Appendix J Pipeline Design, Construction, Operation and Maintenance Plan

The following changes between the Draft and Final Environmental Impact Statement were made to Appendix J.

- A revised Appendix J Pipeline Design, Construction, Operation & Maintenance has replaced the former Appendix J.

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Appendix J Pipeline Design, Construction, Operation & Maintenance

Construction Methods and Operations

The design, construction, testing and operation of the pipeline are addressed in US DOT gas pipeline safety regulations at 49 CFR Part 192. Coos Pipeline will meet or exceed all relevant regulations applicable to gas transmission pipelines. Coos County will contract with a qualified operator to operate and maintain the gas transmission system under Part 192. The Contract operator will be required to formulate and follow a detailed Operation and Maintenance Plan (O&M) for this system, including an Emergency Procedures Plan.

This section addresses some of the major issues of design, construction and operation of the 12-inch mainline. The smaller laterals will be built and run to the same standards outlined here, in the operator's O&M and Emergency plans, and in 49 CFR Part 192.

Project Design Criteria

The proposed natural gas pipeline would originate at an existing Williams Gas pipeline just south of Roseburg; extend southwest for approximately 60 miles where it would terminate at a distribution facility that would be built in Coos Bay. The line will take gas at Williams' operating pressure and deliver without pressure regulation to various delivery points in Douglas and Coos counties. Williams' system in the Roseburg area is currently limited to maximum allowable operating pressure (MAOP) of 896 pounds per square inch (psi). However, other parts of its system have been expanded and up-rated to 960 psi. The Coos Pipeline will be rated at 1000 pounds/square inch (psi) to anticipate any system upgrades that Williams might make in the near future.

Pipe Design

Pipe design is covered in Part 192 Subpart C (starting at paragraph 192.101). Pipe strength specifications depend on population density and MAOP. Most of the pipeline will be constructed of pipe with the following specifications:

- 12-3/4-inch outside diameter .250 inch wall API 5LX-52 carbon steel line pipe
- Specified Minimum Yield Strength: 2039 psi
- Typical Operating Pressure at Williams: 600 to 800 psi
- Maximum Allowable Operating Pressure: 1000 psi (Class 3)
- Minimum Test Pressure: 1500 psi (Class 3)

More than 90 percent of the route is very rural, with 10 or fewer buildings per mile for human occupancy specified at 192.5 as a Class 1 location. Some scattered portions of the route are in Class 2 locations near rural communities with 11 to 45 buildings per mile. Some of those areas such as Fairview and Libby could become Class 3 locations (46 or more homes per mile). The pipeline passes within 100 yards of Lookingglass School and Coos Country Club, both gathering places which could also be defined as Class 3, if occupied by at least 20 persons at least 5 days per week for 10 weeks per year. To avoid any confusion between class locations and different pipe specifications, the entire pipeline will be built and tested to Class 3 specifications

Extra Strength Pipe

In some areas where strength and reliability are especially critical, the pipeline will be built with heavier wall thickness pipe. This extra-strength pipe can withstand higher test and operating pressures:

- 12-3/4-inch outside diameter .375-inch wall API 5LX-52 carbon steel line pipe

- Specified Minimum Yield Strength: 3059 psi

The communities of Lookingglass, Dora, Fairview, Sumner, Coos City (country club area), Libby and the outskirts of Coos Bay now have (or could eventually have) Class 3 areas. Heavier pipe will be used in these potential Class 3 areas and all bores and many stream, wetland and road crossings.

Test Design

Part 192 Subpart J specifies testing procedures. Part 192.619 requires the test pressure to be 150 percent of MAOP at Class 3 locations. The minimum required test pressure at any point during the test will be 1500 psi, to assure that every point along the system can be operated to 1000 psi MAOP.

Parts 192.503 and 505 address other test requirements. The test must maintain pressure for at least 8 hours. Natural gas can be used as a test medium, but the maximum test pressure is insufficient for the desired MAOP in any class location. Air or inert gas (usually nitrogen) also has a pressure limitation, but can be used to qualify the entire pipeline for 1000 psi MAOP in Class 2 areas.

There are two further limitations to nitrogen testing: any occupied building within 100 yards would have to be evacuated during the test; and existing or potential Class 3 areas would have to be separately hydrotested. Because of these limitations most, of the pipeline will be tested with water (hydrotested) to allow unrestricted Class 3 operations.

Hydrotesting is a common practice with little risk, even with the high pressures that are routinely used. Clean water is pumped into the pipeline at one end, usually pushing a foam plug or “pig” in front to eliminate air. When the pipeline is full, a high pressure pump is used to raise the internal pressure up to the design pressure. Since water is nearly incompressible, this additional pressure takes very few gallons of water. Conversely, even a tiny leak in the pipe is very evident, as the pressure recorder shows a definite drop.

Every point in a test section must experience the minimum required test pressure. Since water is a dense medium, the ups-and-downs of the terrain translate into changes in pressure within the pipe, at about 1 psi per 2.4 feet of elevation change. The Coos Pipeline starts at Williams at 600 ft elevation (or “MSL” for feet above mean sea level), rises to approximately 3000 ft at Reston Ridge, and drops to near sea level near Coos Bay. The range in pressures will exceed the limits of the 12-inch line pipe.

Because of that, the test sections must be carefully chosen to ensure the minimum test pressures at all high elevations points, while not exceeding the Specified Minimum Yield Strength (SMYS) rating of the pipe at the lowest point. The mainline will be tested in at least 4 sections. The lateral pipe has a wider pressure range and can be tested as one section.

Testing and Inspection:

<u>Weld testing and inspection:</u> Each weld will be visually inspected by a certified welding inspector, and X-rayed to detect invisible defects.

<u>Hydrostatic leak test:</u> Every joint of the pipe is hydrostatically tested (e.g., pressure-tested with water at the factory) to comply with the DOT and American Petroleum Institute (API) specifications. The finished pipeline would be hydrostatically pressure tested to at least 1,500 psi, to detect leakage or failure. This is 150 percent of pipeline’s MAOP. Because of the elevation differences, testing must be done in sections to avoid exceeding the SMYS of the pipe (2,039 psi).

Corrosion Protection

Part 192 Subpart I specifies that all new buried steel pipelines must be protected from corrosion. The pipeline must be coated with a suitable protective and electrically insulating coating. Coos Pipeline will have a 3-layered epoxy and polyethylene coating system. The welds are covered with a polyethylene heat-shrink sleeve, and the entire coating is electrically inspected for coating faults as it is lowered into the ditch. Select padding and rock shield will be used to protect the coating from damage.

DOT also requires active corrosion prevention, provided with “cathodic protection” applied during construction or soon after. A system of sacrificial *anodes* is connected to the pipeline. The anodes produce an electrical current which flows through the earth and collects on the pipeline *cathode*. The anodes corrode and the pipeline is protected as long as this current flows. Anodes can be made of magnesium, which produces a natural *galvanic* current when coupled with steel, or graphite or steel anodes, through which current is driven from an external *impressed current* source.

The effectiveness of the coating and cathodic protection is easily checked with a volt meter and electrode at least once per year, per DOT. Cathodic test stations are installed about every mile. A wire is attached directly to the pipe from the station, and is used to check the cathodic protection level, and to attach an electronic locator to find the pipe.

Block Valves

Block valve settings provide means of stopping flow through the pipeline, with blowdown valves to release gas pressure if necessary. Part 192.179 specifies maximum distances between block valves. Coos Pipeline will have several valves capable of automatic (self-closing) or remote (offsite human or computer) operation. Coos Pipeline will also install check valves in one or more block valves, which allow flow in only one direction, and prevent backflow. These types of valves can reduce the response and exposure time in the event of a line break.

The contract pipeline operator will have final authority over the selection and installation of these types of valves. All valves are checked, lubricated and operated at least one per year, per DOT.

Other Pipeline Appurtenances

Other sections of Part 192 address design, construction and operation of other pipeline appurtenances. Line markers, cathodic test stations, exposed sections, meters and regulators are some of the design features covered by Part 192.

I. General Methods

1. Safety

Fire hazard (in situ flammables and flammable materials) **-** During construction, the contractor will be required to abide

by state fire regulations. Any flammable materials must be transported, contained, and used in accordance with Office of

a) Safety and Health Administration (OSHA) requirements. Any empty containers (if applicable) must be disposed of properly, in accordance with EPA requirements.

b) Toxic materials hazard - All toxic materials must be used in accordance with OSHA standards.

c) Explosive materials hazard - All explosives must be used in accordance with OSHA requirements.

d) Mechanical hazard: The construction contractor would be required to follow OSHA requirements for operation of all equipment at the construction site.

e) Electrical Hazard: Within Bonneville Power Administration (BPA) and Pacific Power & Light (PP&L) rights-of-way, the high voltage powerlines could induce a current in the pipeline, especially long welded sections exposed in or above the trench. The construction contractor shall be required to have and follow a plan to continuously ground the pipe, such that construction workers would be protected from electrical shock by these induced currents.

f) Susceptibility of hazard to public - The public is susceptible to hazard under the following conditions:

- If the contractor fails to follow required safety procedures during public’s presence at or near the construction site;
- If the public enters the construction site without proper approval;
- If, during the public’s presence at or near the construction site, an act of God occurs.

II. Access Road Construction Methods

No new roads would be built. BPA and PP&L currently maintain all exisiting roads and access roads within the proposed action corridor.

III. Pipeline Construction Methods

1. Work area:

Pipeline construction would require a working space, which varies from 20 to 60 feet wide. In the Coos Bay Wagon Road (CBW Road), construction would take place entirely within the roadbed, which is about 20 feet wide. In a few areas along the power corridor with steep side slopes, the disturbed area could be 60 feet wide. In most sections, the area of disturbance would be 30 to 40 feet wide. Some grading would be required to install the pipe, but the grade would be substantially restored to its original state before revegetation.

2. Assembly and Refueling Areas:

Assembly and refueling activities would be confined to designated roads.

3. Road Closures:

Roads would be closed only when construction is active and within the road right-of-way. No night construction is expected, and crews normally work 6 days per week. Most paved road crossings would be bored-under, which would require traffic control (flaggers) but no road closure. Work within the CBW Road would force road closure during the ditch, lay and backfill stages. In the remote section east of Sitkum (10 miles), the CBW Road would be closed during daytime working hours, and re-opened in the evenings and off-days. There may be some night closure in the most difficult sections. In the canyon section from Sitkum to Dora (4 miles), the wider working space should allow limited traffic flow during the day, such as on the hour. Most work along the CBW Road would require traffic control for other operations, such as preparation and final cleanup.

4. Site preparation prescriptions:

In the powerline corridor, herbaceous vegetation within 20 feet of the trench is removed. The following types of sites are expected to occur along the proposed pipeline route. Each type of construction has an estimated amount of time to prepare the right-of-way and excavate the ditch. After the ditch is prepared, then stringing, welding, laying and backfill can be done at up to one mile per day.

a) **Level or gently sloping surfaces on clay or silty soils:** Site preparation consists of clearing of brush and trees mentioned above. Typical progress would be 4,000 to 10,000 linear feet per day.

b) **Moderate to steep topography:** Temporary grading would be required in topography too steep for safe operation of trenching and pipe laying equipment. The scope and nature of soil disturbance would be consistent with that found in the Erosion Control Plan (ECP) (Appendix H in the FEIS). Progress along slopes is slower than progress on soils of the same type on level or gentle slopes, depending upon the slope gradient, but would typically range from 2,000 to 4,000 feet per day. The very steep approach to Reston Ridge would be slower.

c) **Road bed site:** Pipeline construction within or near the road bed (the width between the road shoulders) requires traffic management (signs and flaggers), pavement cutting and pavement disposal. Typical progress is 1,000 to 2,000 linear feet per day.

d) **Bedrock or rock face situations:** Burial of the pipeline within rock sites requires extra work ripping, rock sawing or trenching, or drilling and blasting. Rock sawing and trenching typically progress at 500 to 1,000 feet per day. Drilling and blasting activities normally progress at 200 to 400 feet per day.

e) **Talus sites:** Digging within talus sites requires site preparation similar to that of steep slopes (temporary grading to enable safe equipment operations), with the additional requirement of constructing pre-engineered soil retention structures (usually rock-filled cages) at the foot of the cut slope, which prevents soil movement above the work area. There are no known talus sites along the corridor.

f) **Along streams:** Construction parallel to streams would be planned to avoid operation of equipment within riparian zones. Procedures would follow the ECP (Appendix H in the FEIS), using sediment barriers to prevent materials from entering the stream. The rate of progress depends upon soil conditions and topography; a typical maximum rate is 1,000 to 2,000 linear feet per day.

g) **Stream crossings:** Stream crossings would be accomplished using one of the following methods, depending upon existing conditions.

- Large or particularly sensitive streams, estuaries and large wetlands would be crossed with directional-drilling equipment. Site preparation is usually minimal - the entry and target locations are carefully chosen to be flat and open and the entry point would have a small excavation for the initial drill entry. Directional-drill activity takes from 3 to 10 days, depending on length, rock strata, and complexity. See subsection 7a for details, as well as Figures J-1 through J-3.
- Small streams with active flows would be crossed using a Bag-and-Flume method. The stream is dammed with sandbags to temporarily contain stream flow and a flume directs flow around the construction area. After 'bagging and fluming', the streambed is trenched using conventional excavators and rock removal techniques. The stream banks may be cut back to soften the approach angle, then restored after construction to original grade. Such a crossing would typically take less than a day (6-8 hours).
- Trenching across a dry stream bed or runoff channel does not require additional site preparation. Site preparation and pipeline crossing of an inactive small stream (intermittent) would take between one and two hours.

h) **Wetland crossings:** Wetland crossings would be directionally-drilled to avoid impacts (Figures J-1 through J-3).

5. Installation:

The pipe would be installed to a minimum depth of 36 inches to top of pipe. In bedrock, installation would be a minimum of 24 inch depth to top of pipe. Bedrock is expected for 10-20 percent of the route between Reston and Dora.

Installation process: All equipment would be operated in accordance with OSHA and DEQ standards and guidelines. This includes procedures for operating equipment in or near streams, wetlands, talus slopes, steep terrain, and exposed bedrock sites. The following operations are included in the installation process:

a) Ditch digging

b) Pipe joint welding

c) Lay pipe and backfill ditch (replace and compact original soil)

d) Tie-ins (includes installation of block valves, road bores, and stream crossings)

e) Testing & Cleanup (hydrostatic testing, install line markers and cathodic test stations, painting and locking of block valves)

6. Pipeline bedding:

Along most of the route, the native soil would be returned to the ditch and compacted around the pipe. In areas where the backfill is too coarse or rocky and would damage the coating, then pipe padding material (such as sand or volcanic ash) is imported to compact around the pipe, with native backfill above that. In the segment within the CBW Road, most of the backfill would be imported road base. The excess native soil would be hauled and stored for use by Coos County in its ongoing road department operations.

Directional-Drilling and Reaming Procedures

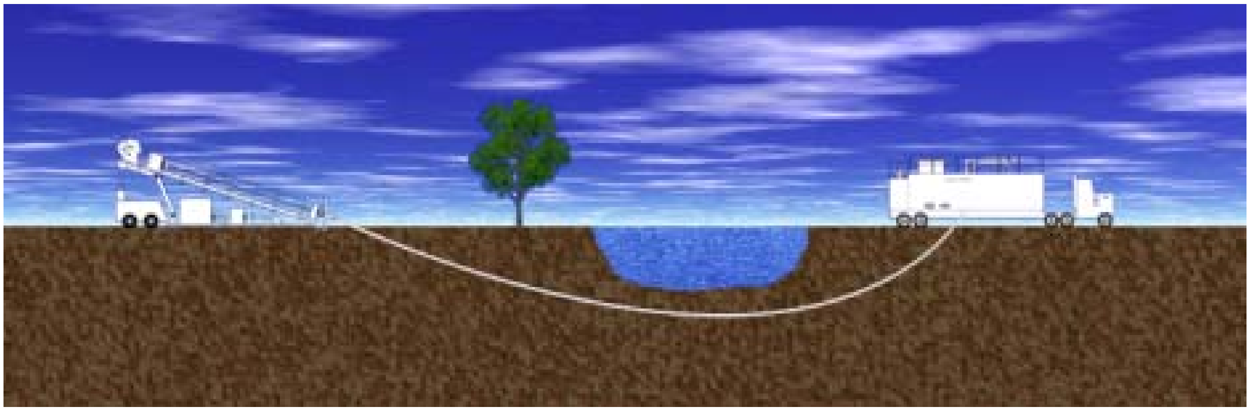

Figure J-1 Directional-Drill Crossing: Pilot Hole

Figure J-2: Reaming Process

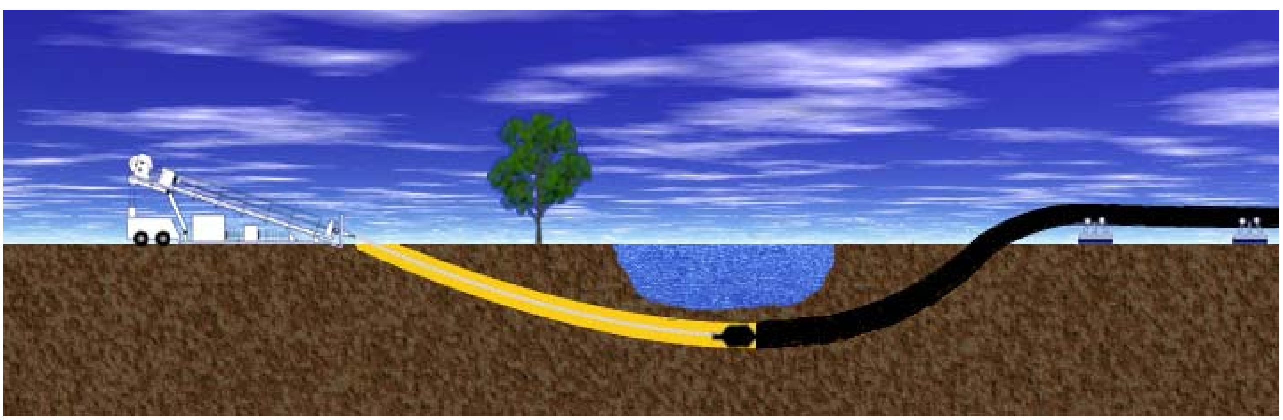

Figure J-3: Pull-Back

7. Pipeline installation procedures for sensitive or difficult sites:

a) Directional boring of stream and wetland crossings: Horizontal drilling beneath the stream bed requires drilling at a shallow angle from one side of the stream, boring at a safe distance beneath the stream bed, and exiting on the other side well away from the stream channel. A small “pilot” hole is drilled first, typically about 4 to 6 inches in diameter (Figure J-1). From the exit point, a larger reamer is pulled back through the pilot hole to enlarge the bore. This process continues until the bore is 30 percent to 50 percent oversize, such as a 16-inch bore for this 12-inch pipeline (see Figure J-2). The pipeline for the entire length of the bore is welded together on the opposite side of the drilling unit. After the joints are coated and pipe is pressure tested, it is pulled back through the ground-bore in a continuous operation. (see Figure J-3).

b) Steep terrain and sharp turns require the pipe to be bent with specialized pipe bending equipment. After backfill, water bars and other erosion control measures will be applied in steep areas.

c) Narrow roadway requires use of smaller crews and equipment working more slowly due to the reduced width of the working space.

d) Bedrock sometimes cannot be broken with a tractor-mounted excavator. Specialized techniques for rock removal are used, depending on the hardness and fracturing of the rock layer. Rock trenchers have carbide teeth and are effective on softer rock. Rock saws are also used to cut a well-defined trench wall. The hardest rock requires drilling and blasting.

8. Grade restoration and site revegetation:

Each site would be restored to original grade; the surface would be reseeded to establish native plants in accordance with the ECP in Appendix H of the FEIS.

9. Cleanup:

All litter and materials remaining after completion of construction would be removed from the site. Equipment would be removed from the right-of-way as soon as possible, after completion of its assigned task.

Construction Related to Ancillary Facilities

The EIS describes in detail the construction of the 12 inch pipeline to Coos Bay, including the block valves, delivery and city gate stations, and other appurtenances. Coos County also plans to build smaller pipeline laterals to Coquille, Myrtle Point and Bandon. NW Natural and possibly the City of Bandon plan to build gas distribution networks in those towns. The present plans for laterals and distribution networks are described in this document, and are subject to change. Apart from these projects, there are no ancillary facilities planned.

The following assemblies are required in the proposed action:

a) Meter Station - required at the delivery points from Williams near Roseburg and to NW Natural in Coos Bay. Each meter station would be fabricated offsite in a controlled welding facility. The station site would need to be leveled, graveled and fenced. Construction of modest concrete supports will be required for the piping and metering building. Site preparation, installation and testing take about two weeks for each station.

b) Block valve with blowdowns - required at 5 strategic locations along the route. Each block valve will require about one day for site preparation, installation and testing.

Pipeline Joining system

The pipe sections would be welded together. A suitable protective coating would be applied over the welded joints to prevent corrosion of the uncoated weld area.

Block valve assembly

This assembly is approximately 4 feet long (Figure J-4) and includes the following:

- Block valve: A 12-inch ball valve is welded directly inline with the buried pipeline. The stainless steel ball rotates around a steel axle or "stem", which is turned by hand or (for valves 6-inch and larger) a series of gears. On buried valves such as this, the stem is extended above ground in a pipe casing. These 12-inch valves would be fitted with gear boxes and hand wheels for manual operation, or with pneumatic or gas-powered operators for automatic or remote operation. The valve operator would be 30 to 48 inches above ground, and would be about the same size as a five gallon bucket.
- Blowdown valves: A "blowdown" valve would be positioned vertically from the pipeline, one on each side of, and about 2 feet away from, the block valve. Each valve consists of a 4-inch pipeline stem extending above grade. Near its upper end is a valve and a heavy threaded cap (Refer to "Operation Description" or "Pipeline Shutdown" for a description of the purpose for a blowdown valve.)
- Block valve protection: All valves will be locked with a key available only to pipeline operators. The entire footprint will be surrounded with a chain link fence with locked gate. Depending on location and traffic volume, the fence and valve will be protected with concrete or pipe barricades.

Block valve Protection: The entire block valve footing (about 2 feet wide and 8 feet long) would be suitably protected from physical damage, vandalism and unauthorized operation.

Pipeline Supporting Materials: Native soil, or imported gravel and roadbase material.

Fuels: Diesel would be used for most of the large equipment in the construction project. Gasoline would be used in transport vehicles.

Chemicals (coolant, lubricants, cleaning materials, etc.)**:** as needed to support the construction machinery and equipment.

Pipeline markers: DOT requires pipeline markers as needed to delineate the route. These are typically bright yellow composite plastic line markers showing location information (station number) and a warning, spaced at about 10 per mile, or more in difficult terrain or populated areas.

Cathodic test stations: Plastic support pipe with copper wire leads to the pipeline would be spaced at intervals of approximately one mile, to provide for pipeline location and periodic cathodic protection testing.

Erosion control construction materials: See Appendix H of the FEIS.

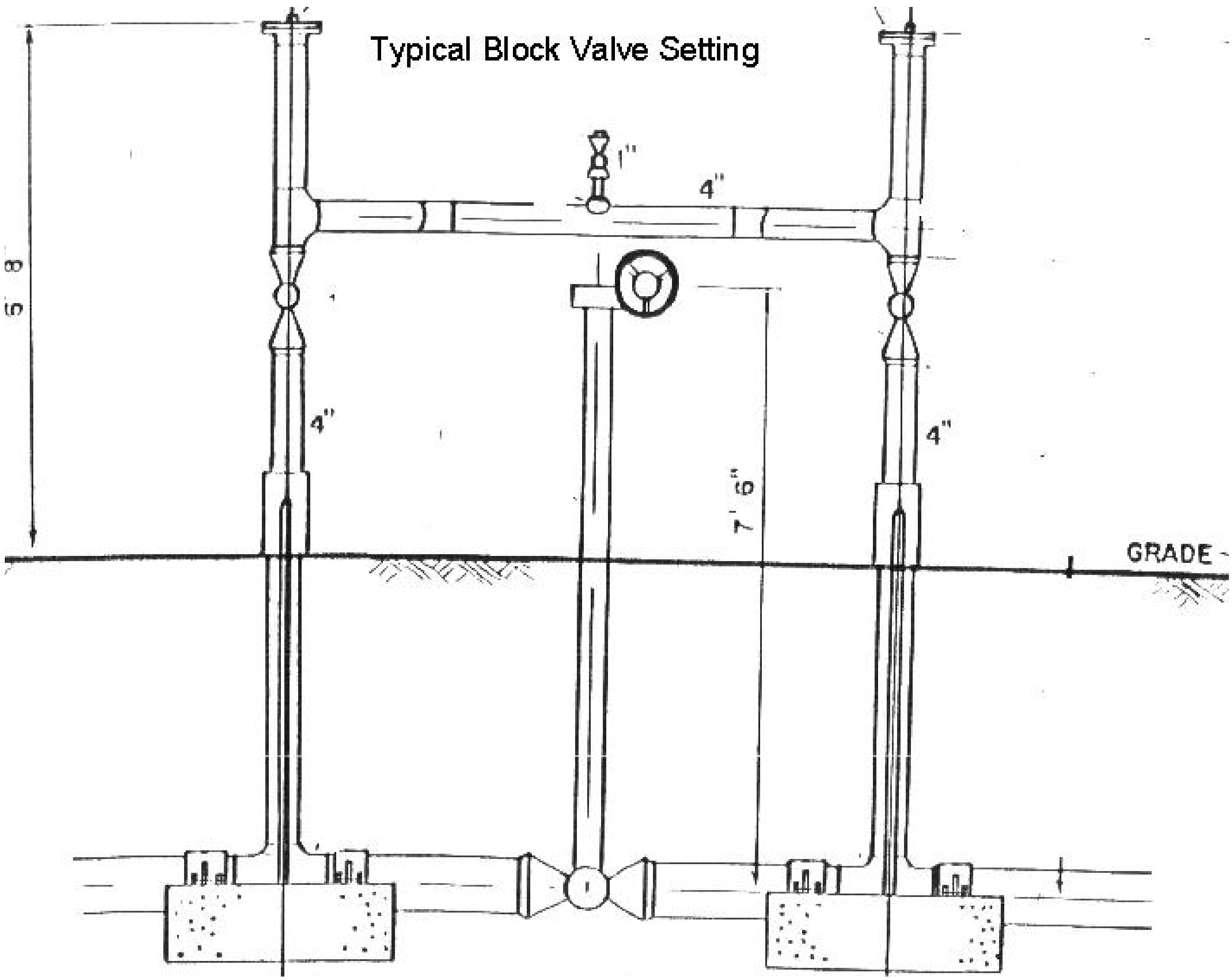

Figure J-4: Typical Block Valve Setting

Equipment Required During Construction

Diesel freight truck with flat-bed trailer and low-boy trailer options, backhoe, bulldozer, side-boom pipe-layer, front-end loader, air driven tools, impact wrench, various hand tools and equipment necessary for welding the pipeline segments together.

Hauling Schedule

The pipeline segments would arrive at either Roseburg or Coos Bay (depending upon shipping methods). Materials delivery from a Roseburg or Coos Bay storage area would arrive on a just-in-time basis; these materials would then be placed into their permanent configuration at the construction site within a few days of delivery. Deliveries of pipe and materials would be expected to occur every day. One full truck load of pipe carries about 1,200 feet of pipe. Therefore, deliveries should not exceed one to two trucks per day.

Construction Schedule

The entire construction sequence - clearing, trenching, pipe string and weld, laying in and backfill, cleanup and mulching - would typically take place over just a few days for any particular 200 yard segment. Each of those steps would take about 1 or 2 hours for a short segment, then the noise and dust from the next segment would be greatly diminished and quickly return to normal. The steps are not usually consecutive, though, as the construction group or “spread” literally spreads down the corridor. A typical sequence could be: ground clearing in the morning, ditching early afternoon, pipe stringing late in the day, weld and backfill next day, cleanup and mulch the third day.

The total length of time for completing of any local segment depends on the type of terrain and speed of travel. On most of the segments along PP&L or BPA, the entire process would usually be finished over a span of 1 to 3 days. Steeper sections and road sections could span 3 or 4 days, as digging and logistics are more difficult. The narrowest, rockiest portions of the CBW Road could take up to 7 days from start to finish. There are just a few short sections where this could be expected, in the canyons both directions from Sitkum.

The directional-drilling crews and tie-in crews are independent of the mainline spreads. The bores could be done weeks or months ahead of the mainline (or vice versa), and then a separate tie-in crew would tie together the loose ends, backfill and cleanup. For any particular short segment, however, the cumulative local impact will be much less than 7 days.

Construction can be scheduled in accordance with specific time-of-day or time-of-year restrictions applicable to wildlife or other concerns on public lands.

Labor Force

The construction contractor could employ up to 200 workers distributed among several separate construction groups or “spreads” in the pipeline corridor. Spreads would merge or divide as needed. In the corridor portions characterized by open terrain, each spread could employ a large workforce (30 or more workers). When the terrain is narrow canyons or steep slopes, the spread would likely be closer to a dozen workers. Additional crews - with just a few workers each - would accomplish specialized aspects of the project, such as manage road traffic, boring and drilling, tie-ins, hydrostatic testing, meter station and block valve construction, and erosion control/revegetation tasks.

All work would take place during daylight hours, which are adjustable to any justifiable need throughout the course of the construction. The operations of the spreads would be managed by the construction contractor’s supervisors.

Construction Inspectors

Full-time onsite inspectors will be hired by Coos County to observe different critical phases of construction. These inspectors have authorization to change contractor procedures, to excavate work already buried, and to shut down construction if needed, in the pursuit of a high-quality finished pipeline.

Welding inspectors and X-ray technicians are highly specialized pipeline industry workers, who are onsite to examine every finished weld joint. Ditch and backfill inspectors watch the trenching, pipe laying and covering/compaction/cleanup process. This inspector will watch the electronic "jeeping" of the coating just before backfill.

Other inspectors watch road and stream crossings and tie-ins to pre-built sections, if separate from the main spread of construction workers. A chief inspector watches over the whole process and assigns inspectors to tasks as needed.

In addition to the traditional pipeline inspectors, the Coos Pipeline will have other specialty inspectors. An archaeological consultant will look for disturbance of cultural resources. The ECR will watch for compliance with the ECP. A wildlife biologist will look for disturbance of wildlife and wildlife habitat. Work within public road ROW may be monitored by a road department inspector.

System Description

Pipeline

The pipeline's expected life span is unlimited. The system components are as follows:

- Delivery station from Williams Gas Pipeline near Roseburg.
- Pipeline (entirely buried except for bridge crossings).
- Block valves, including above-ground "blowdown" valves.
- Magnesium corrosion prevention anodes are buried below the pipe.
- Cathodic test stations are plastic above ground test stations with copper wire leads to a pipeline connection below ground.
- Line markers (above-ground).
- End-point at City Gate Station at Ocean Boulevard.

A Delivery Station consists of:

- A steel pipe manifold and pigging facilities;
- Pressure regulators (if required);
- Electronic measuring instruments to relay critical parameter data (gas pressure, gas temperature, gas flow rate, and alarms) to Williams' Supervisory Control and Data Acquisition (SCADA) facility in real-time sequence;
- A meter building (approximately 240 sq. ft.);
- A steel fence surrounding the plot.

City Gate Station

A city gate station is usually built at the edge of a city, to deliver gas from the high-pressure transmission pipeline to a lower pressure local distribution system. In many ways, the city gate station is exactly analogous to an electrical substation. A city gate station includes the following:

- Block Valve and Blowdown: A ball valve and single blowdown are the end of the transmission pipeline. The block valve is the same size as the pipeline, and the blowdown is usually two or three pipe sizes smaller. The block valve could be buried inline or above-ground, and could be fitted with pneumatic or gas-powered operators for automatic or remote operation.
- Meter: A gas meter would be installed to measure the volume of gas flowing to the customer. Meters are usually fitted with electronic totalizing computers and SCADA equipment to relay flow and pressure information to a remote monitoring center.
- Pressure Regulators: The city gate stations for the Coos Pipeline will not include pressure regulators. The distribution entity (Bandon or NW Natural to Coos Bay, Coquille and Myrtle Point) will install regulators as needed to reduce the pressure to distribution pressure, which is typically 60 psi or less.
- Station Protection: All valves will be locked with a key available only to pipeline operators. The entire footprint will be surrounded with a chain link fence with locked gate. Depending on location and traffic volume,

the fence and valve will be protected with concrete or pipe barricades.

Associated Facilities

The Coos County Pipeline would have no other facilities.

Operation Description

The pipeline would operate continuously. The County plans to contract the pipeline operation to an experienced pipeline operator. A crew of trained operators employed by the pipeline operations contractor would operate and maintain the pipeline in accordance with DOT requirements and a comprehensive O&M Plan tailored to this system. The Oregon Public Utilities Commission would routinely inspect the pipeline operations.

Pipeline Capacity:

The 12-inch pipeline can transport natural gas at a flow rate of up to 70 million cubic feet per day, assuming a line pressure of 800 psi. This capacity could be expanded 20 percent by boosting the pressure to 1,000 psi, with the addition of a compressor station near the Williams delivery connection in Douglas County. At the Williams' current operating pressures, the Coos pipeline would operate with stresses around 30 to 40 percent of the SMYS of the pipeline steel. The addition of a compressor station is allowable and within the prescribed safety limits of the pipe, but this added capacity is not likely to become necessary.

Pipeline Monitoring:

The contract pipeline operator will be required to monitor pressures and flow rates at critical points in the system. For example, the Williams delivery station and the Coos Bay city gate are monitoring points. The operator must monitor conditions full-time 24 hours/7 days, and must be equipped to immediately respond to and solve an abnormal condition. Most candidates for contract operation have 24/7 call centers and control rooms for this purpose.

The operator will have final authority over the selection and installation of remote or automatic valves to be used to isolate abnormal conditions.

Pipeline Shutdown:

Any or all block valves can be used to interrupt the flow of the gas in the pipeline. If the pipeline needs to be emptied, the natural gas is “bled off” by opening the “blow down” valve within the isolated segment of pipeline.

Maintenance Description

Access roads

All access roads would be maintained to the degree necessary to provide access for pipeline inspection and maintenance. These roads are currently maintained by BPA and PP&L.

Vegetation Removal

Minimal vegetation removal would be required for pipeline maintenance because brush removal is periodically done for powerline corridor maintenance.

Pipeline Patrols

DOT requires an annual inspection of the entire pipeline right-of-way for encroachments, unauthorized digging activity, soil erosion, earth movement, drainage problems, and gas leaks.

Corrosion Control Survey

Cathodic test stations would be located along the pipeline at regular intervals up to a mile. Test stations allow a direct connection for electronically locating the pipeline, and for checking the corrosion control system. A survey of the level of cathodic protection is required once per calendar year under DOT Part 192 regulations.

Maintenance of Facilities

Apart from regular patrols, corrosion inspections and painting, the pipeline requires very little maintenance. Block and blowdown valves must be cycled closed and open once per year and lubricated, if possible. Erosion (such as sunken ditches) will be addressed as needed with water bars, mulching or other measures taken as necessary to stop it. There is usually no reason to excavate a section of pipe after construction, except to expose a few feet for utility crossings or to repair damage done by a third party excavator.

Abandonment Description

In the event the proposed pipeline is permanently abandoned, it would remain empty in its constructed configuration with all valves in a closed position. If a portion of this abandoned pipeline were to obstruct future construction projects, or otherwise interfere with the environment, the County would contract an operator to remove the portion(s) causing the impact, and the resultant openings in the pipeline would be capped.