July 5, 1995
by Rich Maurer

SANTA ROSA SUBREGIONAL LONG-TERM WASTEWATER PROJECT

CONSTRUCTION RELATED IMPACTS ON TRANSPORTATION CORRIDORS

INTRODUCTION

The most significant impacts on the transportation corridors will occur during construction operations for pipelines installed along and across public rights-of-way, and for truck importation of some construction materials for some reservoir dams where sufficient on site materials are not available.

Construction of other project components such as pipelines on private properties, construction of reservoir facilities, pump stations and associated storage tanks, ASR wells, direct discharge outfall, and Geysers distribution piping are anticipated to have minimal impact on the public transportation corridors other than initial transport of construction equipment and supplies to the work sites, daily transport of workmen to the work sites, and infrequent truck delivery of small quantities of additional construction materials.

PIPELINE CONSTRUCTION

General

The most significant impact on the transportation corridors will be for construction of the many miles of pipelines planned in the public rights-of-way. Most of these public corridors are two lane roads, with narrow shoulders, and are further constricted by poleline utilities down one or both sides, parallel drainage ditches, and private fencelines, landscaping and occasional structures. Buried utility crossings are not expected to be frequently encountered due to the rural setting of most of the pipeline alignments. This will not be true for those pipelines passing through the Rohnert Park and Cotati urban areas. Buried electrical power, telephone, cable television, water supply, sewer, stormdrain, and gas lines are expected in these areas. The buried water supply aqueduct of the SCWA will be crossed in a few locations.

Surface features crossed will include State highways 1, 12, 37, 101, 116, 121, and 128, and the Northwest Pacific Railroad. Numerous creeks and flood control channels will be crossed. Pipeline sizes will range from 8 inch diameter to 60 inch diameter,

with most sections in the public rights-of-way being in the 12 inch to 48 inch range. Due to the many miles of pipelines to be constructed, and the extensive construction area, it is likely that multiple pipeline installation crews will be at work simultaneously at different locations.

Staging Areas

A staging area will be required to stockpile construction materials and equipment and act as a base of operations for construction crews and managers. Each staging area could be approximately 5 to 10 acres in area and located adjacent to the public right-of-way. Size and number of staging areas would depend on local conditions along the construction route and whether or not the piping sections would need to be stockpiled in a staging area as opposed to along the pipeline alignment prior to installation. Because of the length of the pipelines proposed for the various alternative projects, a staging area about every 5 to 8 miles will be required. Particularly if different contractors are involved in constructing the many miles of piping, multiple staging areas should be anticipated.

It is anticipated that the contractors will arrange with private property owners for the temporary use of a portion of their property for a staging area. The contractors would pick sites with nearby electrical power and telephone services. The contractor must comply with local ordinances and codes to maintain at the staging areas proper sanitary conditions, drainage control, dust control, security, public safety, and traffic control. As the arrangement for staging areas will be private contractual matters between property owners and the contractors, and because there are numerous candidate sites along the many miles of proposed piping which could serve as suitable staging areas, the matter of location of staging areas is best left to the contractors during the construction of the selected project. Consequently, staging areas have not been shown on the current preliminary drawings.

Construction Workmen on Site

For pipeline construction, the number of workmen on the site each day will be fairly constant and generally independent of the size of the pipeline. About 20 workmen will be required at each construction site each day to conduct traffic control, surveying, trench excavation, pipe handling, pipe laying and joining, valve installation, trench backfilling, truck and equipment operation, pavement restoration, and supervision and inspection. Multiple construction crews are likely, but would be separated by several miles.

Disposal of Excess Excavated Soil

Construction of the pipelines will result in the net removal of soil from the trenches. Consequently, many thousands of cubic yards of excess material must be trucked from the pipeline alignment to other sites. In practice, the contractor will attempt to reduce transportation costs by locating nearby private property owners willing to accept some of this material. For project Alternatives 2 and 3, some of this material might be employed for construction of the reservoir embankment dam or access roads, if the different construction contracts are coordinated. The County or nearby cities may also identify needs for some of this excavated excess soil. The disposal of construction soils will be a private contractual matter between the contractors and the private property owners or government agencies and, consequently, disposal sites will not be identified on the current preliminary drawings.

The net volume of excess soil to be transported from the pipeline worksites will vary depending on the diameter and length of the pipelines. For each of the alternative projects, the total volume of excess soil resulting from construction of all the pipelines will be determined within the next few weeks as all pipelines are sized. At the removal rate of 16 cubic yards per tandem truck load, the number of truck loads will then be estimated. For the largest diameter pipelines planned for the projects (up to 60 inch diameter, used to transmit water to the reservoirs, or from the reservoirs and into the irrigation disposal areas) the estimation of spoil material will require approximately 200 tandem truck loads per mile of pipeline length (reducing to about 12 truck loads per mile for the smallest pipes). At an approximate headway of 100 to 200 feet of pipe installed per day (300 to 600 feet for the smallest pipes), this will result in 4 to 8 truck trips per day to and from the worksite (reducing to one to two truck trips per day for the smallest pipes). This assumes that some of the excavated material is suitable for backfill and will be stockpiled alongside the trench and not temporarily trucked away. Additional truck and equipment trips will be required each day to transport workmen, lengths of pipe, equipment, and pavement restoration materials to the worksite.

Length of Construction

The time to construct a given pipeline depends on the diameter of the pipe, the nature of the excavated soils, the local traffic conditions, the presence of buried utilities or surface obstructions, the number of bends in the pipeline, the width of the right-of-way, the need excavate a wider construction easement, the crossing of highways and railroads, and other factors. Based on the total length of pipelines for the alternative projects, and assuming an average headway of so many feet of pipeline installed per day, and adding an additional 30% for weekends and construction

delays, the calendar-day length of construction for each project is estimated on the attached table. All appurtenant facilities associated with the pipelines (ie, road repairs and repaving, pump stations, etc.) could be constructed within this time schedule if the various construction contracts are so coordinated.

Construction Impacts on Traffic

Because there are over 200 miles of pipelines under study for the alternative projects, not all specific conditions related to pipeline construction can be easily summarized. Generalizations are necessary. Once a specific project is selected for actual construction then specific construction impacts and mitigations can be determined. Refinement of route selection may be advisable in certain cases to minimize impacts.

Construction impacts on traffic would depend mostly on the percentage of road width that would be taken up by the construction activities (ie, diameter of pipeline being installed), and by the characteristics of the local setting (ie, slope of road, normal traffic intensity, opportunity for road closure during construction, rural or urban location, buried utilities, etc.). The larger diameter piping will have relatively more impact on the immediate road traffic. Most of the public rights-of-way designated as pipeline alignments are two lane roads in rural settings. Most of these roads have available alternative routes for public traffic. Impact on local traffic will, therefore, be minimized. Some of the pipeline alignments are through urban settings (ie, Rohnert Park, Cotati, Windsor, etc) which will have more significant and unavoidable impacts. In all cases, one lane of traffic will be closed in the area of construction, and continuous traffic control procedures will be required to safely direct traffic through the construction zone. At times, the second traffic lane will need to be closed while excavated soil is being truck loaded or while pipe sections or backfill material are being offloaded. Traffic delays of a few hours at a time, a few times during the workday could be expected.

Where the right-of-way is sufficiently wide, the contractor can expedite his activities (and minimize impact on traffic) by stockpiling lengths of pipe along the pipeline alignment at the edge of the right-of-way or construction easement. This would be the preferred approach. In cases where this is not possible due to the narrowness of the right-of-way, the proximity of adjacent private structures or utilities in the right-of-way, or the steepness or rocky nature of the cliffs adjacent to the right-of-way, the contractor will stockpile sections of pipe in a staging area and truck materials to the jobsite as needed. This is more costly and time consuming, and results in more truck traffic in the immediate construction zone.

The width of the construction zone is shown on the attached sketches for various situations of local setting. (see attached figure for MAXIMUM CROSS section.) The length of the construction zone will vary depending on the diameter of the pipe in question and the nature of the local setting but, in general, will range from 500 feet to 2,000 feet at any one time. Within this construction zone, practices would be employed to minimize duration of closure of connecting roads and driveways to accommodate local traffic and emergency vehicles.

For the smaller diameter pipeline sections (up to about 24 inch diameter) the construction contracts can be written to require the contractor to close the construction trench at the end of each work day, and to restore the pavement sufficient to allow nighttime traffic to proceed nearly unimpeded. For the larger diameter piping (larger than about 24 inch diameter, which constitutes more than half the total length of piping for any of the alternative projects) closure of trench at the end of the day will not be economically feasible due to the slower construction progress that would be associated with larger diameter piping (ie, reopening and, later, backfilling and closing the trench each day would consume so much of the construction workday that construction progress would be slowed, thereby adding to the construction cost and lengthening the construction schedule and impact on traffic).

Road and Railroad Pipeline Crossings

Several crossings of roads and railroads will be required, including the Northwest Pacific Railroad, State highways 12, 101, 116 and 128, as well as many Sonoma County roads, some Marine County roads, and roads within the Cities of Rohnert Park, Cotati, Windsor, Sebastopol, and Santa Rosa. Due to encroachment permit requirements, and to minimize impact on road traffic, it will be necessary to use jack and bore construction techniques (rather than open trench construction procedures) to make many of these crossings. This procedure involves excavating a pit on either side of the road and using special equipment to excavate soil while pushing a conductor casing pipe under the road to the other pit. The water pipeline is then installed within the conductor casing. Traffic above is not disrupted during this operation.

This technique will be required for all State highway crossings, railroad crossings, and is anticipated to be necessary for crossings of at least Valley Ford Road, Redwood Highway (in Cotati), Adobe Road, Petaluma Hill Road, Frates Road, Lakeville Highway, Guerneville Road, River Road, and Old Redwood Highway (in Windsor).

Tunnels

A tunnel has been proposed to carry the transmission pipeline through a ridge on its way between the plant and the Tolay or Sears Point reservoirs, or through another ridge to the Two Rock reservoir. These tunnel locations are shown on drawings RES-2 and RES-3A. This specialized construction would require special construction equipment and a dedicated construction crew of about 20 workmen. About 6,000 cubic yards of material would be excavated for either of these proposed tunnels. This material could be used in construction of the reservoir dam, so transport off site on the public roads would not be necessary. Some vehicle traffic would be associated daily with bringing the workmen to the site. After excavation, a more concentrated period of truck traffic would be necessary for delivery of piping sections (to be installed in the finished) tunnel and tunnel backfill concrete. This traffic would total approximately 20 truck trips per day over about two months.

This tunnel work could proceed concurrently with other construction activities and would take about 9 months to complete.

Pump Stations

Construction of several pump stations are associated with the various pipelines. Most of these would be located either at the Laguna plant or at the new reservoir dam or at the existing Delta or West College ponds, all on City owned property. Some irrigation distribution pump stations would be constructed on newly purchased small lots adjacent to public roads and connected to the pipelines in the public right-of-way. These pump stations are listed on the Pump Stations Characteristics Table as pump stations "WCI-1, 2, 3, etc", "SCI-1, 2 ,3, etc", "FGB", BVB", "G2", "G3", and "G4", and are shown on the drawings.

Relatively light impact on the public traffic corridors would be required to carry workmen, equipment and construction materials to these work sites. This work could proceed concurrent with other construction activities and would take about 12 months to complete.