Discount Factor (7%)	Present Value
0	$3,370,928	$0	$3,370,928	1.000	$3,370,928
1	$0	$300,000	$300,000	0.935	$280,500
2	$0	$300,000	$300,000	0.873	$261,900
3	$0	$300,000	$300,000	0.816	$244,800
4	$0	$300,000	$300,000	0.763	$228,900
5	$0	$300,000	$300,000	0.713	$213,900
6	$0	$75,000	$75,000	0.666	$49,950
7	$0	$75,000	$75,000	0.623	$46,725
8	$0	$75,000	$75,000	0.582	$43,650
9	$0	$75,000	$75,000	0.544	$40,800
10	$0	$75,000	$75,000	0.508	$38,100
11	$0	$75,000	$75,000	0.475	$35,625
12	$0	$75,000	$75,000	0.444	$33,300
13	$0	$75,000	$75,000	0.415	$31,125
14	$0	$75,000	$75,000	0.388	$29,100
15	$0	$75,000	$75,000	0.362	$27,150
16	$0	$75,000	$75,000	0.339	$25,425
17	$0	$75,000	$75,000	0.317	$23,775
18	$0	$75,000	$75,000	0.296	$22,200
19	$0	$75,000	$75,000	0.277	$20,775
20	$0	$75,000	$75,000	0.258	$19,350
21	$0	$75,000	$75,000	0.242	$18,150
22	$0	$75,000	$75,000	0.226	$16,950
23	$0	$75,000	$75,000	0.211	$15,825
24	$0	$75,000	$75,000	0.197	$14,775
25	$0	$75,000	$75,000	0.184	$13,800
26	$0	$75,000	$75,000	0.172	$12,900
27	$0	$75,000	$75,000	0.161	$12,075
28	$0	$75,000	$75,000	0.15	$11,250
29	$0	$75,000	$75,000	0.141	$10,575
30	$0	$75,000	$75,000	0.131	$9,825
TOTAL					**$5,224,103**

PRESENT VALUE ANALYSIS

Alternative: GW-3-Whole House Treatment Systems

Name: Engineering Costing Analysis for Focused Feasibility Study - Mottolo Superfund Site in Raymond, NH

Site: Areas 1, 2 and 4 **Location: Raymond, NH** **Phase: Feasibility Study** **Base Year Date: 2010** **Date: 6/17/10**	**Description: Provide Whole House Treatment**

Year	Capital Cost	Annual O&M Cost	Periodic Cost	Total Cost	Discount Factor (7%)	Present Value
0	$655,025	$0	$0	$655,025	1.000	$655,025
1	$0	$160,000	$362,580	$522,580	0.935	$488,612
2	$0	$160,000	$362,580	$522,580	0.873	$456,212
3	$0	$160,000	$362,580	$522,580	0.816	$426,425
4	$0	$160,000	$362,580	$522,580	0.763	$398,729
5	$0	$160,000	$362,580	$522,580	0.713	$372,600
6	$0	$160,000	$106,290	$266,290	0.666	$177,349
7	$0	$160,000	$106,290	$266,290	0.623	$165,899
8	$0	$160,000	$106,290	$266,290	0.582	$154,981
9	$0	$160,000	$106,290	$266,290	0.544	$144,862
10	$0	$160,000	$172,390	$332,390	0.508	$168,854
11	$0	$160,000	$106,290	$266,290	0.475	$126,488
12	$0	$160,000	$106,290	$266,290	0.444	$118,233
13	$0	$160,000	$106,290	$266,290	0.415	$110,510
14	$0	$160,000	$106,290	$266,290	0.388	$103,321
15	$0	$160,000	$106,290	$266,290	0.362	$96,397
16	$0	$160,000	$106,290	$266,290	0.339	$90,272
17	$0	$160,000	$106,290	$266,290	0.317	$84,414
18	$0	$160,000	$106,290	$266,290	0.296	$78,822
19	$0	$160,000	$106,290	$266,290	0.277	$73,762
20	$0	$160,000	$239,590	$399,590	0.258	$103,094
21	$0	$160,000	$106,290	$266,290	0.242	$64,442
22	$0	$160,000	$106,290	$266,290	0.226	$60,182
23	$0	$160,000	$106,290	$266,290	0.211	$56,187
24	$0	$160,000	$106,290	$266,290	0.197	$52,459
25	$0	$160,000	$106,290	$266,290	0.184	$48,997
26	$0	$160,000	$106,290	$266,290	0.172	$45,802
27	$0	$160,000	$106,290	$266,290	0.161	$42,873
28	$0	$160,000	$106,290	$266,290	0.15	$39,944
29	$0	$160,000	$106,290	$266,290	0.141	$37,547
30	$0	$160,000	$135,790	$295,790	0.131	$38,748
TOTAL						**$5,082,041**

PRESENT VALUE ANALYSIS

Alternative: GW-4-Installation of Community Well Public Water Supply System

Name: Engineering Costing Analysis for Focused Feasibility Study - Mottolo Superfund Site in Raymond, NH

Site: Areas 1, 2 and 4
Location: Raymond, NH
Phase: Feasibility Study
Base Year Date: 2010
Date: 6/17/10

Description: Provide Community Well

Year	Capital Cost	Annual O&M Cost	Periodic Cost	Total Cost	Discount Factor (7%)	Present Value
0	$4,624,557	$0	$0	$4,624,557	1.000	$4,624,557
1	$0	$80,000	$300,000	$380,000	0.935	$355,300
2	$0	$80,000	$300,000	$380,000	0.873	$331,740
3	$0	$80,000	$300,000	$380,000	0.816	$310,080
4	$0	$80,000	$300,000	$380,000	0.763	$289,940
5	$0	$80,000	$300,000	$380,000	0.713	$270,940
6	$0	$80,000	$75,000	$155,000	0.666	$103,230
7	$0	$80,000	$75,000	$155,000	0.623	$96,565
8	$0	$80,000	$75,000	$155,000	0.582	$90,210
9	$0	$80,000	$75,000	$155,000	0.544	$84,320
10	$0	$80,000	$75,000	$155,000	0.508	$78,740
11	$0	$80,000	$75,000	$155,000	0.475	$73,625
12	$0	$80,000	$75,000	$155,000	0.444	$68,820
13	$0	$80,000	$75,000	$155,000	0.415	$64,325
14	$0	$80,000	$75,000	$155,000	0.388	$60,140
15	$0	$80,000	$75,000	$155,000	0.362	$56,110
16	$0	$80,000	$75,000	$155,000	0.339	$52,545
17	$0	$80,000	$75,000	$155,000	0.317	$49,135
18	$0	$80,000	$75,000	$155,000	0.296	$45,880
19	$0	$80,000	$75,000	$155,000	0.277	$42,935
20	$0	$80,000	$146,965	$226,965	0.258	$58,557
21	$0	$80,000	$75,000	$155,000	0.242	$37,510
22	$0	$80,000	$75,000	$155,000	0.226	$35,030
23	$0	$80,000	$75,000	$155,000	0.211	$32,705
24	$0	$80,000	$75,000	$155,000	0.197	$30,535
25	$0	$80,000	$75,000	$155,000	0.184	$28,520
26	$0	$80,000	$75,000	$155,000	0.172	$26,660
27	$0	$80,000	$75,000	$155,000	0.161	$24,955
28	$0	$80,000	$75,000	$155,000	0.15	$23,250
29	$0	$80,000	$75,000	$155,000	0.141	$21,855
30	$0	$80,000	$75,000	$155,000	0.131	$20,305
TOTAL						**$7,489,019**

PRESENT VALUE ANALYSIS

Alternative: GW-1-No Action

Name: Engineering Costing Analysis for Focused Feasibility Study - Mottolo Superfund Site in Raymond, NH

Site: Areas 1, 2, 3, and 4 **Location: Raymond, NH** **Phase: Feasibility Study** **Base Year Date: 2010** **Date: 6/17/10**	**Description: No Action Alternative includes residential well sampling**

Year	Capital Cost	Periodic Cost	Total Cost	Discount Factor (7%)	Present Value
0	$0	$0	$0	1.000	$0
1	$0	$300,000	$300,000	0.935	$280,500
2	$0	$300,000	$300,000	0.873	$261,900
3	$0	$300,000	$300,000	0.816	$244,800
4	$0	$300,000	$300,000	0.763	$228,900
5	$0	$300,000	$300,000	0.713	$213,900
6	$0	$75,000	$75,000	0.666	$49,950
7	$0	$75,000	$75,000	0.623	$46,725
8	$0	$75,000	$75,000	0.582	$43,650
9	$0	$75,000	$75,000	0.544	$40,800
10	$0	$75,000	$75,000	0.508	$38,100
11	$0	$75,000	$75,000	0.475	$35,625
12	$0	$75,000	$75,000	0.444	$33,300
13	$0	$75,000	$75,000	0.415	$31,125
14	$0	$75,000	$75,000	0.388	$29,100
15	$0	$75,000	$75,000	0.362	$27,150
16	$0	$75,000	$75,000	0.339	$25,425
17	$0	$75,000	$75,000	0.317	$23,775
18	$0	$75,000	$75,000	0.296	$22,200
19	$0	$75,000	$75,000	0.277	$20,775
20	$0	$75,000	$75,000	0.258	$19,350
21	$0	$75,000	$75,000	0.242	$18,150
22	$0	$75,000	$75,000	0.226	$16,950
23	$0	$75,000	$75,000	0.211	$15,825
24	$0	$75,000	$75,000	0.197	$14,775
25	$0	$75,000	$75,000	0.184	$13,800
26	$0	$75,000	$75,000	0.172	$12,900
27	$0	$75,000	$75,000	0.161	$12,075
28	$0	$75,000	$75,000	0.15	$11,250
29	$0	$75,000	$75,000	0.141	$10,575
30	$0	$75,000	$75,000	0.131	$9,825
TOTAL					**$1,853,175**

PRESENT VALUE ANALYSIS

Alternative: GW-2-Extension of Public Water Supply

Name: Engineering Costing Analysis for Focused Feasibility Study - Mottolo Superfund Site in Raymond, NH

Site: Areas 1, 2, 3, and 4 **Location: Raymond, NH** **Phase: Feasibility Study** **Base Year Date: 2010** **Date: 6/22/10**	**Description: Extended Public Water Supply**

Year	Capital Cost	Periodic Cost	Total Cost	Discount Factor (7%)	Present Value
0	$4,460,283	$0	$4,460,283	1.000	$4,460,283
1	$0	$300,000	$300,000	0.935	$280,500
2	$0	$300,000	$300,000	0.873	$261,900
3	$0	$300,000	$300,000	0.816	$244,800
4	$0	$300,000	$300,000	0.763	$228,900
5	$0	$300,000	$300,000	0.713	$213,900
6	$0	$75,000	$75,000	0.666	$49,950
7	$0	$75,000	$75,000	0.623	$46,725
8	$0	$75,000	$75,000	0.582	$43,650
9	$0	$75,000	$75,000	0.544	$40,800
10	$0	$75,000	$75,000	0.508	$38,100
11	$0	$75,000	$75,000	0.475	$35,625
12	$0	$75,000	$75,000	0.444	$33,300
13	$0	$75,000	$75,000	0.415	$31,125
14	$0	$75,000	$75,000	0.388	$29,100
15	$0	$75,000	$75,000	0.362	$27,150
16	$0	$75,000	$75,000	0.339	$25,425
17	$0	$75,000	$75,000	0.317	$23,775
18	$0	$75,000	$75,000	0.296	$22,200
19	$0	$75,000	$75,000	0.277	$20,775
20	$0	$75,000	$75,000	0.258	$19,350
21	$0	$75,000	$75,000	0.242	$18,150
22	$0	$75,000	$75,000	0.226	$16,950
23	$0	$75,000	$75,000	0.211	$15,825
24	$0	$75,000	$75,000	0.197	$14,775
25	$0	$75,000	$75,000	0.184	$13,800
26	$0	$75,000	$75,000	0.172	$12,900
27	$0	$75,000	$75,000	0.161	$12,075
28	$0	$75,000	$75,000	0.15	$11,250
29	$0	$75,000	$75,000	0.141	$10,575
30	$0	$75,000	$75,000	0.131	$9,825
TOTAL					**$6,313,458**

PRESENT VALUE ANALYSIS

Alternative: GW-3-Whole House Treatment

Name: Engineering Costing Analysis for Focused Feasibility Study - Mottolo Superfund Site in Raymond, NH

Site: Areas 1, 2, 3, and 4
Location: Raymond, NH
Phase: Feasibility Study
Base Year Date: 2010
Date: 6/17/10

Description: Provide Whole House Treatment

Year	Capital Cost	Annual O&M Cost	Periodic Cost	Total Cost	Discount Factor (7%)	Present Value
0	$845,951	$0	$0	$845,951	1.000	$845,951
1	$0	$209,260	$381,950	$591,210	0.935	$552,781
2	$0	$209,260	$381,950	$591,210	0.873	$516,126
3	$0	$209,260	$381,950	$591,210	0.816	$482,427
4	$0	$209,260	$381,950	$591,210	0.763	$451,093
5	$0	$209,260	$381,950	$591,210	0.713	$421,533
6	$0	$209,260	$115,975	$325,235	0.666	$216,607
7	$0	$209,260	$115,975	$325,235	0.623	$202,621
8	$0	$209,260	$115,975	$325,235	0.582	$189,287
9	$0	$209,260	$115,975	$325,235	0.544	$176,928
10	$0	$209,260	$198,875	$408,135	0.508	$207,333
11	$0	$209,260	$115,975	$325,235	0.475	$154,487
12	$0	$209,260	$115,975	$325,235	0.444	$144,404
13	$0	$209,260	$115,975	$325,235	0.415	$134,973
14	$0	$209,260	$115,975	$325,235	0.388	$126,191
15	$0	$209,260	$115,975	$325,235	0.362	$117,735
16	$0	$209,260	$115,975	$325,235	0.339	$110,255
17	$0	$209,260	$115,975	$325,235	0.317	$103,099
18	$0	$209,260	$115,975	$325,235	0.296	$96,270
19	$0	$209,260	$115,975	$325,235	0.277	$90,090
20	$0	$209,260	$288,475	$497,735	0.258	$128,416
21	$0	$209,260	$115,975	$325,235	0.242	$78,707
22	$0	$209,260	$115,975	$325,235	0.226	$73,503
23	$0	$209,260	$115,975	$325,235	0.211	$68,625
24	$0	$209,260	$115,975	$325,235	0.197	$64,071
25	$0	$209,260	$115,975	$325,235	0.184	$59,843
26	$0	$209,260	$115,975	$325,235	0.172	$55,940
27	$0	$209,260	$115,975	$325,235	0.161	$52,363
28	$0	$209,260	$115,975	$325,235	0.15	$48,785
29	$0	$209,260	$115,975	$325,235	0.141	$45,858
30	$0	$209,260	$154,725	$363,985	0.131	$47,682
TOTAL						**$6,063,984**

PRESENT VALUE ANALYSIS

Alternative: GW-Installation of Community Well Public Water Supply System

Name: Engineering Costing Analysis for Focused Feasibility Study - Mottolo Superfund Site in Raymond, NH

Site: Areas 1, 2, 3, and 4 **Location: Raymond, NH** **Phase: Feasibility Study** **Base Year Date: 2010** **Date: 6/17/10**	**Description: Provide Community Well**

Year	Capital Cost	Annual O&M Cost	Periodic Cost	Total Cost	Discount Factor (7%)	Present Value
0	$5,596,999	$0	$0	$5,596,999	1.000	$5,596,999
1	$0	$80,000	$300,000	$380,000	0.935	$355,300
2	$0	$80,000	$300,000	$380,000	0.873	$331,740
3	$0	$80,000	$300,000	$380,000	0.816	$310,080
4	$0	$80,000	$300,000	$380,000	0.763	$289,940
5	$0	$80,000	$300,000	$380,000	0.713	$270,940
6	$0	$80,000	$75,000	$155,000	0.666	$103,230
7	$0	$80,000	$75,000	$155,000	0.623	$96,565
8	$0	$80,000	$75,000	$155,000	0.582	$90,210
9	$0	$80,000	$75,000	$155,000	0.544	$84,320
10	$0	$80,000	$75,000	$155,000	0.508	$78,740
11	$0	$80,000	$75,000	$155,000	0.475	$73,625
12	$0	$80,000	$75,000	$155,000	0.444	$68,820
13	$0	$80,000	$75,000	$155,000	0.415	$64,325
14	$0	$80,000	$75,000	$155,000	0.388	$60,140
15	$0	$80,000	$75,000	$155,000	0.362	$56,110
16	$0	$80,000	$75,000	$155,000	0.339	$52,545
17	$0	$80,000	$75,000	$155,000	0.317	$49,135
18	$0	$80,000	$75,000	$155,000	0.296	$45,880
19	$0	$80,000	$75,000	$155,000	0.277	$42,935
20	$0	$80,000	$146,965	$226,965	0.258	$58,557
21	$0	$80,000	$75,000	$155,000	0.242	$37,510
22	$0	$80,000	$75,000	$155,000	0.226	$35,030
23	$0	$80,000	$75,000	$155,000	0.211	$32,705
24	$0	$80,000	$75,000	$155,000	0.197	$30,535
25	$0	$80,000	$75,000	$155,000	0.184	$28,520
26	$0	$80,000	$75,000	$155,000	0.172	$26,660
27	$0	$80,000	$75,000	$155,000	0.161	$24,955
28	$0	$80,000	$75,000	$155,000	0.15	$23,250
29	$0	$80,000	$75,000	$155,000	0.141	$21,855
30	$0	$80,000	$75,000	$155,000	0.131	$20,305
TOTAL						**$8,461,461**

PRESENT VALUE ANALYSIS

Alternative: GW-1-No Action

Name: Engineering Costing Analysis for Focused Feasibility Study - Mottolo Superfund Site in Raymond, NH

Site: Areas 1, 2, 4 and 5 **Location: Raymond, NH** **Phase: Feasibility Study** **Base Year Date: 2010** **Date: 6/17/10**	**Description: No Action Alternative includes residential sampling**

Year	Capital Cost	Periodic Cost	Total Cost	Discount Factor (7%)	Present Value
0	$0	$0	$0	1.000	$0
1	$0	$300,000	$300,000	0.935	$280,500
2	$0	$300,000	$300,000	0.873	$261,900
3	$0	$300,000	$300,000	0.816	$244,800
4	$0	$300,000	$300,000	0.763	$228,900
5	$0	$300,000	$300,000	0.713	$213,900
6	$0	$75,000	$75,000	0.666	$49,950
7	$0	$75,000	$75,000	0.623	$46,725
8	$0	$75,000	$75,000	0.582	$43,650
9	$0	$75,000	$75,000	0.544	$40,800
10	$0	$75,000	$75,000	0.508	$38,100
11	$0	$75,000	$75,000	0.475	$35,625
12	$0	$75,000	$75,000	0.444	$33,300
13	$0	$75,000	$75,000	0.415	$31,125
14	$0	$75,000	$75,000	0.388	$29,100
15	$0	$75,000	$75,000	0.362	$27,150
16	$0	$75,000	$75,000	0.339	$25,425
17	$0	$75,000	$75,000	0.317	$23,775
18	$0	$75,000	$75,000	0.296	$22,200
19	$0	$75,000	$75,000	0.277	$20,775
20	$0	$75,000	$75,000	0.258	$19,350
21	$0	$75,000	$75,000	0.242	$18,150
22	$0	$75,000	$75,000	0.226	$16,950
23	$0	$75,000	$75,000	0.211	$15,825
24	$0	$75,000	$75,000	0.197	$14,775
25	$0	$75,000	$75,000	0.184	$13,800
26	$0	$75,000	$75,000	0.172	$12,900
27	$0	$75,000	$75,000	0.161	$12,075
28	$0	$75,000	$75,000	0.15	$11,250
29	$0	$75,000	$75,000	0.141	$10,575
30	$0	$75,000	$75,000	0.131	$9,825
TOTAL					**$1,853,175**

PRESENT VALUE ANALYSIS

Alternative: GW-2-Extension of Public Water Supply

Name: Engineering Costing Analysis for Focused Feasibility Study - Mottolo Superfund Site in Raymond, NH

Site: Areas 1, 2, 4 and 5 **Location: Raymond, NH** **Phase: Feasibility Study** **Base Year Date: 2010** **Date: 6/22/10**	**Description: Extend Public Water Supply**

Year	Capital Cost	Periodic Cost	Total Cost	Discount Factor (7%)	Present Value
0	$3,932,734	$0	$3,932,734	1.000	$3,932,734
1	$0	$300,000	$300,000	0.935	$280,500
2	$0	$300,000	$300,000	0.873	$261,900
3	$0	$300,000	$300,000	0.816	$244,800
4	$0	$300,000	$300,000	0.763	$228,900
5	$0	$300,000	$300,000	0.713	$213,900
6	$0	$75,000	$75,000	0.666	$49,950
7	$0	$75,000	$75,000	0.623	$46,725
8	$0	$75,000	$75,000	0.582	$43,650
9	$0	$75,000	$75,000	0.544	$40,800
10	$0	$75,000	$75,000	0.508	$38,100
11	$0	$75,000	$75,000	0.475	$35,625
12	$0	$75,000	$75,000	0.444	$33,300
13	$0	$75,000	$75,000	0.415	$31,125
14	$0	$75,000	$75,000	0.388	$29,100
15	$0	$75,000	$75,000	0.362	$27,150
16	$0	$75,000	$75,000	0.339	$25,425
17	$0	$75,000	$75,000	0.317	$23,775
18	$0	$75,000	$75,000	0.296	$22,200
19	$0	$75,000	$75,000	0.277	$20,775
20	$0	$75,000	$75,000	0.258	$19,350
21	$0	$75,000	$75,000	0.242	$18,150
22	$0	$75,000	$75,000	0.226	$16,950
23	$0	$75,000	$75,000	0.211	$15,825
24	$0	$75,000	$75,000	0.197	$14,775
25	$0	$75,000	$75,000	0.184	$13,800
26	$0	$75,000	$75,000	0.172	$12,900
27	$0	$75,000	$75,000	0.161	$12,075
28	$0	$75,000	$75,000	0.15	$11,250
29	$0	$75,000	$75,000	0.141	$10,575
30	$0	$75,000	$75,000	0.131	$9,825
TOTAL					**$5,785,909**

PRESENT VALUE ANALYSIS

Alternative: GW-4-Installation of Community Well Public Water Supply System

Name: Engineering Costing Analysis for Focused Feasibility Study - Mottolo Superfund Site in Raymond, NH

Site: Areas 1, 2, 4 and 5
Location: Raymond, NH
Phase: Feasibility Study
Base Year Date: 2010
Date: 6/17/10

Description: Provide Community Well

Year	Capital Cost	Annual O&M Cost	Periodic Cost	Total Cost	Discount Factor (7%)	Present Value
0	$5,024,098	$0	$0	$5,024,098	1.000	$5,024,098
1	$0	$80,000	$300,000	$380,000	0.935	$355,300
2	$0	$80,000	$300,000	$380,000	0.873	$331,740
3	$0	$80,000	$300,000	$380,000	0.816	$310,080
4	$0	$80,000	$300,000	$380,000	0.763	$289,940
5	$0	$80,000	$300,000	$380,000	0.713	$270,940
6	$0	$80,000	$75,000	$155,000	0.666	$103,230
7	$0	$80,000	$75,000	$155,000	0.623	$96,565
8	$0	$80,000	$75,000	$155,000	0.582	$90,210
9	$0	$80,000	$75,000	$155,000	0.544	$84,320
10	$0	$80,000	$75,000	$155,000	0.508	$78,740
11	$0	$80,000	$75,000	$155,000	0.475	$73,625
12	$0	$80,000	$75,000	$155,000	0.444	$68,820
13	$0	$80,000	$75,000	$155,000	0.415	$64,325
14	$0	$80,000	$75,000	$155,000	0.388	$60,140
15	$0	$80,000	$75,000	$155,000	0.362	$56,110
16	$0	$80,000	$75,000	$155,000	0.339	$52,545
17	$0	$80,000	$75,000	$155,000	0.317	$49,135
18	$0	$80,000	$75,000	$155,000	0.296	$45,880
19	$0	$80,000	$75,000	$155,000	0.277	$42,935
20	$0	$80,000	$146,965	$226,965	0.258	$58,557
21	$0	$80,000	$75,000	$155,000	0.242	$37,510
22	$0	$80,000	$75,000	$155,000	0.226	$35,030
23	$0	$80,000	$75,000	$155,000	0.211	$32,705
24	$0	$80,000	$75,000	$155,000	0.197	$30,535
25	$0	$80,000	$75,000	$155,000	0.184	$28,520
26	$0	$80,000	$75,000	$155,000	0.172	$26,660
27	$0	$80,000	$75,000	$155,000	0.161	$24,955
28	$0	$80,000	$75,000	$155,000	0.15	$23,250
29	$0	$80,000	$75,000	$155,000	0.141	$21,855
30	$0	$80,000	$75,000	$155,000	0.131	$20,305
TOTAL						**$7,888,560**

PRESENT VALUE ANALYSIS

Alternative: GW-1-No Action

Name: Engineering Costing Analysis for Focused Feasibility Study - Mottolo Superfund Site in Raymond, NH

Site: Areas 1, 2, 3, 4 & 5 **Location: Raymond, NH** **Phase: Feasibility Study** **Base Year Date: 2010** **Date: 6/17/10**	**Description: No Action Alternative includes residential well sampling**

Year	Capital Cost	Periodic Cost	Total Cost	Discount Factor (7%)	Present Value
0	$0	$0	$0	1.000	$0
1	$0	$300,000	$300,000	0.935	$280,500
2	$0	$300,000	$300,000	0.873	$261,900
3	$0	$300,000	$300,000	0.816	$244,800
4	$0	$300,000	$300,000	0.763	$228,900
5	$0	$300,000	$300,000	0.713	$213,900
6	$0	$75,000	$75,000	0.666	$49,950
7	$0	$75,000	$75,000	0.623	$46,725
8	$0	$75,000	$75,000	0.582	$43,650
9	$0	$75,000	$75,000	0.544	$40,800
10	$0	$75,000	$75,000	0.508	$38,100
11	$0	$75,000	$75,000	0.475	$35,625
12	$0	$75,000	$75,000	0.444	$33,300
13	$0	$75,000	$75,000	0.415	$31,125
14	$0	$75,000	$75,000	0.388	$29,100
15	$0	$75,000	$75,000	0.362	$27,150
16	$0	$75,000	$75,000	0.339	$25,425
17	$0	$75,000	$75,000	0.317	$23,775
18	$0	$75,000	$75,000	0.296	$22,200
19	$0	$75,000	$75,000	0.277	$20,775
20	$0	$75,000	$75,000	0.258	$19,350
21	$0	$75,000	$75,000	0.242	$18,150
22	$0	$75,000	$75,000	0.226	$16,950
23	$0	$75,000	$75,000	0.211	$15,825
24	$0	$75,000	$75,000	0.197	$14,775
25	$0	$75,000	$75,000	0.184	$13,800
26	$0	$75,000	$75,000	0.172	$12,900
27	$0	$75,000	$75,000	0.161	$12,075
28	$0	$75,000	$75,000	0.15	$11,250
29	$0	$75,000	$75,000	0.141	$10,575
30	$0	$75,000	$75,000	0.131	$9,825
TOTAL					**$1,853,175**

PRESENT VALUE ANALYSIS

Alternative: GW-2-Extension of Public Water Supply

Name: Engineering Costing Analysis for Focused Feasibility Study - Mottolo Superfund Site in Raymond, NH

Site: Areas 1, 2, 3, 4 & 5
Location: Raymond, NH
Phase: Feasibility Study
Base Year Date: 2010
Date: 6/22/10

Description: Extend Public Water Supply

Year	Capital Cost	Periodic Cost	Total Cost	Discount Factor (7%)	Present Value
0	$5,001,907	$0	$5,001,907	1.000	$5,001,907
1	$0	$300,000	$300,000	0.935	$280,500
2	$0	$300,000	$300,000	0.873	$261,900
3	$0	$300,000	$300,000	0.816	$244,800
4	$0	$300,000	$300,000	0.763	$228,900
5	$0	$300,000	$300,000	0.713	$213,900
6	$0	$75,000	$75,000	0.666	$49,950
7	$0	$75,000	$75,000	0.623	$46,725
8	$0	$75,000	$75,000	0.582	$43,650
9	$0	$75,000	$75,000	0.544	$40,800
10	$0	$75,000	$75,000	0.508	$38,100
11	$0	$75,000	$75,000	0.475	$35,625
12	$0	$75,000	$75,000	0.444	$33,300
13	$0	$75,000	$75,000	0.415	$31,125
14	$0	$75,000	$75,000	0.388	$29,100
15	$0	$75,000	$75,000	0.362	$27,150
16	$0	$75,000	$75,000	0.339	$25,425
17	$0	$75,000	$75,000	0.317	$23,775
18	$0	$75,000	$75,000	0.296	$22,200
19	$0	$75,000	$75,000	0.277	$20,775
20	$0	$75,000	$75,000	0.258	$19,350
21	$0	$75,000	$75,000	0.242	$18,150
22	$0	$75,000	$75,000	0.226	$16,950
23	$0	$75,000	$75,000	0.211	$15,825
24	$0	$75,000	$75,000	0.197	$14,775
25	$0	$75,000	$75,000	0.184	$13,800
26	$0	$75,000	$75,000	0.172	$12,900
27	$0	$75,000	$75,000	0.161	$12,075
28	$0	$75,000	$75,000	0.15	$11,250
29	$0	$75,000	$75,000	0.141	$10,575
30	$0	$75,000	$75,000	0.131	$9,825
TOTAL					**$6,855,082**

PRESENT VALUE ANALYSIS

Alternative: GW-4-Installation of Community Well Public Water Supply System

Name: Engineering Costing Analysis for Focused Feasibility Study - Mottolo Superfund Site in Raymond, NH

Site: Areas 1, 2, 3, 4 & 5
Location: Raymond, NH
Phase: Feasibility Study
Base Year Date: 2010
Date: 6/17/10

Description: Provide Community Well

Year	Capital Cost	Annual O&M Cost	Periodic Cost	Total Cost	Discount Factor (7%)	Present Value
0	$5,980,757	$0	$0	$5,980,757	1.000	$5,980,757
1	$0	$80,000	$300,000	$380,000	0.935	$355,300
2	$0	$80,000	$300,000	$380,000	0.873	$331,740
3	$0	$80,000	$300,000	$380,000	0.816	$310,080
4	$0	$80,000	$300,000	$380,000	0.763	$289,940
5	$0	$80,000	$300,000	$380,000	0.713	$270,940
6	$0	$80,000	$75,000	$155,000	0.666	$103,230
7	$0	$80,000	$75,000	$155,000	0.623	$96,565
8	$0	$80,000	$75,000	$155,000	0.582	$90,210
9	$0	$80,000	$75,000	$155,000	0.544	$84,320
10	$0	$80,000	$75,000	$155,000	0.508	$78,740
11	$0	$80,000	$75,000	$155,000	0.475	$73,625
12	$0	$80,000	$75,000	$155,000	0.444	$68,820
13	$0	$80,000	$75,000	$155,000	0.415	$64,325
14	$0	$80,000	$75,000	$155,000	0.388	$60,140
15	$0	$80,000	$75,000	$155,000	0.362	$56,110
16	$0	$80,000	$75,000	$155,000	0.339	$52,545
17	$0	$80,000	$75,000	$155,000	0.317	$49,135
18	$0	$80,000	$75,000	$155,000	0.296	$45,880
19	$0	$80,000	$75,000	$155,000	0.277	$42,935
20	$0	$80,000	$146,965	$226,965	0.258	$58,557
21	$0	$80,000	$75,000	$155,000	0.242	$37,510
22	$0	$80,000	$75,000	$155,000	0.226	$35,030
23	$0	$80,000	$75,000	$155,000	0.211	$32,705
24	$0	$80,000	$75,000	$155,000	0.197	$30,535
25	$0	$80,000	$75,000	$155,000	0.184	$28,520
26	$0	$80,000	$75,000	$155,000	0.172	$26,660
27	$0	$80,000	$75,000	$155,000	0.161	$24,955
28	$0	$80,000	$75,000	$155,000	0.15	$23,250
29	$0	$80,000	$75,000	$155,000	0.141	$21,855
30	$0	$80,000	$75,000	$155,000	0.131	$20,305
TOTAL						**$8,845,219**

PRESENT VALUE ANALYSIS

Alternative: GW-1-No Action

Name: Engineering Costing Analysis for Focused Feasibility Study - Mottolo Superfund Site in Raymond, NH

Site: Areas 1, 2, 4, 5 & 6 **Location: Raymond, NH** **Phase: Feasibility Study** **Base Year Date: 2010** **Date: 6/17/10**	**Description: No Action Alternative includes residential well sampling**

Year	Capital Cost	Periodic Cost	Total Cost	Discount Factor (7%)	Present Value
0	$0	$0	$0	1.000	$0
1	$0	$300,000	$300,000	0.935	$280,500
2	$0	$300,000	$300,000	0.873	$261,900
3	$0	$300,000	$300,000	0.816	$244,800
4	$0	$300,000	$300,000	0.763	$228,900
5	$0	$300,000	$300,000	0.713	$213,900
6	$0	$75,000	$75,000	0.666	$49,950
7	$0	$75,000	$75,000	0.623	$46,725
8	$0	$75,000	$75,000	0.582	$43,650
9	$0	$75,000	$75,000	0.544	$40,800
10	$0	$75,000	$75,000	0.508	$38,100
11	$0	$75,000	$75,000	0.475	$35,625
12	$0	$75,000	$75,000	0.444	$33,300
13	$0	$75,000	$75,000	0.415	$31,125
14	$0	$75,000	$75,000	0.388	$29,100
15	$0	$75,000	$75,000	0.362	$27,150
16	$0	$75,000	$75,000	0.339	$25,425
17	$0	$75,000	$75,000	0.317	$23,775
18	$0	$75,000	$75,000	0.296	$22,200
19	$0	$75,000	$75,000	0.277	$20,775
20	$0	$75,000	$75,000	0.258	$19,350
21	$0	$75,000	$75,000	0.242	$18,150
22	$0	$75,000	$75,000	0.226	$16,950
23	$0	$75,000	$75,000	0.211	$15,825
24	$0	$75,000	$75,000	0.197	$14,775
25	$0	$75,000	$75,000	0.184	$13,800
26	$0	$75,000	$75,000	0.172	$12,900
27	$0	$75,000	$75,000	0.161	$12,075
28	$0	$75,000	$75,000	0.15	$11,250
29	$0	$75,000	$75,000	0.141	$10,575
30	$0	$75,000	$75,000	0.131	$9,825
TOTAL					**$1,853,175**

PRESENT VALUE ANALYSIS

Alternative: GW-2-Extension of Public Water Supply

Name: Engineering Costing Analysis for Focused Feasibility Study - Mottolo Superfund Site in Raymond, NH

Site: Areas 1, 2, 4, 5 & 6 **Location: Raymond, NH** **Phase: Feasibility Study** **Base Year Date: 2010** **Date: 6/22/10**	**Description: Extend Public Water Supply**

Year	Capital Cost	Periodic Cost	Total Cost	Discount Factor (7%)	Present Value
0	$4,009,612	$0	$4,009,612	1.000	$4,009,612
1	$0	$300,000	$300,000	0.935	$280,500
2	$0	$300,000	$300,000	0.873	$261,900
3	$0	$300,000	$300,000	0.816	$244,800
4	$0	$300,000	$300,000	0.763	$228,900
5	$0	$300,000	$300,000	0.713	$213,900
6	$0	$75,000	$75,000	0.666	$49,950
7	$0	$75,000	$75,000	0.623	$46,725
8	$0	$75,000	$75,000	0.582	$43,650
9	$0	$75,000	$75,000	0.544	$40,800
10	$0	$75,000	$75,000	0.508	$38,100
11	$0	$75,000	$75,000	0.475	$35,625
12	$0	$75,000	$75,000	0.444	$33,300
13	$0	$75,000	$75,000	0.415	$31,125
14	$0	$75,000	$75,000	0.388	$29,100
15	$0	$75,000	$75,000	0.362	$27,150
16	$0	$75,000	$75,000	0.339	$25,425
17	$0	$75,000	$75,000	0.317	$23,775
18	$0	$75,000	$75,000	0.296	$22,200
19	$0	$75,000	$75,000	0.277	$20,775
20	$0	$75,000	$75,000	0.258	$19,350
21	$0	$75,000	$75,000	0.242	$18,150
22	$0	$75,000	$75,000	0.226	$16,950
23	$0	$75,000	$75,000	0.211	$15,825
24	$0	$75,000	$75,000	0.197	$14,775
25	$0	$75,000	$75,000	0.184	$13,800
26	$0	$75,000	$75,000	0.172	$12,900
27	$0	$75,000	$75,000	0.161	$12,075
28	$0	$75,000	$75,000	0.15	$11,250
29	$0	$75,000	$75,000	0.141	$10,575
30	$0	$75,000	$75,000	0.131	$9,825
TOTAL					**$5,862,787**

PRESENT VALUE ANALYSIS

Alternative: GW-4-Installation of Community Well and Public Water Supply System

Name: Engineering Costing Analysis for Focused Feasibility Study - Mottolo Superfund Site in Raymond, NH

Site: Areas 1, 2, 4, 5 & 6
Location: Raymond, NH
Phase: Feasibility Study
Base Year Date: 2010
Date: 6/17/10

Description: Provide Community Well

Year	Capital Cost	Annual O&M Cost	Periodic Cost	Total Cost	Discount Factor (7%)	Present Value
0	$5,095,925	$0	$0	$5,095,925	1.000	$5,095,925
1	$0	$80,000	$300,000	$380,000	0.935	$355,300
2	$0	$80,000	$300,000	$380,000	0.873	$331,740
3	$0	$80,000	$300,000	$380,000	0.816	$310,080
4	$0	$80,000	$300,000	$380,000	0.763	$289,940
5	$0	$80,000	$300,000	$380,000	0.713	$270,940
6	$0	$80,000	$75,000	$155,000	0.666	$103,230
7	$0	$80,000	$75,000	$155,000	0.623	$96,565
8	$0	$80,000	$75,000	$155,000	0.582	$90,210
9	$0	$80,000	$75,000	$155,000	0.544	$84,320
10	$0	$80,000	$75,000	$155,000	0.508	$78,740
11	$0	$80,000	$75,000	$155,000	0.475	$73,625
12	$0	$80,000	$75,000	$155,000	0.444	$68,820
13	$0	$80,000	$75,000	$155,000	0.415	$64,325
14	$0	$80,000	$75,000	$155,000	0.388	$60,140
15	$0	$80,000	$75,000	$155,000	0.362	$56,110
16	$0	$80,000	$75,000	$155,000	0.339	$52,545
17	$0	$80,000	$75,000	$155,000	0.317	$49,135
18	$0	$80,000	$75,000	$155,000	0.296	$45,880
19	$0	$80,000	$75,000	$155,000	0.277	$42,935
20	$0	$80,000	$146,965	$226,965	0.258	$58,557
21	$0	$80,000	$75,000	$155,000	0.242	$37,510
22	$0	$80,000	$75,000	$155,000	0.226	$35,030
23	$0	$80,000	$75,000	$155,000	0.211	$32,705
24	$0	$80,000	$75,000	$155,000	0.197	$30,535
25	$0	$80,000	$75,000	$155,000	0.184	$28,520
26	$0	$80,000	$75,000	$155,000	0.172	$26,660
27	$0	$80,000	$75,000	$155,000	0.161	$24,955
28	$0	$80,000	$75,000	$155,000	0.15	$23,250
29	$0	$80,000	$75,000	$155,000	0.141	$21,855
30	$0	$80,000	$75,000	$155,000	0.131	$20,305
TOTAL						**$7,960,387**

PRESENT VALUE ANALYSIS

Alternative: GW-1-No Action

Name: Engineering Costing Analysis for Focused Feasibility Study - Mottolo Superfund Site in Raymond, NH

Site: Areas 1, 2, 3, 4, 5 and 6 **Location: Raymond, NH** **Phase: Feasibility Study** **Base Year Date: 2010** **Date: 6/17/10**	**Description: No Action Alternative includes residential well sampling**

Year	Capital Cost	Periodic Cost	Total Cost	Discount Factor (7%)	Present Value
0	$0	$0	$0	1.000	$0
1	$0	$300,000	$300,000	0.935	$280,500
2	$0	$300,000	$300,000	0.873	$261,900
3	$0	$300,000	$300,000	0.816	$244,800
4	$0	$300,000	$300,000	0.763	$228,900
5	$0	$300,000	$300,000	0.713	$213,900
6	$0	$75,000	$75,000	0.666	$49,950
7	$0	$75,000	$75,000	0.623	$46,725
8	$0	$75,000	$75,000	0.582	$43,650
9	$0	$75,000	$75,000	0.544	$40,800
10	$0	$75,000	$75,000	0.508	$38,100
11	$0	$75,000	$75,000	0.475	$35,625
12	$0	$75,000	$75,000	0.444	$33,300
13	$0	$75,000	$75,000	0.415	$31,125
14	$0	$75,000	$75,000	0.388	$29,100
15	$0	$75,000	$75,000	0.362	$27,150
16	$0	$75,000	$75,000	0.339	$25,425
17	$0	$75,000	$75,000	0.317	$23,775
18	$0	$75,000	$75,000	0.296	$22,200
19	$0	$75,000	$75,000	0.277	$20,775
20	$0	$75,000	$75,000	0.258	$19,350
21	$0	$75,000	$75,000	0.242	$18,150
22	$0	$75,000	$75,000	0.226	$16,950
23	$0	$75,000	$75,000	0.211	$15,825
24	$0	$75,000	$75,000	0.197	$14,775
25	$0	$75,000	$75,000	0.184	$13,800
26	$0	$75,000	$75,000	0.172	$12,900
27	$0	$75,000	$75,000	0.161	$12,075
28	$0	$75,000	$75,000	0.15	$11,250
29	$0	$75,000	$75,000	0.141	$10,575
30	$0	$75,000	$75,000	0.131	$9,825
TOTAL					**$1,853,175**

PRESENT VALUE ANALYSIS

Alternative: GW-2-Extension of Public Water

Name: Engineering Costing Analysis for Focused Feasibility Study - Mottolo Superfund Site in Raymond, NH

Site: Areas 1, 2, 3, 4, 5 and 6
Location: Raymond, NH
Phase: Feasibility Study
Base Year Date: 2010
Date: 6/22/10

Description: Extend Public Water Supply

Year	Capital Cost	Periodic Cost	Total Cost	Discount Factor (7%)	Present Value
0	$5,053,123	$0	$5,053,123	1.000	$5,053,123
1	$0	$300,000	$300,000	0.935	$280,500
2	$0	$300,000	$300,000	0.873	$261,900
3	$0	$300,000	$300,000	0.816	$244,800
4	$0	$300,000	$300,000	0.763	$228,900
5	$0	$300,000	$300,000	0.713	$213,900
6	$0	$75,000	$75,000	0.666	$49,950
7	$0	$75,000	$75,000	0.623	$46,725
8	$0	$75,000	$75,000	0.582	$43,650
9	$0	$75,000	$75,000	0.544	$40,800
10	$0	$75,000	$75,000	0.508	$38,100
11	$0	$75,000	$75,000	0.475	$35,625
12	$0	$75,000	$75,000	0.444	$33,300
13	$0	$75,000	$75,000	0.415	$31,125
14	$0	$75,000	$75,000	0.388	$29,100
15	$0	$75,000	$75,000	0.362	$27,150
16	$0	$75,000	$75,000	0.339	$25,425
17	$0	$75,000	$75,000	0.317	$23,775
18	$0	$75,000	$75,000	0.296	$22,200
19	$0	$75,000	$75,000	0.277	$20,775
20	$0	$75,000	$75,000	0.258	$19,350
21	$0	$75,000	$75,000	0.242	$18,150
22	$0	$75,000	$75,000	0.226	$16,950
23	$0	$75,000	$75,000	0.211	$15,825
24	$0	$75,000	$75,000	0.197	$14,775
25	$0	$75,000	$75,000	0.184	$13,800
26	$0	$75,000	$75,000	0.172	$12,900
27	$0	$75,000	$75,000	0.161	$12,075
28	$0	$75,000	$75,000	0.15	$11,250
29	$0	$75,000	$75,000	0.141	$10,575
30	$0	$75,000	$75,000	0.131	$9,825
TOTAL					**$6,906,298**

PRESENT VALUE ANALYSIS

Alternative: GW-4-Installation of Community Well Public Water Supply System

Name: Engineering Costing Analysis for Focused Feasibility Study - Mottolo Superfund Site in Raymond, NH

Site: Areas 1, 2, 3, 4, 5 and 6
Location: Raymond, NH
Phase: Feasibility Study
Base Year Date: 2010
Date: 6/17/10

Description: Provide Community Well

Year	Capital Cost	Annual O&M Cost	Periodic Cost	Total Cost	Discount Factor (7%)	Present Value
0	$6,053,636		$0	$6,053,636	1.000	$6,053,636
1	$0	$80,000	$300,000	$380,000	0.935	$355,300
2	$0	$80,000	$300,000	$380,000	0.873	$331,740
3	$0	$80,000	$300,000	$380,000	0.816	$310,080
4	$0	$80,000	$300,000	$380,000	0.763	$289,940
5	$0	$80,000	$300,000	$380,000	0.713	$270,940
6	$0	$80,000	$75,000	$155,000	0.666	$103,230
7	$0	$80,000	$75,000	$155,000	0.623	$96,565
8	$0	$80,000	$75,000	$155,000	0.582	$90,210
9	$0	$80,000	$75,000	$155,000	0.544	$84,320
10	$0	$80,000	$75,000	$155,000	0.508	$78,740
11	$0	$80,000	$75,000	$155,000	0.475	$73,625
12	$0	$80,000	$75,000	$155,000	0.444	$68,820
13	$0	$80,000	$75,000	$155,000	0.415	$64,325
14	$0	$80,000	$75,000	$155,000	0.388	$60,140
15	$0	$80,000	$75,000	$155,000	0.362	$56,110
16	$0	$80,000	$75,000	$155,000	0.339	$52,545
17	$0	$80,000	$75,000	$155,000	0.317	$49,135
18	$0	$80,000	$75,000	$155,000	0.296	$45,880
19	$0	$80,000	$75,000	$155,000	0.277	$42,935
20	$0	$80,000	$146,965	$226,965	0.258	$58,557
21	$0	$80,000	$75,000	$155,000	0.242	$37,510
22	$0	$80,000	$75,000	$155,000	0.226	$35,030
23	$0	$80,000	$75,000	$155,000	0.211	$32,705
24	$0	$80,000	$75,000	$155,000	0.197	$30,535
25	$0	$80,000	$75,000	$155,000	0.184	$28,520
26	$0	$80,000	$75,000	$155,000	0.172	$26,660
27	$0	$80,000	$75,000	$155,000	0.161	$24,955
28	$0	$80,000	$75,000	$155,000	0.15	$23,250
29	$0	$80,000	$75,000	$155,000	0.141	$21,855
30	$0	$80,000	$75,000	$155,000	0.131	$20,305
TOTAL						**$8,918,098**