



**TESORO LOGISTICS OPERATIONS, LLC.  
HIGH PLAINS PIPELINE SYSTEM – ND**

**BEULAH BASIN  
RAIL LOADING 10" PIPELINE  
PROJECT**

**SCOPE**



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**PROJECT SCOPE**

Tesoro Logistic Operations, LLC. is bidding construction of the Beulah Basin Rail Loading 10" Pipeline located near Beulah, ND. The CONTRACTOR will submit a detailed construction schedule with the Uniform Bid Sheets. The schedules will reflect all required activities from mobilization through finish, clean up and demobilization along with anticipated duration.

Construction will consist of building an approximately 4.1 mile 10" API 5L X52 .250 wall crude oil pipeline. The new pipeline will originate at the launcher valve off Tesoro Logistics 16" main line @ ZAP Block Valve (MP 55.78 and tie-in to a receiver valve at Tesoro Logistics Beulah Basin Rail Loading Delivery Facility located near Beulah, ND.

The work will be completed in strict accordance with these CONTRACT DOCUMENTS, the U.S. Department of Transportation Hazardous Materials Regulations, and Transportation of Liquids by Pipeline, Title 49, Part 195.

The CONTRACTOR will base his bid, schedule and size of work force on meeting the dates set forth in this section. Overtime work by the CONTRACTOR, if necessary to comply with such dates will not be considered for any extra compensation due the CONTRACTOR by the TESORO.

Construction scheduled dates are as follows:

| Construction Start | In-Service Date    | Completion Date    |
|--------------------|--------------------|--------------------|
| <b>JUNE 2014</b>   | <b>AUGUST 2014</b> | <b>AUGUST 2014</b> |

Construction start date will mean actual CONTRACTOR operation in the field. In service date will mean acceptance by TESORO of the final tie-ins and/or the hydrostatic test successfully completed. Completion date will mean the acceptance by the TESORO of final clean up.

The CONTRACTOR will submit a detailed construction schedule with the Uniform Bid Sheets. The schedules will reflect all required activities from mobilization through finish clean up and demobilization along with anticipated duration.

**2.0 STANDARD CONDITIONS**

**2.1 GENERAL**

The scope of work requires all work being in compliance with all federal, state, and local regulations. The work will also be performed in accordance with industry and TESORO codes including standards, specifications, guidelines, rules, and policies.

Personnel working on the site will be required to wear personal protective equipment including FRC, hard hats and safety glasses. A fire/safety watch required during any hot work performed at the pump stations.

New piping 2" NPS and larger will require hydro test ANSI 600 # pressure (between 1850 and 1900 Psig) for 8 hours underground or 4 hours above ground as required by DOT. All testing instrumentation and equipment must be certified, calibrated, and current. All tests will be documented by the Contractor with signed charts, photos and/or sketches.

All welds require 100% radiography. All welders will qualify to API 1104 welding procedure. All radiography data and welder certifications and a project weld map will be provided to TESORO.

Concrete will have a minimum compressive strength of 4,000 psi unless stated otherwise. All cement will be type V per ASTM C150. Reinforcing steel for the pipe supports will conform to ASTM A615 Grade 60. The rebar will be covered by at least 2" of concrete. The cement grout for the pipe support plates will be Five Star non-shrink grout or equal meeting ASTM C-1107 Grade C requirements.

Electrical work will be per NEC and UFC requirements.

MSDS sheets for the products will be available from Tesoro.

Permit conditions to be adhered to as part of the project and work.

### **3.0 SUPERVISORY CONSTRUCTION PERSONNEL**

The CONTRACTOR will provide with the Uniform Bid Sheets the names of the key supervisory personnel, down to the foreman level, that would be utilized if awarded the work. The CONTRACTOR is encouraged to include a short work related experience summary for each of the key supervisory personnel.

### **PROPOSED SUBCONTRACTORS**

The CONTRACTOR will name all subcontractors he proposes to use in the event that he is awarded the work. The utilization of any proposed subcontractors will be subject to TESORO approval.

### **5.0 HEALTH & SAFETY (H&S) PLAN**

#### **5.1 GENERAL**

The CONTRACTOR will provide TESORO with a copy of its health and safety plan. The plan will address all state and federal standards for injury and illness prevention and comply with the requirements of 29 CFR 1910.120 Hazardous Waste Operations and Emergency Response.

#### **5.2 HEALTH AND SAFETY SUMMARIES**

The CONTRACTOR will provide the following information with his bid:

**5.2.1** Occupational illness and injury data.

**5.2.2** This information will be provided for that entity within your TESORO that will perform the actual work.

**5.3 ENVIRONMENTAL NOTICES/CONDITIONS**

The CONTRACTOR is responsible for the health and safety of its employees and subcontractors. The CONTRACTOR will assure regulatory compliance with all state and federal regulations for employee health and safety, and environmental pollution control. The TESORO will monitor the CONTRACTOR'S activities in these areas and provide technical consultation only.

**6.0 SCOPE OF WORK - MECHANICAL CONTRACTOR**

**6.1 GENERAL**

**6.1.1** Mobilize to job site.

**6.1.2** Documentation of facility before construction with video cameras and color photographs.

**6.1.3** Welder(s) to be tested to the TESORO procedure.

**6.1.4** Notify Underground Alert at least 48 hours preceding any excavation. Prior to the excavation CONTRACTOR will "pot-hole" for the visual confirmation of underground utilities and pipelines.

**6.1.5** Access, clear and grade right-of-way and furnish and install all temporary roads, fences, gates and any other facilities and traffic delineation to enable CONTRACTOR to access work.

**6.1.6** Prefab piping spools to minimized down time to operations. Field measure existing facility to verify dimensions prior to Prefab.

**6.1.7** Install all temporary roads, fences, gates and any other facilities and traffic delineation to enable CONTRACTOR to access work sites.

**6.1.8** The temporary workspaces are defined on the drawings.

**6.1.9** Includes the requirements stated in Permits / Restrictions Section.

**6.1.10** Prepare hydrostatic test plan for all station piping modifications and submit to COMPANY for approval, run air swab and cleaning fill and dispose of test water.

**6.1.11** CONTRACTOR is responsible making all necessary piping connections, or transportation costs required to hydrotest piping.

- 6.1.12 The CONTRACTOR shall furnish the permit (if applicable) for the disposal of the water for the hydrostatic test. CONTRACTOR is responsible for any temporary piping or transportation necessary to return the water to the disposal site.
  - 6.1.13 CONTRACTOR is responsible for hauling water for all other operations, and arranging for additional water acquisition if necessary.
  - 6.1.14 After all of the pipe has been installed, the pipeline shall be cleaned, hydrostatically tested and dried with foam pigs to remove all free condensation. Additional cleaning and/or drying will be at the direction of the COMPANY.
  - 6.1.15 CONTRACTOR will assist COMPANY with startup of piping & new equipment.
  - 6.1.16 CONTRACTOR shall minimize the opportunities for runoff of water and sediments. Specific measures to prevent the runoff of the water and sediments will include the installation of silt fences and hay bales.
  - 6.1.17 Restoring of the right-of-way in accordance to the requirements stated in the Permits / Restrictions Section and per the COMPANY's direction.
  - 6.1.18 The pipeline & station ROW and temporary workspaces are defined on the drawings.
  - 6.1.19 All above ground pipe painted to TESORO specifications.
  - 6.1.20 Continuous clean up of ROW and job sites / stations to the satisfaction of TESORO and in accordance with the Permit / Restriction Section; make all necessary permanent repairs to gates and fences.
  - 6.1.21 Return surplus materials to the Watford City Pipeline Office. Surplus materials shall be cleaned and all materials re-racked or stacked on pallets as directed by the COMPANY. All line pipe pups longer than six (6) feet shall be re-beveled and welded into nominal forty (40) foot lengths at CONTRACTOR'S expense.
  - 6.1.22 CONTRACTOR shall provide an As Built of all piping installations and station modifications.
  - 6.1.23 Demobilize from job site.
- 6.2 BEULAH BASIN RAIL LOADING 10" PIPELINE**
- 6.2.1 Construction of a new 10" API 5L X52 crude oil pipeline approximately 4.1 miles .

- 6.2.2 Construction will include installing the new 10" pipeline under railroad tracks at the Beulah Rail Loading facility using an existing 16" casing approximately 106' long.
- 6.2.3 Construction will include installing the new 10" pipeline using an existing casing for road crossing.
- 6.2.4 Install CP Stations per drawings & specifications.
- 6.2.5 Connect new 10" pipeline with Tesoro's launcher valve @ ZAP Block Valve (MP 55.78). (Per detail drawings and specifications)
- 6.2.6 Connect new 10" pipeline with Tesoro's receiver valve @ Beulah Basin Meter Facility. (Per detail drawings and specifications)
- 6.2.7 Hydrotest new 10" crude oil pipeline from ZAP tie-in to Beulah Basin Rail Loading facility per specifications. Requires an 8 hour hydrotest to meet DOT requirements.
- 6.2.8 Pipeline Construction include the following:
  - Trench per project & Permit requirements
  - String pipe
  - Weld pipe
  - Field coat girth welds joints & misc fittings per specifications.
  - Jeep pipe coating
  - Padding & backfill per project & permit requirements
  - Run a Gauge Plate
  - Hydrotest
  - Run foam drying swab pigs
- 6.2.9 Pipeline Contractor will restore ROW to project & permit requirements.

**7.0 WORK - BY OTHERS**

**7.1 TESORO FURNISHED**

- 7.1.1 Construction drawings for station piping, pump, electrical, instrumentation and foundations.
- 7.1.2 The TESORO will have piping, pumps, motors & other materials to be furnished by TESORO stockpiled at Dunn Center or other designated storage sites and will make them available to the CONTRACTOR as described in the Materials Section. The CONTRACTOR will perform all other work required for completion of the construction and testing of the station piping modifications.
- 7.1.3 The TESORO will contract with a third party to perform Radiographic inspection of all new welds. The TESORO requires 100 percent radiographic inspection of all new welds.



- 7.1.4 Radiographic interpretation by third party is subject to review by the TESORO. Film will be reviewed within 24 hours and CONTRACTOR notified as to any change in interpretation.

**8.0 TESTING REQUIRED**

**8.1 MECHANICAL**

- 8.1.1 Piping hydrostatically tested by contractor. Tesoro will witness the hydro test.
- 8.1.2 Tesoro will provide inspection of welds. Contractor will provide adequate notice so that Tesoro can schedule x-rays.



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PROJECT**

**CONSTRUCTION SPECIFICATIONS**

**PIPELINE CONSTRUCTION SPECIFICATIONS**

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**1.0 RIGHTS-OF-WAY AND PERMITS; DAMAGE SETTLEMENTS SEGMENT PROGRESS**

**1.1 RIGHTS-OF-WAY AND PERMITS**

**1.1.1 DEFINITIONS**

**MAINTAINED RIGHT-OF-WAY:** The area within TESORO's right-of-way easements, including the pipeline route and certain access routes, which are maintained by TESORO on an ongoing basis.

**CONSTRUCTION RIGHT-OF-WAY:** The maintained right-of-way plus any supplemental area along the pipeline route arranged for by TESORO on a temporary basis for construction purposes.

**WORK AREA:** The construction ROW plus any area outside the construction right-of-way which has been previously disturbed by construction, access roads, staging, storage, etc., or has had side-cast material placed on it.

**1.1.2 By TESORO**

TESORO will obtain rights-of-way and access easements for the routing, operation and maintenance of the line within both the maintained right-of-way and the construction right-of-way. TESORO will obtain all permits necessary for construction that must be obtained, as required by governmental authorities.

TESORO will furnish a summary of right-of-way and permit conditions affecting construction of the pipeline and appurtenant facilities as included in Permits / Restrictions / Right-Of-Way / Easements Section. CONTRACTOR shall comply with these conditions unless specifically amended by TESORO in writing.

Drawings and reference documents pertinent to rights-of-way, easements, land, and permits are included in Permits / Restrictions / Right-Of-Way / Easements Section as available, and will be provided to CONTRACTOR as obtained by TESORO during the course of work.

**1.1.3 By CONTRACTOR**

Any additional permits required for actual construction, including those which by regulation must be obtained by the CONTRACTOR actually performing the work, shall be obtained and paid for by CONTRACTOR. CONTRACTOR shall report to TESORO in writing

identifying necessary permits and shall transmit copies of such permits to TESORO when received.

CONTRACTOR shall identify, obtain, and pay for access arrangements to cross property, traverse private roads, pass through gates to reach the construction right-of-way or provide additional work space outside the construction right -of-way.

TESORO shall approve these arrangements prior to the CONTRACTOR paying for these access agreements.

CONTRACTOR shall obtain and pay for use of private property for staging or storage areas which is not within the construction right-of-way unless furnished by TESORO per the Materials Section.

CONTRACTOR shall report to TESORO in writing describing these arrangements for crossing or use of property, and shall submit releases or waivers by the affected landTESOROs or tenants upon completion of construction and cleanup. TESORO will not release contract retention until evidence of landTESORO acceptance is delivered by CONTRACTOR to TESORO.

CONTRACTOR shall arrange and pay for any additional service required by authorities or TESOROs at crossings of railroads, streets, roads, foreign pipelines, canals or streams, including permits, easements, or necessary permission for these crossings. This additional service includes items arising from inspection, operation, or safety requirements either during or after completion of construction work, or necessary subsequent maintenance or repair work either impossible to accomplish at the time of construction or resulting from incomplete or inadequate construction.

CONTRACTOR shall inform TESORO in writing of all such arrangements made with authorities and TESOROs.

**1.1.4 Authority of Government Agency to Direct Work**

Federal, State, City, and/or County Agency representatives have no authority to directly alter CONTRACTOR'S work of construction of the pipeline other than for safety or regulatory requirements. If an agency representative attempts to alter or direct CONTRACTOR'S work, CONTRACTOR shall immediately contact TESORO. CONTRACTOR will resolve any issues with the agency and provide TESORO with Proof of resolution.

**1.2 DAMAGE SETTLEMENTS WITH PROPERTY TESOROS AND TENANTS**

**1.2.1 Paid by TESORO**

Prior to construction, TESORO will settle directly with property TESOROs and tenants for damages necessary for construction within the construction right-of-way only.

**1.2.2 Paid by CONTRACTOR**

CONTRACTOR shall be solely responsible for settling claims arising from damage to public or private property caused by CONTRACTOR other than damages settled by TESORO, if any, as stated in Section 1.2.1 above, to the satisfaction of TESOROs, tenants, and TESORO. CONTRACTOR shall promptly report to TESORO such claims as they arise.

CONTRACTOR shall negotiate directly with land TESOROs and tenants, and pay settlements for damages during construction for which he is responsible. CONTRACTOR is not entitled to any additional compensation from TESORO as a result of these settlements.

In the event CONTRACTOR is unable to negotiate a settlement with the land TESORO or tenant, TESORO will negotiate a settlement and deduct payments from CONTRACTOR'S compensation.

**1.3 GOOD WILL**

The "good will" of property TESOROs and tenants is a valuable asset to TESORO. CONTRACTOR shall make every effort to make a lasting positive impression on property TESOROs and tenants. CONTRACTOR shall also cooperate wholeheartedly with TESORO in all public relations matters.

**1.4 SEGMENT PROGRESS**

Continuous Progress of Segment Activities

Except as otherwise approved by TESORO, CONTRACTOR shall perform the work as a continuous segment operation, completing all activities affecting land use (ditching or stringing through ground restoration). TESORO may require CONTRACTOR to alter his rate of progress on any portion of work or to stop the commencement of work on new property until cleanup has been entirely completed at all places where any activity affecting land use began more than 10 days previously. CONTRACTOR shall not be entitled to reimbursement for unproductive time resulting from enforcement of the provisions of this Section.

Distance Between Construction Crews

During construction, CONTRACTOR shall not allow the distance between the crews to exceed the distance governed by the regulatory agencies and or as stated in the Permits / Restrictions / Right-Of-Way / Easements Section:

If a temporary interruption of work is required during construction, the filler/cap pass welders shall complete all welds made by the root/hot pass welders before leaving the job.

All welds started shall be completed during the same day.

## 2.0 MATERIALS

### 2.1 MATERIALS FURNISHED BY TESORO

Quantities of each material item, anticipated delivery dates, receiving points or TESORO-maintained warehouse locations are listed in the Materials Section. TESORO will provide only those materials as specifically listed in the Materials Section or designated as "By TESORO" on project drawings.

Storage sites provided or arranged for by TESORO are identified in the Materials Section.

Items to be off-loaded by CONTRACTOR from carriers' trucks or railcars arranged for by TESORO are identified in the Materials Section.

### 2.2 MATERIALS MANAGEMENT

#### 2.2.1 General

CONTRACTOR shall handle materials as required to perform the work. The term "handle" shall mean to collect, receive, tally, load, transport, and unload, store, uncrate, and warehouse. CONTRACTOR shall handle all materials in conformance to applicable codes, standards and specifications listed in the Exhibits Section and manufacturers' specifications and instructions.

#### 2.2.2 Responsibility for Materials

CONTRACTOR shall be responsible for proper control and care of materials furnished by TESORO and shall perform necessary warehouse administrative duties. CONTRACTOR shall tally material receipts, report shortages and damages, and inventory surplus material remaining on completion of construction. All TESORO-furnished material withdrawn by CONTRACTOR but not permanently installed, shall be returned to TESORO, or be replaced or paid for by CONTRACTOR.

CONTRACTOR shall take necessary steps such as painting, greasing, installation of rust preventative oil, or covering to protect material from mechanical damage or corrosion. Instruments, control panels, and electrical equipment sensitive to conditions of humidity and temperature shall be suitably stored.

CONTRACTOR shall apply color codes for identification of alloy materials, if utilized, when they are received to ensure that these alloy materials are properly installed and that the correct weld rod is used.

CONTRACTOR shall be solely responsible for (damage, lost, stolen, etc.) to TESORO-furnished materials after CONTRACTOR has received them.

**2.2.3** Diversion or Re-consignment of Material

Any additional cost for diversion or re-consignment of material being shipped by TESORO, only to suit CONTRACTOR'S convenience, shall be at CONTRACTOR'S expense.

**2.2.4** Demurrage Charges

When TESORO provides transportation services for pipe and other materials from suppliers, CONTRACTOR shall promptly unload or load out the pipe and other materials so as to avoid demurrage charges, provided that TESORO has notified CONTRACTOR at least 24 hours in advance of the arrival of the carrier's transportation equipment and has not otherwise delayed CONTRACTOR. CONTRACTOR shall reimburse TESORO for any transportation charges incurred by TESORO because of CONTRACTOR'S delay in unloading or loading out.

**2.3 MATERIALS HANDLING**

Pipe, valves, fittings, and other materials shall be loaded and/or unloaded with adequately sized equipment in good, safe condition. Slings shall be constructed or padded so as to prevent damage to pipe or coating. End hooks may be used only with TESORO approval; if used, they shall be rubber or brass coated to prevent damage to beveled ends and pipe walls. Chains shall NOT be used to handle pipe.

When transporting pipe, valves, fittings and other materials, adequate tie-downs shall be used. Cradles, padding or other strapping necessary to protect materials during transportation shall be placed to prevent shifting loads.

**2.4 PIPE**

**2.4.1** Pipe Identification

CONTRACTOR shall maintain identification of pipe grade and pipe specification, serial number, wall thickness, manufacturer, etc., when mill identification markings are cut off or obliterated, by clearly marking each partial joint of pipe.

**2.4.2** Pipe Documentation and Inventory

For each size, wall thickness, grade, and type of coating, CONTRACTOR shall maintain a weekly inventory showing total pipe received, pipe laid, pipe on hand at storage areas, pipe on CONTRACTOR'S trucks or in CONTRACTOR'S double-jointing or temporary storage yards.

#### **2.4.3 Pipe Transport by CONTRACTOR**

When CONTRACTOR is responsible for shipments of pipe from pipe coating plants, shipments shall conform to the applicable API Recommended Practice and to regulations and rules of the carrier. Truck shipments shall conform to recommendations of API RP 5L 1, Recommended Practice for Railroad Transportation of Line Pipe.

Bare pipe shall be stacked so that the longitudinal weld seams, if applicable, do not touch adjacent pipe surfaces.

Padding shall be provided to protect coated pipe from damage to the coating. CONTRACTOR shall submit details for protection of pipe coating to TESORO for approval at least 5 days before shipments are scheduled to begin.

When coated pipes are transported, the bottom tier of pipe shall be supported by padded cradles. The cradles should be sized (scaloped) for the specific diameter of the coated pipe being transported or otherwise designed to ensure that the pipe joints do not move during transport. Padding shall be replaced when it becomes worn.

Three-inch minimum clearance between the bottom of the pipe joints in the bottom tier and the bed of the transporting vehicle shall be provided to allow for flexing.

Pipe should be secured by padded straps or straps made of a resilient material. No chains, trailer stakes, or other metal objects including the devices used to tighten the straps shall come in contact with the coating.

During transport, the coated pipes shall be protected from loose or flying objects that would damage the coating. Flat bed trailers shall have solid beds. Bogie trailers shall have mud flaps on the wheels and canvas or other effective protective cover between the bottom tier of pipe and the road.

Full-encirclement separation bands on coated pipe must be kept in place during transport, including stringing. The separation bands shall be at least three-eighths inch thick, made of rubber hard enough to resist noticeable compression, or equivalent; nylon or polypropylene rope may be used when approved by TESORO. Sufficient bands spaced equidistant shall be used to avoid any contacts between pipe joints, at least three for 40- foot joints and at least five for 60- and 80-foot joints.

#### 2.4.4 Stockpiling

Pipe shall be racked in neat rows and tiers so as to prevent damage to pipe and coating and to be accessible during all types of weather conditions.

The storage area shall be located on relatively high ground and shall have adequate drainage so as to prevent any water puddle formation during rain storms. The area shall have adequate bearing strength so that no ground settling occurs which would adversely affect the piping arrangement.

The bottom row of pipe shall be elevated at least 6 inches off the ground on sand windrows or earthen berms covered with polyethylene sheeting or sufficiently padded wooden skids.

Pipe joints should be adequately restrained at all times to prevent rolling by using blocks or stanchions for the pipe to rest against. For coated pipe, if the blocks or stanchions are metal or wood, rubber strips shall be provided at bearing contacts with the pipe. Stowing cables used to secure the pipe shall be isolated from any contact with pipe by a protective layer such as rubber strips.

Storage areas shall be organized so that racks of different joint lengths, diameters, wall thickness and type of coating can be readily accessed for handling and load-out.

Bare pipe shall be stacked in a staggered pattern so that each pipe in the stack is supported for the full length of pipe by two pipes in the lower row. Bare submerged-arc welded pipe shall be racked so that the longitudinal weld seams do not touch adjacent pipe surfaces.

Full-encirclement separation bands must be in place on spiral-weld pipe joints and coated pipe joints; see Section 2.4.3. Pipe with coating subject to deterioration under ultra-violet exposure shall be covered with an ultra-violet-resistant material while stockpiled for periods longer than two months.

#### 2.4.5 Pipe and/or Coating Damaged in Transport or Installation

CONTRACTOR shall repair or cut off, as specified by TESORO, sections of pipe and/or coating damaged in shipment to delivery points or during installation. Once CONTRACTOR takes possession of pipe and fittings, CONTRACTOR shall be liable for the pipe and fittings while in CONTRACTOR'S possession. Pipe will be considered damaged prior to receipt by CONTRACTOR only if CONTRACTOR notifies TESORO of damage so that TESORO can inspect damage before CONTRACTOR handles pipe in any manner. Any pipe or coating

damage not called to TESORO's attention before CONTRACTOR handles it shall be repaired or replaced by CONTRACTOR at his own expense. Pipe or coating damaged in transport by CONTRACTOR or during construction shall be repaired or replaced at CONTRACTOR'S expense.

#### **2.4.6 Pipe Pups**

Pipe required to replace welds cut out of the line shall be cut from pieces of pipe shorter than 6 feet, when available. The replacement piece shall be of same wall thickness, grade and specification as that cut out.

For sizes NPS 6 and larger, all pieces of pipe exceeding 6 feet in length which are cut off when making tie-in welds or for other reasons shall be hauled ahead and welded into the pipeline in locations where pipe of same wall thickness, grade, and specification is being laid. Pieces over 6 feet in length of same wall thickness, grade, and specification remaining at the end of the work shall be welded into approximate 40-foot joints, hydrostatically tested to the pressures specified in the Exhibits Section, ends beveled, hauled to and stacked at storage sites as directed by TESORO.

### **2.5 MATERIALS FROM TESORO STORAGE**

#### **2.5.1 Materials Withdrawal**

For TESORO furnished materials to be issued to CONTRACTOR at a TESORO storage yard, CONTRACTOR shall prepare a list of the materials required and shall arrange with TESORO for pick-up of the materials. This list shall include a brief description of the material and shall include a reference drawing number indicating where the material is to be used. CONTRACTOR'S requests for withdrawal of such material shall be limited by quantities shown on the drawings or Lists of Materials supplied by TESORO. CONTRACTOR shall obtain approval from TESORO before requesting material in excess of such quantities. Two copies of this list of materials shall be submitted to TESORO when picking up materials; one copy will be returned to CONTRACTOR with the materials, the second will be signed by CONTRACTOR and retained by TESORO. CONTRACTOR shall load all materials.

#### **2.5.2 Material Return to TESORO Storage**

When TESORO furnished materials are found to be excess items, CONTRACTOR shall return and unload such materials, accompanied by a list of material describing them, in duplicate, at TESORO storage yard designated by TESORO.

#### **2.5.3 End-of-Job Consolidation of TESORO Furnished Surplus Materials** CONTRACTOR shall supply a detailed list of TESORO-furnished

material withdrawn from TESORO storage and not permanently installed within one week after the final successful hydro-test. CONTRACTOR shall return all TESORO surplus material to TESORO storage locations designated by TESORO.

### **3.0 PRELIMINARY AND GENERAL CONSTRUCTION REQUIREMENTS**

#### **3.1 PRELIMINARY ARRANGEMENTS**

CONTRACTOR shall familiarize himself with all provisions affecting construction included in the pipeline right-at-way agreements and easements secured by TESORO. CONTRACTOR shall comply with the requirements of right-of-way agreements, easements, leases, and other agreements obtained by TESORO or CONTRACTOR relating to the work and shall cooperate with TESORO in satisfying all reasonable requirements of property TESOROs. Work necessary to comply with right-of-way easements and permit conditions contained in documents included in the Permits / Restrictions / Right-Of-Way / Easements Section shall be performed by CONTRACTOR at no additional cost to TESORO. CONTRACTOR'S demonstrated costs for other such work will be reimbursed as an adjustment to his compensation. CONTRACTOR shall notify and consult the property TESOROs or tenants in advance of construction and entrance on any property to determine the procedure that will result in the least damage to or interference with the TESOROs' or tenants' operations.

#### **3.2 DOCUMENTATION BEFORE CLEARING**

Prior to clearing, CONTRACTOR shall document the undisturbed right-of-way condition. This documentation shall be done with video cameras and color photographs taken at 400 foot intervals or maximum line-of-sight, whichever is less, in agricultural and developed lands, and taken at greater intervals to show of typical conditions in undeveloped lands. Videos and photographs shall be taken at every road and railroad crossing, with views showing the full length of the crossing on the road or railroad right-of-way. Videos and photographs shall be taken at river and watercourse crossings and in all areas where grading is to be done. Videos and photographs shall be taken of private roads which will be used for access to the construction right-of-way. Each video and picture shall be narrated and labeled with the stationing or location and direction toward which it was viewed; the access road narration and label shall include the right-of-way stationing accessed by the road. Two copies of this report shall be provided to TESORO within 14 calendar days of beginning clearing.

#### **3.3 PROPERTY PROTECTION**

Clearing, grading, ditching, boring, pipe stringing, bending, welding, coating, laying, and backfilling activities along the pipeline route shall be confined to the width of the construction right-of-way and specific temporary access routes arranged for by CONTRACTOR. Arrangements for temporary access shall be made in accordance with Section 1.2.2. CONTRACTOR'S operations shall be so

conducted that no unnecessary damage or inconvenience is caused to the public or to TESOROs and tenants of property.

CONTRACTOR shall exercise every care to prevent interference with the normal supply and distribution of water in irrigated lands.

CONTRACTOR shall be responsible for designing and providing access to the job site, including temporary roads and bridges, modifications to roads (widening or curve straightening, for example) and bridges (widening or reinforcing, for example), and any other necessary temporary facilities. CONTRACTOR shall secure permission of the landTESOROs or controlling authorities. All such construction or modifications, with permits, shall be submitted for TESORO review prior to work taking place.

CONTRACTOR shall exercise due care to avoid damaging existing improvements or facilities, utilities, fences, and trees and shrubbery that are not to be removed in clearing operations. All trees and shrubbery that are not to be removed, pole lines, fences, signs, survey markers and monuments, buildings and structures, conduits, cables, pipelines under or above ground, sewer and waterlines, all highway or street facilities, and any other improvements or facilities within or adjacent to the work area shall be protected by CONTRACTOR from injury or damage. If such objects are injured or damaged by CONTRACTOR'S operations, they shall be replaced or restored at CONTRACTOR'S expense, to a condition equal to that prior to construction.

CONTRACTOR shall secure approval of the landTESOROs or controlling authorities before filling or bridging public or natural ditches, drains, or canals along the construction right-of-way for passage of equipment. CONTRACTOR'S design for these crossings must be submitted to TESORO for review prior to construction.

When crossing highways, railroads, or hard surfaced roads which may be damaged by moving equipment, CONTRACTOR shall sufficiently shield such surfaces to prevent damage. Surfaces damaged due to CONTRACTOR'S equipment shall be repaired by CONTRACTOR to the satisfaction of the controlling authority and TESORO at CONTRACTOR'S expense.

### **3.4 ROAD CLOSURES**

CONTRACTOR shall obtain prior approval from the controlling authority prior to any road closure, regardless of the duration. CONTRACTOR shall make every effort possible to minimize road closures and traffic delays, and to schedule road closures so they will not interfere with normal commute and school traffic.

### **3.5 PERMANENT SURVEY MONUMENTS**

CONTRACTOR shall preserve permanent survey monuments and bench marks. In the event CONTRACTOR disturbs any permanent monument or bench marks, they shall be replaced by a Registered Land Surveyor acting under TESORO's

instructions; replacement cost will be deducted from CONTRACTOR'S compensation.

### 3.6 WORKS AROUND EXISTING PIPELINES AND OTHER BURIED FACILITIES

#### 3.6.1 General

Where pipeline construction work parallels or crosses existing pipelines, cables, power lines, conduits, structures, or facilities either owned by TESORO or others, extreme care shall be exercised by CONTRACTOR at all times. CONTRACTOR shall be responsible for contacting authorities and TESOROs, and locating such facilities before driving over them or excavating. In the event CONTRACTOR damages or breaks any pipelines, cables, power lines, conduits, structures or facilities, CONTRACTOR shall be liable for all damages or losses, including product losses, cleanup and pipeline shutdown time costs, and shall fully indemnify and hold TESORO harmless from any attendant personal injury or property damage claims.

TESORO hereby notifies CONTRACTOR that it has not done any research in identifying existing pipelines and other buried facilities not shown on the construction drawings.

The fact that any existing facility is not shown on the plans and drawings shall not relieve CONTRACTOR of his responsibility for ascertaining the existence of any underground or aboveground improvements or facilities, which may be subject to damage by reason of CONTRACTOR'S operations.

The CONTRACTOR shall adequately support exposed substructures to the satisfaction of the substructure TESORO and/or the TESORO Representative.

The clearance between the pipe and other substructures shall be at least twenty four (24) inches unless closer proximity is specifically authorized in each instance by the TESORO Representative and is allowed by permit authorities.

All utilities shall be repaired immediately in accordance with the standards of the TESORO / agency having jurisdiction.

#### 3.6.2 Underground Service Alert Notification

Prior to extensive grading or any excavation operation, CONTRACTOR shall advise Underground Service Alert Center (or other underground utility locating services, where available) of the location of the grading or excavation; notification shall be a minimum of 48 hours before performing work. CONTRACTOR shall also notify TESOROs of facilities or structures that will be exposed during excavation or crossed by the

new line at least three days prior to excavation. CONTRACTOR shall confirm to TESORO not later than the day before beginning the grading or excavation that these notifications have been made.

### 3.6.3 Locating Existing Pipelines

Where grading, ditching or other work crosses or parallels existing pipelines (whether active or inactive), CONTRACTOR shall locate and mark the pipeline regardless of any prior similar work by TESORO or its surveyor. Before any grading, including grubbing, CONTRACTOR shall confirm the location of foreign lines. Location of existing lines shall be confirmed by exposing ("daylighting") the top of the existing pipeline. Daylighting shall be done by hand.

CONTRACTOR shall not expose the existing pipelines unless Pipeline TESOROs Representative and TESORO Representative are present.

### 3.6.4 Parallel Pipelines

CONTRACTOR shall not cross existing parallel pipelines with any equipment and shall not work within 5 feet of existing pipelines, unless specifically approved by TESORO / pipeline TESOROs in writing.

Visual confirmation of the location of parallel TESORO pipelines by exposing ("daylighting") the top half of the existing pipeline will be required at all horizontal PI's (points of intersection) greater than 3 degrees, at all foreign pipeline crossings, and at a maximum spacing of 200 feet. Daylighting shall be done by hand. A backhoe shall not be used unless specifically approved by TESORO. If the use of a backhoe is approved, the bucket shall be blinded (teeth removed) and the backhoe positioned to dig parallel to the highest existing pipe.

Any coating damage done to the foreign pipeline by the CONTRACTOR shall be reported and repaired to the satisfaction of the foreign pipeline TESORO.

### 3.6.5 Provision for Cathodic Protection Test Leads

TESORO intends to coordinate the installation of test leads for cathodic protection interference testing between TESORO's new pipeline and any foreign steel pipeline being crossed.

This may require leaving the crossing exposed for several days until all interested parties can be present. This will not be the basis for an adjustment to CONTRACTOR'S compensation. CONTRACTOR shall not attempt to install any device or do any other work on pipeline crossings without a TESORO Representative present or prior written TESORO approval.

## 3.7 DUST CONTROL

CONTRACTOR shall control dust as required by authorities and to TESORO's satisfaction. TESORO approved additives may be used to minimize water requirements. CONTRACTOR shall submit his additive proposal for TESORO's approval 30 days prior to use for dust control.

**3.8 CLEAN-UP**

During the performance of the work, CONTRACTOR shall keep a reasonable degree of order at all work sites by disposing of accumulated rubbish and excess material, and at the completion of the work all areas of CONTRACTOR'S work shall be cleared of debris, left-over tools, consumable supplies, and material which may have accumulated as a result of CONTRACTOR'S performance of the work. Where CONTRACTOR, after due notice, fails to keep the areas of his work reasonably clean and safe, or fails to clean these areas at the completion of the work, TESORO may perform this work. The cost of such work will be deducted from CONTRACTOR'S compensation.

Excess pipe, other materials and equipment supplied by TESORO, or for which TESORO has paid, shall be picked up from the right-of-way and delivered to a designated TESORO facility.

Roads, driveways, trails, gates, bridges or other structures and access routes used and damaged by CONTRACTOR during construction shall be replaced or repaired and left in good condition by CONTRACTOR. The right-of-way shall be returned to as near original condition as possible.

**3.9 NIGHT CAPS**

Open ends of pipeline sections, when unattended, shall be effectively closed or plugged immediately by using a "night cap" approved by TESORO to prevent dirt, debris or animals from entering the pipe.

**4.0 CONSTRUCTION ROUTE MARKING, LINE INVENTORY, AND SURVEYING**

**4.1 GENERAL CONSTRUCTION MARKING**

TESORO will set markers at intervals along the route to identify the pipeline alignment and easement. CONTRACTOR shall set additional markers (if necessary) to establish the pipeline alignment, easement and the construction right-of-way as required for his construction activities. CONTRACTOR shall re-establish the survey line and restore any marker knocked out or lost prior to ditching the line, or section thereof, because of CONTRACTOR'S activities such as stringing, right-of-way preparation, etc. Markers at reference points for survey control points, such as PI's, shall not be disturbed or covered by CONTRACTOR'S operations.

**4.2 SURVEYING - LINE INVENTORY**

TESORO will measure as-built length of the pipeline and stationing of appurtenances.

## **5.0 FENCING, CLEARING AND GRADING**

### **5.1 FENCES**

All existing fences removed by CONTRACTOR shall be replaced with new materials in kind or better. All temporary fences constructed by CONTRACTOR shall be 4-strand, 12 1/2 gauge barbed wire fences with treated wooden posts. Posts shall be set at least 2'-8" below natural grade and shall extend 5'-0" above finished grade. The fence shall follow the land contours so that the lowest wire is never more than 18" above grade.

### **5.2 TEMPORARY GATES**

Temporary wire gates shall be constructed wherever fences cross the construction right-of-way or access routes, except where adequate gates are already present. Posts and braces shall be installed on each side of the gate, and fence wires shall be tensioned and securely fastened before the fence is cut. CONTRACTOR'S watchmen shall be stationed wherever gates are left open. CONTRACTOR shall be solely responsible for any losses resulting from his failure to adequately provide gates or to fence private or public property.

Unless TESORO specifies that permanent gates are to be installed at certain locations, CONTRACTOR shall, after completion of pipeline construction, restore the fences to not less than their original condition.

### **5.3 PERMANENT GATES**

Where specified in the drawings and the Contract Documents, CONTRACTOR shall install permanent gates of the type shown on project drawings.

### **5.4 CLEARING REGULATIONS**

Clearing of the construction right-of-way where it passes through wooded land and environmentally sensitive habitats shall be done by CONTRACTOR in accordance with the Permits / Restrictions / Right-Of-Way / Easements Section and laws and regulations governing such lands, including fire protection, disposal, and cleanup.

### **5.5 BRUSH AND TREE REMOVAL**

CONTRACTOR shall remove only as necessary brush and timber from the right-of-way prior to disturbing the topsoil. CONTRACTOR shall make every effort possible to minimize tree cutting and brush removal. This includes minor pipeline alignment changes as directed by TESORO. These shall be made at no additional cost to TESORO if the lines remain within 50 feet of the original

alignment. Brush and tree removal shall be in accordance to the Permits / Restrictions / Right-Of-Way / Easements Section.

#### **5.6 DEBRIS DISPOSAL**

Trees, brush, stumps, or other material shall not be pushed from the construction right-of-way. Merchantable timber shall be cut and delivered to property TESOROs, if so requested, or as directed by TESORO. Non-merchantable timber, stumps, brush, etc., shall be properly disposed of by CONTRACTOR offsite. Alternatively, CONTRACTOR may chip non- merchantable timber, stumps, brush, etc. and stockpile it along the right-of-way for use in restoration. Debris disposal shall be in accordance to the Permits / Restrictions / Right-Of-Way / Easements Section.

#### **5.7 TOPSOIL SEGREGATION**

After trees and shrubs have been removed as necessary, six inches of native topsoil or as specified in the Permits / Restrictions / Right-Of-Way / Easements Section (including grasses and very small brush) shall be removed from the way. Topsoil from deep cuts made to achieve a graded work area shall also be stockpiled upslope of the graded right-of-way. A drainage diversion ditch shall be installed upslope of the native topsoil stockpile. Care shall be taken to minimize ground cover disturbance at the edge of the construction right-of-way.

#### **5.8 SLOPE LIMITS**

Cut slopes shall not be steeper than the angle of repose of soil or 1: 1 without TESORO approval.

Slope limitations shall be in accordance to the Permits /Restrictions, Drawings or Exhibits Sections.

#### **5.9 SIDE-CAST MATERIALS**

CONTRACTOR shall make every effort to contain side-cast materials. This may require installing temporary fences and/or retaining walls to prevent damage by falling material and to limit the work area required for final grading and restoration.

### **6.0 DITCHING**

#### **6.1 CHARACTER OF DITCH AND DEPTH OF COVER**

The ditch shall be of sufficient width and in such alignment as to permit laying the pipe therein without straining the pipe and without injury to the protective coatings. Except as otherwise specified in this Specification or on drawings, the ditch shall provide minimum cover between the top of the pipe and the original or

final ground surface, whichever is lower, as required by the applicable Federal 49 CFR Part 195, or by other regulatory requirements if more stringent.

All excavations shall be in accordance to the California Code of Regulations. The CONTRACTOR shall be responsible for the required OSHA permit for excavations or trenches five (5) feet in depth or deeper.

The CONTRACTOR shall supply to the TESORO detailed plans, specifications, and calculations prepared by a civil engineer currently registered in the State of California when such information is required by "state" mandate. No person will enter an excavation not in compliance with this mandate.

The CONTRACTOR shall be responsible for immediately notifying the TESORO in the event any suspected contaminated soil is encountered.

#### 6.1.1 Additional Cover

CONTRACTOR shall provide additional cover to meet special construction requirements contained in the drawings, right-of-way and permit conditions as included in the Permits / Restrictions Section. Where additional cover is required by TESORO and is not shown on the drawings or in the Permits / Restrictions Section, CONTRACTOR shall provide the cover required and receive additional compensation. Where additional cover is required at crossings of roads, railroads, rivers, streams, ditches, other pipelines, culverts, or similar obstructions, it is considered as "foreseeable" and shall be provided at no additional cost to TESORO.

#### 6.1.2 Watercourse Crossings

At rivers, streams, ditches, washes, and gullies the ditch shall be dug to allow the pipe to gradually sag into and rise away from the lowest point. The minimum cover between high water limits of water courses, both natural and constructed, shall be 60 inches, unless otherwise indicated in the Permits / Restrictions Section.

#### 6.1.3 Bedding

The bottom of the ditch shall be free of sharp rocks, debris, or any foreign material which might damage protective coatings, and shall be graded and bedded so that it will afford sufficient bearing to support the pipe without visible deflection along its length.

At locations where there is extensive continuous rock, and at TESORO'S request, CONTRACTOR shall provide and install a double thickness of heavy-duty TESORO-approved "rockshield" around the pipe.

### 6.2 PROTECTION AT OPEN DITCHES

CONTRACTOR shall provide suitable barricades or fencing around open ditches in areas where vehicular traffic, cattle or other livestock are located, or where the public could fall.

CONTRACTOR shall provide dirt plugs in the ditch where necessary to allow livestock crossing. Open ditches within 20 feet of paved roads may require flagmen and signs to control and alert traffic.

Local authorities may require that no open ditch remain unattended. These requirements shall be fulfilled by CONTRACTOR at no additional cost to TESORO.

Protection of open ditches shall be in accordance to the Permits / Restrictions / Right-Of-Way / Easements Section.

### 6.3 SHORING AND BRACING

Where personnel enter excavations 5 feet or more in depth, the excavation shall be protected by a support system of shoring or bracing meeting OSHA standards. Such protection shall also be provided in excavations less than 5 feet deep where hazardous earth movement may be expected. Shoring or bracing systems shall be inspected daily and after a rainstorm or other hazard-increasing occurrence.

### 6.4 EXISTING PIPELINES AND/OR STRUCTURES

**6.4.1** See Section 3.6 regarding CONTRACTOR'S responsibility for locating existing buried facilities, and provision for cathodic protection test leads. Minimum clearance between crossed lines and other structures shall be 24 inches, except in specific cases where TESORO may approve less in writing. CONTRACTOR shall comply with crossing requirements of the TESOROs of other pipelines or facilities if more stringent than required by this specification.

### 6.5 ROCK EXCAVATION AND BLASTING

#### 6.5.1 General

Where excavation for grading or ditching is in loose or solid rock, extreme care shall be exercised so as not to scatter loose rock or cause damage to property. If loose rock is scattered in tillable lands, CONTRACTOR shall pick up and dispose of such rock.

Solid rock is rock in its natural formation that cannot be ditched by using a track hoe or equivalent or a dozer equipped with a ripper, sized and operated in accordance with good pipeline practice; but requires removal by sawing, drilling and blasting. In addition, where the bottom of the ditch is in rock, or has hard protrusions capable of damaging pipe coating, ditch bottom must be padded as specified in Section 6.1.4.

**6.5.2 Ditching Where Rock is encountered**

Where continuous rock is encountered for distances greater than 100 feet at a depth that will not permit the minimum cover specified for normal ditching operations, TESORO may authorize in writing less cover but none less than required by ANSIIASME B31.4 and CFR Title 49, Part 195 for liquid lines. Reduction of normal minimum depth of cover will only be considered when excavation cannot be accomplished with a dozer equipped with a ripper, rooters, plows, or other similar equipment. Bid prices for rock excavation shall be based on the cubic yard of rock removed, and shall be paid in addition to the normal per foot lay price.

Extra ditch width and depth obtained due to removing more material than required shall not be included in calculation of extra cost.

**6.5.3 Blasting**

Blasting shall not be permitted.

**6.6 TOPSOIL SEGREGATION**

In cultivated agricultural areas topsoil overlaying infertile material shall be separately excavated and placed so that it may be replaced into the upper portion of the backfill. Where indicated on project drawings or defined elsewhere in this specification or the Contract Documents, this shall be done at no additional cost to TESORO.

**6.7 RESTRICTED USE OF EXCAVATION EQUIPMENT**

In cases where shrubbery, fruit trees or valuable growing timber is encountered in the construction right-of-way, and in locations where, in the opinion of TESORO, the use of normal trenching equipment may result in unnecessary damage or injury to property, or where excessive side cuts and excavations would be required, TESORO may require the ditch to be excavated with special light equipment. Where foreseen or indicated on project drawings this shall be done at no additional cost to TESORO. Where enforceable, additional compensation to CONTRACTOR will be in accordance with the Uniform Bid Sheets Section.

Where the pipeline crosses existing lines, CONTRACTOR shall locate and expose these existing lines by hand prior to performing any other work at that location. CONTRACTOR shall not expose the crossing pipelines unless TESORO Representative and pipeline TESORO's Representative are present. See Sections 3.3 and 3.6.

**7.0 STRINGING, BENDING, LINEUP****7.1 STRINGING**

**7.1.1 Handling of Pipe**

Loading-out, hauling, and stringing of pipe along the construction right-of-way shall be done so as not to damage coating, dent the pipe, or scar the bevels; see Section 2.4.

**7.1.2 Changes in Pipe/Coating**

Stringing shall conform to stationing locations specified on alignment sheets for changes in pipe size, wall thickness, grade, and type of coating. Deviations from these locations must be approved by TESORO in writing. Where stationing may not be specific -- such as related to topographic features, property lines, etc. -- CONTRACTOR shall report stationing as actually strung to TESORO Representative the same day as strung.

**7.1.3 Sequence with Ditching**

Stringing shall not precede normal ditching operations or blasting unless specifically approved by TESORO in writing.

**7.2 BENDING****7.2.1 Field Bends**

CONTRACTOR shall make field bends so that the pipe will conform to the bottom of the ditch. Pipe shall not be bent ahead of ditching unless TESORO approves in writing.

Bending equipment shall be suitably designed and adequately padded to avoid damage to pipe coating. An internal mandrel shall be used if needed to produce smooth bends. Hot bending, miters, and wrinkle bends are not permitted.

**7.2.2 Field Bend Limits****7.2.2.1 Minimum Radius of Bends**

Unless otherwise approved by TESORO, the radius of field bends in feet shall not be less than the following:

For fusion-bonded epoxy coating: 3.2 x pipe NPS

Tighter bends up to limits as permitted by ANSI/ASME B31.4, shall only be made with written TESORO approval.

**7.2.2.2 Diameter Reduction Limit**

The pipe diameter at bends shall not be reduced by more than 2.5% of the nominal pipe diameter.

#### 7.2.2.3 Wall Thickness Reduction Limit

Pipe wall thickness after bending shall not be less than the minimum permitted by the specification under which the pipe was manufactured. For seamless pipe with varying wall thickness around the circumference, the thinnest wall thickness of the pipe joint shall be at the inside of the bend. For API Specification 5L pipe the minimum wall thickness is 0.875 x nominal wall thickness for pipe NPS 18 and smaller; 0.92 x nominal wall thickness for welded NPS 20 and larger; 0.90 x nominal wall thickness for seamless NPS 20 and larger.

#### 7.2.2.4 Minimum Tangent Length

Minimum tangent length of straight pipe at each end of a bent joint shall be 6 feet.

### 7.2.3 Cold Weather Precautions

7.2.3.1 When atmospheric temperature is below 40°F, the pipe shall be preheated to 60°F, measured by temp-sticks, before bending. The pipe shall be preheated to a distance of 3 feet on either side of the bend, and the heat shall be maintained during the bending operation. Surface temperature of coated pipe shall not exceed 120°F, measured with temp-sticks. Bends must be made smoothly and slowly without sudden strains.

### 7.2.4 Shop-fabricated Bends or Fittings

Shop-fabricated bends or fittings furnished by TESORO shall be installed in the line by CONTRACTOR. All fittings, pipe bends, both shop-fabricated and field bent, shall be checked before being welded into the line by pulling a sizing plate completely through the bent section. The sizing plate assembly shall be furnished by CONTRACTOR and approved by TESORO. The sizing plate shall be of three-eighths inch thick Aluminum plate. The assembly shall maintain the sizing plate in a position normal to the longitudinal axis of the pipe.

The diameter of the sizing plate shall be 97.5% of the nominal internal diameter of the pipe. Each sizing plate shall be stamped with the pipe size, nominal wall thickness, and plate diameter.

After successfully running the sizing plate to the satisfaction of the TESORO, the sizing plate shall be turned over to the TESORO for their D.O.T. files.

### 7.3 LINE-UP

#### 7.3.1 Internal Obstructions

Before welding, the inside of each length of pipe shall be thoroughly examined to make sure that it is free of dirt, animals, or other obstructions. If dirty or obstructed in any way, the pipe shall be swabbed out before being welded into the pipeline.

#### 7.3.2 Longitudinal Weld Seams

When lining-up pipe having a longitudinal weld seam, the pipe shall be aligned and welded so that the seam will be located on the upper surface of the line and within 30 degrees of top center. Successive joints shall be rotated to right or left to avoid aligning the seams in adjacent joints, and so as to have a minimum distance between seams at the joint of two inches.

#### 7.3.3 Temporary Pipe Supports (Skids)

Temporary pipe supports of sufficient strength, size, and number shall be used to support the pipe alongside the ditch, or when necessary over the ditch without collapsing the ditch. Special pads, approved by TESORO, shall be placed between the supports and coated pipe to prevent coating damage resulting from weight and thermal expansion of the pipe. The spacing of the supports shall be such that loads on individual supports will not cause coating damage.

#### 7.3.4 Wall-thickness Transitions

Joint design for pipe of different wall thickness exceeding one-sixteenth inch mismatch shall conform to ANSI/ASME B31.4. If the thicker-wall pipe or fitting is the same or higher grade as the thinner wall pipe, it's inside wall shall be ground to a smooth 4:1 taper.

If the thicker wall pipe or fitting is the lower grade, a transition piece made of the same grade as the thinner wall pipe shall be used and with a wall thickness equal to the thicker wall pipe or fitting. Length of the transition piece shall be 1.5 times pipe diameter (12 inch minimum) up through NPS 24, and 1 times pipe diameter for larger sizes. Both ends shall be beveled for butt-welding, with an internal 4:1 machined taper to match the internal diameter of the thinner wall pipe.

### 8.0 PIPE WELDING

Welding of the pipeline and associated piping facilities shall conform to API Standard 1104 (latest edition).

#### 8.1 WELDING PROCEDURE QUALIFICATION

Procedure qualification shall be in accordance with API Standard 1104, TESORO's welding procedures, attached, and the following.

**8.1.1 Procedure Specifications by TESORO**

TESORO will provide forms as included in the attached. CONTRACTOR has the option to propose alternative Procedure Specifications, subject to TESORO approval; in this case and for welding situations not covered by Procedure Specifications included in the attached. CONTRACTOR shall qualify procedures in accordance with Section 8 and TESORO's welding procedures.

**8.1.2 Procedure Specifications by CONTRACTOR**

CONTRACTOR shall submit for TESORO review and approval a Procedure Specification for each essential variable grouping on forms similar to Figures shown in API Standard 1104 at least 7 days before scheduled pipeline welding work. The Procedure Specifications shall be approved by TESORO before CONTRACTOR makes qualification test welds. Procedure Specifications shall cover all welding situations anticipated for the project, such as new pipe to new pipe, new pipe to existing pipe, and branch connections, and shall cover the sizes, wall thicknesses and grades of pipe and fittings for the project.

**8.1.3 Test Joints and Testing**

Welding and testing of joints shall be in accordance to API Standard 1104. Testing shall be done by an independent testing laboratory approved by TESORO. Coupon test reports shall be on forms similar to Figures shown in API Standard 1104.

TESORO Representative will witness welding of test joints and will review and accept or reject the test results. CONTRACTOR shall notify TESORO of time and place of qualification welding at least 2 days in advance.

In addition to the required mechanical testing for compliance to API 1104, the CONTRACTOR shall have an independent testing laboratory perform Rockwell C hardness (HRC) tests of procedure welds in accordance with the Drawings. No single hardness reading shall exceed HRC 22. The results of each survey shall be made a part of the permanent WPS record.

A weld repair procedure shall be qualified in accordance with API 1104 and hardness testing of the repair area performed as required above.

**8.1.4 Approval of Procedures**

Procedures with accepted test results shall be submitted to TESORO for final approval. TESORO reserves the right to reject any procedure which in TESORO's opinion will not produce acceptable welds.

Acceptance or approval by TESORO shall not alter CONTRACTOR'S responsibility for producing acceptable welds.

#### 8.1.5 Qualified and Approved Procedures

Qualified and approved procedures shall be adhered to during construction. If CONTRACTOR proposes a change in essential variables requiring a new procedure, the new procedure must be qualified and approved. In the event TESORO rejects a procedure during the course of the work, CONTRACTOR shall immediately cease production welding per that procedure until the rejected procedure is remedied and replaced by a new qualified and approved procedure.

#### 8.1.6 Costs of Procedure

Costs of procedure qualifications and testing shall be at CONTRACTOR'S expense, except TESORO will provide line pipe for test qualifications.

### 8.2 WELDER QUALIFICATION

#### 8.2.1 Welder Qualification

Welder qualification shall be in accordance with API Standard 1104 and the following. All welders employed or engaged by CONTRACTOR for pipeline welding must successfully complete either the single or multiple qualification tests for each of the previously qualified welding procedures.

Welder qualification for butt welds by radiography per API Standard 1104 is not permissible except by TESORO's written direction for exceptional circumstances.

Testing shall be done by an independent testing laboratory approved by TESORO. Results shall be reported on forms similar to Figures shown in API Standard 1104.

TESORO Representative will witness test welding, review test results, and will promptly notify CONTRACTOR as to the qualification or failure to qualify of each welder. CONTRACTOR shall notify TESORO of time and location of qualification test welding at least 2 days in advance.

Costs of welding tests and testing shall be at CONTRACTOR'S expense, except TESORO will provide line pipe for test qualifications.

#### 8.2.2 Qualified Welders

Each welder must be qualified for the type and method of welding he will perform. Multiple qualifications are required for welders performing branch connection or doing manifold fabrication welding.

A welder making a successful Procedure Qualification test weld is automatically qualified for that procedure.

#### **8.2.3 Additional Tests**

Welders must be re-qualified if there is any change in the essential variables for welder qualification.

TESORO reserves the right to require and witness additional tests at any time if there is doubt about the competence of a welder. TESORO will reimburse CONTRACTOR for the cost of such additional tests only if the test is passed.

Welders who do not pass retests shall not be permitted to weld on the remainder of the project.

### **8.3 WELDER IDENTIFICATION**

CONTRACTOR shall issue an identification number to each qualified welder. Each weld made by that welder shall be so identified. Any weld worked on by more than one welder shall be identified by the number of each welder participating in the weld.

All welds shall be marked by each welder with an ink or "Paint Stick" pipe marker on the top quarter of the pipe using the identification number assigned to him, and shall clearly designate each area that each welder has welded, including passes. Any weld not identified by the welder(s) shall be subject to cutout at CONTRACTOR'S expense. CONTRACTOR shall keep TESORO currently supplied with an up-to-date list of the identification numbers, welders' names, and procedure(s) and scope each is qualified. If a welder leaves the job, his number shall not be reassigned.

### **8.4 PRODUCTION WELDING**

Production welding, including tie-ins, branch connections, and manifold fabrication, shall be done in accordance with API Standard 1104, the applicable ANSI/ASME Code, applicable Federal and State regulations, TESORO'S welding procedures and the following:

#### **8.4.1 Surface Cleaning and Bevel Preparation**

The internal and external surfaces of each pipe shall be machine buffed for a nominal distance of 2 inches back from the bevel to remove rust,

scale, dirt or other foreign materials before aligning for welding. Grinding shall not be used for this purpose.

All bevels shall be buffed or wire brush cleaned to a bright finish prior to welding. Beveled ends damaged during handling shall be satisfactorily repaired or re-beveled. Pieces of pipe which have been previously cut off for tie-ins or other reasons shall be re-beveled before welding.

If use of air-driven tools results in an oil film on the bevels, the oil film shall be removed using a suitable solvent.

#### 8.4.2 Pipe Material Flaws and Defects

The welder or his supervisor shall report, and TESORO

Representative shall be notified, whenever any flaws, laminations, inclusions, etc. in the pipe material or other defects such as dents or arc burns are found during the cleaning, beveling, or welding operations.

#### 8.4.3 Arc Burns

CONTRACTOR shall insure that arcing does not occur between the ground leads of the welding machines and the pipe or fittings or alignment clamp. Striking an arc on the pipe or fittings at any point other than the welding groove shall not be permitted. Any arc burn shall be removed by cutting out a cylinder of pipe containing the arc burn not less than 1.5 times pipe diameter in length (12 inches minimum) for sizes through NPS 24, and 1 times pipe diameter for larger sizes.

All arc burns shall be reported to TESORO Representative.

#### 8.4.4 Preheating

Pipe ends shall be preheated to 100°F minimum whenever the atmospheric temperature is below 50°F or when pipe is wet or damp. Anyone of the following conditions requires 150-200°F minimum preheat to be maintained during welding:

When the atmospheric temperature is below 40°F. The normal welding procedure technique shall be augmented by: Once started, the weld shall be completed in a continuous operation without allowing the stringer bead or subsequent pass to cool below 60°F. If either of these passes cools below 60°F while slag, scale or oxide is being removed, the pipe shall be reheated for a distance of 3 inches on either side of the weld to a 150-200°F minimum.

All repair welds except for recapping. Repair welds shall be preheated in the area of repair extending a minimum of

3 inches beyond the ends of the repair cavity. Back welding shall not be allowed.

When, for any reason, it is necessary for specific welding procedure and material combinations to alleviate existing conditions that would limit the welding technique or adversely affect the quality of the weld.

Preheating shall be accomplished by a method acceptable to TESORO and shall cover a band at least 3 inches wide on each side of the weld. The minimum preheat temperature shall be maintained throughout the welding and shall be checked frequently by use of temperature indicating crayons. Welders shall have crayons on hand during preheat operations.

#### **8.4.5 Weather Conditions**

In the case of cold, windy, or stormy weather, CONTRACTOR shall provide protection for the welding and shall protect the welds from sudden variations in temperature until welds have cooled.

Welding shall not be carried on when the TESORO Representative indicates that the weather is unsuitable for welding operations.

#### **8.4.6 Protection of Pipe Coating**

Nonflammable sleeves at least 18 inches wide shall be wrapped around coated pipe adjacent to the weld area during welding to prevent damage to the coating by weld splatter. The sleeves should be held in place to make an all-around snug fit.

### **8.5 PRODUCTION WELD EXAMINATION AND TESTING**

#### **8.5.1 Inspection of Pipeline**

Inspection of pipeline girth welds shall be in accordance with API Standard 1104 and the following. Normal inspection will be radiography. 100% of all girth welds shall be x-rayed. All girth weld inspection is for 100% of the circumference.

Radiographic Inspection of the girth welds shall be performed by a third party contracted by CONTRACTOR.

#### **8.5.2 Weld Acceptability**

Weld acceptability by non-destructive testing will be in accordance with API Standard 1104 as modified by the following:

Cracks are not permitted.

Inadequate penetration, lack of fusion and root-pass undercutting as defined in API 1104 are not permitted.

Radiograph interpretation will be by the radiographic technician and TESORO Representative. TESORO reserves the right to reject any weld, in accordance with API 1104.

**8.5.3 Test Field Girth Welds**

TESORO may at any time sample and test field girth welds to ensure that the required quality and mechanical properties are maintained. The welds will be destructively tested per API 1104.

The cost of cut-out, test, re-weld and subsequent radiography will be borne by TESORO if the weld passes the test or by CONTRACTOR if the weld fails the test.

**8.6 REPAIR OR REMOVAL OF DEFECTIVE WELDS**

**8.6.1** Repair or cut-out of defective welds shall be in accordance with API Standard 1104.

**8.6.2** Defective welds may be repaired or cut out at CONTRACTOR'S option, unless TESORO Representative directs that the defective weld shall be cut out.

**8.6.3** Repairs

Welds may be repaired within the following limits:

**8.6.3.1** Flame gouging shall not be used to remove the defective area. Air-arc gouging may be used to remove flaws providing that the procedure and welder are qualified to perform this repair.

**8.6.3.2** An area covering a minimum of 3 inches on each side of the repair shall be preheated to 200°F minimum, and temperature maintained during welding.

**8.6.3.3** All repair cavities shall be a minimum of two inches in length.

**8.6.3.4** Only one repair shall be allowed in any given area of the weld. Repairs to previous repairs are not permitted.

**8.6.3.5** Repair of cracks is not permitted.

**8.6.3.6** Back welding to repair root bead defects shall not be allowed.

**8.6.4** Cut-outs

8.6.4.1 Whenever cutting out a weld leaves the two ends of the pipe so that they cannot be properly spaced without damaging the line, they shall be joined by welding in a short piece of pipe not less than 1.5 times the pipe diameter (12 inch minimum) for sizes through NPS 24, and 1 times pipe diameter for larger sizes. The two new welds will be radiographed and accepted in the same manner as production welds.

**8.6.5** Excessive Repairs and Cut-outs

8.6.5.1 When a high rate of unacceptable welding occurs, TESORO may direct CONTRACTOR to cease production welding until the cause is identified and remedied, by either revising the welding procedure or removing the welder(s) responsible for poor workmanship from the job. Normally TESORO considers more than one repair or reject per ten welds to be a high rate of unacceptable welding.

**8.6.6** Costs

8.6.6.1 Costs for repairs, cut-outs and additional radiography or other non-destructive testing to examine the repaired welds and the new welds at cut-outs shall be at CONTRACTOR'S expense.

**9.0** COATINGS

**9.1** GENERAL

**9.1.1** Definitions

"Coating" describes anything additional to the bare pipe such as shop-applied Fusion Bond Epoxy (FBE) as well as field-applied epoxy.

"Field joint" is used to describe any field coating necessary to maintain the continuity or integrity of the pipe coating system including but not limited to coating at girth welds and branch connections of shop-coated pipe.

**9.1.2** Handling of Shop-Coated Pipe

CONTRACTOR shall take special care in handling coated pipe to avoid damage to the coating.

TESORO's approval of CONTRACTOR'S proposed method for stacking and handling of coated pipe does not relieve CONTRACTOR of his responsibility for testing of coating and repairs

**9.1.3 Storage and Protection of Coating Materials**

Coating materials shall be stored and handled by CONTRACTOR in strict conformance with manufacturer's instructions and recommendations.

**9.1.4 Inspection and Testing of Coating**

All pipe coating shall be cleaned and tested by CONTRACTOR using suitable holiday detection equipment after field joints are applied. As a minimum, the coating shall be inspected visually and electrically tested (jeeped) first after field joints are applied and visual damages have been repaired, and finally behind the last lowering-in cradle. Voltage levels shall be in accordance with NACE Standard HP0274-74 or for fusion-bonded epoxy coating the applicable NACE Standard, or at 125 - 150 volts per mil thickness of coating. CONTRACTOR'S proposed testing equipment and procedure shall be submitted to TESORO for approval at least 10 days prior to beginning of coating work. CONTRACTOR shall have on hand suitable equipment to verify voltage of the holiday detection equipment.

Where pipe is not immediately shaded after lowering in, coating shall be visually inspected at time of backfilling, and repairs made before backfilling if coating is damaged.

Field joints shall be approved by TESORO Representative before pipe is lowered into the ditch.

**9.1.5 Repair of Coating Damage and Defects**

Coating damage and defects found visually or by "jeeping" shall be repaired by CONTRACTOR at no additional cost to TESORO, unless damage to TESORO-furnished coated pipe is reported to TESORO at time of receipt by CONTRACTOR and verified at that time by TESORO Representative. The repair method shall be as specified in Section 9.0. CONTRACTOR shall "Jeep" the pipe.

**9.1.6 Training for Installation of FBE to the Girth Welds**

Prior to the application of FBE to the girth welds, CONTRACTOR shall have a representative of the supplier of the induction coil equipment, provide a site training session for all CONTRACTOR personnel who will perform girth weld coating or coating repair work. CONTRACTOR shall notify TESORO at least 3 days ahead as to the location and time of the training session.

**9.1.7 Weather Conditions**

Application of coating, field joints, and repairs, and holiday detection testing shall not be done during inclement weather, unless weather

protection and other measures approved by TESORO are provided by CONTRACTOR.

## 9.2 PROJECT COATING SYSTEMS

Pipe and fittings shall be coated by TESORO with FBE.

## 9.3 FUSION-BONDED EPOXY COATING ON FIELD JOINTS

Fusion-Bond Epoxy coating of field joints shall be applied in accordance to the specifications attached by CONTRACTOR.

## 9.4 FIELD COATING OF SHOP-FABRICATED BENDS

All shop fabricated bends (hot bends or fittings) shall be shop coated. CONTRACTOR shall handle the shop fabricated bends in accordance with Section 2.0.

## 9.5 REPAIRS TO FUSION-BONDED EPOXY

### 9.5.1 Materials and Application

CONTRACTOR supplied Fusion Bond Epoxy patch and repair materials shall be compatible with the specified coating system.

### 9.5.2 Surface Preparation for Fusion-Bonded Epoxy

Damaged coating materials shall be removed, and remaining adhering coating feathered.

Bare pipe and 3 inches of sound coating shall be wiped clean of any dirt, oil, or grease per SSPC-SP-1. Gasoline, kerosene, shall not be used.

Bare pipe surfaces shall be cleaned with power wire brushes per SSPC-SP-3. Joint area surfaces shall be in accordance with SSPC-VIS-1.

The sound coating adjacent to the defect shall be roughened using at least the equivalent of 80 grit emery papers.

After cleaning, all dirt, grit, and other particles remaining on the prepared surfaces shall be blown off with clean dry, oil-free air or by other effective means approved by TESORO. Repair application shall be within 20 minutes of cleaning.

### 9.5.3 Repairs to Fusion-bonded Epoxy Coatings

CONTRACTOR provided patch sticks for field holiday' and damaged coating repair shall be compatible to original pipe mill coating.

## 9.6 COATING OF CADWELDED ANODE AND TEST LEAD CONNECTIONS

**9.6.1 Materials and Application**

A" cadwelded anode and test lead connections shall be coated in accordance to Section 9.3.

**10.0 LOWERING-IN, BACKFILLING, TIE-INS, RESTORATION****10.1 GENERAL**

**10.1.1** CONTRACTOR shall assure that inventory and location measurements have been recorded before the pipe is lowered in and backfilled.

**10.1.2** The pipeline shall conform to the bottom of the ditch at a depth providing at least the specified minimum cover. See Section 6.1.

**10.1.3** Pipe with buckles, wrinkles, distortion, flattening, gouging, grooves, notches, dents exceeding those allowed by ASME/ANSI Code or other damage shall not be laid. A dent containing a stress concentrator, such as a scratch, gouge, groove or arc burn shall be removed. Damaged pipe shall be removed at CONTRACTOR'S expense, and the value of pipe and coating will be deducted from CONTRACTOR'S compensation.

**10.2 LOWERING-IN**

**10.2.1** The pipe shall not be lowered into the ditch until protective coatings have been applied and satisfactorily tested, and the ditch bottom has been properly prepared to receive the pipe without damaging the coating. Preparation of the ditch shall be in accordance to Section 6.1 and includes, but is not limited to, removing all scrap materials, debris and loose rock.

**10.2.2** The pipeline shall be lowered into the ditch in such a manner that the proper amount of slack is secured, taking into consideration ambient temperatures and design operating temperature of the pipeline.

**10.3 BACKFILLING****10.3.1 Shading**

Immediately after the pipe has been lowered, it shall be shaded by filling at least 12 inches around and on top of the pipe with loose dirt or sand free from sharp edged rocks, rocks larger than one (1) inch in diameter, vegetation, and foreign objects, so that the pipe coating is not damaged by the shading material. CONTRACTOR shall keep the shading as close as possible to the lowering-in operation and at no time shall the distance between the two operations exceed the distance governed by the regulatory agencies, permits or 1,000 feet. All pipe that has been lowered into the ditch shall be shaded by the end of each working day, except where necessary to leave exposed to make tie-ins, repairs to pipe or coating, or to connect cathodic protection leads or other appurtenances.

Where suitable rock free (one inch or less) material is not available within 100' of the backfill location, CONTRACTOR shall obtain and install Select Backfill Material on top of the pipe. CONTRACTOR shall be compensated for this Select Backfill Material in accordance with the Uniform Bid Sheets.

#### 10.3.2 Backfilling

Backfilling shall proceed without delay after shading so as to minimize hazards and interruptions to surface use of the land.

Remaining backfill may contain rock, but shall be graded so that rock in the next 12 inches of backfill (within 18 inches of pipe) shall be less than 6 inches in diameter.

In cultivated agricultural areas where topsoil has been segregated in ditching operations, the topsoil shall be placed in the upper part of the backfill. See Section 6.6.

A 6 to 12-inch berm of soil shall be placed over the trench to allow for settlement after all other compaction and restoration requirements are met, except where this would prevent meeting special restoration provisions. This crown shall be wheel rolled and shaped by suitable pneumatic-tired equipment, except in terrain where use of such equipment is not practical.

#### 10.3.3 "Rock Shield"

Where suitable rock-free material for shading and backfill around and over the first 6 inches above the pipe cannot be economically segregated or imported, CONTRACTOR may install a TESORO-approved "rockshield" around the pipe before lowering in, in lieu of select shading and backfill material. Acceptable "rockshield" types are:

- Rockguard
- Tapecoat TerraShield, one-quarter inch thick, perforated.
- Conwed Square Mesh (flat backed)
- Plastinet III (flat backed)

#### 10.3.4 CONTRACTOR shall be compensated for the installation of the rock shield in accordance with the Uniform Bid Sheets.

##### Agricultural and Grazing Lands

In cultivated areas backfilling shall be completed the same day as the pipe is shaded.

In agricultural areas and grazing lands no rock shall be placed in the top of the backfill which would interfere with plowing, cultivating, or re-seeding for grazing. Surplus rock shall be disposed of to the satisfaction of TESORO, landTESORO, and/or tenant at no additional cost to TESORO. The work area shall be restored to its original topography, contour and erosional resistance.

CONTRACTOR shall reconstruct or repair irrigation ditches across the pipeline right-of-way and wherever disturbed by CONTRACTOR'S operations, as required by TESORO, landTESORO, and/or tenant.

#### **10.3.5 Railroad, Highway and Road Crossings, Levees, Waterways**

Backfilling and resurfacing, at railroads, highways, roads, driveways, levees, canals, rivers, ditches, creeks, streams, shall be done in a manner acceptable to the private TESORO or government authority having jurisdiction as listed in the Permits /Restrictions Section.

Backfill over the shading material shall be granular material placed in lifts no thicker than 6 inches compacted thickness, and compacted with hand-operated compaction equipment to obtain the percentage of compaction required by the TESORO or controlling authority.

Sidewalks, curbs, gutters, and shoulders, damaged or removed by CONTRACTOR, shall be repaired or replaced.

Backfill shall be compacted to a minimum relative compaction of 95% dry density per ASTM D-1556 or D-2922 and D-3017 under railroads, highways, roads, driveways and at levees, and 90% at banks of other water courses. Unless directed otherwise by TESORO or controlling authority.

Field dry density tests shall be performed, as a minimum, for each 200 square feet of lift surface. Tests shall be distributed throughout the length and depth of the trench. TESORO reserves the right to choose test locations or to request additional tests. If such additional tests show densities to be less than specified herein, or by the TESORO or controlling authority, CONTRACTOR shall pay for the additional tests; otherwise, TESORO will reimburse CONTRACTOR for the tests.

#### **10.3.6 Trench Plugs**

CONTRACTOR shall furnish and install sacked (sacks filled with a minimum of one cubic foot of earth / sand per sack) plugs to surface at locations directed by TESORO.

Additional lump sum unit compensation for the trench plug shall be in accordance with the Uniform Bid Sheets Section.

### 10.3.7 TIE-INS

This section covers the tie-ins between continuous sections of the pipeline at intervals and at locations such as crossings and appurtenances where normal pipe laying is interrupted. (As used here, the term "tie-in" does not refer to work done to connect the new pipeline to an existing pipeline system or operating facility).

The lengths between continuous sections lowered into the ditch shall provide for (a) pipe bends conforming to the ditch and (b) proper "slack" in the line considering pipe temperatures when laid and operating temperatures.

Tie-ins at a crossing shall be made only after all requirements and testing for the crossing are complete.

Radiographic inspection must be performed on tie-in welds, coating at tie-ins must be visually inspected and if necessary "jeeped", and inventory data recorded before backfilling.

## 10.4 GRADING AND EROSION CONTROL

### 10.4.1 Final grading

CONTRACTOR shall perform final grading to restore the work area to original contours, unless otherwise shown on project drawings or defined in permits and right-of-way conditions or directed by TESORO in writing.

Surplus rock larger than 1" in diameter shall be disposed off to the satisfaction of TESORO and LandTESORO at no additional cost to TESORO.

Side-cast materials, both inside and outside the construction right-of-way, shall be retrieved and graded over the work area. Care shall be taken to minimize disturbance to adjacent areas and native ground cover.

### 10.4.2 Topsoil Replacement

Topsoil removed and stockpiled during clearing shall be evenly spread over the entire work area.

### 10.4.3 Cross Drain Ditches (Water Bars)

CONTRACTOR shall construct cross drain ditches at approximately 50-foot intervals across the work area where ground slopes are steeper than 3:1 (horizontal: vertical) or in accordance with the Permits / Restrictions / Right-Of-Way / Easements Section or as directed by TESORO.

### 10.4.4 Special Erosion Control Measures

Where shown on project drawings or in accordance with the Permits/Restriction Section, CONTRACTOR shall provide and construct special erosion control measures.

#### **10.4.5 Re-vegetation**

CONTRACTOR shall re-vegetate the pipeline right-of-way in accordance to the requirements stated in the Permits! Restrictions Section.

#### **10.4.6 Documentation After Restoration**

After clean-up and restoration, CONTRACTOR shall document the right-of-way after construction. This shall include video and color photographs in agricultural and developed lands as described in Section 3.2. One copy of this documentation shall be provided to TESORO within 30 calendar days of completing restoration, other than re-vegetation.

### **11.0 CATHODIC PROTECTION TEST AND BONDING LEADS AND FACILITIES**

#### **11.1 GENERAL**

CONTRACTOR shall install cathodic protection test and bonding leads and test stations, anode cables, and other cathodic protection facilities.

TESORO will furnish materials only as described in the Materials Section.

#### **11.2 TEST AND BONDING STATIONS**

**11.2.1** Test and bonding leads and stations shall be installed at locations designated by TESORO. Pipeline coating shall be applied at leads in accordance with Section 9.3. CONTRACTOR shall protect leads and stations from damage by clean-up and grading crews. After final grading is complete in the area of any station. CONTRACTOR shall make a continuity check on the leads, and shall replace leads found to be faulty.

**11.2.2** At crossings of existing TESORO-owned pipelines CONTRACTOR shall install test and bonding leads and stations on the existing lines.

**11.2.3** At crossing of foreign pipelines, CONTRACTOR shall leave the foreign lines exposed until the foreign operator has installed his test leads and test stations, or has witnessed the installation by CONTRACTOR.

### **12.0 LINE MARKERS AND SIGNS**

## 12.1 MARKERS AND SIGNS

CONTRACTOR shall install line marker posts or warning signs, and identification signs at appurtenances where directed by TESORO.

Line marker posts are not shown on drawings but shall be installed by CONTRACTOR in such a manner that each line marker post is visible from the next line marker post. Installation shall conform to API Recommended Practice RP 1109 and other applicable regulations.

Warning signs shall be installed on line marker posts at:

- Each side of road and railroad crossings.
- Each side of a waterway.
- Fence lines across open or agricultural property.
  
- Crossings of other lines (irrigation, oil, gas, telephone, utilities) where practical.

Details for markers and signs are shown on project drawings.

## 13.0 MAJOR CROSSINGS

### 13.1 GENERAL

CONTRACTOR shall install the pipeline at crossings in accordance with requirements of the TESORO or authority having jurisdiction over the crossed facility.

### 13.2 RIVER AND WATERCOURSE CROSSINGS

At rivers, streams, and major canals CONTRACTOR shall install the pipeline in accordance with project drawings. See Section 6.1.3 regarding excavation at rivers, streams and other natural watercourses.

## 14.0 COMPLETION TESTS

### 14.1 GENERAL

CONTRACTOR shall perform completion tests on the pipeline, including furnishing pumps, temporary piping and instrumentation, scrapers, etc. required for the testing. Hydrostatic testing shall be in accordance with API Recommended Practice 1110 and the following sections.

#### 14.1.1 Testing Program

CONTRACTOR shall submit for TESORO approval a description of his proposed hydrostatic testing program at least 15 days in advance of testing, with diagrams, data on rated flow/pressure capacity of pumps, type of scrapers, personnel organization and work schedule, communications, etc.

#### 14.1.2 Test Report

CONTRACTOR shall submit to TESORO within 5 days after testing a complete hydrostatic test report in duplicate for each section of pipeline tested, including but not limited to:

- 14.1.2.1 Detailed description of test equipment, with diagram of test equipment hook-up from water source to the mainline and diagram of test facilities along with the pipeline under test.
- 14.1.2.2 Certification documents for the deadweight tester and calibrated pressure instruments.
- 14.1.2.3 Description of the pipeline test section, with profile and data on size, wall thickness, grade, type of manufacture.
- 14.1.2.4 Test Record and Certification Form as shown in API RP 1110
- 14.1.2.5 Deadweight tester pressure versus time log (original).  
Original pressure recording charts, showing:

- Description of pipeline test section.
- Name and address of CONTRACTOR (and testing sub-CONTRACTOR, if any).
- Names of TESORO and CONTRACTOR
- Representatives witnessing the test.
- Test pressure.
- Test medium.
- Explanation of any pressure variations that appear on the chart.
- Serial number of recorder.
- Pressure reading verifications of recorder against the deadweight tester before and after use.
- 

Other reporting data as may be required by Federal, State and local regulations.

#### 14.2 COMPLETION TESTS

Completion tests include a scraper test by running a series of scrapers through the line, one with a sizing plate, and a hydrostatic pressure test. Testing shall be done after the line, or a major section as designated by TESORO, has been laid, with all connections and line appurtenances installed.

**14.2.1 Water for Tests**

CONTRACTOR shall acquire the permit for water withdrawal; provide the water for the hydro test and transporting it to the job site.

**14.2.2 Scraper Test**

CONTRACTOR shall test the completed line by filling it with water and running pipeline scrapers designed for the size of pipe. A series of three scrapers shall be run through the full length of each section of the line.

Scrapers shall be three or four-cup displacement pigs. The third pig shall have a gauging plate in front of the first cup or in the center of the pig. The gauging plate diameter shall be 97.5% of the minimum nominal internal diameter of pipe in the test section.

Pumping equipment or compressors for running scrapers shall have sufficient capacity to move scrapers at a speed of not less than one mile per hour.

Depending upon the condition of the scrapers at the end of the run and upon the quality of cleaning performed by the scrapers, TESORO may direct CONTRACTOR to run additional scrapers through the line. The cost of running these additional scrapers to further verify the adequacy of the line or to obtain satisfactory cleaning shall be at no additional cost to TESORO.

The progress of the scrapers shall be followed by CONTRACTOR as they travel through the line. Any obstruction which stops the scrapers (other than a regular scraper trap) shall be immediately removed and the line promptly repaired. When such repairs have been made, the line shall not be backfilled until inspected and approved by TESORO.

After successfully running the sizing plates CONTRACTOR shall provide TESORO the sizing plates for their D.O.T. files.

**14.2.3 Hydrostatic Test**

After the completed line, or a section thereof, has been filled with water by the scraper test, CONTRACTOR shall perform a hydrostatic test which stresses the pipe at the low point of the section being tested to the pressures specified in the Hydrotest Section. TESORO will compute the test pressure required and will designate the length and location of each section of line that may be covered by one test. The line shall hold the specified test pressure without further pumping for a minimum stabilized period of 8 hours. While pressuring the line, CONTRACTOR shall patrol

sections of the line where leakage would likely cause damage or hazard to others.

Test pressure shall be applied against temporary test valves, blind flanges, spectacle blinds or weld caps. In no instance shall a closed mainline valve be utilized as a test block valve.

The hydrotest procedure shall incorporate the following:

- When approximately 75% of the test pressure is reached, increase pressure gradually in increments of about 2.5% of *test* pressure every ten minutes unless pump capacity is limiting. While pressuring observe and record at five-minute intervals (a) pressures, using the deadweight tester and the test gage, (b) volume of water pumped as measured in the tank, and (c) pump stroke counter reading. At about 20-minute intervals check the pressure recorder readings against the deadweight pressures to confirm that the recorder is functioning properly. If there should be a sudden drop in pressure, indicating a line break, record the pressure just before the drop and stop pumping.
- When the test pressure is reached, stop the test pump. If the pressure should drop below test pressure within a few minutes and then appear to stabilize, resume pumping to raise the pressure to test pressure again while continuing to observe and record data. Disconnect the pump from the line. Continue observing and recording deadweight pressures at 5-minute intervals for at least an hour, and 15 minutes thereafter until the end of the test.
- In the event warm ground temperatures cause the line pressure to increase above the maximum test pressure, water must be bled slowly and carefully from the line to lower the pressure to test pressure. The water shall be drained to the tank and the volume accurately measured, at the same time taking pressure data with the deadweight tester. If line pressure again rises to the maximum, this operation shall be repeated.
- When the pressure has stabilized and held steady for at least 8 hours, the test can be considered satisfactory.

Pressure instrumentation should be calibrated and include the following:

- A Bourdon-tube pressure test gage, calibrated immediately before the test, with a reading accuracy of 0.1 % of full scale.
- A deadweight pressure tester, capable of measuring increments of 1.0 psi, certified for accuracy and traceable to the National Institute of Standards and Technology (formerly National

Bureau of Standards) calibrated a maximum of six (6) months before the test.

- A 24-hour pressure recorder, checked against the deadweight tester immediately before and after use with a supply of correct range chart paper. Test pressure should be about 80% of the recorder's maximum scale.
- Pressure gages, calibrated within one month before the test, with reading accuracy of 1% of full scale for use at locations along the line where pressures are observed. If ambient or night chill temperatures are below 35°F, CONTRACTOR shall take measures to prevent freezing in aboveground mainline piping and test piping and instrumentation.

### 14.3 REPAIRS AND RETESTS

CONTRACTOR shall have available during the progress of completion tests crews which can be dispatched to perform any necessary repair work. If leakage is found, CONTRACTOR shall make repairs immediately, after which the test shall be repeated. CONTRACTOR shall bear the expense of repairs and retests due to his faulty workmanship or defective or unsatisfactory material furnished by CONTRACTOR. TESORO will bear the expense of repairs and retests due to defective material furnished by TESORO.

#### 14.3.1 DEWATERING

CONTRACTOR shall arrange for and dispose the hydrostatic test water.



**TESORO LOGISTICS OPERATIONS, LLC.  
HIGH PLAINS PIPELINE SYSTEM – ND**

**BEULAH BASIN  
RAIL LOADING 10" PIPELINE  
PROJECT**

**FUSION BOND EPOXY COATING  
OF  
GIRTH WELDS**

## FUSION BOND EPOXY COATING OF GIRTH WELDS

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## 1.0 SCOPE

### 1.1 GENERAL

1.1.1 The minimum Dry Film Thickness (DFT) to the Fusion Bond Epoxy (FBE) coating shall be 20 mils to be applied to the girth welds.

1.1.2 These specifications are intended to cover the requirements for the field application of thin film thermosetting epoxy coating to pipeline circumferential (or girth) welds in pipe previously shop coated with epoxy, as well as the testing and repairing of the coating. Nothing contained herein shall be construed to relieve the Contractor of the obligation necessary for complete and satisfactorily coated pipe.

### 1.2 CLARIFICATION OF REQUIREMENTS

When coating or accessory material application or other requirements are omitted, uncertain, or in conflict with other project documents, the TESORO shall be notified for clarification of such requirements before quoting this Specification or the application of the material in question.

## 2.0 GENERAL

### 2.1 MANUFACTURER'S PUBLISHED DATA

Manufacturer's published data regarding coating and accessory materials storage, mixing, application, curing, etc., shall be considered an integral part of this Specification.

### 2.2 STORAGE OF MATERIAL

All coating and accessory materials shall be stored at the temperature and under the conditions required by the material manufacturer to prevent damage to and deterioration of the materials. Materials that have been damaged or allowed to deteriorate shall not be used for any application under this Specification.

## 3.0 THIN FILM THERMOSET EPOXY PIPE COATING

### 3.1 GENERAL

This segment of the specification is intended to cover the requirements of field application of thin film thermosetting epoxy coating to the girth welds of pipe previously shop coated with epoxy.

- 3.1.1 The Contractor supplied powdered resin used in the coating of the girth welds shall be one type - supplied by Nap-Gard.
- 3.1.2 Powdered epoxy shall be segregated and identified by batch number. Batches shall be used in rotational order starting with the oldest batch first.
- 3.1.3 Any deviations from this specification must be approved in writing by TESORO.

### 3.2 SURFACE PREPARATION

- 3.2.1 Contractor shall inspect and clean the bare steel pipe adjacent to and including the girth weld surface in accordance with Steel Structures Painting Council (SSPC), Surface Preparation Standards, SP-1 to remove oil, grease and loosely adhering deposits. Oil and grease shall be removed with a totally volatile, nonflammable solvent.
- 3.2.2 Following the initial cleaning described in Section 3.2.1 above, pipe shall be heated in a uniform manner to a minimum temperature of 5°F above the dew point temperature to assure that all moisture, grease and oil are removed. Contractor shall then blast clean the exterior bare pipe surface to near-white metal in accordance with SSPC SP-10 or National Association of Corrosion Engineers (NACE) Standard TM-01- 75. The grit or shot utilized by Contractor shall produce a surface profile of not less than 1.5 MILS and not greater than 3.5 MILS.
- 3.2.3 Any slivers or bristles of steel remaining on the newly blasted surface shall be removed by the use of high speed wire brushes, sanders, files or other approved methods. Remaining surface imperfections such as scale, burrs, scabs, weld spatter, etc. may be removed by grinding, provided that the remaining wall thickness measured by an electronic thickness gauge is no less than 5% less than the nominal wall thickness.
- 3.2.4 After the cleaning and surface preparation, the exterior of the pipe shall be cleaned of residual grit/shot and other contaminants by air blast or vacuum cleaning.
- 3.2.5 Girth welds shall be available for inspection by the TESORO representative after the blast cleaning, but before the actual coating process begins.
- 3.2.6 A minimum of two inches of the shop applied FBE coating on each side of the girth weld shall be roughened and the edge feathered to allow for adhesion of the new coating to the shop coating.
- 3.2.7 The cleaning crew shall work three welds ahead of the coating crew so that the blasting function does not contaminate the applied coating or bulk

materials and to limit the time available for surface rust to form on the cleaned pipe.

### 3.3 COATING APPLICATION

- 3.3.1 The application of the selected epoxy coating system shall be in accordance with the manufacturer's recommendations, including any primer or acid wash recommended by the manufacturer to enhance the bond of the epoxy to the pipe surface.
- 3.3.2 Pipe shall be uniformly preheated (after abrasive blast cleaning) to a temperature range of 462°F to 500°F or as otherwise specified by the epoxy manufacturer and approved by the TESORO. In no case shall the pipe temperature be raised above 500°F. Preheat temperatures shall be continuously monitored with Tempilstik.
- 3.3.3 Oxidation and/or bluing of the steel pipe in any apparent form shall be cause for rejection and recycling of the pipe through the cleaning process at no cost to the TESORO.
- 3.3.4 Girth weld heating shall be accomplished using induction heating and only with 100% duty-cycle machine. Flame heating is not permitted.
- 3.3.5 The induction heating machine shall be of such size that the weld joint will be uniformly heated to the 462°F specified temperature. The heat source shall not leave residue or contaminate the weld joint surface.
- 3.3.6 The heating zone shall extend around the circumference of the pipe, and over the roughened area of the previously applied shop coating.
- 3.3.7 The coating shall be applied using automatic spray techniques to a uniform minimum cured film thickness - as specified in Section 1.1.2. At no point shall coating thickness be less than the specified thickness.

### 3.4 INSPECTION AND TESTING

The Contractor is responsible for meeting the following requirements for inspection and testing of the coating.

- 3.4.1 Inspection records shall be maintained on each pipe joint and copies shall be made available to the TESORO.
- 3.4.2 Cured coating shall be of uniform color, thickness, and gloss, and shall be free of blisters, pinholes, sags or other irregularities judged detrimental by the TESORO.
- 3.4.3 The finished coating shall be inspected for thickness prior to lowering in or backfill. Each coated joint shall be checked at a minimum of four

random locations around pipe using a magnetic dry film thickness gauge. The Contractor provided gauge shall be calibrated at least once per eight-hour shift to U.S. Department of Commerce certified coating thickness standards.

**3.4.4** Where the minimum thickness is less than that specified, the coating thickness of the affected joint shall be measured at four different locations. The average of each set of measured values shall exceed the thickness specified in this specification.

**3.4.5** Any pipe joint with coating thickness not in compliance with section 3.3.7 or 3.4.4 of the specification shall be recoated at no cost to the TESORO.

### **3.5 HOLIDAY TESTING**

**3.5.1** The detector shall be a pulsed DC voltage type set within the range of 125 to 150 volts per mil thickness of coating. The test wand shall not be moved over the surface faster than 1 ft/sec.

**3.5.2** The holiday detector shall be calibrated at least once per eight-hour shift with a high impedance peak reading kilovolt meter.

**3.5.3** All holidays found shall be repaired.

**3.5.4** Where excessive holidays are encountered, Contractor shall cease coating operations and ascertain the cause of the defects. After corrective action is taken, trial coating runs shall be made to prove that the holiday problem has been corrected.

**3.5.5** Adequate lighting shall be available to facilitate a proper visual inspection of the girth weld coating system.

### **3.6 COATING REPAIR**

**3.6.1** The area to be repaired shall be cleaned of all rust, damaged coating and foreign material. All repaired areas shall maintain the proper anchor pattern required by the original shot blasting criteria.

**3.6.2** Repair material shall be compatible with the manufacturer's recommendations and shall be 100% solids liquid epoxy compounds.

**3.6.3** The repair compound shall be applied in accordance with the manufacturer's recommendations to a thickness no less than the specified coating and, except for pinholes, shall overlap the adjacent undamaged coating by a minimum of one inch.

### **3.7 REMOVAL OF COATING**

- 3.7.1 The following procedure shall be used to remove existing coating when necessary to make cuts, install taps or cathodic protection test stations.
  - 3.7.1.1 Coating may be burned off using a rosebud tip on an acetylene torch. Note: At no time shall the pipe be heated to above 400°F. Pipe temperature shall be monitored with a Tempilstik crayon.
  - 3.7.1.2 When existing coating turns black, it can then be removed with a power brush. Heat may be applied a second time if necessary recoating shall conform to Section 3.0 of this Specification



**TESORO LOGISTICS OPERATIONS, LLC.  
HIGH PLAINS PIPELINE SYSTEM - ND**

**BEULAH BASIN  
RAIL LOADING 10" PIPELINE  
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**POWERCRETE "J" COATING  
OF  
GIRTH WELDS**

**POWERCRETE "J" COATING  
OF  
GIRTH WELDS**

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## 1.0 SCOPE

### 1.1. GENERAL

These specifications are intended to cover the complete mill application of Powercrete "J" over Fusion Bonded Epoxy (FBE) coated girth weld; the testing and repairing of the coating, and the handling of the coated pipe. Nothing contained herein shall be construed to relieve the CONTRACTOR of the obligation necessary for complete and satisfactorily coated pipe.

The minimum thickness of the Powercrete "J" coating to be applied to the girth welds shall be 50 Mils.

### 1.2. CLARIFICATION OF REQUIREMENT

When coating or accessory material application or, other requirements are omitted, uncertain, or in conflict with other project documents, the COMPANY shall be notified for clarification of such requirements before quoting this Specification or the application of the material in question.

## 2.0 GENERAL

### 2.1. MANUFACTURER'S PUBLISHED DATA

Manufacturer's published data regarding coating and accessory materials storage, mixing, application, curing, etc., shall be considered an integral part of this Specification.

### 2.2. STORAGE OF MATERIAL

All coating and accessory materials shall be stored at the temperature and under the conditions required by the material manufacturer to prevent damage to and deterioration of the materials. Materials that have been damaged or allowed to deteriorate shall not be used for any application under this Specification.

## 3.0 POWERCRETE "J" COATING

This specification covers the requirement of spray or hand application of Powercrete "J", a polymer concrete coating to be applied over the girth weld on the primary FBE coating.

CONTRACTOR shall furnish all labor, supervision, materials, equipment and related hardware required for completing an acceptable coating.

Coating materials shall be plainly and permanently marked, stored, and applied in

accordance with the manufacturer's specification as directed by the COMPANY'S authorized representative.

### 3.1. SURFACE PREPARATION

The surface of the girth weld must be free of all deterioration of the primary coating, mud, oil, grease, moisture and other contamination. This coating shall be applied within two (2) days of Fusion Bond Epoxy application to the girth weld.

The entire primary coated surface shall be checked for holidays using a continuous electric holiday detector. The detector shall be set at 125-150 volts per mil thickness of coating, and shall be checked and re-calibrated, if necessary, every four (4) hours. All coating defects shall be marked with a nongrease marker and repaired and electrically re-inspected in accordance with the primary coating manufacturer's recommendations and to the satisfaction of the COMPANY.

The area of the primary coating to be repaired shall be cleaned of all rust, damaged coating and foreign material. The edges of the primary coating shall be lightly abraded adjacent to pinholes and shall be feathered adjacent to larger areas by hand sanding. All repaired areas shall maintain the proper anchor pattern required by the original shot blasting criteria.

Repair material shall be compatible with the primary coating manufacturer's recommendations, and shall be approved for use by COMPANY.

The repair compound shall be applied in accordance with the manufacturer's recommendations to a thickness no less than the specified primary coating and, except for pinholes, shall overlap the adjacent undamaged coating by a minimum of one inch.

### 3.2. POWERCRETE "J" COATING APPLICATION

The girth weld shall be preheated to insure that no surface moisture is present during actual coating application. Surface temperature can be as high as 130°F depending on local atmospheric conditions. Under no conditions should the coating be applied with a pipe surface in excess of 160°F, and less than 120°F. The pipe temperature shall be checked with appropriate temperature sticks.

The areas to be coated shall be shielded from the wind so that the coating is not contaminated. Dust and contaminants blown onto the wet coating shall necessitate stripping, re-blasting, and re-coating.

The girth weld shall be coated immediately after heating using a spray gun or other methods acceptable to the COMPANY, suitable for the purpose.

The first layer shall be applied uniformly to dry film thickness of not more than 18 Mils unless a casting mold is being used, or a thinner coating thickness is desired.

Successive layers of 20-40 Mils can be applied allowing 10 minutes between applications until desired thickness is achieved.

The coating shall taper uniformly and feather into the original coating with 12" of lap on both sides of the girth weld.

Any field joint having less than the specified minimum thickness shall be completely re-cleaned per Section 3.2 as necessary, reheated as per Section 3.3.1, and additional coating applied to achieve the specified dry film thickness.

Cured coating shall be of uniform color, gloss, and thickness, and shall be free of blisters, pinholes, fish eyes, sags, pimples, craters, and other irregularities. It is understood that contact with moisture after application may cause discoloration without affecting the quality of the coating.

Complete cure of the coating shall be verified prior to handling or installation.

The coating shall have a Shores Durometer Type "D" minimum reading of 75 after 24 hours.

Any joint of pipe having less than the specified minimum hardness will, at the COMPANY'S option 1) be re-tested after 24 hours, or 2) have the defective coating removed and reapplied as per this specification.

### 3.3. INSPECTION AND TESTING

All work done under this specification shall be subject to inspection and acceptance by the COMPANY. All parts of the CONTRACTOR'S facilities associated with this work shall be accessible to the COMPANY.

Coating thickness checks shall be made at ambient temperature with a magnetic pull-off film thickness gauge, which has been calibrated within the previous 24 hours, using a U.S. Bureau of Standards certified coating calibration standard. The thickness of the calibration standard shall be within 20% of the minimum required coating thickness. Thickness measurements shall be made in accordance with Steel Structures Painting Council, Surface Preparation Standards (SSPC)PA2, Section 2. The thickness measurements shall be made at the 12 o'clock and 6 o'clock position on the girth weld. Coating hardness checks shall be made at ambient temperature with a Type "0" Shores Durometer, laboratory calibrated within the previous 60 working days, in good working condition and no obvious damage. The checks will be made at 12 o'clock and 6 o'clock position on the girth weld.

Adequate lighting shall be available to facilitate a through visual inspection of the coating surface.

### 3.4. COATING REPAIRS



The CONTRACTOR, at no additional cost to the COMPANY, shall repair all damage detected by visual inspection.

Scars, dents, damaged areas, and large holidays shall be cleaned by removing all rust, scale, dirt or other foreign material and loose coating by using hand or power driven wire brushes. The area to be patched (holiday plus at least 3/4 inch of surrounding coating) shall be suitably roughened before patching (preferably by 120 grit "wet" or "dry" sandpaper). Files may not be used. Dust generated by the sanding is to be removed with a clean, dry cloth or brush prior to patching.

Areas not meeting hardness requirements shall be removed using a method that will not damage the primary coating or pipe.

COMPANY approved coating mixtures shall be used for patching holidays and damaged coating.

The surface to be patched shall be heated with a small torch until the patch area is thoroughly dry. The Powercrete "J" shall be mixed and applied over the heated surface.

Patches shall overlap the surrounding undamaged coating by a minimum of 3/4 inch.

Repairs are subject to re-inspection at the discretion of the COMPANY.



**TESORO LOGISTICS OPERATIONS, LLC.  
HIGH PLAINS PIPELINE SYSTEM - ND**

**BEULAH BASIN  
RAIL LOADING 10" PIPELINE  
PROJECT**

**HYDROSTATIC TEST PROCEDURE**

## **1.0 BACKGROUND AND SCOPE**

Tesoro Logistic Co. is proposing constructing approximately 4.1 miles of 10" crude oil pipeline from the Zap Block Gate Valve # 55 to the Basin Beulah Rail Loading Facility. The new pipeline will connect to an existing Tesoro Logistics 16" main line from Dunn Center to Mandan Refinery. The Zap Block Gate Valve is located approximately 55.78 miles North of Mandan, ND.

All station piping work & modifications will require hydrotest.

### **HYDROSTATIC TEST MEDIUM, SOURCE & DISPOSAL**

TEST MEDIUM: Water

WATER SUPPLY: The water will be supplied by the contractor.

WATER DISPOSAL: After the test, the water will be discharge according to existing environmental requirements.

## **2.0 DETERMINATION OF TEST PRESSURE AND DURATION**

All new piping will be hydrostatically tested to true 600 # pressure rating (between 1850 and 1900 psig) for 4 hours if above ground and 8 hours if underground. All testing instrumentation and equipment must be certified, calibrated, and current. All tests will be documented with signed charts, photos and/or sketches.

Minimum Test Pressure: 1850 psi

Maximum Test Pressure: 1900 psi

If water has to be added or removed, the volume will need to be documented. For this specific test, there are no elevation issues.

Deadweight readings will be taken at least every 10 minutes for the first hour and then every 15 minutes for the remainder of the test.

## **3.0 TEST CONSTRAINTS**

Since the hydrotest will be conducted outside, the piping and all associated facilities will need to be under a tent to minimize any direct sunlight or weather effects.

TESORO and contractor personnel participating in tasks for the hydrotest will need to provide OQ documentation for the required hydrotest tasks prior to the hydrotest. A copy of the OQ documentation for all responsible personnel will need to be included in the project file.

## **4.0 BASIS FOR ACCEPTANCE AND VALIDITY**

Following the fill of the system, a "Stabilization Period" will be implemented during which the temperature of the water, pipe and air equalize to the extent necessary to conduct a valid pressure test. This "Stabilization Period" will depend on the individual test conditions.

For a pressure test to be acceptable, the pressure drop should not exceed 2 psi/hour for the duration of the test, unless the test inspector determines that the pressure drop occurred for reasons other than a leak.

At the conclusion of the test, A Tesoro representative must sign all reports. Additionally, pressure recording charts should contain the following information:

|                        |                     |
|------------------------|---------------------|
| Test Report Number     | Test Medium         |
| AFE/Work Order Number  | Test Duration       |
| Service of Line Tested | Elevation Variation |
| Test Date              | Pipe Specifications |

*Deadweight Test Gauge Readings:*

|                         |  |
|-------------------------|--|
| Minimum Pressure (psig) | Minimum Temperature (°F)               |
| Maximum Pressure (psig) | Maximum Temperature (°F)               |
| Test spring Range       | Pressure Readings at defined intervals |

This information should be accompanied by a Tesoro personnel signature and certification statement such as, *"This is to certify that all piping and related fittings thereto as evidenced by this pressure recording chart have been subjected to a pressure test at the pressure and time duration indicated."*

Upon completion of the pressure test, the Project Manager will review the data produced. The Project Manager will prepare a Pressure Test Summary Report

**5.0 EQUIPMENT**

The accuracy of the equipment listed below is to be verified before each test and is to be calibrated and verified against certified test equipment within a period of six months before the test.

A copy of the deadweight and chart recorder calibration certification must be obtained before conducting the pressure test. Certification records for all equipment will be maintained with pressure test results, including:

Pressure Recording Instruments – A continuous record of the test pressure is to be obtained during each pressure test with a pressure recorder.

Temperature Recording Instruments – A continuous record of the ambient and ground (if underground test) near the pipe temperatures are to be maintained during each pressure test.

Pressure Test Equipment – Test pressure is to be continually verified by use of test equipment, including deadweight testing equipment or digital gauge.

#### **6.0 ENVIRONMENTAL AND SAFETY CONSIDERATIONS**

During the pressure test, Tesoro will ensure that every reasonable precaution is taken to protect the safety of employees and the general public. Tesoro will take all practical steps, including those listed below, to keep persons not working on test operations outside of the testing area until the pressure is reduced to or below the normal operating pressure.

Personnel performing the test should approach the pressurized line only in the performance of their duties. Where possible, personnel shall use safety barriers for protection from the pressurized line and position the testing equipment so as to minimize potential hazards.

Adequate support, bracing and location of pumping equipment and pressure piping shall be used in connecting to the facility to be tested.  
summarizing the test and acceptance of the test as a valid indication of the launcher's integrity.

#### **7.0 ENVIRONMENTAL AND SAFETY CONSIDERATIONS**

During the pressure test, Tesoro will ensure that every reasonable precaution is taken to protect the safety of employees and the general public. Tesoro will take all practical steps, including those listed below, to keep persons not working on test operations outside of the testing area until the pressure is reduced to or below the normal operating pressure.

Personnel performing the test should approach the pressurized line only in the performance of their duties. Where possible, personnel shall use safety barriers for protection from the pressurized line and position the testing equipment so as to minimize potential hazards.

Adequate support, bracing and location of pumping equipment and pressure piping shall be used in connecting to the facility to be tested.



**TESORO LOGISTICS OPERATIONS, LLC.  
HIGH PLAINS PIPELINE SYSTEM – ND**

**BEULAH BASIN  
RAIL LOADING 10" PIPELINE  
PROJECT**

**PIPELINE HYDROSTATIC TEST  
SPECIFICATIONS  
&  
FIELD TEST FORMS**



**PIPELINE HYDROSTATIC TEST SPECIFICATIONS**

**&**

**FIELD TEST FORMS**

**GENERAL**

- |                    |  |
|--------------------|--|
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| <b>SECTION 1 B</b> | <b>GENERAL SCOPE</b>                     |
| <b>SECTION 1 C</b> | <b>DEFINITIONS</b>                       |
| <b>SECTION 1 D</b> | <b>DESIGN, PLANNING, &amp; EXECUTION</b> |
| <b>SECTION 1 E</b> | <b>SPECIAL CONDITIONS</b>                |
|                    | ➤ <b>Hydrostatic Test Pressures</b>      |
|                    | ➤ <b>Contractor Staging Area</b>         |

## SECTION 1 A

### PURPOSE

This Standard establishes uniform practices for the design and planning, execution, review, and documentation for hydrostatic tests of piping associated with new construction, existing pipelines, station piping, and emergency stock pipe in accordance with:

- Department of Transportation (DOT) 49 CFR 195.300, Subpart-E — Pressure Testing
- Department of Transportation (DOT) 49 CFR 192.500, Subpart-J — Testing Requirements
- ANSI B31.4, "Liquid Petroleum Transportation Piping",
- ANSI B31.8, "Gas Transmission and Distribution Piping Systems,"
- API 1110, "Pressure Testing of Liquid Petroleum Pipelines", Department of Transportation (DOT) 49 CFR 195.452, Integrity Management Program (IMP) Pipeline Integrity Management
- API 1160, "Managing System Integrity for Hazardous Liquid Pipelines"
- Tesoro Logistics LP "Integrity Management Program"

This Standard is intended to be consistent with all Tesoro Logistics LP Standards.

## SECTION 1 B

### GENERAL SCOPE

This Standard covers piping associated with new construction, existing lines, station piping, and emergency stock pipe in both Department of Transportation (DOT) and "non-DOT" regulated service pipelines in accordance with the latest edition of the applicable codes and standards and as set forth herein.

## SECTION 1 C

## DEFINITIONS

**"Accepted Test Pressure"** shall mean the minimum pressure observed during the continuous period of time equal to the minimum specified test duration.

**"Central File"** shall mean the storage facility for all completed Hydrostatic Test Books.

**"Central Files-Ref-No"** shall mean Central Files Reference Number assigned to an original Hydrostatic Test Book.

**"Central Files Administrator"** shall mean the individual tasked with maintaining Tesoro Logistics LP pipeline documentation.

**"TESORO Representative"** shall mean the person assigned by the "TESORO" as its representative.

**"Component"** shall mean any part of a pipeline, which may be subjected to pump pressure including, but not limited to pipe, valves, appurtenances, fitting, flanges, and closures.

**"Contractor's Manager"** shall mean the person assigned by the "Contractor" as the Manager / Superintendent or his designated representative.

**"Project Engineer"** shall mean the individual tasked with providing engineering oversight for Tesoro Logistics LP district pipeline facilities.

**"Operations Manager"** shall mean the individual tasked with providing oversight for Tesoro Logistics LP's district pipeline operations.

**"Drafting Coordinator"** shall mean the individual tasked with maintaining Tesoro Logistics LP pipeline drawings.

**"Extra Work"** shall mean that work not included in the "Scope of Work," but is work requested of the "Contractor" by the "TESORO Representative."

**"Health, Environment and Safety Department Representative"** shall mean the individual tasked with ensuring Tesoro Logistics LP Health, Environment and Safety Standards and practices are followed.

**"IDP" shall mean the "Internal Design Pressure"** allowed based on the material characteristics (grade, wall thickness, type). The IDP is normally defined as the pressure that will result in a stress equal to the Specified Minimum Yield Strength ("SMYS") of the material multiplied by an applicable design factor.

**"Engineering Administrative Assistant"** shall mean the individual tasked with maintaining Tesoro Logistics LP pipeline engineering files — Hydrostatic Test Data Base.

**"Engineering Manager"** shall mean the individual tasked with providing oversight for Tesoro Logistics LP pipeline engineering functions.

**"Hydrostatic Test Log"** normally means a recording of data during a hydrostatic test at equally spaced time intervals. For tests performed prior to 1/8/71, the Office of Pipeline Safety has indicated that any record (documentation or data) may be used to show that

an acceptable test was conducted, as long as such records were made at the time of the test and result directly from that testing

**"Hydrostatic Test Book"** is Tesoro Logistics LP. (TLLP) record of the hydrostatic test and ensures that the record created by Tesoro Logistics LP complies with current Department of Transportation (DOT) 49 CFR 195.300, Subpart-E — Pressure Testing and the Department of Transportation (DOT) 49 CFR 195.452, Integrity Management Program (IMP) governing the content of such records.

**"Hydrostatic Test Database"** shall mean the sum of Tesoro Logistics LP entire hydrostatic test records required by Department of Transportation (DOT) 49 CFR 195.300 Subpart-E — Pressure Testing and the Department of Transportation (DOT) 49 CFR 195.452, Integrity Management Program (IMP) governing the content of such records — including supporting drawing, files, etc.

**"Mainline"** shall mean all parts of a pipeline facility through which a hazardous liquid moves in transportation, including, but not limited to, line pipe, valves, fittings, and other appurtenances connected to the line pipe.

**"MAOP"** means the "maximum operating pressure allowed" based on the material characteristics (Grade, Wall Thickness, and Type). The MAOP is normally defined as the pressure that will result in a stress equal to the Specified Minimum Yield Strength ("SMYS") of the material multiplied by an applicable design factor. "

**"Mechanical Contractor"** shall mean the firm or organization, including Mechanical Contractor's employees, agents, and other representatives, and the employees, agents, and other representatives of its' "Subcontractors" which have agreed / contracted to provide labor, material, and equipment necessary to hydrostatically test newly constructed pipeline or station as described by this Standard and Attachments.

**"Operations Superintendent / Foreman"** shall mean the individual tasked with providing operations oversight for Tesoro Logistics LP Jurisdictional and non-DOT Jurisdictional pipeline facilities.

**"On-Site Piping"** shall mean piping that is fabricated in the field and is hydrostatically tested separately before being tied into a larger system (mainline or station piping).

**"TESORO"** shall mean Tesoro Logistics LP. (TLLP), and its' operated systems. In the event that the TESORO is performing the Scope of this Standard, the terms "Mechanical Contractor" and "Testing Contractor" shall also apply to the "TESORO."

**"Pipeline"** shall mean all parts of a pipeline facility through which a hazardous liquid moves in transportation, including, but not limited to, line pipe, valves, fittings, and other appurtenances connected to the line pipe.

**"Pre-Fabricated Assembly"** means any part of a pipeline consisting of more than one piping component that is fabricated prior to installation in a pipeline and for which a post installation hydrostatic test is normally impractical.

**"Pressure Test Record Review"** shall mean the process used for assessing a hydrostatic test record for completeness. The "Pressure Test Record Review" documents this process.

**"Project Engineer"** means the primary person assigned to manage the physical completion and the engineering / operational records associated with a project. This

individual may be a Tesoro Logistics LP. Employee or a contracted individual who will be overseeing the proper documentation of the hydrostatic testing activities.

**"Scope of Work"** as used herein refers to any job specific requirement set forth by "TESORO" in addition to the general requirements set forth in this Standard.

"SMYS" means the "specified minimum yield strength of the material."

**"Specification"** as used herein refers to the minimum requirements of the TESORO in the performance of the "Scope of Work."

**"Specified Minimum Hydrostatic Test Pressure"** means the designated minimum pressure to which a pipeline section is to be tested. The minimum test pressure will usually be specified by the person responsible for the hydrostatic test and will be based on the pipe's physical characteristics and operating requirements. It is normally the minimum test pressure that should be applied to the most elevated point in the test segment.

**"Standard"** as used herein refers to the Codes, Regulations, Specifications, and Standards described in this Standard, and all other forms or documents comprising the contract between "TESORO" and the "Contractor" for the work described herein.

**"Station"** shall mean all parts of a pipeline facility through which a hazardous liquid moves in transportation, including, but not limited to, piping between station isolation valves, pumping units, fabricated assemblies therein, and lines to breakout tanks.

**"Stock Pipe"** shall mean pipe specifically hydrostatically tested by itself and is not associated with any piping system (station or mainline) and will be stored as inventory, including piping that was hydrostatically tested as part of a project, but is left over for inventory.

**"Subcontractor"** shall mean the firm or organization that has agreed to perform a portion of the work contracted to the "Contractor".

**"Tesoro"** or **"TESORO"** means Tesoro Logistics LP. (TLLP)

**"Testing Contractor"** shall mean the firm or organization including Testing Contractor's employees, agents and other representatives which has agreed / contracted with "TESORO" to provide labor, material and equipment necessary to provide hydrostatic testing services on existing pipelines and stations. In addition, on newly constructed pipelines or stations, "Mechanical Contractor as a "Subcontractor" to provide testing services may utilize "Testing Contractor". In some instances, the "Mechanical Contractor" may provide "Testing Contractor" services.

## SECTION 1 D

### INTRODUCTION

This Standard establishes uniform practices that shall be followed for the design and planning, execution, review, and documentation for hydrostatic testing of piping associated with new construction, existing pipelines, station piping, and emergency stock pipe for all Tesoro Logistics LP. (TLLP) operated pipeline systems or parts of a system. The practice has been designed in accordance with the following regulations, standards, codes, and practices:

Part 192, Title 49 CFR – "Transportation of Natural and Other Gas by Pipeline: Minimum Federal Safety Standards,".

Part 195, Title 49 CFR - "Transportation of Hazardous Liquids by Pipeline: Minimum Federal Safety Standards,".

ANSI B31.4, "Liquid Petroleum Transportation Piping,".

ANSI B31.8, "Gas Transmission and Distribution Piping Systems,".

API 1110, "Pressure Testing of Liquid Petroleum Pipelines,".

API 1160, "Managing System Integrity for Hazardous Liquid Pipelines,".

Any conflict in this Standard shall be reported immediately to the Engineering Manager. In the case of conflict between this Standard, referenced publications, or other associated documents, the following order of precedence shall be applicable:

***Applicable law***

**Codes or standards having the force of law**

**This Standard**

All newly constructed pipelines and modification to existing pipelines shall be properly pressure tested before being placed in or returned to service.

This Standard applies to pressure testing of both Liquid Petroleum Transportation Piping and Gas Transmission and Distribution Piping Systems.

**ROLES AND RESPONSIBILITY**

It is the responsibility of the Engineering Manager to ensure that all Tesoro Logistics LP. (TLLP) operated pipeline systems, or parts thereof, are properly pressure tested following this Standard. The responsibility for the actual performance of the design and planning, execution, and documentation of the pressure test may be done by Contract Engineer or Contract Engineer, Central Files Administrator, Engineering Administrative Assistant, and Drafting Coordinator.

Engineering Department shall be responsible for:

Approving the number and limits of proposed test segments for the pipeline or station piping that is to be isolated for purposes of pressure testing.

Approving the test pressure range required for each test, including the minimum pressure at the primary pressure reading location (deadweight tester), highest elevation in the test section, the maximum pressure allowed at the lowest elevation in the test section, and the maximum pressurization allowed above the minimum for variations due to stabilization.

Ensuring that all hydrostatic tests are designed, executed and documented following this Standard.

Reviewing and approving the hydrostatic test documentation (Hydrostatic Test Book) for completeness and accuracy.

Reviewing and approving the Hydrostatic Test Review forms (See Appendices) that summarizes the supporting documentation in the underlying Hydrostatic Test Book.

Reviewing and approving the hydrostatic test updates to Hydrostatic Test Record Database and the Hydrostatic Test Drawing Files.

Project Engineer shall be responsible for hydrostatic testing of DOT Jurisdictional pipeline facilities and other associated non-DOT Jurisdictional piping.

Contract Engineer shall be responsible for hydrostatic testing of non-DOT Jurisdictional pipeline facilities — gathering systems.

It is the responsibility of the Project Engineer or Contract Engineer to determine the hydrostatic test segment limits and test pressures.

**The Pipeline Pressure Test Record** shall be utilized by the Project Engineer or Contract Engineer to communicate the proposed test parameters.

It is the responsibility of the Project Engineer or Contract Engineer to create and complete the Hydrostatic Test Book, and to ensure that all necessary hydrostatic test records created are complete and accurate following this Standard.

For existing pipelines / stations — the Project Engineer or Contract Engineer shall be responsible for preparing the Hydrostatic Test Plan and writing the Hydrostatic Test Plan's Critical Task Analysis for performing the hydrostatic test. For existing pipelines / stations, the Critical Task Analysis shall be reviewed and approved by the Engineering Department and Operations Manager.

The Engineering Department shall be responsible for writing the Commissioning, Decommissioning and Re-Commissioning Plan section of the Hydrostatic Test Plan.

On new pipeline / station construction, the Mechanical Contractor is responsible for hydrostatic testing services. However, Mechanical Contractor may utilize a Testing Contractor to perform such work. The testing requirements listed in this Standard shall

be adhered to by Mechanical Contractor / Testing Contractor. The Mechanical Contractor is responsible for preparing the Hydrostatic Test Plan following form and content of the "Hydrostatic Test Plan Outline / Format for Testing Pipelines" .

For existing pipelines / stations, the Mechanical Contractor, TESORO, or TESORO's Testing Contractor may be responsible for the hydrostatic testing services. The testing requirements listed in this Standard shall be adhered to by Mechanical Contractor, TESORO, or TESORO's Testing Contractor.

All hydrostatic tests shall be conducted under the supervision of a qualified Inspector following Tesoro Logistics LP. (TLLP) Operator Qualification Plan.

The Inspector shall ensure that the specifications and procedures contained in this Standard are adhered to during the performance of all hydrostatic tests.

It is the responsibility of the Project Engineer or Contract Engineer to complete the "Hydrostatic Test Qualification Calculation" and the "Constrained Pipe Qualification Calculation" for 'buried-pipe' hydrostatic tests, and to approve the hydrostatic tests prior to rigging-down. When the Testing Contractor performs the Hydrostatic Test Qualification and Constrained Pipe Qualification Calculations, the Project Engineer or Contract Engineer shall verify the qualification calculations, and approve the hydrostatic test.

It is the responsibility of the Project Engineer or Contract Engineer to complete the Hydrostatic Test Review upon finalizing the Hydrostatic Test Book. The completed Hydrostatic Test Book (original and copy) shall be forwarded to the Central Files Administrator for inclusion into the Central Files, database input, and approval routing. The Project Engineer or Contract Engineer shall make a copy of the Hydrostatic Test Book and place it in the Project File while the original is being reviewed and approved.

The Central Files Administrator is responsible for maintaining the documentation management procedures contained herein and to maintain the Hydrostatic Test Books in Central Files.

It is the responsibility of the Drafting Coordinator to maintain the Hydrostatic Test Drawing files. Once the Hydrostatic Test Book has been approved, it is the responsibility of the Drafting Coordinator to update the drawings in the Hydrostatic Test Drawing files.

**TRAINING AND QUALIFICATION**

Performance of hydrostatic testing Operator Qualified "covered tasks" shall be in accordance with Tesoro Logistics LP. (TLLP) Operator Qualification Plan.

**DOCUMENTATION — Documentation Specified In The Standard Is Mandatory.**

**TESORO HYDROSTATIC TEST DESIGN AND PLANNING**

**Hydrostatic Test Design Specifications**

This section provides the Project Engineer or Contract Engineer planning considerations to perform hydrostatic testing. As applicable, all newly constructed or installed pipelines or existing pipelines that are relocated, replaced, or otherwise physically changed (excluding lowering) shall be hydrostatically tested before being placed in or returned to service (See either 49 CFR 195.302 or CFR 192.503, where applicable.).

**Summary of Pressure Test Requirements**

| <b>LIQUID LINES</b>                      | <b>Minimum Test Pressure</b>   | <b>Minimum Test Time (hrs.)</b> | <b>Controlling Regulation</b> |
|--|--------------------------------|---------------------------------|-------------------------------|
| Non-DOT Jurisdictional Piping            | Consult with Contract Engineer | Consult with Contract Engineer  | ASME B31.4                    |
| Drain Lines open to atmospheric sumps(2) | 100 psi w/ Air or Water        | 1                               | None                          |



**BEULAH BASIN RAIL LOADING 10" PIPELINE PROJECT**

**CONSTRUCTION PROJECT DOCUMENT  
MAY 19, 2014**

| <b>LIQUID LINES</b>                               | <b>Minimum Test Pressure</b> | <b>Minimum Test Time (hrs.)</b> | <b>Controlling Regulation</b> |
|---|------------------------------|---------------------------------|-------------------------------|
|   | or Equivalent Static Test    |                                 |                               |
| DOT Jurisdictional Piping                         |                              |                                 | DOT 195<br>ASME B31.4         |
| Buried Pipe                                       | 1.25 x MOP<br>1.10 x MOP     | 4<br>4(1)                       | DOT 195<br>ASME B31.4         |
| Visually Examined Pipe Segments, Components, Etc. | 1.25 x MOP                   | 4                               | DOT 195<br>ASME B31.4         |
|   |                              |                                 |                               |
| <b>GAS LINES (Steel Pipe)</b>                     | <b>Minimum Test Pressure</b> | <b>Minimum Test Time (hrs.)</b> | <b>Controlling Regulation</b> |
| MOP > 30 Percent of SMYS                          |                              |                                 | DOT 192<br>ASME B31.8         |
| Class 1 Locations <sup>(3)</sup> <sup>(4)</sup>   | 1.10 x MOP                   | 8                               | DOT 192<br>ASME B31.8         |
| Class 2 Locations <sup>(3)</sup> <sup>(4)</sup>   | 1.25 x MOP                   | 8                               | DOT 192<br>ASME B31.8         |
| Class 3 Locations <sup>(3)</sup>                  | 1.50 x MOP                   | 8                               | DOT 192<br>ASME B31.8         |
| Class 4 Locations <sup>(3)</sup>                  | 1.50 x MOP                   | 8                               | DOT 192<br>ASME B31.8         |



1. Consideration shall be given to testing the piping for 8 continuous hours at a pressure equal to 125 percent, or more, of the maximum operating pressure (MOP) if conditions warrant.
2. Drain piping is not considered to be DOT Jurisdictional and operates at such a low percentage of yield strength that a hydrostatic test conducted in compliance with DOT 195 to confirm its integrity is not required. All threaded connections in the drain piping should be checked for leakage during the "Proof Test" or "Stand-Up Test." No formal documentation in the form of a test record shall be required for the "Proof Test" associated with drain piping open to atmospheric sumps.
3. For fabricated units and short sections of pipe for which a post-installation test is impractical, a pre-installation strength test must be conducted by maintaining the pressure at or above the test pressure for at least (4) hours.
4. See additional testing criteria for Class 1 and Class 2 locations in DOT 192.505(a) and (b).

**New or Existing DOT Jurisdictional Line Pipe / Station Piping:**

Station piping shall be hydrostatically tested to the flange rating of the new installation.

New line pipe and stock pipe shall be hydrostatically tested to a minimum of 90% of "SMYS."

Line pipe being installed into an existing line shall match the wall thickness, grade, and minimum test pressures of pipe immediately upstream and downstream of the installation.

**Bends**

Bends formed by "cold" processes (even those made with previously hydrostatically tested pipe) shall be hydrostatically tested after they are formed, prior to being placed in service.

**Components**

A component, other than pipe, that is the only item being replaced or added to the pipeline system need not be hydrostatically tested if the manufacturer certifies that either:

The component was tested to at least the test pressure required for the pipeline to which it is added, or

The component was manufactured under a "quality control system" as identified below that ensures that each item manufactured is at least equal in strength to a prototype and that the prototype was tested to at least the test pressure required for the pipeline to which it is added.

Pipeline components manufactured in accordance with the following standards do not require hydrostatic testing by Tesoro Logistics LP. (TLLP) when the component is the only item added to the pipeline.

| Manufacturing Standard | Components Covered                        |
|------------------------|---|
| API 6D                 | Valves, closures, swivels, and mechanical |

|                |   |
|----------------|---|
|                | connectors                                      |
| API 600        | Steel gate and plug valves for refinery service |
| ASME Sec. VIII | Closures and pressure vessels                   |
| ANSI B16.5     | Flanges, flanged valves, and fittings           |
| ANSI B16.9     | Weld-End fittings                               |
| MSS SP 44      | High-Yield flanges                              |
| MSS SP 75      | Weld-End fittings                               |
| ANSI B16.11    | Screw-End fittings                              |
| ANSI B16.34    | Weld -End valves                                |

Pre-fabricated piping assemblies (including those made utilizing previously tested line pipe and components) shall be hydrostatically tested as a unit prior to installation. It is permissible to divide the piping into multiple test sections; however, the breaks should be made at flanged connections whenever possible. The welds not subject to hydrostatic testing should be limited to tie-in welds whenever practical and shall be non-destructively tested (radiograph or equivalent) in their entirety.

**Test Medium**

The test medium for Tesoro Logistics LP. (TLLP) should be water. An alternate medium may be used with the appropriate approval from the Engineering Manager. If a medium other than water is to be utilized on a DOT-Jurisdictional line for testing purposes, all applicable requirements as outlined under section CFR 195.306 or CFR 192.503 shall be met.

Tesoro Logistics LP. (TLLP) Health, Environment and Safety Department shall select or approve the sources of water to be used and may specify requirements for filtering, chemical treatment, and / or the use of additives such as corrosion inhibitors, leak-finding aids, etc.

The acquisition and disposal of test media shall be reviewed by Tesoro Logistics LP. (TLLP) Health, Environment and Safety Department Representative prior to executing the work to ensure all permits, (if necessary) have been acquired and limitations addressed.

**Hydrostatic Test Pressure and Duration**

For mainline piping, consideration shall be given to testing the entire section of piping to a minimum of 95% of the SMYS of the pipe where practical to provide for maximum future utilization of the pipe. For emergency stock pipe, the pipe should be tested to a minimum of 95% of yield strength unless the pipe is of sufficient diameter / wall thickness / grade combination that installed flange pressure ratings or test equipment

may actually limit the potential pressures the pipe could operate at. This is normally the case with small diameter pipe (<10-inch).

The following table lists the minimum test pressures for various ANSI piping classifications. The strength of each piping component (pipe, valve, fittings, and flanges) to be tested must be considered in determining the ANSI classification and resultant hydrostatic test pressure.

| <b>Standard Minimum / Maximum Test Pressures</b> |  |  |
|--|--|--|
| <b>ANSI CLASSIFICATION (Liquid Lines)</b>        | <b>MIN. TEST PRESSURE (psi) (ASME B31.4)</b>                           | <b>MAX. TEST PRESSURE (psi) (Recommended)</b>                          |
| ANSI 150<br>(IDP=285 psi)                        | 356 psi  | 425 psi  |
| ANSI 300<br>(MAOP=740 psi)                       | 925 psi  | 1100 psi   |
| ANSI 400<br>(IDP=990 psi)                        | 1238 psi   | 1475 psi   |
| ANSI 600*<br>(MAOP=1480 psi)                     | 1850 psi*  | 2200 psi*  |
| ANSI 900*<br>(IDP=2220 psi)                      | 2775psi*   | 3300 psi*  |
| ANSI 1500*<br>(MAOP=3705 psi)                    | 4630 psi*  | 5500 psi*  |
| <b>ANSI CLASSIFICATION (GAS LINES)</b>           | <b>MIN. TEST PRESSURE (psig) (ASME B31.8)</b>                          | <b>MAX. TEST PRESSURE (psig) (Recommended)</b>                         |
| ANSI 150<br>(IDP=275 psi)                        | Class 1: 303 psi<br>Class 2: 344 psi<br>Classes 3 and 4: 413 psi       | Class 1: 353 psi<br>Class 2: 394 psi<br>Classes 3 and 4: 463 psi       |
| ANSI 300<br>(MAOP=720 psi)                       | Class 1: 792 psi<br>Class 2: 900 psi<br>Classes 3 and 4: 1080 psi      | Class 1: 842 psi<br>Class 2: 950 psi<br>Classes 3 and 4: 1130 psi      |
| ANSI 600*<br>(IDP=1440 psi)                      | Class 1: 1584 psi*<br>Class 2: 1800 psi*<br>Classes 3 and 4: 2160 psi* | Class 1: 1634 psi*<br>Class 2: 1850 psi*<br>Classes 3 and 4: 2210 psi* |

|                              |  |  |
|------------------------------|--|--|
| ANSI 900*<br>(IDP=2160 psi)  | Class 1: 2376 psi*<br>Class 2: 2700 psi*<br>Classes 3 and 4: 3240 psi* | Class 1: 2426 psi*<br>Class 2: 2750 psi*<br>Classes 3 and 4: 3290 psi* |
| ANSI 1500*<br>(IDP=3600 psi) | Class 1: 3960 psi*<br>Class 2: 4500 psi*<br>Classes 3 and 4: 5400 psi* | Class 1: 3410 psi*<br>Class 2: 4550 psi*<br>Classes 3 and 4: 5450 psi* |

**\*NOTE:** For pipe 14 inches in diameter or greater, caution should be used in utilizing these pressures since the flange hub may limit IDP of the flange. Specify calculated values for minimum and maximum test pressures that comply with MSS-SP-44 "Steel Pipeline Flanges."

**Buried Pipe Segments**

The test duration for buried pipe segments that is required by regulations for liquid pipelines is at least 4 continuous hours at a pressure equal to 125 percent or more of the maximum operating pressure (MOP) and additional 4 continuous hours at a pressure equal to 110 percent or more of the MOP. Consideration shall be given to testing the piping for 8 continuous hours at a pressure equal to 125 percent or more of the maximum operating pressure (MOP) when conditions warrant.

**Exposed Pipe Segments, Assemblies, and Components**

The test duration for exposed pipe, assemblies, and components (when all the piping can be visually examined for leakage during the test) shall be at least 4 continuous hours at a pressure equal to 125 percent or more of the maximum operating pressure (MOP).

**Above Ground Storage Tanks**

Design and procedural requirements for hydrostatic testing above ground storage tanks shall be conducted and documented in accordance with Tesoro Logistics LP. (TLLP) storage tank Standards.

**Maximum Allowed Test Pressures**

The maximum allowed test pressures on piping subject to a hydrostatic test should **not** exceed **98%** of SMYS for any piping under test, nor should it exceed **1.5** times the MAOP of any flanges without prior approval from the Engineering Manager.

**Hydrostatic Test Design and Planning Process and Documentation**

**Purpose**

This section provides the Project Engineer or Contract Engineer with guidelines to ensure uniform procedures for designing and planning and documenting hydrostatic tests for new construction, existing pipelines, station piping and associated appurtenances, and emergency stock pipe in accordance with the Department of Transportation (DOT) 49 CFR 195.300 Subpart-E — Pressure Testing, Department of

Transportation (DOT) 49 CFR 192.500 Subpart-J — Testing Requirements, and Department of Transportation (DOT) 49 CFR 195.452, Integrity Management Program (IMP).

To ensure uniformity of design and planning and documentation, a Hydrostatic Test Book and all its specified attachments shall be compiled for all DOT and non-DOT Jurisdictional hydrostatic tests. The Hydrostatic Test Book shall be prepared by the Project Engineer or Contract Engineer with the following tabs

- Hydrostatic Test Review
- Hydrostatic Test Index
- Hydrostatic Test Drawing
- Pipeline Pressure Test Record Narrative
- Hydrostatic Test Plan Pressure / Temperature Charts (original and copy)
- Calibration Certificates
- Deadweight Tester
- Chart Recorder
- Temperature and / or Pressure probes, etc

***Supporting Drawings (as applicable)***

- DOT Jurisdictional Drawing Mark-Up
- Hydrostatic Test Drawing Mark-Up
- Hydrostatic Test Configuration Drawing
- Pressure Control Section Drawing Mark-Up
- Revised MOP Profile
- Two-Line Piping Installation Mark-Up,
- Alignment Sheet Drawing Mark-Up
- Mainline Pipe Installation Mark-Up
- Hydrostatic Test Qualification Calculations
- Constrained Pipe Qualification Calculation
- Pipe Installation Summary
- Pipe Installation Summary
- Failure Analysis / Records
- Hydrostatic Test Failure Record
- Purchase Orders
- Material Test Reports (MTR)
- Operator Qualifications
- Field Notes
- The Hydrostatic Test Review
- Hydrostatic Test Index

- Hydrostatic Test Drawing

The Hydrostatic test book shall also include are Tesoro Logistics LP. (TLLP) records that ensures the hydrostatic test record created by Tesoro complies with Department of Transportation (DOT) 49 CFR 195.452, Integrity Management Program (IMP) and Tesoro's Integrity Management Program governing the content of such records.

The Pipeline Pressure Test Record and all its specified attachments, is Tesoro's record of the pressure test of the pipelines and / or pipeline facilities that meets the Department of Transportation regulations, industry standards, and TESORO policies, procedures, and practices. The Pipeline Pressure Test Record shall be completed for all pressure tests, and filed under the appropriate tab in the Hydrostatic Test Book.

Once the hydrostatic test has been completed, the Hydrostatic Test Review, and Hydrostatic Test Drawing shall be updated to ensure compliance with Tesoro's Integrity Management Plan. A separate Form shall be required for each test conducted.

If the test includes pipe that will be installed at different locations or facilities, or are made of more than one line or line section, a Hydrostatic Test Forms shall be required to be completed for each location, facility, or line section tested.

The hydrostatic test data should be recorded on the second and or third pages of the Form. All required support documents shall be attached to the Form.

Narrative — A 'Narrative' shall be required for all 'constrained' (below-ground) tests and for all tests for which a 'failure' occurred. The Narrative should include a brief discussion of the test preparation, including date of the test, the duration of the test, a discussion of any failures occurring during the test, an explanation of any pressure discontinuities that appear on the charts, and personnel involved with the hydrostatic test, etc. A copy of the Hydrostatic Test Plan (Critical Task Analysis) with a column added to document actual times, events, and results of the test may be considered as adequate.

The Hydrostatic Test Plan should provide the following minimum information: A detailed Hydrostatic Test Plan shall be required for all DOT Jurisdictional constrained (buried) line pipe and station pipe test segments including Hydrostatic Test Plan Template, drawings supported by tables showing the test segments or assemblies, the location of the Deadweight Tester and injection points, and the minimum and maximum test pressures and minimum durations for each test segment.

The calculations utilized to determine the minimum and maximum target test pressures.

For pipelines where the elevation change is greater than one-hundred feet, elevation profiles showing the test limits and the hydraulic elevation gradient for each test segment supported by the calculations used to determine the pressure limits.

Isolation drawings showing the locations of all valves, valve requiring removal, blinds, and equipment to be locked-out and tagged-out (LO/TO), highlighting the weakest link or controlling component in each test section.

Valve listing specifying the station number or location, the type, size, ANSI pressure rating, manufacturer, and serial number of all valves tested and removed under the plan.

Test medium type and volume required (line fill plus failure contingency volumes) including acquisition, handling, and disposal to ensure an adequate supply of test medium to fill the line section, assembly or component.

A detailed Project Execution Plan including Critical Task Analysis annotated with applicable Operator Qualification and environmental and safety precautions and procedures.

A Commissioning, Decommissioning, and Re-Commissioning Plan shall be included.

A Purge Plan to purge the pipeline of its residual content, to ensure the section being tested is completely filled with the test medium, and to ensure test medium's removal at the end of the test.

Pressure / Temperature Charts and Data — A Pipeline Hydrostatic Test Sticker shall be filled out and placed on the back of *each* chart to ensure all required data for the hydrostatic test is collected. Pressure / temperature charts are to be certified by the person responsible for the test by placing their signature on the front of the chart and sticker.

Calibration Certificates (Deadweight Tester, Chart Recorder, Temperature and or Pressure probes, etc.) — The latest calibration certificates are required for the deadweight tester and all recorders (pressure and temperature), and probes.

**\*\* The calibration date must be no more than one year prior to the hydrostatic test date.**

Operator Qualifications — The Operator Qualifications for both the hydrostatic test technician and supervising Inspector shall be included as part of the test record.

Hydrostatic Test Design and Planning Process

The flowchart "Hydrostatic Test Design and Implementation", shows the overall design and planning, execution, documentation, and review and approval process for all Tesoro Logistics LP, (TLLP) hydrostatic tests.

The Project Engineer or Contract Engineer shall get copies of the (1) Hydrostatic Test Drawing and supporting piping drawings

Using the Hydrostatic Test Drawing and piping drawings as a base, The Project Engineer or Contract Engineer shall create the Hydrostatic Test Drawing Mark-Up by delineating the limits of each test section annotating each test segment with the following information:

- Date
- Description (including the Field Test Number)
- ANSI Piping Classification
- Minimum Test Pressure (psi)
- 0.80 X Minimum Test Pressure (psi)
- AFE/Project #
- Comments

The Project Engineer or Contract Engineer shall complete the Design Data section of the Hydrostatic Test Pressure Record (See Appendices) including attachments, Assign the Hydrostatic Test Number to the test and complete the summary information.

If the Design Data lowers the MOP of the piping, the Engineering Department shall forward the information to the Operation Department for approval.

Once the Design Data has been approved, the Engineering Department shall forward the signed Hydrostatic Test Pressure Record (See Appendices) to operations as approval to proceed with the hydrostatic test.

### **Hydrostatic Test Execution**

This section provides the Mechanical / Testing Contractor, Inspector, and Project Engineer or Contractor Engineer with the specifications for the performance of hydrostatic testing to ensure uniform testing of new construction, existing pipelines, station piping and associated appurtenances, and emergency stock pipe in accordance with the Department of Transportation (DOT) 49 CFR 195.300 Subpart-E — Pressure Testing, Department of Transportation (DOT) 49 CFR 192.500 Subpart-J — Testing Requirements, and Department of Transportation (DOT) 49 CFR 195.452, Integrity Management Program (IMP).

### **Hydrostatic Test Execution Specifications**

A Hydrostatic Test Plan shall be required for all DOT Jurisdictional and non-DOT Jurisdictional 'constrained' (buried) pipelines and station pipe test segments.

The Project Engineer or Contract Engineer shall prepare the Hydrostatic Test Plan covering all existing pipelines, pipeline segment, and station piping.

The Mechanical Contractor shall prepare the Hydrostatic Test Plan for all new pipeline and station construction.

Tesoro's Operations shall be responsible for the commissioning, decommissioning and re-commissioning of all Tesoro's existing pipeline, segments of pipelines and stations.

Decommissioning covers all activities required to remove the system from active service including the removal of liquid from the system to the extent that no release will occur while the system is being taken out-of-service. Re-Commissioning covers all activities required to return the system to active service.

The Engineering Department shall be responsible for writing the Commissioning, Decommissioning, and Re-Commissioning plan portions of the Hydrostatic Test Plan.

Tesoro's Lock-Out / Tag-Out (LO/TO) Plan and Procedures shall be followed at all times.

### **The Operations shall ensure**

- Sufficient personnel are on site to conduct the commissioning, decommissioning, and re-commissioning activities.
- Serviceability of the valves, gauges, etc., scheduled for use in the performance of the decommissioning / drain-up and re-commissioning activities.
- Piping section being tested is isolated in accordance with the Hydrostatic Test Plan and Commissioning, Decommissioning, and Re-Commissioning Plan.

- All equipment or energy-storing devices are locked-out and tagged-out in accordance with the Hydrostatic Test Plan — Critical Task Analysis, Commissioning, Decommissioning, and Re-Commissioning Plan, and Tesoro's Lock-Out / Tag-Out (LO/TO) Plan and Procedures.
- All rectifiers attached to piping under test are turned-off, locked-out and tagged-out in accordance with the Hydrostatic Test Plan, Commissioning, Decommissioning, and Re-Commissioning Plan, and Tesoro's Lock-Out / Tag-Out (LO/TO) Plan and Procedures.
- All main line and station valves that will be included in the hydrostatic test shall be positioned flagged open, and physically inspected during the period of the test for stem leakage or leakage of auxiliary piping.

Mechanical Contractor / Testing Contractor shall place Contractor LO/TO at all locations locked out and tagged out by Operations.

Operations shall approve the installation of all temporary blind flanges, or weld caps, at the locations shown by Hydrostatic Test Plan to isolate the test section.

The Testing Contractor is responsible for adhering to the following hydrostatic testing specifications.

Testing Contractor shall be responsible for knowing and completing the hydrostatic test documentation requirements outlined in this Standard, and providing the TESORO with the required information in a timeframe designated by the TESORO.

Testing Contractor shall furnish as a minimum the following instruments for the hydrostatic testing:

- Deadweight tester appropriate for the test pressure specified and calibrated to a maximum of one (1) pound increments.
- Calibrated pressure recording instruments appropriate for the test pressure specified, with a minimum 10-inch, 24-hour rotating chart with 50 psi maximum increments, or a strip chart recorder which can be read to the same resolution. Testing Contractor shall ensure that the chart recorder pens provide a clear and distinct trace.
- Calibrated temperature measuring and recording instruments with a range of 0 - 150 degrees F with 10 degree F maximum increments, with a minimum 10 - inch, 24 hour rotating chart (or strip chart of same resolution) for recording line temperature.

All testing instruments, including pressure gauges, pressure recorders, pressure indicators, temperature gauges, thermometers, and temperature recorder shall be calibrated within the past 12 months prior to use. Certification of equipment calibration shall be provided to TESORO prior to the beginning of the test.

The test instruments shall be installed at, or near the point where the line is filled or at the pressure location as directed by TESORO. These instruments shall be manned at all times when the line is under test unless more than one set of instruments is installed on the same test section for redundancy.

TESORO may install, at its option, the TESORO's deadweight tester or other equipment to monitor the equipment installed by Testing Contractor. The Testing Contractor shall provide the necessary connection points.

All equipment and materials supplied for hydrostatic testing by Testing Contractor shall meet the approval of TESORO prior to being used; all equipment shall be properly selected and maintained in good working condition. Pumping equipment shall have safety relief valves to prevent over-pressurizing beyond the specified test pressure. The relief valves shall be set at the specified test pressure plus 5%.

Water shall be used as the test medium. Specific deviations are allowed under 49 CFR195, Section 195.306 for certain types of lines. TESORO may approve alternate test mediums on a case-by-case basis.

Water to be used in the test shall be clean, fresh filtered water as approved by TESORO. A sample will be furnished to TESORO for analysis upon request. Testing Contractor shall work with TESORO's Health, Environmental & Safety Representative to coordinate the discharge permit unless otherwise noted by TESORO. Testing Contractor shall not discharge water without a discharge permit.

Once the water has been placed into the mainline or station test section(s), samples shall be pulled for analysis. Two to three samples shall be required for all mainline tests (head end, tail end, and mid-point if possible). At the discretion of Tesoro's Health, Environmental and Safety Representative, station piping tests may or may not require a water sample to be pulled.

The TESORO's Health, Environmental and Safety Representative shall coordinate sampling testing. Samples shall be delivered to the assigned laboratory as soon as possible. Hydrostatic testing shall proceed only after confirmation of receipt and, or test results from the Health, Environmental and Safety Representative.

After the pipeline segment is filled with water and all recording instruments indicate that the temperature and pressure in the pipeline have stabilized and the pipeline has had all air bled, Testing Contractor shall pressurize the line with the pressurizing pump, maintaining continuous surveillance over the operation to ensure that the pressure does not exceed the maximum specified test pressure.

After the specified test pressure is obtained and pumping has stopped, the pressurizing pump shall be disconnected or its connection to the line shall be blocked, and the piping connections to the pipeline shall be inspected for leakage. Once the piping has been inspected, the Testing Contractor shall start the hydrostatic test on the ¼-hour.

For 'constrained pipe' (buried), the specified test pressure shall be held for a period of 8 hours (4 continuous hours at a minimum of 125% of MOP and 4 continuous hours at a minimum of 110% of MOP or 8 continuous hours at a minimum of 125% of MOP).

For exposed and visible pipe, the specified test pressure shall be held for a period of 4-hour at a minimum 125% of MOP.

For all hydrostatic tests, the pressure and temperature readings shall be recorded, pressure and temperature recorders run continuously, and the specified test pressure verified as being maintained.

The Testing Contractor shall provided a means to accurately inject / collect and measure the amount of 'fluid-add' and 'fluid-bleed' (measured to the nearest 1/3 fluid ounce (or

0.01 liters). In the event that the Testing Contractor does not provide an accurate means of injecting, collecting, and measuring, the Testing Contractor shall bear all the costs associated with any delay, including delays resulting in missing the scheduled pipeline testing window.

In the event of testing equipment failure, all costs of repairing and re-pressuring shall be borne by Testing Contractor, including delays resulting in missing scheduled pipeline testing window.

The Testing Contractor shall provide one or more back-up temperature probe / recorder on-site in the event of a temperature probe failure.

Testing Contractor shall insure that during the test, the test head is protected and / or shaded from the elements to minimize the temperature / pressure effect on the system.

Testing Contractor shall place the constrained pipe (ground) temperature probe along the pipe at least two feet back from the cut, covered by a minimum of two (2) feet of earth.

Testing Contractor shall place the unconstrained pipe (exposed) temperature probe on the pipe to be out of direct sunlight for the entire test period.

Dead-weight tester pressure recorder checks shall be made at the commencement, middle, and termination of the test period. The results of the dead-weight tester checks shall be recorded on the Pipeline Pressure Test Record.

The test pressure and temperature recorders shall be set to real time and all additional pressure / temperature and temperature chart recorder shall be time synchronized.

The Testing Contractor's technician shall take and record the test pressure and temperature data on the Pipeline Pressure Test Record with the following minimum information:

- Time
- Deadweight pressure
- Pressure gage indicator reading (as applicable)
- Volume of 'fluid-add'
- Volume of 'fluid bleed'
- Corresponding pressure change resulting from 'fluid-adds' and 'bleeds'
- (record from and to)
- Constrained pipe (ground) temperature probe values, probes
- Unconstrained pipe (exposed) temperature probe values, probes
- Ambient air temperature
- Pressure reading difference between the dead-weight and the pressure
- Chart recorder at the beginning, middle, and end of the test.

For each constrained (buried) pipe hydrostatic test, Testing Contractors shall provide the TESORO a copy of the Pipeline Pressure Test Record times, test pressures, test temperatures, 'fluid-add' and 'fluid-bleed' volumes, pressure-temperature variation calculations, and test notes, for analysis and hydrostatic test approval.

The Testing Contractors shall not terminate the hydrostatic test until the Tesoro has approved the test, or provided further instruction.

A complete record of leaks and failures occurring during the test shall be maintained. The record shall include the exact location, calculated, or observed pressure at the location of the failure / leak, type and cause of failure, method of repair, etc. All records shall be submitted to TESORO for approval and retention.

If during the test period a drop in pressure associated with a leak should occur, Testing Contractors shall search for leaks, de-pressure, and de-water the line to the extent necessary to repair the leak (s).

After a leak has been repaired, the line shall be refilled and the pressurizing process as outlined previously shall be performed again. The above testing process shall be repeated until all leaks are permanently repaired and the specified test pressure can be satisfactorily maintained following the specification.

For new construction, leaks and failures resulting from poor workmanship on the part of Mechanical Contractor (leaks that cannot be ascribed to inherent mechanical or metallurgical deficiencies) shall be repaired as directed by TESORO and all costs of repairing, re-pressuring, and re-testing shall be borne by Mechanical Contractor.

For leaks caused by exceeding the specified maximum test pressure by 10 psig or more, as indicated by the pressure recording devices, shall be termed poor workmanship on the part of the Testing Contractor and all costs of repairing, re-pressuring and re-testing shall be borne by Testing Contractor.

In the event of freezing temperature, Testing Contractor shall prevent freezing of test lines and above-grade piping. Testing Contractor shall provide bales of straw, heaters, and canvas tents to cover areas of pipe that are susceptible to freezing during the hydrostatic test. No anti-freeze or equal shall be added to the test water unless approved by TESORO.

All temporary installations / connections, etc., shall be dismantled and the pipeline shall be brought into its permanent state by the Testing Contractor.

Testing Contractor shall leave the premises clean and in the same conditions as existed prior to running the tests.

#### Hydrostatic Test Execution

The Inspector shall ensure that the Testing Contractor meets all the requirements of this Standard.

Prior to beginning the hydrostatic test, the Inspector shall file or cause to be filed the following applicable documentation under the appropriate tab in the Hydrostatic Test Book:

- Operator Qualification as required by Tesoro Logistics LP. (TLLP) Operator Qualification Plan for both the Inspector and Testing Contractor's technician — all tests.
- Calibration Certifications for the Dead-weight Tester, Chart Recorder (s), and temperature probes (and chart recorders) — all tests.
- A Pipe Installation Summary giving for each diameter pipe, the grade, wall thickness, and heat number, and a similar tally of high-yield fitting and flanges

including the heat numbers — all new construction and modifications to existing piping.

- The MTR for each heat number including high-yield fittings and flanges — all new construction and modifications to existing piping.
- Copies of the Purchase Order (or equivalent) for all pipe and high-yield fittings and flanges — all new construction and modifications to existing piping.
- Hydrostatic Test Plan — mandatory for all constrained (buried) pipe tests.

**Prior to the beginning of the hydrostatic test, the Inspector shall**

- Confirm that the test water source is in accordance with Hydrostatic Test Plan and applicable permits.
- Ensure that the test water sample kits are available for collecting discharge water samples in accordance with permits. (If applicable)
- Ensure that the Mechanical or Testing Contractor gathers all necessary water samples required by the NPDES – National Pollutant Discharge Elimination System, sampling program and other applicable permits.  
(If applicable)
- Ensure failure samples shall be appropriately handled and labeled in accordance with NPDES sampling program and other applicable permits.
- Ensure that all frac-tanks to be used have secondary spill containment in place.
- Verify that the test pressures are appropriate for the facility to be tested, in accordance with the approved Hydrostatic Test Plan.
- Ensure that the test duration is in accordance with 49 CFR Part 195, Subpart-E, 195.304 – Test Pressure or Department of Transportation (DOT) 49 CFR 192.500, Subpart-J — Testing Requirements.
- Verify that hydrostatic testing equipment (deadweight tester, recorders, temperature probes, etc.) satisfies the minimum acceptance criterion identified in this Standard.
- Verify the range for the deadweight tester and chart recorder are appropriate for test planned
- Ensure the hydrostatic test technician understands that the minimum test pressure at the deadweight shall not be allowed to fall below the established minimum test pressure as defined in the Pipeline Pressure Test Record, nor rise above the established maximum test pressure.
- Ensure the chart recorder pens are providing a clear and distinct trace.
- Ensure the testing contractor has provided a means to accurately inject / collect and measure the amount of 'fluid-add' and 'fluid-bleed' (measured to the nearest 1/3 fluid ounce (or 0.01 liters).
- Verify the Testing Contractor has one or more back-up temperatures

- probes on site in the event of a temperature probe failure.
- Verify all temperature probes are calibrated.
  - Ensure that the constrained pipe (ground) temperature probe is placed along the pipe at least two (2) feet back from the cut and covered by a minimum of two (2) feet of earth.
  - Ensure that the unconstrained pipe (exposed) temperature probe is placed on the pipe out of direct sunlight for the entire test period.
  - Confirm ambient air temperature probe is calibrated.
  - Confirm all air has been bled from the test section and the system has been allowed to equilibrate prior to the start of the test.
  - Verify test head is protected and / or shaded from the elements.
  - Verify the Testing Contractor has taken steps to prevent freezing of test lines and above grade piping.
  - Confirm that biocide, tracer gas, anti-freeze, etc. are used in accordance with the Hydrostatic Test Plan.
  - Verify all pressure / temperature and additional temperature chart recorder are time synchronized.
  - Ensure the hydrostatic testing technician completes the Pipeline Pressure Test Record with the following minimum information:
    - time
    - dead-weight pressure
    - pressure indicator reading
    - volume of 'fluid-add'
    - volume of 'fluid bleed'
    - corresponding pressure change from 'fluid-adds' and 'bleeds' (record from and to)
    - constrained pipe (ground) temperature probe values 1, 2, 3, etc. as applicable
    - unconstrained pipe (exposed) temperature probe values 1, 2, 3, etc., as applicable
    - ambient air temperature
    - pressure reading difference between the dead-weight and the pressure chart recorder at the beginning, middle, and end of the test.
  - Inspect all Mechanical / Testing Contractor's supplied hoses, valves, fittings, etc., prior to hydrostatic testing to ensure that materials are adequate for the pressure rating and in good condition.

- Conduct the Hydrostatic Test Safety review at the morning tailgate meeting.

**During the Hydrostatic Test**

- Ensure that personnel keep as much distance as possible between them and the facility under test.
- Witness initial pressurization, taking deadweight readings, bleed-offs, pump-ups, and stroke vs. pressure readings.
- Visually inspect above ground piping, flanges, valves, appurtenances, Etc. and record the findings under the Comments section of the Pipeline Pressure Test Record.
- Ensure that the specified hydrostatic test pressure range is maintained during the hydrostatic testing period.
- Verify that the Mechanical or Testing Contractor logs the 'fluid bleeds' and 'fluid-adds' required to maintain the pressure within the desired range.
- Conduct a real time QA / QC hydrostatic test procedures and data gathering by the hydrostatic test technician and helpers. For constrained (buried) tests, the Inspector shall monitor the pressure recording charts for unexplained pressure drops, and calculate and compare the predicted pressure change (based on volume change — 'fluid-adds and bleeds') to the measured pressure changes recorded by the deadweight tester.
- Ensure that all failures and leaks are documented following this Standard.

**After the Hydrostatic Test**

- QA / QC the hydrostatic test data provided by the Testing Contractor and complete the Pipeline Pressure Test Record.
- Confirm that a "Pipeline Qualification Test" Sticker has been placed on the back of the test charts.
- Confirm that the discharge of hydrostatic test water is in accordance with the approved Hydrostatic Test Plan, NPDES permit, and Health, Environmental & Safety requirements.
- Monitor dewatering operations.
- Construct a detailed isometric drawing showing the piping and location of the test head, 'air bleeds', temperature probes, etc., and document the test with annotated digital photography. For tests that include pipe for installation at multiple locations, the Inspector shall create separate isometric drawings of the actual test and installation drawing for each piece installed.

After the hydrostatic test has been completed, the Project Engineer or Contract Engineer is responsible for adhering to the following hydrostatic testing specifications.

The Project Engineer shall QA / QC the hydrostatic test data (test log, chart, chart stickers, etc.) collected by the Inspector for clarity, accuracy, and completeness, and file or cause them to be filed under the appropriate tab in Hydrostatic Test Book.

Upon completion of the test, the Project Engineer shall write the Project Narrative and file it under the appropriate tab in Hydrostatic Test Book.

#### Leak Repair and Failure Preservation / Documentation

This section provides the Mechanical Contractor, Testing Contractor, Inspector, Contract Engineer and Project Engineer guidelines for the repair and documentation of leaks.

The Mechanical Contractor shall be responsible for making the One Call Notification for all dig locations.

The Project Engineer or Contract Engineer shall be responsible for immediately notifying Tesoro's Environmental, Safety and Regulatory Representative of all leak locations in order to initiate land TESORO notifications.

Fixing leaks, leaking gaskets, connections, etc. while the line is pressurized **shall not be allowed** without prior approval from the Operations..

Once a leak or failure has been found, the method for repairing the leak permanently or temporarily and the pressure at which the repair method shall occur shall be determined and approved by Engineering Department.

All fittings and valves that are replaced during the test because of inherent mechanical or metallurgical deficiencies shall be reported to the Operations together with the location and pressure at which they failed. Such materials shall be tagged and delivered to an TESORO-designated storage area for further examination and final disposition.

For leaks found within the pipe wall of existing pipe due to corrosion, the repair technique as well as the amount of pipe replaced at the location shall be determined by Engineering Department.

When leaks occur in circumferential welds, the method of repair shall be determined by Engineering Department.

Project Engineer or Contract Engineer shall identify all failed pipe, flange, fitting, valve, and appurtenance specimens to be collected for failure analysis. For proper analysis, the specimen must be properly identified and the failed pipe, particularly the fracture surface, must be protected from corrosion and other *damage*.

- On all failures requiring cutout, a photograph shall be taken and a sketch made of the specimen in-place by the Inspector before the pipe is disturbed. Photographs should also be taken after the pipe is removed from the ditch and also at the central storage site. Each photograph shall be marked with test section and failure number, as well as the date and time the photograph was taken.
- On all failures requiring cutout, the top of the pipe (12 o'clock position), direction of flow (arrow pointing downstream) and a "North" arrow are to be marked with a paint marker or other indelible marker. In addition, failures are to be circled, with care being taken not to get paint or ink on the failure. Hydrostatic test failures are to be identified sequentially by test section, failure number, and milepost and / or station number. The name of the person and TESORO gathering the pipe

specimen, the station number, test section and failure numbers are to be written on pipe.

- As soon as is practical after excavation or exposures of the failure segment, the fracture surfaces are to be coated with a light, water-dispersing oil, such as Vaseline or motor oil. During subsequent handling, it is essential that failure surfaces not be damaged or contaminated. No attempt shall be made to clean the failure surfaces other than to remove mud with water. The failure surfaces should not to be rubbed, brushed, sandblasted, or otherwise contacted. After the failed segment of pipe has been removed from the line and treated as described above, the segment should be wrapped and taped in a water resistant film such as polyethylene to prevent contamination during transport and storage. The plastic film should be positioned on the failure segment so as to permit access to the failure surfaces for examination or reapplication of the oil coating.
- Extreme care should be exercised to prevent digging tool contact with the pipe near the failure surface during excavation. In handling the pipe, no hooks, chains, slings, or similar metal devices are to contact the pipe at a failure location.
- All torch and or cold cuts shall be a minimum of six inches from any failure surface.
- Each failure cutout shall be taken to a central storage location for subsequent visual examination. It is essential that all failures be protected from mechanical damage during handling and transportation, and that the oil coating is replenished as frequently as necessary to maintain coverage and prevent corrosion. The samples are to be stored in such a manner that failures are accessible for visual examination.
- For each failure, the following applicable information will be reported.
  1. Test section
  2. Failure number
  3. Date and time of failure
  4. Location of failure (milepost and/or station number)
  5. Pressure at failure location
  6. Length of pipe replaced
  7. Description of the failure (pipe seam, pipe body, girth weld, etc.)
  8. Width, length of failure, and clock position.

Pipe description including diameter, wall thickness, seam type, manufacturer, and date.

The failure pressure to be reported is the calculated failure pressure at the location of the failure considering elevation. Under "Description of Failure," it should be reported whether the failure was a leak or a rupture and whether it was in the longitudinal weld, girth weld, or pipe body. The Hydrostatic Test Failure Record shall be used to document the conditions at the time of failure. The Hydrostatic Test Failure Record should be made a part of the permanent hydrostatic test record and filed in the Hydrostatic Test Book.

Pipeline / Station Piping Cleaning, Drying, and Commissioning / Re-Commissioning

Mechanical Contractor shall supply all equipment necessary to dewater and clean the line to meet the requirements of this specification including all test instruments to indicate that the provisions are being met.

For new pipeline construction — upon completion of the hydrostatic test, the Mechanical Contractor shall pass a pig through the pipeline using good sealing cup or disc pigs acceptable to TESORO. Mechanical Contractor shall use nitrogen for propelling pigs. Mechanical Contractor shall perform as many pig runs as are required to remove water from the line, subject to TESORO approval. The pig velocity shall not exceed 3 feet per second.

For existing pipeline, batching pigs or a combination of batching pigs and disk pigs shall be used to separate and isolate the test water placement across the test section(s) from the product or crude normally used in the line. The pig velocity shall not exceed 3 feet per second.

After acceptance by TESORO of dewatering and cleaning, the pipe shall be closed to prevent the ingress of foreign substances into the pipeline.

Mechanical Contractor shall ensure that:

- All freeze plugs have been removed.
- All isolation devices installed during the decommissioning are removed.
- All blind flanges are removed, and all valves or spool pieces are re-installed.
- All valves are turned to the closed operating position.
- All Contractor Lock-Out and Tag-Out devices have been removed.

Hydrostatic Test Execution Documentation Process

The Testing Contractor shall complete the Test Pressure and Temperature sections of the Pipeline Pressure Test Record, annotate the Hydrostatic Test Stickers and affix it them to the appropriate charts, and sign and date the Pipeline Pressure Test Record, and Hydrostatic Test Stickers in the appropriate locations.

The hydrostatic tests records shall be delivered to the Project Engineer or Contract Engineer, or Inspector upon the completion of the hydrostatic test.

The Project Engineer or Contract Engineer shall QA / QC all hydrostatic test records generated in the field and file them in Hydrostatic Test Book.

Hydrostatic Test Record Quality Assurance and Control, Archival, and Distribution Processes

Purpose — to provide Project Engineer or Contract Engineer with a standardized process of hydrostatic records management in accordance to Tesoro Logistics LP. (TLLP) "Integrity Management Program," the Department of Transportation (DOT) Integrity Management Program (IMP) 49 CFR 195.452, and API 1160 — "Managing System Integrity for Hazardous Liquid Pipelines."

The objective is to ensure that hydrostatic test documentation has been properly reviewed and approved for completeness and accuracy.

The review, quality assurance and control, and documentation process is summarized in the "Hydrostatic Test Book Review Flowchart".

The Hydrostatic Test Book is Tesoro Logistics LP. (TLLP) record of the hydrostatic test and ensures that the record created by Tesoro complies with current Department of Transportation (DOT) 49 CFR 195.300 Subpart-E — Pressure Testing and the Department of Transportation (DOT) 49 CFR 195.452, Integrity Management Program (IMP), and Tesoro Logistics LP. (TLLP) "Integrity Management Program" governing the content of such records.

This Standard and "Hydrostatic Test Review" shall be used for the review of new hydrostatic test records and the assessment of pre-existing hydrostatic test records of mainline pipelines, station piping, and emergency stock pipe.

The Project Engineer shall complete the "Hydrostatic Test Review" of the Hydrostatic Test Book to verify if all the necessary information has been included in the test record. The completion of the "Pressure Test Record Review" is Tesoro's process that ensures the Hydrostatic Test Book is complete, and can be used to assess the adequacy of exiting records.

The "Hydrostatic Test Review" (See Appendices) was designed to meet the requirements set forth in Department of Transportation (DOT) 49 CFR 195.300 Subpart-E — Pressure Testing.

The Department of Transportation (DOT) Required Information (Information Required After 1/8/1971, Items 1 through 9) identifies the specific requirements that should be present in a 'complete' hydrostatic test record as specified by Department of Transportation (DOT) 49 CFR 195.300 Subpart-E — Pressure Testing.

Pressure Recording Charts — Pressure recording charts were required with the first promulgation of 49 CFR 195.310 (Federal Register, Volume 35, No. 219, November 7, 1970, page 17183).

#### ***Test Instrument Calibration Data***

- A log of pressure readings is required for all tests performed after 1/8/1971. A 'log' is normally considered to be data recorded during the test at equally spaced time intervals. For pressure tests performed prior to 1/8/1971, the Office of Pipeline Safety (OPS) has indicated that any record (documentation or data) may be used to show that an acceptable test was conducted; however, such records must have been made at the time of the test and result directly from the testing.
- Calibration Certification data and or Serial Number for the deadweight tester (or equivalent) is required for all test performed after 10/21/1985 ((Federal Register, Volume 50, Number 165, August 26, 1985, page 34470).

#### **Operator Identified**

- If the 'operator's name' is not specifically listed in the test record, Tesoro Logistics LP (TLLP) shall be the designated operator.
- Indicate 'Yes' if the records show the name of any individual.
- If the records do not show the name of a third-party test TESORO indicate 'No.' If the records do not show the test TESORO's name, Tesoro Logistics LP (TLLP) shall be the designated test TESORO, and 'N/A' should be indicated.

**Minimum Test Duration**

- The effective date for the original Subpart E Hydrostatic Testing Requirements is 1/8/1971. The minimum test duration for tests performed prior to 1/8/1971 is 8 hours when all piping was not visually inspected during the test and 4 hours when all piping was visually inspected for leakage during the test.
- Between 1/8/1971 and 9/8/1980, all newly installed piping was required to be tested for a minimum duration of 24 hours.
- After 9/8/80, piping that is subject to testing requirements of Subpart-E and can be visually inspected during the test must be tested for a minimum of four (4) continuous hours at a pressure equal to 125% or more of the maximum operating pressure (Federal Register, Volume 45, No.175, September 8, 1980, page 59166). After 9/8/1980 in the case of piping that cannot be visually inspected for leakage, the piping that is subjected to testing requirements of Subpart-E shall be tested for an additional four (4) continuous hours at a pressure equal to 110% or more of the maximum operating pressure (Federal Register, Vol. 45, No.175, September 8, 1980, page 59166).

**Minimum Test Pressure** — the minimum test pressure noted on the test review form is the minimum test pressure recorded at the deadweight tester, and is dependent upon when the test was performed.

- For a hydrostatic test performed before 1/8/1971, the minimum test pressure shall be the highest minimum test pressure in any 8-hour window identified in the test record.
- For a hydrostatic test performed between 1/8/1971 and 9/8/1980, the minimum test pressure that occurred during the 24 hour period is to be utilized as the minimum test pressure.
- For a hydrostatic test performed after 9/8/1980 at 125% or more of the MOP where the pipe could not have been visually inspected for leakage for a minimum of 8 continuous hours or 4 continuous hours where pipe is visually inspected during the test, the minimum test pressure is the minimum pressure during the test period.
- For a hydrostatic test performed after 9/8/1980 and where the pipe could not have been visually inspected for leakage during the first 4 hour test period at a pressure equal to 125% or more of MOP, the test pressure may be reduced to a pressure of 110% or more of MOP for the additional 4 hours of testing (leak test).

**Test Medium Identified** — if not shown on the test record, the test medium should be assumed to be water and 'Yes' should be checked.

**Description of Facility Tested**

- **Mainline Tests** — if test boundaries are not identified for pipelines containing scraper traps, it shall be assumed the mainline test ended at the bypass valve and mainline block valve of the scraper trap (inclusive).
- **Station Test** — if the description of the piping tested is not clearly understood by wording, drawings, and/or sketches, the record shall be noted on the review form as incomplete.

Explanation of Pressure Discontinuities — if the pressure discontinuities on the chart can be analyzed and attributed to weather conditions, then the notation of weather condition shall be considered as evidence of 'explanation.'

**Profile of Test Section**

- For hydrostatic tests conducted after 1/8/1971 per DOT 49 CFR 195, a profile of the test section shall be completed and attached to the record if the elevation difference in the test section exceeds 100 feet.
- If the elevations are not included in the test record, then the elevations of the dead weight tester, high point and low point of the test section shall be obtained from the profile.

Test Record Documentation Complete      Identify whether the test record documentation is 100% complete.

The "Pipe Information" section summarizes pipe data information for all new construction, modifications, and stock pipe.

The "Data for Determining MOP" section summarizes the limiting components in the test section and shows the calculation for determining the MOP of the pipe.

**RECORDS MANAGEMENT**

The Hydrostatic Test Drawings and Documentation Requirements

shows the drawings and documents that shall be updated following the completion of a hydrostatic test.

**TRAINING**

Purpose — To provide with a standardized process for designing and planning, executing, reviewing and documenting hydrostatic tests in accordance with Tesoro Logistics LP. (TLLP) "Integrity Management Program," the Department of Transportation (DOT) 49 CFR 195.452, Integrity Management Program (IMP), and API 1160 — "Managing System Integrity for Hazardous Liquid Pipelines."

Learning Objectives — understand this Standard as it relates to the job function in accordance with Tesoro Logistics LP. (TLLP) "Integrity Management Program," the Department of Transportation (DOT) 49 CFR 195.452, Integrity Management Program (IMP), and API 1160 — "Managing System Integrity for Hazardous Liquid Pipelines."

**Related Training**

Tesoro Logistics LP. (TLLP) "Integrity Management Program"

Tesoro Logistics LP. (TLLP) Standard for "Pipeline Repairs."

Tesoro Logistics LP. (TLLP) Lock-Out / Tag-Out (LO/TO) Plan and Procedures.

Tesoro Logistics LP. (TLLP) Operator Qualification Plan.

**References**

Part 192, Title 49 CFR — "Transportation of Natural and Other Gas by Pipeline: Minimum Federal Safety Standards," Revised as of October 1, 2002



Part 195, Title 49 CFR - "Transportation of Hazardous Liquids by Pipeline: Minimum Federal Safety Standards", Revised as of October 1, 2002

ANSI B31.4, "Liquid Petroleum Transportation Piping", 1998 Edition,

ANSI B31.8, "Gas Transmission and Distribution Piping Systems," 1995 Edition

API 1110, "Pressure Testing of Liquid Petroleum Pipelines," 4th Edition

API 1160, "Managing System Integrity for Hazardous Liquid Pipelines," 1st Edition

## **SECTION 1 E**

### **SPECIAL CONDITIONS**

#### **HYDROSTATIC TEST PRESSURES**

The CONTRACTOR shall perform a hydrostatic test on the pipeline, which stresses the pipe at the low point of the section being tested to a minimum of 1000 psi.

#### **CONTRACTOR STAGING AREA**

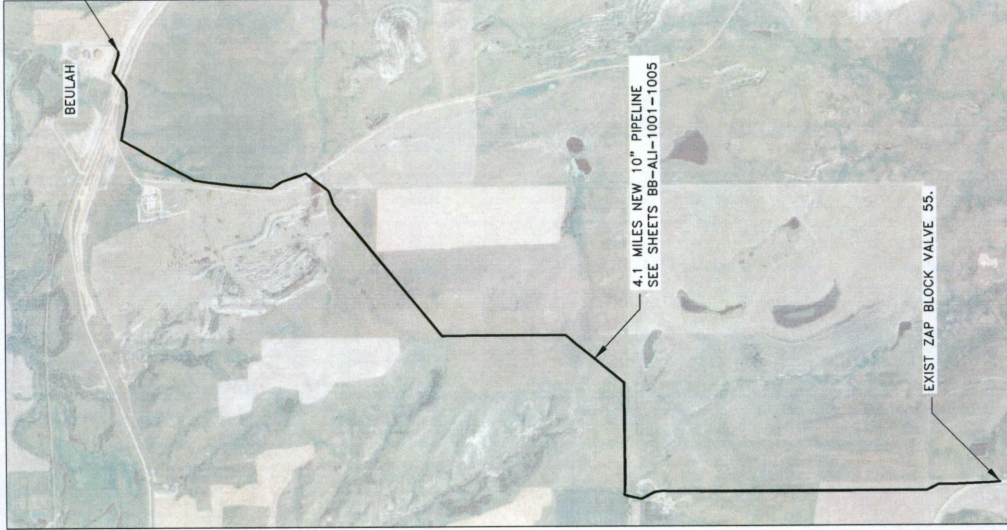
CONTRACTOR must furnish a staging yard for work force to assemble and depart daily. No private (no-CONTRACTOR) vehicles will be allowed in the vicinity of work. The intent is to minimize traffic in the work area.



19100 RIDGEWOOD PARKWAY  
SAN ANTONIO, TX 78259

# BEULAH STATION

NEW 4.1 MILE 10" ZAP TO BEULAH  
ASBUILT PIPELINE ALIGNMENT



## VICINITY MAP

NOT TO SCALE

MERCER COUNTY, NORTH DAKOTA

### DRAWING LIST

| DRAWING NUMBER | DESCRIPTION                           | DISCIPLINE |
|----------------|---------------------------------------|------------|
| BB-ALI-1001    | ALIGNMENT SHEET - STA 1+00 - 50+00    | PIPING     |
| BB-ALI-1002    | ALIGNMENT SHEET - STA 50+00 - 99+00   | PIPING     |
| BB-ALI-1003    | ALIGNMENT SHEET - STA 99+00 - 148+00  | PIPING     |
| BB-ALI-1004    | ALIGNMENT SHEET - STA 148+00 - 197+00 | PIPING     |
| BB-ALI-1005    | ALIGNMENT SHEET - STA 197+00 - 215+00 | PIPING     |
| BB-BOR-2001    | BORE SHEET - STA 154+65 - 160+00      | PIPING     |
| BB-BOR-2001    | BORE SHEET - STA 203+50 - 208+50      | PIPING     |
| BB-TLY-1006    | PIPE TALLY                            | PIPING     |
| BB-TLY-1007    | PIPE TALLY                            | PIPING     |
| BB-TLY-1008    | PIPE TALLY                            | PIPING     |
| BB-TLY-1009    | PIPE TALLY                            | PIPING     |
| BB-TLY-1010    | PIPE TALLY                            | PIPING     |
| BB-TLY-1011    | PIPE TALLY                            | PIPING     |
| BB-TLY-1012    | PIPE TALLY                            | PIPING     |
| BB-TLY-1013    | PIPE TALLY                            | PIPING     |
| BB-TLY-1014    | PIPE TALLY                            | PIPING     |
| BB-TLY-1015    | PIPE TALLY                            | PIPING     |
| BB-TLY-1016    | PIPE TALLY                            | PIPING     |
| BB-GA-2001     | SITE PLAN                             | PIPING     |
| BB-GA-2100     | SITE PLAN                             | PIPING     |
| BB-MISC-9000   | BARRED TEE DETAIL                     | PIPING     |



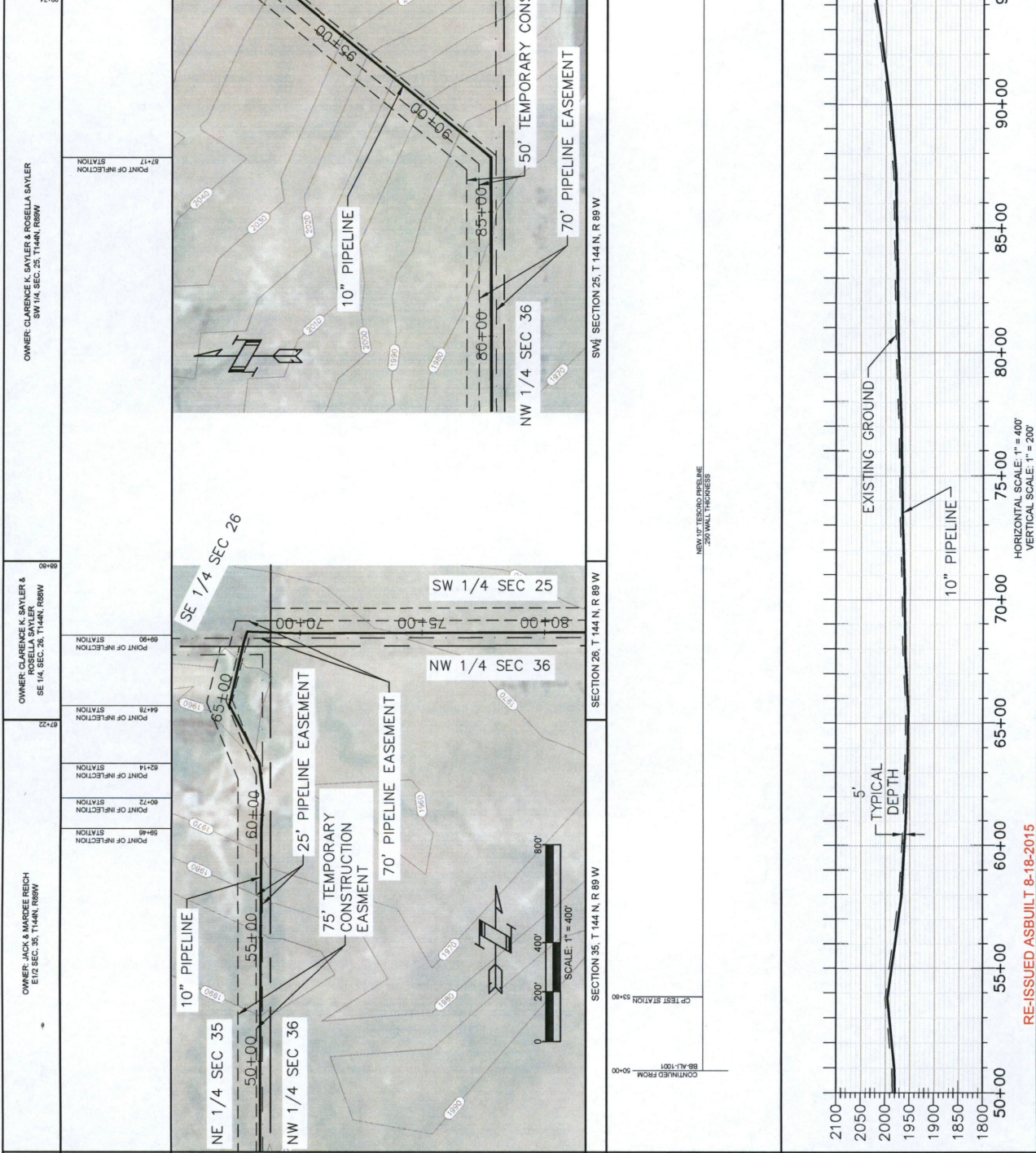
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RE-ISSUED ASBUILT 8-18-2015



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| <b>TESORO LOGISTICS</b><br>NEW 10" LINE<br>ALIGNMENT SHEET<br>STATION 50+00-90+00<br>BEULAH BASIN<br>STATION 30+00-90+00 |  | <b>EDK TECHNICAL COMPANY, INC.</b><br>DRAWING NO. _____<br>SHEET NO. _____<br>DATE _____ |  |
| DESIGNED BY: _____<br>CHECKED BY: _____<br>DATE: _____   |  | PROJECT NO.: _____<br>PROJECT NAME: _____<br>PROJECT LOCATION: _____                     |  |
| REVISIONS<br>NO. DESCRIPTION DATE<br>1 AS-BUILT 8/18/2015<br>2 RE-DESIGNED AS-BUILT 8/18/2015                            |  | SCALE: 1" = 400'<br>HORIZONTAL SCALE: 1" = 400'<br>VERTICAL SCALE: 1" = 200'             |  |

|  |   |   |  |   |
|--|---|---|--|---|
| OWNER: GERALD & CONNIE BEBER<br>E 1/2 SEC. 25, T144N, R89W | OWNER: CLARENCE K. SAYLER & ROSELLA SAYLER<br>SW 1/4 SEC. 25, T144N, R89W | OWNER: CLARENCE K. SAYLER & ROSELLA SAYLER<br>SE 1/4 SEC. 26, T144N, R89W | OWNER: JACK & MARDEE REICH<br>E 1/2 SEC. 35, T144N, R89W | OWNER: CLARENCE K. SAYLER & ROSELLA SAYLER<br>SE 1/4 SEC. 26, T144N, R89W |
|--|---|---|--|---|



|  |   |  |   |
|--|---|--|---|
| <b>TRACT NUMBER</b><br>OWNERSHIP/AGENCY<br>HORIZONTAL DATUM: NAD83 (1982)<br>COORDINATE SYSTEM:<br>UTM ZONE 13 (US FEET) | <b>STATIONING</b><br>PIPELINE PLAN (SCALE AS SHOWN) | <b>MATERIAL</b><br>PLUS CALLOUTS<br>PIPELINE SCHEMATIC & DETAILS<br>HEAVYWALL PIPE<br>CASING PIPE<br>CONCRETE COATING<br>INSULATION BEAD | <b>PROFILE</b><br>LEGEND<br>GROUND PROFILE<br>EXISTING PIPE<br>NEW PIPE |
|--|---|--|---|

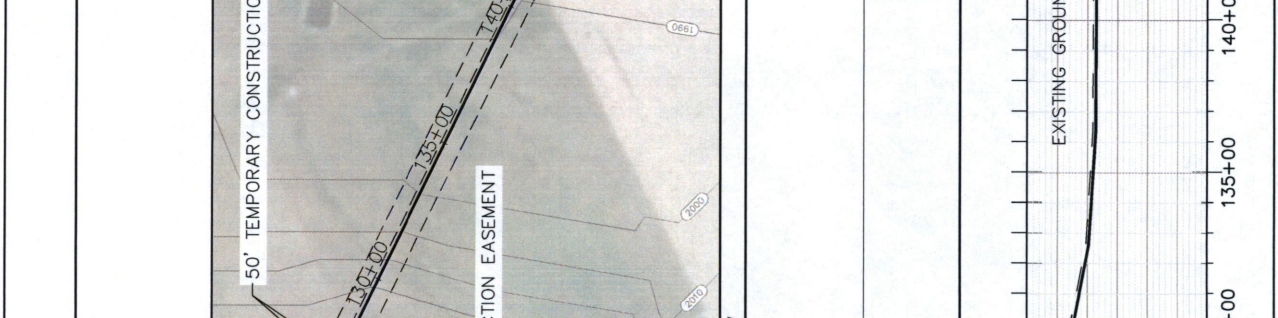
NOTE: STATIONING IS BASED ON HORIZONTAL DISTANCES.

RE-ISSUED AS-BUILT 8-18-2015

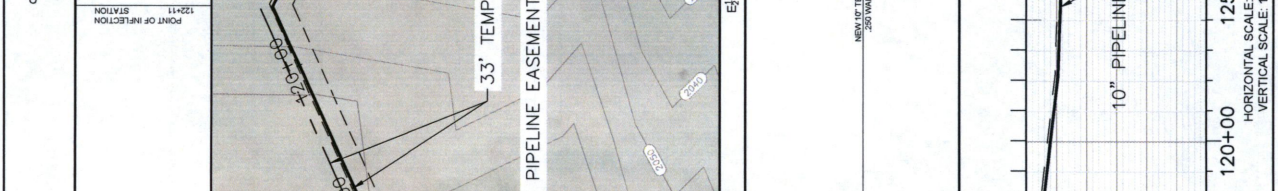
|  |  |   |  |
|--|--|---|--|
| <b>TESORO LOGISTICS</b><br>NEW 10" LINE ALIGNMENT SHEET<br>BEULAH BASIN<br>STATION 99+00-148+00<br>SCALE: 1" = 400'<br>PLOT: BB-ALI-1003<br>REV: 2 |  | <b>EDK TECHNICAL COMPANY, Inc.</b><br>DRAWING NO. _____<br>SHEET NO. _____<br>DATE: 8/18/2015 |  |
| DESIGNED BY: _____<br>CHECKED BY: _____<br>DATE: _____   |  | REVISIONS<br>NO. DATE DESCRIPTION<br>1 8/18/15 AS-BUILT                                       |  |

|   |   |
|---|---|
| OWNER: CLARENCE K. SAYLER & ROSELIA SAYLER<br>SW 1/4, SEC. 25, T.144N, R.89W<br>89-74 | OWNER: GERALD & CONNIE BEBER<br>E 1/2, SEC. 25, T.144N, R.89W |
|---|---|

|   |  |
|---|--|
| STATIONING<br>HORIZONTAL DATUM: NAD83(1983)<br>COORDINATE SYSTEM: UTM ZONE 18Q UTM<br>UNIT: METERS TO (60 FEET) | PIPELINE PLAN (SCALE AS SHOWN)<br>POINT OF INFLECTION 100+96<br>POINT OF INFLECTION 132+11 |
|---|--|



|   |   |
|---|---|
| LEGEND<br>EXISTING PIPELINE: ---<br>PROPOSED PIPELINE: - - -<br>SECTION LINE: - - -<br>PROPERTY LINE: - - -<br>FENCE: ---<br>BARBED CABLE: ---<br>FOREIGN PIPELINE: - - -<br>SECTION CALLOUT: #<br>ABOVE GROUND: ---<br>BELOW GROUND: --- | PIPELINE TALLY<br>1+00 TO 50+00<br>250 WT. CR. BPE 5L X52<br>PIPE WITH 14-18 MILS<br>FBE:<br>4900'-0" |
|---|---|

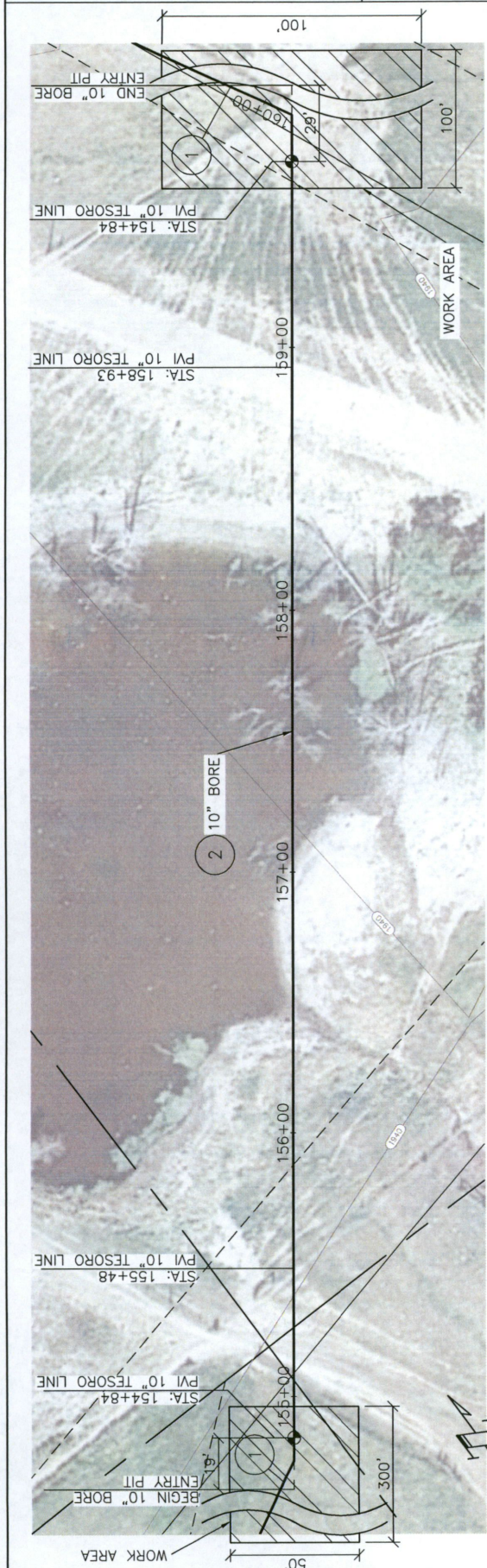


|  |   |
|--|---|
| LEGEND<br>EXISTING PROFILE: ---<br>EXISTING PIPE: - - -<br>NEW PIPE: - - - | MATERIAL<br>PLUS CALLOUTS<br>PIPELINE SCHEMATIC DETAILS<br>HEAVYWALL PIPE<br>CONCRETE COATING<br>INDUCTION BOND |
|--|---|

|   |   |
|---|---|
| PROFILE<br>HORIZONTAL SCALE: 1" = 400'<br>VERTICAL SCALE: 1" = 200' | NOTE: STATIONING IS BASED ON HORIZONTAL DISTANCE.<br><b>RE-ISSUED ASBUILT 8-18-2015</b> |
|---|---|

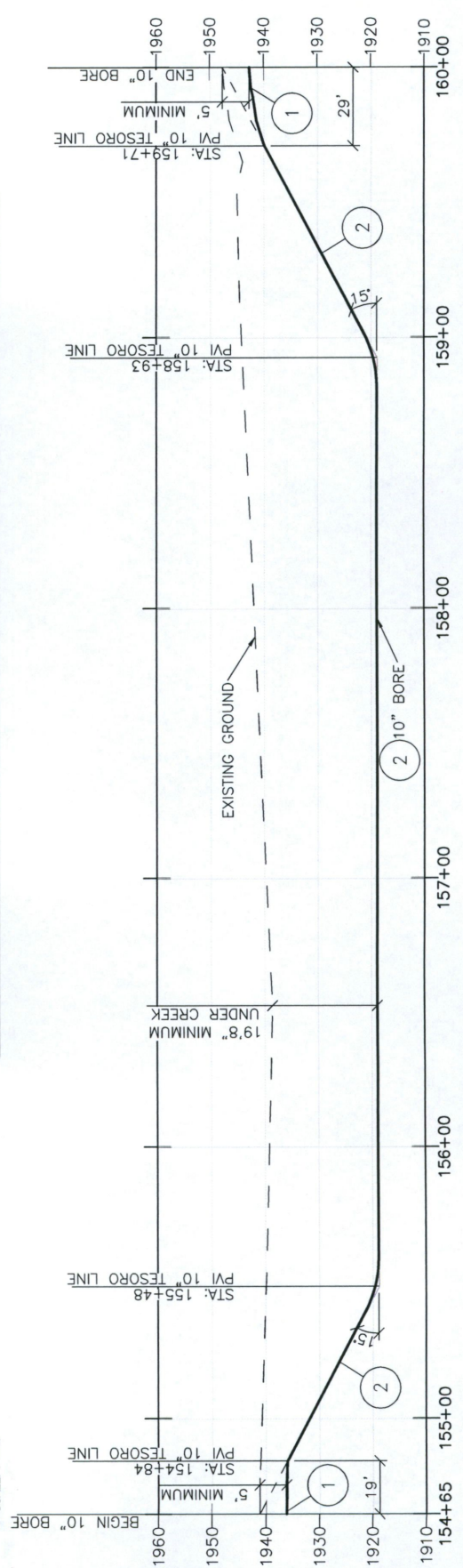






**BILL OF MATERIAL — STA: 154+65 TO 160+00**

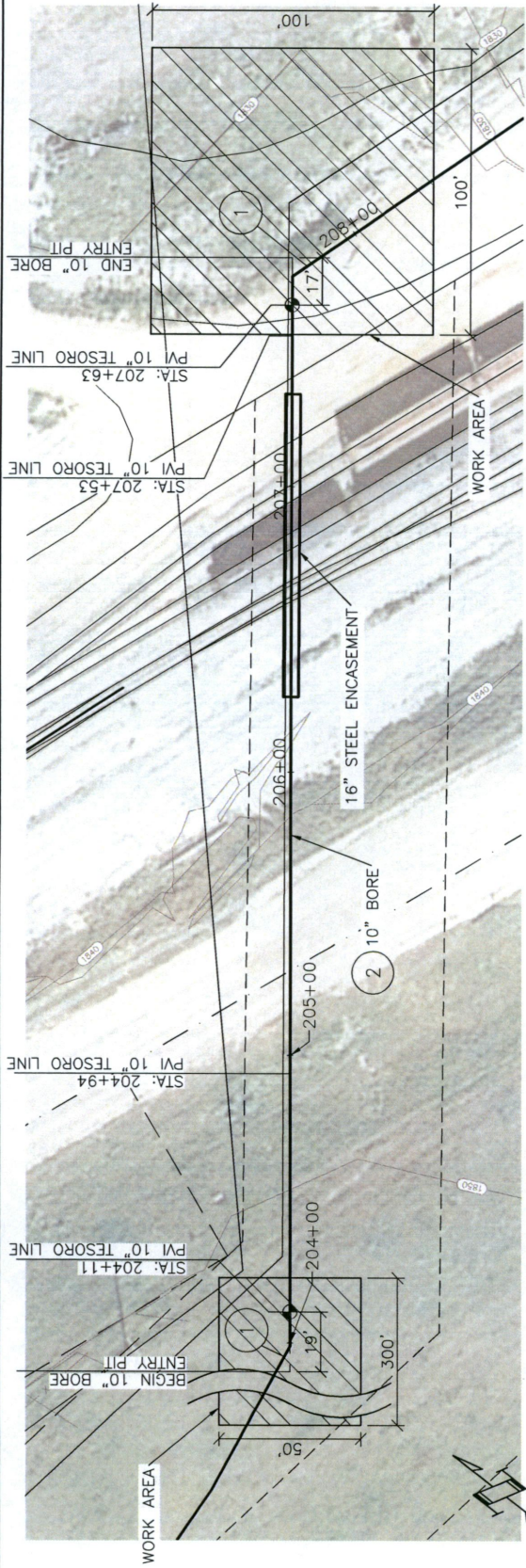
| MARK | QTY | SIZE | DESCRIPTION  | LENGTH |
|------|-----|------|--|--------|
| 1    | 1   | 10"  | PIPE, .250 WALL, API 5L, X-52, WITH 14-16 MILS FBE   | 48'    |
| 2    | 1   | 10"  | PIPE, .365 WALL, API 5L, X-52, WITH 14-16 MILS FBE, & WITH .30-.40 MILS POWERCONCRETE "J" COATING OR EQUAL | 535'   |



HORIZONTAL SCALE: 1" = 40'  
 VERTICAL SCALE: 1" = 20'

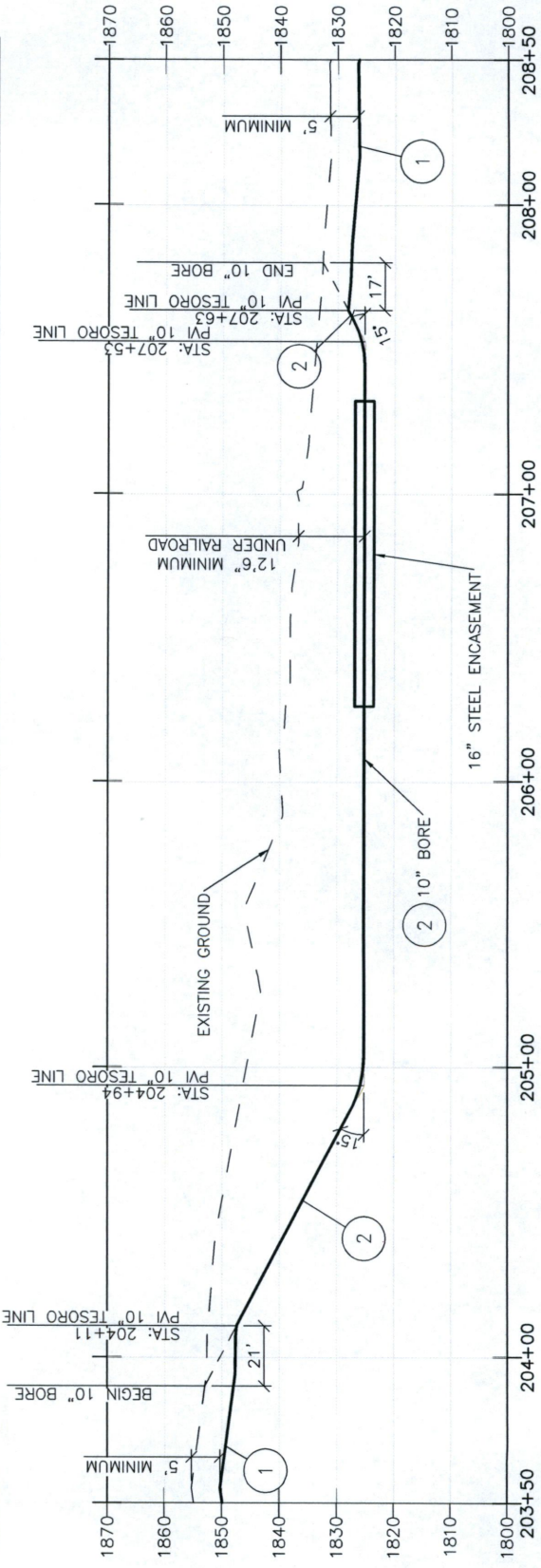
RE-ISSUED ASBUILT 8-18-2015

|                                 |  |                          |  |                            |  |
|---------------------------------|--|--------------------------|--|----------------------------|--|
| TESORO LOGISTICS OPERATIONS LLC |  | NEW 10" LINE             |  | DESIGNED BY: EDR TECHNICAL |  |
| BEULAH BASIN                    |  | STATION 203+50 TO 208+50 |  | DRAWN BY: [REDACTED]       |  |
| REV 2                           |  | REV 1                    |  | DATE: 8/18/2015            |  |
| REV 1                           |  | REV 0                    |  | DATE: 8/18/2015            |  |
| REV 0                           |  | REV 0                    |  | DATE: 8/18/2015            |  |



**BILL OF MATERIAL - STA: 203+50 TO 208+50**

| MARK | QTY | SIZE | DESCRIPTION   | LENGTH |
|------|-----|------|---|--------|
| 1    | 1   | 10"  | PIPE, .250 WALL, API 5L, X-52, WITH 14-16 MILS FBE  | 148'   |
| 2    | 1   | 10"  | PIPE, .250 WALL, API 5L, X-52, WITH 14-16 MILS FBE, WITH POWERCONCRETE "J" COATING OR EQUAL | 352'   |



HORIZONTAL SCALE: 1" = 40'  
 VERTICAL SCALE: 1" = 20'

RE-ISSUED ASBUILT 8-18-2015







TESORO LOGISTICS OPERATIONS LLC  
 NEW 10" LINE  
 PIPE TALLY  
 BEULAH BASIN  
 ZAP TO BEULAH

EDK TECHNICAL COMPANY, Inc.  
 PROJECT NO. 1  
 DATE 8/19/2015

| REV | DATE      | BY | DESCRIPTION             |
|-----|-----------|----|-------------------------|
| 1   | 8/19/2015 |    | ISSUED FOR CONSTRUCTION |
| 2   | 8/19/2015 |    | REVISIONS               |

| STA   | JOINT # | MFG      | WALL  | COATING                          | WELD XRAY# | HEAT # | WELDERS MARK | Depth | Comments |
|-------|---------|----------|-------|----------------------------------|------------|--------|--------------|-------|----------|
| 29+66 | ML 60   | TEX ISLE | 0.25" | TEX ISLE X-0-17060 3M6233P 14-16 | ML 60      | 442153 | 12           |       |          |
| 27+08 | ML 61   | TEX ISLE | 0.25" | TEX ISLE X-0-17060 3M6233P 14-16 | ML 61      | 442153 | 12           |       |          |
| 27+90 | ML 62   | TEX ISLE | 0.25" | TEX ISLE X-0-17060 3M6233P 14-16 | ML 62      | 442157 | 12           |       |          |
| 27+92 | ML 63   | TEX ISLE | 0.25" | TEX ISLE X-0-17060 3M6233P 14-16 | ML 63      | 442157 | 12           |       |          |
| 28+34 | ML 64   | TEX ISLE | 0.25" | TEX ISLE X-0-17060 3M6233P 14-16 | ML 64      | 442157 | 12           |       |          |
| 28+76 | ML 65   | TEX ISLE | 0.25" | TEX ISLE X-0-17060 3M6233P 14-16 | ML 65      | 442154 | 12           |       |          |
| 29+18 | ML 66   | TEX ISLE | 0.25" | TEX ISLE X-0-17060 3M6233P 14-16 | ML 66      | 442157 | 12           |       |          |
| 29+60 | ML 67   | TEX ISLE | 0.25" | TEX ISLE X-0-17060 3M6233P 14-16 | ML 67      | 442154 | 12           |       |          |
| 30+02 | ML 68   | TEX ISLE | 0.25" | TEX ISLE X-0-17060 3M6233P 14-16 | ML 68      | 442154 | 12           |       |          |
| 30+44 | ML 69   | TEX ISLE | 0.25" | TEX ISLE X-0-17060 3M6233P 14-16 | ML 69      | 442152 | 12           |       |          |
| 30+86 | ML 70   | TEX ISLE | 0.25" | TEX ISLE X-0-17060 3M6233P 14-16 | ML 70      | 442152 | 12           |       |          |
| 31+27 | ML 71   | TEX ISLE | 0.25" | TEX ISLE X-0-17060 3M6233P 14-16 | ML 71      | 442152 | 12           |       |          |
| 31+69 | ML 72   | TEX ISLE | 0.25" | TEX ISLE X-0-17060 3M6233P 14-16 | ML 72      | 442152 | 12           |       |          |
| 32+11 | ML 73   | TEX ISLE | 0.25" | TEX ISLE X-0-17060 3M6233P 14-16 | ML 73      | 442153 | 12           |       |          |
| 32+52 | ML 74   | TEX ISLE | 0.25" | TEX ISLE X-0-17060 3M6233P 14-16 | ML 74      | 442154 | 12           |       |          |
| 32+94 | ML 75   | TEX ISLE | 0.25" | TEX ISLE X-0-17060 3M6233P 14-16 | ML 75      | 442152 | 12           |       |          |
| 33+35 | ML 76   | TEX ISLE | 0.25" | TEX ISLE X-0-17060 3M6233P 14-16 | ML 76      | 442154 | 12           |       |          |
| 33+77 | ML 77   | TEX ISLE | 0.25" | TEX ISLE X-0-17060 3M6233P 14-16 | ML 77      | 442152 | 12           |       |          |
| 34+19 | ML 78   | TEX ISLE | 0.25" | TEX ISLE X-0-17060 3M6233P 14-16 | ML 78      | 442154 | 12           |       |          |
| 34+61 | ML 79   | TEX ISLE | 0.25" | TEX ISLE X-0-17060 3M6233P 14-16 | ML 79      | 442152 | 12           |       |          |
| 35+03 | ML 80   | TEX ISLE | 0.25" | TEX ISLE X-0-17060 3M6233P 14-16 | ML 80      | 442152 | 12           |       |          |
| 35+45 | ML 81   | TEX ISLE | 0.25" | TEX ISLE X-0-17060 3M6233P 14-16 | ML 81      | 442152 | 12           |       |          |
| 35+87 | ML 82   | TEX ISLE | 0.25" | TEX ISLE X-0-17060 3M6233P 14-16 | ML 82      | 442152 | 12           |       |          |
| 36+29 | ML 83   | TEX ISLE | 0.25" | TEX ISLE X-0-17060 3M6233P 14-16 | ML 83      | 442153 | 12           |       |          |
| 36+70 | ML 84   | TEX ISLE | 0.25" | TEX ISLE X-0-17060 3M6233P 14-16 | ML 84      | 442152 | 12           |       |          |

| STA   | JOINT # | MFG      | WALL  | COATING                          | WELD XRAY# | HEAT # | WELDERS MARK | Depth | Comments |
|-------|---------|----------|-------|----------------------------------|------------|--------|--------------|-------|----------|
| 18+17 | ML 35   | TEX ISLE | 0.25" | TEX ISLE W.07060 3M6233P 14-16   | ML 35      | 442154 | 12           |       |          |
| 18+59 | ML 36   | TEX ISLE | 0.25" | TEX ISLE W.07060 3M6233P 14-16   | ML 36      | 442154 | 12           |       |          |
| 17+01 | ML 37   | TEX ISLE | 0.25" | TEX ISLE W.07060 3M6233P 14-16   | ML 37      | 442154 | 12           |       |          |
| 17+43 | ML 38   | TEX ISLE | 0.25" | TEX ISLE W.07060 3M6233P 14-16   | ML 38      | 442153 | 12           |       |          |
| 17+85 | ML 39   | TEX ISLE | 0.25" | TEX ISLE W.07060 3M6233P 14-16   | ML 39      | 442152 | 12           |       |          |
| 18+27 | ML 40   | TEX ISLE | 0.25" | TEX ISLE W.07060 3M6233P 14-16   | ML 40      | 442154 | 12           |       |          |
| 18+69 | ML 41   | TEX ISLE | 0.25" | TEX ISLE W.07060 3M6233P 14-16   | ML 41      | 442154 | 12           |       |          |
| 19+11 | ML 42   | TEX ISLE | 0.25" | TEX ISLE W.07060 3M6233P 14-16   | ML 42      | 442154 | 12           |       |          |
| 19+53 | ML 43   | TEX ISLE | 0.25" | TEX ISLE W.07060 3M6233P 14-16   | ML 43      | 442157 | 12           |       |          |
| 19+95 | ML 44   | TEX ISLE | 0.25" | TEX ISLE W.07060 3M6233P 14-16   | ML 44      | 442154 | 12           |       |          |
| 20+37 | ML 45   | TEX ISLE | 0.25" | TEX ISLE X-0-17060 3M6233P 14-16 | ML 45      | 442153 | 12           |       |          |
| 20+79 | ML 46   | TEX ISLE | 0.25" | TEX ISLE X-0-17060 3M6233P 14-16 | ML 46      | 442153 | 12           |       |          |
| 21+20 | ML 47   | TEX ISLE | 0.25" | TEX ISLE X-0-17060 3M6233P 14-16 | ML 47      | 442157 | 12           |       |          |
| 21+62 | ML 48   | TEX ISLE | 0.25" | TEX ISLE X-0-17060 3M6233P 14-16 | ML 48      | 442153 | 12           |       |          |
| 22+04 | ML 49   | TEX ISLE | 0.25" | TEX ISLE X-0-17060 3M6233P 14-16 | ML 49      | 442152 | 12           |       |          |
| 22+46 | ML 50   | TEX ISLE | 0.25" | TEX ISLE X-0-17060 3M6233P 14-16 | ML 50      | 442154 | 12           |       |          |
| 22+88 | ML 51   | TEX ISLE | 0.25" | TEX ISLE X-0-17060 3M6233P 14-16 | ML 51      | 442154 | 12           |       |          |
| 23+30 | ML 52   | TEX ISLE | 0.25" | TEX ISLE X-0-17060 3M6233P 14-16 | ML 52      | 442153 | 12           |       |          |
| 23+72 | ML 53   | TEX ISLE | 0.25" | TEX ISLE X-0-17060 3M6233P 14-16 | ML 53      | 442157 | 12           |       |          |
| 24+14 | ML 54   | TEX ISLE | 0.25" | TEX ISLE X-0-17060 3M6233P 14-16 | ML 54      | 442152 | 12           |       |          |
| 24+56 | ML 55   | TEX ISLE | 0.25" | TEX ISLE X-0-17060 3M6233P 14-16 | ML 55      | 442153 | 12           |       |          |
| 24+98 | ML 56   | TEX ISLE | 0.25" | TEX ISLE X-0-17060 3M6233P 14-16 | ML 56      | 442153 | 12           |       |          |
| 25+40 | ML 57   | TEX ISLE | 0.25" | TEX ISLE X-0-17060 3M6233P 14-16 | ML 57      | 442153 | 12           | 7.6'  |          |
| 25+82 | ML 58   | TEX ISLE | 0.25" | TEX ISLE X-0-17060 3M6233P 14-16 | ML 58      | 442154 | 12           |       |          |
| 26+24 | ML 59   | TEX ISLE | 0.25" | TEX ISLE X-0-17060 3M6233P 14-16 | ML 59      | 44248  | 12           |       |          |

RE-ISSUED ASBUILT 8-18-2015

| STA   | JOINT # | MFG      | WALL  | COATING                              | WELD DRAY# | HEAT # | WELDERS MARK | Depth | Comments |
|-------|---------|----------|-------|--------------------------------------|------------|--------|--------------|-------|----------|
| 37+12 | ML 85   | TEX ISLE | 0.25" | TEX ISLE X.O.-17060<br>3MG233P 14-16 | ML 85      | 442153 | 1 2          |       |          |
| 37+54 | ML 86   | TEX ISLE | 0.25" | TEX ISLE X.O.-17060<br>3MG233P 14-16 | ML 86      | 442154 | 1 2          |       |          |
| 37+95 | ML 87   | TEX ISLE | 0.25" | TEX ISLE X.O.-17060<br>3MG233P 14-16 | ML 87      | 442154 | 1 2          |       |          |
| 38+38 | ML 88   | TEX ISLE | 0.25" | TEX ISLE X.O.-17060<br>3MG233P 14-16 | ML 88      | 442154 | 1 2          |       |          |
| 38+78 | ML 89   | TEX ISLE | 0.25" | TEX ISLE X.O.-17060<br>3MG233P 14-16 | ML 89      | 442154 | 1 2          |       |          |
| 39+20 | ML 90   | TEX ISLE | 0.25" | TEX ISLE X.O.-17060<br>3MG233P 14-16 | ML 90      | 442152 | 1 2          |       |          |
| 39+62 | ML 91   | TEX ISLE | 0.25" | TEX ISLE X.O.-17060<br>3MG233P 14-16 | ML 91      | 442153 | 1 2          |       |          |
| 40+03 | ML 92   | TEX ISLE | 0.25" | TEX ISLE X.O.-17060<br>3MG233P 14-16 | ML 92      | 442154 | 1 2          |       |          |
| 40+45 | ML 93   | TEX ISLE | 0.25" | TEX ISLE X.O.-17060<br>3MG233P 14-16 | ML 93      | 442154 | 1 2          |       |          |
| 40+87 | ML 94   | TEX ISLE | 0.25" | TEX ISLE X.O.-17060<br>3MG233P 14-16 | ML 94      | 442154 | 1 2          |       |          |
| 41+29 | ML 95   | TEX ISLE | 0.25" | TEX ISLE X.O.-17060<br>3MG233P 14-16 | ML 95      | 442154 | 1 2          |       |          |
| 41+71 | ML 96   | TEX ISLE | 0.25" | TEX ISLE X.O.-17060<br>3MG233P 14-16 | ML 96      | 442157 | 1 2          |       |          |
| 42+13 | ML 97   | TEX ISLE | 0.25" | TEX ISLE X.O.-17060<br>3MG233P 14-16 | ML 97      | 442157 | 1 2          |       |          |
| 42+55 | ML 98   | TEX ISLE | 0.25" | TEX ISLE X.O.-17060<br>3MG233P 14-16 | ML 98      | 442157 | 1 2          |       |          |
| 42+97 | ML 99   | TEX ISLE | 0.25" | TEX ISLE X.O.-17060<br>3MG233P 14-16 | ML 99      | 442157 | 1 2          |       |          |
| 43+38 | ML 100  | TEX ISLE | 0.25" | TEX ISLE X.O.-17060<br>3MG233P 14-16 | ML 100     | 442157 | 1 2          |       |          |
| 43+80 | ML 101  | TEX ISLE | 0.25" | TEX ISLE X.O.-17060<br>3MG233P 14-16 | ML 101     | 442153 | 1 2          |       |          |
| 44+22 | ML 102  | TEX ISLE | 0.25" | TEX ISLE X.O.-17060<br>3MG233P 14-16 | ML 102     | 442153 | 1,000000     |       |          |
| 44+64 | ML 103  | TEX ISLE | 0.25" | TEX ISLE X.O.-17060<br>3MG233P 14-16 | ML 103     | 442154 | 1 2          |       |          |
| 45+06 | ML 104  | TEX ISLE | 0.25" | TEX ISLE X.O.-17060<br>3MG233P 14-16 | ML 104     | 442148 | 1 2          |       |          |
| 45+48 | ML 105  | TEX ISLE | 0.25" | TEX ISLE X.O.-17060<br>3MG233P 14-16 | ML 105     | 14949  | 1 2          |       |          |
| 45+90 | ML 106  | TEX ISLE | 0.25" | TEX ISLE X.O.-17060<br>3MG233P 14-16 | ML 106     | 442148 | 1 2          |       |          |
| 46+32 | ML 107  | TEX ISLE | 0.25" | TEX ISLE X.O.-17060<br>3MG233P 14-16 | ML 107     | 442148 | 1 2          |       |          |
| 46+74 | ML 108  | TEX ISLE | 0.25" | TEX ISLE X.O.-17060<br>3MG233P 14-16 | ML 108     | 442148 | 1 2          |       |          |
| 47+16 | ML 109  | TEX ISLE | 0.25" | TEX ISLE X.O.-17060<br>3MG233P 14-16 | ML 109     | 442148 | 1 2          |       |          |
|       | ML 110  | TEX ISLE | 0.25" | TEX ISLE X.O.-17060<br>3MG233P 14-16 | ML 110     | 442152 | 1 2          |       |          |
|       | ML 111  | TEX ISLE | 0.25" | TEX ISLE X.O.-17060<br>3MG233P 14-16 | ML 111     | 442154 | 1 2          |       |          |
|       | ML 112  | TEX ISLE | 0.25" | TEX ISLE X.O.-17060<br>3MG233P 14-16 | ML 112     | 442154 | 1 2          |       |          |
|       | ML 113  | TEX ISLE | 0.25" | TEX ISLE X.O.-17060<br>3MG233P 14-16 | ML 113     | 442154 | 1 2          |       |          |
|       | ML 114  | TEX ISLE | 0.25" | TEX ISLE X.O.-17060<br>3MG233P 14-16 | ML 114     | 442154 | 1 2          |       |          |
|       | ML 115  | TEX ISLE | 0.25" | TEX ISLE X.O.-17060<br>3MG233P 14-16 | ML 115     | 442157 | 1 2          |       |          |
|       | ML 116  | TEX ISLE | 0.25" | TEX ISLE X.O.-17060<br>3MG233P 14-16 | ML 116     | 442157 | 1 2          |       |          |
|       | ML 117  | TEX ISLE | 0.25" | TEX ISLE X.O.-17060<br>3MG233P 14-16 | ML 117     | 442148 | 1 2          |       |          |
|       | ML 118  | TEX ISLE | 0.25" | TEX ISLE X.O.-17060<br>3MG233P 14-16 | ML 118     | 442148 | 1 2          |       |          |
|       | ML 119  | TEX ISLE | 0.25" | TEX ISLE X.O.-17060<br>3MG233P 14-16 | ML 119     | 442154 | 1 2          |       |          |
|       | ML 120  | TEX ISLE | 0.25" | TEX ISLE X.O.-17060<br>3MG233P 14-16 | ML 120     | 144949 | 1 2          |       |          |
|       | ML 121  | TEX ISLE | 0.25" | TEX ISLE X.O.-17060<br>3MG233P 14-16 | ML 121     | 442148 | 1 2          |       |          |
|       | ML 122  | TEX ISLE | 0.25" | TEX ISLE X.O.-17060<br>3MG233P 14-16 | ML 122     | 442148 | 1 2          |       |          |
|       | ML 123  | TEX ISLE | 0.25" | TEX ISLE X.O.-17060<br>3MG233P 14-16 | ML 123     | 442152 | 1 2          |       |          |
|       | ML 124  | TEX ISLE | 0.25" | TEX ISLE X.O.-17060<br>3MG233P 14-16 | ML 124     | 442152 | 1 2          |       |          |
|       | ML 125  | TEX ISLE | 0.25" | TEX ISLE X.O.-17060<br>3MG233P 14-16 | ML 125     | 442154 | 1 2          |       |          |
|       | ML 126  | TEX ISLE | 0.25" | TEX ISLE X.O.-17060<br>3MG233P 14-16 | ML 126     | 442154 | 1 2          |       |          |
|       | ML 127  | TEX ISLE | 0.25" | TEX ISLE X.O.-17060<br>3MG233P 14-16 | ML 127     | 442148 | 1 2          |       |          |
|       | ML 128  | TEX ISLE | 0.25" | TEX ISLE X.O.-17060<br>3MG233P 14-16 | ML 128     | 442154 | 1 2          |       |          |
|       | ML 129  | TEX ISLE | 0.25" | TEX ISLE X.O.-17060<br>3MG233P 14-16 | ML 129     | 442152 | 1 2          |       |          |
|       | ML 130  | TEX ISLE | 0.25" | TEX ISLE X.O.-17060<br>3MG233P 14-16 | ML 130     | 442154 | 1 2          |       |          |
|       | ML 131  | TEX ISLE | 0.25" | TEX ISLE X.O.-17060<br>3MG233P 14-16 | ML 131     | 442154 | 1 2          |       |          |
|       | ML 132  | TEX ISLE | 0.25" | TEX ISLE X.O.-17060<br>3MG233P 14-16 | ML 132     | 442157 | 1 2          |       |          |
|       | ML 133  | TEX ISLE | 0.25" | TEX ISLE X.O.-17060<br>3MG233P 14-16 | ML 133     | 442157 | 1 2          |       |          |
|       | ML 134  | TEX ISLE | 0.25" | TEX ISLE X.O.-17060<br>3MG233P 14-16 | ML 134     | 442157 | 1 2          |       |          |
|       | ML 135  | TEX ISLE | 0.25" | TEX ISLE X.O.-17060<br>3MG233P 14-16 | ML 135     | 442152 | 1 2          |       |          |
|       | ML 136  | TEX ISLE | 0.25" | TEX ISLE X.O.-17060<br>3MG233P 14-16 | ML 136     | 442152 | 1 2          |       |          |
|       | ML 137  | TEX ISLE | 0.25" | TEX ISLE X.O.-17060<br>3MG233P 14-16 | ML 137     | 442152 | 1 2          |       |          |

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| STA   | JOINT # | MFG      | WALL  | COATING                              | WELD XRAY# | HEAT # | WELDERS MARK | Depth                         | Comments |
|-------|---------|----------|-------|--------------------------------------|------------|--------|--------------|-------------------------------|----------|
| 37+12 | ML 85   | TEX ISLE | 0.25" | TEX ISLE X.O.-17060<br>3MG233P 14-16 | ML 85      | 442153 | 12           |                               |          |
| 37+54 | ML 88   | TEX ISLE | 0.25" | TEX ISLE X.O.-17060<br>3MG233P 14-16 | ML 86      | 442154 | 12           |                               |          |
| 37+95 | ML 89   | TEX ISLE | 0.25" | TEX ISLE X.O.-17060<br>3MG233P 14-16 | ML 87      | 442154 | 12           |                               |          |
| 38+36 | ML 90   | TEX ISLE | 0.25" | TEX ISLE X.O.-17060<br>3MG233P 14-16 | ML 88      | 442154 | 12           |                               |          |
| 38+78 | ML 91   | TEX ISLE | 0.25" | TEX ISLE X.O.-17060<br>3MG233P 14-16 | ML 89      | 442154 | 12           |                               |          |
| 39+20 | ML 92   | TEX ISLE | 0.25" | TEX ISLE X.O.-17060<br>3MG233P 14-16 | ML 90      | 442152 | 12           |                               |          |
| 39+62 | ML 93   | TEX ISLE | 0.25" | TEX ISLE X.O.-17060<br>3MG233P 14-16 | ML 91      |        | 12           | PIF10, Approx. Qtr Line X-ray |          |
| 40+03 | ML 94   | TEX ISLE | 0.25" | TEX ISLE X.O.-17060<br>3MG233P 14-16 | ML 92      | 442153 | 12           |                               |          |
| 40+45 | ML 95   | TEX ISLE | 0.25" | TEX ISLE X.O.-17060<br>3MG233P 14-16 | ML 93      | 442154 | 12           |                               |          |
| 40+87 | ML 96   | TEX ISLE | 0.25" | TEX ISLE X.O.-17060<br>3MG233P 14-16 | ML 94      | 442154 | 12           |                               |          |
| 41+29 | ML 97   | TEX ISLE | 0.25" | TEX ISLE X.O.-17060<br>3MG233P 14-16 | ML 95      | 442154 | 12           |                               |          |
| 41+71 | ML 98   | TEX ISLE | 0.25" | TEX ISLE X.O.-17060<br>3MG233P 14-16 | ML 96      | 442154 | 12           |                               |          |
| 42+13 | ML 99   | TEX ISLE | 0.25" | TEX ISLE X.O.-17060<br>3MG233P 14-16 | ML 97      | 442157 | 12           |                               |          |
| 42+55 | ML 100  | TEX ISLE | 0.25" | TEX ISLE X.O.-17060<br>3MG233P 14-16 | ML 98      | 442157 | 12           |                               |          |
| 42+97 | ML 101  | TEX ISLE | 0.25" | TEX ISLE X.O.-17060<br>3MG233P 14-16 | ML 99      | 442157 | 12           |                               |          |
| 43+39 | ML 102  | TEX ISLE | 0.25" | TEX ISLE X.O.-17060<br>3MG233P 14-16 | ML 100     | 442157 | 12           |                               |          |
| 43+80 | ML 103  | TEX ISLE | 0.25" | TEX ISLE X.O.-17060<br>3MG233P 14-16 | ML 101     | 442157 | 12           |                               |          |
| 44+22 | ML 104  | TEX ISLE | 0.25" | TEX ISLE X.O.-17060<br>3MG233P 14-16 | ML 102     | 442153 | 12           |                               |          |
| 44+64 | ML 105  | TEX ISLE | 0.25" | TEX ISLE X.O.-17060<br>3MG233P 14-16 | ML 103     | 442153 | 1,000,000    |                               |          |
| 45+06 | ML 106  | TEX ISLE | 0.25" | TEX ISLE X.O.-17060<br>3MG233P 14-16 | ML 104     | 442154 | 12           |                               |          |
| 45+48 | ML 107  | TEX ISLE | 0.25" | TEX ISLE X.O.-17060<br>3MG233P 14-16 | ML 105     | 442146 | 12           |                               |          |
| 45+90 | ML 108  | TEX ISLE | 0.25" | TEX ISLE X.O.-17060<br>3MG233P 14-16 | ML 106     | 144949 | 12           |                               |          |
| 46+32 | ML 109  | TEX ISLE | 0.25" | TEX ISLE X.O.-17060<br>3MG233P 14-16 | ML 107     | 442148 | 12           |                               |          |
| 46+74 | ML 110  | TEX ISLE | 0.25" | TEX ISLE X.O.-17060<br>3MG233P 14-16 | ML 108     | 442148 | 12           |                               |          |
| 47+16 | ML 111  | TEX ISLE | 0.25" | TEX ISLE X.O.-17060<br>3MG233P 14-16 | ML 109     | 442148 | 12           |                               |          |
|       | ML 112  | TEX ISLE | 0.25" | TEX ISLE X.O.-17060<br>3MG233P 14-16 | ML 110     | 442148 | 12           |                               |          |
|       | ML 113  | TEX ISLE | 0.25" | TEX ISLE X.O.-17060<br>3MG233P 14-16 | ML 111     | 442154 | 12           |                               |          |
|       | ML 114  | TEX ISLE | 0.25" | TEX ISLE X.O.-17060<br>3MG233P 14-16 | ML 112     | 442148 | 12           |                               |          |
|       | ML 115  | TEX ISLE | 0.25" | TEX ISLE X.O.-17060<br>3MG233P 14-16 | ML 113     | 442154 | 12           |                               |          |
|       | ML 116  | TEX ISLE | 0.25" | TEX ISLE X.O.-17060<br>3MG233P 14-16 | ML 114     | 442154 | 12           |                               |          |
|       | ML 117  | TEX ISLE | 0.25" | TEX ISLE X.O.-17060<br>3MG233P 14-16 | ML 115     | 442148 | 12           |                               |          |
|       | ML 118  | TEX ISLE | 0.25" | TEX ISLE X.O.-17060<br>3MG233P 14-16 | ML 116     | 442157 | 12           |                               |          |
|       | ML 119  | TEX ISLE | 0.25" | TEX ISLE X.O.-17060<br>3MG233P 14-16 | ML 117     | 442154 | 12           |                               |          |
|       | ML 120  | TEX ISLE | 0.25" | TEX ISLE X.O.-17060<br>3MG233P 14-16 | ML 118     | 442148 | 12           |                               |          |
|       | ML 121  | TEX ISLE | 0.25" | TEX ISLE X.O.-17060<br>3MG233P 14-16 | ML 119     | 442149 | 12           |                               |          |
|       | ML 122  | TEX ISLE | 0.25" | TEX ISLE X.O.-17060<br>3MG233P 14-16 | ML 120     | 442154 | 12           |                               |          |
|       | ML 123  | TEX ISLE | 0.25" | TEX ISLE X.O.-17060<br>3MG233P 14-16 | ML 121     | 144949 | 12           |                               |          |
|       | ML 124  | TEX ISLE | 0.25" | TEX ISLE X.O.-17060<br>3MG233P 14-16 | ML 122     | 442148 | 12           |                               |          |
|       | ML 125  | TEX ISLE | 0.25" | TEX ISLE X.O.-17060<br>3MG233P 14-16 | ML 123     | 442148 | 12           |                               |          |
|       | ML 126  | TEX ISLE | 0.25" | TEX ISLE X.O.-17060<br>3MG233P 14-16 | ML 124     | 442152 | 12           |                               |          |
|       | ML 127  | TEX ISLE | 0.25" | TEX ISLE X.O.-17060<br>3MG233P 14-16 | ML 125     | 442152 | 12           |                               |          |
|       | ML 128  | TEX ISLE | 0.25" | TEX ISLE X.O.-17060<br>3MG233P 14-16 | ML 126     | 442154 | 12           |                               |          |
|       | ML 129  | TEX ISLE | 0.25" | TEX ISLE X.O.-17060<br>3MG233P 14-16 | ML 127     | 442148 | 12           |                               |          |
|       | ML 130  | TEX ISLE | 0.25" | TEX ISLE X.O.-17060<br>3MG233P 14-16 | ML 128     | 442148 | 12           |                               |          |
|       | ML 131  | TEX ISLE | 0.25" | TEX ISLE X.O.-17060<br>3MG233P 14-16 | ML 129     | 442154 | 12           |                               |          |
|       | ML 132  | TEX ISLE | 0.25" | TEX ISLE X.O.-17060<br>3MG233P 14-16 | ML 130     | 442152 | 12           |                               |          |
|       | ML 133  | TEX ISLE | 0.25" | TEX ISLE X.O.-17060<br>3MG233P 14-16 | ML 131     | 442154 | 12           |                               |          |
|       | ML 134  | TEX ISLE | 0.25" | TEX ISLE X.O.-17060<br>3MG233P 14-16 | ML 132     | 442154 | 12           |                               |          |
|       | ML 135  | TEX ISLE | 0.25" | TEX ISLE X.O.-17060<br>3MG233P 14-16 | ML 133     | 442157 | 12           |                               |          |
|       | ML 136  | TEX ISLE | 0.25" | TEX ISLE X.O.-17060<br>3MG233P 14-16 | ML 134     | 442157 | 12           |                               |          |
|       | ML 137  | TEX ISLE | 0.25" | TEX ISLE X.O.-17060<br>3MG233P 14-16 | ML 135     | 442152 | 12           |                               |          |

| STA   | JOINT # | MFG      | WALL  | COATING                         | WELD XRAY# | HEAT # | WELDERS MARK | Depth | Comments                      |
|-------|---------|----------|-------|---------------------------------|------------|--------|--------------|-------|-------------------------------|
| 88+03 | ML 138  | TEX ISLE | 0.25" | TEX ISLE W.017060 3MG233P 14-16 | ML 135     | 442154 | 121212.00000 | 1.2   |                               |
| 88+46 | ML 142  | TEX ISLE | 0.25" | TEX ISLE W.017060 3MG233P 14-16 | T118       | 442154 | 121212.00000 | 0     | PHI2                          |
| 88+88 | ML 143  | TEX ISLE | 0.25" | TEX ISLE W.017060 3MG233P 14-16 | ML 196     | 442154 | 121212.00000 | 1.2   |                               |
| 88+90 | ML 144  | TEX ISLE | 0.25" | TEX ISLE W.017060 3MG233P 14-16 | ML 197     | 442154 | 121212.00000 | 1.2   |                               |
| 88+72 | ML 139  | TEX ISLE | 0.25" | TEX ISLE W.017060 3MG233P 14-16 | T119       | 442148 | 121212.00000 | 0     | PHI13                         |
| 88+14 | ML 140  | TEX ISLE | 0.25" | TEX ISLE W.017060 3MG233P 14-16 | ML 194     | 442148 | 121212.00000 | 1.2   | 5.1'                          |
| 88+56 | ML 141  | TEX ISLE | 0.25" | TEX ISLE W.017060 3MG233P 14-16 | ML 195     | 442148 | 121212.00000 | 1.2   |                               |
| 88+96 | N/A     | N/A      | N/A   | N/A                             | T120       | 442157 |              |       |                               |
| 81+13 | N/A     | N/A      | N/A   | N/A                             | T121       |        |              |       | PHI4, 22.5' Elbow             |
| 81+14 | N/A     | N/A      | N/A   | N/A                             | T122       |        |              |       |                               |
| 81+15 | N/A     | N/A      | N/A   | N/A                             | T123       |        |              |       |                               |
| 81+22 | ML 145  | TEX ISLE | 0.25" | TEX ISLE W.017060 3MG233P 14-16 | ML 198     | 442154 | 121212.00000 | 1.2   |                               |
| 81+62 | ML 146  | TEX ISLE | 0.25" | TEX ISLE W.017060 3MG233P 14-16 | ML 199     | 442148 | 121212.00000 | 1.2   |                               |
| 82+04 | ML 147  | TEX ISLE | 0.25" | TEX ISLE W.017060 3MG233P 14-16 | ML 200     | 442154 | 121212.00000 | 1.2   |                               |
| 82+46 | ML 148  | TEX ISLE | 0.25" | TEX ISLE W.017060 3MG233P 14-16 | ML 201     | 442154 | 121212.00000 | 1.2   |                               |
| 82+88 | ML 149A | TEX ISLE | 0.25" | TEX ISLE W.017060 3MG233P 14-16 | ML 202     | 442148 | 121212.00000 | 1.2   |                               |
| 83+30 | ML 149B | TEX ISLE | 0.25" | TEX ISLE W.017060 3MG233P 14-16 | ML 203     | 442154 | 121212.00000 | 1.2   |                               |
| 83+70 | N/A     | N/A      | N/A   | N/A                             | T126       |        |              |       | PHI15                         |
| 83+78 | N/A     | N/A      | N/A   | N/A                             | T127       |        |              |       |                               |
| 83+80 | N/A     | N/A      | N/A   | N/A                             | T130       |        |              |       |                               |
| 83+86 | ML 149C | TEX ISLE | 0.25" | TEX ISLE W.017060 3MG233P 14-16 | ML 204     | 442154 | 121212.00000 | 1.2   | 6.5'                          |
| 84+22 | ML 149D | TEX ISLE | 0.25" | TEX ISLE W.017060 3MG233P 14-16 | ML 205     | 442154 | 121212.00000 | 2.1   |                               |
| 84+64 | ML 149E | TEX ISLE | 0.25" | TEX ISLE W.017060 3MG233P 14-16 | ML 206     | 442157 | 121212.00000 | 2.1   |                               |
| 85+06 | ML 149F | TEX ISLE | 0.25" | TEX ISLE W.017060 3MG233P 14-16 | ML 208     | 442154 | 121212.00000 | 2.1   |                               |
| 85+48 | ML 149G | TEX ISLE | 0.25" | TEX ISLE W.017060 3MG233P 14-16 | ML 209     | 442154 | 121212.00000 | 2.1   | PHI16, Approx. Sec Line X-ray |
| 86+22 | N/A     | N/A      | N/A   | N/A                             | ML 206     |        |              |       |                               |
| 86+35 | N/A     | N/A      | N/A   | N/A                             | ML 206     |        |              |       | PHI17                         |

| STA   | JOINT # | MFG      | WALL  | COATING                         | WELD XRAY# | HEAT # | WELDERS MARK | Depth | Comments                      |
|-------|---------|----------|-------|---------------------------------|------------|--------|--------------|-------|-------------------------------|
| 88+74 | N/A     | N/A      | N/A   | N/A                             | T128       |        |              |       |                               |
| 88+82 | N/A     | N/A      | N/A   | N/A                             | T124       |        |              |       | PHI18                         |
| 88+84 | N/A     | N/A      | N/A   | N/A                             | T125       |        |              |       |                               |
| 88+87 | 148K    | TEX ISLE | 0.25" | N/A                             | 296.000000 | 442154 |              |       |                               |
| 87+29 | 148L    | TEX ISLE | 0.25" | N/A                             | 297.000000 | 141506 |              |       |                               |
| 87+71 |         |          |       |                                 |            |        |              |       | PHI19, Approx. Sec Line X-ray |
| 87+80 | 148M    | TEX ISLE | 0.25" | N/A                             | 298.000000 | 141949 |              |       |                               |
| 88+13 | 148N    | TEX ISLE | 0.25" | N/A                             | 298.000000 | 141908 |              |       |                               |
| 88+55 |         |          |       |                                 |            |        |              |       |                               |
| 88+90 | ML 150  | TEX ISLE | 0.25" | TEX ISLE W.017060 3MG233P 14-16 | T117       | 442148 |              |       | PHI20                         |
| 88+23 | ML 151  | TEX ISLE | 0.25" | TEX ISLE W.017060 3MG233P 14-16 | ML 138     | 442154 |              |       |                               |
| 88+74 | ML 152  | TEX ISLE | 0.25" | TEX ISLE W.017060 3MG233P 14-16 | ML 137     | 442157 |              |       |                               |
| 70+16 | ML 153  | TEX ISLE | 0.25" | TEX ISLE W.017060 3MG233P 14-16 | ML 138     | 442154 |              |       |                               |
| 70+58 | ML 154  | TEX ISLE | 0.25" | TEX ISLE W.017060 3MG233P 14-16 | ML 139     | 442148 |              |       |                               |
| 71+00 | ML 155  | TEX ISLE | 0.25" | TEX ISLE W.017060 3MG233P 14-16 | ML 140     | 144849 |              |       |                               |
| 71+42 | ML 156  | TEX ISLE | 0.25" | TEX ISLE W.017060 3MG233P 14-16 | ML 141     | 442154 |              |       |                               |
| 71+84 | ML 157  | TEX ISLE | 0.25" | TEX ISLE W.017060 3MG233P 14-16 | ML 142     | 442157 |              |       |                               |
| 72+26 | ML 158  | TEX ISLE | 0.25" | TEX ISLE W.017060 3MG233P 14-16 | ML 143     | 442148 |              |       |                               |
| 72+68 | ML 159  | TEX ISLE | 0.25" | TEX ISLE W.017060 3MG233P 14-16 | ML 144     | 442148 |              |       |                               |
| 73+09 | ML 160  | TEX ISLE | 0.25" | TEX ISLE W.017060 3MG233P 14-16 | ML 145     | 442157 |              |       |                               |
| 73+51 | ML 161  | TEX ISLE | 0.25" | TEX ISLE W.017060 3MG233P 14-16 | ML 146     | 442148 |              |       |                               |
| 73+93 | ML 162  | TEX ISLE | 0.25" | TEX ISLE W.017060 3MG233P 14-16 | ML 147     | 442148 |              |       |                               |
| 74+35 | ML 163  | TEX ISLE | 0.25" | TEX ISLE W.017060 3MG233P 14-16 | ML 148     | 442148 |              |       |                               |
| 74+77 | ML 164  | TEX ISLE | 0.25" | TEX ISLE W.017060 3MG233P 14-16 | ML 149     | 442148 |              |       |                               |
| 75+19 | ML 165  | TEX ISLE | 0.25" | TEX ISLE W.017060 3MG233P 14-16 | ML 150     | 442148 |              |       |                               |
| 75+61 | ML 166  | TEX ISLE | 0.25" | TEX ISLE W.017060 3MG233P 14-16 | ML 151     | 442154 |              |       |                               |
| 76+03 | ML 167  | TEX ISLE | 0.25" | TEX ISLE W.017060 3MG233P 14-16 | ML 152     | 141506 |              |       |                               |

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| STA   | JOINT #                    | MFG      | WALL  | COATING                        | WELD XRAY# | HEAT # | WELDERS MARK | Depth | Comments        |
|-------|----------------------------|----------|-------|--------------------------------|------------|--------|--------------|-------|-----------------|
| 89+25 | 1909                       | TEX ISLE | 0.25" | TEXISLEW07060<br>3MG6233P14-16 | ML 153     | 141506 | 2.1          | 7.3   |                 |
| 89+35 | ML 191                     | TEX ISLE | 0.25" | TEXISLEW07060<br>3MG6233P14-16 | ML 154     | 141506 | 2.1          |       |                 |
| 89+80 | #885 ML 176 141508<br>41.7 | TEX ISLE | 0.25" | TEXISLEW07060<br>3MG6233P14-16 | ML 155     | 442154 | 2.1          |       |                 |
| 89+81 | ML 192                     | TEX ISLE | 0.25" | TEXISLEW07060<br>3MG6233P14-16 | ML 156     | 141506 | 2.1          |       |                 |
| 89+82 | ML 193                     | TEX ISLE | 0.25" | TEXISLEW07060<br>3MG6233P14-16 | ML 157     | 442154 | 2.1          |       |                 |
| 89+84 | ML 194                     | TEX ISLE | 0.25" | TEXISLEW07060<br>3MG6233P14-16 | ML 158     | 442154 | 2.1          |       |                 |
| 89+85 | ML 195                     | TEX ISLE | 0.25" | TEXISLEW07060<br>3MG6233P14-16 | ML 159     | 442154 | 2.1          |       |                 |
| 89+86 | ML 196                     | TEX ISLE | 0.25" | TEXISLEW07060<br>3MG6233P14-16 | ML 160     | 141506 | 2.1          |       |                 |
| 89+89 | ML 197                     | TEX ISLE | 0.25" | TEXISLEW07060<br>3MG6233P14-16 | ML 161     | 141506 | 2.1          |       |                 |
| 89+92 | ML 198                     | TEX ISLE | 0.25" | TEXISLEW07060<br>3MG6233P14-16 | ML 162     | 141506 | 2.1          |       |                 |
| 89+94 | ML 199                     | TEX ISLE | 0.25" | TEXISLEW07060<br>3MG6233P14-16 | ML 163     | 141504 | 2.1          |       |                 |
| 89+95 | ML 200                     | TEX ISLE | 0.25" | TEXISLEW07060<br>3MG6233P14-16 | ML 164     | 141508 | 2.1          |       |                 |
| 89+97 | ML 201                     | TEX ISLE | 0.25" | TEXISLEW07060<br>3MG6233P14-16 | ML 165     | 141509 | 2.1          |       |                 |
| 89+99 | ML 202                     | TEX ISLE | 0.25" | TEXISLEW07060<br>3MG6233P14-16 | ML 166     | 141506 | 2.1          |       |                 |
| 91+41 | ML 203                     | TEX ISLE | 0.25" | TEXISLEW07060<br>3MG6233P14-16 | ML 167     | 141506 | 2.1          |       |                 |
| 91+83 | ML 204                     | TEX ISLE | 0.25" | TEXISLEW07060<br>3MG6233P14-16 | ML 168     | 141509 | 2.1          |       |                 |
| 92+24 | ML 205                     | TEX ISLE | 0.25" | TEXISLEW07060<br>3MG6233P14-16 | ML 169     | 442154 | 2.1          |       |                 |
| 92+66 | ML 206                     | TEX ISLE | 0.25" | TEXISLEW07060<br>3MG6233P14-16 | ML 170     | 442154 | 2.1          |       |                 |
| 93+08 | ML 207                     | TEX ISLE | 0.25" | TEXISLEW07060<br>3MG6233P14-16 | ML 171     | 141506 | 2.1          |       |                 |
| 93+50 | ML 208                     | TEX ISLE | 0.25" | TEXISLEW07060<br>3MG6233P14-16 | ML 172     | 141506 | 2.1          |       |                 |
| 93+91 | ML 209                     | TEX ISLE | 0.25" | TEXISLEW07060<br>3MG6233P14-16 | ML 173     | 141506 | 2.1          |       |                 |
| 94+33 | ML 210                     | TEX ISLE | 0.25" | TEXISLEW07060<br>3MG6233P14-16 | ML 174     | 141504 | 2.1          |       |                 |
| 94+75 | ML 211                     | TEX ISLE | 0.25" | TEXISLEW07060<br>3MG6233P14-16 | ML 175     | 442148 | 2.1          |       |                 |
| 95+17 | ML 212                     | TEX ISLE | 0.25" | TEXISLEW07060<br>3MG6233P14-16 | ML 176     | 442148 | 2.1          | 7.8   |                 |
| 95+59 | ML 213                     | TEX ISLE | 0.25" | TEXISLEW07060<br>3MG6233P14-16 | ML 177     | 442148 | 2.1          |       | PH21, 45" Elbow |

| STA   | JOINT # | MFG      | WALL  | COATING                        | WELD XRAY# | HEAT # | WELDERS MARK | Depth | Comments |
|-------|---------|----------|-------|--------------------------------|------------|--------|--------------|-------|----------|
| 78+45 | ML 168  | TEX ISLE | 0.25" | TEXISLEW07060<br>3MG6233P14-16 | ML 153     | 141506 | 2.1          | 7.3   |          |
| 78+87 | ML 169  | TEX ISLE | 0.25" | TEXISLEW07060<br>3MG6233P14-16 | ML 154     | 141506 | 2.1          |       |          |
| 77+29 | ML 170  | TEX ISLE | 0.25" | TEXISLEW07060<br>3MG6233P14-16 | ML 155     | 442154 | 2.1          |       |          |
| 77+71 | ML 171  | TEX ISLE | 0.25" | TEXISLEW07060<br>3MG6233P14-16 | ML 156     | 141506 | 2.1          |       |          |
| 78+13 | ML 172  | TEX ISLE | 0.25" | TEXISLEW07060<br>3MG6233P14-16 | ML 157     | 442154 | 2.1          |       |          |
| 78+54 | ML 173  | TEX ISLE | 0.25" | TEXISLEW07060<br>3MG6233P14-16 | ML 158     | 442154 | 2.1          |       |          |
| 78+96 | ML 174  | TEX ISLE | 0.25" | TEXISLEW07060<br>3MG6233P14-16 | ML 159     | 442154 | 2.1          |       |          |
| 79+38 | ML 175  | TEX ISLE | 0.25" | TEXISLEW07060<br>3MG6233P14-16 | ML 160     | 141506 | 2.1          |       |          |
| 79+80 | ML 176  | TEX ISLE | 0.25" | TEXISLEW07060<br>3MG6233P14-16 | ML 161     | 141509 | 2.1          |       |          |
| 80+22 | ML 177  | TEX ISLE | 0.25" | TEXISLEW07060<br>3MG6233P14-16 | ML 162     | 141506 | 2.1          |       |          |
| 80+64 | ML 178  | TEX ISLE | 0.25" | TEXISLEW07060<br>3MG6233P14-16 | ML 163     | 141506 | 2.1          |       |          |
| 81+06 | ML 179  | TEX ISLE | 0.25" | TEXISLEW07060<br>3MG6233P14-16 | ML 164     | 141504 | 2.1          |       |          |
| 81+47 | ML 180  | TEX ISLE | 0.25" | TEXISLEW07060<br>3MG6233P14-16 | ML 165     | 141508 | 2.1          |       |          |
| 81+89 | ML 181  | TEX ISLE | 0.25" | TEXISLEW07060<br>3MG6233P14-16 | ML 166     | 141509 | 2.1          |       |          |
| 82+31 | ML 182  | TEX ISLE | 0.25" | TEXISLEW07060<br>3MG6233P14-16 | ML 167     | 141506 | 2.1          |       |          |
| 82+73 | ML 183  | TEX ISLE | 0.25" | TEXISLEW07060<br>3MG6233P14-16 | ML 168     | 141506 | 2.1          |       |          |
| 83+15 | ML 184  | TEX ISLE | 0.25" | TEXISLEW07060<br>3MG6233P14-16 | ML 169     | 442154 | 2.1          |       |          |
| 83+56 | ML 185  | TEX ISLE | 0.25" | TEXISLEW07060<br>3MG6233P14-16 | ML 170     | 442154 | 2.1          |       |          |
| 83+98 | ML 186  | TEX ISLE | 0.25" | TEXISLEW07060<br>3MG6233P14-16 | ML 171     | 141506 | 2.1          |       |          |
| 84+40 | ML 187  | TEX ISLE | 0.25" | TEXISLEW07060<br>3MG6233P14-16 | ML 172     | 141506 | 2.1          |       |          |
| 84+82 | ML 188  | TEX ISLE | 0.25" | TEXISLEW07060<br>3MG6233P14-16 | ML 173     | 141506 | 2.1          |       |          |
| 85+24 | ML 189  | TEX ISLE | 0.25" | TEXISLEW07060<br>3MG6233P14-16 | ML 174     | 141504 | 2.1          |       |          |
| 85+66 | ML 190  | TEX ISLE | 0.25" | TEXISLEW07060<br>3MG6233P14-16 | ML 175     | 442148 | 2.1          |       |          |
| 86+07 | N/A     | N/A      | N/A   | N/A                            | T15        | 442148 | N/A          |       |          |
| 86+16 | N/A     | N/A      | N/A   | N/A                            | T16        | 442148 | N/A          |       |          |
| 86+17 | N/A     | N/A      | N/A   | N/A                            | T14        | 442148 | N/A          |       |          |
| 86+18 | N/A     | N/A      | N/A   | N/A                            | T10        | 442148 | N/A          |       |          |

RE-ISSUED ASBUILT 8-18-2015

| STA    | JOINT # | MFG            | WALL           | COATING                       | WELD XRAY# | HEAT # | WELDERS MARK | Depth                      | Comments |
|--------|---------|----------------|----------------|-------------------------------|------------|--------|--------------|----------------------------|----------|
| 114+34 | ML 258  | TEX ISLE 0.25" | TEX ISLE 0.25" | TEXISLEW.017060 3MG233P 14-16 | ML 252     | 141506 | 12           |                            |          |
| 114+76 | ML 259  | TEX ISLE 0.25" | TEX ISLE 0.25" | TEXISLEW.017060 3MG233P 14-16 | ML         | 141506 | 12           |                            |          |
| 114+86 | ML 260  | TEX ISLE 0.25" | TEX ISLE 0.25" | TEXISLEW.017060 3MG233P 14-16 | ML 254     |        | 12           | PH28, Approx. On Line Xing |          |
| 115+17 | ML 261  | TEX ISLE 0.25" | TEX ISLE 0.25" | TEXISLEW.017060 3MG233P 14-16 | ML 255     | 141509 | 12           |                            |          |
| 115+59 | ML 262  | TEX ISLE 0.25" | TEX ISLE 0.25" | TEXISLEW.017060 3MG233P 14-16 | ML 256     | 442148 | 12           |                            |          |
| 116-01 | ML 263  | TEX ISLE 0.25" | TEX ISLE 0.25" | TEXISLEW.017060 3MG233P 14-16 | ML 257     | 141506 | 12           |                            |          |
| 116+43 | ML 264  | TEX ISLE 0.25" | TEX ISLE 0.25" | TEXISLEW.017060 3MG233P 14-16 | ML 258     | 141508 | 12           |                            |          |
| 116+85 | ML 265  | TEX ISLE 0.25" | TEX ISLE 0.25" | TEXISLEW.017060 3MG233P 14-16 | ML 259     | 141506 | 12           |                            |          |
| 117+27 | ML 266  | TEX ISLE 0.25" | TEX ISLE 0.25" | TEXISLEW.017060 3MG233P 14-16 | ML 260     | 141506 | 12           |                            |          |
| 117+68 | ML 267  | TEX ISLE 0.25" | TEX ISLE 0.25" | TEXISLEW.017060 3MG233P 14-16 | ML 261     | 141506 | 12           |                            |          |
| 118-10 | ML 268  | TEX ISLE 0.25" | TEX ISLE 0.25" | TEXISLEW.017060 3MG233P 14-16 | ML 262     | 141506 | 12           |                            |          |
| 118+51 | ML 269  | TEX ISLE 0.25" | TEX ISLE 0.25" | TEXISLEW.017060 3MG233P 14-16 | ML 263     | 141509 | 12           |                            |          |
| 118+83 | ML 270  | TEX ISLE 0.25" | TEX ISLE 0.25" | TEXISLEW.017060 3MG233P 14-16 | ML 264     | 442154 | 12           | PH29                       |          |
| 119+35 | ML 271  | TEX ISLE 0.25" | TEX ISLE 0.25" | TEXISLEW.017060 3MG233P 14-16 | ML 265     | 442154 | 12           |                            |          |
| 119+76 | ML 272  | TEX ISLE 0.25" | TEX ISLE 0.25" | TEXISLEW.017060 3MG233P 14-16 | ML 266     | 442154 | 12           |                            |          |
| 120-18 | ML 273  | TEX ISLE 0.25" | TEX ISLE 0.25" | TEXISLEW.017060 3MG233P 14-16 | N/A        | 144849 | N/A          |                            |          |
| 120+60 | ML 274  | TEX ISLE 0.25" | TEX ISLE 0.25" | TEXISLEW.017060 3MG233P 14-16 | ML 266     | 442153 | 12           |                            |          |
| 121+03 | N/A     | N/A            | N/A            |                               | TI13       |        | 121212.00000 |                            |          |
| 121+10 | N/A     | N/A            | N/A            |                               | TI14       |        | 0            |                            |          |
| 121+12 | N/A     | N/A            | N/A            |                               | TI15       |        | N/A          | PH30, 45° Elbow            |          |
| 121+13 | N/A     | N/A            | N/A            |                               | TI16       |        | N/A          |                            |          |
| 121+20 | ML 274  | TEX ISLE 0.25" | TEX ISLE 0.25" | TEXISLEW.017060 3MG233P 14-16 | ML 267     | 442157 | 12           |                            |          |
| 121+58 | ML 275  | TEX ISLE 0.25" | TEX ISLE 0.25" | TEXISLEW.017060 3MG233P 14-16 | ML 268     | 442154 | 12           |                            |          |
| 122+00 | ML 276  | TEX ISLE 0.25" | TEX ISLE 0.25" | TEXISLEW.017060 3MG233P 14-16 | ML 269     | 442157 | 12           |                            |          |
| 122+42 | ML 277  | TEX ISLE 0.25" | TEX ISLE 0.25" | TEXISLEW.017060 3MG233P 14-16 | ML 270     | 144849 | 12           |                            |          |
| 122+84 | ML 278  | TEX ISLE 0.25" | TEX ISLE 0.25" | TEXISLEW.017060 3MG233P 14-16 | ML 271     | 144849 | 12           |                            |          |
| 123+25 | ML 279  | TEX ISLE 0.25" | TEX ISLE 0.25" | TEXISLEW.017060 3MG233P 14-16 | ML 271     | 144849 | 12           |                            |          |

| STA    | JOINT #    | MFG            | WALL           | COATING                       | WELD XRAY# | HEAT # | WELDERS MARK | Depth | Comments |
|--------|------------|----------------|----------------|-------------------------------|------------|--------|--------------|-------|----------|
| 123+67 | ML 280     | TEX ISLE 0.25" | TEX ISLE 0.25" | TEXISLEW.017060 3MG233P 14-16 | ML 272     | 442157 | 12           |       |          |
| 124+09 | ML 281     | TEX ISLE 0.25" | TEX ISLE 0.25" | TEXISLEW.017060 3MG233P 14-16 | ML 273     | 442154 | 12           |       |          |
| 124+51 | ML 282     | TEX ISLE 0.25" | TEX ISLE 0.25" | TEXISLEW.017060 3MG233P 14-16 | ML 274     | 144849 | 12           |       |          |
| 124+83 | ML 283     | TEX ISLE 0.25" | TEX ISLE 0.25" | TEXISLEW.017060 3MG233P 14-16 | ML 275     | 442152 | 12           |       |          |
| 125+35 | ML 284     | TEX ISLE 0.25" | TEX ISLE 0.25" | TEXISLEW.017060 3MG233P 14-16 | ML 276     | 442157 | 12           |       |          |
| 125+77 | ML 285     | TEX ISLE 0.25" | TEX ISLE 0.25" | TEXISLEW.017060 3MG233P 14-16 | ML 277     | 442157 | 12           |       |          |
| 126+19 | ML 286     | TEX ISLE 0.25" | TEX ISLE 0.25" | TEXISLEW.017060 3MG233P 14-16 | ML 278     | 442152 | 12           |       |          |
| 126+61 | ML 287     | TEX ISLE 0.25" | TEX ISLE 0.25" | TEXISLEW.017060 3MG233P 14-16 | ML 279     | 442152 | 12           |       |          |
| 127+03 | ML 288     | TEX ISLE 0.25" | TEX ISLE 0.25" | TEXISLEW.017060 3MG233P 14-16 | ML 280     | 442152 | 12           | PH42  |          |
| 127+44 | ML 289     | TEX ISLE 0.25" | TEX ISLE 0.25" | TEXISLEW.017060 3MG233P 14-16 | ML 281     | 442148 | 12           |       |          |
| 127+86 | ML 290     | TEX ISLE 0.25" | TEX ISLE 0.25" | TEXISLEW.017060 3MG233P 14-16 | ML 282     | 442148 | 12           |       |          |
| 128+28 | ML 291     | TEX ISLE 0.25" | TEX ISLE 0.25" | TEXISLEW.017060 3MG233P 14-16 | ML 283     | 442148 | 12           | 5.9   |          |
| 128+70 | ML 292     | TEX ISLE 0.25" | TEX ISLE 0.25" | TEXISLEW.017060 3MG233P 14-16 | ML 284     | 442148 | 12           |       |          |
| 129+11 | ML 293     | TEX ISLE 0.25" | TEX ISLE 0.25" | TEXISLEW.017060 3MG233P 14-16 | ML 285     | 442148 | 12           |       |          |
| 129+53 | ML 294     | TEX ISLE 0.25" | TEX ISLE 0.25" | TEXISLEW.017060 3MG233P 14-16 | ML 286     | 442148 | 12           |       |          |
| 129+95 | ML 295     | TEX ISLE 0.25" | TEX ISLE 0.25" | TEXISLEW.017060 3MG233P 14-16 | ML 287     | 442148 | 12           |       |          |
| 130+37 | ML 296     | TEX ISLE 0.25" | TEX ISLE 0.25" | TEXISLEW.017060 3MG233P 14-16 | ML 288     | 442157 | 12           |       |          |
| 130+78 | ML 297     | TEX ISLE 0.25" | TEX ISLE 0.25" | TEXISLEW.017060 3MG233P 14-16 | ML 289     | 442157 | 12           |       |          |
| 131+20 | ML 298     | TEX ISLE 0.25" | TEX ISLE 0.25" | TEXISLEW.017060 3MG233P 14-16 | ML 290     | 442148 | 12           |       |          |
| 131+61 | ML 299     | TEX ISLE 0.25" | TEX ISLE 0.25" | TEXISLEW.017060 3MG233P 14-16 | ML 291     | 442148 | 12           |       |          |
| 132+03 | ML 300     | TEX ISLE 0.25" | TEX ISLE 0.25" | TEXISLEW.017060 3MG233P 14-16 | ML 292     | 442152 | 12           |       |          |
| 132+45 | ML 301     | TEX ISLE 0.25" | TEX ISLE 0.25" | TEXISLEW.017060 3MG233P 14-16 | ML 293     | 442148 | 12           |       |          |
| 132+87 | ML 302     | TEX ISLE 0.25" | TEX ISLE 0.25" | TEXISLEW.017060 3MG233P 14-16 | ML 294     | 442148 | 12           |       |          |
| 133+29 | ML 303     | TEX ISLE 0.25" | TEX ISLE 0.25" | TEXISLEW.017060 3MG233P 14-16 | ML 295     | 442148 | 12           | 6.4   |          |
| 133+70 | 304.000000 | TEX ISLE 0.25" | TEX ISLE 0.25" | N/A                           | ML 300     | 442148 | 121212.00000 | 0     |          |

**TESORO LOGISTICS OPERATIONS LLC**  
 NEW 10" LINE  
 PIPE TALLY  
 BEULAH BASIN  
 ZAP TO BEULAH  
 PREPARED BY:  
 DATE: 8/18/2015  
 DRAWN BY: [Blank]  
 CHECKED BY: [Blank]  
 DATE: [Blank]

**EDK TECHNICAL COMPANY, INC.**  
 2000 N. [Blank] ST.  
 BEULAH, MO 64601  
 TEL: [Blank] FAX: [Blank]

REFERENCE DRAWINGS:  
 ASBULL 8-18-2015

RE-ISSUED ASBULL 8-18-2015

| STA    | JOINT # | MFG      | WALL  | COATING                        | WELD XRAY# | HEAT # | WELDERS MARK | Depth | Comments |
|--------|---------|----------|-------|--------------------------------|------------|--------|--------------|-------|----------|
| 103+86 |         |          |       |                                |            |        |              |       |          |
| 104+28 | ML 233  | TEX ISLE | 0.25" | TEXISLE W.017060 3MG233P 14-16 | ML 227     | 442158 | 12           |       |          |
| 104+70 | ML 234  | TEX ISLE | 0.25" | TEXISLE W.017060 3MG233P 14-16 | ML 228     | 144949 | 12           | 6.0'  |          |
| 105+12 | ML 235  | TEX ISLE | 0.25" | TEXISLE W.017060 3MG233P 14-16 | ML 229     | 144949 | 12           |       |          |
| 105+54 | ML 236  | TEX ISLE | 0.25" | TEXISLE W.017060 3MG233P 14-16 | ML 230     | 442149 | 12           |       |          |
| 105+96 | ML 237  | TEX ISLE | 0.25" | TEXISLE W.017060 3MG233P 14-16 | ML 231     | 442148 | 12           |       |          |
| 106+38 | ML 238  | TEX ISLE | 0.25" | TEXISLE W.017060 3MG233P 14-16 | ML 232     | 141508 | 12           |       | PH26     |
| 106+80 | ML 239  | TEX ISLE | 0.25" | TEXISLE W.017060 3MG233P 14-16 | ML 233     | 141508 | 12           |       |          |
| 107+22 | ML 240  | TEX ISLE | 0.25" | TEXISLE W.017060 3MG233P 14-16 | ML 234     | 144949 | 12           | 6.3'  | PH27     |
| 107+63 | ML 241  | TEX ISLE | 0.25" | TEXISLE W.017060 3MG233P 14-16 | ML 235     | 141508 | 12           |       |          |
| 108+06 | ML 242  | TEX ISLE | 0.25" | TEXISLE W.017060 3MG233P 14-16 | ML 236     | 144949 | 12           |       |          |
| 108+47 | ML 243  | TEX ISLE | 0.25" | TEXISLE W.017060 3MG233P 14-16 | ML 237     | 144949 | 12           |       |          |
| 108+89 | ML 244  | TEX ISLE | 0.25" | TEXISLE W.017060 3MG233P 14-16 | ML 238     | 442149 | 12           |       |          |
| 109+32 | ML 245  | TEX ISLE | 0.25" | TEXISLE W.017060 3MG233P 14-16 | ML 239     | 141508 | 12           |       |          |
| 109+73 | ML 246  | TEX ISLE | 0.25" | TEXISLE W.017060 3MG233P 14-16 | ML 240     | 141508 | 12           |       |          |
| 110+15 | ML 247  | TEX ISLE | 0.25" | TEXISLE W.017060 3MG233P 14-16 | ML 241     | 141509 | 12           |       |          |
| 110+57 | ML 248  | TEX ISLE | 0.25" | TEXISLE W.017060 3MG233P 14-16 | ML 242     | 141509 | 12           |       |          |
| 110+99 | ML 249  | TEX ISLE | 0.25" | TEXISLE W.017060 3MG233P 14-16 | ML 243     | 141506 | 12           |       |          |
| 111+41 | ML 250  | TEX ISLE | 0.25" | TEXISLE W.017060 3MG233P 14-16 | ML 244     | 141506 | 12           |       |          |
| 111+83 | ML 251  | TEX ISLE | 0.25" | TEXISLE W.017060 3MG233P 14-16 | ML 245     | 141508 | 12           |       |          |
| 112+24 | ML 252  | TEX ISLE | 0.25" | TEXISLE W.017060 3MG233P 14-16 | ML 246     | 141509 | 12           |       |          |
| 112+66 | ML 253  | TEX ISLE | 0.25" | TEXISLE W.017060 3MG233P 14-16 | ML 247     | 141508 | 12           |       |          |
| 113+08 | ML 254  | TEX ISLE | 0.25" | TEXISLE W.017060 3MG233P 14-16 | ML 248     | 141508 | 12           |       |          |
| 113+50 | ML 255  | TEX ISLE | 0.25" | TEXISLE W.017060 3MG233P 14-16 | ML 249     | 141508 | 12           |       |          |
| 113+92 | ML 256  | TEX ISLE | 0.25" | TEXISLE W.017060 3MG233P 14-16 | ML 250     | 141508 | 12           |       |          |
|        | ML 257  | TEX ISLE | 0.25" | TEXISLE W.017060 3MG233P 14-16 | ML 251     | 442154 | 12           |       |          |

| STA    | JOINT #    | MFG      | WALL  | COATING                        | WELD XRAY# | HEAT # | WELDERS MARK | Depth | Comments                     |
|--------|------------|----------|-------|--------------------------------|------------|--------|--------------|-------|------------------------------|
| 98+01  |            |          |       |                                |            |        |              |       |                              |
| 98+43  | ML 214     | TEX ISLE | 0.25" | TEXISLE W.017060 3MG233P 14-16 | ML 210     | 442152 | 21           |       |                              |
| 98+85  | ML 215     | TEX ISLE | 0.25" | TEXISLE W.017060 3MG233P 14-16 | ML 211     | 442157 | 21           |       |                              |
| 97+26  | ML 216     | TEX ISLE | 0.25" | TEXISLE W.017060 3MG233P 14-16 | ML 212     | 442149 | 21           | 6.5'  | PH23                         |
| 97+68  | ML 217     | TEX ISLE | 0.25" | TEXISLE W.017060 3MG233P 14-16 | ML 213     | 442153 | 21           |       |                              |
| 97+89  | ML 218     | TEX ISLE | 0.25" | TEXISLE W.017060 3MG233P 14-16 | ML 214     | 141508 | 21           |       |                              |
| 98+10  | ML 215     | TEX ISLE | 0.25" | TEXISLE W.017060 3MG233P 14-16 |            | 141508 | 21           |       |                              |
| 98+30  | ML 219     | TEX ISLE | 0.25" | TEXISLE W.017060 3MG233P 14-16 |            | 442152 |              |       |                              |
| 98+56  | ML 220     | TEX ISLE | 0.25" | TEXISLE W.017060 3MG233P 14-16 |            | 442152 |              |       |                              |
| 98+74  |            |          |       |                                | ML 216     |        | 21           |       | PH24, Approx. Off Line X-ray |
| 99+15  | ML 221     | TEX ISLE | 0.25" | TEXISLE W.017060 3MG233P 14-16 |            | 442148 |              |       |                              |
| 99+28  | N/A        | N/A      | N/A   |                                |            | 442149 |              |       |                              |
| 99+35  | N/A        | N/A      | N/A   |                                | TI12       |        |              |       |                              |
| 99+36  | N/A        | N/A      | N/A   |                                | TI9        |        |              |       |                              |
| 99+37  | N/A        | N/A      | N/A   |                                | TI8        |        |              | 5.3'  | PH25, 45° Elbow              |
| 99+44  | N/A        | N/A      | N/A   |                                | TI11       |        |              |       |                              |
| 99+48  | 222.000000 | TEX ISLE | 0.25" |                                |            |        |              |       |                              |
| 99+89  | ML 222     | TEX ISLE | 0.25" | TEXISLE W.017060 3MG233P 14-16 | ML 217     | 442148 | 12           |       |                              |
| 100+31 | ML 223     | TEX ISLE | 0.25" | TEXISLE W.017060 3MG233P 14-16 |            | 442153 |              |       |                              |
| 100+51 | ML 224     | TEX ISLE | 0.25" | TEXISLE W.017060 3MG233P 14-16 |            | 442152 |              |       |                              |
| 100+83 | ML 225     | TEX ISLE | 0.25" | TEXISLE W.017060 3MG233P 14-16 | ML 218     | 141508 | 12           |       |                              |
| 101+35 | ML 226     | TEX ISLE | 0.25" | TEXISLE W.017060 3MG233P 14-16 | ML 219     | 442152 | 12           |       |                              |
| 101+77 | ML 227     | TEX ISLE | 0.25" | TEXISLE W.017060 3MG233P 14-16 | ML 220     | 442149 | 12           |       |                              |
| 102+19 | ML 228     | TEX ISLE | 0.25" | TEXISLE W.017060 3MG233P 14-16 | ML 221     | 442154 | 12           |       |                              |
| 102+60 | ML 229     | TEX ISLE | 0.25" | TEXISLE W.017060 3MG233P 14-16 | ML 222     | 442149 | 12           |       |                              |
| 103+02 | ML 230     | TEX ISLE | 0.25" | TEXISLE W.017060 3MG233P 14-16 |            | 442152 |              |       |                              |
| 103+44 | ML 231     | TEX ISLE | 0.25" | TEXISLE W.017060 3MG233P 14-16 | ML 224     | 442152 | 12           |       |                              |
|        | ML 232     | TEX ISLE | 0.25" | TEXISLE W.017060 3MG233P 14-16 | ML 225     | 442157 | 12           |       |                              |

RE-ISSUED ASBUILT 8-18-2015

| STA    | JOINT #   | MFG      | WALL   | COATING         | WELD XRAY# | HEAT #  | WELDERS MARK | Depth | Comments                           |
|--------|-----------|----------|--------|-----------------|------------|---------|--------------|-------|------------------------------------|
| 145+43 | 332.00000 | TEX ISLE | 0.25"  | N/A             | ML328      | 144949  | 121212.00000 |       |                                    |
| 145+94 | 333.00000 | TEX ISLE | 0.25"  | N/A             | ML342      | 144949  | 121212.00000 |       |                                    |
| 146+26 | 334.00000 | TEX ISLE | 0.25"  | N/A             | ML344      | 442159  | 121212.00000 |       |                                    |
| 146+68 | 335.00000 | TEX ISLE | 0.25"  | N/A             | ML344      | 144949  | 121212.00000 |       |                                    |
| 147+10 | 336.00000 | TEX ISLE | 0.25"  | N/A             | ML345      | 144949  | 121212.00000 | 6.3   | PH#33                              |
| 147+52 | 337.00000 | TEX ISLE | 0.25"  | N/A             | ML346      | 442154  | 121212.00000 |       |                                    |
| 147+94 | 338.00000 | TEX ISLE | 0.25"  | N/A             | ML347      | 442152  | 121212.00000 |       |                                    |
| 148+36 | 339.00000 | TEX ISLE | 0.25"  | N/A             | ML348      | 442152  | 121212.00000 |       |                                    |
| 148+77 | 340.00000 | TEX ISLE | 0.25"  | N/A             | ML349      | 442152  | 121212.00000 |       |                                    |
| 149+19 | 341.00000 | TEX ISLE | 0.25"  | N/A             | ML350      | 442157  | 121212.00000 |       |                                    |
| 149+61 | 342.00000 | TEX ISLE | 0.25"  | N/A             | ML351      | 442152  | 121212.00000 |       |                                    |
| 150+03 | 343.00000 | TEX ISLE | 0.25"  | N/A             | ML352      | 442148  | 121212.00000 |       |                                    |
| 150+45 | 344.00000 | TEX ISLE | 0.25"  | N/A             | ML353      | 442148  | 121212.00000 | 6.6   | PH#34                              |
| 150+88 | 347.00000 | TEX ISLE | 0.25"  | TEX ISLE M6233P | TE54       | 442152  | 121212.00000 | 1.2   |                                    |
| 151+25 | 348.00000 | TEX ISLE | 0.25"  | TEX ISLE M6233P | ML-462     | 442152  | 121212.00000 | 1.2   | PH#35                              |
| 151+66 | 349.00000 | TEX ISLE | 0.25"  | TEX ISLE M6233P | ML-463     | 442152  | 121212.00000 | 1.2   |                                    |
| 152+08 | 350.00000 | TEX ISLE | 0.25"  | TEX ISLE M6233P | ML-464     | 144949  | 121212.00000 | 1.2   |                                    |
| 152+49 | 351.00000 | TEX ISLE | 0.25"  | TEX ISLE M6233P | ML-465     | 442148  | 121212.00000 | 1.2   |                                    |
| 152+91 | SP-96819  | TEX ISLE | 0.25"  | N/A             | TE53       | 3M6233P | 121212.00000 | 1.2   |                                    |
| 153+33 | 356 B.INT | TEX ISLE | 0.365" | ARO             | 448.000000 | SP95820 | A1 A2        |       | PH#36, Begin Bore                  |
| 153+76 | 357 B.INT | TEX ISLE | 0.365" | ARO             | 447.000000 | SP95820 | A1 A2        |       | PH#37                              |
| 154+06 | 358 B.INT | TEX ISLE | 0.365" | ARO             | 448.000000 | SP95821 | A1 A2        |       | PH#38, Approx. Section Line X-ling |
| 154+17 | 359 B.INT | TEX ISLE | 0.365" | ARO             | 449.000000 | SP95822 | A1 A2        |       | PH#39, Approx. Section Line X-ling |
| 154+26 | 360 B.INT | TEX ISLE | 0.365" | ARO             | 450.000000 | SP95823 | A1 A2        |       |                                    |
| 154+59 | 361 B.INT | TEX ISLE | 0.365" | ARO             | 451.000000 | SP95824 | A1 A2        |       |                                    |
| 155+01 | 362 B.INT | TEX ISLE | 0.365" | ARO             | 452.000000 | SP95825 | A1 A2        |       |                                    |
| 155+42 | 363 B.INT | TEX ISLE | 0.365" | ARO             | 453.000000 | SP95826 | A1 A2        |       |                                    |
| 155+64 | 364 B.INT | TEX ISLE | 0.365" | ARO             | 454.000000 | SP95827 | A1 A2        |       |                                    |

| STA    | JOINT #   | MFG      | WALL  | COATING | WELD XRAY# | HEAT # | WELDERS MARK | Depth | Comments |
|--------|-----------|----------|-------|---------|------------|--------|--------------|-------|----------|
| 134+12 | 305.00000 | TEX ISLE | 0.25" | N/A     | ML301      | 442152 | 121212.00000 |       |          |
| 134+54 | 306.00000 | TEX ISLE | 0.25" | N/A     | ML302      | 442148 | 121212.00000 |       |          |
| 134+96 | 307.00000 | TEX ISLE | 0.25" | N/A     | ML303      | 442148 | 121212.00000 |       |          |
| 135+38 | 308.00000 | TEX ISLE | 0.25" | N/A     | ML304      | 442157 | 121212.00000 |       |          |
| 135+80 | 309.00000 | TEX ISLE | 0.25" | N/A     | ML305      | 442148 | 121212.00000 |       |          |
| 136+22 | 310.00000 | TEX ISLE | 0.25" | N/A     | ML306      | 144949 | 121212.00000 |       |          |
| 136+64 | 311.00000 | TEX ISLE | 0.25" | N/A     | ML307      | 442152 | 121212.00000 |       |          |
| 137+06 | 312.00000 | TEX ISLE | 0.25" | N/A     | ML308      | 442157 | 121212.00000 |       |          |
| 137+48 | 313.00000 | TEX ISLE | 0.25" | N/A     | ML309      | 442148 | 121212.00000 |       |          |
| 137+90 | 314.00000 | TEX ISLE | 0.25" | N/A     | ML310      | 144949 | 121212.00000 |       |          |
| 138+31 | 315.00000 | TEX ISLE | 0.25" | N/A     | ML311      | 442148 | 121212.00000 |       |          |
| 138+73 | 316.00000 | TEX ISLE | 0.25" | N/A     | ML312      | 144949 | 121212.00000 |       |          |
| 139+15 | 317.00000 | TEX ISLE | 0.25" | N/A     | ML313      | 442148 | 121212.00000 |       |          |
| 139+57 | 318.00000 | TEX ISLE | 0.25" | N/A     | ML314      | 442148 | 121212.00000 |       |          |
| 139+99 | 319.00000 | TEX ISLE | 0.25" | N/A     | ML315      | 442148 | 121212.00000 |       |          |
| 140+41 | 320.00000 | TEX ISLE | 0.25" | N/A     | ML316      | 442148 | 121212.00000 |       |          |
| 140+83 | 321.00000 | TEX ISLE | 0.25" | N/A     | ML317      | 442148 | 121212.00000 |       |          |
| 141+24 | 322.00000 | TEX ISLE | 0.25" | N/A     | ML318      | 442148 | 121212.00000 |       |          |
| 141+66 | 323.00000 | TEX ISLE | 0.25" | N/A     | ML319      | 442154 | 121212.00000 |       |          |
| 142+08 | 324.00000 | TEX ISLE | 0.25" | N/A     | ML320      | 442148 | 121212.00000 |       |          |
| 142+49 | 325.00000 | TEX ISLE | 0.25" | N/A     | ML321      | 442148 | 121212.00000 | 6.6   |          |
| 142+91 | 326.00000 | TEX ISLE | 0.25" | N/A     | ML322      | 442154 | 121212.00000 |       |          |
| 143+33 | 327.00000 | TEX ISLE | 0.25" | N/A     | ML323      | 442157 | 121212.00000 |       |          |
| 143+75 | 328.00000 | TEX ISLE | 0.25" | N/A     | ML324      | 442148 | 121212.00000 |       |          |
| 144+17 | 329.00000 | TEX ISLE | 0.25" | N/A     | ML325      | 442148 | 121212.00000 |       |          |
| 144+59 | 330.00000 | TEX ISLE | 0.25" | N/A     | ML326      | 442148 | 121212.00000 |       |          |
| 145+00 | 331.00000 | TEX ISLE | 0.25" | N/A     | ML327      | 144949 | 121212.00000 |       |          |

RE-ISSUED ASSBUILT 8-18-2015

TESORO LOGISTICS OPERATIONS L.L.C. NEW 10" LINE BEULAH BASIN ZAP TO BEULAH

SCALE: AS NOTED ONE BB-TL-1-1013

EDK TECHNICAL COMPANY, Inc.

DATE: 8/18/2015

DESCRIPTION: REFERENCE DRAWINGS

REV: 1 ASSBUILT 8/18/2015

REV: 2

| STA    | JOINT #    | MFG      | WALL  | COATING       | WELD XRAY#   | HEAT # | WELDERS MARK | Depth | Comments |
|--------|------------|----------|-------|---------------|--------------|--------|--------------|-------|----------|
| 165-87 | 426.000000 | TEX ISLE | 0.25" | N/A           | ML437JF-4259 | 442158 | 121212.00000 |       |          |
| 166-29 | 427.000000 | TEX ISLE | 0.25" | N/A           | ML354        | 14598  | 121212.00000 |       |          |
| 166-71 | 428.000000 | TEX ISLE | 0.25" | N/A           | ML355        | 442148 | 121212.00000 |       |          |
| 167-13 | 429.000000 | TEX ISLE | 0.25" | N/A           | ML356        | 442149 | 121212.00000 |       |          |
| 167-54 | 430.000000 | TEX ISLE | 0.25" | N/A           | ML357        | 141508 | 121212.00000 |       |          |
| 167-96 | N/A        | N/A      | N/A   | N/A           | ML358        | N/A    | 121212.00000 |       |          |
| 168-38 | 432.000000 | TEX ISLE | 0.25" | 3M6253P 14-16 | ML359        | 442148 | 121212.00000 |       |          |
| 168-80 | 433.000000 | TEX ISLE | 0.25" | 3M6253P 14-16 | ML360        | 442154 | 121212.00000 |       |          |
| 169-22 | 434.000000 | TEX ISLE | 0.25" | 3M6253P 14-16 | ML361        | 442148 | 121212.00000 |       |          |
| 169-64 | 435.000000 | TEX ISLE | 0.25" | 3M6253P 14-16 | ML362        | 442152 | 121212.00000 |       |          |
| 170-06 | 436.000000 | TEX ISLE | 0.25" | 3M6253P 14-16 | ML363        | 442152 | 121212.00000 |       |          |
| 170-48 | 437.000000 | TEX ISLE | 0.25" | 3M6253P 14-16 | ML364        | 141508 | 121212.00000 |       |          |
| 170-89 | 438.000000 | TEX ISLE | 0.25" | 3M6253P 14-16 | ML365        | 442154 | 121212.00000 |       |          |
| 171-31 | 439.000000 | TEX ISLE | 0.25" | 3M6253P 14-16 | ML366        | 442148 | 121212.00000 |       |          |
| 171-73 | 440.000000 | TEX ISLE | 0.25" | 3M6253P 14-16 | ML367        | 442154 | 121212.00000 |       | PH44     |
| 172-15 | 441.000000 | TEX ISLE | 0.25" | 3M6253P 14-16 | ML368        | 141508 | 121212.00000 | 7.0'  |          |
| 172-57 | 442.000000 | TEX ISLE | 0.25" | 3M6253P 14-16 | ML369        | 442154 | 121212.00000 |       |          |
| 172-99 | 443.000000 | TEX ISLE | 0.25" | 3M6253P 14-16 | ML370        | 442157 | 121212.00000 |       |          |
| 173-41 | 444.000000 | TEX ISLE | 0.25" | 3M6253P 14-16 | ML371        | 442157 | 121212.00000 |       |          |
| 173-82 | 445.000000 | TEX ISLE | 0.25" | 3M6253P 14-16 | ML372        | 442157 | 121212.00000 |       |          |
| 174-24 | 446.000000 | TEX ISLE | 0.25" | 3M6253P 14-16 | ML373        | 442157 | 121212.00000 |       |          |
| 174-66 | 447.000000 | TEX ISLE | 0.25" | 3M6253P 14-16 | ML374        | 442157 | 121212.00000 |       |          |
| 175-08 | 448.000000 | TEX ISLE | 0.25" | 3M6253P 14-16 | ML375        | 442154 | 121212.00000 |       |          |
| 175-50 | 449.000000 | TEX ISLE | 0.25" | 3M6253P 14-16 | ML376        | 442149 | 121212.00000 |       |          |
| 175-92 | 450.000000 | TEX ISLE | 0.25" | 3M6253P 14-16 | ML377        | 442157 | 121212.00000 |       |          |

| STA    | JOINT #    | MFG      | WALL   | COATING | WELD XRAY# | HEAT #  | WELDERS MARK | Depth | Comments |
|--------|------------|----------|--------|---------|------------|---------|--------------|-------|----------|
| 156-26 | 363 BANT   | TEX ISLE | 0.365" | ARO     | 453.000000 | SP96827 | A1A2         |       |          |
| 156-68 | 364 BANT   | TEX ISLE | 0.365" | ARO     | 454.000000 | SP96828 | A1A2         |       |          |
| 157-09 | 365 BANT   | TEX ISLE | 0.365" | ARO     | 455.000000 | SP96829 | A1A2         |       |          |
| 157-51 | 366 BANT   | TEX ISLE | 0.365" | ARO     | 456.000000 | SP96830 | A1A2         |       |          |
| 157-92 | 367 BANT   | TEX ISLE | 0.365" | ARO     | 457.000000 | SP96831 | A1A2         |       |          |
| 158-34 | 368 BANT   | TEX ISLE | 0.365" | ARO     | 458.000000 | SP96832 | A1A2         |       |          |
| 158-76 | 369 BANT   | TEX ISLE | 0.365" | ARO     | 459.000000 | SP96833 | A1A2         |       |          |
| 159-18 | N/A        | N/A      | N/A    | N/A     | TH50       | N/A     | 1 2          | PH40  |          |
| 159-60 | 410.000000 | TEX ISLE | 0.25"  | N/A     | ML329      | 144949  | 121212.00000 | 9'    |          |
| 159-97 | 411.000000 | TEX ISLE | 0.25"  | N/A     | ML330      | 144949  | 121212.00000 |       | PH41     |
| 160-39 | 412.000000 | TEX ISLE | 0.25"  | N/A     | ML331      | 141509  | 121212.00000 |       |          |
| 160-81 | 413.000000 | TEX ISLE | 0.25"  | N/A     | ML332      | 141506  | 121212.00000 |       |          |
| 161-22 | 414.000000 | TEX ISLE | 0.25"  | N/A     | ML333      | 442149  | 121212.00000 |       |          |
| 161-64 | 415.000000 | TEX ISLE | 0.25"  | N/A     | ML334      | 144949  | 121212.00000 |       |          |
| 162-06 | 416.000000 | TEX ISLE | 0.25"  | N/A     | ML335      | 144949  | 121212.00000 |       |          |
| 162-48 | 417.000000 | TEX ISLE | 0.25"  | N/A     | ML336      | 442149  | 121212.00000 |       |          |
| 162-90 | 418.000000 | TEX ISLE | 0.25"  | N/A     | ML337      | 144949  | 121212.00000 |       |          |
| 163-32 | 419.000000 | TEX ISLE | 0.25"  | N/A     | ML338      | 442152  | 121212.00000 |       | PH42     |
| 163-74 | 420.000000 | TEX ISLE | 0.25"  | N/A     | ML339      | 141509  | 121212.00000 | 5.6'  |          |
| 164-16 | 421.000000 | TEX ISLE | 0.25"  | N/A     | ML340      | 141509  | 121212.00000 |       |          |
| 164-57 | 422.000000 | TEX ISLE | 0.25"  | N/A     | 341.000000 | 442149  | 121212.00000 |       |          |
| 165-40 | N/A        | N/A      | N/A    | N/A     | N/A        | 442149  | N/A          |       |          |
| 165-47 | N/A        | N/A      | N/A    | N/A     | TH40       | N/A     | 121212.00000 |       |          |
| 165-48 | N/A        | N/A      | N/A    | N/A     | TH41       | N/A     | 121212.00000 |       |          |
| 165-49 | N/A        | N/A      | N/A    | N/A     | TH42       | N/A     | 121212.00000 | 5.0'  | PH43     |

RE-ISSUED ASBUILT 8-18-2015









