Prepared for:
U.S. Army Corps of Engineers
New England District

FINAL DECISION DOCUMENT
FORMER ATLAS S-11 SITE
ELLENBURG, NEW YORK
FORMERLY USED DEFENSE SITE C02NY0216

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Prepared by:

The Johnson Company, Inc.
100 State Street, Suite 600
Montpelier, VT 05602

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PART 1: THE DECLARATION

1.1 SITE NAME AND LOCATION

The former Atlas S-11 Site (the Site) is located in Ellenburg, New York. The Site is a Formerly Used Defense Site (FUDS) (# C02NY0216), but is not listed on the National Priorities List (NPL).

1.2 STATEMENT OF BASIS AND PURPOSE

This Decision Document presents the final remedy selected for the Site, which was developed in accordance with the Comprehensive Environmental Response, Compensation and Liability Act of 1980 (CERCLA), as amended, 42 U.S.C. §§ 9601 et. seq. and the National Oil and Hazardous Substances Pollution Contingency Plan (NCP) as amended, 40 C.F.R. Part 300. This final decision for the Site is based on the Administrative Record which was developed in accordance with Section 113(k) of CERCLA and is available for public review at the Sara A. Munsil Free Library, 5139 Route 11, Ellenburg Depot, NY 12935, and the U.S. Army Corps of Engineers New England District Office, 696 Virginia Road, Concord, MA 01742-2751.

The District Commander for the United States Army Corps of Engineers, New England District (USACE) has been delegated the authority to approve this Decision Document. The lead regulatory agency for this Site is the New York State Department of Environmental Conservation (NYSDEC). The State of New York concurs with the selected remedy described herein.

1.3 DESCRIPTION OF SELECTED REMEDY

The final remedy selected by the USACE for the Site is No Action.

1.4 STATUTORY DETERMINATIONS

No remedial action is necessary at the Site to ensure protection of human health and the environment.

1.5 AUTHORIZING SIGNATURES

The selected remedy for the Site (No Action), is protective of human health and the environment, and is cost effective. This remedy does not satisfy the statutory preference for remedies that utilize treatment as a principal element to reduce the toxicity, mobility, or volume of hazardous substances; however, the hazardous substances present at the Site pose no unacceptable risk to human health and the environment.

Date	Charles P. Samaris Colonel, Corps of Engineers District Engineer

PART 2: THE DECISION SUMMARY

2.1 SITE NAME, LOCATION, AND DESCRIPTION

The former Atlas S-11 property (the Property) is located on Bull Run Road, approximately 1/4 mile north of Route 11 (Figure 1), in the hamlet of Ellenburg Depot, Town of Ellenburg, Clinton County, New York. The Site, for purposes of this Decision Document, includes the Property and an area to the southeast with groundwater impacted with contaminants originating from the Property.

2.2 SITE HISTORY AND REGULATORY REQUIREMENTS

2.2.1 Site History

The Department of Defense (DOD) acquired the Property in 1960 for an Atlas Intercontinental Ballistic Missile (ICBM) site. The Property was one of 12 in the region that formed the Plattsburg Atlas Missile Complex. Prior to this acquisition, the Property was used for agricultural purposes. This ICBM site was deactivated in 1965 and the Property was conveyed by the General Services Administration to the Town of Ellenburg in 1967. The Town used the Property for recreation and the Quonset huts on the Property for vehicle storage (Figure 2). The current owner of the Property is Leonard Casey, and the Property is currently used by a private business for storing architectural stone.

2.2.2 Prior Investigations and Studies

In 1988, the USACE contracted with Law Environmental, Inc. to conduct a preliminary investigation for the presence or absence of chemical contamination resulting from former DOD activities on the Property. Investigation activities included installing three groundwater monitoring wells and collecting samples from surface soil, groundwater, and missile silo water on the Property. The soil and water samples were analyzed for volatile organic compounds (VOCs), semivolatile organic compounds (SVOCs), and metals. Trichloroethene (TCE) was detected in one of the monitoring wells at a concentration of 6 micrograms per liter (µg/L), which exceeded the federal drinking water maximum contaminant level (MCL) of 5 µg/L. TCE was also detected at concentrations below 5 µg/L in another monitoring well and in water collected from the missile silo. TCE is a VOC that degrades slowly in the environment to form

breakdown products. One of these breakdown products, *cis*-1,2-dichloroethene (*cis*-1,2-DCE), was also detected in groundwater on the Property at concentrations less than its MCL of 70 µg/L.

In August 1990, a subsurface investigation was conducted by TWM Northeast, Inc. in Ellenburg Depot for the New York State Department of Environmental Conservation (NYSDEC). The subsurface investigation was conducted because VOCs were detected in water supply wells and springs in Ellenburg Depot by the NYSDEC. Five overburden wells and one bedrock well were installed and sampled for VOCs in Ellenburg Depot. The investigation did not detect VOCs in the overburden or bedrock monitoring wells, and the source of the VOCs in the water supply wells and springs was not identified.

In April 1991, a second subsurface investigation was conducted by TWM Northeast, Inc. for the NYSDEC. The investigation focused on potential sources of VOCs, including Northland Hides Processing, Inc. (Northland Hides) and the Site. The data collected during this investigation indicated that Northland Hides did not appear to be the source of the VOCs detected in wells and springs in the area. TCE and *cis*-1,2-DCE were detected in water samples collected from shallow bedrock monitoring wells and the former missile silo at the Site.

The USACE commissioned Weston Solutions, Inc. (Weston) to conduct a Remedial Investigation (RI) from 1998 through 2003 under the FUDS program, which included the following activities:

- Geophysical survey and soil test pit investigations;
- Passive soil gas survey (176 sample points) and soil sampling;
- Fracture trace analysis and bedrock core sampling;
- Groundwater monitoring well installations (eight wells);
- Monitoring well and water supply well sampling (six sampling rounds);
- Surface water and sediment sampling in the Great Chazy River;
- Former missile silo water vertical profile sampling (five discrete depth samples);
- Well packer test and heat pulse flow meter (HPFM) investigation; and
- Analysis for naturally occurring biodegradation of TCE in groundwater.

Following completion of RI activities, Weston presented the following conclusions in the RI report (Weston, 2005):

- Concentrations of VOCs detected in soil samples collected from the Property did not exceed the NYSDEC Technical and Administrative Guidance Memorandum (TAGM) criteria (NYSDEC, 1994);
- SVOCs detected at concentrations exceeding TAGM criteria in soil samples were attributed to the presence of asphalt in the soil;
- Metals concentrations detected in soil samples represented naturally occurring background levels;
- Former DOD activities at the Site may be the source of TCE in groundwater, but no distinct point source remains at the Site;
- TCE was not detected in groundwater samples at concentrations exceeding the MCL, except at MW-01, where TCE was detected once in an initial groundwater sample at 5.7 μg/L in November 2000, slightly exceeding the MCL of 5 μg/L;
- Based on the conceptual site model (CSM) and HPFM data, groundwater likely discharges into the Great Chazy River;
- Based on sediment and surface water sampling results, no impacts to the Great Chazy River from groundwater discharges were documented; and
- The observed decline of TCE concentrations over time in groundwater at the Site is likely the result of dilution, dispersion, and limited biodegradation.

Following completion of the RI, the USACE commissioned Weston and then The Johnson Company (JCO) to implement long-term groundwater monitoring at the Site under the FUDS program. The long-term groundwater monitoring program consisted of six individual groundwater monitoring events completed from 2006 through 2008. The groundwater monitoring network included one of the groundwater monitoring wells installed during the RI (MW-3) and five potable wells in nearby Ellenburg Depot (PW-24, PW-35, PW-68, PW-80 and PW-118). Groundwater concentrations detected during the long-term groundwater monitoring program were all less than one-half of the applicable MCLs. The locations of the long-term groundwater monitoring wells are shown on Figure 3.

Groundwater sampling results indicate that the Property appears to be the source of TCE in the aquifer, but a specific point source was not established. Based on the evidence presented in the RI it is believed that there is no distinguishable point source on or near the surface of the Property (Weston, 2005). Groundwater sampling results also showed detections of a TCE breakdown product (*cis*-l,2-DCE), which supports the supposition that natural attenuation is likely occurring and TCE may continue to decrease over time through the natural attenuation process (Weston, 2005).

TCE was not detected in groundwater samples at concentrations exceeding the MCL during either the homeowner well sampling program (conducted from December 1998 to September 1999) or the RI groundwater investigations (conducted from November 2000 to September 2003), with the exception of one sample collected during the first round of sampling from MW-01, located on the Property (Weston, 2005). This well, MW-01, and MW-02 were installed to a depth of 200 feet below ground surface (bgs) during the RI in 2000. The monitoring well MW-01 was installed near the missile silo to a depth of 200 feet bgs, which corresponded to the depth of the missile silo (175 feet bgs). The monitoring well MW-02 was installed in Ellenburg Depot at a location that is downgradient of the Property and MW-01. The location of MW-02 was selected to determine the location of water bearing fractures and contaminated intervals, and to help determine if there was a deeper transport zone contaminated with VOCs. During the first sampling round, groundwater in MW-01 contained a TCE concentration (5.6 μg/L, duplicate sample 5.7 μg/L), marginally exceeding its MCL of 5 μg/L. Subsequent concentrations detected at that location ranged from 1.6 μg/L to 4.9 μg/L, which are below the MCL, and concentrations appeared to have decreased over time (Weston, 2005).

The USACE conducted a Baseline Human Health Risk Assessment (HHRA) for the Site in 2009 (USACE, 2009), which estimated the potential current and future risks to human health from exposure to VOCs associated with former DOD activities at the Site. The HHRA estimated carcinogenic risk and non-carcinogenic hazards associated with potential exposure to VOCs in groundwater due to vapor intrusion and household use of groundwater. Based on the calculated potential risks in the HHRA, concentrations of VOCs in groundwater at the Site pose no

unacceptable risks to human health. Since the RI concluded that contaminated groundwater was not impacting surface water or sediments, an ecological risk assessment was not conducted for the Site.

In accordance with Section 3.4.2.2 of USEPA RI/FS Guidance (USEPA, 1988), a Feasibility Study (FS) is not required if the HHRA indicates the Site poses little or no risk to human health or the environment. In these cases, such as the former Atlas S-11 Site, the RI and HHRA can be used to document a No Action decision. Although a FS was not necessary for the Site, the USACE decided to voluntarily conduct an FS to provide additional documentation for selection of an appropriate remedial alternative. The FS was prepared by JCO in 2010 to evaluate the potential remedial actions for the Site. Because unacceptable human health risks are not present at the Site, the FS only evaluated options that do not require active remediation. The FS evaluated the following four remedial alternatives (JCO, 2010a):

Alternative 1 – No Action;

Alternative 2 – Institutional Controls (deed restriction on the Property);

Alternative 3 – Additional Long-Term Groundwater Monitoring (annual groundwater sampling for 5 years); and

Alternative 4 – Institutional Controls and Additional Long-Term Groundwater Monitoring (Alternatives 2 and 3 combined).

All four of the alternatives compared favorably and fairly similarly against the evaluation criteria. The largest differences were the costs associated with each alternative. Alternative 1 (No Action) was selected as the Site remedy and had the least cost, i.e. no cost, while the other alternatives, which included long-term monitoring and site review reports, had markedly higher costs. None of the alternatives evaluated in the FS required active groundwater treatment, because detected concentrations of VOCs were below MCLs and were being degraded further by limited natural attenuation, which reduces contaminant toxicity, mobility and/or volume. Although none of the alternatives included active groundwater treatment, all four of the alternatives are effective, compliant, and protective of human health.

2.2.3 Regulatory Background

The DOD has the responsibility to remediate former DOD facilities under the Defense Environmental Restoration Program (DERP) for FUDS and, therefore, is responsible for site investigation and remediation activities at the Site. The goal of the USACE is to achieve regulatory closure for the Site. FUDS program policy (USACE, 2004) requires USACE to:

- Comply with the DERP Statute (10 USC 2701 et seq.) and CERCLA, Executive Orders 12580 and 13016, the NCP, DERP guidance, and Army policies for the FUDS program;
- Coordinate with the lead regulator, which is the NYSDEC;
- Conduct a remedial investigation with a baseline risk assessment to evaluate the need for remediation; and
- In a response action, attain standards and meet requirements that are consistent with CERCLA and NCP processes and criteria.

Site investigation and remediation activities must follow federal laws, guidance, and methods. Substantive requirements provided by the state may be determined to be applicable or relevant and appropriate requirements (ARARs). The NYSDEC has participated by providing regulatory oversight of the FUDS investigation. Although NYSDEC has no regulatory authority under the federal program, USACE seeks the involvement and consensus of the state, but does not require it. It is the policy of the USACE to uphold federal laws assuring that activities conducted at the Site are protective of human health and the environment, and meet other substantive requirements that are determined to be ARARs.

The RI and FS were conducted under the DERP for FUDS**,** and performed in accordance with the CERCLA and NCP, including United States Environmental Protection Agency (USEPA) RI/FS Guidance (USEPA, 1988) and pursuant to USACE ER 200-3-1 (USACE, 2004). Since the HHRA indicated that the Site poses no unacceptable risk to human health, an abbreviated FS was prepared in accordance with Section 3.4.2.2 of the USEPA RI/FS Guidance document (USEPA, 1988).

2.3 COMMUNITY PARTICIPATION

The first public meetings for the Site were conducted by USACE on October 28, 1998. An afternoon and an evening meeting were held, and each meeting was preceded by a poster session, which allowed for informal discussions about the Site with community members. In addition to the USACE Project Manager and environmental consultant, these meetings were attended by two representatives from the NYSDEC, the Project Manager from the New York State Department of Health (NYSDOH), and a toxicologist from the federal Agency for Toxic Substances and Disease Registry (ATSDR). At these meetings, the USACE stated that a Restoration Advisory Board (RAB) would be established if there was sufficient community interest.

A RAB was formed following these initial meetings, and the first RAB meeting was held in March 1999. The RAB initially was comprised of eleven community members and representatives of the Clinton County Health Department. Representatives from USACE and NYSDEC also attended the RAB meetings. The RAB meetings were open to the public and advance notice for each meeting was published in the local newspaper. Eleven RAB meetings were held between 1999 and 2003, during which the results of the on-going RI were presented. Opportunities for the public to ask questions about the Site were provided during all of the RAB meetings. An informational newsletter was initiated, and ten issues were published and distributed to a mailing list of interested parties between 1999 and 2003. Minutes from the RAB meetings and copies of the newsletters are retained in the Administrative Record.

Three additional public meetings were held subsequent to the initial public meeting and formation of the RAB. The second public information meeting was held in March 1999 concurrent with the first RAB meeting and a third public information meeting was held in September 1999. The most recent public meeting was held in November 2010 to present the Proposed Plan (JCO, 2010b) and solicit public comments on the USACE preferred remedial alternative of No Action. Notice of each public meeting was published in advance in the *Press*

Republican, Plattsburgh, New York. A detailed presentation of the public comments received on the Proposed Plan is included in Part 3 of this Decision Document.

2.4 SCOPE OF REMEDIAL RESPONSE ACTION

The final remedy presented in this Decision Document was selected by the USACE for the entire Site, which includes the Property and the area to the southeast of the Property where groundwater is impacted with VOCs originating from the Property.

2.5 SUMMARY OF SITE CHARACTERISTICS

2.5.1 Physical Setting

The Site includes approximately 15 acres of open land surrounded by woods and some agricultural fields (Figure 1). The Site contains a single former missile silo that is approximately 70 feet in diameter, 175 feet deep, and is covered by reinforced concrete doors that are flush with the ground surface. Other visible structures at the Site include two Quonset buildings (each approximately 40 by 100 feet), two smaller storage buildings, and a concrete entrance stairwell that was used for access to the underground missile control facilities (Figure 2). This stairwell is flooded to a depth of approximately 20 feet bgs. An inner 8-foot-high, chain-link fence and an outer 3-foot-high, barbed-wire fence surround the central area of the Site. A private business currently uses a portion of the Site as a storage area for pallets of architectural stone.

The hamlet of Ellenburg Depot is located southeast of the Site, along U.S. Route 11 and the Great Chazy River (See Figure 2). The area between the Site and Ellenburg Depot consists primarily of wooded areas, with some agricultural fields at the edge of Ellenburg Depot. A review of NYSDEC environmental resource information did not indicate any rare, threatened or endangered species, or significant natural areas in the vicinity of the Site.

2.5.2 Surface Water and Wetlands

The Site does not contain surface waters or wetlands. An unnamed stream is present southeast of the Site and flows south through Ellenburg Depot into the Great Chazy River. Brandy Brook is located north of the Site. Significant wetlands mapped on the National Wetland

Inventory (NWI) Map and State of New York Wetlands Map are located north of the Site, contiguous with Brandy Brook. Three mapped wetlands are also located south and southeast of the Site, two of which appear to be contiguous with the unnamed stream mentioned above. The third wetland is contiguous with the Great Chazy River to the south of the Site. These mapped wetlands are designated as Class 2 wetlands by NYSDEC.

2.5.3 Geology and Hydrogeology

The geology of Ellenburg Depot and most of the surrounding area consists of glacial till overburden, which is underlain by a fractured sandstone formation. The glacial till layer is typically 10 to 50 feet thick (Weston, 2005). The sandstone formation typically consists of quartz sandstone, as well as arkose and shale.

The groundwater flow direction is toward the south/southeast in the bedrock based on water levels in groundwater monitoring wells at the Site (Weston, 2005). Well records obtained from the NYSDOH indicate that water supply wells in Ellenburg Depot range in depth from 16 to 232 feet bgs, with casing depths from 11 to 39 feet bgs. Based on construction information for 49 wells, the average well depth in Ellenburg Depot is approximately 75 feet bgs. Well yields reportedly range from 6 to 20 gallons per minute.

Fracture trace analysis and observations of sandstone outcrops in the vicinity of the Site indicate that a well-developed fracture system exists in the bedrock in the area (Weston, 2005). The principal fracture plane orientations are north-northwest to south-southeast, east-northeast to west-southwest and northwest to southeast. These observed bedrock fracture systems likely affect the groundwater flow regime at the Site. While the north to south trending fractures represent the shortest and most direct pathway to the local discharge zone (Great Chazy River), the generally east to west trending fractures induce cross-gradient flow, resulting in an easterly displaced contaminant plume (Weston, 2005). This is generally consistent with the observed distribution of VOCs in groundwater at the Site and in Ellenburg Depot.

2.5.4 Nature and Extent of Contamination

Groundwater

Groundwater is the primary media of concern at the Site. Groundwater sampling was conducted at the Site from 1988 to 2008 and included analysis for VOCs, SVOCs, and metals. Thallium was detected at concentrations exceeding the MCL; however, this metal is naturally occurring in the bedrock at the Site. Iron and manganese, which do not have health-based MCLs, were detected at levels that exceed their secondary standards (aesthetic-based MCLs), but these compounds are also naturally occurring in the bedrock at the Site. Sodium, which does not currently have an MCL, was detected at apparently elevated concentrations in monitoring well samples, but this is believed to be the result of road deicing (Weston, 2005). Although petroleum-related compounds, 1,2-dichloroethane, and tetrachloroethene were detected in a few wells in Ellenburg Depot, these contaminants are not related to DOD activities at the Site (Weston, 2005).

TCE and the associated breakdown product *cis*-1,2-DCE were detected in groundwater samples collected from shallow groundwater wells at the Site. However, the detected concentrations of TCE and *cis*-1,2-DCE were less than their respective MCLs, except TCE in a groundwater sample collected in 1988 and another sample collected in 2000. TCE was detected in a sample collected from one monitoring well on the Property at a concentration of 6 µg/L in 1988, and at 5.6 µg/L (5.7 µg/L in the associated duplicate sample) in a sample collected from MW-01 in November 2000. Concentrations of TCE detected in all other samples collected from MW-01 and other monitoring wells at the Site since 2000 were less than the MCL. Concentrations of TCE and *cis*-1,2-DCE detected in samples collected from wells in Ellenburg Depot from 2000 to 2008 were less than the MCLs.

Soil

Soil samples collected from the Site were analyzed for metals, VOCs, and SVOCs. The concentrations of VOCs did not exceed NYSDEC TAGM criteria (Weston, 2005). Only one soil sample had SVOCs concentrations that exceeded NYSDEC TAGM criteria. This SVOC exceedance was in a soil sample collected from test pit TP-1 at a depth of 4.0 to 4.5 feet bgs

where asphalt, which is known to contain SVOCs, was present in the trench soil (Weston, 2005). The concentrations of metals detected in soil samples collected from the Site exceed the NYSDEC TAGM criteria; however, these concentrations represent naturally occurring background levels (Weston, 2005).

Sediment and Surface Water

Sediment and surface water samples were collected from the Great Chazy River to the southeast of the Site and the samples were analyzed for VOCs. VOCs were not detected in these sediment and surface water samples. Based on the relatively low concentrations of VOCs detected in groundwater samples collected from potable wells near the Great Chazy River and the absence of VOC detections in sediment and surface water samples, it is unlikely groundwater discharges are impacting the Great Chazy River (Weston, 2005).

2.6 CURRENT AND POTENTIAL FUTURE SITE AND RESOURCE USES

The current land use at the Site includes commercial use at the Property, agricultural use of the open land between the Property and the hamlet of Ellenburg Depot, and mixed commercial and residential use in Ellenburg Depot. Groundwater is used for potable water at the Site, which includes the Property and nearby residences and businesses in Ellenburg Depot. These current land and resource uses are also anticipated to be the likely future uses at the Site.

2.7 SITE RISKS

A HHRA was conducted for the Site to evaluate potential risks to human health from VOCs in groundwater at the Site (USACE, 2009). Since the RI concluded that contaminated groundwater was not impacting surface water or sediments, an ecological risk assessment was not conducted for the Site. The HHRA estimates potential risks to human health if no remedial action is taken at the Site. It provides the basis for taking action and identifies the contaminants and exposure pathways that need to be addressed by the remedial action. This section of the Decision Document summarizes the results of the HHRA for the Site.

2.7.1 Identification of Chemicals of Concern

Several years of groundwater sampling at the Site identified the following compounds of potential concern (COPCs) in groundwater for the HHRA: chloroform, *cis*-1,2-DCE, TCE, toluene, and xylene. The HHRA used the most recent (2006 through 2008) concentrations of COPCs detected in samples collected from the six long-term groundwater monitoring wells. These most recent data were selected, because they are most representative of current concentrations in groundwater at the Site. All data were determined to be acceptable following strict validation protocols, which qualified the data as acceptable for use in the HHRA.

2.7.2 Exposure Assessment

Based on the CSM, COPCs in groundwater at the Site are migrating from the Property toward groundwater wells in Ellenburg Depot, which is located downgradient of the Property. The exposure assessment considered soil vapor intrusion and residential use of groundwater wells at the Site. Residential use of groundwater wells includes exposure to groundwater by ingestion, dermal contact, and inhalation (household water use). The inhalation exposure considered inhalation of COPCs during showering and soil vapor intrusion from contaminated groundwater. The vapor intrusion exposure pathway was evaluated for COPCs in groundwater using the Johnson & Ettinger model, provided by the USEPA.

Although exposure point concentrations (EPCs) used in a HHRA are typically an estimate of the average concentrations (i.e., to represent average exposures across the Site and over time), the HHRA for the Site used the maximum detected concentration for each COPC, regardless of the actual well location. This conservative approach creates a hypothetical location where groundwater has all of the maximum COPC concentrations that were detected at different well locations across the Site. If risks for this hypothetical location are acceptable, then the risks for each of the individual wells would be acceptable and risks based on average COPC concentrations at the Site also would be acceptable. The following concentrations of the COPCs were used in the HHRA: 1.1 μg/L chloroform; 0.78 μg/L *cis*-1,2-DCE; 2.1 μg/L TCE; 0.5 μg/L toluene; and 0.5 μg/L total xylenes.

2.7.3 Toxicity Assessment

The toxicity assessment considered the toxicity of each COPC, the probable exposure dose, and the health effects that could result from exposure to the COPCs. The HHRA evaluated both carcinogenic and non-carcinogenic effects for exposure to COPCs at the Site. Carcinogenic health effects were assumed to be cumulative over a lifetime of exposure, without a lower limit or threshold of effect. Non-carcinogenic health effects were assumed to be effective over the duration of exposure, with a lower limit or threshold below which the adverse effect is not expressed.

The USEPA has developed Reference Doses (RfDs) and Reference Concentrations (RfCs) for chronic and subchronic exposures to non-carcinogens. The RfD is intended to provide a reasonable estimate of the threshold at which human health effects are expected to occur over time, up to a lifetime of exposure. Inhalation of vapor (from household water) was considered for COPCs that are sufficiently volatile (USEPA, 2001). A Hazard Quotient (HQ), or total Hazard Index (HI) is used to evaluate noncarcinogenic risks associated with potential exposure to COPCs at the Site.

The USEPA assumes that carcinogenic dose-response is linear at low doses, and the numerical estimate for oral exposures is referred to as the cancer slope factor (CSF). The CSF is an estimate of the upper-bound excess lifetime cancer risk from daily exposure to a COPC at a unit dose. For inhalation exposures, the numerical estimate is expressed as the unit risk (UR), which represents an upper-bound excess lifetime cancer risk estimate for continuous exposure to a unit concentration of a COPC in air (USEPA, 2005). An Excess Lifetime Carcinogenic Risk (ELCR) is used to evaluate carcinogenic risks associated with potential exposure to COPCs at the Site.

2.7.4 Risk Characterization

A detailed presentation of risk characterization for the Site is included in the HHRA (Appendix A of the FS) (JCO, 2010a). The risk characterization combined information from the exposure and toxicity assessments to derive estimates of the magnitude or likelihood of adverse

health effects from exposure to COPCs at the Site. The risk characterization in the HHRA evaluated cancer risks associated with carcinogenic COPCs and non-cancer health effects associated with non-carcinogenic COPCs.

Carcinogenic risks associated with a COPC was expressed as the ELCR, which is the extra risk of developing cancer from contact with a COPC at the Site during a lifetime, that is in addition to the risk of developing cancer from all other sources at the Site. A cumulative ELCR was calculated by summing the individual pathway ELCRs to estimate the combined cancer risks associated with exposure to all COPCs from all exposure routes for a residential receptor at the Site. Under the federal NCP for hazardous waste sites, the generally acceptable risk range for site-related exposures is from $1x10^{-4}$ to $1x10^{-6}$ (one in 10,000 to one in a million), and an ELCR less than $1x10^{-6}$ (one in a million) is considered *de minimus* (minimal). Therefore, hazardous waste sites with an ELCR less than $1x10^{-4}$ generally do not require remedial action.

Non-carcinogenic risk associated with a COPC was evaluated using a ratio of the exposure dose to the toxic reference dose (RfD). This ratio of exposure dose to RfD is referred to as the HQ, and the sum of all HQs is referred to as the HI. An HQ less than 1 indicates that non-carcinogenic health effects are unlikely to result from exposure to that COPC at the Site. An HI less than 1 indicates that non-carcinogenic health effects are unlikely to result from exposure to all COPCs from all exposure routes for a residential receptor at the Site.

The HHRA calculated the excess cancer risk and non-carcinogenic hazard quotient for vapor intrusion at the Site to be approximately $1x10^{-6}$ and 0.001, respectively. The HHRA estimated the total risk for exposure from household use of groundwater at the Site to be approximately:

- $7x10^{-7}$ (seven in ten million) for age-adjusted excess cancer risk;
- 0.02 non-carcinogenic hazard quotient for a child; and
- 0.008 non-carcinogenic hazard quotient for an adult.

Based on the HHRA (assuming conservative exposure assumptions), concentrations of COPCs in groundwater at the Site pose no unacceptable risk to human health. Therefore, no remedial action is necessary at the Site to ensure protection of human health and the environment.

Uncertainty is inherent in all risk estimates due to the combined effect of uncertainties introduced by field sample efforts, laboratory measurements, toxicity studies (typically conducted with animals), derivation of toxicity values for humans, and assumptions made in the exposure assessment. At the Site, the primary concern with respect to uncertainty is the magnitude of the risk estimates for the community. In the HHRA, an effort was made to provide risk estimates that over-predict actual exposures at the Site. As a result of this approach, the uncertainties are such that the actual risks at the Site are likely to be lower than those estimated in the HHRA.

2.8 DOCUMENTATION OF SIGNIFICANT CHANGES

The Proposed Plan identified Alternative 1, No Action, as the Preferred Alternative for the Site (JCO, 2010b). The Proposed Plan for the Site was released for public comment on November 27, 2010, and the USACE reviewed all comments received during the public comment period. It was determined that no significant change to the remedy, as originally identified in the Proposed Plan, was necessary or appropriate for the Site.

PART 3: THE RESPONSIVENESS SUMMARY

3.1 INTRODUCTION

On November 27, 2010, the USACE published notice of a public meeting and a public comment period regarding the Proposed Plan for the former Atlas S-11 Site located in Ellenburg Depot, New York (the Site). The public comment period began on November 29, 2010 and ended on January 3, 2011. The public meeting was held at the North Adirondack High School Auditorium on November 30, 2010. The Corps received several verbal comments during the public meeting, but did not receive any written comments from citizens during the public comment period. This Responsiveness Summary presents the comments received from citizens during the public meeting and the USACE responses to these comments.

3.2 PUBLIC MEETING OVERVIEW

The public meeting was called to order at 6:00 PM by Todd Hall from JCO, followed with an introduction by Jim Kelly, the Project Manager from the USACE. The nine attendees were presented with printed handouts of the Proposed Plan and copies of slides from a PowerPoint presentation. Two large poster boards were displayed on easels near the front of the auditorium for easier viewing and reference by the attendees. Todd Hall presented a summary of the Proposed Plan with the PowerPoint presentation from 6:06 to 6:24 PM. Following the presentation, Jim Kelly opened the floor to questions from the attendees. After all questions from the attendees were addressed by the USACE, Jim Kelly provided a brief summary of the anticipated next steps for the Site. The meeting was then adjourned at 6:56 PM.

The tone of the meeting was informal and the USACE representatives attempted to have attendees move forward toward the front of the large auditorium, where the poster boards and a collection of Site documents were available for review and consultation. The attendees declined and instead, the USACE representatives advanced up into the aisles to get closer to individuals and obviate the need for microphones.

3.3 SUMMARY OF COMMENTS AND RESPONSES

Curtis DeCoste: *In which well was TCE reported at concentrations above the MC) at 5.6/5.7 µg/L and is it still present or did it dissipate?*

> **Response:** Mr. DeCoste was directed to the poster board where the locations were shown for most of the wells monitored throughout the RI. The well in question (MW-01) was located and pointed out to Mr. DeCoste. Additionally, the specific data for MW-01 was obtained from the available RI report. The data indicated that there is no TCE source that remains at the Site.

Curtis DeCoste: *How deep was the well?*

> **Response:** The RI found no further indication of a TCE source in any wells or other samples (including stream water and sediment samples) subsequent to the initial exceedances of TCE in the study area. While there were some low level detections in a small number of samples, there was no compelling evidence that any TCE source remains at the Site. The well in question (MW-01) is an open bedrock monitoring well drilled 200 feet deep and the MCL exceedance in question was observed during the first sampling round from a sample collected from the bottom of the borehole.

Roger Stinger: *Did the (monitoring) wells go 200 feet deep?*

> **Response:** Not many. Some did, but generally wells were completed in the shallower horizons within the subsurface.

Roger Stinger: *What was the time lapse between when the DOD transferred ownership of the Property until the start of the investigation?*

> **Response:** DOD used the property between 1960 and 1967. The NYSDEC sampled several sites/properties in 1989; the USACE began their investigation in 1988 (referring to the confirmation study completed by Law Environmental, Inc.).

Roger Stinger: *Was the investigation triggered in response to concerns from citizens, the State, or a possible local outbreak of cancer?*

> **Response:** The Corps was authorized through Congressional action in the SARA legislation in 1986 to investigate FUDS properties. This triggered a national effort by the USACE to identify FUDS properties and establish if there were residual contaminants at these properties, even though most of these properties were no longer in DOD control/ownership. The Property was one of these many properties identified and subsequently investigated by the USACE.

Margaret (Peggy) Hogan: *How independent are the results, given that this was a site owned/controlled by the DOD and the USACE did the investigation?*

Response: Multiple agencies and contracted environmental consulting companies were involved with the various sampling events, during which "blind" and duplicate samples were collected during most of these sampling events. The blind samples were sent to different independent laboratories to ensure the contracted laboratory was accurately measuring what was in the collected samples.

The USACE contractor activities:

- 1988 – Law Environmental, Inc.: confirmation study at the Property.
- 1998-2003 – Weston Solutions, Inc.: CERCLA RI, including quarterly sampling of residential wells in Ellenburg Depot. Samples were analyzed by Severn Trent Laboratories.
- 2006-2008 – The Johnson Company: bi-annual sampling of monitoring and residential wells. Samples were analyzed by Severn Trent Laboratories.

NYSDEC contractor activities:

- 1989 onwards – sampling of residential wells within Ellenburg Depot and the surrounding area. Samples were analyzed by an independently-selected laboratory.
- 1990 – TWM Northeast, Inc.: subsurface investigation in Ellenburg Depot. Samples were analyzed by an independently-selected laboratory.
- 1991 – TWM Northeast, Inc.: subsurface investigation at the Property and other local industrial sites. Samples were analyzed by an independently-selected laboratory.

The results of the USACE and NYSDEC collected samples were similar. All results were shared between the two agencies and were presented in project reports that are available at the local library, which is the repository for the local community review and comment.

Curtis DeCoste: *What is the CERCLA?*

Response: CERCLA is an acronym for Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) and is a law enacted by Congress to enact standards, authority, and protocols for addressing hazardous materials/wastes at contaminated sites within the U.S. More detailed cleanup protocols and processes were

subsequently defined and/or established by the USEPA and other entities (including the USACE and State environmental agencies). The USACE protocols followed for this FUDS investigation are very similar to those promulgated by the USEPA. The USACE chose to complete a FS and Decision Document for the Site, which are not required under USEPA regulations. The USACE ultimately requires these documents to capture the public involvement when determining the final remedy for the Site.

Margaret (Peggy) Hogan: *What is the provision for a "surprise" five years down the road?*

Response: The CERCLA process allows for the revalidation of a site, should conditions change. Currently, risk levels are well below regulatory guidelines.

Woman and Husband (who had a NYSDEC system to treat water): *Any chance of impact to our wells downgradient (of the location where the exceedance was measured)?*

Response: There is no evidence that there is a discrete source of contaminants remaining in the aquifer at the Site, based on several consecutive years of analytical results. The majority of the collected samples focused on groundwater that occurs within the more productive horizons of the near surface aquifer. This near surface aquifer is primarily the universal source that is being tapped by residences for personal and residential use in the vicinity of the Site.

Roger Stinger: *Stated that he felt all his questions were answered, he offered praise, and he was satisfied that a concerted effort was made to establish there was no concern for the unrestricted use of groundwater.*

PART 4: REFERENCES

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USEPA, 2001. *Risk Assessment Guidance for Superfund, Volume I: Human Health Environmental Evaluation Manual (Part D, Standardized Planning, Reporting, and Review of Superfund Risk Assessments). Final.* U.S. Environmental Protection Agency Publication 9285.7-47, December 2001.

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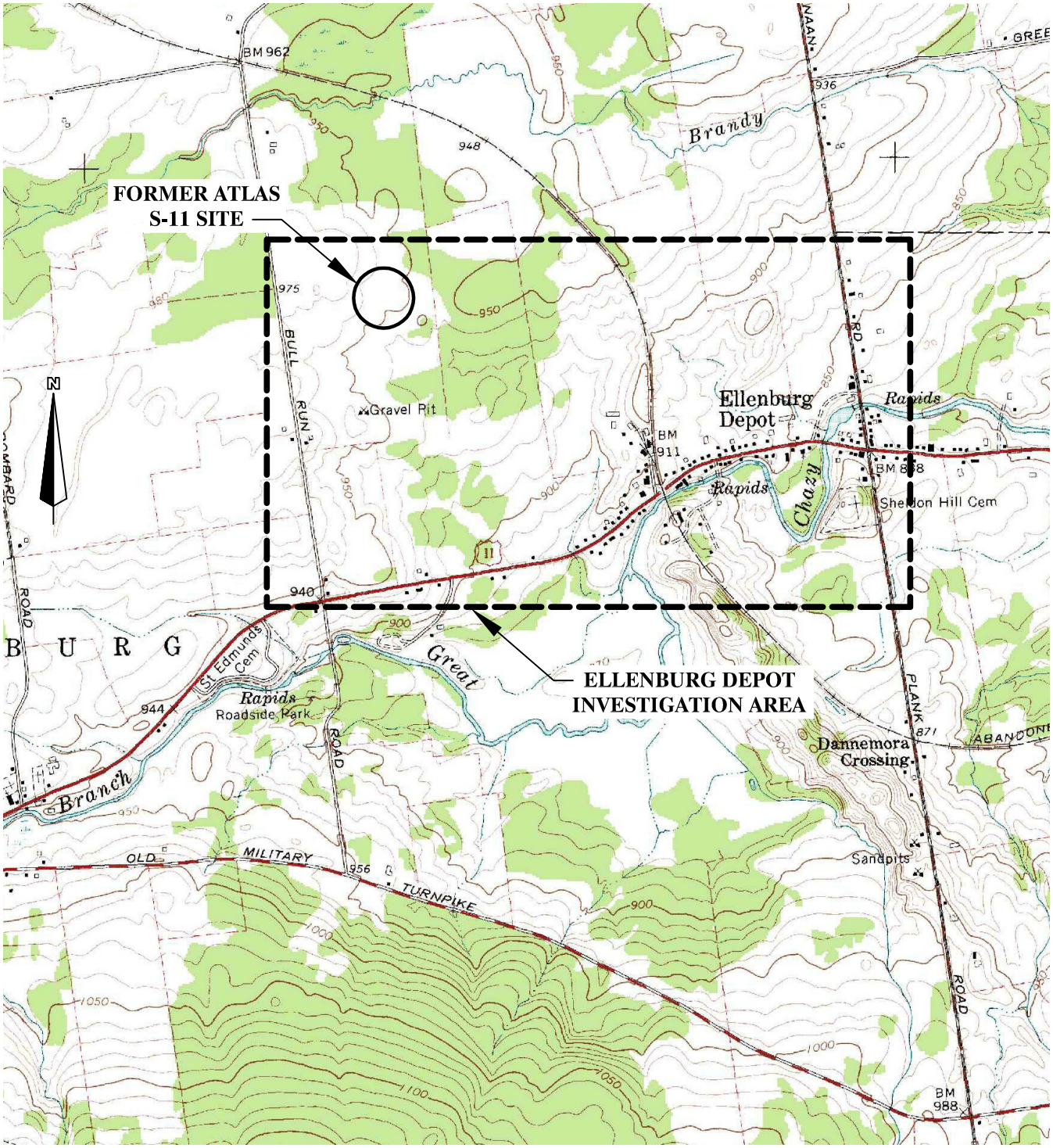
FIGURES

K:\1-2128-5\GIS\Location Map.dwg



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1 0.5 0 1

MILES

1000 0 1000 2000 3000 4000 5000 6000 7000 8000 9000 10000

FEET

QUADRANGLE LOCATION

Source: 1964 USGS 7.5' Ellenburg Depot, N.Y.

FIGURE 1: LOCATION MAP
FORMER ATLAS S-11 SITE
ELLENBURG, NEW YORK

The Johnson Company

100 State Street, Suite 600
Montpelier, VT 05602

Drawn by: TJK	Date: 06/06/11
Chk'd by: TAH	Date: 06/09/11
Scale: As Shown	Project: 1-2128-5

MISSILE SITE ROAD

LIQUID NITROGEN FILL STAND WITH MANHOLE TO SHAFT (AT LEAST 15' TO 20' DEEP)

BUILDINGS (FORMER PUMP HOUSES)

OUTHOUSE

MW-1105

MW-1106

PUMP

METAL FRAMES

TETRACHLOROETHENE DRUM

DRAINAGE PATHWAYS

COVERED STAIRWAY (LAUNCH CONTROL ENTRANCE)

LOW VEGETATION

CONCRETE PAD WITH METAL PLATE (BOLTED)

OLD EQUIPMENT

MANHOLE

VENT

PROPANE TANKS

MW-01

MW-1104

5'X8' CONCRETE PAD

CONCRETE BLOCKS

PORTS (BRASS)

METAL PLATES

4'x4' PAD (CONCRETE)

STEEL GRATE

VENT

ROCK STOCKPILE

AST: 6' x 3' Diamter

HEAVY VEGETATION

SILO (CONCRETE)

LOW VEGETATION

VENT

MW-1103

4'x6' PAD (CONCRETE)

SHAFT

SLOPE

QUONSET HUTS

AST: 9' x 4' Diameter

SILO DOORS

SMALL WOOD POST

SLOPE

REPORTED SILO DISCHARGE DRAIN LOCATION (NOT FOUND)

HEAVY VEGETATION

MW-1101

4'x6'x7' PIT

PIPE

DRAINAGE PATHWAY

MW-1102

ROCK STOCKPILES

LOW VEGETATION

OLD EQUIPMENT

FILL AREA

PROPERTY LINE

ohe

LEGEND

GROUNDWATER MONITORING WELL LOCATION

DRAINAGE PATHWAY

FENCE

ROCK STOCKPILE

VEGETATION

N

0 25 50 75

SCALE IN FEET

HISTORICALLY DISTURBED AREA

SOURCE: WESTON SOLUTIONS, INC. SITE MAP DATED 12-10-04.

GIS\Site Map.dwg

FIGURE 2
CURRENT PROPERTY FEATURES
FORMER ATLAS S-11 SITE
ELLENBURG, NEW YORK

THE JOHNSON COMPANY, INC.
Environmental Sciences and Engineering
100 STATE STREET MONTPELIER, VT 05602

DATE: 08/25/11 DRAWN BY: TJK PROJECT: 1-2128-5 SCALE: SHOWN

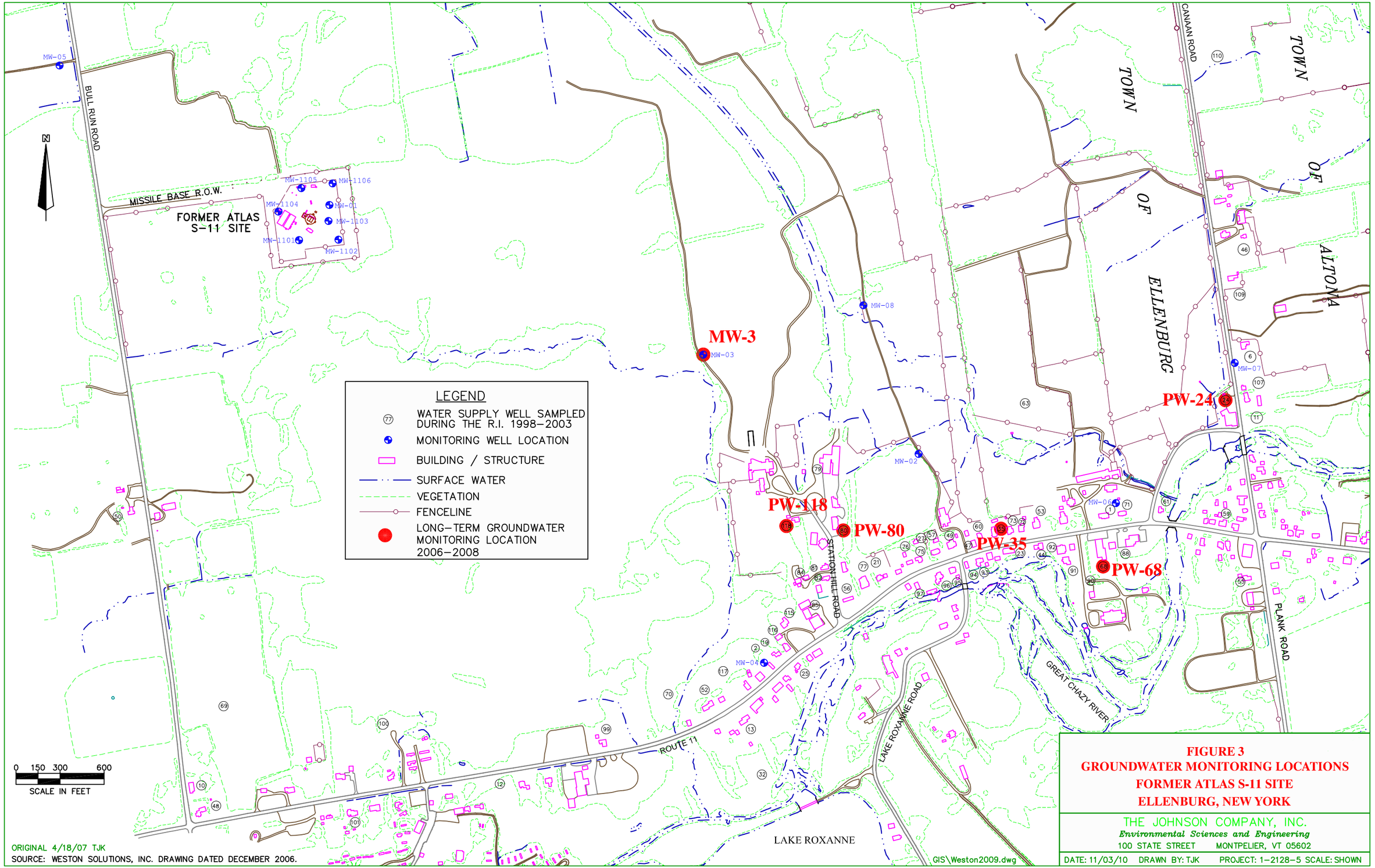

FIGURE 3
GROUNDWATER MONITORING LOCATIONS
FORMER ATLAS S-11 SITE
ELLENBURG, NEW YORK

THE JOHNSON COMPANY, INC.
Environmental Sciences and Engineering
100 STATE STREET MONTPELIER, VT 05602

DATE: 11/03/10 DRAWN BY: TJK PROJECT: 1–2128–5 SCALE: SHOWN