- Similar impacts in the Reach 5 backwaters, the shallower portions of Woods Pond, the Reach 7 impoundments, and Rising Pond;

- The permanent loss of mature overhanging trees on the riverbanks and of vertical and undercut banks in Reaches 5A and 5B, with the consequent loss of the wildlife species that depend on those habitat features, as well as a reduction in animal slides and burrows on the banks and access routes for wildlife movement to and from the River;

- Long-term impacts in the areas that would be cleared for access roads and staging areas, including loss of trees and, in some areas, wetlands, as well as changes in the soil stratigraphy and composition – all of which would, at a minimum, last for decades, with the extent and timing of recovery to pre-remediation conditions uncertain; and

- Fragmentation of the current, largely intact forested riparian corridors in the PSA, with the consequent loss of connectivity among habitats and disruption of the wildlife that depend on those corridors.

As noted above, the standard of "overall protection" of the environment includes a balancing of the short-term and long-term ecological impacts of the alternatives with the residual risks. In particular, "it is important to determine whether the loss of a contaminated habitat is a greater impact than the benefit of providing a new, modified but less contaminated habitat" (EPA, 2005d, p. 6-6). Based on such balancing, due to the substantial adverse ecological impacts summarized above, SED 8 would have a net negative ecological effect and thus would not provide overall protection of the environment.

Summary: Based on the foregoing considerations, SED 8 would meet the standard of providing overall protection of human health. However, given the long-term harm to the unique ecosystem of the PSA that would result from its implementation, SED 8 would not meet the standard of providing overall protection of the environment.

6.9 Evaluation of Sediment Alternative 9

6.9.1 Description of Alternative

SED 9 is a sediment remediation alternative that was identified and described by EPA. It would involve the removal of a total of 921,000 cy of sediment and riverbank soil, including 886,000 cy of sediment over 333 acres plus 35,000 cy of bank soil as part of bank stabilization over 14 linear miles of riverbank. A total of 336 acres would be capped (333 acres after removal and 3 acres without removal). Specifically, the elements of SED 9 include the following:

- Reach 5A: Sediment removal in the entire reach (134,000 cy over 42 acres), followed by capping;
- Reach 5B: Sediment removal in the entire reach (88,000 cy over 27 acres), followed by capping;
- Reach 5C: Sediment removal in the entire reach (156,000 cy over 57 acres), followed by capping;
- Riverbanks in Reaches 5A and 5B: Bank stabilization (14 linear miles, comprising both banks along 7 miles of River) and removal of bank soils where necessary as part of the stabilization (35,000 cy);
- Reach 5 backwaters: Combination of sediment removal with capping (109,000 cy over 68 acres) and capping without removal (3 acres);
- Reach 6 (Woods Pond): Sediment removal (244,000 cy over 60 acres), followed by capping;
- Reach 7 impoundments (Reaches 7B, 7C, 7E, 7G): Sediment removal (84,000 cy over 38 acres), followed by capping;
- Reach 8 (Rising Pond): Sediment removal (71,000 cy over 41 acres), followed by capping; and
- Reach 7 (Channel) and Reaches 9 through 16: MNR.

Figures 6-24a-b identifies the remedial action(s) that would be taken in each reach as part of SED 9. This alternative differs from all of the sediment removal alternatives discussed above in that, under SED 9, at EPA's direction: (a) all sediment removal and capping work, including in Reaches 5A and 5B, would be performed in the "wet" by equipment operating within the River (either on the river bottom or on barges); and (b) removal of the sediments in the Reach 5 backwaters and Reaches 6, 7, and 8 would be performed concurrently with removal activities in the Reach 5 channel, but capping in those reaches would be delayed, where necessary, until after all the removal/capping activities in Reach 5 have been completed.

The following summarizes the general remedial approach (and associated assumptions) related to implementation of SED 9. Based on production rates and other inputs and assumptions specified by EPA, it is estimated that SED 9 would require approximately 14 years to complete. A construction timeline for implementation of SED 9 is provided in

CDF(s). In addition, construction of a CDF in Woods Pond and/or the backwaters would permanently reduce the existing flood storage capacity in those areas. Assuming that sufficient flood storage compensation could not be obtained, an increase in the surface water elevation would be expected in these areas during high flow events.

Summary: Based on the above considerations, TD 2 would provide overall protection of human health by permanently isolating PCB-containing sediment from human receptors. However, because construction of the CDF(s) would have significant adverse environmental impacts in Woods Pond and/or the backwaters by permanently altering the aquatic habitat and the flood storage capacity of the area(s) where the CDF(s) would be located, TD 2 would not meet the standard of providing overall protection of the environment.

9.3 Evaluation of Local Disposal in On-Site Upland Disposal Facility (TD 3)

9.3.1 Description of Alternative

Implementation of TD 3 would involve the permanent disposition of removed sediment/soil at an Upland Disposal Facility constructed in close proximity to the River, but outside the 500-year floodplain. The removed sediment and soil would be loaded into trucks at the staging areas, covered, and transported over on-site and local roadways to a nearby Upland Disposal Facility.

Three potential locations for an Upland Disposal Facility have been identified to date. These sites are located near Woods Pond, Forest Street in Lee, and Rising Pond (referred to, respectively, as the Woods Pond, Forest Street, and Rising Pond Sites) and are shown on Figures 9-3, 9-6, and 9-9, respectively. The Upland Disposal Facility would be designed and constructed at one or more of these locations for the disposition both of materials that contain PCB concentrations under 50 mg/kg and those that contain PCB concentrations at or above 50 mg/kg and thus would be subject to substantive TSCA requirements.

As discussed above, the range of potential volumes of sediments and floodplain soils that could be removed from the River and floodplain under the array of sediment and floodplain soil alternatives discussed in Sections 6 and 7 extends from 191,000 *in situ* cy, based on a combination of SED 3 and FP 2, to 2.9 million *in situ* cy, based on a combination of SED 8 and FP 7. However, due to variations in the size, configuration, and topography of the three potential locations, the maximum estimated disposal capacity is different for each location. For each of the three potential locations, Table 9-1 shows the overall approximate property size, estimated minimum and maximum disposal capacities, and the following acreage information for the minimum and maximum volume estimates: land area that would be

required for an Upland Disposal Facility, including set-back and buffer areas that would not be disturbed; the size of the facility's operational footprint (i.e., the area that would be disturbed for waste disposal plus access roads, material staging areas, and other ancillary facilities, but excluding set-back and buffer areas); and the size of the actual landfill area that would be used for permanent waste disposal.

Table 9-1 – Summary of Estimated Disposal Capacities and Approximate Land Requirements for Potential Upland Disposal Facility Locations

Location (Configuration)	Property Size	Disposal Capacity	Land Area Required	Operational Footprint Size	Landfill Size
Woods Pond (Minimum)	75 acres	191,000 cy	53 acres	25 acres	6 acres
Woods Pond (Maximum)		2.0 million cy	75 acres	61 acres	18 acres
Forest Street (Minimum)	195 acres	191,000 cy	115 acres	42 acres	10 acres
Forest Street (Maximum)		1.0 million cy	193 acres	95 acres	34 acres
Rising Pond (Minimum)	106 acres	191,000 cy	62 acres	27 acres	4 acres
Rising Pond (Maximum)		2.9 million cy	101 acres	84 acres	44 acres

As shown in the above table, for combinations of sediment and floodplain alternatives involving disposal of volumes up to approximately 1.0 million cy, all three disposal site options would be sufficient. For combinations of sediment and floodplain alternatives involving the disposal of a greater volume, a disposal location that has sufficient capacity to handle that volume or a combination of two disposal locations could be utilized. However, to simplify the evaluations in this section of the Revised CMS Report, these evaluations have considered the minimum and maximum disposal capacity, as well as the minimum and maximum operational footprint (i.e., the area that would be disturbed), at each of these locations. Since the maximum estimated disposal capacity is different for each location, the evaluations of the maximum disposal scenario in this section are site-specific and not comparable among locations.

The general remedial approach (and associated assumptions) for implementation of TD 3 are discussed below. While a description of the configuration, construction, operation, and closure of the Upland Disposal Facility is provided in this Revised CMS Report for

evaluation purposes, the specific methods and components of this alternative (if selected) would be determined during the design process based on more detailed engineering considerations and site investigations.

Site Selection and Procurement: The first step in implementing TD 3 would be to select a site (or sites) on which to construct the Upland Disposal Facility. As noted above, three locations have been identified to date as potential locations for an Upland Disposal Facility Each of these locations is relatively close to the River (to facilitate transfer of sediments to it), but is situated outside the 500-year floodplain and has either limited or no sensitive habitats or could be configured to avoid or minimize the impacts on such habitats. GE owns or has a right to acquire the necessary portions of each of these sites.

The natural communities within the three potential disposal sites were classified using a combination of aerial photographic interpretation and review of Massachusetts GIS mapping. The natural communities, current land use, and estimated acreages for each disposal site are described below.

Woods Pond Site: The Woods Pond Site is a 75-acre parcel located immediately south of Woods Pond, as shown on Figure 9-3. The current land use includes a portion of an active sand and gravel quarry and construction area, an inactive portion of the sand and gravel quarry (now a disturbed field), and a wooded area. The property is bounded to the north by Valley Street and Woods Pond, to the south by the Town of Lee's sanitary landfill and commercial property, to the west by an active sand and gravel quarry, and to the east by Woodland Road, low density residential properties, open pasture, and undeveloped forest. Depending on the quantity of material to be disposed of, approximately 25 to 61 acres would be used for the development and operation of the Upland Disposal Facility (see operational footprint in Table 9-1). If this site is selected, the specific location and configuration of the disposal facility within this property would be determined during design. For the purposes of this Revised CMS Report, the conceptual layouts and configurations of the Upland Disposal Facility at this site are shown on Figures 9-4 and 9-5.

Currently, approximately 40 acres (53%) of the overall property at this site consist of an area that is currently or was previously used as a sand and gravel mining facility. This previously altered area contains all or portions of four small man-made ponds (which would not appear to constitute regulated waterbodies or wetlands) totaling approximately 1.1 acre in size. An overhead electrical transmission line easement runs generally north-south through the property; the land in this easement area also consists of previously altered land and accounts for an additional approximately 8 acres on the property. The remaining portions of the property are undeveloped and consist of approximately 27 acres of upland forest and 0.4 acre of shrub swamp habitat. The

shrub swamp is located in the northeastern portion of the site and would be located within the maximum operational footprint but outside of the minimum operational footprint of an Upland Disposal Facility at this site.

Forest Street Site: The Forest Street Site is approximately 195 acres in size[496] and is located in Lee, MA, approximately 1 mile south of Interstate 90 and 1 mile east of the Housatonic River, as shown on Figure 9-6. This site is generally bounded to the north and east by Goose Pond Brook, Forest Street, low-density residential housing, and undeveloped forest; to the south by undeveloped forest; and to the west by undeveloped forest and a utility corridor. Immediately to the east and adjacent to the property is a former industrial facility that includes an abandoned mill building and two closed landfills. Depending on the quantity of material to be disposed of, approximately 42 to 95 acres would be used for the development and operation of the Upland Disposal Facility (see operational footprint in Table 9-1). If this site is selected, the specific location and configuration of the disposal facility within this property would be determined during design. For the purposes of this Revised CMS Report, the conceptual layouts and configurations of the Upland Disposal Facility at this site are shown in Figures 9-7 and 9-8.

This property is largely forested, with upland forest comprising 192 acres (98%) of the overall property and the remainder consisting of approximately 1.8 acres of cleared open land and 1.5 acres of wooded coniferous swamp in the southern portion of the site. The site has areas of steep topography with slopes ranging from 15% to 45%. The identified minimum and maximum operational footprints for an Upland Disposal Facility at this site would not affect any wetlands habitat (see Figures 9-7 and 9-8). However, the maximum operational footprint would require construction of a new road crossing of Goose Pond Brook along the east side of the site to provide access from Forest Street (see Figure 9-8).

Rising Pond Site: The Rising Pond Site is located adjacent to, and west of, Rising Pond, as shown on Figure 9-9. The site is bounded to the north and east by the Housatonic River/Rising Pond; to the south by an open field/construction stockpile area, undeveloped forest and commercial property; and to the west by Van Duesenville Road, residential property, cropland, and commercial property. The site consists of three separate lots owned by GE, totaling approximately 106 acres in size. Depending on the quantity of material to be disposed of, approximately 27 to 84 acres would be used for development and operation of the Upland Disposal Facility (see operational

[496] This acreage includes an approximately 3-acre easement outside the property boundary that would be granted by the current property owner.

footprint in Table 9-1). If this site is selected, the specific location and configuration of the disposal facility within this property would be determined during design. For the purposes of this Revised CMS Report, the conceptual layouts and configurations of the Upland Disposal Facility at this site are shown on Figures 9-10 and 9-11.

The property is largely forested, with an access road across the southern portion of the site, a small area of cleared land on the southeast portion of the site, and a small area of cropland at the extreme southern end of the site. Topography on the site is relatively flat with slopes ranging from 0 to 8%. Approximately 102 acres (96%) of the overall property are covered by upland forest consisting of mixed hardwood and coniferous forest communities. An area of open land approximately 3.3 acres in size is located along the southern portion of the property. A small area (approximately 0.5 acre) of forested wetland is present on the southwestern edge of the site, and would be impacted by the maximum (but not the minimum) operational footprint of the Upland Disposal Facility (see Figures 9-10 and 9-11).

Site Preparation: Site preparation activities would include clearing and grubbing vegetation, followed by the earth work necessary to prepare the site for landfill construction. Construction of the landfill at the Woods Pond Site under the minimum volume scenario would be largely confined to the current/former sand and gravel quarry portion of the site. Under the maximum volume scenario, construction of the landfill would impact active and inactive portions of the sand and gravel quarry area, a portion of upland forested habitat, a linear utility easement, and a portion of the small (0.4 acre) shrub swamp wetland. The Forest Street and the Rising Pond Sites consist primarily of upland forest, which would be cleared in varying amounts for the landfill construction at these sites under both the minimum and maximum volume scenarios; no wetlands would be affected by the landfill construction at either of these sites. Site preparation would also include building the necessary infrastructure, including access roads and support facilities.

Landfill Construction: A base liner and sidewall system would be constructed to hold the removed materials at the Upland Disposal Facility. During construction of the landfill, a base liner would be installed over a re-graded surface. For purposes of this Revised CMS Report, it was assumed that the base liner system would include 6 inches of fill on top of a double liner system (which would include two composite liners), a double leachate collection system (which would include piping and a granular drainage layer above each liner), and two layers of geocomposite material (Figure 9-12).[497] The landfill would be

[497] A single granular drainage layer with collection piping would be placed on top of a single layer of geocomposite, which would be placed on top of a single composite liner. These layers would then be repeated to make up the final base liner system.

constructed with sloped surfaces that would allow for precipitation to drain to appropriate collection points, and would include other appropriate stormwater management features, including surface water diversion berms, stormwater detention basins, and drainage swales.

As discussed further below, it is assumed that construction of the landfill would be performed sequentially in a series of cells, such that individual smaller units or cells would be constructed, operated, and closed within the confines of the entire facility.

Upland Disposal Facility Operations: Once the necessary infrastructure, access roads, and support facilities are in place, trucks would transport the dewatered sediment/soil to the landfill, which would be segregated into 3-acre cells to efficiently manage the materials. The dewatered sediment/soil would be placed in approximate 2-foot-thick lifts within the cells and compacted prior to placing the next lift. A temporary "daily" cover would be placed over the active portions of the facility at the end of each work day to minimize: (1) the amount of precipitation entering the consolidated materials to limit generation of leachate; and (2) airborne dust. Once the consolidation material within a cell reaches the maximum design height, an interim cover would be installed over that material. The final cover would be installed in phases, as described in the Final Cover Installation section below.

It is anticipated that the construction and operation of the landfill would be performed in a series of cells, such that individual smaller units or cells would be constructed, operated, and closed within the confines of the entire facility. For purposes of evaluation in this Revised CMS Report, it has been assumed that approximately 3 acres would be open and operating at a given time.

The volume of leachate generated was assumed to be similar to that generated at the GE-Pittsfield On-Plant Consolidation Areas (OPCAs). At the resulting estimated rate of leachate generation (150,000 gallons per month), construction of an on-site water treatment facility was not considered to be cost-effective. Instead, it was assumed that the leachate would be collected and temporarily stored in on-site tanks and transported via a 5,000-gallon water truck on an as-needed basis to GE's Building 64G water treatment facility at its Pittsfield plant for treatment and discharge. Building 64G has a maximum treatment capacity of approximately 700 gallons per minute, and thus has sufficient excess capacity to accommodate the anticipated leachate volumes associated with the operation of the landfill. The travel distances to the Building 64G water treatment facility would be approximately 10 miles for the Woods Pond Site, approximately 15 miles for the Forest Street Site, and approximately 20 miles for the Rising Pond Site. As such, travel distance for the water truck would not be a limiting factor. The option to construct an on-site treatment facility will be retained as a possible approach to be considered during design if TD 3 is selected.

Operations Monitoring and Maintenance: Monitoring and maintenance would be performed during facility operations. For purposes of this Revised CMS Report, it has been assumed that these activities would include daily air monitoring for particulate matter (during facility operations) and monthly air monitoring for PCBs, as well as semi-annual groundwater monitoring of upgradient and downgradient wells. It would also include periodic leachate collection and treatment/disposal, stormwater management, routine inspections, and maintenance of the stormwater diversion berms, stormwater detention basins, and drainage swales.

The total duration over which the placement of removed materials in the Upland Disposal Facility would occur would depend on the selected sediment and floodplain remediation alternatives. This time period would range from approximately 5 years (the duration of SED 10, the shortest sediment alternative) to 52 years (the duration of SED 8, the longest alternative), assuming that any floodplain remediation would also be completed within those same time frames.[498]

Engineering/Institutional Controls: During construction and operation of the Upland Disposal Facility, access restrictions would be established (i.e., fencing, signs) to prevent unauthorized access to the area. The fences and signs would remain following closure of the facility. In addition, deed restrictions would be established to prohibit interference with the Upland Disposal Facility and to prevent a future change in use of that area.

Final Cover Installation: Sediments and soils would be placed and compacted in 3-acre cells within the landfill. An interim cover would be installed over the consolidated material once the material within a cell reaches the maximum design height, to reduce infiltration of precipitation. The final cover would be installed over areas of completed consolidation, based on surface drainage, consolidation material operations, and constructability. For purposes of this Revised CMS Report, it was assumed that the final cover system would include (from bottom to top): a 6-inch-thick soil grading layer, a geosynthetic clay liner, a flexible membrane liner, a geosynthetic drainage layer, an 18-inch-thick soil protection

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[498] Note that the combination of sediment and floodplain alternatives with the shortest duration (SED 10 and FP 9) is not the same as the combination with the smallest volume (SED 3 and FP 2). For the evaluations in this section that are based on removal volumes, the latter combination is used as the basis for the lower end of the range. In addition, quantitative evaluations that assess active disposal operations (e.g., truck trips, traffic accident risks, risks to workers) are based on the assumed years of operation, rather than overall duration. The years of operation represent the number of years during which materials removed from the River and floodplain would be actively being disposed of (i.e., excluding years when the only activities being conducted under the sediment and floodplain alternatives would be capping, backfilling, or restoration activities). For TD 3, the assumed years of operation range from approximately 8 years based on the volume of SED 3 and FP 2 (the smallest-volume combination) to approximately 19 to 40 years based on the maximum capacity of a disposal facility at the location in question.

layer, and a 6-inch-thick soil layer on the top. The landfill cover would be planted with herbaceous vegetation

Long-Term Post-Closure Monitoring and Maintenance: A post-closure long-term monitoring and maintenance program would be implemented for the Upland Disposal Facility. For purposes of this Revised CMS Report, it has been assumed that this program would include performance of long-term upgradient and downgradient groundwater and stormwater runoff monitoring, as well as inspection and maintenance activities. The monitoring components for TD 3 have been assumed to include groundwater monitoring at 10 and 20 locations for the minimum- and maximum-sized facilities, respectively. The inspection and maintenance activities would focus on the cover system and other associated components, including the surface water drainage system, the leachate management system, fences, and warning signs. Maintenance and/or repairs would be performed as necessary. Leachate treatment/disposal would also be performed on a routine basis. Appropriate deed restrictions would be maintained on the land. For purposes of this Revised CMS Report, it has been assumed that this long-term monitoring and maintenance program would last for 100 years, with visual inspections and groundwater monitoring conducted twice annually in the first five years after closure and then once a year for the remainder of the 100-year period.

Restoration of Other Affected Areas: Support areas outside the landfill that are disturbed by the construction or operation of the facility, such as materials staging areas and access roads that are no longer needed after closure, would be restored to their pre-existing conditions to the extent practicable. This would include the removal of any materials brought in during construction to temporarily improve the surface for equipment. The surface soil in these areas would be prepared (e.g., by scarification or tilling) before being reseeded with a rapidly establishing native grass seed mix to prevent erosion. Additional woody plantings would be installed if necessary, based on the habitat community present prior to construction. For example, replanting of support areas constructed within upland forest habitats (such as at the Rising Pond and Forest Street Sites) could include the planting of native trees similar to those established in the surrounding upland forest. However, as discussed in prior sections, it would take at least 50 to 100 years to restore all the functions of a mature upland forest community. Restoration of the quarry/field area at the Woods Pond Site would likely consist of establishing grassland habitat.

9.3.2 Overall Protection of Human Health and the Environment – Introduction

As discussed in Section 9.1.2, the evaluation of whether a treatment/disposal alternative would provide overall human health and environmental protection relies heavily on the evaluations under several other Permit criteria – notably, long-term effectiveness and permanence (including long-term adverse impacts), short-term effectiveness, and

compliance with ARARs. For that reason, the evaluation of whether TD 3 would be protective of human health and the environment is presented at the end of Section 9.3 so that it can take account of the evaluations under those other criteria.

9.3.3 Control of Sources of Releases

Placement of PCB-containing sediments and soils into an Upland Disposal Facility located outside the 500-year floodplain would effectively and permanently isolate those materials from being released into the environment and transported within the River or onto the floodplain. The components of the facility described in Section 9.3.1, including the double base liner system, the double leachate collection system, and the cover system, would be designed to prevent releases from the Upland Disposal Facility to the surrounding environment; and the facility would be operated and would be monitored and maintained (both during and after operation) to ensure that it continues to isolate the PCB-containing materials within the landfill.

9.3.4 Compliance with Federal and State ARARs

The potential ARARs identified by GE for TD 3 in accordance with directions from EPA are listed in tables in Appendix C. As directed by EPA, separate tables have been prepared for the Woods Pond Site (Tables T-3.a through T-3.c), the Forest Street Site (Tables T-3.d through T-3.f), and the Rising Pond Site (Tables T-3.g through T-3.i). No chemical-specific ARARs have been identified for TD 3, although several guidances to be considered are listed in Tables T-3.a, T-3.d, and T-3.g.

Review of the potential location-specific and action-specific ARARs listed in these tables indicates that implementation of TD 3 at any of the identified locations would achieve certain of those ARARs, but that there are some potential ARARs that would or may require a specific EPA approval or finding or that would or may not be met.[499] Those potential ARARs are discussed below.

TSCA Requirements

EPA's regulations under TSCA establish certain technical requirements for chemical waste landfills used for disposal of PCBs, including siting, design, operation, and monitoring requirements (40 CFR § 761.75(b)). Any of these requirements may be waived by EPA

[499] For the reasons discussed in Section 2.1.3, a number of these regulatory requirements do not constitute ARARs for the Rest of River remedial action, but are listed in these tables as potential ARARs per EPA's direction.

based on a finding that that requirement is not necessary to protect against an unreasonable risk of injury to health or the environment (40 CFR § 761.75(c)(4)). In addition, the regulations allow EPA to provide a risk-based approval of an alternate method of disposal of PCB remediation waste if EPA finds that such method will not pose an unreasonable risk of injury to health or the environment (40 CFR § 761.61(c)).

Construction and operation of an Upland Disposal Facility at any of the above-identified locations would meet all the siting, design, and operation requirements of § 761.75, with a few qualifications or exceptions. First, while the existing soils at each of these locations would not meet requirements in § 761.75(b)(1) regarding the permeability and characteristics of the existing soil, the facility would be constructed with a synthetic membrane liner with equivalent low permeability, as allowed under § 761.75(b)(2) (with EPA approval) in places where the existing soil does not have the characteristics specified in § 761.75(b)(1). Second, all of these sites would likely not meet one or more of the requirements of § 761.75(b)(3) relating to hydrologic conditions (e.g., that the bottom of the liner must be at least 50 feet from the historical high water table, that groundwater recharge areas should be avoided, and that there be no hydraulic connection between the site and a surface waterbody). These hydrological issues would be investigated during design. However, even if those requirements were not met, the Upland Disposal Facility would have a double liner and leachate collection system (as discussed further below) to prevent impacts to groundwater (and ultimately to surface water), as well as a groundwater monitoring network to ensure that groundwater is not impacted during or after operations. In addition, construction of an Upland Disposal Facility at the Forest Street Site would not meet the requirement of § 761.75(b)(5) that a landfill be located in an area of low to moderate relief to minimize erosion and landslides or slumping. However, the facility would have engineered measures in place to reduce the potential for occurrence of these conditions. Such measures would, as necessary, include slope benching or terracing, berm buttressing and intermittent erosion breaks/sediment traps.

Under the TSCA regulations, even if one or more of these specific requirements in § 761.75(b) were not met, the Upland Disposal Facility would comply with the TSCA regulations through an EPA determination that the facility meets the substantive criteria for a waiver of those requirement(s) under § 761.75(c)(4) or for a risk-based approval of the facility location and design under § 761.61(c) – i.e., that the facility would not pose an unreasonable risk of injury to health or the environment. For the Building 71 On-Plant Consolidation Area (OPCA) at the GE Facility (which was authorized to receive TSCA-regulated materials), EPA specifically determined in the CD, pursuant to § 761.61(c), that use of that landfill would not pose an unreasonable risk of injury to health or the environment (CD Appendix D). Moreover, in other cases involving on-site landfills, EPA has waived specific locational requirements of § 761.75(b) such as those identified above, pursuant to § 761.75(c)(4), based upon a determination that, even without meeting them,

the landfill would not present an unreasonable risk of injury to health or the environment.[500] Given the safeguards to be built into the Upland Disposal Facility, such a finding would be warranted here.

Requirements Relating to Wetlands, Waterbodies, and Priority Habitat

As discussed in Section 9.3.1, all of the identified sites for an Upland Disposal Facility are located outside the floodplain of the Housatonic River, and the identified configurations for such a facility at all these sites would not contain or affect any regulated waterbodies, wetlands, or other resource areas under the Massachusetts Wetlands Protection Act with the following exceptions:

(1) The maximum (but not minimum) operational footprint for an Upland Disposal Facility at the Woods Pond Site contains the small (0.4 acre) shrub swamp, which may or may not meet the jurisdictional prerequisites for a regulated wetland under federal or state law (an issue that would be investigated during design).

(2) The maximum operational footprint for an Upland Disposal Facility at the Forest Street Site would require construction of an access road that would involve building a new crossing of a small stream in the southern portion of the site (Goose Pond Brook); and it would also be located within the 100-foot buffer zone of that stream. In addition, portions of both the minimum and maximum operational footprints would be within the 200-foot Riverfront Area of Goose Pond Brook (a jurisdictional resource area under the Massachusetts Wetland Protection Act).

(3) The maximum (but not minimum) operational footprint for an Upland Disposal Facility at the Rising Pond Site would impact a small (0.5-acre) forested wetland which may or may not meet the jurisdictional prerequisites for a regulated wetland under federal or state law. Further, should the adjacent section of Rising Pond be determined to constitute a river under the Massachusetts Wetlands Protection Act, a portion of the 200-foot Riverfront Area would be impacted by the maximum (but not the minimum) operational footprint.

[500] See, e.g., Record of Decision (ROD) for the Field Brook Site, Operable Unit IV, in Ashtabula, Ohio (EPA, 1997b); ROD for Paoli Rail Yard (EPA, 1992b); ROD for the King Highway Landfill – Operable Unit 3 of the Allied Paper/Portage Creek/Kalamazoo River Site (EPA, 1998b); ROD Amendment for Norwood PCB Site (EPA, 1996b); ROD for Berkley Products Company Dump Site (EPA, 1996c); ROD for Picillo Farm Site (EPA, 1985). See also OU-13 ROD for the Oak Ridge Reservation (U.S. Department of Energy [USDOE], 1999; concurred in by EPA).

As shown in the relevant ARARs tables for TD 3 at these locations (in Appendix C), to the extent that the operational footprint for any of these facilities would impact a regulated wetland, waterbody, or other jurisdictional resource area, the potentially applicable requirements would include one or more of the following: EPA's and the Corps of Engineers' regulations under Section 404 of the Clean Water Act (40 CFR Part 230, 33 CFR Parts 320-323); the federal Executive Order for Wetlands Protection (E.O. 11990); the Massachusetts water quality certification regulations for discharges of dredged or fill material into waters of the U.S. (314 CMR 9.06); and the Massachusetts Wetlands Protection Act regulations (310 CMR 10.53(3)(q)). Those requirements provide that there must be no practicable alternative with less adverse impact on the aquatic ecosystem or wetlands and that appropriate and practicable steps must be taken to minimize or mitigate any adverse effects on such areas. Thus, if those requirements constitute ARARs, EPA would have to find that there is no practicable alternative to the construction and use of the Upland Disposal Facility at the site in question and that this project would include practicable steps to minimize or mitigate harm to such resources, or else it would need to waive these requirements under CERCLA and the NCP. In addition, there are a few other requirements of these regulations that might not be met.[501]

The identified configurations for an Upland Disposal Facility at the Woods Pond and Forest Street Sites (including both the minimum and maximum configurations) would not impact any Priority Habitat for state-listed species under MESA.[502] According to the 2010 NHESP mapping, the overall property at the Rising Pond Site contains 47 acres of mapped Priority Habitat for the state-listed wood turtle, and the maximum (but not minimum) operational footprint would affect a portion (approximately 25 acres) of that habitat. As shown in the

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[501] Notably, the maximum (but not minimum) operational footprint for an Upland Disposal Facility at the Rising Pond Site would affect the Estimated Habitat of a state-listed wildlife species (the wood turtle), and thus the prohibition in the Massachusetts water quality certification regulations and the Massachusetts Wetlands Protection Act regulations on projects with such an effect would not be met. In addition, in the event that the implementation of TD 3 were not considered a "limited project" under 310 CMR 10.53(3)(q), it might not meet some of the other applicable requirements of the Massachusetts Wetlands Protection Act regulations at the Forest Street or Rising Pond Site – e.g., the prohibition on loss of > 5000 square feet of bordering vegetated wetlands (if any) and/or the requirement to maintain a 100-foot-wide area of undisturbed vegetation along the river in a Riverfront Area (subject to certain exceptions) – depending on the size of the operational footprint and other factors.

[502] For the Woods Pond Site, the 2010 NHESP mapping shows no Priority Habitat within the site (although Priority Habitat adjoins the site on its northwest corner), and the 2008 NHESP mapping showed a small portion (0.8 acre) of Priority Habitat within the site. However, under both sets of mapping, neither the minimum nor the maximum operational footprint of the disposal facility would impact any Priority Habitat. For the Forest Street Site, only 2008 NHESP mapping is available. It shows 0.7 acre of Priority Habitat in the northern portion of the site, but neither the minimum nor the maximum operational footprint of the disposal facility would impact that area.

MESA assessment for the wood turtle in Appendix L, the development of the facility within the maximum operational footprint would involve a take of the wood turtle. Thus, under this scenario, if MESA and its implementing regulations constitute an ARAR, their prohibition on a take of a state-listed species would need to be waived as technically impracticable to meet.[503]

Requirements Under RCRA and State Hazardous Waste Regulations

EPA's regulations under RCRA establish detailed and rigorous requirements for facilities that treat, store, or dispose of material that constitutes a hazardous waste under those regulations (40 CFR Part 264). The Massachusetts hazardous waste regulations likewise impose detailed and rigorous requirements on facilities that treat, store, or dispose of materials that constitute hazardous waste on the same grounds.[504] However, under the MCP, the on-site disposal of contaminated media constituting hazardous waste as part of a remedial action is exempt from the State's hazardous waste regulations unless the MDEP determines that compliance with those regulations is required (310 CMR 40.0033(5)).[505]

As discussed above, based on prior experience at other portions of the Housatonic River and floodplain, it is not anticipated that the sediments and soils that would be removed from the River, riverbanks, and floodplain in the Rest of River area would constitute characteristic hazardous waste under RCRA or the Massachusetts hazardous waste regulations (see Section 6.3.4). Thus, it is not expected that the EPA RCRA regulations and Massachusetts hazardous waste regulations would apply to the Upland Disposal Facility. However, representative TCLP testing of the sediments and soils subject to removal would be conducted during design to confirm that result. We have considered whether, in the unlikely event that the TCLP testing should show that particular sediments or soils to be placed in the Upland Disposal Facility would constitute hazardous waste, the Upland Disposal Facility

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[503] The MESA regulations contain a provision authorizing the Director of the MDFW to permit a take of a state-listed species under certain conditions (321 CMR 10.23). However, as discussed in Section 5.4, this provision does not constitute an ARAR for the Rest of River remedial action.

[504] As noted above, although wastes with PCB concentrations $\geq$ 50 mg/kg are listed hazardous wastes in Massachusetts, the Massachusetts hazardous waste regulations exempt facilities that manage such wastes so long as such facilities comply with EPA's TSCA regulations (310 CMR 30.501(3)(a)), which the Upland Disposal Facility would do. Hence, the discussion here relates to materials that would constitute hazardous waste on other grounds, which are the same as those under EPA's RCRA regulations.

[505] For purposes of the ARARs evaluation herein, it is assumed that the Rest of River remedial action would constitute a remedial action under the MCP by virtue of the MCP's "adequately regulated" provisions (310 CMR 40.0111). In such a case, the MCP provides (in section 40.0033(5)) that, if the MDEP does not issue a written notification that the remedial action must comply with the state hazardous waste regulations, the remedial action shall be considered a remedial action initiated by the MDEP, which is exempt from those regulations under 310 CMR 30.801(11).

at each of the above-identified locations would meet the substantive requirements of those regulations.[506]

For the federal RCRA regulations, in the unlikely event that some sediments or soils to be placed in the Upland Disposal Facility are found to constitute RCRA hazardous waste, that facility would meet the substantive technical requirements for a hazardous waste landfill, including the design, operating, groundwater protection, closure, and post-closure requirements for such a landfill. This is because, as a conservative measure, the facility would be designed to meet the technical requirements for a RCRA landfill, including the requirements for a double liner/leachate collection system (40 CFR § 264.301), even though it is not expected that those requirements would apply.

With respect to the RCRA land disposal restrictions (40 CFR Part 268), it is again not expected that these restrictions would apply, since it is anticipated that any sediments and soils to be placed in the Upland Disposal Facility would either not constitute hazardous waste at all or would meet alternate standards for contaminated soil in 40 CFR § 268.49,[507] which allow land disposal without treatment if the material has concentrations of the relevant constituents less than 10 times the Universal Treatment Standards. However, if some excavated materials were nevertheless considered to be subject to the treatment requirement in these regulations, that requirement would not be met, because alternative TD 3 would not involve treatment. In that case, either the treatment requirement could be waived by EPA under CERCLA and the NCP as technically impracticable to meet, or those specific materials would have to be sent elsewhere for treatment and disposal. A waiver would be justified from a protectiveness standpoint, since: (a) in the unlikely event that these restrictions applied, that would be due to certain non-PCB constituents (e.g., metals); and (b) EPA eliminated such non-PCB constituents from detailed evaluation in its HHRA and ERA.

Finally, with respect to the state hazardous waste regulations, even if some materials to be placed in the Upland Disposal Facility were found to constitute hazardous waste under those regulations (on grounds other than containing PCBs $\geq$ 50 mg/kg), the facility would be

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[506] In this regard, it does not appear that EPA's Area of Contamination (AOC) policy would apply to the facility at any of the identified locations. Under that policy, the movement and disposition of hazardous waste within an overall area of dispersed contamination would not constitute "placement" of such waste and would not trigger the technical RCRA design and operating requirements or the RCRA land disposal restrictions. However, each of the identified potential locations for an Upland Disposal Facility is located outside the overall area of PCB contamination. Thus, in this evaluation, we have assumed that the AOC policy would not apply.

[507] For purposes of the provisions of Part 268, including these alternate standards, the definition of soil in 40 CFR § 268.2(k) would include sediments.

exempt from those regulations under the above-described MCP exemption unless the MDEP determines that compliance with those regulations is required (310 CMR 40.0033(5)). In the unlikely event that some materials did constitute such hazardous waste and the MCP exemption did not apply, the Upland Disposal Facility at each of the potential locations identified above would meet the substantive requirements of the regulations for a hazardous waste landfill, including the location, design, operating, groundwater protection, closure, and post-closure requirements for such a landfill, with a few potential exceptions relating to the location of the facility, as described below.

The state hazardous waste regulations provide that a hazardous waste landfill may not be located within 1000 feet of an existing private drinking water well or within the groundwater flow path of such a well, or within the flow path of groundwater supplying a "potential private underground drinking water source," or on land overlying or within the flow path of a "potential public underground drinking water source" (310 CMR 30.704, 703(4) 30.010).[508] Review of available information indicates that, at the Woods Pond Site, the disposal facility would be within 1000 feet of an existing drinking water well in an adjacent campground and would potentially not meet some of the other locational requirements mentioned above – issues that would be investigated during design. For the Rising Pond and Forest Street Sites, it is unknown at this time whether a landfill would meet all of the above-mentioned requirements relating to actual or potential private or public underground drinking water sources – which are matters that would be investigated during design. To the extent that any of these hazardous waste requirements were found to apply and could not be met at the selected landfill location, GE would seek a waiver of such requirement(s) from EPA on the ground of technical impracticability.[509]

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[508] A "potential private underground drinking water source" is defined as a groundwater source that is capable of sustaining a yield of between 2 and 100 gallons per minute [gpm] of drinking water and has less than 10,000 mg/L of TDS, unless it is economically or technologically impractical to render that water fit for human consumption. A "potential public underground drinking water source" is defined as a groundwater source that is capable of sustaining a yield of 100 gpm or more of drinking water and has less than 10,000 mg/L of TDS, unless it is economically or technologically impractical to render that water fit for human consumption.

[509] It should be noted that the Massachusetts site assignment regulations for solid waste facilities (310 CMR 16.00) and solid waste management regulations (310 CMR 19.00) would not apply to the Upland Disposal Facility because 310 CMR 19.013(2) exempts from those regulations remedial actions conducted pursuant to the MCP and, as noted above, the Rest of River remedial action would constitute a remedial action under the MCP by virtue of the MCP's "adequately regulated" provisions (310 CMR 40.0111).

9.3.5 Long-Term Reliability and Effectiveness

An assessment of long-term reliability and effectiveness of TD 3 has included an evaluation of the magnitude of residual risk, the adequacy and reliability of the alternative, and any potential long-term adverse impacts associated with the alternative on human health or the environment.

9.3.5.1 Magnitude of Residual Risk

TD 3 would include the disposal of PCB-containing sediments/soils removed from the Rest of River in an Upland Disposal Facility, located outside the 500-year floodplain of the Housatonic River. The materials placed in this facility would be isolated from underlying soils and groundwater and from surface receptors, which would prevent contact by human and ecological receptors with those materials. Erosion control measures would be installed to minimize the risk of erosion during operations, and the long-term monitoring and maintenance program would address potential erosion over the long term. Since the potential for erosion at the Forest Street Site is higher than at the Woods Pond or Rising Pond Sites due to its steeper topography, more extensive engineering/erosion controls would be necessary at the Forest Street Site. Additionally, engineering/institutional controls, such as signs, fencing, and deed restrictions, would be in place to further limit the potential for human exposure after construction and closure of the facility.

9.3.5.2 Adequacy and Reliability of Alternative

Evaluation of the adequacy and reliability of TD 3 has included an assessment of the factors discussed below.

Use of Technology under Similar Conditions

Landfill disposal is commonly used as a remedy component for removed soil and sediment containing PCBs. Disposal facilities with leachate collection and impermeable base liner and cover systems have been constructed and used as part of a final remedy for a number of sediment sites containing PCBs, including the Upper ½ and 1½ Mile Reaches of the Housatonic River; the Alcoa Grasse River Study Area in Massena, New York; the Ormet Corporation Site in Hannibal, Ohio; the Allied Paper/Portage Creek/Kalamazoo River Superfund Site in Kalamazoo, Michigan; the Bennington Municipal Sanitary Landfill in Bennington, Vermont; the Fields Brook Site in Ashtabula, Ohio; and the River Raisin at the Ford Outfall in Monroe, Michigan. In addition, consolidation of dredged sediments into an upland disposal facility was selected as part of the remedy for the Onondaga Lake Site in Syracuse, New York, and more recently for the removal and on-site consolidation of approximately 2.5 million cy of dredged coal ash released to a nearby embayment at the

Tennessee Valley Authority (TVA) Kingston Superfund Site in Roane County, Tennessee. While the designs differ based on location-specific factors, the general landfill components and objectives are similar to those assumed for TD 3.

Overall Effectiveness and Reliability

The capacity of the Upland Disposal Facility would depend on the location selected for the facility. As discussed in Section 9.3.1, maximum estimated design capacities for such a facility at the three identified sites are approximately 1.0 million cy at the Forest Street Site, 2.0 million cy at the Woods Pond Site, and 2.9 million cy at the Rising Pond Site. Therefore, for disposal volumes up to approximately 1.0 million cy, there would be three site options for constructing an on-site disposal facility; while for greater disposal volumes, a disposal location that has sufficient capacity to handle that volume or a combination of two disposal locations would be used.

At any of the potential locations, the Upland Disposal Facility would be constructed outside the 500-year floodplain with appropriate double liner, cover, and double leachate collection systems. As a result, implementation of TD 3 would be an effective and reliable means of permanently disposing of the removed sediments and soils.

Reliability of Operation, Monitoring, and Maintenance Requirements

A combination of OMM techniques would be implemented during and after active use of the Upland Disposal Facility, as described in Section 9.3.1. Once constructed, periodic mowing of the cap would help maintain the cap integrity by limiting the growth of trees and shrubs. During operations and following closure, collected leachate would be temporarily stored in on-site tanks and transported, as needed, to GE's water treatment facility in Pittsfield (although as described above, the option of constructing an on-site water treatment facility would be considered during design). Periodic visual inspections would be conducted to identify any areas of erosion or damage to the cap. Groundwater and stormwater runoff would be monitored to confirm the long-term effectiveness of TD 3. Maintenance activities at the facility would include, as necessary, periodic repairs to the cap, including cleaning and repair of the stormwater conveyance and collection system and re-seeding of the cover areas; maintenance of vegetation along the perimeter of the facility; and maintenance and repair of the fences and signs. Such monitoring and maintenance techniques are commonly applied at other landfill sites, and are considered a reliable means of ensuring long-term protection against exposure to the contained materials within the facility. Labor and materials needed to perform the OMM activities are expected to be readily available.

Technical Component Replacement Requirements

TD 3 would be effective at isolating the excavated/dredged sediment and soil from the surrounding environment. The impermeable base liner and cap system would permanently contain the soil/sediment. OMM activities would be implemented to monitor the effectiveness of the facility.

In the unlikely event that the cap or liner system required repair, an assessment would be conducted to determine the type and methods of repair. The effort required would depend on the nature and extent of the deficiency. Risks posed to site workers performing maintenance activities would be mitigated through development and implementation of a facility-specific health and safety plan.

9.3.5.3 Potential Long-Term Adverse Impacts on Human Health or the Environment

The evaluation of potential long-term adverse impacts of TD 3 on human health or the environment has included an assessment of several components, as described below.

Potentially Affected Populations

Under TD 3, the PCB-containing sediments and soils placed in the Upland Disposal Facility would remain in place permanently. The presence of bottom liner and cap systems would isolate those materials and prevent contact by human and ecological receptors with those materials, and implementation of engineering/institutional controls and a monitoring and maintenance program would ensure the long-term integrity and effectiveness of the facility. Hence, this alternative would not have an adverse effect on human health. The ecological populations affected by the implementation of TD 3 would depend upon the type of habitat present at the location selected for construction of the facility. The potential long-term impacts of TD 3 on biota and their habitat are discussed further below.

Long-Term Adverse Ecological Impacts

The primary long-term ecological impact from TD 3 would be the removal of habitat from productive use by the wildlife species that currently inhabit the selected site. Since any of the potential locations for the facility would be outside of the 500-year floodplain of the River and away from wetlands (with a few possible minor exceptions, discussed above[510]),

[510] As noted above, the maximum (but not minimum) operational footprints would affect a 0.4-acre shrub swamp at the Woods Pond Site and a 0.5-acre forested wetland at the Rising Pond Site, and would require an access crossing of Goose Pond Brook at the Forest Street Site.

placement of the facility would largely avoid long-term impacts to those types of habitats and the species that inhabit them and would thus reduce the potential for significant long-term ecological impacts. Otherwise, specific impacts would depend on the location selected for the Upland Disposal Facility as well as the final disposal volume. The potential impacts associated with the minimum and maximum disposal volume scenarios developed for each site are discussed below.[511] The acreages considered in the below discussion represent the operational footprints that would be directly impacted by the facility and its operations (as listed in Table 9-1 in Section 9.3.1).

Woods Pond Site: The Woods Pond Site consists primarily of active and inactive portions of a sand and gravel facility, with smaller areas composed of an upland pine-mixed hardwood forest, a small shrub swamp, and an overhead electric utility corridor.

- Minimum Operational Footprint: The operational footprint for an Upland Disposal Facility at this site under the minimum volume scenario (approximately 191,000 cy) covers approximately 25 acres. Most of this area (more than 21 acres) consists of previously disturbed land that is currently used as a sand and gravel quarry or was formerly used for such purposes and now consists of heavily disturbed fields and overhead utility easements. Since this area has little habitat value, there would be no significant long-term ecological impacts in this area. The remainder of the operational footprint consists of 3.4 acres of upland forest. The clearing of this 3.4-acre area would involve the removal of all trees, shrubs, and herbaceous vegetation, displacing wildlife which use this habitat. Where such clearing work would occur within support areas (e.g., materials staging areas, access roads) that would no longer be needed after closure, the areas would be replanted, although, as discussed previously, it would take at least 50 to 100 years for a replanted upland forest to return to its current mature condition. While the capped landfill itself plus any areas needed to support it after closure would be permanently altered, this area consists mainly of previously disturbed land, with only a small portion consisting of upland forest habitat (0.2 acre within the landfill). In short, the impacts of an Upland Disposal Facility under this scenario on upland forest habitat would affect only a very small portion of this overall habitat type in and near the Rest of River area.

- Maximum Operational Footprint: The operational footprint for an Upland Disposal Facility at the Woods Pond Site under the maximum volume scenario (approximately 2.0 million cy) covers approximately 61 acres. The majority of this area (approximately

[511] As discussed above, the maximum volume scenarios for these three sites are not the same. They are 1.0 million cy for the Forest Street Site, 2.0 million cy for the Woods Pond Site, and 2.9 million cy for the Rising Pond Site.

38 acres) consists of previously disturbed land that is currently operated as a sand and gravel quarry or was formerly used for such purposes and now consists of heavily disturbed fields and overhead utility easements. Since this area has little habitat value, there would be no significant long-term ecological impacts in this area. The remainder of the operational footprint includes roughly 21 acres of upland forest and the small (0.4-acre) shrub swamp. Again, the clearing of these areas would involve the removal of all trees, shrubs, and herbaceous vegetation, displacing wildlife which use these habitats. Where this work would occur within support areas that would no longer be needed after closure, the areas would be restored to the extent practicable; but it would take at least 50 to 100 years for a replanted upland forest to return to its current mature condition. The capped landfill itself (which would include approximately 5 acres of upland forest and 0.1 acre of the shrub swamp) and the support areas that are needed for it after closure would be permanently altered. While much of this area consists of previously disturbed land, it includes some upland forest habitat and a small portion of the shrub swamp habitat, which would be permanently lost for wildlife use. Even under the maximum operational footprint, however, the impacted forest and shrub swamp habitats would constitute only very small portions of these habitats in and near the Rest of River area.

Forest Street Site: The Forest Street Site is composed primarily of upland pine-mixed hardwood forest.

- Minimum Operational Footprint: The operational footprint for an Upland Disposal Facility at this site under the minimum volume scenario (approximately 191,000 cy) covers approximately 42 acres. Development of an Upland Disposal Facility under this footprint would require the clearing of approximately 41 acres of upland forest and involve the removal of all trees and associated biomass, all snags and downed woody debris, and all shrubs and herbaceous vegetation in the cleared area. Where this work would occur within support areas (e.g., materials staging areas and access roads) that would no longer be needed after closure, the areas would be replanted. However, as discussed previously, it would take at least 50 to 100 years for a replanted upland forest to return to its current mature condition. Moreover, the capped landfill itself, which would include 9 acres of upland forest, and the support areas that are needed for it after closure would be permanently altered. The permanent elimination of upland forest in this area would result in the loss of habitat for interior forest wildlife, including individual birds and mammals that currently use the forested habitat located at this site. The remaining portion of the operational footprint (approximately 1.5 acres) consists of cleared open field and disturbed land. The minimum operational footprint at this site would not impact the coniferous wooded swamp located on the property.

- Maximum Operational Footprint: The operational footprint for an Upland Disposal Facility at the Forest Street Site under the maximum volume scenario (approximately 1.0 million cy) covers approximately 95 acres. Development of an Upland Disposal Facility under this footprint would require the clearing of approximately 93 acres of upland forest. Ecological impacts to the forested habitat would be similar in nature to those described above for the minimum volume footprint but would cover a greater area. The remaining portion of the operational footprint consists of cleared open field and disturbed land (approximately 1.5 acres). The maximum operational footprint at this site would not impact the coniferous wooded swamp on the property.

Rising Pond Site: The Rising Pond Site consists primarily of upland coniferous and mixed hardwood forest.

- Minimum Operational Footprint: The operational footprint for an Upland Disposal Facility at this site under the minimum volume scenario (approximately 191,000 cy) covers approximately 27 acres, virtually all of which consist of upland forest habitat. Development of an Upland Disposal Facility under this footprint would thus involve the clearing of those 27 acres, including removal of all trees and associated biomass, all snags and downed woody debris, and all shrubs and herbaceous vegetation in the cleared area. Where this work would occur within support areas (e.g., materials staging areas and access roads) that would no longer be needed after closure, the areas would be replanted. However, as discussed previously, it would take at least 50 to 100 years for a replanted upland forest to return to its current mature condition. Moreover, the capped landfill itself, which would include 5 acres of upland forest, and the support areas that are needed for it after closure would be permanently altered. Again, the permanent elimination of upland forest in this area would result in the loss of habitat for interior forest wildlife, including individual birds and mammals that currently use this area of forest located along the Housatonic River corridor. This footprint would not impact the mapped Priority Habitat for the state-listed wood turtle.

- Maximum Volume Footprint: The approximate area of the Rising Pond Site that would be used for an Upland Disposal Facility under the maximum volume footprint (approximately 2.9 million cy) covers approximately 84 acres. Development of an Upland Disposal Facility under this footprint would require the clearing of approximately 80 acres of upland forested habitat and 0.5 acre of forested swamp habitat. Ecological impacts to the upland forested habitat would be similar to those described above for the minimum volume footprint but would cover a greater area. Impacts to the small forested swamp would occur within the development area and reduce the habitat diversity of the area, particularly for amphibian and reptile species (such as the eastern American toad and the northern black racer). The remaining portion of the development area (approximately 4 acres) would be constructed on previously

disturbed open land used as roadways, open land, and cropland. The development area under this maximum footprint would overlap into approximately 25 acres of mapped Priority Habitat for the state-listed wood turtle on the eastern portion of the site. Wood turtles inhabit forested habitat for foraging during the spring and summer and also use open undeveloped upland habitat for nesting in the late spring/early summer. The construction of the Upland Disposal Facility under this footprint would reduce suitable available habitat for this species and would constitute a take of this species under MESA (see MESA assessment for wood turtle in Appendix L).

The long-term impacts discussed above would be localized primarily to the discrete development area where the Upland Disposal Facility would be located.

Long-Term Impacts on Aesthetics

The long-term impacts on aesthetics from the construction of an Upland Disposal Facility depend on the location and current use of the area. While the Upland Disposal Facility would be capped and vegetated, the presence of the facility, as well as the need to construct and maintain roads and stormwater structures at the site, could have a permanent impact on the aesthetics of the area, depending on the location selected for the facility. For example, at the Forest Street Site, construction of the Upland Disposal Facility would create an opening in the dense forested hillside that could be visible from some vantage points; and at the Rising Pond Site, the facility would result in the permanent visible loss of forest land. Again, however, these impacts would be localized in the area of the facility. At the Woods Pond Site, the aesthetic impacts would be less, since the facility would be constructed in large part in a disturbed area that is or was used for sand and gravel operations; and although some trees in the forested area would be removed, the trees along Woodland Road would be left in place to shield the landfill to a degree from surrounding properties. In fact, following closure of the facility, the presence of the capped surface with herbaceous vegetation would improve in the appearance of this area over its current condition.

Potential Measures to Mitigate Long-Term Adverse Impacts

Measures would be implemented to mitigate the potential long-term adverse impacts associated with the implementation of TD 3. As previously mentioned in Section 9.3.1, the implementation of OMM activities and engineering/institutional controls would minimize the potential for a release from and exposure to PCBs present in the Upland Disposal Facility. Placement of the disposal facility outside of the 500-year floodplain and away from or with minimal impacts on wetlands would avoid or minimize long-term impacts to those types of habitats. Following completion of operations, the facility surface would be restored with an

herbaceous vegetative cover, and the adjacent disturbed areas would be restored to the type of habitat that previously existed there.

9.3.6 Reduction of Toxicity, Mobility, or Volume

The degree to which TD 3 would reduce the toxicity, mobility, or volume of PCBs is discussed below.

Reduction of Toxicity: This alternative would not include any treatment processes that would reduce the toxicity of the PCBs in the removed sediments and soils. However, leachate collected in the leachate collection system would be temporarily stored in on-site tanks and transported, as needed, to GE's water treatment facility in Pittsfield. (As discussed earlier in this section, construction of an on-site water treatment facility would be considered during design.) In addition, although it is not anticipated, if any free NAPL, drums of liquid waste, or the like are removed from the River or floodplain, that waste would not be placed in the Upland Disposal Facility, but would be segregated and transported off-site for treatment and disposal, as appropriate.

Reduction of Mobility: TD 3 would result in the reduced mobility of PCBs by permanently containing the PCBs in the sediment and soil removed from the River and floodplain within the Upland Disposal Facility. Once placed within that facility, these materials would be isolated from surface water infiltration, leaching to groundwater, or otherwise mobilizing.

Reduction of Volume: TD 3 would not reduce the volume of PCB-containing material.

9.3.7 Short-Term Effectiveness

Evaluation of the short-term effectiveness of TD 3 has included consideration of the short-term impacts of implementing this alternative on the environment (in terms of both ecological effects and increases in GHG emissions), on local communities (both near the facility as well as communities along truck transport routes), and on the workers involved in the disposition activities. For TD 3, short-term impacts are those that would occur during the construction and operation of the Upland Disposal Facility and associated closure.

Impacts on the Environment – Ecological Effects

The short-term effects on the environment resulting from implementation of TD 3 would include the destruction of the habitat and destruction or displacement of the wildlife residing in the location selected for construction of the Upland Disposal Facility. In addition, short-term impacts would occur in the adjacent areas disturbed during construction of the supporting access roads and staging areas. Specific impacts would depend on the location

selected for the facility. As discussed above, the placement of the Upland Disposal Facility outside of the 500-year floodplain and away from or with minimal impacts to wetlands would avoid or minimize impacts to those types of habitats and the biota that inhabit them. For the three potential locations for the facility, considering both their minimum and maximum operational footprints,[512] the short-term ecological effects would be as follows:

For a facility located at the Woods Pond Site, the short-term ecological effects would consist primarily of the loss of forested habitat within the operational footprint of the facility and, for the maximum volume scenario only, the limited shrub swamp habitat within the operational footprint. It is estimated that the construction of an Upland Disposal Facility and associated facilities at this site under the maximum volume scenario would result in the clearing and use of 21 acres of upland forested habitat and 0.4 acre of shrub swamp habitat. This clearing would prevent the use of those areas by the birds, mammals, reptiles, and other wildlife that use those habitats. However, since the remaining portion of the operational footprint (approximately 38 acres) would be situated on previously altered land that is or was used for sand and gravel quarry operations (as well as on a utility right-of-way), the overall short-term ecological impacts would be limited. Under the minimum volume scenario, most of the operational footprint (more than 21 of 25 acres) would consist of the previously altered land, where no significant adverse ecological effects would occur; and the clearing of other habitats would be reduced to 3.4 acres of forested upland habitat.

For a facility located at the Forest Street Site, the short-term ecological effects would consist primarily of the loss of upland forest habitat within the operational footprint of the facility. It is estimated that the development of an Upland Disposal Facility and associated facilities at this site would result in the clearing and use of a total of 41 to 93 acres of such forested habitat. This clearing would prevent the use of those areas by the birds, mammals, reptiles, and other wildlife that use that forested habitat. Erosion and sedimentation would be a particular concern on this site due to the steep slopes and the presence of the adjacent Goose Pond Brook. While short-term adverse ecological impacts would occur for all volume scenarios, the extent of those impacts would directly correlate to the volume of waste to be disposed of and thus the size of the operational footprint.

For a facility located at the Rising Pond Site, the short-term ecological effects would consist primarily of the loss of forest habitat within the operational footprint of the facility. It is estimated that the construction of an Upland Disposal Facility and associated facilities at this site would result in the clearing and use of a total of 27 to 80 acres of forested upland habitat and 0.5 acre of forested swamp habitat (maximum footprint only). This clearing

[512] Note again that the maximum operational footprints at these three locations are based on different disposal volumes.

would prevent the use of those areas by the birds, mammals, reptiles, and other wildlife that use that forested habitat. The extent of these impacts would directly correlate to the volume of waste to be disposed of and thus the size of the operational footprint. In addition, the maximum operational footprint at this site would impact approximately 25 acres of mapped Priority Habitat for the state-listed wood turtle; this would reduce foraging and potential nesting habitat for the wood turtle and may result in mortality of individual animals. Impacts on this Priority Habitat would not occur under the minimum operational footprint.

Carbon Footprint – GHG Emissions

As described in Section 5.6 and Appendix M, estimates of the carbon footprint composed of GHG emissions anticipated to occur through the implementation of TD 3 – i.e., the construction and use of an Upland Disposal Facility for removed sediments and soils – have been developed for the time frame over which this alternative would be implemented. These estimates have been made for the minimum and maximum volume scenarios at each of the three identified sites. The estimates for those three sites differ due to differences in transport distance from the areas of removal, and the maximum estimates differ further due to differences in the maximum volumes subject to disposal.

The estimates of total GHG emissions for TD 3 range from 5,500 to 22,000 tonnes at the Woods Pond Site, 14,000 to 52,000 tonnes at the Forest Street Site, and 9,800 to 61,000 tonnes at the Rising Pond Site. However, as noted above, the only one of these individual sites that could accommodate the full upper-bound volume of removed materials (2.9 million cy based on SED 8 and FP 7) is the Rising Pond Site.[513] In these circumstances, the overall range of total GHG emissions for TD 3 is considered to extend from 5,500 tonnes (based on the minimum volume at the Woods Pond Site) to 61,000 tonnes (based on the maximum volume at the Rising Pond Site).

Of these totals, the GHG emissions associated with direct emission sources (primarily construction activities, tree removal, and associated mulch decay/sequestration of the vegetation) range from approximately 5,000 tonnes to 56,000 tonnes, while the off-site GHG emissions (primarily refinement of diesel fuel and excavation of disposal facility cap and liner materials) were calculated to range from approximately 460 tonnes to 4,500 tonnes. The range of total GHG emissions estimated for this alternative is equivalent to the annual output of 1,100 to 11,700 passenger vehicles.

[513] As noted above, a combination of disposal sites could also be used for the upper-bound volume. However, separate estimates of GHG emissions have not been made for such combinations.

Impacts on Local Communities and Communities Along Truck Transport Routes

Implementing TD 3 would also result in short-term impacts to the local communities. These short-term effects would include increased truck traffic and noise from construction. Truck traffic to deliver construction materials, equipment, and sediments/soils to the Upland Disposal Facility would persist for the duration of the project. This additional traffic and equipment would increase the likelihood of noise levels and the emissions of vehicle/equipment exhaust and nuisance dust to the air. These factors would especially affect any residents and businesses located in the immediate vicinity of the Upland Disposal Facility.

The increased truck traffic would affect both local communities and areas along the routes used to transport construction materials to the site for construction and closure of the Upland Disposal Facility. The impacts on local communities would be different for the three potential locations. Although the number of truck trips from the removal areas to the disposal sites would not differ among the three sites, the distances from the removal areas would vary.

- The Woods Pond Site is approximately 0.3 miles south of the PSA, which is the area where most of the sediment and soil removal activities would occur. If TD 3 were implemented at the Woods Pond Site, truck traffic from the PSA would primarily be routed along Woodland Road and East Street.

- The Forest Street Site is approximately 3.9 miles away from the PSA. Although the Forest Street Site is located in Lee, trucks would bypass the downtown area to the extent practicable. Truck traffic from the PSA to the Forest Street Site would be expected to travel predominantly on Woodland Road, East Street, and Mill Street.

- The Rising Pond Site is approximately 14 miles by road south of the PSA. Truck traffic from the PSA to the Rising Pond Site would likely travel through Lenox and Stockbridge.

For comparability with the other treatment/disposition alternatives, an estimate has been made of the number of off-site truck trips that would be involved in implementation of TD 3 (i.e., excluding the local truck trips for transporting excavated materials from the temporary staging areas to the Upland Disposal Facility). Based on a range of potential facility sizes, which would depend on the volume of material to be disposed of in the facility (from a combination of SED 3 and FP 2 to a combination of SED 8 and FP 7), and assuming that 16-ton trucks would be used to transport construction materials to the site, the total numbers of off-site truck trips to transport construction materials to the site for construction and closure of the Upland Disposal Facility are shown in Table 9-2. The total number of

vehicle miles that these trucks would travel would range from approximately 73,000 miles (for the Woods Pond Site) to approximately 269,000 miles (for the Rising Pond Site), including return trips.

Table 9-2 – Estimated Import Truck Trips for TD 3

Import Truck Trips	Woods Pond Site	Forest Street Site	Rising Pond Site
Lower-Bound Volume	1,451 (180)	6,175 (770)	1,456 (180)
Upper-Bound Volume	3,267 (110)	67,983 (3,580)	5,387 (130)

Notes:

1. Truck trips estimated assuming 16-ton capacity trucks for importing material and equipment to the site.
2. The number in parenthesis represents average annual truck trips.

Appendix N includes an analysis of potential accident risks from increased truck traffic for each of the three potential locations. This analysis was based on the off-site truck trips to transport construction materials to the site for construction and closure of the Upland Disposal Facility, as shown in Table 9-2.[514] These estimates have been made for the minimum and maximum volume scenarios at each of the three identified sites. This analysis indicates that the increased truck traffic to implement TD 3 would result in the following estimated non-fatal injuries due to accidents and fatalities from accidents:[515]

- For a facility at the Woods Pond Site, an estimated 0.03 to 0.08 total non-fatal injuries (average of 0.00 to 0.003 non-fatal injuries per year), with a probability of 3% to 7% of at least one such injury, and an estimated 0.002 to 0.004 total fatalities (average of 0.0002 to 0.0001 fatalities per year), with a probability of 0.2% to 0.4% of at least one such fatality;

- For a facility at the Forest Street Site, an estimated 0.15 to 1.60 total non-fatal injuries (average of 0.018 to 0.084 non-fatal injuries per year), with a probability of 14% to 80% of at least one such injury, and an estimated 0.007 to 0.07 total fatalities (average of 0.0008 to 0.0039 fatalities per year), with a probability of 0.7% to 7% of at least one such fatality;

[514] The risks associated with transport of excavated materials from the staging areas to the Upland Disposal Facility have been evaluated as part of risks to workers, discussed below.

[515] Note again that, due to differences in the maximum volume estimates for each site, the maximum injury and fatality estimates for these three sites are not comparable.

- For a facility at the Rising Pond Site, an estimated 0.03 to 0.13 total non-fatal injuries (average of 0.004 to 0.003 non-fatal injuries per year), with a probability of 3% to 12% of at least one such injury, and an estimated 0.002 to 0.01 total fatalities (average of 0.00025 fatalities per year for both the minimum and maximum scenarios), with a probability of 0.2% to 1% of at least one such fatality

Potential Measures to Avoid, Minimize, or Mitigate Short-Term Environmental and Community Impacts

Several actions would be taken in an attempt to avoid, minimize, or mitigate the negative short-term environmental impacts from construction and operation of the Upland Disposal Facility. The facility would be constructed in as small an area as necessary, so as to minimize the amount of habitat disturbed. Engineering controls and BMPs would be implemented, to the extent practical and as needed, to reduce detrimental effects from construction and operation of the disposal facility on the environment and local communities. Some potential BMPs that would likely be implemented during construction include, but are not limited to, the following:

- Stormwater management engineering controls and BMPs at the Upland Disposal Facility, including (as appropriate):
  - Hay or straw bales;
  - Silt fences;
  - Grass channel and water quality swale with a pretreatment device (e.g., sediment forebay with a check dam);
  - Constructing the landfill in a series of smaller cells, which would be capped once filled; and
  - Compacting sediments and soils and covering them with a temporary (daily) cover and then with an interim cover once the material in a given cell reaches the maximum design height;

- Air quality management (dust suppression) engineering controls and BMPs:
  - Inspection of trucks prior to entering public roadways to identify and, if necessary, remove any accumulated soil on the exterior of the trucks;
  - Implementation of equipment decontamination procedures;
  - Use of lined and tarped trucks;
  - Use of dust control measures, as needed, at the disposal facility and on unpaved roadways;
  - Constructing the landfill in a series of smaller cells, which would be capped once filled; and

  - Compacting sediments and soils and covering them with temporary (daily) cover and then with an interim cover once the material in a given cell reaches the maximum design height;

- Proper equipment and vehicle maintenance;
- Limitations on truck idling;
- Utilization of good housekeeping practices at the disposal facility;
- Avoidance of truck transport and disposal facility construction and operations at night except where necessary, and minimizing such activities on weekends and holidays;
- Efforts to avoid truck traffic through densely populated areas where practical;
- Where such travel is necessary, implementation of measures to ensure the safety of the impacted communities (e.g., traffic control, consultation with local public officials);
- Performance of routine air monitoring during facility construction and operation, as appropriate, in accordance with a project-specific air monitoring plan; and
- Groundwater monitoring to minimize or mitigate potential detrimental effects of the operation of the Upland Disposal Facility on the affected communities.

Risks to Remediation Workers

Implementation of TD 3 would also result in health and safety risks to site workers during the construction, filling, and closure of the Upland Disposal Facility. Implementation of this alternative is estimated to involve approximately 305,800 to 1,836,000 man-hours over a range of 8 to 40 years of operation. Appendix N includes an analysis of potential accident-related risks to workers from implementation of TD 3, including the risks to industrial truck drivers transporting excavated materials from the staging areas to the Upland Disposal Facility, based on the assumed years of operation for an Upland Disposal Facility at each site and using worker fatality and injury information from the Bureau of Labor Statistics.[516] This analysis indicates that implementation of TD 3 would result in the following estimated non-fatal injuries and fatalities to workers:

[516] As noted in Appendix N, these estimates slightly underestimate the worker site accident risks since the labor hours on which they are based do not include service support hours.

- For a facility at the Woods Pond Site, an estimated 2.69 to 10.6 non-fatal injuries to workers (0.34 to 0.37 average annual non-fatal injuries) (with a probability of 93% to 100% of at least one such injury) and an estimated 0.02 to 0.08 worker fatalities (0.002 to 0.003 average annual fatalities) (with a probability of 2% to 8% of at least one such fatality);

- For a facility at the Forest Street Site, an estimated 2.92 to 7.23 non-fatal injuries to workers (0.36 to 0.38 average annual non-fatal injuries) (with a probability of 95% to 100% of at least one such injury) and an estimated 0.02 to 0.05 worker fatalities (0.003 average annual fatalities) (with a probability of 2% to 5% of at least one such fatality); and

- For a facility at the Rising Pond Site, an estimated 2.82 to 16.4 non-fatal injuries to workers (0.35 to 0.41 average annual non-fatal injuries) (with a probability of 94% to 100% of at least one such injury) and an estimated 0.02 to 0.11 worker fatalities (0.003 average annual fatalities) (with a probability of 2% to 11% of at least one such fatality).

9.3.8 Implementability

9.3.8.1 Technical Implementability

The technical implementability of TD 3 has been evaluated in terms of the following factors:

General Availability of Technology: The labor, materials, and equipment needed to implement TD 3 at any of the three potential locations are readily available. These include equipment, such as mechanical excavators and bulldozers, transport equipment such as trucks and conveyors, and other common landfill construction materials (i.e., geosynthetic clay liner, flexible impermeable membrane liner, leachate piping).

Ability To Be Implemented: Upland landfills are routinely constructed and operated as a means to contain contaminated material. It is anticipated that an Upland Disposal Facility could be constructed at any of the three potential locations using conventional construction methods, and that disposal operations for the excavated sediments and soils could likewise be performed using conventional equipment to place and compact the sediments and soils. Construction and operation of a disposal facility at the Forest Street Site would require a more complicated design than would a facility at either the Woods Pond or Rising Pond Site. This stems from the fact that specialized construction equipment and techniques would likely be required at the Forest Street Site due in part to its steep terrain and potentially shallow bedrock conditions.

Reliability: Experience at other sites indicates that an Upland Disposal Facility would be a reliable means of containing sediments and soils containing PCBs. A discussion of on-site landfill use at other sites was previously provided in Section 9.3.5.2.

Availability of Space for Facilities: The three potential locations are of sufficient size to support construction of an Upland Disposal Facility. The required size of the Upland Disposal Facility and any support areas would be developed based on the sediment and soil volumes for the selected remedy. At the Rising Pond Site, there are approximately 106 acres suitable for constructing an Upland Disposal Facility, which could contain a maximum soil/sediment volume of 2.9 million cy. The Woods Pond and Forest Street Sites are smaller – they would be able to hold maximum volumes of approximately 2.0 million cy and 1.0 million cy, respectively. As previously mentioned, for disposal volumes up to approximately 1.0 million cy, any of the identified sites could be used; and for disposal volumes greater than approximately 1.0 million cy, a disposal site that has sufficient capacity to handle the necessary volume or a combination of two disposal sites would be used.

Availability of Equipment, Materials, and Personnel: As noted above, equipment, materials, and personnel necessary to construct, operate, monitor, and maintain an Upland Disposal Facility at any of the three potential locations are readily available.

Ease of Conducting Additional Corrective Measures: Although the facility components are not expected to fail, if it should be determined during routine OMM activities that the cap, liner, or leachate collection systems are not providing adequate containment, an assessment would be conducted to determine the need for and methods of repair. The effort required would depend on the nature and extent of the deficiency. As noted previously, it is currently anticipated that repairs could be made using labor and materials that are readily available.

Ability to Monitor Effectiveness: The effectiveness of TD 3 at any of the three potential locations would be maintained over time through visual inspections and periodic groundwater and stormwater monitoring. The standard approaches for monitoring the effectiveness of TD 3 are considered proven and readily available.

9.3.8.2 Administrative Implementability

The evaluation of the administrative implementability of TD 3 has included consideration of regulatory requirements, need for access agreements, and coordination with government agencies.

Regulatory Requirements: Implementation of TD 3 would be an "on-site" activity for purposes of the permit exemption set forth in Section 121(e) of CERCLA and Paragraph 9.a of the CD. As such, no federal, state, or local permits or approvals would be required. However, this alternative would be required to meet the substantive requirements of applicable regulations that are designated as ARARs (unless waived). An evaluation of compliance with potential ARARs for construction and operation of an Upland Disposal Facility at the three potential locations is included in Tables T-3.a though T-3.i in Appendix C and was summarized in Section 9.3.4.

Access: GE is the current owner of the Rising Pond Site and has the right to acquire the Woods Pond and Forest Street sites. Thus, GE has or can obtain the right to permanent access to each site to construct and operate an Upland Disposal Facility. Upon site approval, it would be necessary for GE work with utility companies and other easement holders to ensure the appropriate site access to construct and operate the facility.

Coordination with Agencies: Both prior to and during implementation of TD 3 at any of the three potential locations, GE would need to coordinate with EPA, as well as state and local agencies to provide support with public/community outreach programs.

9.3.9 Cost

Estimated total costs to implement TD 3 have been calculated for each potential location, based on a range of disposal volumes. These costs represent the range of estimated labor, equipment, and materials costs for the construction, operation, closure, and post-closure care of an Upland Disposal Facility for the minimum and maximum volume scenarios at each of the three identified sites. The low-end volume is based on the combination of SED 3 and FP 2 (combined 191,000 *in situ* cy) for all three potential locations. The high-end volumes vary for the three sites based on the largest Upland Disposal Facility that can be constructed at each site and thus are not comparable – i.e., Forest Street Site's capacity is approximately 1.0 million cy, Woods Pond Site's capacity is 2.0 million cy, and Rising Pond Site's capacity is 2.9 million cy (which is equivalent to the combined *in situ* volume for SED 8 and FP 7). The estimated costs differ for the three potential locations for an Upland Disposal Facility, as described below. In addition, for each location, total estimated present worth costs were developed using a discount factor of 7%, an assumed overall duration ranging from 10 years (the estimated duration for SED 3 and FP 2)[517] to 19, 29, or 52 years

[517] Note that the minimum duration for determining present worth costs (10 years) is different from the shortest possible duration for implementing sediment and floodplain alternatives (5 years, as discussed above), because the former is the estimated duration for the alternatives that involve the lowest removal volume and thus comprise the basis for the lower-bound cost estimate (SED 3 and FP 2).

(the estimated maximum durations of TD 3 for a disposal facility at the Forest Street, Woods Pond, and Rising Pond Sites, respectively, based on their disposal capacities), and a post-closure OMM period of 100 years. More detailed information and assumptions underlying these cost estimates for each of the potential locations for an Upland Disposal Facility are included in Appendix Q.

Cost Estimate for TD 3 at Woods Pond Site

The total costs to implement TD 3 at the Woods Pond Site range from $42 M to $125 M (not including costs associated with sediment and floodplain soil removal activities), with the low end based on the combination of SED 3 and FP 2 (191,000 cy) and the high end based on a maximum capacity of approximately 2.0 million cy. The capital costs (which include construction and closure of the Upland Disposal Facility) range from $17 M to $48 M. Annual operations costs estimated for the transport to and placement of sediments and soils in the Upland Disposal Facility range from $1.2 M to $1.9 M per year, resulting in total operations costs of approximately $9 M to $55 M. The range of annual monitoring and maintenance costs assumed to be incurred after closure of the Upland Disposal Facility are approximately $250,000 to $361,000 per year, resulting in total post-closure monitoring and maintenance costs of approximately $16 M to $22 M. The following summarizes the total costs estimated for implementation of TD 3 at the Woods Pond Site.

TD 3 – Woods Pond Site	Minimum Est. Cost	Maximum Est. Cost[1]	Description
Total Capital Cost	$17 M	$48 M	Total cost for engineering, labor, equipment, materials associated with construction, and closure
Total Operations Cost	$9 M	$55 M	Total operations cost for placement of sediments and soils
Total Post-Closure Monitoring and Maintenance Cost	$16 M	$22 M	Total cost for performance of the 100-year post-closure monitoring and maintenance program
Total Cost for Alternative	$42 M	$125 M	Total cost for TD 3 in 2010 dollars

[1] Maximum estimated cost is based on an Upland Disposal Facility with a maximum capacity of 2.0 million cy.

The range of total estimated present worth cost (developed as described above) for implementation of TD 3 at the Woods Pond Site is approximately $21 M to $45 M.

Cost Estimate for TD 3 at Forest Street Site

The total costs to implement TD 3 at the Forest Street Site range from $53 M to $141 M (not including costs associated with sediment and floodplain soil removal activities), with the low end based on the combination of SED 3 and FP 2 (191,000 cy) and the high end based on a maximum capacity of approximately 1.0 million cy. The capital costs (which include construction and closure of the Upland Disposal Facility) range from $28 M to $84 M. Annual operations costs estimated for the transport to and placement of sediments and soils in the Upland Disposal Facility range from $1.2 M to $1.8 M per year, resulting in total operations costs of approximately $9 M to $34 M. A range of annual monitoring and maintenance costs assumed to be incurred after closure of the Upland Disposal Facility are approximately $251,000 to $368,000 per year, resulting in total post-closure monitoring and maintenance costs of approximately $16 M to $23 M. The following summarizes the total costs estimated for implementation of TD 3 at the Forest Street Site.

TD 3 – Forest Street Site	Minimum Est. Cost	Maximum Est. Cost[1]	Description
Total Capital Cost	$28 M	$84 M	Total cost for engineering, labor, equipment, materials associated with construction, and closure
Total Operations Cost	$9 M	$34 M	Total operations cost for placement of sediments and soils
Total Post-Closure Monitoring and Maintenance Cost	$16 M	$23 M	Total cost for performance of the 100-year post-closure monitoring and maintenance program
Total Cost for Alternative	$53 M	$141 M	Total cost for TD 3 in 2010 dollars

[1] Maximum estimated cost is based on an Upland Disposal Facility with a maximum capacity of 1.0 million cy.

The total range of estimated present worth cost (developed as described above) for implementation of TD 3 at the Forest Street Site is approximately $29 M to $68 M.

Cost Estimate for TD 3 at Rising Pond Site

The total costs to implement TD 3 at the Rising Pond Site range from $36 M to $201 M (not including costs associated with sediment and floodplain soil removal activities), with the low end based on the combination of SED 3 and FP 2 (191,000 cy) and the high end based on the combination of SED 8 and FP 7 (combined 2.9 million cy). The capital costs associated with this range of estimated volumes (which include construction and closure of the Upland Disposal Facility) are $9.3 M to $67 M, as determined by the size of the Upland

Disposal Facility and associated appurtenances. Annual operations costs estimated for the transport to and placement of sediments and soils in the Upland Disposal Facility range from $1.5 M to $2.7 M per year, resulting in total operations costs of approximately $11 M to $110 M. Annual monitoring and maintenance costs assumed to be incurred after closure of the Upland Disposal Facility range from approximately $246,000 to $378,000 per year, resulting in total post-closure monitoring and maintenance costs of approximately $15 M to $24 M. The following summarizes the total costs estimated for implementation of TD 3 at the Rising Pond Site.

TD 3 – Rising Pond Site	Minimum Est. Cost	Maximum Est. Cost[1]	Description
Total Capital Cost	$9.5 M	$67 M	Total cost for engineering, labor, equipment, materials associated with construction, and closure
Total Operations Cost	$11 M	$110 M	Total operations cost for placement of sediments and soils
Total Post-Closure Monitoring and Maintenance Cost	$15 M	$24 M	Total cost for performance of the 100-year post-closure monitoring and maintenance program
Total Cost for Alternative	$36 M	$201 M	Total cost for TD 3 in 2010 dollars

[1] Maximum estimated cost is based on an Upland Disposal Facility with a maximum capacity of 2.9 million cy.

The range of total estimated present worth costs (developed as described above) for implementation of TD 3 at the Rising Pond Site is approximately $17 M to $49 M.

9.3.10 Overall Protection of Human Health and the Environment – Conclusions

As explained in Section 9.3.2, the evaluation of whether TD 3 would provide overall protection of human health and the environment draws upon the evaluations under several other Permit criteria, discussed in prior sections.

General Effectiveness: As discussed in Section 9.3.5, implementing TD 3 at any of the three potential locations would provide long-term effectiveness by permanently isolating the PCB-containing sediments and soils in an Upland Disposal Facility with appropriate liner, cover, and leachate collection systems. The materials placed in the facility would be isolated from underlying soils and groundwater and from surface receptors, which would prevent contact by human and ecological receptors with those materials. OMM activities for the Upland Disposal Facility would be conducted to ensure the long-term stability of the facility. In addition, access restrictions would prohibit interference with the facility or any change in land use and thus help maintain the long-term effectiveness of this alternative.

Compliance with ARARs: As discussed in Section 9.3.4, review of the potential ARARs for TD 4 indicates that implementation of TD 4 at any of the identified locations would meet certain of those ARARs, provided that any necessary determinations are obtained from EPA (e.g., a risk-based determination under EPA's TSCA regulations or, if necessary, a finding that there is no practicable alternative with less adverse impacts on wetlands or the aquatic ecosystem and that all practicable steps to minimize or mitigate such impacts would be employed). However, there is a limited number of potential ARARs that may not be met – e.g., the MESA prohibition on a take of a state-listed species under the maximum configuration at the Rising Pond Site, and certain federal or state hazardous waste requirements in the highly unlikely event that the materials to be placed in the Upland Disposal Facility should be found to constitute hazardous waste. If these requirements did apply and were considered ARARs, they would need to be waived as technically impracticable to meet or on some other ground.

Human Health Protection: An Upland Disposal Facility at any of the potential locations would provide protection of human receptors by permanently isolating the PCB-containing sediments and soils from those receptors. Access and deed restrictions would be employed to limit use of the site, and long-term monitoring and maintenance would be conducted to protect against future releases of and exposures to the contained PCBs. As such, TD 3 would provide protection of human health and would not be expected to cause long-term adverse impacts on human health.

Environmental Protection: An Upland Disposal Facility would provide protection of ecological receptors by permanently isolating the PCB-containing sediments and soils from those receptors. At the same time, implementation of TD 3 would result in the loss of the habitat within the footprint of the Upland Disposal Facility (plus adjacent areas for support facilities and transportation access). Since the Upland Disposal Facility would be placed outside of the 500-year floodplain of the River and away from or with minimal impacts on wetlands, it would not impact such sensitive habitats. The principal ecological impacts of interest would consist of the permanent loss of forested upland habitat in the area of the facility, with the consequent loss of the wildlife species that use that habitat. The extent of that loss would vary depending on the selected location for the facility and the size of the facility, as discussed below.

- At the Woods Pond Site, the minimum operational footprint of an Upland Disposal Facility would primarily affect disturbed land that is or was used for the long-term sand and gravel quarry operations (over 21 acres), with only a small amount of forested upland habitat (3.4 acres). Thus, under this scenario, no significant long-term adverse ecological impacts would be expected. The maximum operational footprint would affect a greater amount of upland forest habitat (21 acres), as well as a 0.4-acre shrub swamp, where the clearing would have long-term negative impacts on the ability of

those areas to support wildlife. However, even under this scenario, the majority of the affected area (38 acres) consists of previously disturbed land for the sand and gravel quarry operations, and the impacted forest and shrub swamp habitats would constitute only very small portions of those overall habitats in and near the Rest of River area.

- At the Forest Street Site, the operational footprint of an Upland Disposal Facility would affect a larger amount of upland forest habitat – 41 to 93 acres. Such impacts would represent a substantial encroachment into existing areas of contiguous forested habitat, and would have negative impacts on the capacity of the forested area to support interior forest wildlife species, with the extent of those impacts dependent on the size of the facility. On the other hand, these impacts would be localized to the area of the Upland Disposal Facility, rather than extending throughout the Rest of River area.

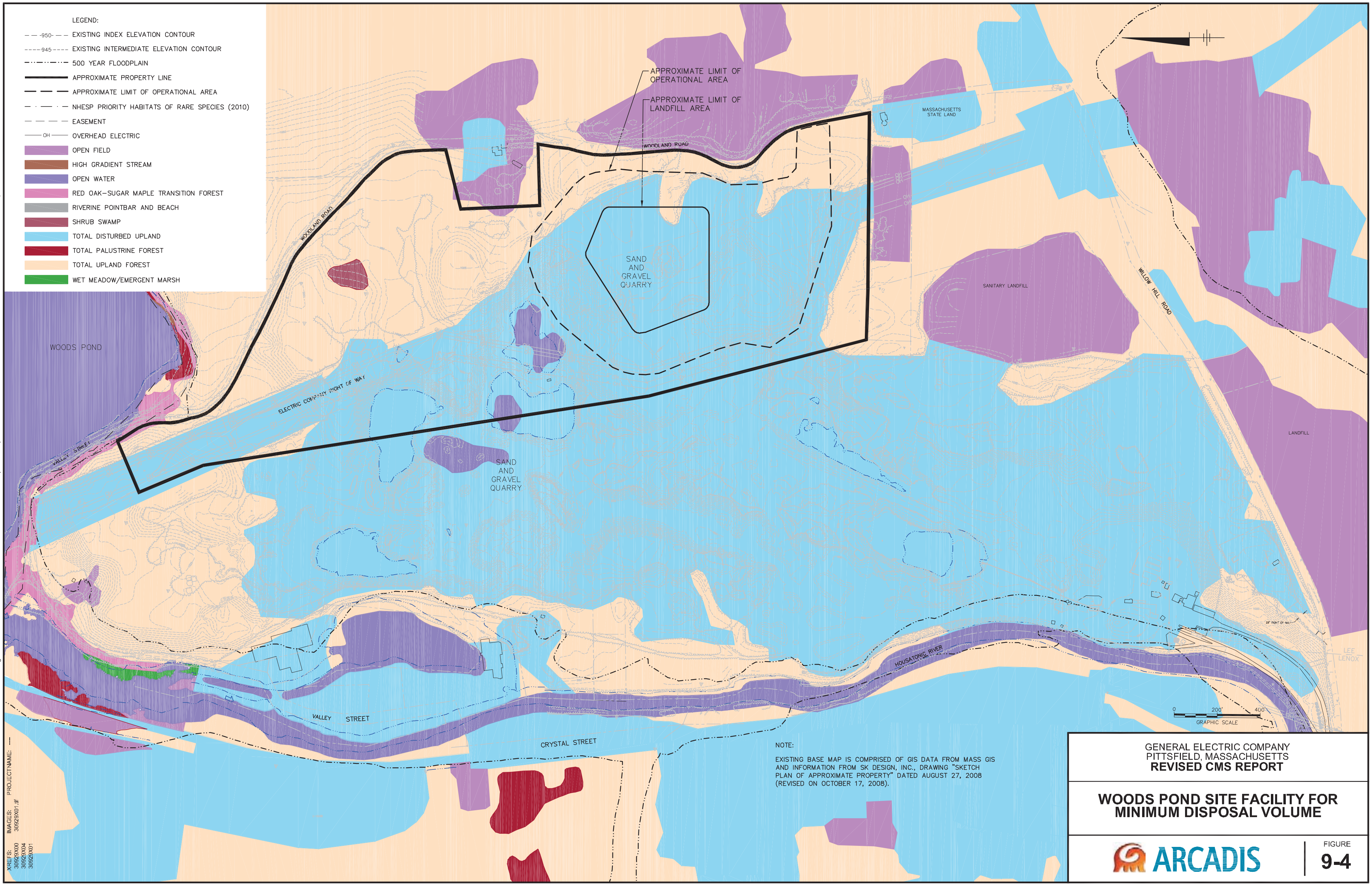
- At the Rising Pond Site, the operational footprint of an Upland Disposal Facility would affect 27 to 80 acres of upland forest habitat (as well as a 0.5-acre forested wetland under the maximum operational footprint). Again, this clearing would have negative impacts on the capacity of the forested area to support forest wildlife species (with the extent of those impacts dependent on the size of the facility). Further, since the affected forested area is situated along the Housatonic River corridor, the clearing would fragment the forested corridor in that area. In addition, the maximum operational footprint at this site would affect a portion of mapped Priority Habitat for the state-listed wood turtle. Again, however, these impacts would be localized to the area of the disposal facility, rather than extending throughout the Rest of River.

Summary: Based on the above considerations, it is concluded that implementation of TD 3 at any of the potential locations would provide overall protection of human health and the environment.

9.4 Evaluation of Chemical Extraction (TD 4)

9.4.1 Description of Alternative

TD 4 involves treatment of the removed sediments and soils by chemical extraction. In general terms, chemical extraction is the process of mixing an extraction fluid/solvent with removed sediment and soil, so that PCBs in the sediment or soil are preferentially transferred into the extraction fluid. The resulting PCB-containing fluid is then treated or disposed of. The specific extraction fluid and the equipment and processes used to separate the extraction fluid from the treated sediment or soil vary and are vendor-specific. Although several vendors have historically developed and used various solvents and equipment with varying degrees of success, no commercially available chemical extraction

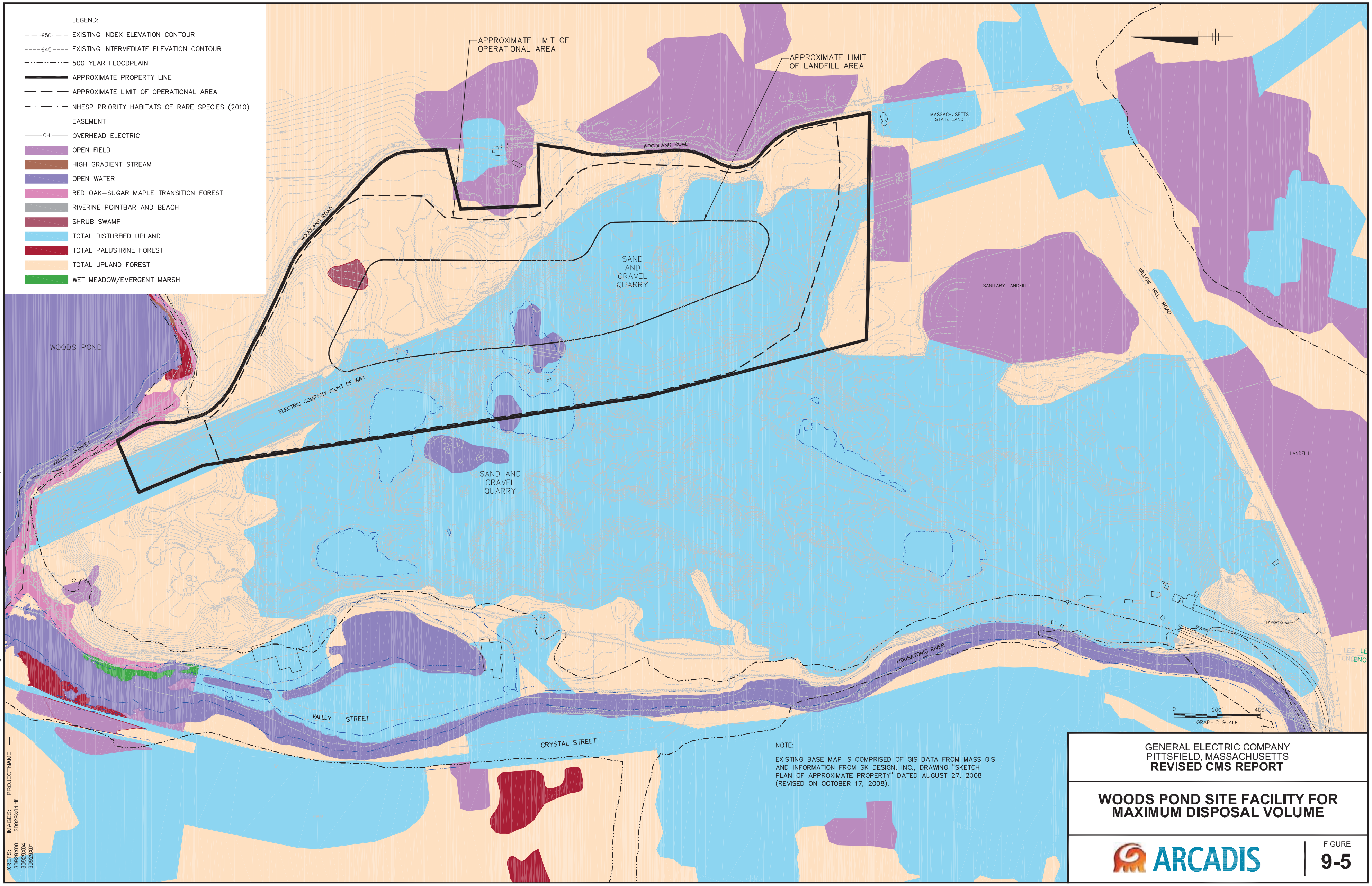

LEGEND:
EXISTING INDEX ELEVATION CONTOUR
EXISTING INTERMEDIATE ELEVATION CONTOUR
500 YEAR FLOODPLAIN
APPROXIMATE PROPERTY LINE
APPROXIMATE LIMIT OF OPERATIONAL AREA
NHESP PRIORITY HABITATS OF RARE SPECIES (2010)
EASEMENT
OVERHEAD ELECTRIC
OPEN FIELD
HIGH GRADIENT STREAM
OPEN WATER
RED OAK–SUGAR MAPLE TRANSITION FOREST
RIVERINE POINTBAR AND BEACH
SHRUB SWAMP
TOTAL DISTURBED UPLAND
TOTAL PALUSTRINE FOREST
TOTAL UPLAND FOREST
WET MEADOW/EMERGENT MARSH
APPROXIMATE LIMIT OF OPERATIONAL AREA
APPROXIMATE LIMIT OF LANDFILL AREA
WOODLAND ROAD
SAND AND GRAVEL QUARRY
MASSACHUSETTS STATE LAND
SANITARY LANDFILL
WILLOW HILL ROAD
LANDFILL
WOODS POND
ELECTRIC COMPANY RIGHT OF WAY
SAND AND GRAVEL QUARRY
HOUSATONIC RIVER
VALLEY STREET
CRYSTAL STREET
LEE
LENOX
0
200'
400'
GRAPHIC SCALE
NOTE:
EXISTING BASE MAP IS COMPRISED OF GIS DATA FROM MASS GIS AND INFORMATION FROM SK DESIGN, INC., DRAWING "SKETCH PLAN OF APPROXIMATE PROPERTY" DATED AUGUST 27, 2008 (REVISED ON OCTOBER 17, 2008).

GENERAL ELECTRIC COMPANY
PITTSFIELD, MASSACHUSETTS
REVISED CMS REPORT

WOODS POND SITE FACILITY FOR MINIMUM DISPOSAL VOLUME

ARCADIS

FIGURE
9-4



LEGEND:
-950- EXISTING INDEX ELEVATION CONTOUR
-945- EXISTING INTERMEDIATE ELEVATION CONTOUR
500 YEAR FLOODPLAIN
APPROXIMATE PROPERTY LINE
APPROXIMATE LIMIT OF OPERATIONAL AREA
NHESP PRIORITY HABITATS OF RARE SPECIES (2010)
EASEMENT
OH OVERHEAD ELECTRIC
OPEN FIELD
HIGH GRADIENT STREAM
OPEN WATER
RED OAK–SUGAR MAPLE TRANSITION FOREST
RIVERINE POINTBAR AND BEACH
SHRUB SWAMP
TOTAL DISTURBED UPLAND
TOTAL PALUSTRINE FOREST
TOTAL UPLAND FOREST
WET MEADOW/EMERGENT MARSH
APPROXIMATE LIMIT OF OPERATIONAL AREA
APPROXIMATE LIMIT OF LANDFILL AREA
MASSACHUSETTS STATE LAND
SANITARY LANDFILL
LANDFILL
WILLOW HILL ROAD
WOODLAND ROAD
WOODS POND
SAND AND GRAVEL QUARRY
SAND AND GRAVEL QUARRY
ELECTRIC COMPANY RIGHT OF WAY
HOUSATONIC RIVER
VALLEY STREET
CRYSTAL STREET
0 200' 400'
GRAPHIC SCALE

NOTE:

EXISTING BASE MAP IS COMPRISED OF GIS DATA FROM MASS GIS AND INFORMATION FROM SK DESIGN, INC., DRAWING "SKETCH PLAN OF APPROXIMATE PROPERTY" DATED AUGUST 27, 2008 (REVISED ON OCTOBER 17, 2008).

GENERAL ELECTRIC COMPANY
PITTSFIELD, MASSACHUSETTS
REVISED CMS REPORT

WOODS POND SITE FACILITY FOR MAXIMUM DISPOSAL VOLUME

ARCADIS

FIGURE **9-5**

CITY: SYRACUSE, NY DIV/GROUP: ENVCAD DB: K. DAVIS LD: K. DAVIS PIC: P. KEANEY PM: D. KNUTSEN TM: G. GREAPENTROG LYR: ON=*;OFF=*REF* PAGESETUP: --- PLOTSTYLETABLE: --- PLOTTED: 10/4/2010 9:35 AM BY: DAVIS, KATHI
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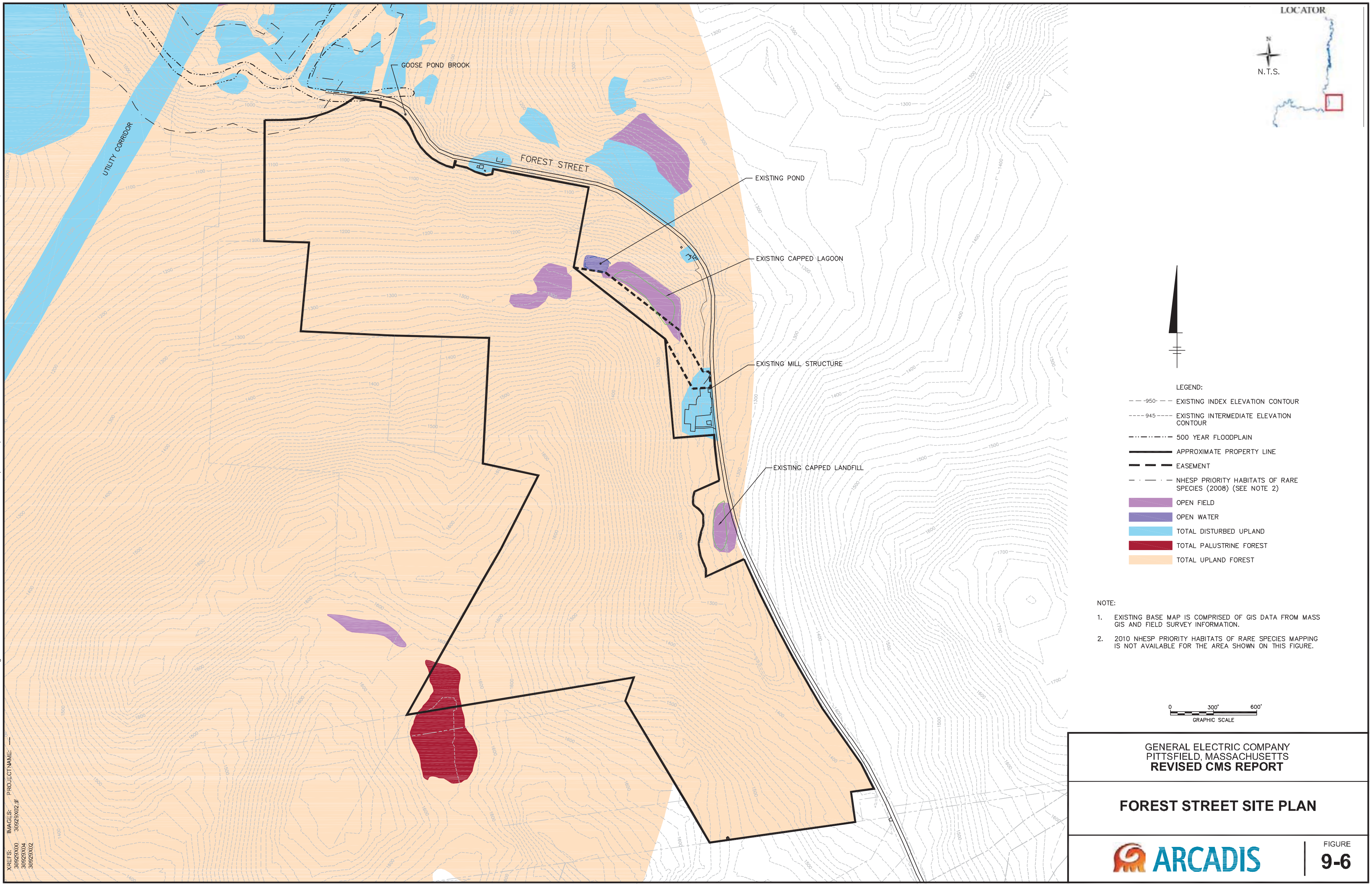

NOTE:

1. EXISTING BASE MAP IS COMPRISED OF GIS DATA FROM MASS GIS AND FIELD SURVEY INFORMATION.
2. 2010 NHESP PRIORITY HABITATS OF RARE SPECIES MAPPING IS NOT AVAILABLE FOR THE AREA SHOWN ON THIS FIGURE.

GENERAL ELECTRIC COMPANY
PITTSFIELD, MASSACHUSETTS
REVISED CMS REPORT

FOREST STREET SITE PLAN

ARCADIS

FIGURE
9-6

CITY: SYRACUSE, NY DIV/GROUP: ENVCAD DB: K. DAVIS LD: K. DAVIS PIC: P. KEANEY PM: D. KNUTSEN TM: G. GREAPENTROG LYR: ON=*;OFF=*REF*
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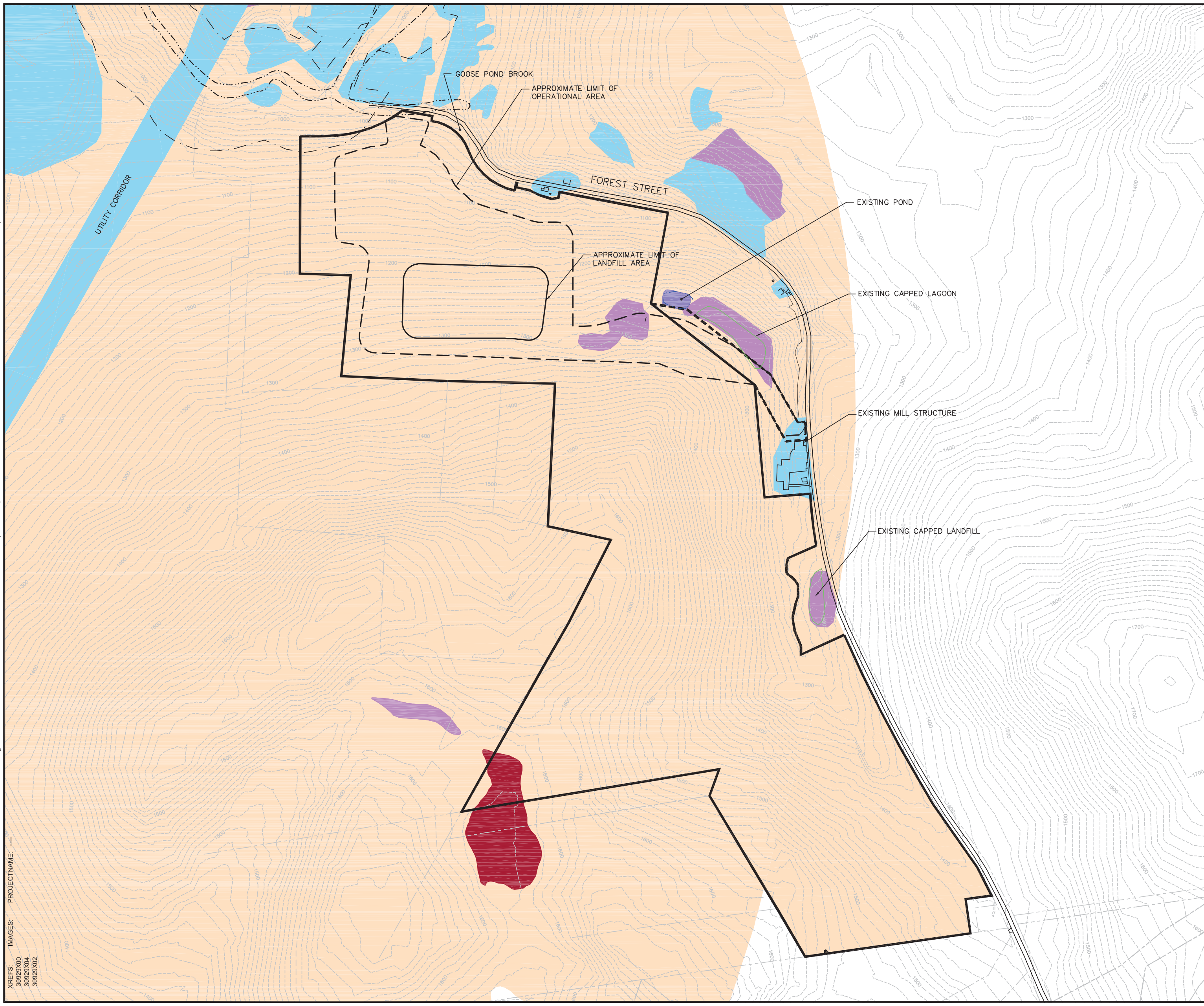
30929X04
30929X02



GOOSE POND BROOK
APPROXIMATE LIMIT OF OPERATIONAL AREA
FOREST STREET
EXISTING POND
APPROXIMATE LIMIT OF LANDFILL AREA
EXISTING CAPPED LAGOON
EXISTING MILL STRUCTURE
EXISTING CAPPED LANDFILL
UTILITY CORRIDOR
LEGEND:
EXISTING INDEX ELEVATION CONTOUR
EXISTING INTERMEDIATE ELEVATION CONTOUR
500 YEAR FLOODPLAIN
APPROXIMATE PROPERTY LINE
EASEMENT
APPROXIMATE LIMIT OF OPERATIONAL AREA
NHESP PRIORITY HABITATS OF RARE SPECIES (2008) (SEE NOTE 2)
OPEN FIELD
OPEN WATER
TOTAL DISTURBED UPLAND
TOTAL PALUSTRINE FOREST
TOTAL UPLAND FOREST
0 300' 600'
GRAPHIC SCALE

NOTE:

1. EXISTING BASE MAP IS COMPRISED OF GIS DATA FROM MASS GIS AND FIELD SURVEY INFORMATION.
2. 2010 NHESP PRIORITY HABITATS OF RARE SPECIES MAPPING IS NOT AVAILABLE FOR THE AREA SHOWN ON THIS FIGURE.

GENERAL ELECTRIC COMPANY
PITTSFIELD, MASSACHUSETTS
REVISED CMS REPORT

FOREST STREET SITE FACILITY FOR MINIMUM DISPOSAL VOLUME

ARCADIS

FIGURE
9-7

CITY: SYRACUSE, NY DIV/GROUP: ENVCAD DB: K. DAVIS LD: K. DAVIS PIC: P. KEANEY PM: D. KNUTSEN TM: G. GREAPENTROG LYR: ON=*;OFF=*REF*
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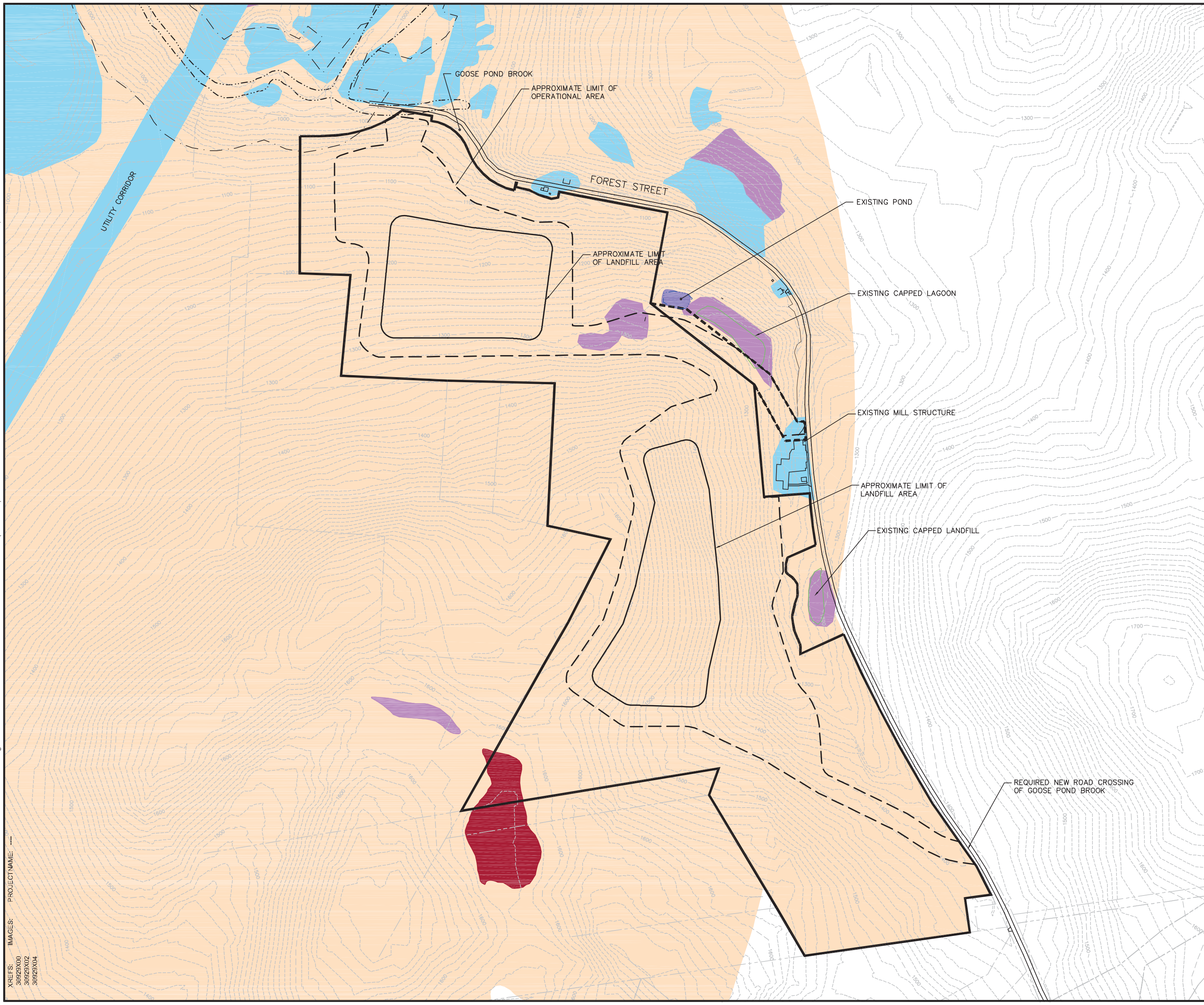

LEGEND:

- EXISTING INDEX ELEVATION CONTOUR (-950-)
- EXISTING INTERMEDIATE ELEVATION CONTOUR (945)
- 500 YEAR FLOODPLAIN
- APPROXIMATE PROPERTY LINE
- EASEMENT
- APPROXIMATE LIMIT OF OPERATIONAL AREA
- NHESP PRIORITY HABITATS OF RARE SPECIES (2008) (SEE NOTE 2)
- OPEN FIELD
- OPEN WATER
- TOTAL DISTURBED UPLAND
- TOTAL PALUSTRINE FOREST
- TOTAL UPLAND FOREST

NOTE:

1. EXISTING BASE MAP IS COMPRISED OF GIS DATA FROM MASS GIS AND FIELD SURVEY INFORMATION.
2. 2010 NHESP PRIORITY HABITATS OF RARE SPECIES MAPPING IS NOT AVAILABLE FOR THE AREA SHOWN ON THIS FIGURE.

GENERAL ELECTRIC COMPANY
PITTSFIELD, MASSACHUSETTS
REVISED CMS REPORT

FOREST STREET SITE FACILITY FOR MAXIMUM DISPOSAL VOLUME

ARCADIS

FIGURE
9-8

CITY: SYRACUSE, NY DIV/GROUP: ENVCAD DB: K. DAVIS LD: K. DAVIS PIC: P. KEANEY PM: D. KNUTSEN TM: G. GREAPENTROG LYR: ON=*;OFF=*REF*
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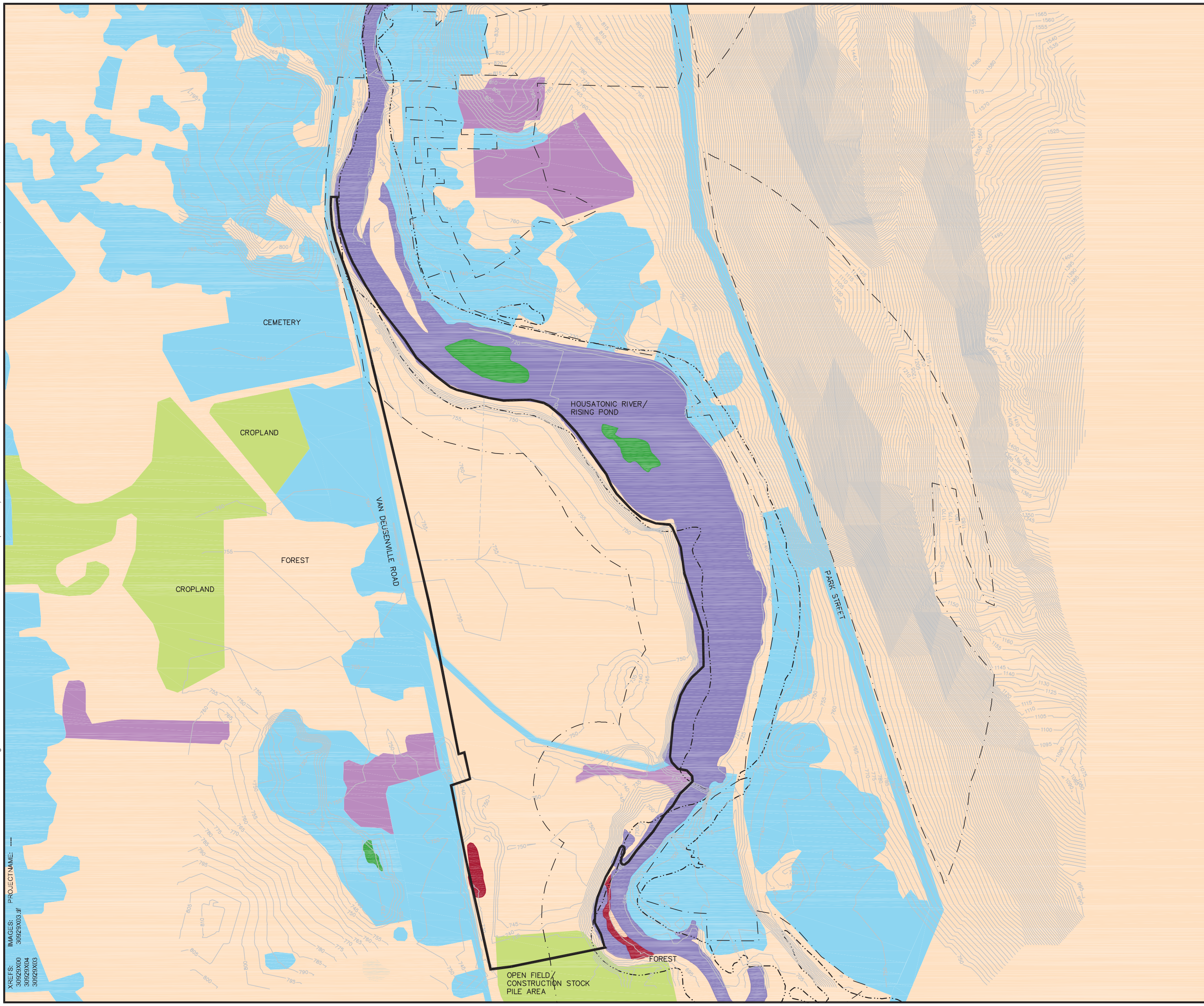
30929X04



LEGEND:

— — -950- — — EXISTING INDEX ELEVATION CONTOUR
- - - - 945 - - - - EXISTING INTERMEDIATE ELEVATION CONTOUR
500 YEAR FLOODPLAIN
APPROXIMATE PROPERTY LINE
NHESP PRIORITY HABITATS OF RARE SPECIES (2010)
AGRICULTURAL FIELD
OPEN FIELD
OPEN WATER
TOTAL DISTURBED UPLAND
TOTAL PALUSTRINE FOREST
TOTAL UPLAND FOREST
WET MEADOW/EMERGENT MARSH

NOTE:
EXISTING BASE MAP IS COMPRISED OF GIS DATA FROM MASS GIS.

0 300' 600'
GRAPHIC SCALE

GENERAL ELECTRIC COMPANY
PITTSFIELD, MASSACHUSETTS
REVISED CMS REPORT

RISING POND SITE PLAN

ARCADIS

FIGURE
9-9

CITY: SYRACUSE, NY DIV/GROUP: ENVCAD DB: K. DAVIS LD: K. DAVIS PIC: P. KEANEY PM: D. KNUTSEN TM: G. GREAPENTROG LYR: ON=*;OFF=*REF* PAGESETUP: --- PLOTSTYLETABLE: --- PLOTTED: 10/8/2010 1:38 PM BY: DAVIS, KATHI
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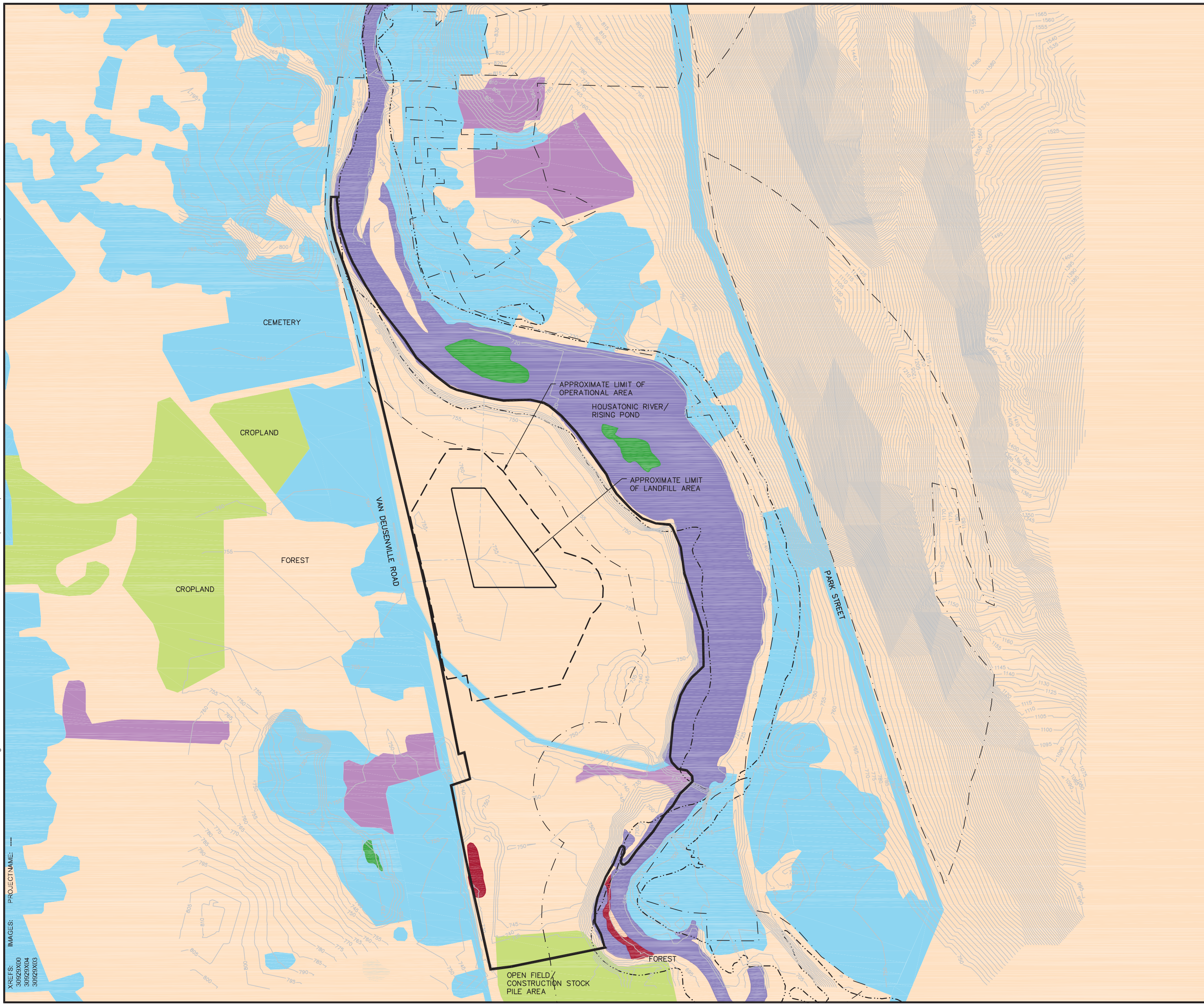

LEGEND:

- EXISTING INDEX ELEVATION CONTOUR (950)
- EXISTING INTERMEDIATE ELEVATION CONTOUR (945)
- 500 YEAR FLOODPLAIN
- APPROXIMATE PROPERTY LINE
- APPROXIMATE LIMIT OF OPERATIONAL AREA
- NHESP PRIORITY HABITATS OF RARE SPECIES (2010)
- AGRICULTURAL FIELD
- OPEN FIELD
- OPEN WATER
- TOTAL DISTURBED UPLAND
- TOTAL PALUSTRINE FOREST
- TOTAL UPLAND FOREST
- WET MEADOW/EMERGENT MARSH

NOTE:
EXISTING BASE MAP IS COMPRISED OF GIS DATA FROM MASS GIS.

0 300' 600'
GRAPHIC SCALE

GENERAL ELECTRIC COMPANY
PITTSFIELD, MASSACHUSETTS
REVISED CMS REPORT

RISING POND SITE FACILITY FOR MINIMUM DISPOSAL VOLUME

ARCADIS

FIGURE
9-10

CITY: SYRACUSE, NY DIV/GROUP: ENVCAD DB: K. DAVIS LD: K. DAVIS PIC: P. KEANEY PM: D. KNUTSEN TM: G. GREAPENTROG LYR: ON=*;OFF=*REF*
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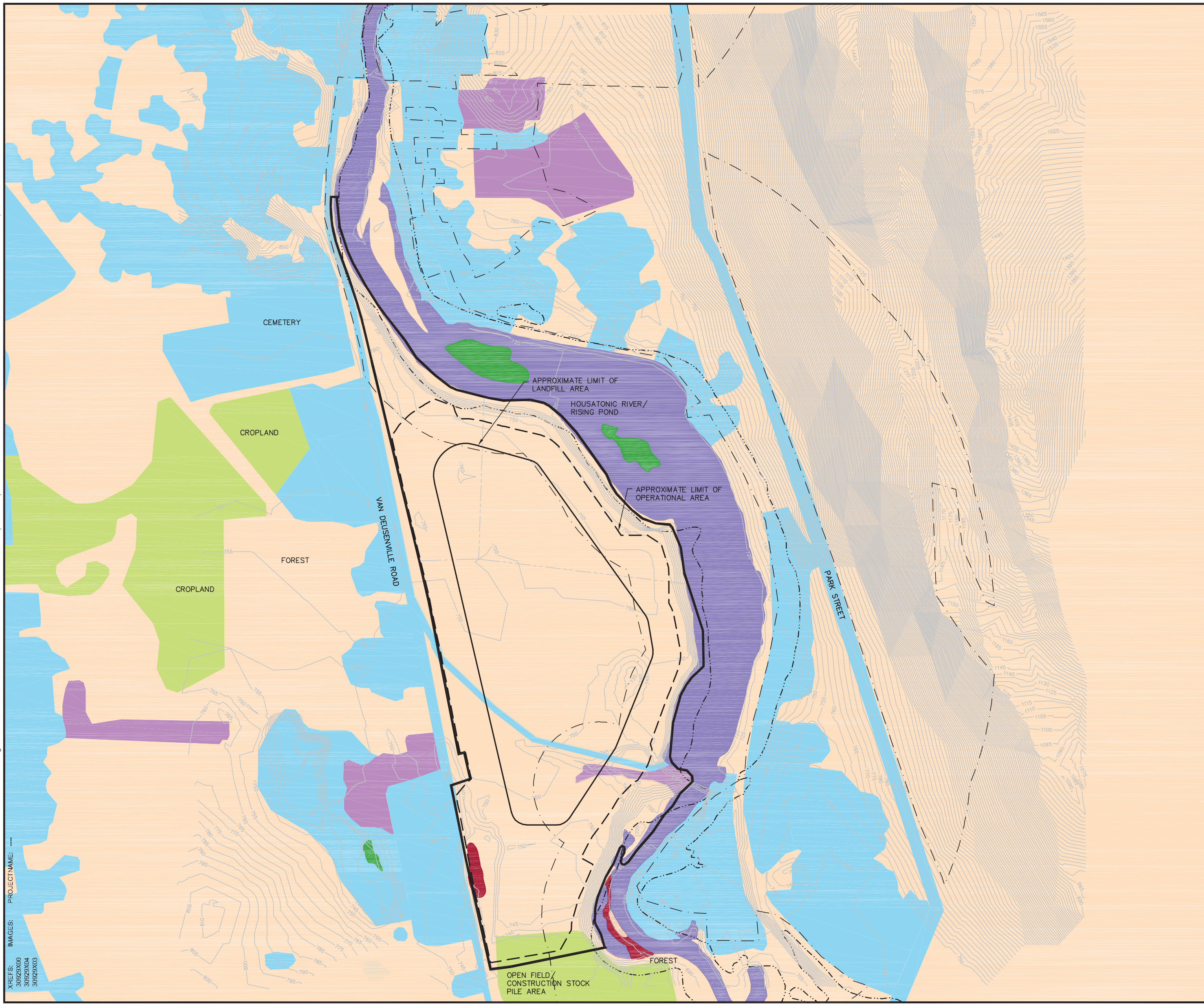

LEGEND:

- -950- EXISTING INDEX ELEVATION CONTOUR
- -945- EXISTING INTERMEDIATE ELEVATION CONTOUR
- 500 YEAR FLOODPLAIN
- APPROXIMATE PROPERTY LINE
- APPROXIMATE LIMIT OF OPERATIONAL AREA
- NHESP PRIORITY HABITATS OF RARE SPECIES (2010)
- AGRICULTURAL FIELD
- OPEN FIELD
- OPEN WATER
- TOTAL DISTURBED UPLAND
- TOTAL PALUSTRINE FOREST
- TOTAL UPLAND FOREST
- WET MEADOW/EMERGENT MARSH

NOTE:
EXISTING BASE MAP IS COMPRISED OF GIS DATA FROM MASS GIS.

0 300' 600'
GRAPHIC SCALE

GENERAL ELECTRIC COMPANY
PITTSFIELD, MASSACHUSETTS
REVISED CMS REPORT

RISING POND SITE FACILITY FOR MAXIMUM DISPOSAL VOLUME

ARCADIS

FIGURE
9-11

CITY: SYRACUSE, NY DIV/GROUP: ENVCAD DB: K. DAVIS LD: K. DAVIS PIC: P. KEANEY PM: D. KNUTSEN TM: G. GREAPENTROG LYR: ON=*;OFF=*REF*
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XREFS: 30929X00 30929X04 30929X03 IMAGES: PROJECTNAME: ----