



EDi No. 244



21. PANTEX Plant Well 15-16A Water Valve & Pipeline Replacement

22. Year Completed Professional Service:

Year Completed (if applicable) Construction:

PO Box 30030 Amarillo, TX 79120

n/a

2007

Contract Role:  Prime Contractor  Subcontractor

CAGE Code: ID1U3

DUNS Number: 61.680.5073

23 a. Project Owner/Customer:

23 b. Point of Contact Name:

23 c. POC Contact Info.:

BWXT PANTEX, LLC  
P.O. Box 30020  
Amarillo, TX 79120-0020

Amber D. Bullard  
Contract Specialist

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Key Personnel:

Chris Edgmon/Project Manager	EDi, Albuquerque Office	cedgmon@edi-nm.com	505.341.3578
Dave Luna/ Site Supervisor	EDi, Albuquerque Office	dluna@edi-nm.com	505.341.3578

24. (Include scope, size, and cost) Brief Description of Project and Relevance to this Contract:

Awarded Price: \$190,000.00

Final/Projected Cost: \$255,284.00

Award Date: 05.29.2007

Contract No.: 00055358

Period of Performance: 05.30.2007 – 11.15.2007

Final or Projected Schedule: 09.30.2007

Contract Type:  Firm Fixed Price  Cost Reimbursement  Time and Materials  Cost Plus Fixed Fee  
 Cost Plus Award Fee  Performance Based

Type of Work Performed: 237110, Water & Sewer Line and Related Structures Construction

% of Work Self Performed: 70%

% of Work as Subcontractor: 30%

Notes: An additional \$134,716.00 was added to scope of work and the project was completed ahead of schedule.

Technical Representative (if applicable):

Tech Rep. Agency & Address:

Tech Rep. Contact Info.:

Marlin Conner

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Background

The Pantex Plant is a government-owned, contractor-operated facility managed and operated by B&W Pantex for the U.S. Department of Energy (DOE). The Pantex Plant is located in the Texas Panhandle in Carson County. It is approximately 17 miles northeast of Amarillo. The Plant site is bounded on the north by Texas Farm-to-Market Road (FM) 293, on the east by FM 2373, and on the west by FM 683. To the south, DOE-owned property on the site extends to within 1.6 km (1 mi) of U.S. Highway 60. The installation consists of 9,100 acres, of which about 2,000 acres is used for industrial purposes, with the remaining land use for security purposes.

The objective of this project was to provide additional water supply for use at the Pantex Plant by utilizing existing water wells located on site. The facility is responsible for maintaining the safety, security, and reliability of the nation’s nuclear weapons stockpile. Work preformed to support this mission includes life extension programs, weapons dismantlement, testing and fabrication of high explosive components, and interim storage and surveillance of plutonium pits.

Scope of Work

EDi was teamed for this task with AMEC Earth and Environmental, Inc. (AMEC). The scope of this project included the design and installation of a conveyance line to connect existing water Well 15-16A (15-16) to the Pantex Plant Water Distribution system

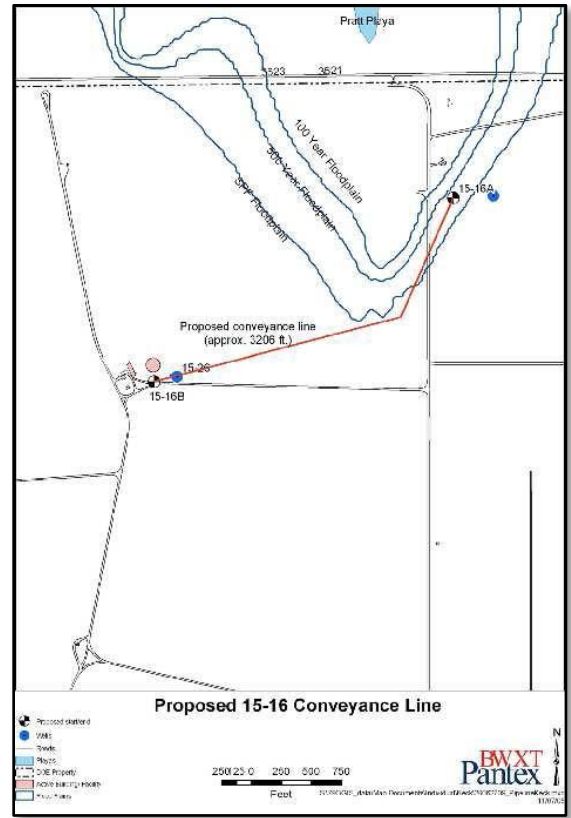
**Pantex Plant Well 15-16A Water Valve & Pipeline Replacement** (continued)

(WDS) near Well 15-26 . Well 15-16A was drilled and completed in 2004, but was not connected to the WDS. The discharge line from well 15-16A is tied into the old collection line from well 15-16 west of the new well at the cathodic protection station, but this old collection line has been cut and capped prior to the collection line from well 15-17. This existing line was dismantled at the cathodic protection station just West of well 15-16A, and rerouted from this point, to the tie-in location Southwest of well 15-26. The objective of this project was to provide additional water supply for use at Pantex by using Well 15-16A.

The scope of this project included the design and installation of a conveyance line to connect existing water (from Well 15-16A) to the Pantex Plant Water Distribution System (WDS). Well 15-16A was drilled and completed in 2004, but was not connected to the WDS. As the Plant’s need for water increased, well 15-16A became another source of additional supply. The initial discharge line from well 15-16A was tied into an old collection line at the cathodic protection station, but was cut and capped. The scope also included the dismantlement of this old line.

Approximately 3,200 feet of SDR 11 municipal grade HDPE (high-density polyethylene) with a pressure rating of 160 psi was installed under this Firm Fixed Priced Contract. All underground water pipe was buried a minimum of 36 inches, which is 12 inches below the 24-inch frost line.

All project specific work plans, health and safety plans, and other related project documents were prepared in accordance with the Scope of Work, Pantex Plant specification, and the various requirements of EPA and OSHA.



*Well 15-16A conveyance line layout and location.*

The technical scope for this task was divided into four (4) task areas. The task areas are outlined below:

- Task 1 – Project Planning;
- Task 2 – Project Design;
- Task 3 – Field Implementation; and
- Task 4 –Reporting and Project Closeout.

**Task 1 – Project Planning**

All project specific plans were prepared in accordance with the SOW and Specifications 01300 submittals. The planning phase generally fell into the following major categories:

- Planning documents as specified by the contract specifications requiring BWXT review and approval;
- Permits and / or notifications to regulatory agencies requiring BWXT review and approval prior to submission to the regulatory agencies;
- Administrative submissions to BWXT providing required information needed for site security, site access and site control;
- Mobilization, badging, and site specific training of project staff;
- Procurement, mobilization and inspection of equipment and materials;
- Procurement, mobilization, badging and site specific training of subcontractors; and
- BWXT specific work permits and request are required prior to and during actual physical work on the site.

Submittals, such as planning documents and agencies notifications, requiring BWXT review and approval were prepared by technical resources from the AMEC Office located in Albuquerque, New Mexico, with support from the EDi Project Manager, also located in Albuquerque.

Administrative submittals, such as list of employees, subcontractors, vehicles, equipment, notifications of arrival dates and times for vendors and subcontractors, and personnel, training records, and other administrative submittals were coordinated and managed through EDi’s Albuquerque Office.

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The EDi Team self performed a “Readiness Evaluation,” to evaluate readiness to implement the scope of work in the field. The EDi Site Superintendent coordinated with BWXT safety, security, waste management, engineering and fire departments to obtain all the BWXT necessary permits and / or requests to begin field work. These permits included but were not limited to:

- Safe Work Permit
- Excavation Permit
- Hot Work Permit

These permits and/or requests were issued upon NTP. Once received, EDi worked closely with the various departments within BWXT to obtain the required permits and approvals to begin field activities.

**Task 2 – Project Design**

The EDi Team Project Manager and Engineer performed a site visit and collected information necessary to begin planning and design tasks. A Texas licensed surveyor was mobilized to survey the pipeline route and offset points. This information was used as a basis for development of site plan drawings as part of the design phase. The offset points were used during construction to control and monitor construction progress.

The EDi Team developed design documentation and drawings per applicable BWXT Pantex specifications, codes and standards, including:

- Division Specifications
- Texas Administrative Code (TAC) Title 30 §290.41
- American Water Works Association
- Uniform Plumbing Code
- IAPMO, Uniform Plumbing Code
- Texas Commission of Environmental Quality (TCEQ)

The design also incorporated the applicable BWXT Pantex Division Specifications stipulated in Section 2.1 of the RFP Scope of Work. Division 1 Specifications and relevant Division 2 Specifications (e.g.. Specification 02510, Water Distribution, and Section 02080, Piped Utilities – Basic Materials and Methods and 02300 Earthwork) were followed. Engineering drawings were prepared in compliance with the BWXT Pantex’s Engineering Drawing Development Manual, MNL-293006. The design and engineering drawings were supported by site survey, field verification, and calculations. The following drawings were used for this project:

- Title Sheet (with Project Area Location and Drawing Index)
- General Notes, Legend and Abbreviations
- Site Plan (overall)
- Site Plan – East Connection
- Site Plan – West Connection
- Utilities Plan
- Miscellaneous Details and Sections – Sheet 1
- Miscellaneous Details and Sections – Sheet 2
- Cathodic Protection Details



*Fused HDPE Pipe*



*HDPE during placement in the excavation*



*HDPE in trench. Backfilling and compaction in progress.*

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The site plan was developed based on survey data generated by a registered State of Texas land surveyor during the initial design activities. The Utilities Plan was generated based on BWXT Pantex-provided electronic AutoCAD files. Three sheets of details were considered necessary to reflect the installation of each tie-in point, flush valve installation, cathodic protection test stations, and road crossing.

**Task 3- Field Implementation**

This task included mobilization of the necessary labor, equipment, and materials to perform the construction work and engineering evaluations outlined in the scope of work and documented in the technical plans and specifications. This task also included the activities subsequent to physical construction, final clean up of the work areas, general site restoration, and reseeded in select areas.

The EDi Team attended a project kickoff meeting to convey project understanding and received information and feedback from BWXT Pantex regarding implementation, safety, quality, and security requirements. The EDi Team installed the new pipeline, which consisted of approximately 3,100 linear feet of buried, 8-inch SDR 11 municipal grade high density polyethylene (HDPE) pipeline with a pressure rating of 160 pounds per square inch (psi). Prior to installation, the EDi Team obtained a valid excavation permit and conducted potholing prior to excavation to locate potential utilities that were located within the excavation boundary of the new trench. The pipe was inspected immediately upon delivery and each 40-foot section of pipe was visually inspected prior to placement in the excavation. The pipeline was installed a minimum of 36-inches below grade from the 15-16A well house to the Pantex Plant WDS located near Well 15-26. Excavations were performed in compliance with 29 CFR 1926, Occupational Safety and Health Administration Standards for Excavations, and the BWXT Pantex Division Specifications.



*Trench during backfill operations. Utility marking tape visible in foreground.*

The tie-in point to the existing water supply distribution system was below grade, downstream of an existing 8-inch valve.

The pipeline trench was excavated with minimum dimensions of 2.5 feet wide and 4 feet deep. During installation, the pipeline was placed on approximately 4 inches of bedding sand to provide uniform, firm support for the newly installed pipeline. Sand was placed through the haunching area of the pipe and initial backfill zone, to 12-inches above the newly installed pipeline. The pipeline construction included the installation of trace wire to facilitate future detection and pipe location. The trace wire used was #12 AWG (minimum) XHHW, and was installed the entire length of the excavation. The trace wire was placed approximately 12 inches above the pipeline and was routed to the surface and terminated at the utility line marker posts. A utility trace station was constructed at each utility line marker, and the trace station boxes were labeled to identify the utility. In addition to the trace wire, metallic marking tape approved for burial was installed in the utility trench at approximately 12 inches below the finished grade. Marker tape was color coded blue, in accordance with American Public Works Association standards and with BWXT Specification Section 01565. A visual inspection of the pipeline was conducted prior to backfilling. A minimum of 3 feet of clean fill was installed over the pipeline. Pipe bedding consisted of clean sand, free of vegetative matter. Material with less than 5% fines (200 mesh) and the largest grain size at 100% passing 0.25 inch diameter was utilized. Fill material over the pipe bedding consisted of soils excavated for the pipeline trench.



*Trench during backfill and compaction activities.*

The EDi Team proposed the use of mechanical joint restraints to be utilized to account for thrust. In addition to installing the mechanical restraints, cast-in-place concrete thrust blocks were utilized at the request of BWXT. Gate valves were installed for general shut off, flow direction and diversion. Two gate valves were proposed for construction and three (3) were installed during field implementation. The third valve was added at the request of BWXT Pantex to allow for the ability to isolate the flushing hydrant from the 15-16A conveyance line. One valve was installed at each of the two (2) tie-in points, and the flush station valve was integral to the flushing hydrant. Two air release valves were installed at each tie-in location. The newly installed valves complied with the appropriate guidance in AWWA Manual M44, Distribution Valves: Selection, Installation,

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Field Testing, and Maintenance, AWWA Standard C500 Series, as well as, BWXT Pantex Specification 02510, Water Distribution.

Each installed valve, the ductile iron tie-in fittings, and the flushing hydrant were cathodically protected utilizing 32-pound magnesium, sacrificial anodes. Cathodic protection test stations were also installed at the locations identified above. A photographic log of the pipeline installation activities is provided as Appendix A of this report.

A foam pig was utilized to flush and clean the newly installed pipeline. No debris was observed during the pigging operations. Cloudy water with suspended solids was observed briefly in the water when the pig exited the pipe, but it cleared up immediately (within 1 – 2 seconds). The pig was inspected and found to be in good condition with no visible damage.

During the flushing operations, a stopwatch was utilized. 15 minutes and 50 seconds elapsed from the time the pig was launched at the East end of the pipeline until it was recovered at the West end of the pipeline connection. The rate of flow was calculated at 511GPM, equaling a flushing velocity of 3.26 ft/s. This flow rate met the criteria set forth in AWWA Standard C651-99, Section 4.4.3.2 “Preliminary Flushing” requiring a minimum flushing velocity of 2.5 ft/s. Chlorination was accomplished by injecting a Sodium Hypochlorite 10% solution at the source tie in, as outlined in AWWA Standard C651-99, Section 4.4.3.3. The chlorine injection was regulated at a precalibrated flow rate, and approximately 14 gallons of Sodium Hypochlorite solution was dispensed during this operation. Chlorine content measurements were taken using a chlorine field test kit, which indicated a concentration of 180 PPM. After a 24 hour period, the chlorinated water was flushed from the pipeline and neutralized with granular sodium metabisulfite. Flushing operations and field testing continued until the chlorine residual was non-detectable.



*Project area during final site grading and restoration*

Pipe and hydrostatic pressure tests were conducted on the new pipeline and valves in accordance with the BWXT approved procedure (Pipeline Disinfection Procedure, Submittal No. 015). The Pipeline Disinfection Procedure is provided as Appendix B. The pipeline was tested for leakage upon completion of installation in accordance with the BWXT approved procedure (Pipeline Installation and Flushing, Submittal No. 011). Leakage did not exceed rates specified within the approved procedure. The table below provides the results of the hydrostatic test conducted on September 19 and 20, 2007. The Pipeline Installation and Flushing Procedure are provided as Appendix C.

Water samples from water contained within the newly installed pipeline were collected and analyzed for biological constituents by BWXT Pantex upon completion of the disinfection.

**Task 4 – Reporting and Project Closeout**

Field activities were completed and final acceptance of the pipeline by BWXT Pantex was obtained on September 23, 2007.

**25. Firms/Subcontractors involved with this Project:**

	(1) Firm Name	(2) City and State	(3) Role
a.	AMEC Earth & Environmental Vickie Maranville, Waste Manager email: vickie.maranville@amec.com	8519 Jefferson, NE Albuquerque, NM 87113 Phone: 505.821.1801   Fax: 505.821.7371	Teaming Partner
b.	AEROTEK Staffing Services Sean Ziegler	6700 Jefferson , NE   Building E Albuquerque, NM 87109 Phone: 505.342.5014 • Fax: 505.342.5052	Project Staffing