

Appendix E.08 – Hazardous Waste and Contaminated Materials



Hazardous Materials Assessment Methodology

January 30, 2014
FINAL

Submitted by:



Table of Contents

1.	HAZARDOUS MATERIALS	1
1.1	INTRODUCTION	1
1.2	DEFINITIONS.....	1
1.3	RELATED RESOURCES.....	2
1.4	AGENCY AND REGULATORY FRAMEWORK	2
1.4.1	<i>Regulatory Compliance</i>	4
1.5	METHODOLOGY TO ASSESS EFFECTS.....	5
1.5.1	<i>Existing Conditions</i>	5
1.5.2	<i>Environmental Consequences</i>	8
1.5.3	<i>Mitigation Strategies</i>	9
1.6	TIER 1 EIS OUTCOMES	9
1.7	APPLICABILITY TO TIER 2 ASSESSMENTS.....	10

Tables

TABLE 1 – RELATED RESOURCE INPUTS TO HAZARDOUS MATERIALS ASSESSMENT	2
TABLE 2 – MANAGEMENT AND REGULATION OF HWCMS.....	2
TABLE 3 – DATA SOURCES FOR THE EVALUATION OF HWCMS	6

1. Hazardous Materials

1.1 INTRODUCTION

This methodology explains how the NEC FUTURE program will address the potential effects of the Tier 1 EIS Alternatives on hazardous wastes and contaminated materials (HWCMs) in the Tier 1 EIS.

Soil and groundwater beneath a site can become contaminated because of past or present uses on the site or on adjacent properties. Actions associated with the Alternatives Considered, such as excavation, earthmoving, and dewatering, could disturb HWCM sites and expose the built and natural environment to contaminants. Impacts from HWCMs can occur when a) HWCM exists on a site and b) an action would increase exposure pathways; or c) an action would introduce new activities or processes using HWCM. In addition, exposure to contaminated sites and materials could result in potential health effects on construction workers and surrounding communities.

This methodology presents the regulatory framework, involved government agencies, expected regulatory and other outcomes of the Tier 1 EIS process and relevance to Tier 2, project-level assessments. It also identifies data sources, metrics and methods to be used to document existing conditions and analyze environmental consequences. This methodology may be revised as the NEC FUTURE program advances and new information is available.

1.2 DEFINITIONS

Included in HWCMs are those substances that are dangerous or potentially harmful to public health or the environment, as defined below by the U.S. Environmental Protection Agency (USEPA). The discovery of HWCMs within the footprint of the Tier 1 EIS Alternatives may have an adverse impact on public and worker safety, budgets and the timely completion of the project; therefore, an assessment of potential areas of contamination should be conducted early in the project development process. When HWCMs are discovered early in the project development process, the sites can either be avoided entirely or addressed in a cleanup plan.

Topic areas covered in this methodology include:

- ▶ **Hazardous Wastes:** Hazardous wastes are divided into two categories: characteristic or listed waste. These are wastes that the USEPA has determined to be hazardous by the properties they exhibit (i.e., ignitability, corrosively, reactivity, toxicity) or if it is acutely hazardous (i.e., can cause death, disabling injury or serious illness at low doses); or if it contains listed toxic constituents capable of posing a potential hazard to public health or the environment. Hazardous wastes include those chemicals and commercial commodities identified by the USEPA through regulatory oversight identified in Table 2.
- ▶ **Contaminated Materials:** Contaminated materials are substances, though not hazardous as specifically identified by the USEPA, which may cause pollution of the soils and groundwater requiring remedial actions for the protection of public health and the environment.

- ▶ HWCM sites: For the purpose of this methodology, these are properties that have been impacted by HWCMs, which may be manifested in the soil, groundwater or soil gas because of past or present uses on the site or from adjacent properties. These sites are identified in the data sources listed in Table 3.

1.3 RELATED RESOURCES

The effects assessments for other resources evaluated as part of the Tier 1 EIS will contribute to the assessment of effects on HWCMs. These related resources are identified in Table 1. Note that the effects assessments for those related resources will be documented within their respective Tier 1 EIS sections.

Table 1 – Related Resource Inputs to Hazardous Materials Assessment

Resource	Input to Hazardous Materials Assessment
Geology	<ul style="list-style-type: none"> ▪ Location of geologic resources that could contain hazardous materials or are vulnerable to contamination (karst terrain) and could be affected by the Tier 1 EIS Alternatives

Source: NEC FUTURE JV Team, 2013

1.4 AGENCY AND REGULATORY FRAMEWORK

The USEPA is the primary federal agency that both oversees the protection of human health and the environment and has regulatory authority over HWCM sites. HWCMs are also subject to regulation at the state level. These regulating agencies are identified in Table 2. Applicable legislation and regulations, also listed in Table 2, will be considered, consistent with a Tier 1 level of assessment, in the evaluation of impacts to HWCMs for the NEC Future program.

Table 2 – Management and Regulation of HWCMs

Agency	Regulatory Oversight	Description of Regulation	Regulated Resource
USEPA	<ul style="list-style-type: none"> ▪ Toxic Substances Control Act (TSCA) 	<ul style="list-style-type: none"> ▪ Regulates new and existing commercial chemicals 	Known or suspected HWCM sites. These include: <ul style="list-style-type: none"> ▪ National Priorities List (NPL) ▪ RCRA Corrective Actions (CORRACTS) ▪ RCRA Information Systems (RCRA Info) ▪ RCRA Treatment, Storage & Disposal Facilities (TSDFs) ▪ Brownfield Sites ▪ HWCM sites listed in State data sources (Table 3)
USEPA Washington, D.C. District Department of the Environment	<ul style="list-style-type: none"> ▪ Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA) as amended 	<ul style="list-style-type: none"> ▪ Regulates cleanup, closing, and liability of HWCM sites 	
	<ul style="list-style-type: none"> ▪ Resource Conservation & Recovery Act (RCRA) 	<ul style="list-style-type: none"> ▪ Regulates the generation, treatment, and disposal of HWCMs 	
	<ul style="list-style-type: none"> ▪ Superfund Amendments and Reauthorization Act (SARA) 	<ul style="list-style-type: none"> ▪ Amendment to CERCLA, providing additional controls in the Superfund Program 	

Table 2 – Management and Regulation of HWCMs (continued)

Agency	Regulatory Oversight	Description of Regulation	Regulated Resource
USEPA Washington, D.C. District Department of the Environment (cont'd)	<ul style="list-style-type: none"> ▪ Emergency Planning and Community Right-to-Know Act (EPCRA). ▪ Brownfield Revitalization Amendment Act of 2000, D.C. Law 13-312, D.C. Official Code § 8-631 	<ul style="list-style-type: none"> ▪ Allows for planning and information sharing of HWCMs ▪ State regulatory framework governing activities potentially affecting HWCM sites. 	Known or suspected HWCM sites. These include: <ul style="list-style-type: none"> ▪ National Priorities List (NPL) ▪ RCRA Corrective Actions (CORRACTS) ▪ RCRA Information Systems (RCRA Info) ▪ RCRA Treatment, Storage & Disposal Facilities (TSDFs) ▪ Brownfield Sites ▪ HWCM sites listed in State data sources (Table 3)
Maryland Voluntary Cleanup and Revitalization Program Act	<ul style="list-style-type: none"> ▪ Article - Environment Section 7-266.1 and 7-506.1 Annotated Code of Maryland 	<ul style="list-style-type: none"> ▪ State regulatory framework governing activities potentially affecting HWCM sites. 	
State of Delaware	<ul style="list-style-type: none"> ▪ Delaware code title 7 chapter 91 		
Pennsylvania Land Recycling and Brownfield Program	<ul style="list-style-type: none"> ▪ An Act 1995-2; Chapter 250 issued under sect 104(a), 301(c) and 303(a) of the Land Recycling and Environmental Remediation Standards Act (35 P. S. § 6026.104(a), 6026.301(c) and 6026.303(a); sect 105(a) of the Solid Waste Management Act (35 P. S. § 6018.105(a)); and sect 1917-A of The Administrative Code of 1929 (71 P. S. § 510-17) 		
State of New Jersey	<ul style="list-style-type: none"> ▪ New Jersey Brownfield and Contaminated Site Remediation Act P.L. 1997, Chapter 278 		
New York State Brownfield Cleanup Program	<ul style="list-style-type: none"> ▪ New York State Brownfield Cleanup Program (BCP) Chapter 1 of the Laws of 2003 		

Table 2 – Management and Regulation of HWCMS (continued)

Agency	Regulatory Oversight	Description of Regulation	Regulated Resource
State of Rhode Island	<ul style="list-style-type: none"> ▪ Rhode Island General Laws, Chapter 42-35, Chapter 23-19.1, Chapter 23-19.14, Chapter 42-17.1-2, Chapter 46-12 and Chapter 46-13.1, particularly Sections 23-19.1-6, 23-19.1-10.3, 23-19.1-11.1, 46-12-3, and 46-12-5 	<ul style="list-style-type: none"> ▪ State regulatory framework governing activities potentially affecting HWCMS sites. 	Known or suspected HWCMS sites. These include: <ul style="list-style-type: none"> ▪ National Priorities List (NPL) ▪ RCRA Corrective Actions (CORRACTS) ▪ RCRA Information Systems (RCRA Info) ▪ RCRA Treatment, Storage & Disposal Facilities (TSDFs) ▪ Brownfield Sites ▪ HWCMS sites listed in State data sources (Table 3)
State of Connecticut	<ul style="list-style-type: none"> ▪ Connecticut General Statutes §32-9cc; Regulations of Connecticut State Agencies section 22a-133k-1 through 22a-133k-3 		
State of Massachusetts	<ul style="list-style-type: none"> ▪ 310 CMR 40.0001 through 40.9999, cited collectively as 310 CMR 40.0000, are promulgated by the Commissioner of the Department of Environmental Protection under M.G.L. c. 21E, "3(c), 3(d), 3(e), 3A(d), 3A(f), 3A(g), 3A(m), 3B, 5A, 6, 7 and 14, and M.G.L. c. 21A, ' 2(28), M.G.L. c. 21C and M.G.L. c. 111, ' 160. 310 CMR 40.0000 collectively comprises the Massachusetts Contingency Plan (the "MCP") 		

Source: NEC FUTURE JV Team, 2013

1.4.1 Regulatory Compliance

No formal agency approvals would be requested for the Tier 1 EIS. However, the FRA will engage in dialogue with the USEPA on methodologies, assumptions, and findings of the Tier 1 EIS analysis. The requirements for subsequent Tier 2 evaluations, including compliance with federal and state regulations will be described in the Tier 1 EIS. During the Tier 1 EIS process, the FRA will identify

potential opportunities to streamline subsequent Tier 2 environmental reviews (see Section 1.7). Coordination with USEPA will be consistent with the NEC FUTURE's Agency Coordination Plan and support the Statement of Principles (SOP) established between the FRA and federal regulatory agencies as part of the Council on Environmental Quality (CEQ) Pilot program.

1.5 METHODOLOGY TO ASSESS EFFECTS

This effects assessment methodology identifies the approach and assumptions for describing existing conditions of HWCMs and environmental consequences of the Tier 1 EIS Alternative on those resources. It identifies data sources, defines the Affected Environment and Context Area considered for HWCMs and presents the approach for evaluating potential direct effects.¹ Direct effects include encroachment or alteration of HWCMs. Indirect effects,² such as those resulting from induced growth as a result of the Tier 1 EIS Alternatives will be addressed in a separate methodology (see Indirect Effects Assessment Methodology).

1.5.1 Existing Conditions

The source data listed in Table 3 will be used for establishing existing conditions for HWCM sites.

HWCM sites within the Affected Environment and Context Area will be documented in the Tier 1 EIS. The Affected Environment is a two-mile wide swath centered on the Representative Route³ for each of the Tier 1 EIS Alternatives. This two-mile swath is conservative and is based on the American Society for Testing and Materials (ASTM) Standards for HWCM, which recommends a records source and search distance of up to one-mile. This distance would include all possible contaminant sources, as well as potential contaminant migration.

For this Tier 1 EIS, analysis will be limited to the HWCM sites identified in Table 3 (e.g., those contaminated material sites and hazardous waste sites listed on the NPL Superfund, RCRA CORRACTS, Brownfield, RCRA INFO sites, TSDFs and various state databases). Other types of sites associated with lower levels of contamination and lesser potential to impact the Alternatives Considered, such as Toxic Chemical Release Inventory (TRI) sites or sites with leaking underground storage tanks (LUSTs), would be considered in subsequent Tier 2 evaluations, when site-specific analysis could be tied to more detailed alignment plans and profiles.

¹ Direct Effects are caused by the action and occur at the same time and place (40 CFR § 1508.8)

² Indirect Effects are those effects that occur later in time or are further removed in distance (40 CFR § 1508.8)

³ Representative Route refers to a proposed route or potential alignment for a Tier 1 EIS Alternative. The Representative Route includes the physical footprint of the improvements associated with the Tier 1 EIS Alternatives. The horizontal and vertical dimensions of the footprint of the Representative Route are based on prototypical cross-sections for these improvements. The Representative Route is used as a proxy for estimating the potential effects of a route whose location could shift during subsequent project-level reviews.

Table 3 – Data Sources for the Evaluation of HWCMs

Hazardous Material	Data Source	Data Application
Federal Data	<ul style="list-style-type: none"> ▪ National Priorities List (NPL) ▪ RCRA Corrective Actions (CORRACTS) ▪ RCRA Information Systems (RCRA Info) ▪ RCRA Treatment, Storage & Disposal Facilities (TSDFs) ▪ Brownfield Sites 	<ul style="list-style-type: none"> ▪ List will be reviewed for Superfund sites: sites that have been identified as the worst hazardous waste sites that can pose a severe contamination risk or threat to public health and/or the environment. ▪ Data will be reviewed for sites that are currently undergoing corrective action, sites for which a remedy has been selected, sites for which construction has been completed, and sites where the corrective action cleanup is complete. ▪ Includes information on Large Quantity Generator (LQG) and Small Quantity Generator (SQG) facilities that generate hazardous wastes. ▪ Data will be reviewed to identify facilities involved with the treatment of hazardous waste, the temporary storage of hazardous waste prior to treatment or disposal, or the disposal of wastes. ▪ Data will be reviewed to identify sites contaminated because they were previously used for industrial or certain commercial uses, but have the potential to be reused or redeveloped once they are appropriately cleaned up. ▪ Data will be mapped in GIS and overlain on the affected environment

Table 3 – Data Sources for the Evaluation of HWCMS (continued)

Hazardous Material	Data Source	Data Application
State Data	<p>Washington, D.C.</p> <ul style="list-style-type: none"> ▪ DC Voluntary Cleanup Program Sites List <p>Maryland</p> <ul style="list-style-type: none"> ▪ Brownfield Site inventory List ▪ Voluntary Cleanup program list ▪ Land Use Control Sites(List Bullet 3 style) <p>Delaware</p> <ul style="list-style-type: none"> ▪ Certified List of Brownfield Sites ▪ State Hazardous Waste Inventory, Solid Waste and Unpermitted Landfills, and Solid Waste Resource Recovery Sites <p>Pennsylvania</p> <ul style="list-style-type: none"> ▪ Voluntary Cleanup Program Sites ▪ Municipal Waste Operations <p>New Jersey</p> <ul style="list-style-type: none"> ▪ Brownfield Site List ▪ Known Contaminated Sites (KCS) ▪ Deed Notices for KCS or sites on Site Remediation Programs <p>New York</p> <ul style="list-style-type: none"> ▪ Brownfield Cleanup Program Sites ▪ Voluntary Cleanup program Sites ▪ Environmental Remediation Sites <p>Rhode Island</p> <ul style="list-style-type: none"> ▪ CERCLA Known Contaminated Sites ▪ Solid/Medical/Hazardous Wastes Sites ▪ Contaminated Sites with Response Action Planned/Completed (most completed) <p>Massachusetts</p> <ul style="list-style-type: none"> ▪ Tier Classified Chapter 21 Sites ▪ MassDEP Oil and/or Hazardous Material Sites With Activity and Use Limitations ▪ Solid Waste Land Disposal Sites 	<p>Data will be reviewed to identify sites:</p> <ul style="list-style-type: none"> ▪ Contaminated or are perceived to be contaminated by hazardous substances ▪ With contamination caused by previous industrial or commercial use. ▪ Have land use restrictions due to known site contamination. ▪ Contaminated and have been identified as Hazardous Waste Corrective Action sites, Site Investigation & Restoration Branch sites, Solid Waste Landfills, Solid Waste Resource Recovery sites, & Unpermitted Landfills-Dumps. ▪ Sites that are inventories as abandoned landfills and pose potential environmental hazards. ▪ Data will be mapped in GIS and overlain on the affected environment

Source: NEC FUTURE JV, 2013

Based on the information that will be collected above, it is likely that numerous HWCMS sites will be identified within the Affected Environment. Therefore, a secondary analysis will also be performed to identify HWCMS sites that can be considered high-risk for adverse effects (i.e., “High-Risk HWCMS sites”) based on their proximity to the infrastructure improvements associated with each Alternative. High-Risk HWCMS sites will be defined as those that occur within a 300-foot wide swath centered on the Representative Route for Tier 1 EIS Alternatives. The 300-foot swath is sufficiently wide to:

- ▶ Encompass and account for the improvements associated with a Representative Route including infrastructure improvements (such as embankments, aerial structures, track improvements), ancillary facilities (such as stations, yards and parking structures), or service changes
- ▶ Account for contiguous HWCMs that may extend beyond the Representative Route

HWCM sites, including high-risk HWCM sites, within the Affected Environments for each Tier 1 EIS Alternative will be identified for each state on a county-by-county basis. This information will be presented in tables and mapped using GIS.

The Context Area is five miles wide, centered on the Representative Route for each Tier 1 EIS Alternative. Within the Context Area, HWCMs will be mapped, but total area will not be quantified, in order to qualitatively characterize the resources that could be affected should the Representative Route shift. For resources within the Context Area, general characteristics of, and relative size and location of, HWCMs will be presented; this information will be used to supplement the quantitative assessment of effects for the Affected Environment.

1.5.2 Environmental Consequences

Environmental consequences of the Tier 1 EIS Alternatives will be assessed within the Affected Environment. A qualitative assessment of resources present in the Context Area will be used to supplement the effects assessment.

The following steps will be undertaken to identify the number and type of HWCM sites and High-Risk HWCM sites that exist within the Affected Environment and are potentially impacted by the Tier 1 EIS Alternatives:

- ▶ Part 1: HWCM sites
 - Identify the HWCM sites that occur within the Affected Environment for each Tier 1 EIS Alternative using a GIS overlay of the HWCM resources identified in Table 3.
 - Calculate the total number of HWCM sites within the Affected Environment for each of the Tier 1 EIS Alternatives.
 - Overlay and analyze the HWCM sites that occur within the Affected Environments with GIS data from related resources (see Table 1). Additional constraints by resource will be qualitatively described. Specific effects will be addressed quantitatively in the resource-specific sections.
 - Identify areas of particular concern, such as concentrations of HWCM sites.
- ▶ Part 2: High-Risk HWCM sites
 - Identify the High-Risk HWCM sites (i.e., those that occur within the 300-foot swath around the Representative Route for each Tier 1 EIS Alternative) using a GIS overlay of the HWCM resources identified in Table 3.
 - Calculate the total number of High-Risk HWCM sites associated with each of the Tier 1 EIS Alternatives.

- Overlay and analyze the High-Risk HWCM sites with GIS data from related resources (see Table 1). Additional constraints by resource will be qualitatively described. Specific effects will be addressed quantitatively in the resource-specific sections.

HWCM sites within the Context Area will be qualitatively discussed with regard to the potential for impacts should there be a shift in a Representative Route.

Public health effects associated with HWCM sites will also be considered. For the Tier 1 EIS, the potential impacts on humans and the natural environment from exposure to HWCM sites that could result from implementation of a Tier 1 EIS Alternative would be qualitatively discussed. This discussion would include the potential health effects on construction workers and surrounding communities as a result of exposure to contaminated sites and materials. As part of Tier 2 analysis, materials handling plans, personnel protection, workplace monitoring, alternative designs and methods of construction would be developed to minimize health effects from contaminated materials.

Temporary construction-related effects to HWCMs will be described as to the location, duration and type of activity. The NEC FUTURE program overall approach to assessing construction-related effects at the Tier 1 EIS level is further described in a separate Construction Effects Assessment Approach document. Construction methods and activities for the Tier 1 EIS Alternatives will be the basis of this assessment and will be described in Chapter 2.

1.5.3 Mitigation Strategies

A menu of potential mitigation measures will be developed on a programmatic scale for further consideration in Tier 2. An example of programmatic mitigation measures for HWCMs would include contaminant management to prevent any existing contamination from migrating to adjacent sites, and providing a safe working environment to protect both the workers and the public.

1.6 TIER 1 EIS OUTCOMES

The Tier 1 EIS Hazardous Materials assessment will:

- ▶ Calculate the number of HWCM sites within the Affected Environment.
- ▶ Calculate the number of High-Risk HWCM sites within the Affected Environment (i.e., those that occur within a 300-foot swath surrounding the Representative Route associated with each Tier 1 EIS Alternative).
- ▶ Show graphically on maps the location and type of HWCM sites within the Affected Environment and Context Area as well as High-Risk HWCM sites
- ▶ Overlay relevant geologic information, as described in Table 1, to supplement HWCM site identification and effects.
- ▶ Identify the number and type of HWCM sites and High-Risk HWCM sites potentially impacted by the Tier 1 EIS Alternatives

- ▶ Identify a menu of potential mitigation measures.
- ▶ Describe regulatory compliance requirements for subsequent Tier 2 evaluations

1.7 APPLICABILITY TO TIER 2 ASSESSMENTS

The Tier 1 EIS will identify areas where avoidance may be possible—and/or may require subsequent investigations during Tier 2 analyses. Tier 2 analyses would include site-specific evaluations of potential impacts to public health and the environment. This could include an evaluation of past and current uses of the site, inspection of the site and adjacent properties, interviews with persons knowledgeable about site activities, discussion with regulatory agencies regarding known issues at the site and an analysis of all known information to provide an environmental assessment of the site. Tier 2 evaluations could also include sampling of the soils and groundwater on, or adjacent to, the site.

Additionally, FRA will identify ways in which agency coordination during the Tier 1 EIS process could create efficiencies and help streamline subsequent Tier 2 reviews and approvals. For example, if a particular portion or element of a Tier 1 EIS Alternatives avoids the physical encroachment or any other impact on HWCMS, FRA may coordinate with USEPA to determine whether or not those portions need further evaluation during the Tier 2 environmental review process.

Application of Effects-Assessment Methodology

8.1 HAZARDOUS WASTE AND CONTAMINATED MATERIALS: APPLICATION OF EFFECTS-ASSESSMENT METHODOLOGY

8.1.1 Variations to Effects-Assessment Methodology

The following variations from the Effects-Assessment Methodology occurred during the process of conducting the Tier 1 Draft EIS analysis:

- ▶ The methodology stated that as part of Environmental Consequences, hazardous waste and contaminated materials (HWCM) sites within both the Affected Environment and High-Probability Area¹ would be counted as effects. For consistency with the approach to evaluating Environmental Consequences for other Tier 1 Draft EIS resources areas, the methodology was updated to include identification of HWCM sites within the Representative Route. HWCM sites within the Affected Environment and High-Probability Area are still identified as part of the existing conditions characterization.

8.1.2 Data Variations

There were no variations to the data sources presented in the Effects-Assessment Methodology.

The data on HWCM sites were compiled in June-August 2012 and in terms of “All Appropriate Inquiry” (a U.S. Environmental Protection Agency derived federal standard for the process of evaluating a property’s environmental conditions and assessing the likelihood of any contamination) and ASTM standards. The data have not been updated since that time.

8.1.3 Criteria for Analysis

Existing Conditions and Environmental Consequences

- ▶ The HWCM sites were identified for the entire alignment at the county level. Counties with a higher number of HWCM sites will require more planning, and there is a significant chance that additional undocumented HWCM sites will also be present in these areas.
- ▶ The dataset includes a count of HWCM sites by county for the Environmental Consequences, High-Probability Area, Affected Environment, and Context Area.

¹ “High-Probability Area” is defined in Appendix E, Section E.8 Hazardous Waste and Contaminated Materials Methodology as “High-Risk.”

Data Matrices

Geography		RCRA Info							RCRA TSDF							State							TOTAL Hazardous Waste and Contaminated Materials Sites								
State	County	Context Area (Occurrences)							Context Area (Occurrences)							Context Area (Occurrences)							Context Area (Occurrences)								
		Existing NEC	Alternative 1	Alternative 2	Alternative 3				Existing NEC	Alternative 1	Alternative 2	Alternative 3				Existing NEC	Alternative 1	Alternative 2	Alternative 3				Existing NEC	Alternative 1	Alternative 2	Alternative 3					
					via CC and PVD (3.1)	via LI and PVD (3.2)	via LI and WOR (3.3)	via CC and WOR (3.4)				via CC and PVD (3.1)	via LI and PVD (3.2)	via LI and WOR (3.3)	via CC and WOR (3.4)				via CC and PVD (3.1)	via LI and PVD (3.2)	via LI and WOR (3.3)	via CC and WOR (3.4)				via CC and PVD (3.1)	via LI and PVD (3.2)	via LI and WOR (3.3)	via CC and WOR (3.4)		
DC	District of Columbia	20	20	20	20	20	20	20	0	0	0	0	0	0	0	0	19	19	19	19	19	19	19	19	93	93	93	93	93	93	93
MD	Prince George's	11	11	11	11	11	11	11	0	0	0	0	0	0	0	0	19	19	19	19	19	19	19	19	56	56	56	56	56	56	56
MD	Anne Arundel	8	8	8	8	8	8	8	0	0	0	0	0	0	0	0	15	15	15	15	15	15	15	15	39	39	39	39	39	39	39
MD	Howard	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	2	2	2	2	2	2	2	4	4	4	4	4	4	4
MD	Baltimore County	14	14	14	15	15	15	15	1	1	1	1	1	1	1	1	32	32	32	33	33	33	33	33	72	72	72	74	74	74	74
MD	Baltimore City	28	28	28	32	32	32	32	2	2	2	2	2	2	2	2	217	219	219	234	234	234	234	234	552	560	560	599	599	599	599
MD	Harford	12	12	12	12	12	12	12	1	1	1	1	1	1	1	1	8	8	8	9	9	9	9	9	57	57	57	61	61	61	61
MD	Cecil	12	12	14	14	14	14	14	1	1	1	1	1	1	1	1	18	18	18	18	18	18	18	18	93	93	97	97	97	97	97
DE	New Castle	26	26	27	26	26	26	26	2	2	2	2	2	2	2	2	313	313	328	325	325	325	325	325	550	550	577	573	573	573	573
PA	Delaware	27	27	26	27	27	27	27	2	2	2	2	2	2	2	2	355	355	330	356	356	356	356	356	402	402	373	403	403	403	403
PA	Montgomery	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5	5	2	5	5	5	5	5	5	5	2	5	5	5	5
PA	Philadelphia	80	80	80	86	86	86	86	2	2	2	2	2	2	2	2	767	767	771	825	825	825	825	825	1,352	1,352	1,357	1,419	1,419	1,419	1,419
PA	Bucks	41	41	41	41	41	41	41	6	6	6	6	6	6	6	6	226	226	226	226	226	226	226	226	309	309	309	309	309	309	309
NJ	Salem	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0	19	19	19	20	20	20	20	20	85	85	85	86	86	86	86
NJ	Gloucester	1	1	7	10	10	10	10	1	1	2	3	3	3	3	3	2	2	12	16	16	16	16	16	6	6	33	46	46	46	46
NJ	Camden	5	5	5	12	12	12	12	0	0	0	1	1	1	1	1	19	19	17	103	103	103	103	103	36	36	33	292	292	292	292
NJ	Burlington	12	12	12	12	12	12	12	2	2	2	2	2	2	2	2	102	102	102	102	102	102	102	102	219	219	219	219	219	219	219
NJ	Mercer	27	27	27	28	28	28	28	1	1	1	1	1	1	1	1	314	314	314	315	315	315	315	315	751	751	751	753	753	753	753
NJ	Middlesex	91	91	92	92	92	92	92	3	3	3	3	3	3	3	3	537	537	539	539	539	539	539	539	1,031	1,031	1,036	1,036	1,036	1,036	1,036
NJ	Somerset	2	2	2	2	2	2	2	0	0	0	0	0	0	0	0	26	26	26	26	26	26	26	26	49	49	49	49	49	49	49
NJ	Union	49	49	49	49	49	49	49	8	8	8	8	8	8	8	8	522	522	522	522	522	522	522	522	1,030	1,030	1,030	1,030	1,030	1,030	1,030
NJ	Essex	77	77	77	77	77	77	77	6	6	6	6	6	6	6	6	626	626	626	626	626	626	626	626	1,433	1,433	1,433	1,433	1,433	1,433	1,433
NJ	Bergen	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0	16	16	16	16	16	16	16	16	28	28	28	28	28	28	28
NJ	Hudson	55	55	55	59	59	59	59	1	1	1	1	1	1	1	1	790	797	797	844	844	844	844	844	1,351	1,362	1,361	1,445	1,445	1,445	1,445
NY	New York	193	193	194	195	195	195	195	0	0	0	0	0	0	0	0	48	48	48	48	48	48	48	48	278	278	279	280	280	280	280
NY	Richmond	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6
NY	Queens	69	69	77	77	195	195	77	2	2	2	2	3	3	2	41	41	41	66	66	66	66	66	139	139	147	147	307	307	147	
NY	Kings	68	67	87	87	132	132	87	0	0	0	0	0	0	0	0	21	21	29	29	41	41	29	29	97	96	129	129	208	208	129
NY	Bronx	98	98	98	98	98	98	98	0	0	0	0	0	0	0	0	47	47	49	49	47	47	49	49	172	172	174	174	172	172	174
NY	Westchester	28	28	28	39	28	28	39	0	0	0	0	0	0	0	0	28	28	28	56	28	28	56	66	66	66	109	66	66	109	
NY	Putnam	0	0	0	4	0	0	4	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	6	0	0	6	
NY	Nassau	0	0	0	0	52	52	0	0	0	0	2	2	0	0	0	0	0	90	90	0	0	0	0	0	0	0	187	187	0	
NY	Suffolk	0	0	0	0	84	84	0	0	0	0	2	2	0	0	0	0	0	54	54	0	0	0	0	0	0	0	171	171	0	
CT	Fairfield	37	37	37	50	37	37	50	17	17	17	24	17	17	24	2,632	2,673	2,682	3,116	2,675	2,675	3,116	2,874	2,915	2,925	3,394	2,917	2,917	3,394		
CT	Litchfield	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
CT	New Haven	42	42	66	60	66	66	60	8	8	16	18	16	16	18	910	910	1,258	1,331	1,258	1,258	1,331	1,052	1,052	1,487	1,557	1,487	1,487	1,557		
CT	Hartford	0	0	39	43	39	52	56	0	0	8	12	8	13	17	0	0	1,320	1,382	1,295	1,690	1,777	0	0	1,571	1,647	1,543	2,057	2,161		
CT	Tolland	0	0	0	0	0	2	2	0	0	0	0	0	0	0	0	0	143	143	143	145	145	0	0	144	144	144	157	157		
CT	Windham	0	0	4	4	4	0	0	0	0	3	3	3	0	0	0	0	0	70	70	70	2	2	0	0	82	82	82	2	2	
CT	Middlesex	2	2	4	2	3	2	2	1	1	1	1	1	1	1	93	93	103	93	101	93	93	100	100	112	100	109	100	100		
CT	New London	12	14	12	12	12	12	12	5	6	5	5	5	5	5	353	393	353	353	353	353	353	394	439	394	394	394	394	394	394	
RI	Washington	2	4	2	2	2	2	2	0	0	0	0	0	0	0	45	45	45	45	45	45	45	58	60	58	58	58	58	58	58	
RI	Kent	10	10	10	10	10	10	10	0	0	0	0	0	0	0	21	21	21	21	21	21	21	40	40	40	40	40	40	40	40	
RI	Providence	27	27	32	32	32	27	27	2	2	2	2	2	2	2	86	86	113	113	113	86	86	574	574	618	618	618	574	574		
MA	Hampden	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	2	0	0	0	0	0	0	2	2	
MA	Worcester	0	0	0	0	0	22	22	0	0	0	0	2	3	3	0	0	0	0	0	223	223	0	0	0	0	0	288	288	288	
MA	Middlesex	24	24	24	24	24	26	26	0	0	0	0	0	0	0	103	103	103	103	103	333	333	137	137	137	137	417	417	417		
MA	Bristol	16	16	16	16	16	16	16	4	4	4	4	4	4	4	77	77	84	84	84	77	77	112	112	119	119	112	112	112		
MA	Norfolk	8	8	8	8	8	9	9	1	1	1	1	1	1	1	95	96	96	96	96	129	129	105	106	106	106	140	140	140		
MA	Suffolk	33	33	33	33	33	61	61	0	0	0	0	0	0	0	439	439	439	439	439	735	735	691	691	691	691	1,131	1,131	1,131		
DC	Total	20	20	20	20	20	20	20	0	0	0	0	0	0	0	19	19	19	19	19	19	19	93	93	93	93	93	93	93	93	
MD	Total	85	85	87	92	92	92	92	5	5	5	5	5	5	5	311	313	313	330	330	330	330	873	881	885	930	930	930	930		
DE	Total	26	26	27	26	26	26	26	2	2	2	2	2	2	2	313	313	328	325	325	325	325	550	550	577	573	573	573			