M-638

Formerly Utilized Sites Remedial Action Program (FUSRAP)

ADMINISTRATIVE RECORD

for the Maywood Site, New Jersey

US Army Corps of Engineers®

M-638

MAYWOOD INTERIM STORAGE SITE

ENVIRONMENTAL SURVEILLANCE PLAN

B1.0 MAYWOOD INTERIM STORAGE SITE MAYWOOD, NEW JERSEY

B1.1 SITE LOCATION AND DESCRIPTION

MISS is located in Bergen County, New Jersey, approximately 20 km (12 mi) north-northeast of New York City and 21 km (13 mi) northeast of Newark, New Jersey (Figure B1-1). The Maywood site consists of MISS; the adjacent Stepan Company property; and nearby residential, commercial, and governmental properties (vicinity properties). The total population within an 80-km (50-mi) radius is approximately 17 million (1990 Census).

B1.2 SITE HISTORY

From 1916 to 1959, Maywood Chemical Works (MCW) extracted radioactive thorium and rare earth metals from monazite sand to produce mantles for gas lanterns. The waste materials generated during this process contained thorium-232 and its associated decay products, with lesser amounts of radionuclides in the uranium-238 decay series. The slurry containing waste from these operations was pumped into two earthen-diked retention ponds west of the plant. Some process wastes, along with tea and coca leaves from other MCW operations, were removed from the property and used as mulch and fill on nearby properties. Additional waste apparently migrated offsite through natural drainage associated with the former Lodi Brook. In 1959 the facility was sold to the Stepan Company. The Stepan Company has never processed radioactive material (BNI 1992a).

In 1961, the Atomic Energy Commission issued a radioactive material license to Stepan Company for radioactive material storage and remediation of the facility. From 1966 to 1968, contaminated material was removed from the property west of New Jersey Route 17 and buried in three pits on the Stepan Company property. In 1983, the EPA added the Maywood site to the National Priorities List, and the following year cleanup of radioactive contamination at the Maywood site was assigned by Congress to DOE. To expedite remediation of the site and its vicinity properties, DOE purchased a 4.7-ha portion of the Stepan Company property for use as an interim storage facility for radioactively contaminated materials (BNI 1992a). This property was referred to as MISS. From 1984 to 1986, approximately 27,000 m^3 of radioactively contaminated soil were excavated to remediate 25 vicinity properties, and these soils were used to create the waste storage pile at MISS.

The removal and off-site disposal of the interim storage pile began in 1994 and is scheduled to be complete in late 1996. The pile material is being shipped off-site to Envirocare of Utah, Inc.

B1.3 GEOLOGY/HYDROGEOLOGY/HYDROLOGY

The site lies within the Newark Basin, which extends from the Hudson River Valley in New York to southeastern Pennsylvania (Olsen 1980). Bedrock consists of alternating beds of dark reddish-brown sandstone and siltstone. Erosional processes have affected the bedrock surface, creating closed low areas, small isolated knobs, and large residual high-standing features. As a result, the bedrock surface has controlled the distribution of unconsolidated surficial sediments and continues to influence the location of surface runoff and groundwater flow (BNI 1992b).

The unconsolidated surficial sediments in the study area were deposited by fluvial and glacial processes and consist primarily of sand, silt, and clay. These deposits can be divided into three units: (1) an upper unit of poorly stratified sand, silt, and gravel; (2) a middle unit of clayey silt and sand, with varying amounts of organic material; and (3) a lower unit of stratified, fine-grained sand and silt. Generally, the boundaries between these units are poorly defined.

In addition to the naturally occurring unconsolidated sediments at the site, significant backfilling and reworking of the MISS/Stepan/Lodi area are apparent. Former process-waste retention ponds and settling areas along the western boundary of MISS have been filled, Westerly Brook has been culverted and redirected across the northwestern portion of the property, and Lodi Brook south of the site has been culverted. These activities have destroyed much of the natural depositional features of the shallow overburden.

Groundwater in the Maywood area occurs in both the bedrock and the overlying unconsolidated deposits. Depth to water is shallow and ranges from approximately 0.6 to 5.1 m (2 to 17 ft) below ground surface (BNI 1996. Water levels fluctuate in response to short- and long-term seasonal changes in precipitation and evapotranspiration. Water levels are generally highest in the spring and lowest in the fall and winter. Groundwater flow is toward the west and southwest.

Surface water courses and drainages in the vicinity of MISS include Westerly Brook and Lodi Brook. Westerly Brook is culverted where it enters the northwestern corner of the MISS property. The subsurface culvert redirects Westerly Brook to the west, the south, and then to the west again along the northern and western property boundaries. After leaving MISS, the culvert remains below grade for about 330 m (1,100 ft) before it terminates. At this point, Westerly Brook

reemerges and continues its westward course. Ultimately, Westerly Brook discharges into the Saddle River.

Before much of the urban development in the Maywood/Lodi area, Lodi Brook flowed from a marshy area south of the present Stepan property toward the south across relatively flat, open topography. However, since the area was developed, the course of the brook has been straightened, channeled, and covered over much of its natural course. In Lodi, community developments now cover most of the former brook channel. This former channel carried the wastewater discharge from MCW and deposited contaminated material along its course.

B1.4 REGULATORY COMPLIANCE

The primary regulatory guidelines that affect activities at MISS are found in DOE Orders, federal statutes, and federal regulations, as defined in the FUSRAP S/RID, and state and local regulations. S/RID requirements are generally applicable to all FUSRAP sites, while the applicability of other regulations varies from site to site.

Clean Air Act

Section 112 of the Clean Air Act authorized EPA to promulgate NESHAPs, which is applicable to MISS under Subparts H, Q, and M. Compliance with the nonradon radionuclide standards (Subpart H) is verified by applying the EPA-approved CAP88-PC model. Radon flux monitoring at the interim storage pile verifies compliance with Subpart Q of NESHAPs. The national emission standard for asbestos is provided in Subpart M of NESHAPs. One drum of asbestos and another drum that is suspect (labeled as asbestos) are in a storage area at MISS; loose asbestos is buried and commingled with soil in a small area that is marked by warning signs and roped off. When the buried asbestos is excavated, compliance with standards in Subpart M will be required, and applicable state requirements will be identified.

Clean Water Act

No stormwater permit has been determined to be applicable to MISS.

Resource Conservation and Recovery Act

No RCRA-regulated wastes are present at MISS.

Toxic Substances Control Act

Applicable federal and state standards pertaining to asbestos handling and removal will be complied with when the loose asbestos buried onsite is excavated.

Comprehensive Environmental Response, Compensation, and Liability Act

CERCLA and NCP are the primary sources of federal regulatory authority for remedial action at MISS. Remediation of the site is being managed by DOE under Executive Order 12580.

Because MISS is on the NPL, an FFA is required for site remedial actions. DOE and EPA Region II signed an FFA on September 17, 1990, which became effective on April 22, 1991. Specifically, the parties to the FFA intend that activities covered by the agreement will achieve compliance with CERCLA and will meet or exceed all ARARs.

National Environmental Policy Act

Remedial actions at MISS will be conducted under CERCLA authority. The NEPA values have been incorporated into the RI/FS prepared for the site.

A categorical exclusion for environmental monitoring and surveillance at all FUSRAP sites was prepared and approved in 1992 (DOE 1992).

Other Major Environmental Statutes and Executive Orders

The following major environmental statutes and executive orders were reviewed.

- FIFRA: There are no substances regulated by this act at MISS.
- Endangered Species Act: There are no endangered species at MISS.
- MCLs and MCLGs established under the SDWA are potential remediation goals for groundwater at FUSRAP sites and may be identified as ARARs for CERCLA actions. NJDEP has adopted these federal standards into its own regulations, which are more stringent for certain contaminants. NJDEP MCLs and MCLGs have been identified as ARARs for the CERCLA action at MISS.

- NHPA is the primary source of statutory authority related to the preservation of cultural and historic resources. The New Jersey State Historic Preservation Office has been consulted periodically on planned remediation activities at MISS. A Phase IA study has been completed and submitted for review by EPA and the New Jersey agency.

- Executive Order 11988 (Floodplain Management) requires federal agencies to provide protection to floodplains by reducing the risk of flood loss; minimizing the impact of floods on human safety, health, and welfare; and restoring and preserving the natural and beneficial values served by floodplains. Federal agencies must determine whether any proposed actions will occur in a floodplain. No DOE actions have affected floodplains at MISS. Any proposed action will be evaluated to determine whether it will occur in a floodplain.

- Executive Order 11990 (Protection of Wetlands) requires federal agencies to minimize the destruction, loss, or degradation of wetlands and to preserve and enhance the natural and beneficial value of wetlands. Federal agencies must determine whether any proposed action will affect the integrity and quality of wetlands. No DOE actions have affected wetlands at MISS.

B1.5 SAMPLING RATIONALE

The overall goals of the environmental surveillance program at MISS are to provide a historical perspective of contaminant levels in various media, to provide a timely indication of contaminant release or migration, and to provide an indication of the magnitude and extent of contamination should a release or migration occur. Environmental surveillance activities are necessary at MISS to ensure that onsite waste and contamination do not pose a threat to human health and the environment through inadvertent or unanticipated release or migration. These monitoring activities include the surveillance of all credible transport pathways; the selection of suitable surveillance locations; and the application of appropriate sampling methods, techniques, and analyses. To achieve this goal, the program has been designed to meet the applicable requirements of DOE Orders 5400.1 and 5400.5, the *Environmental Regulatory Guidance for Radiological Effluent Monitoring and Environmental Surveillance*, and other applicable federal, state, and local regulations.

Contamination at MISS is present in the interim storage pile, former retention ponds, the ground surface, and onsite structures. Potential exposure to this existing contamination is most likely to occur through air, groundwater, surface water, and streambed sediments. The environmental surveillance program at MISS has been developed to provide direct surveillance of these potential

exposure routes through periodic sampling and analysis of radioactive and chemical constituents. Figures B1-2 and B1-3 present the environmental surveillance program that has been implemented at MISS and indicate sampling locations and media. Tables B1-1 through B1-5 detail the sampling locations, media, analytes, QC samples, and frequency.

The contamination at MISS is primarily from the processing of thorium for use in gas lantern mantles. The processing of thorium generates wastes and residues containing elevated levels of radioactive constituents such as uranium, radium, thorium, and a variety of metals. The environmental surveillance program at MISS requires analysis and/or measurement of these radioactive constituents and metals in the air, groundwater, surface water and streambed sediments.

Volatile organic compounds (VOCs) have been detected in the groundwater at MISS. The source is undetermined, but the use of degreasers or solvents during processing is probable. Benzene, toluene, ethlybenzene, and xylene from underground storage tanks (now removed) have also been detected upgradient of MISS. Therefore, in addition to analyzing for radionuclides and metals in groundwater samples, the environmental surveillance program at MISS includes analysis for VOCs in groundwater samples.

Atmospheric monitoring of radon-222 and radon-220 and external gamma radiation occur along fenceline locations surrounding MISS and known areas of radioactive contamination or emissions to assess potential exposure levels to the public and site workers. Measurement of radon flux is periodically conducted at discrete grid intersections on top of the interim waste storage pile, but will be discontinued once pile removal is complete. Measurement of radon-222 and radon-220 and external gamma radiation adjacent to Stepan buildings are used to assess potential exposure to site workers.

Groundwater monitoring wells have been selected to assess groundwater quality upgradient, downgradient, in the source area, and at the MISS/Stepan boundary. The groundwater monitoring program includes analysis of radioactive constituents, metals, and VOCs. Both the upper and lower groundwater systems are monitored at MISS because of the absence of a competent confining layer, the existence of an onsite downward vertical hydraulic gradient, and the identification of groundwater contamination in some lower groundwater system wells.

Surface water and streambed sediment sampling includes the analysis of radioactive constituents and metals along Westerly Brook and Lodi Brook. Surface water and streambed sediment sampling locations along Westerly Brook are used to assess upstream and downstream contamination. Because Lodi Brook drains areas of known contamination, surface water and

streambed sediment sampling is conducted to monitor the potential downstream migration of contamination. Lodi Brook's western tributary is monitored to assess downgradient contaminant levels from the site. Lodi Brook's eastern tributary is monitored at two sampling locations. These locations are used to provide an indication of the potential downstream migration of contamination in Lodi Brook.

B1.6 BIBLIOGRAPHY

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FIGURES FOR APPENDIX B1

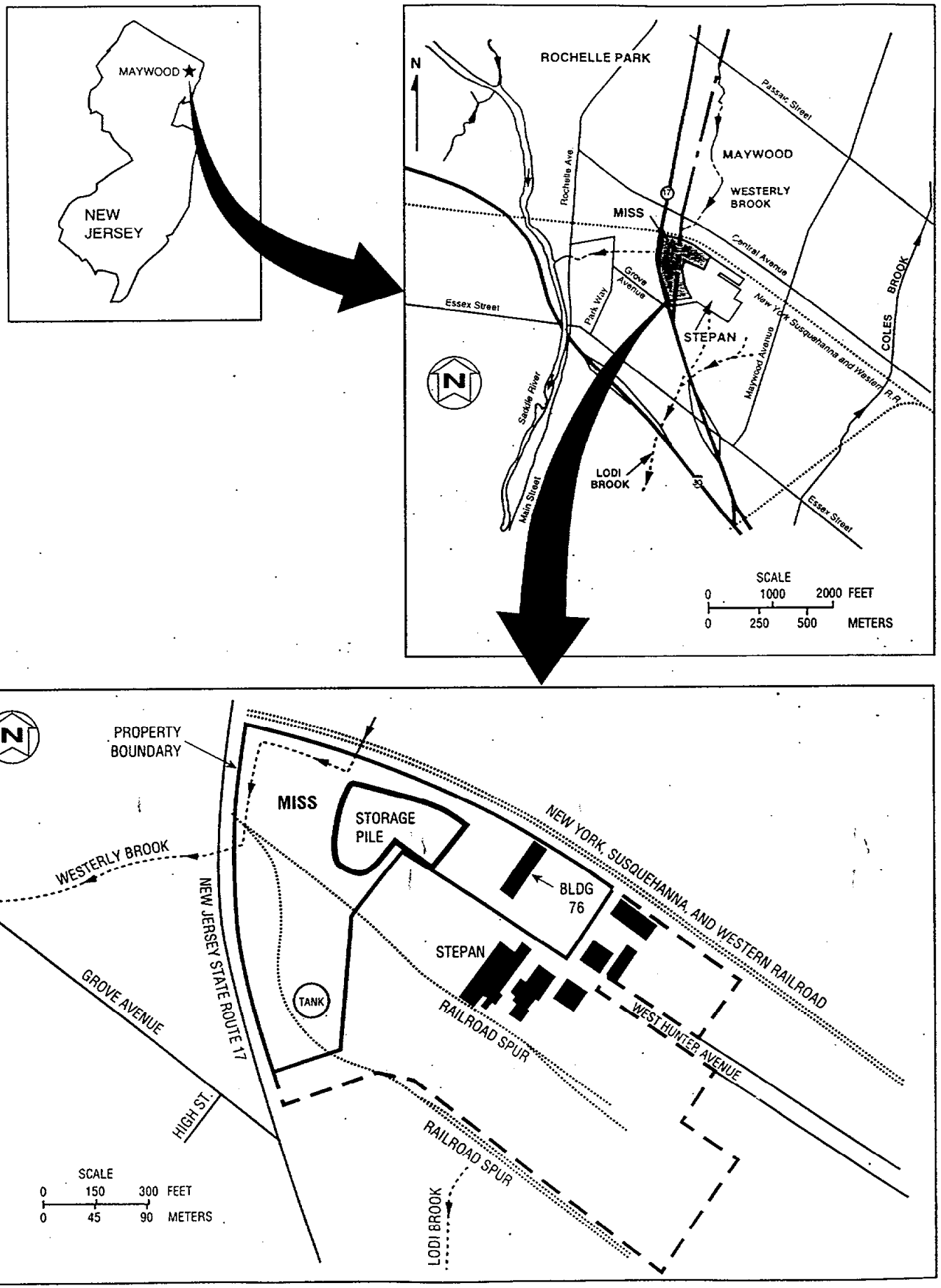

Figure B1-1
Maywood Interim Storage Site, Site Location and Site Map

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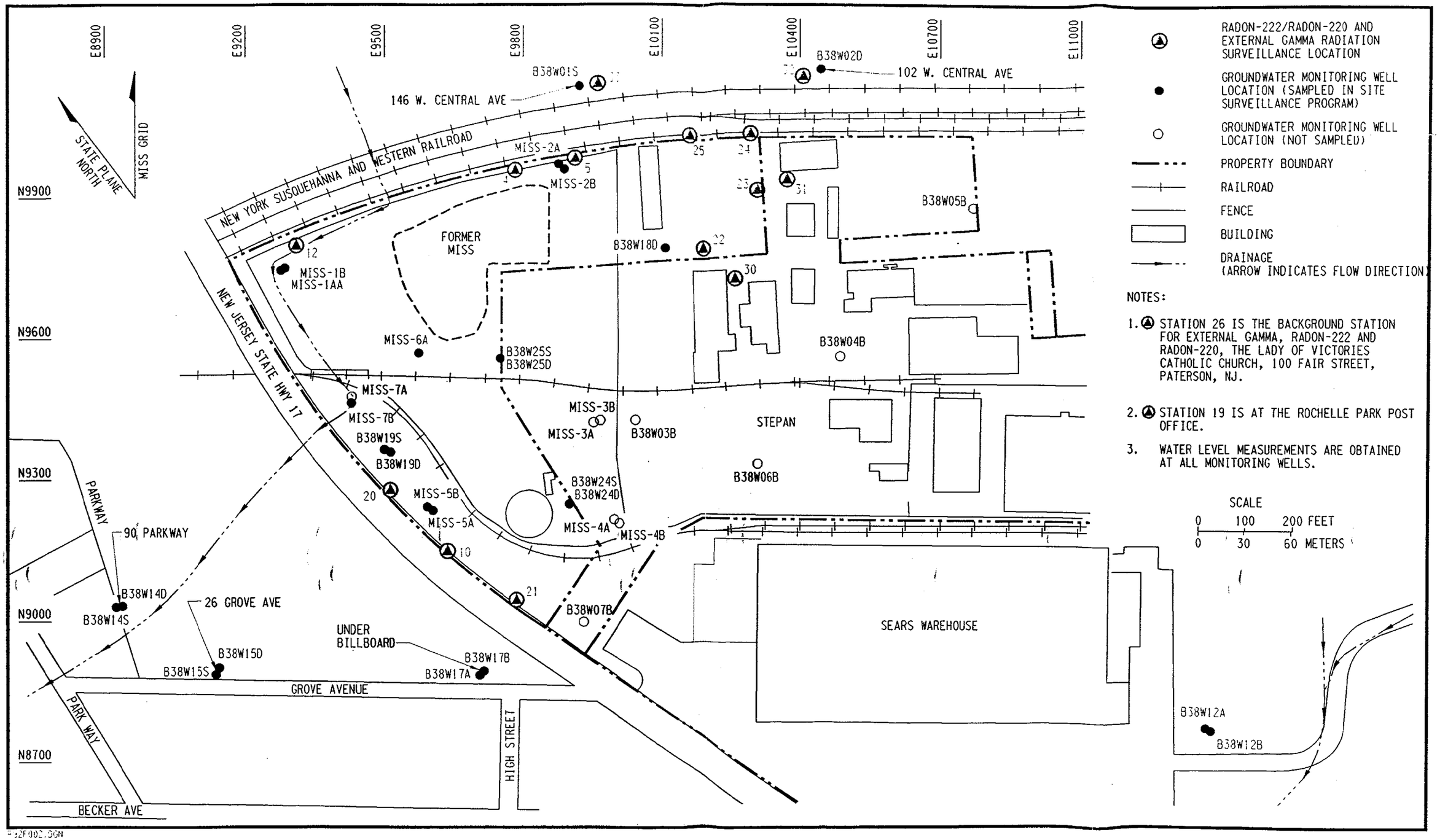

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Figure B1-2
Maywood Interim Storage Site Environmental Surveillance Sampling Locations:
External Gamma Radiation, Radon-222/Radon-220, and Groundwater

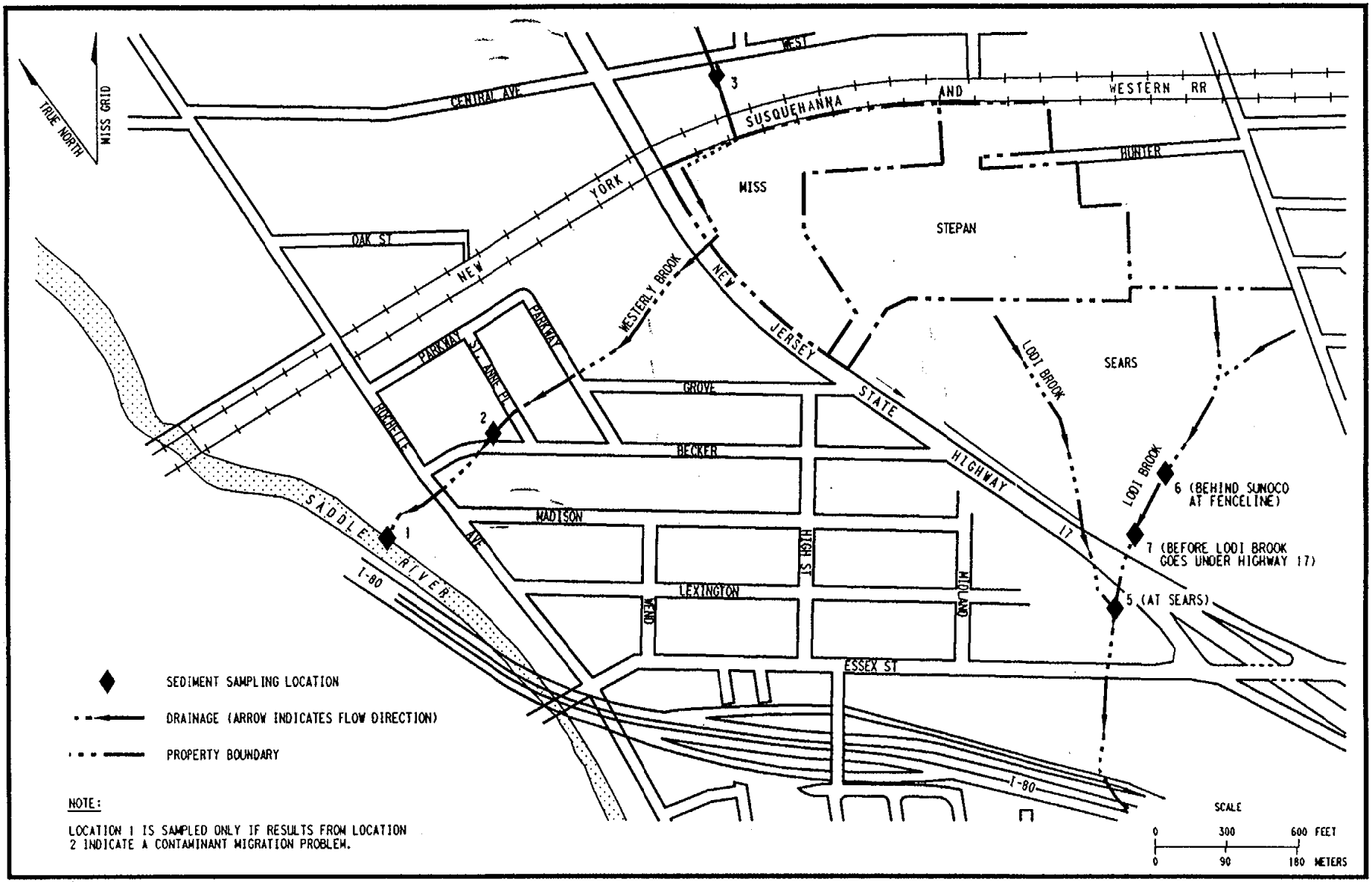

Figure B1-3
Surface Water and Sediment Sampling Locations
in the Vicinity of Maywood Interim Storage Site

TABLES FOR APPENDIX B1

TABLE B1 - 1: Analytes, Detection Limits, and Media

Maywood Interim Storage Site

Analytes	Media and Target Detection Limits				
	Atmospheric	Groundwater	Surface Water	Sediment	Stormwater
RADIONUCLIDES					
Radium-226	--	0.5 pCi / L	--	0.5 pCi / g	--
Radium-228	--	0.5 pCi / L	--	0.5 pCi / g	--
Total uranium	--	0.03 µg / L	--	0.1 µg / g	--
Thorium-230	--	0.5 pCi / L	--	0.5 pCi / g	--
Thorium-232	--	0.5 pCi / L	--	0.5 pCi / g	--
Thorium-228	--	0.5 pCi / L	--	0.5 pCi / g	--
External gamma radiation	10 mrem / 6 months	--	--	--	--
Radon-222 / Radon-220	0.3 pCi / L	--	--	--	--
METALS (List 1, ICPAES)					
Aluminum	--	45 µg / L	--	5 mg / kg	--
Barium	--	2 µg / L	--	2 mg / kg	--
Beryllium	--	0.3 µg / L	--	0.1 mg / kg	--
Boron	--	20 µg / L	--	5 mg / kg	--
Cadmium	--	4 µg / L	--	1 mg / kg	--
Calcium	--	10 µg / L	--	10 mg / kg	--
Chromium	--	7 µg / L	--	1 mg / kg	--
Cobalt	--	7 µg / L	--	1 mg / kg	--
Copper	--	6 µg / L	--	1 mg /kg	--
Iron	--	7 µg / L	--	10 mg / kg	--
Magnesium	--	25 µg / L	--	20 mg / kg	--
Manganese	--	8 µg / L	--	1 mg / kg	--
Molybdenum	--	8 µg / L	--	2 mg / kg	--
Nickel	--	15 µg / L	--	1 mg / kg	--
Potassium	--	200 µg / L	--	200 mg / kg	--
Silver	--	7 µg / L	--	0.2 mg / kg	--
Sodium	--	29 µg / L	--	10 mg / kg	--
Vanadium	--	8 µg / L	--	1 mg / kg	--
Zinc	--	2 µg / L	--	1 mg / kg	--
METALS (List 2, GFAA)					
Antimony	--	1.5 µg / L	--	10 mg / kg	--
Arsenic	--	1 µg / L	--	1 mg / kg	--
Lead	--	1 µg / L	--	2 mg / kg	--
Lithium	--	2 µg / L	2 µg / L	2 mg / kg	--
Selenium	--	2 µg / L	--	1 mg / kg	--
Thallium	--	1 µg / L	--	1 mg / kg	--

TABLE B1 - 1: Analytes, Detection Limits, and Media

Maywood Interim Storage Site

Analytes	Media and Target Detection Limits				
	Atmospheric	Groundwater	Surface Water	Sediment	Stormwater
ORGANICS					
Volatile Organic Compounds					
Acetone	--	10 µg / L	--	--	--
Acrolein	--	20 µg / L	--	--	--
Acrylonitrile	--	10 µg / L	--	--	--
Benzene	--	5 µg / L	--	--	--
Bromodichloromethane	--	5 µg / L	--	--	--
Bromoform	--	5 µg / L	--	--	--
Bromomethane	--	10 µg / L	--	--	--
2 -Butanone	--	10 µg / L	--	--	--
Carbon disulfide	--	5 µg / L	--	--	--
Carbon tetrachloride	--	5 µg / L	--	--	--
Chlorobenzene	--	5 µg / L	--	--	--
Chloroethane	--	10 µg / L	--	--	--
Chloroform	--	5 µg / L	--	--	--
Chloromethane	--	10 µg / L	--	--	--
1,1 - Dichloroethane	--	5 µg / L	--	--	--
1,2 - Dichloroethane	--	5 µg / L	--	--	--
1,1 - Dichloroethene	--	5 µg / L	--	--	--
1,2 - Dichloroethene	--	5 µg / L	--	--	--
1,2 - Dichloropropane	--	5 µg / L	--	--	--
cis- 1,3 - Dichloropropylene	--	5 µg / L	--	--	--
trans-1,3 -Dichloropropylene	--	5 µg / L	--	--	--
Chlorodibromomethane	--	5 µg / L	--	--	--
2 - Chloroethylvinyl ether	--	10 µg / L	--	--	--
Ethylbenzene	--	5 µg / L	--	--	--
2 - Hexanone	--	10 µg / L	--	--	--
Methylene chloride	--	5 µg / L	--	--	--
4 - Methyl-2-pentanone	--	10 µg / L	--	--	--
Styrene	--	5 µg / L	--	--	--
1,1,2,2 - Tetrachloroethane	--	5 µg / L	--	--	--
Tetrachloroethene	--	5 µg / L	--	--	--
Toluene	--	5 µg / L	--	--	--
1,1,1 - Trichloroethane	--	5 µg / L	--	--	--
1,1,2 - Trichloroethane	--	5 µg / L	--	--	--
Trichloroethene	--	5 µg / L	--	--	--
Vinyl acetate	--	10 µg / L	--	--	--
Vinyl chloride	--	10 µg / L	--	--	--
Xylenes (total)	--	5 µg / L	--	--	--

Note: -- indicates no analysis.

TABLE B1 - 2: Sampling Rationale
External Gamma Radiation
Maywood Interim Storage Site

Sampling Location ID	Frequency	Radiological Analyses	Chemical Analyses	Sampling Location Rationale
4	Semiannually	✓		MISS fenceline, storage pile vicinity
5	Semiannually	✓		MISS fenceline, storage pile vicinity
10	Semiannually	✓		MISS fenceline
12	Semiannually	✓		MISS fenceline
19	Semiannually	✓		Offsite, New Rochelle Post Office
20	Semiannually	✓		MISS fenceline
21	Semiannually	✓		MISS fenceline
22	Semiannually	✓		MISS fenceline, contaminated area adjacent to Building 76
23	Semiannually	✓		MISS fenceline, contaminated area adjacent to Building 76
24	Semiannually	✓		MISS fenceline, contaminated area adjacent to Building 76
25	Semiannually	✓		MISS fenceline, contaminated area adjacent to Building 76
26	Semiannually	✓		Background for MISS and WISS
30	Semiannually	✓		On side of Stepan property building
31	Semiannually	✓		On side of Stepan property building
32	Semiannually	✓		North of Building 76
33	Semiannually	✓		Northeast of Building 76

TABLE B1 - 2: Sampling Rationale
Radon-222 / Radon-220 and Radon-222
Maywood Interim Storage Site

Sampling Location ID	Frequency	Radiological Analyses	Chemical Analyses	Sampling Location Rationale
4	Semiannually	✓		MISS fenceline, storage pile vicinity, quality control duplicate taken at this location
5	Semiannually	✓		MISS fenceline, storage pile vicinity
10	Semiannually	✓		MISS fenceline
12	Semiannually	✓		MISS fenceline
19	Semiannually	✓		Offsite, New Rochelle Post Office
20	Semiannually	✓		MISS fenceline
21	Semiannually	✓		MISS fenceline
22	Semiannually	✓		MISS fenceline, contaminated area adjacent to Building 76
23	Semiannually	✓		MISS fenceline, contaminated area adjacent to Building 76
24	Semiannually	✓		MISS fenceline, contaminated area adjacent to Building 76
25	Semiannually	✓		MISS fenceline, contaminated area adjacent to Building 76
26	Semiannually	✓		Background for MISS and WISS
30	Semiannually	✓		On the side of Stepan property building
31	Semiannually	✓		On the side of Stepan property building
32	Semiannually	✓		North of Building 76
33	Semiannually	✓		Northeast of Building 76

TABLE B1 - 2: Sampling Rationale
Groundwater
Maywood Interim Storage Site

Sampling Location ID	Frequency	Radiological Analyses	Chemical Analyses	Sampling Location Rationale
MISS01AA	Annually	✓	✓	Overburden, MISS onsite, former retention pond area
MISS02A	Annually	✓	✓	Overburden, MISS onsite, arsenic-contaminated soils area
MISS05A	Annually	✓	✓	Overburden, MISS onsite, former retention pond area
MISS06A	Annually	✓	✓	Overburden, MISS onsite
B38W01S	Annually	✓	✓	Overburden, offsite, upgradient
B38W14S	Annually	✓	✓	Overburden, offsite, downgradient
B38W15S	Annually	✓	✓	Overburden, offsite, downgradient
B38W17A	Annually	✓	✓	Overburden, offsite, downgradient
B38W19S	Annually	✓	✓	Overburden, MISS onsite, former retention pond area
B38W24S	Annually	✓	✓	Overburden, MISS / Stepan property boundary
B38W25S	Annually	✓	✓	Overburden, MISS / Stepan property boundary
MISS01B	Annually	✓	✓	Bedrock, MISS onsite, former retention pond area
MISS02B	Annually	✓	✓	Bedrock, MISS onsite, arsenic-contaminated soils area
MISS05B	Annually	✓	✓	Bedrock, MISS onsite, former retention pond area
MISS07B	Annually	✓	✓	Bedrock, MISS onsite, former retention pond area
B38W02D	Annually	✓	✓	Bedrock, offsite, upgradient
B38W14D	Annually	✓	✓	Bedrock, offsite, downgradient
B38W15D	Annually	✓	✓	Bedrock, offsite, downgradient
B38W17B	Annually	✓	✓	Bedrock, offsite, downgradient
B38W18D	Annually	✓	✓	Bedrock, MISS property boundary
B38W19D	Annually	✓	✓	Bedrock, MISS onsite, former retention pond area
B38W24D	Annually	✓	✓	Bedrock, MISS / Stepan property boundary
B38W25D	Annually	✓	✓	Bedrock, MISS / Stepan property boundary

TABLE B1 - 2: Sampling Rationale
Surface Water and Sediment
Maywood Interim Storage Site

Sampling Location ID	Frequency	Radiological Analyses	Chemical Analyses	Sampling Location Rationale
SWSD002	Annually		✓	Offsite, downgradient outfall, Westerly Brook
	Semiannually	✓		
SWSD003	Annually		✓	Offsite, upgradient, Westerly Brook
	Semiannually	✓		
SWSD005	Annually		✓	Offsite, downgradient, Lodi Brook
	Semiannually	✓		
SWSD006	Annually		✓	Offsite, downgradient, SEARS / SUNOCO fenceline, Lodi Brook
	Semiannually	✓		
SWSD007	Annually		✓	Offsite, downgradient of SUNOCO property, Lodi Brook, QA/QC samples collected at this location
	Semiannually	✓		
Contingency Sampling Location (if sampling location 2 indicates contamination)				
SWSD001	Semiannually if required	✓	✓	Offsite, downgradient, confluence with Saddle River, Westerly Brook

TABLE B1 - 3: Environmental Surveillance Summary
External Gamma Radiation and Radon-222 / Radon-220
Maywood Interim Storage Site

Measured Parameter	Station Identification	Number of Analyses or Measurements																						Total Analyses per Year
		No. of Sample Locations				Sample Duplicate				Ship Blank				Contingency Sample				Matrix Spike				Matrix Spike Duplicate				
		CY Quarter				CY Quarter				CY Quarter				CY Quarter				CY Quarter				CY Quarter				
		1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	
LABORATORY MEASUREMENTS																										
External gamma radiation (TETLDs)[a]	4, 5, 10, 12, 19, 20,	16		16						1		1		17		17										68
Radon-222 / Radon-220	21, 22, 23, 24, 25, 26,	16		16		1		1																		34
Radon-222	30, 31, 32, 33	16		16		1		1																		34
																										0

a. TETLD = Tissue equivalent thermoluminescent dosimeter

TABLE B1 - 3: Environmental Surveillance Summary
Groundwater
Maywood Interim Storage Site

Measured Parameter	Station Identification	Number of Analyses or Measurements																						Total Analyses per Year
		No. of Sample Locations				Rinsate Blank [b]				Trip Blank [b]				Sample Duplicate				Matrix Spike				Matrix Spike Duplicate				
		CY Quarter				CY Quarter				CY Quarter				CY Quarter				CY Quarter				CY Quarter				
		1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	
FIELD MEASUREMENTS																										
Chemical	MISS01AA, MISS01B, MISS02A,																									
Dissolved oxygen	MISS02B, MISS05A, MISS05B,	23																								23
Eh	MISS06A, MISS07B, B38W01S,	23																								23
Turbidity	B38W02D, B38W14S, B38W14D,	23																								23
Temperature	B38W15S, B38W15D, B38W17A,	23																								23
Specific conductivity	B38W17B, B38W18D, B38W19S,	23																								23
pH	B38W19D, B38W24S, B38W24D,	23																								23
	B38W25S, B38W25D																									
LABORATORY MEASURMENTS																										
Radiological																										
Total uranium		23				10								2												35
Thorium-230	MISS01AA, MISS01B, MISS02A,	23				10								2												35
Thorium-232	MISS02B, MISS05A, MISS05B,	23				10								2												35
Thorium-228	MISS06A, MISS07B, B38W01S,	23				10								2												35
Radium-226	B38W02D, B38W14S, B38W14D,	23				10								2												35
Radium-228	B38W15S, B38W15D, B38W17A,	23				10								2												35
Chemical	B38W17B, B38W18D, B38W19S,																									
ICPAES Metals (List 1)[c]	B38W19D, B38W24S, B38W24D,	23				10								2				2				2				39
GFAA Metals (List 2)[c]	B38W25S, B38W25D	23				10								2				2				2				39
Volatile organic compounds[c]		23				10				10				2				2				2				49

b. Estimated number

c. Table B1-1 includes analytical parameters for metals list 1 and 2, and volatile organic compounds.

TABLE B1 - 3: Environmental Surveillance Summary
Surface Water and Sediment
Maywood Interim Storage Site

Measured Parameter	Station Identification	Number of Analyses or Measurements																				Total Analyses per Year
		Samples				Rinsate Blank [d]				Trip Blank [d]				Sample Duplicate				Matrix Spike				Matrix Spike Duplicate				
		CY Quarter				CY Quarter				CY Quarter				CY Quarter				CY Quarter				CY Quarter				
		1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	
FIELD MEASUREMENTS																										
Dissolved oxygen	SWSD002, SWSD003, SWSD005, SWSD006, SWSD007		5		5																					10
Eh			5		5																				+	10
Turbidity			5		5																					10
Temperature			5		5																					10
Specific conductivity			5		5																					10
pH			5		5																					10
LABORATORY MEASURMENTS																										
SEDIMENT																										
Radiological																										
Total uranium	SWSD002 SWSD003 SWSD005 SWSD006 SWSD007	5		5		1		1						1		1										14
Thorium-230		5		5		1		1						1		1										14
Thorium-232		5		5		1		1						1		1										14
Thorium-228																										
Radium-226		5		5		1		1						1		1										14
Radium-228		5		5		1		1						1		1										14
Chemical																										
ICPAES Metals (List 1) [e]		5				1								1				1				1				9
GFAA Metals (List 2) [e]		5				1								1				1				1				9
SURFACE WATER																										
Chemical																										
Lithium		5												1				1				1				8

d. Estimated number

e. Table B1-1 includes analytical parameters for metals list 1and 2.

TABLE B1 - 4: Deliverables Required for Environmental Surveillance Program

Maywood Interim Storage Site

Deliverable	Regulatory Driver	Frequency	Completion Goal
Environmental Surveillance Technical Memorandum	DOE	Annually	June
NESHAPs Report	40 CFR Part 61, Subpart H	Annually	June

TABLE B1 - 5: Groundwater Level Measurement Locations and Frequency

Maywood Interim Storage Site

Well ID[a]	Well Completion	Manual Measurement[b] Frequency
MISS01AA	Overburden	Quarterly
MISS01B	Bedrock	Quarterly
MISS02A	Overburden	Quarterly
MISS02B	Bedrock	Quarterly
MISS03A	Overburden	Quarterly
MISS03B	Bedrock	Quarterly
MISS04A	Overburden	Quarterly
MISS04B	Bedrock	Quarterly
MISS05A	Overburden	Quarterly
MISS05B	Bedrock	Quarterly
MISS06A	Overburden	Quarterly
MISS07A	Overburden	Quarterly
MISS07B	Bedrock	Quarterly
B38W01S	Overburden	Quarterly
B38W02D	Bedrock	Quarterly
B38W03B	Bedrock	Quarterly
B38W04B	Bedrock	Quarterly
B38W05B	Bedrock	Quarterly
B38W06B	Bedrock	Quarterly
B38W07B	Bedrock	Quarterly
B38W12A	Overburden	Quarterly
B38W12B	Bedrock	Quarterly
B38W14S	Overburden	Quarterly
B38W14D	Bedrock	Quarterly
B38W15S	Overburden	Quarterly
B38W15D	Bedrock	Quarterly
B38W17A	Overburden	Quarterly
B38W17B	Bedrock	Quarterly
B38W18D	Bedrock	Quarterly
B38W19S	Overburden	Quarterly
B38W19D	Bedrock	Quarterly
B38W24S	Overburden	Quarterly
B38W24D	Bedrock	Quarterly
B38W25S	Overburden	Quarterly
B38W25D	Bedrock	Quarterly

a. Well locations are shown on Figure B1 - 1.
b. Manual water level readings taken in accordance with 191-IG-007.