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June 4, 2007

VIA ELECTRONIC AND OVERNIGHT MAIL

Francis C. Cameron, Esq.
Office of the General Counsel
United States Nuclear Regulatory Commission
One White Flint Building
11555 Rockville Pike
Rockville, MD 20852-2738

Re: ABB Site - Windsor, CT

Dear Chip:

The purpose of this letter is to provide the information we discussed during our call on Wednesday, May 30, 2007, regarding residual nuclear waste material at the ABB Windsor property (the "Site") and ABB's objective of completing the cleanup of all such remaining material pursuant to an amendment to the current Site decommissioning plan (the "DP") in order to achieve unrestricted release of the Site and termination of its NRC license. As you know from our prior meetings, the Army Corps of Engineers has expressed the willingness to and is proceeding on the path for release of the Site from the FUSRAP process in order to allow cleanup to proceed under NRC license on an accelerated schedule to meet the interests of the Town of Windsor and the State of Connecticut for timely redevelopment of the Site. There is Congressional support for this initiative and great interest in seeing that the transition occurs seamlessly and promptly so that the DP amendment can be completed and commencement of the cleanup activities can occur in the spring of 2008. ABB appreciates the time and effort to date which the Office of General Counsel and the NRC program staff have devoted to working toward this solution.

In addition to the legal analysis we have provided to support the proposed NRC assumption of oversight of the cleanup of the residual MED/AEC material, during our last meeting (May 17, 2007) we discussed the fact that the FUSRAP-designated areas are commingled with sources of residual waste from both Government contract work and

commercial nuclear fuel fabrication activities. It is well documented in the record that both high-enriched and low-enriched uranium (HEU and LEU, respectively) was on-Site for Government work, while only LEU was used in commercial fuel fabrication activities. As we reviewed the Site map of the FUSRAP areas with you and Joe Gray, I noted, for example, that the record reflects that the Industrial Drain Lines and Site Brook were used from the early 1950s until well into the period of commercial fabrication activities on-Site. See e.g., the attached excerpt from the Corps of Engineers' draft Feasibility Study ("FS") Section 2.2.1 at p. 2-4 which states, in pertinent part, "The drain lines and residuals are not exclusively related to the MED/AEC process. . ." Based upon the Site studies conducted to date, including the Historical Site Assessment and sampling, residual contamination from MED/AEC and commercial fuel fabrication activities is co-located and commingled in the Industrial Drain Lines and Site Brook. These areas are expected to account for the largest share (close to 70%) of the remaining remedial costs to achieve unrestricted release and license termination.

Since our meeting, with the assistance of ABB's in-house expert John Conant and MACTEC, the consulting firm which has had the lead for all on-Site cleanup initiatives, we have reviewed the record regarding each of the other FUSRAP designated areas for some indication of the presence of commercial nuclear residuals co-located and commingled with waste materials from the MED/AEC activities. As you will see from the descriptions below of the FUSRAP areas, a primary source of the information is the draft Feasibility Study for the Site prepared by the Corps and its contractor in May 2005 (referenced excerpts attached) which summarizes analytical data produced in the April 2004 Remedial Investigation Report ("RI"). The Feasibility Study has not been revised nor finalized and will not be in accordance with the transition plan which ABB has prepared and reviewed with the Corps, although the data contained therein will be considered in fashioning the modifications to the Site DP to accommodate cleanup of the MED/AEC residuals. In preparing its draft Feasibility Study, the Corps District relied only upon the 20% and above enrichment criteria from the DOE 1994 initial FUSRAP eligibility screening, even though the FUSRAP designation later was expanded to include lower levels of enriched uranium pursuant to the decision of Brigadier General Temple, the Atlantic Division Commander, and the Corps Headquarters dated May 6, 2004. The fact remains that the Corps' RI and draft FS document that a wide range of enrichments exists in the residual contamination at all the FUSRAP designated areas.

The following FUSRAP areas, in addition to the Site Brook and Industrial Drain Lines, are highlighted on the attached map (Figure 2-2 from the draft Feasibility Study):

1. Clamshell Area – According to anecdotal sources, the Clamshell Area was created as a result of removal of the clamshells from the Site Brook, where the shells had been placed to act as a passive neutralization technique. Sampling reflected a wide range of enrichment values (4% to 33%). As discussed and noted above, the Site Brook was the discharge point for the Industrial Drain Lines which functioned during the period of MED/AEC activities and subsequent commercial nuclear fuel fabrication. See Section 2.3.2 at p. 2-8.

The estimated remedial cost for this area is expected to be approximately 1% of the total remaining remedial cost for the Site.

2. Debris Pile – Although the source of the materials that comprise the pile is unknown, as is the period during which it was created, sampling revealed enrichment levels ranging from natural to 100% with an average enrichment of 44%. See Section 2.3.4 at p. 2-10 and 2-11.

The estimated remedial cost for this area is expected to be less than 1% of the total remaining remedial cost for the Site.

3. Drum Burial Pit – This former sand and gravel borrow pit became a convenient on-Site disposal site for a wide range of waste material starting during the period of MED/AEC operations (1955 to 1960) and was never officially licensed nor subject to a proper closure. It is unclear from historic information obtained whether the area was used exclusively for waste disposal during the period of Government activities. Most of the soil samples, however, revealed residual uranium below 20% enrichment and the Corps concentrated further study of the pit only where enrichment levels of the samples exceeded 20%. See Section 2.3.3 at p. 2-9 and 2-10.

Since in 1990 a partial cleanup occurred (removal action involving 26 drums), the estimate for the remaining area remediation is expected to be less than 10% of the total remaining remedial cost for the Site.

4. Waste Storage Pad – This location historically was believed to have been used for storage and processing of low-level radioactive waste during the period of MED/AEC operations. There also is evidence of post-1961 use of the pad including aerial photos showing drums stored in this area. In addition, field sampling has demonstrated a range of enrichment values in collected samples (less than 4% to over 90%), with approximately 25% of the samples showing enrichment in excess of 20%. See Section 2.3.6 at p. 2-13.

The estimated cleanup cost for this area is expected to be about 15% of the total remaining remedial cost for the Site.

5. Building 3/3A and 6 Area - While historical information first suggested that Building 3 was used exclusively for MED/AEC activities, additional anecdotal information led the Corps to conclude in its May 2005 draft Feasibility Study that "Building 3/3A was used for nuclear fuel fabrication, *some of which* was conducted on behalf of the MED/AEC." (emphasis supplied). It is well documented that Building 3A was built in 1962 (post-MED/AEC work) and Building 6 served MED/AEC and commercial activities. Some soil samples in discreet areas surrounding the buildings evidenced enrichment in excess of 20%, but enrichments found in the Corps studies ranged from natural to 86% with an average enrichment of 5.91%. A few samples were collected from the waste line floor drain locations, but due to access

limitations there are no samples from the waste lines below the buildings where it is suspected that additional commingled material exists. See Section 2.3.1 at p. 2-7 and 2-8.

It should be noted that the anticipated decommissioning of the buildings and subsurface likely will account for less than 5% of the total decommissioning cost of the above-listed areas.

I trust you can appreciate that, based upon the process used by DOE during the FUSRAP initial screening of the Site, the subsequent DOE, Corps and ABB investigations, and the fact that it is extremely difficult to verify or reconstruct conditions which occurred as much as 30 to 50 years ago, there is not absolute certainty to allow one to precisely draw the boundaries of areas for commercial and Government activities. What can be stated with some degree of confidence is that the record reflects the likelihood that each of the DOE-designated FUSRAP areas contains some residuals from commercial nuclear activities, such that it would be difficult, if not impossible, to remove the commercial materials without removing the residual materials from the Government activities. In our view the NRC should be able to conclude for purposes of taking jurisdiction of the cleanup in the FUSRAP areas that there is a reasonable degree of certainty to conclude that all the FUSRAP areas contain co-located and commingled material.

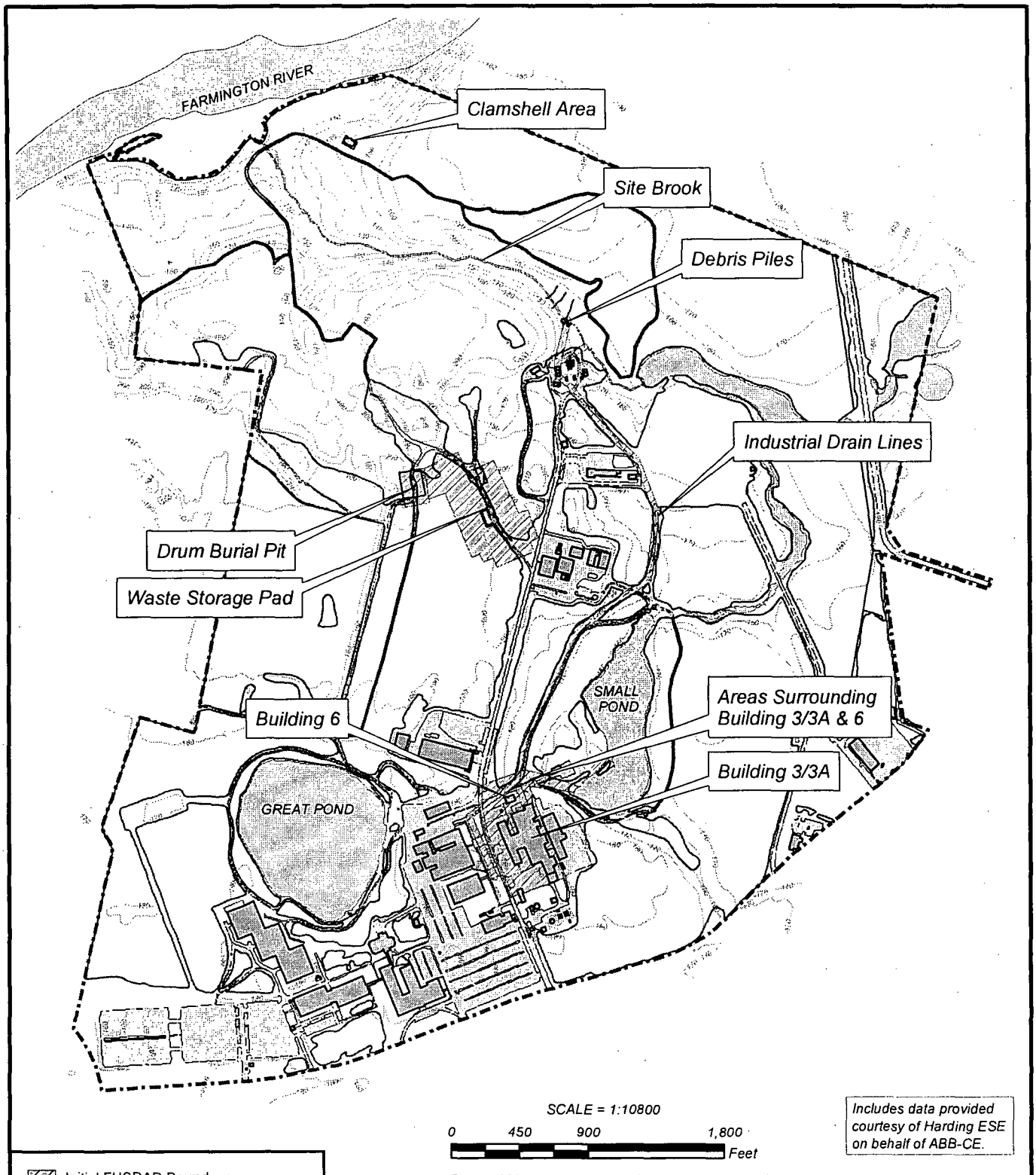
I look forward to our call after you consider this additional information.

Very truly yours,

James A. Thompson, Jr.

JAT/jzg

cc: J. Conant
K. Knauerhase, Esq.
J. Lieberman, Esq.



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Location of FUSRAP Study Areas FUSRAP RI/FS

CE Site Windsor, CT

DRAWN BY	CHECKED BY	DATE	PROJECT NO.
RSE	MDK	05/05	09000-232

Figure Number

2-2

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2.2.1 Elimination of Industrial Drain Lines from Further Evaluation

The Industrial Drain Line area consists of three parallel subsurface pipelines and the surrounding soil. The pipelines are known to have contained (transported) radioactive and chemical materials. The RI evaluated the residual radioactivity within the lines, as well as potential evidence of radioactivity in soil surrounding the lines, which could have resulted from leakage. No uranium enrichment in excess of 20% was observed in any of the 98 soil samples collected from soil surrounding the lines (ENSR, 2004). Therefore, further evaluation of environmental media (i.e., soil) and an associated risk assessment were not necessary under FUSRAP. In addition to soil sampling, 7 samples of residual material from inside the drain lines were collected during the RI. The results indicated that uranium activity concentrations ranged from 30 to 3,321 pCi/g, with associated enrichment values ranging from 8.47 to 50%. The drain lines and residuals are not exclusively related to the MED/AEC process and thus, are not considered in the response action under FUSRAP.

2.2.2 Elimination of Buildings 3/3A and 6 from Further Evaluation

In parallel with the RI program, Buildings 3/3A and 6 were evaluated for potential response actions under FUSRAP. Most of the evaluation was conducted by SAIC and GTS Duratek, under contract with USACE. Building 3/3A was studied in 1988 by SAIC, and Building 6 was studied in 2000/2001 by GTS Duratek. Results of the evaluation were included as appendices to the RI Report (ENSR, 2004). The evaluation included an assessment of potential radioactive penetration, a comparison to risk- and dose-based standards, and consideration of the CERCLA building exclusion policy.

Assessment of Potential Radioactive Penetration

A review of the Building 3/3A and Building 6 data revealed that a small fraction of the radioactive contamination in the building materials was removable. Specifically, for Building 3/3A, the estimated removable fraction of radioactive contamination was <10% and for Building 6, the estimated removal fraction was <40%. This was an indication that radioactive contamination may not have penetrated deep into the building materials, and instead, was retained on the surface of the materials. This observation was further exemplified by a review of the concrete core samples collected at various depths from Building 6. The relationship between surface and deeper concrete samples collected from the floor and walls revealed that uranium activity concentrations decreased significantly (i.e., in most cases, by an order-of-magnitude) as sampling continued deeper into the concrete (ENSR, 2004).

This observation indicated that the gross alpha data measured within the buildings was most likely attributed to airborne radioactively contaminated dust and particulates adhering to interior building surfaces. Based on the analytical data collected from the surfaces, the depth of contaminant penetration was quantified as approximately 1.5 cm (½ inch). The concept of low material-penetration was important

in deriving building-specific Derived Concentration Guideline Levels (DCGLs) and chemical-toxicity based potential cleanup goals. Both sets of calculations assume a removal fraction of less than 10%, which was consistent with the majority of measurements from Buildings 3/3A and 6, and presents an appropriate derivation of building-based protectiveness criteria for the building conditions.

Comparison of Building Data to Risk- and Dose-Based Cleanup Levels

SAIC calculated radioactivity-based DCGLs for the buildings, and ENSR calculated chemical-based potential cleanup goals. The potential cleanup goals pertained to the non-carcinogenic chemical toxicity effects of uranium (total U), which were determined to be insignificant when compared to carcinogenic effects from radioactivity (ENSR, 2004). Thus, the building-based DCGLs were considered to be the driving cleanup levels for comparison. Using a 25 millirem per year (mrem/yr) dose limit, the site-specific DCGLs are 29,000 disintegrations per minute (dpm) per 100 square centimeters (cm^2) for a renovation worker, and 83,000 dpm/100cm^2 for an industrial worker (SAIC, 2002). A total of 8,403 gross alpha measurements were obtained from Building 3/3A, 6,691 fixed-count data points and 1,712 smear samples. The majority of gross alpha data from Building 3/3A revealed radioactive contamination less than 25 dpm/100cm^2, with no values in excess of 10,000 dpm/100cm^2. Similarly for Building 6, a total of 539 gross alpha measurements were obtained, 313 fixed-count data points and 226 smear samples. The maximum gross alpha value recorded was 1,956 dpm/100cm^2 as a fixed-count measurement, while the maximum smear sample recorded was 443 dpm/100cm^2. This revealed that no gross alpha measurements recorded for Buildings 3/3A or 6 exceeded the most conservative cleanup level calculated for the CE site (ENSR, 2004).

Consideration of CERCLA Building Exclusion

Although Buildings 3/3A and 6 were included in the initial site designation (DOE, June 20, 1994), buildings (structures, materials, etc.) are generally excluded from consideration under CERCLA. Buildings are included under CERCLA only if they pose a continuing source of contaminant release into the environment. CERCLA was established to address environmental media, not man-made structures. In 1993, the USEPA Office of Solid Waste and Emergency Response (OSWER) issued a directive that explicitly exempts contaminated buildings from CERCLA. The directive is titled "Response Actions at Sites with Contamination Inside Buildings" (OSWER Directive 9360.3-12). The directive does indicate that there could be exceptions where building contamination could be included under CERCLA, but those cases would be "nationally significant and precedent setting." Because of this directive, combined with finding no samples in excess of the most conservative cleanup levels (29,000 dpm/cm^2), it is not appropriate to further evaluate the buildings under the context of CERCLA.

2.2.3 Elimination of Groundwater and Surface Water from Further Evaluation

Groundwater and surface water samples were collected by USACE in August 2000 and in April 2001 (ENSR, 2004). CE has been collecting similar data through implementation of 15 sampling events over the past decade. An overview of the results, as presented in the RI Report (ENSR, 2004), is presented below.

USACE Data

Groundwater samples were collected by USACE in August 2000 and in April 2001. For both sampling events, groundwater samples were collected from a total of 25 existing site monitoring wells to provide water quality data associated with the FUSRAP areas. The August 2000 data revealed that total U was detected in only one location (MW-E1), at a relatively low activity concentration of 0.45 pCi/L. Analysis of this result, however, exhibited less than 1% enrichment. The April 2001 data revealed the presence of total U at activity concentrations up to 3.4 pCi/L (MW-S02), with a mean of 0.93 pCi/L for detected values. Only one of these samples exhibited greater than 1% enrichment; groundwater collected from MW-0906D exhibited 5.9%, which is still far below the 20% FUSRAP criterion for this site (ENSR, 2004).

Surface water samples from Site Brook were also collected by USACE in November 2000. Results indicated that uranium was present at activity concentrations up to 0.42 pCi/L, with a mean of 0.33 pCi/L for detected values. None of these values contained enriched uranium in excess of 1%. For Site Brook, Co-60 was an additional COPC, but was not detected in any of the surface water samples analyzed (ENSR, 2004).

CE Data

Of the 15 groundwater sampling events conducted by CE, 6 events included the analysis of radionuclides, totaling over 275 individual samples from a network of 78 monitoring wells. Over the course of these programs, only 3 samples have shown the potential presence of enriched uranium in excess of 20%. However, the U-235 activity concentrations in these 3 samples are in the vicinity of analytical detection limits, which greatly reduce the accuracy of enrichment calculations. In addition, the wells were constructed, developed, and sampled in a manner that promotes the presence of suspended solids, which results in analyzing particulate matter, rather than groundwater. Accordingly, the RI concluded that the 3 anomalous samples were not representative of groundwater conditions, and the preponderance of data reveals that enriched uranium in excess of 20% is not present in groundwater (ENSR, 2004).

CE also collected a total of 45 surface water samples over the course of site investigations, 10 of which were analyzed for total U and Co-60. All 10 samples were collected from Site Brook and the Farmington River. None of these surface water samples revealed the presence of enriched uranium in excess of

20%. The highest enrichment value was 12.44%. Similar to the groundwater results, Co-60 was not detected in any surface water samples (ENSR, 2004).

2.2.4 Summary of Areas Excluded from Feasibility Study

In summary, based on the results of the RI Report (ENSR, 2004), the Industrial Drain Lines, Building 3/3A, Building 6, and property-wide groundwater and surface water do not warrant evaluation in this FS. If future investigations during property development or other events reveal that these areas contain contamination that is exclusively related to the MED/AEC process, and if that contamination exceeds the cleanup goals presented later in this FS document, then USACE would consider additional FUSRAP study. Similarly, if other areas of the CE property (such as subsurface piping or visual debris) are identified in the future, which meet the criteria outlined above, then USACE would consider additional FUSRAP study for those areas.

2.3 INDIVIDUAL CONCEPTUAL SITE MODELS FOR SELECTED AREAS

The following paragraphs describe the general characteristics of the FUSRAP areas warranting FS evaluation. The study area boundaries have been refined throughout the RI phase of study. The most current site boundaries (prior to comparison to cleanup levels) are based on the 20% enrichment criterion. The boundaries are also limited to solid matrices (i.e., soil and sediment) at relatively shallow depths (i.e., <1 ft in most areas), and areas of visible and potentially radioactive materials and debris. Because the buildings and aqueous matrices (i.e., groundwater and surface water) were excluded from further evaluation under FUSRAP, they are not described within the following paragraphs.

Refer to Section 2.2 for general CSM detail that applies to all of the FUSRAP areas that are summarized below. Also refer to the CSM figures that update those presented in the RI Report (ENSR, 2004) based on the results of the chemical and radiological risk assessments.

2.3.1 Areas Surrounding Buildings 3/3A and 6

The goal of the RI for this study area was to evaluate potential residual radioactivity in environmental media that may have resulted from the handling of radioactive and associated materials within Buildings 3/3A and 6. Refer to Figure 2-3 for a site layout of this area. Building 3/3A was used for nuclear fuel fabrication, some of which was conducted on behalf of the MED/AEC. Operations within the building complex were converted to fossil fuel research, and subsequently discontinued. Refer to the RI Report (ENSR, 2004) for more historic detail. Building 6 was historically used as a waste-dilution and pumping facility for the liquid streams from Buildings 3 and 5, as well as Building 17 (ENSR, 2004). The topography of the area surrounding the buildings is generally flat, with surface flow toward the east. The geology area consists of fill overlying fine, inter-bedded layers of sand and silt, with trace to small

amounts of cobble. Till (prevalent within other areas with the CE site) was not encountered in the area (HLA, 2000). Groundwater is reported at a depth of approximately 20 feet below ground surface, and interpreted to flow easterly (HLA, 2000).

This area was studied in 1993 as part of the Designation Survey (ORISE, 1994). Subsequent studies were performed in 1998 (SAIC, 1999) and in 2000/2001 (ENSR, 2004). In addition, the property owner (CE) conducted its own studies throughout this period. During the RI phase, Gamma Walkover Survey (GWS) measurements and analytical data compiled by both USACE and CE were reviewed and interpreted. As a result, total U was the only chemical detected in this study area that is potentially associated with prior MED/AEC activities, and which poses a potential risk (ENSR, 2004). Total U was identified as posing potential risks to human health based on its chemical toxicity and radioactivity. Total U was not considered to pose unacceptable risks to ecological receptors.

Uranium enrichment values were calculated for 184 samples; values ranged from natural to 86%, with an average of 5.91%. Of the 184 samples, 22 revealed uranium enrichment in excess of 20%. Based on these calculations, there are three distinct areas where enriched uranium is present: (1) a small area just west of Building 3, and adjacent to the old "High Bay" area, (2) a small area just north of Building 6, and (3) a larger area to the east and south of Building 6. The total U activity concentrations within these three areas ranged from non-detect to 939 pCi/g, with an average of 59 pCi/g for the detected values. The highest total U activity concentration (939 pCi/g) was detected in the surface of the northern portion of the study area, immediately adjacent to the east side of Building 6. In general, the highest total U activities are in the northern portion of the study area, between Buildings 3 and 6, which also coincides with the area containing the highest enrichment values.

2.3.2 Clamshell Area

The Clamshell Area contains a pile of clamshells that were removed from Site Brook. The clamshells were placed into Site Brook to buffer the pH as wastewater passed through them during discharge because wastewater discharged to Site Brook exhibited a low pH value (i.e., acidic condition), which did not comply with water quality requirements. The addition of clamshells as a buffer was reportedly successful as a passive neutralization technique; however, their high absorptive properties retained low-level radioactive and other materials (ENSR, 2004). The uranium-rich clamshells were subsequently removed from Site Brook, and placed in their current location, 600 feet north of the brook (Figure 2-4). The previous location where the clamshells were located has not been identified; however, the entire length of Site Brook that transects the CE site is a separate study area (refer to Site Brook discussions).

The topography in the vicinity of the current clamshell pile is characterized by a drainage swale in an upland area, approximately 600 feet upgradient of the brook. Soil underlying the clamshells consists of light brown silty fine sands. Well-shaded, dense brush growth is present in the area, with emergent plant

species between the clamshell pile and the brook. Groundwater and surface water flow is reported to be southerly towards the direction of Site Brook (HLA, 2000; ENSR, 2004).

This area was studied only in 1999 (HLA, 2000). Based on a review of the data collected, cadmium, silver, and total U are the only chemicals detected that are potentially associated with past MED/AEC processes, and which pose potential risks. Both cadmium and silver were identified as posing potential risks to human health based on their chemical toxicity. Total U was identified as posing potential risks to human health based on its radioactivity. Ecological risks were not associated with these chemicals.

Uranium enrichment values were calculated for 43 soil samples; values ranged from natural to approximately 33%, with an average enrichment value of 10.5%. Of the 43 samples, 18 revealed uranium enrichment in excess of 20%. These data show one area where enriched uranium is present. Within this one area, total U activity concentrations were compiled for 27 soil samples. The results revealed activity concentrations ranging from 0.58 pCi/g to 1,392 pCi/g, with an average of 406 pCi/g for the detected values. The highest total U activity concentration (1,392 pCi/g) was detected in the surface of the central portion of the area, along the southern edge of the clamshell pile. A review of the distribution of total U reveals that the highest activities are distributed throughout the soil that is underlying the clamshell pile.

Because cadmium and silver are not considered to be exclusively related to MED/AEC processes, they are not considered in this FS evaluation under FUSRAP. Thus, this FS evaluates potential response actions for the clamshells and residual total U in soil underlying the clamshells.

2.3.3 Drum Burial Pit

The Drum Burial Pit study area consists of a manmade pit, in which drums and other materials have been disposed. Refer to Figure 2-5 for site detail. Under FUSRAP, the drums and materials within the pit require a response action (e.g., removal). In addition to the contents of the pit, soil around the pit was assessed during the RI phase to determine if there were environmental impacts. The pit was originally a sand and gravel pit, which was filled with miscellaneous waste material from 1955 to 1960. During an excavation conducted in 1990, 26 drums/barrels were discovered and removed (Moulton, 1994). Material found included electrical wiring, plastics, paint cans, personnel protective clothing and asbestos (Weston, 1992). In addition to buried drums and containers, miscellaneous debris, including bottles, pails, and machine parts, have been historically visible and reported at the ground surface. Many buried drums/containers currently exist within the pit, and extend to a depth of 15 feet below ground surface (HLA, 2000).

The geology of the area is described as red silty sand, with gravel and tan very fine sands. Groundwater was encountered at approximately 35 feet below ground surface, and reportedly flows north to northwest

towards the Site Brook and the Farmington River, with minor westerly components in the topographic low areas (HLA, 1999).

This area was studied in 1990 (GZA, 1991; Moulton, 1994), 1993 (ORISE, 1994), 1998 (SAIC, 1999), and 2000/2001 (ENSR, 2004), as well through various studies conducted by CE. Based on the data compiled from those studies, and review of prior MED/AEC activities that occurred on the CE property, cadmium and total U were the only chemicals detected in soil around the pit that are potentially associated with those processes, and which pose potential risks. Both cadmium and total U pose potential risks to human health based on their chemical toxicity. Total U was also identified as posing potential risks to human health based on its radioactivity. Ecological risks were not identified.

Of the 163 soil samples collected and used for uranium enrichment calculations, only two revealed uranium enrichment in excess of 20%. These samples are located on the east side of the burial pit, which enabled refinement of this study area boundary. Total U activity concentrations were compiled for 10 soil samples within the refined study area. The results reveal activity concentrations ranging from natural to 556 pCi/g, with an average of 99.7 pCi/g for the detected values. The maximum value of total U (556 pCi/g) was detected from 6 to 8 feet deep, and the second highest detection (15.9 pCi/g) was detected at the surface. The higher values appear to be present along the eastern edge of the burial pit.

Because cadmium is not considered to be exclusively related to MED/AEC processes, it is considered in this FS evaluation under FUSRAP. Thus, this FS evaluates potential response actions for drums and materials within the Drum Burial Pit, as well as residual total U in soil surrounding the pit.

2.3.4 Debris Pile

The area contains one pile of wood debris and one of concrete debris. Both piles also contain miscellaneous other materials, including metal scraps. Figure 2-6 presents the location of the piles and depicts their general contents. Under FUSRAP, the debris requires a response action (e.g., removal). In addition to the debris, soil in the vicinity of the debris was assessed during the RI phase to determine if there were environmental impacts. The area consists of two distinct piles, one of concrete debris and one of wood debris. Some metallic debris is located within both of the piles, and is most prevalent within the northern edge of the wood debris pile. Each pile is approximately 15 feet in diameter at the base, and 3 feet tall in the center.

The topography in the area is gently sloping towards Site Brook, approximately 30 feet away. The soil within the area consists of light brown silty fine sands. Till, common in many subsurface areas of the CE site, was not encountered in the area of the Debris Pile. Groundwater was encountered at approximately 6 feet below ground surface, and trends northerly in the direction of Site Brook.

The area was studied in 1993 (ORISE, 1994), 1996 (ORISE, 1996), 1998 (SAIC, 1999), and 2000/2001 (ENSR, 2004). Based on a review of data collected during those programs, as well as data collected by CE throughout this timeframe, total U was the only chemical detected in the surrounding soil that is associated with MED/AEC processes, and which poses a potential risk. Total U poses potential risks to human health based on its chemical toxicity and radioactivity; ecological risks were not identified.

Uranium enrichment values were calculated for 46 samples. The results showed values ranging from natural to an estimated 100% enrichment, with an average enrichment value of approximately 44%. Of these samples, 34 revealed uranium enrichment in excess of 20%. These data show one distinct area where enriched uranium, which encompasses both piles.

Total U activity concentrations were compiled for 40 soil samples within this one area. The results reveal total U activity concentrations ranging from non-detect to 3,636 pCi/g, with an average of 545 pCi/g for the detected values. The highest total U activity concentration (3,636 pCi/g) was detected in the surface of the northern portion of the area, immediately adjacent to the piles. In general, the highest total U activities are in the northern portion of the area, and coincide with the highest enrichment values. Further review reveals that elevated activity (i.e., values higher than 100 pCi/g) was present in the upper 2.5 feet sampled.

In summary, this FS evaluates potential response actions for debris at this study area, as well as residual total U in soil surrounding the debris pile.

2.3.5 Site Brook

Site Brook was included as part of the RI based on the potential impacts that could have occurred through the discharge of liquid wastes to surface water in the brook. Discharges to the brook have included treated sanitary wastewater, industrial wastewater, and diluted radioactive wastewater from Building 6, and low-level radioactive wastes from the S1C facility. Site Brook flows northwest from Goodwin Pond, for approximately ½ mile through the CE site, prior to recharging the Farmington River (Figure 2-7).

The floodplain topography is well defined along most of the northern and southern banks of the brook, with a 100-foot difference in elevation between the top of the bank and the streambed. The brook sediment is dominated by coarse material, with little silt or clay. The surface organic materials are underlain by fine washed sands at approximately 6 inches below ground surface (HLA, 1999). Surface water depths are generally less than 1 foot, and the flow rate within the brook has been estimated at 1.5 feet/second or less (HLA, 1999).

The brook has been studied though several investigations, including studies in 1991 (USDOE, 1991), 1993 (ORISE, 1994), 1996 (ORISE, 1996), 1998 (SAIC, 1999), and 2000/2001 (ENSR, 2004). The brook was also studied throughout this timeframe by CE, including the collection of sediment samples along multiple transects. Based on an evaluation of this data, and prior MED/AEC activities (ENSR, 2004), cobalt (Co-60) and total U in brook sediments were the only chemicals detected that are potentially associated with prior MED/AEC activities, and which pose a potential risk. Total U was identified as posing potential risks to both human health and ecological receptors based on its chemical toxicity. Co-60 and total U were identified as posing potential risks to human health based on their radioactivity.

Uranium enrichment values were calculated for 53 soil and 121 sediment samples. Of the 53 soil samples, 35 revealed uranium enrichment in excess of 20%. Of the 121 sediment samples, only 23 revealed uranium enrichment in excess of 20%. These data were used to define eight distinct areas where enriched uranium is present in the study area. Within these eight distinct areas, total U activity concentrations in soil ranged from non-detect to 4,035 pCi/g, with an average of 765 pCi/g for the detected values. The highest total U activity concentration in soil (4,035 pCi/g) was detected in the surface of the middle portion of the study area, immediately downstream from where the brook exhibits a slight change in flow direction. Total U activity concentrations in sediment ranged from non-detect to 2,796 pCi/g, with an average of 229 pCi/g for the detected values. The highest total U activity concentration in sediment (2,796 pCi/g) was detected in the surface of the northwestern portion of the study area. The higher values appear to be in areas generally coinciding with potential depositional areas within the brook (i.e., at areas where the surface flow in the brook changes direction).

The other COPC associated with Site Brook is Co-60. For soil, the results reveal the presence of Co-60 at activity concentrations ranging from non-detect to approximately 11 pCi/g, with an average of 1.98 pCi/g for the detected values within the refined study areas. The highest Co-60 activity concentration in soil (11 pCi/g) was detected in the surface of the eastern portion of the study area, in the immediate vicinity of the outfall of the industrial drain lines and a former sewage treatment plant. For sediment, the results reveal the presence of Co-60 at activity concentrations ranging from non-detect to 5.83 pCi/g, with an average of 1.25 pCi/g for the detected values within the refined study area. The highest Co-60 activity concentration in sediment (5.83 pCi/g) was detected in the surface, along the northwestern portion of the study area. This is the same sample where the highest total U activity concentration was detected. A review of the distribution of Co-60 reveals that the higher values appear in the immediate vicinity of the outfall of the industrial drain lines and sewage treatment plant, and in the middle portion of the study area, immediately downstream from where the brook exhibits a slight change in flow direction. Like the detection of total U, the presence of Co-60 is most prevalent in the surface of the areas investigated.

In summary, this FS evaluates potential response actions for residual total U and Co-60 in soil and sediment within these areas of Site Brook.

2.3.6 Waste Storage Pad

The Waste Storage Pad area consists of an asphalt pad, as well as an adjacent roadway and woodland (Figure 2-8). The pad is adjacent to a dirt access road, and was historically used for materials storage. The pad itself is located in a lightly wooded area with mildly sloping terrain. The area was historically used to store and process low-level radioactive waste. There has also been evidence of machinery from Building 3, was stored in the area for an extended periods prior to disposition.

The pad and surrounding area is approximately 7 acres (HLA, 2000). This area is located within one of the topographically higher areas of the CE site. The ground surface generally slopes to the west and north, which is the inferred direction of surface water runoff. The geology of this area consists of stratified sand and till. The till is present at or near the ground surface immediately east of the area, and dips steeply toward the east with a wedge of stratified sand overlapping and thickening toward the west and north. The depth to groundwater is controlled by the presence and depth of the dense till, and ranges generally from 30 to 45 feet below ground surface, with a northwesterly flow (HLA, 2000).

The area was studied in 1993 (ORISE, 1994), 1998 (SAIC, 1999), and 2000/2001 (ENSR, 2004), and studied by CE throughout this period. Data compiled during the RI phase, combined with a review of MED/AEC operations, resulted in a finding that cadmium, silver and total U were the only chemicals detected in the Waste Storage Pad area that are potentially associated with those processes, and which pose potential risks. Total U was identified as posing potential risks to human health and ecological receptors, based on its chemical toxicity and radioactivity. Cadmium and silver were identified as posing potential risks to human health based on their chemical toxicity.

Uranium enrichment values were calculated for 402 samples, which ranged from natural to approximately 93%, with an average enrichment value of 11.5%. A total of 89 samples revealed uranium enrichment equal to or greater than 20%. Based on this evaluation, the boundary of the Waste Storage Pad area was defined.

Total U activity concentrations were compiled for 211 soil samples within the refined area. The results reveal activity concentrations ranging from non detect to 110,236 pCi/g, with a mean of 1,645 pCi/g for the detected values. The highest total U activity concentration (110,236 pCi/g) was detected in the surface of the northern portion of the study area, immediately west of the access road and waste storage pad. Several samples within the study area were analyzed for chemical parameters. In general, higher concentrations of chemical parameters were correlated with higher total U activity concentrations.

Because cadmium and silver are not considered to be exclusively related to MED/AEC processes, they are not considered in this FS evaluation under FUSRAP. Thus, this FS evaluates potential response actions for residual total U in soil at the Waste Storage Pad area.