

Usace Fusrap Maywood Team and New Jersey Department of Transportation Execute a Coordinated Solution Prior to Highway Improvements

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ABSTRACT

During the fall and winter of 2001 and 2002, the United States Army Corps of Engineers, New York District (USACE) and Shaw Environmental, together with the New Jersey Department of Transportation (NJDOT) combined efforts to the benefit of the taxpayer on a complex project in the Borough of Lodi, Bergen County, New Jersey. Coordination for remediation of a Superfund site, in advance of a much-needed NJDOT roadway improvement project, exceeded the scope and expectations typical of a hazardous waste cleanup project. NJDOT needed to upgrade an existing and deteriorating drainage piping system prior to roadway improvements. The pipe was located on a Formerly Utilized Sites Remedial Action Program (FUSRAP) Maywood Superfund Site vicinity property. FUSRAP is a U.S. federal government program established to address environmental remediation of sites that supported the government's early atomic weapons and nuclear energy research. The upgrade effort was complicated by the presence of subsurface radioactive contamination that would be disturbed during drainage system replacement. To complicate matters further, the work was taking place in an urbanized setting with extensive pedestrian and vehicle traffic. In addition, the work site housed a commercial office of the Bank of New York (BNY), where operations increased dramatically after the September 11, 2001 attacks shut down some of BNY's New York City facilities. This office was considered a 24-hour/7-day essential operation with a need for full-time parking, deliveries, and security. All this had to be considered while maintaining focus on worker and public safety.

The NJDOT civil engineering design called for replacement of an elliptical corrugated metal pipe (ECMP) with 100 meters (m) of pre-cast concrete culvert. There was a critical need to minimize the remedial construction duration, which included a large by-pass pumping operation, removal of impacted soils and debris, final status survey to verify cleanup objective compliance, crane placement of the pre-cast concrete culvert, and expedited backfill to meet schedule and budget expectations of the client, NJDOT, the property owner, and the public. This stakeholder coordination integrated the efforts of the USACE/Shaw team and NJDOT instead of having two separate government agencies expending costs for two independent efforts. The USACE/Shaw team at Maywood was able to accomplish this by working with NJDOT management to establish a schedule, engineering design, procurement and construction-sequencing plan that met remediation goals and completed the drainage replacement improvements in a single integrated effort.

INTRODUCTION

Site Description and History of Government Remedial Activities

The FUSRAP Maywood Superfund Site (FMSS) is located in highly developed and urbanized Bergen County, New Jersey (Figure 1). The primary contaminant of concern at the FMSS is thorium, a naturally occurring radioactive element that was chemically extracted from sand at a now-defunct chemical works from 1916 to 1959. During this period, a slurry mixture containing waste from thorium processing operations, including lesser concentrations of uranium and radium, was pumped to diked retention ponds or otherwise dispersed in an uncontrolled fashion to various locations of the chemical works property. Subject to natural erosion and sediment transport, the uncontrolled waste material was carried to nearby vicinity properties primarily by a storm water drainage channel known as Lodi Brook. Lesser quantities of waste material were physically moved to private properties for use as fill. Eighty-eight properties have been identified as part of the FMSS. These include a mix of residential, commercial and a few government-owned properties. Remediation of the residential properties was initiated by the Department of Energy (DOE) and completed by the USACE in 2000. Since then, the USACE has been actively addressing the remaining commercial and government properties, most of which are active businesses or heavily used public thoroughfares. As documented in the Site's Record of Decision (ROD), areas beneath highways/roads, railroads and buildings within the Site are considered inaccessible. However, if during the course of USACE activities on the Site, a property owner makes a previously inaccessible area available for remediation (e.g., through building demolition); USACE will work with that owner to coordinate excavation and disposal of the contaminated waste.



Fig. 1. Aerial photo showing a portion of the FMSS in Bergen County, New Jersey.

New Jersey Department of Transportation Construction Activities

NJDOT is continually working on transportation initiatives meant to enhance public safety and support additional vehicle traffic. In cases where known contamination is present in proposed highway construction areas, the NJDOT coordinates with responsible parties to ensure, to the extent practicable, that contamination is identified and addressed, prior to the mobilization of utility relocation and construction field crews.

For several years, NJDOT has been planning and implementing a phased construction project for Essex Street and New Jersey State Route 17, two well-traveled roads that transect areas of subsurface radioactive contamination on the FUSRAP Maywood Site. Overall, NJDOT's roadway improvement project involves work on nine properties identified as part of the FUSRAP Maywood Superfund Site. Approximately one-third of the NJDOT footprint coincides with FUSRAP-impacted areas, creating a critical need for coordination between NJDOT, USACE, and affected property owners and tenants.

NJDOT-USACE COORDINATION & COLLABORATION

The phased approach undertaken by NJDOT is continually evolving as conditions change, but accomplishes two primary objectives: to minimize traffic congestion and impacts to commercial businesses during construction activities, and to facilitate any necessary USACE remedial actions in areas of proposed construction.

It was evident to both USACE and NJDOT that working together would help both organizations achieve their individual goals. If either of the parties took a unilateral approach to their work, it would still get accomplished but less efficiently and at a higher cost to taxpayers. By recognizing each organization's needs, limitations, and capabilities, a symbiotic relationship was established. With this partnership, the NJDOT can accomplish their work without the need to address radioactive waste themselves, and the USACE can better accomplish their mission of removing any reasonably accessible pockets of contamination, thereby limiting the areas requiring subsequent institutional controls (i.e., deed restrictions for residual contaminants that otherwise would be left in place).

Numerous meetings were held to discuss details and plan work sequences. NJDOT, USACE and their associated contractor representatives continually focused on identification and separation of responsibilities to ensure that the full scope was covered and made sense for the flow of the work. For example, USACE needed to plan work phasing with NJDOT to ensure that the aggressive remediation schedule for FMSS vicinity properties was not affected by the highway construction and could be maintained in a manner that maximized cost savings, while remaining flexible enough to support the evolving NJDOT construction phasing plans.

Partnering-In-Action

There have been many opportunities for the NJDOT and USACE to collaborate on their respective efforts in common work areas, with more efforts planned. The remainder of this paper focuses on one example; realignment and replacement of a 100 m long portion of the now buried Lodi Brook storm water drainage culvert, which runs under the parking lot of an active commercial business (i.e., the Bank of New York property, located at 160/174 Essex Street in Lodi, NJ).

As part of their planned infrastructure upgrades to support larger roadways, NJDOT planned to replace the existing 1.829 m by 1.118 m ECMP culvert with a 2.286 m by 1.150 m pre-cast concrete box culvert. The existing ECMP culvert was designed to meet the drainage needs for

the immediate region, as they existed in the late 1960s. The replacement pre-cast culvert would increase flow capacity by approximately 40 percent.

Placement of the original ECMP culvert in sections of Lodi Brook that had historically been a surface stream facilitated much of the commercial development in the area. Unfortunately, at that time it was not understood that Lodi Brook carried contamination from the former Maywood Chemical Works property, the source of the radiological contamination of the present-day FMSS. In the intervening period, the U.S. federal government designated the FMSS as a priority hazardous waste cleanup site, and local stakeholders like NJDOT became aware of the extent of contaminant impact.

USACE remediation and excavation sequencing required modification to account for preparation of the culvert sub grade and subsequent delivery of the culvert sections. This all tied into the planning for purchase, delivery, and curing time for concrete culvert sections, and to availability of storage space and overall equipment flow for onsite resources. It became readily apparent through meetings that considerable schedule time and cost savings would be realized by having one integrated remedial and construction effort, executed by a single general contractor and their subcontractors. These meetings were documented to facilitate review and acceptance of commitments made between NJDOT and USACE.

By the end of the planning period, it was agreed that the concrete culvert would be purchased by the NJDOT, consistent with established plans. However, in order to avoid two separate operations, both of which would likely require some level of radiation safety control, the most logical approach was for USACE to conduct all of the physical work (remediation plus placement of the culvert) in one coordinated operation. This way, costs associated with multiple mobilizations of both NJDOT and USACE contractors were avoided. Therefore, USACE and their contractor, Shaw Environmental, executed the work scope in one continuous effort. NJDOT purchased the concrete culvert and supported the installation by reviewing submittals and performing quality assurance inspections during the installation. One important part of the coordination was a Right-of-Entry (ROE) property access agreement executed between USACE and BNY, the property owner. The fact that a property access agreement was already established avoided subsequent access negotiations between the property owner and NJDOT.

Property Owner Involvement

BNY activities at 160/174 Essex Street were a full-time 24-hour/7-day commercial operation. Maintaining access for BNY employees and overall operational logistics were some of their initial concerns. This property was one of three parcels owned by BNY in the immediate vicinity, all of which required remediation. The BNY operation had become a round-the-clock operation following the events of September 11, 2001. Concentrated planning between USACE and BNY was required for provision of access, parking, lighting, and maintaining traffic flow for employees and deliveries, as well as visitors. To ensure the building's operational and vital security needs were met, drainage, sewer, electrical and communication lines within the areal extent of the remediation had to be maintained.

Through numerous meetings and employee briefings, USACE worked closely with BNY to provide important information to their employees. Employee briefings included a history of the FMSS (i.e., the origin of the contamination), a discussion of the radiological hazards present and employee exposure potential, a discussion of the contamination control and monitoring strategies employed by USACE, a general work sequence schedule, and an open question and comment period. The combination of employee briefings and subsequent regular communications between USACE and BNY management created an atmosphere of understanding and trust that helped foster a positive relationship that continues to this day.

Public Involvement and Safety

Local, county, state, and federal government officials and the public were kept informed throughout the project through the combined efforts of a staffed Public Information Center office located in Maywood, NJ and a dedicated team of USACE and contractor community relations representatives. Community relations efforts were required from the planning through execution phases to ensure that USACE activities are understood, and accepted by the public. An active community relations effort is especially important when working in densely populated areas such as the FMSS vicinity.

A project of this nature and scope could not be undertaken without careful planning for interaction with the public. In the case of 160/174 Essex Street, the high volume of vehicle and pedestrian traffic along street and sidewalk areas bordering the property needed the full attention of the coordinating parties. Traffic routing and pedestrian protections, as well as periodic police details for traffic control, were planned for during the coordination and design phases of the project. These steps proved to be effective and provided the necessary protection at the point of pedestrian and traffic interface.

As an example, one of the details associated with the combined remediation and culvert installation scope was a public bus shelter that had to be temporarily relocated, maintained, and then restored along the sidewalk bordering Essex Street. The shelter was located almost directly over the top of the drainage culvert. Again, disruptions to commuters had to be planned for and accommodated in the staging, with warning signage and verbal communication used to notify bus stop users of construction activities that could potentially affect them.

Design and Execution

Final design was a defined scope of work, synchronized to complete USACE remediation of the 160/174 Essex Street property while supporting the NJDOT objective of installing an improved drainage culvert system across it. Collaboration among the property owner, commuters, government officials, the public and other stakeholders combined to get the work done and save taxpayer resources.

Efforts commenced with initial remediation along the by-pass pumping corridor to maintain flow capabilities through the site. Alternate clean connections and piping were established to provide a continuous path for storm water around and along a temporary drainage culvert while remediation and box culvert operations got underway. Once by-pass flows were established, the

remediation was conducted. The site was excavated (Figure 2) in stages utilizing the site-approved work plans and contract specifications until the full alignment of the culvert was remediated to clean-up criteria goals.



Fig. 2. Removal of historic ECMP sections at the 160/174 Essex Street property.

Final sub-grade excavation was conducted at this point in order to create the proper elevation for placement of the compacted stone bedding, in preparation for placement of the concrete box culvert sections (Figure 3).



Fig. 3. Installation of new pre-cast concrete culvert sections at the 160/174 Essex Street property.

Each section required placement of a concrete slab, post tensioning within set tolerances, and continued checks for alignment and grade. At the point of tie-in, a cast-in-place section was created to allow for stop-log and re-direction of drainage capabilities. The structures were placed and flows were fully re-established to typical volumes within the new culvert system. The increased flow capacities currently in place can be used to great advantage during future roadway construction, as well as for their intended purpose of general drainage after the improvements are complete.

Restoration of the BNY property, including paving, landscaping, walkways, lighting and concrete work, was completed as part of a seamless effort, thus saving time and money. The planning for this work by a single contractor helped return the site, adjacent roads, and commuter facilities to their previous uses in a more timely fashion, to the benefit of BNY and the public. Previous vehicle and pedestrian traffic patterns and parking areas were restored, allowing a return to normal flows.

SUMMARY AND CONCLUSION

The involvement of all stakeholders from inception to finish created a model for government entities working together with stakeholders to execute independent work in a manner that

reduced overall cost to the public and minimized impact to the people and businesses that operate in the general vicinity. Simple modifications to civil designs and work sequences eliminated the need for multiple mobilizations to the property. These modifications would not have been foreseen had there not been regular and effective communication between NJDOT and USACE.

The example described in this paper is not just history but also a part of a continuing story. The remainder of the NJDOT roadway and infrastructure improvements around the FMSS has recently been funded. Work will continue under an even more aggressive schedule. Removal of radiological contamination that remains in other areas where NJDOT improvements are planned is currently being coordinated with the objective of additional cost and schedule savings.