## 4.0 EMERGENCY INTERCONNECTION ANALYSIS

This section summarizes the analysis of an emergency interconnection between the Lompoc distribution system and the Vandenberg Village distribution system. The analysis defines, at a conceptual level, the sizes and planning-level costs for facilities that would be required to interconnect the two systems.

Figure 4.1 shows Lompoc and Vandenberg Village service areas, key features in each system, and proposed interconnection facilities to connect the two systems. Figure 4.1 also shows the existing location of the Lompoc emergency interconnection with Mission Hills. The proposed interconnection pipeline would run from Hancock College, the northernmost service in the Lompoc system, to Vandenberg Village Well 1B.

The Lompoc water distribution system consists of a single pressure zone, with a hydraulic gradient of approximately 320 feet, established by the overflow elevations of the four distribution system storage reservoirs, located in the hills on the south part of the Lompoc distribution system. On the north side of the system, a small existing booster pump station, located on North H Street near the "Wye" area, is used to provide fire flow to a small subdivision on the northeast side of the system. Under normal operating conditions, the pump station is bypassed.

In the Vandenberg Village distribution system, groundwater wells located at Sites 1 and 3 (see Figure 4.1) pump into its main pressure zone, which has a hydraulic gradient of approximately 583 feet, established by the elevation of the two distribution system storage reservoirs that provide balancing storage for the system. The proposed interconnection location in the Vandenberg Village system is Site 1, which is where Vandenberg Village has Well 1B, a 300,000 gallon ground-level tank, a booster pump station, and a pressure filter treatment system that treats and delivers water to the system at pressure. This site has two key advantages – it is the principal distribution system delivery point for supply from Wells 3B and 1B, and water from the Lompoc system could be delivered to the ground-level tank at the site, with an approximate ground elevation of 185 feet, rather than having to pump water from the Lompoc system to the Vandenberg Village distribution system operating gradient of 583 feet.

The Lompoc distribution-system hydraulic model was used to evaluate interconnection sizing. For the analysis, static simulations were prepared using a Lompoc demand of 6.6 mgd, which equates to 2030 maximum summer month demand. Various pipeline sizes were evaluated to determine how much flow could be delivered to Vandenberg Village without dropping pressures below 40 psi in the Lompoc system.

The hydraulic analysis indicates that for an 8-inch diameter pipeline, up to 1.8 mgd could be provided to Vandenberg Village, approximately equal to the future average daily demand. With a 10-inch diameter pipeline, up to 2.6 mgd could be provided to Vandenberg Village, approximately 150 percent of the future average daily demand.

With this connection, it may also be possible to deliver water to Vandenberg Village from Mission Hills, via the existing interconnection that Mission Hills has with the City of Lompoc. A check valve would be needed to prevent flow to the City of Lompoc system. Also, the pipeline along Highway 1 would need to be rated at sufficient pressure to be compatible with the Mission Hills system. The ability of Mission Hills to deliver water to Vandenberg Village is unknown, and would need to be evaluated.

Required facilities would include 5,200 feet of new pipeline along Highway 1 and the Site 3 and Site 1 access road, and a pressure sustaining valve to control flow and maintain pressure in Lompoc's system. The pressure sustaining valve was assumed to be located at Site 1, but could also be located in the Lompoc system, if desired. In Section 5, costs are presented for a 10-inch diameter interconnection.

The project described above is expected to result in lower groundwater treatment costs of approximately $380,000 per year. The cost reduction results from a reduction in chemical usage (lime, polymer, and NaOH). Depending on financial factors, such as availability of grant funding and cost to borrow construction funds, and the projected inflation rate, the infiltration system could be expected to payback the capital costs in about 40 years. As a simplified example, funding the full price of the project (no grant money), and assuming that the projected discount rate is approximately the same as the projected inflation rate, the treatment cost savings would pay for the project in 42 years ($15.8 million/$0.38 million/year = 42 years).

### 5.7 Infrastructure for Emergency Interconnection

Proposed infrastructure to provide the emergency interconnection with Vandenberg Village is shown on Figure 4.1. It is proposed to construct a 10-inch diameter pipeline from the end of the Lompoc potable water distribution system at Allen Hancock College, in Highway 1 and in the access road. A pressure sustaining valve station with flow meter would be constructed at the tie-in point at Allen Hancock College. The estimated cost for this infrastructure is shown in Table 5-3. As with the Lompoc Recharge Facilities options, there may be grant funding opportunities that would defray some of the costs for project implementation. Possible grant opportunities that could be considered include Proposition 84 funding or the Federal Emergency Management Agency Hazard Mitigation Assistance Program.

**Table 5-3. Estimated Cost of Emergency Interconnection Proposed Facilities**

| Infrastructure Item | Units | Unit Cost, dollars per unit | Quantity, units | Expanded Cost, dollars |
|---|---|---|---|---|
| 10-Inch Diameter Pipeline in Route 1 | Lineal Feet | 150[(a)] | 3,500 | 525,000 |
| 10-Inch Diameter Pipeline in Access Road | Lineal Feet | 100[(a)] | 1,850 | 185,000 |
| Pressure Sustaining Valve/Flow Meter Station | Lump Sum | 100,000[(b)] | 1 | 100,000 |
| Subtotal | | | | 810,000 |
| Estimating Contingency | | | 25% | 202,500 |
| Subtotal | | | | 1,012,500 |
| Construction Contingency | | | 10% | 101,300 |
| Subtotal | | | | 1,113,800 |
| Other Fees | | | 25% | 278,500 |
| Environmental/CEQA Compliance | | | 5% | 55,700 |
| Total Estimated Project Capital Cost | | | | 1,448,000 |

(a) Assumes cost to construct pipelines in Highway 1 would be more expensive than constructing in the access road.
(b) Includes flow meter and pressure sustaining valve.

LAWRANCE, FISK & McFARLAND, INC.
CONSULTING ENGINEERS • SANTA BARBARA • BREA

Santa Barbara Main Office
928 Garden Street, Suite 1
Santa Barbara, California 93101
Phone (805) 564-2441
Fax (805) 564-8575

April 18, 1994

Honorable Board of Directors
Vandenberg Village Community Services District
3757 Constellation Road
Vandenberg Village, California 93436

Attn: Mr. Tommy A. (TK) Keller, General Manager

Subject: Report on Water System Reliability Study

Ladies and Gentlemen:

Lawrance, Fisk & McFarland, Inc. (LFM) is pleased to present the attached "Report on Water System Reliability." This has been prepared pursuant to the June 17, 1993 Agreement between LFM and Vandenberg Village Community Services District for a Water System Reliability Study.

The authorization for this study and accomplishment of the bulk of the work occurred well prior to the disastrous wildfires in Southern California in late 1993 and the catastrophic Northridge Earthquake of January 17, 1994. Accordingly, your Board is to be commended on its decision to address the issue of Water System Reliability when it did, for wildfires and earthquakes are perennial potential threats to certain vulnerable elements of the District's Water System. Floods and accidents are additional threats.

The report examines the potential hazards of wildfires, floods, earthquakes, power outages, and accidents as they can affect various vulnerable elements of the District's Water System and influence its integrity and reliability for operation. Durations of potential service reductions or actual outages are considered.

Future growth and corresponding water demands were studied according to seven Growth Scenarios, specified by your Board, inasmuch as policies regarding future growth have not yet been established. Future water demands may dictate the size of certain needed future improvements, but many improvements are needed regardless of future water demand and adopted Growth Scenario.

The Report recommends certain water system improvement and/or operational procedures that should be undertaken by the District without regard to future growth and without the need of environmental review. Certain other items are at least partially dependent upon growth factors and/or environmental review considerations.

LFM appreciates the review work of the Water Committee and particularly would like to thank General Manager "TK" Keller and Field Supervisor Martin Damwyk for their helpful contributions during the preparation of this study. Mr. Jonathan V. Leech, AICP, REA of Interface Planning and Counseling Corporation, contributed the Section entitled Environmental Considerations. The undersigned would be happy to answer any questions the District may have regarding the attached Report.

Respectfully submitted,

LAWRANCE, FISK & McFARLAND, INC.

Charles H. Lawrance, P.E.
Vice President

California Registration No. 9037 (CE)
My Registration Expires December 31, 1996

Att: Report

M:\J93040\LTRTRNSM.DOC

(5) Drastically reduced quantities for exterior water usage would theoretically be available only for Scenarios A and B under either demand condition. As a practical matter, "outside" water use would undoubtedly be banned for the duration of the emergency.

## CONCEPTUAL COSTS FOR ADDITIONAL FACILITIES AND IMPROVEMENTS

Table X-6 presents the conceptual costs for the additional facilities that are indicated to be necessary to accommodate the 7 respective Growth Scenarios under consideration. Costs of certain basic needed improvements, irrespective of Scenario, are also shown.

## EMERGENCY MUTUAL SUPPORT INVOLVING ADJOINING WATER SYSTEMS

In studying the reliability of a water system, it is appropriate to consider the prospects for mutual aid from an adjoining water system should an unforeseen catastrophe warrant such emergency assistance. Theoretically, an emergency might arise in which VVCSD's wells production dropped off so severely and abruptly that the best alternative for emergency supply might be piped water from an adjacent water system during such time as new wells were being drilled.

### GENERAL POTENTIALS FOR MUTUAL SUPPORT

In the case of VVCSD, the adjoining water systems are at a significant distance from that of VVCSD as indicated on Figure 6 - Neighboring Municipal Water Systems to VVCSD. For example, VAFB's water distribution system lies about 3 miles northwesterly of the VVCSD. VAFB has adequate supply from the San Antonio Wells and the Santa Ynez Wells, and supplemental supply will soon be available from the Mission Hills Extension Aqueduct. However, the relative remoteness of VAFB from VVCSD disfavors consideration of an emergency pipeline unless all other alternatives had been exhausted. (Presumably, tank trucked water might be available to VVCSD from VAFB under certain conditions.)

As indicated in Figure 6, the City of Lompoc is somewhat more distant from VVCSD than is Mission Hills Community Services District (MHCSD). However, both entities are expanding their service areas and are also proceeding with plans for mutual support by distribution system interconnections at the so-called "Lompoc Wye" and at a short distance easterly thereof. One of MHCSD's interconnection points will be via a planned 14-inch pipeline on Harris Grade Road between Burton Mesa Boulevard and the Wye. A second interconnection is planned on Purisima Road at the proposed Purisima Highlands development east of the Wye. A computer network study is understood to have demonstrated that the distribution systems of Lompoc and MHCSD are compatible for mutual support.

MHCSD's planned 14-inch main will begin on Burton Mesa Boulevard east of Harris Grade Road. This intersection is roughly 3,600 feet away from VVCSD's Site 1, via Burton Mesa Blvd and the cross-country run between Site 1 and the Santa Barbara County Fire Station through which the Fire Station is served from VVCSD. Thus, a possible route for a mutual

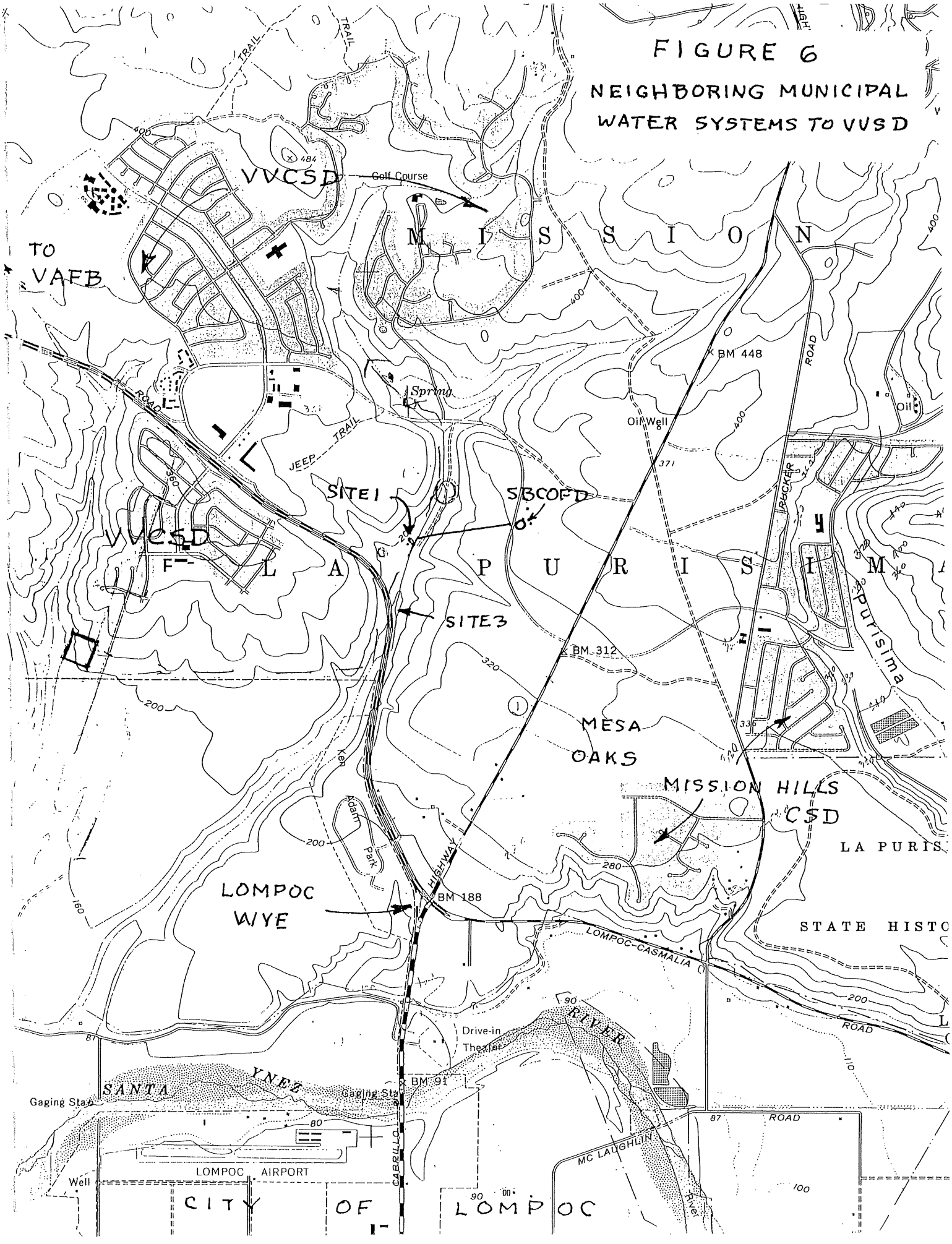


FIGURE 6
NEIGHBORING MUNICIPAL WATER SYSTEMS TO VVSD
VVCSD
Golf Course
TO VAFB
MISSION
ROAD
BM 448
Spring
Oil Well
JEEP TRAIL
SITE1
SBCOFD
VVCSD
FLA PURISSIMA
SITE3
BM 312
Purisima
MESA OAKS
MISSION HILLS CSD
LA PURIS
Ken Adam Park
HIGHWAY
LOMPOC WYE
BM 188
STATE HISTO
LOMPOC-CASMALIA
RIVER
Drive-in Theater
SANTA YNEZ
Gaging Sta
BM 91
LOMPOC AIRPORT
Well
CITY OF LOMPOC
CABRILLO
MC LAUGHLIN

TABLE X-6

CONCEPTUAL COSTS FOR ADDITIONAL FACILITIES AND IMPROVEMENTS

| ITEM | GROWTH SCENARIO A | B | C | D | E | F | G |
|---|---|---|---|---|---|---|---|
| Supply | | | | | | | |
| New Wells Required, Minimum | 0 | 0 | 0 | 1 | 1 | 1 | 1 |
| Proj. Cap. Cost, $1,000,000 | - | - | - | 0.2 | 0.2 | 0.2 | 0.2 |
| Treatment Plant | | | | | | | |
| New Capacity Required, gpm | 500 | 750 | 750 | 1,000 | 1,000 | 1,250 | 1,500 |
| Proj. Cap. Cost, $1,000,000 | 1.0 | 1.3 | 1.3 | 1.6 | 1.6 | 2.0 | 2.4 |
| Pumping Units | | | | | | | |
| New Capacity Required | Limited, for all Scenarios. See Note (4). | | | | | | |
| Proj. Cap. Cost, $1,000 | Not quantified. Involves Sites 1, 5 and St. Andrews | | | | | | |
| Pipelines | | | | | | | |
| New Pipes Required | Optional, Precautionary for Any Scenario | | | | | | |
| Proj. Cap. Cost, $1,000 | See Note (6) | | | | | | |
| Storage | | | | | | | |
| New Capacity Required, m.g. | 1.38 | 1.70 | 1.86 | 2.03 | 2.35 | 2.67 | 3.01 |
| Proj. Cap. Cost, $1,000,000 | 1.0 | 1.3 | 1.4 | 1.5 | 1.8 | 2.0 | 2.3 |
| Basic Improvements, $1000 | | | | | | | |
| Flexible Piping Connections at Tanks 1, 2 & 3 | 120 | 120 | 120 | 120 | 120 | 120 | 120 |
| Improved Access to Site No. 1 at Devis Creek Crossing | 36 | 36 | 36 | 36 | 36 | 36 | 36 |
| Emergency Standby Generator at Site No. 1 | 80 | 90 | 90 | 90 | 90 | 110 | 110 |
| Miscellaneous Electrical Work at Site No. 1 (Allowance) | 50 | 50 | 70 | 70 | 70 | 80 | 80 |
| Improved Fire Resistance of Wooden Bindings | 30 | 30 | 30 | 30 | 30 | 30 | 30 |

Notes:

(1) All conceptual project capital costs are approximate and do not generally include land or right-of-way acquisition, environmental investigations, and permitting processes. All costs are subject to refinement.

(2) New capacities shown are based upon no additional consumer conservation. If additional consumer conservation does occur, these capacities and costs might be reduced correspondingly.

(3) Location of additional wells is uncertain, so allowance for wells does not necessarily include raw water lines to treatment plant.

(4) Unit cost of treatment plant capacity assumed to decline somewhat with increasing plant size.

(5) Reinstatement/revamping of Site 5 and St. Andrews Booster Stations needed. May be able to avoid enlargement of Site 1 Boosters by using 250 HP two-stage centrifugal, more regularly, with or without modification.

(6) No distribution mains within streets are threatened by flood, earthquake or similar hazard. (Augmentation of hydraulic capacity from terminus of the 16-inch supply main from Tank 5 to the northwest part of the distribution should be an eventual goal.) Pipe crossings below Davis Creek may be vulnerable to a major flood, and additional study should be given to the best way to insure their integrity or to replace them, if advisable. Similarly, the raw water pipelines paralleling Davis Creek should be studied as to the best method of insuring their integrity or eventually replacing them. Any replacement program should consider new wells and increase and/or modified raw water capacities to ensure that adequate hydraulic capacity is provided.

(7) For additional storage, a blanket allowance is made of $0.75 per gal capacity. No specific study for siting or optimization has been done. Because of difficulties in obtaining satisfactory sites beyond those already owned by VVCSD, it may prove necessary to expand storage at Sites 1 and 2 to the maximum feasible. In lieu of some of the above ground storage, comparable stand by or peak demand well capacity might be considered, but this could entail complications and costs for treatment and pumping capacity.

(8) Piping connections are needed at all standpipes (Tanks Nos. 1, 2 & 3) but are not easily provided in most cases because of the piping layouts did not anticipate the need for such flexibility. The conceptual costs cited contemplate fairly widespread application of the type of flexible piping used at the recent Tank No. 5 installation.

(9) Allowance for eliminating the current "choke point" at the Site 1 access road crossing of Davis Creek anticipates a new double box culvert capable of passing a 25-year flood event. This assumes that the channel both upstream of the crossing can be widened and cleared sufficiently to pass the same discharge. (However, more severe floods would overtop the banks without major channel improvements.)

(10) The emergency standby generator should be able to handle the 3 smallest booster pumps (total 225 HP) plus either the filter pump (60 HP) or backwash pump (50 HP) simultaneously. A 247 KW power capability unit has been quoted for this proposed service. The 247 KW unit might be adequate also for Well No. 1B, but a larger unit would be required if Wells Nos. 3A and/or 3B are also to be covered. Also for the higher Growth Scenarios a larger unit would probably be necessary anyway. This matter might warrant further study before a decision is made.

(11) Improved fire resistance to the wooden buildings is based upon an allowance of 4,000 sq.ft. of roof area to be covered with steel roofing at a unit cost of $7.50/sq.ft. Discussion with Santa Barbara County Fire Dept. indicates that such a measure would be simpler, more economical, and more reliable than other measures such as providing a deluge system to wet down the roofs to prevent ignition by falling embers from a wildfire.

support pipeline between VVCSD and MHCSD might be a parallel easement in Burton Mesa Boulevard right-of-way and the existing easement between the County Fire and Sheriff's Station and Site 1.

Another potential mutual support pipeline routing between VVCSD and MHCSD might involve a reach of State Highway 1 (Lompoc-Casmalia Road). This might extend as far southerly as the Wye or, more likely, to future MHCSD development extending toward Davis Creek, which would greatly shorten the pipeline run.

Similarly, a mutual support pipeline for VVCSD with Lompoc might involve an extension to the future Alan Hancock Campus, northwest of the Wye.

If any mutual support pipeline connection, especially a permanent connection, were to be made between adjoining water systems, it is presumed that such would be designed for the mutual benefit of the two communities. Such connections are rarely done without considerable investigation and negotiation in order to protect the rights of the participating entities. Furthermore, permanent pipelines are unlikely to be extended significant distances through undeveloped areas without acceptable provisions for cost payback by those benefitted by such extension. Indeed, where growth is not desired, this may deter consideration of any pipeline extension.

## POTENTIAL BASES FOR MUTUAL SUPPORT PIPELINE

The City of Lompoc is understood to be planning a 14-inch main extension north of the Santa Ynez River along H Street (Highway 1) for service to certain areas within and westerly of the "Wye" and with a mutual support interconnection with Mission Hills Community Services District's water distribution system on the east side of the "Wye." The elevation of the hydraulic grade line (HGL) of these contiguous water systems at the interconnection point would be in the order of 500 ft, MSL. This is significantly higher than the HGL elevation at VVCSD's Tank No. 3 (about 225 ft, MSL) but is significantly lower than the HGL of Pressure Zone 1 of VVCSD's water distribution system up to about 583 ft, MSL).

Thus, for emergency water to be obtained by VVCSD from either Lompoc or Mission Hills from the Lompoc Wye area (or the intersection of Burton Mesa Blvd and Harris Grade Road), gravity flow should be possible to VVCSD's Tank No. 3 or the booster pumps suction at Site 1. However, repumping would be required prior to distribution in VVCSD' system. On the other hand, for emergency water to be supplied by VVCSD to either Mission Hills or Lompoc via this same route, treated water being pumped into Pressure Zone 1 could simply be diverted to the south under the pressures induced by the Site No. 1 booster pumps.

### Theoretical Pipeline Capacity

From VVCSD's standpoint, it is assumed that the desirable capacity for receipt of emergency water supply from one or both of the neighbors to the south could be less than its future minimum month demand, as a minimum, and approaching its maximum month demand, as a maximum. That is, the minimum quantity that VVCSD might find helpful is thought to be

about 500 gpm (0.72 mgd) and the maximum is probably in the neighborhood of 1,500 gpm (2.12 mgd). This range of values would also expected to be potentially helpful to Mission Hills Community Services District, should some emergency condition require delivery of water from VVCSD. These values might also suit the City of Lompoc, either as a potential donor or potential beneficiary of emergency water, depending upon circumstances. Thus, hydraulic and other considerations would influence the diameter and nature of the emergency mutual support pipeline, should such be implemented.

**Hydraulic Considerations**

The diameter of an emergency mutual support pipeline would be primarily dependent upon the quantity of water to be conveyed. The following is an illustration of key factors, arbitrarily assuming a pipeline length of some 3,6000 feet and a Hazen-Williams friction coefficient of 130:

| Item | 8-in dia. | 10-in dia. | 12-in dia. |
|---|---|---|---|
| Assumed 0.72 mgd: | | | |
| Velocity, fps | 3.3 | 2.1 | 1.4 |
| Friction loss, ft | 19 | 6.59 | 2.6 |
| Assumed 1.44 mgd: | | | |
| Velocity, fps | 6.6 | 4.2 | 2.8 |
| Friction loss, ft | 68 | 24 | 9.5 |
| Assumed 2.16 mgd: | | | |
| Velocity, fps | 9.8 | 6.3 | 4.2 |
| Friction loss, ft | 140 | 50 | 20 |
| Assumed 2.88 mgd: | | | |
| Velocity, fps | Excessive | 8.4 | 5.6 |
| Friction loss, ft | Excessive | 84 | 34 |

From the data shown above, it is clear that an 8-inch diameter pipeline would prove unduly restrictive. Thus, the minimum pipeline size that should be considered is 10-inch , while a 12-inch diameter would provide greater flexibility. A more detailed investigation, if warranted, would greatly refine this cursory analysis, including possible need for a separate booster pumping station to drive the emergency water northerly to VVCSD.

**Above-Ground Pipeline**

An above-ground pipeline might be a possibility for temporary emergency conditions, depending upon the actual emergency. For example, during the recent 6-year drought that resulted in serious depletion of reservoirs on the Santa Ynez River, the Santa Barbara County Water Agency implemented a temporary emergency pipeline which imported water from Ventura County into coastal Santa Barbara County via two temporary, above-ground pipelines. (One of these ran between Oxnard and Ventura; the other brought exchange water from Casitas Water District into Carpinteria County Water District.) Under the circumstances, it was

necessary for a state of emergency to be declared by the Governor, thereby permitting immediate construction of the pipeline and related works. No environmental impact report was required, but it was required that the pipeline be physically removed after a period of two years.

Both the so-called Rincon (inter-County) Pipeline and the Oxnard-Ventura pipeline and their related emergency facilities were in service only from 1991-93. For both pipelines it was acceptable to lay the emergency pipelines on the surface of the ground. For example, the Rincon Pipeline was laid within the public right-of-way of CALTRANS (State Highway 150) and County of Santa Barbara (Gobernador Canyon Road). For crossings under driveways, the pipe was depressed and placed in a conductor culvert pipe. Over 8,200 feet of 12-inch steel pipe were laid in the Rincon Pipeline, with a capacity of up to 3,000 gpm for importation into the Carpinteria County Water District system and reduced transmission capacity westerly of that system. (There was excessive pressure available for the first reach of the pipeline, so it was acceptable to operate with relatively high pipeline velocities and to limit the pipeline's diameter to 12-inch. Once connected to the CCWD distribution system, pipeline velocities were reduced because of branching pipes, and the supplemental above-ground pipeline could still function as 12-inch diameter.)

Emergency circumstances during the 1990-91 drought crisis for Santa Barbara and vicinity were different from those that might be encountered in the general Lompoc area. This is due to the relatively high dependence of the South Coast communities on surface water supplies, whereas VVCSD, Mission Hills CSD, and Lompoc are supplied solely by the local groundwater. Changes in groundwater storage in a basin the size of the Lompoc Basin usually happen relatively slowly. Thus, dangerous depletion of a surface water supply, such as occurred for the Santa Ynez River reservoirs 1990-91, appears unlikely to develop comparably in the Lompoc Valley to the extent that it would represent an emergency.

It is conceivable that the local wells of VVCSD might sustain damage from an earthquake or some other cause sufficient to curtail their production drastically. Under such circumstances, an emergency pipeline could be of great benefit if it could be implemented without much delay. Based upon the prototype emergency pipelines serving coastal Santa Barbara County 1991-93, it would probably be permissible to lay such emergency pipeline above-ground and within the CALTRANS right-of-way, provided that suitable precautions were undertaken. However, normal CALTRANS practice is to deny access for any "parallel easements" for utilities, although crossing of State highways at an angle can be undertaken by public utilities where necessary.

**Buried Pipeline**

A buried pipeline is highly preferable to an above-ground pipeline from the standpoint of protection against accidents, vandalism, and seismic damage. However, such a "permanent" pipeline would not be as readily implemented as an above-ground emergency pipeline. An environmental impact report would be required, and there would probably be no possibility of a parallel easement in a CALTRANS right-of-way. It might

still be possible to obtain easements within the parcels easterly of CALTRANS' right-of-way, but this would increase costs and might cause difficulties. This might improve the prospects for routing the pipeline along Burton Mesa Boulevard westerly from the northern part of Mesa Oaks Development in Mission Hills, with a cross-country connection to VVCSD's Site No. 1 along the route of the current service to the County Fire Station. (The actual feasibility of this potential project would need to be given detailed investigation, but preliminary considerations appear favorable.)

**Conceptual Construction Costs**

Pipeline construction costs are influenced by pipe diameter, pressure rating, trenching requirements, utility interferences, repaving needs, traffic handling needs, and other aspects. Depending upon actual arrangements, the unit construction costs, $/linear foot, can vary considerably.

For example, the drought emergency Rincon Pipeline involved 12-in steel pipe with split sleeve coupling joints, laid alongside the edge of the roadway without trenching. The unit cost was about $89/l.f., including valves and appurtenances. This unit cost included the costs of pipeline operation for 2 years as well as the cost of future pipeline removal. It also reflected the urgency for completion of the construction, traffic handling considerations on heavily traveled and/or narrow highways and the credit for future salvage. Some of the pipeline entailed fairly high pressures.

The unit construction cost for the Rincon Pipeline was roughly comparable to that which might have been sustained for a permanent (trenched) pipeline requiring somewhat lower average pressure ratings, having welded joints, and experiencing nominal trenching and traffic handling difficulties.

State of California, Department of Water Resources (DWR) studies of pipeline costs have covered a broad range of pipe diameters and pressure ratings. DWR data have indicated that, for the diameters and pressure ratings that might be considered for an emergency mutual support pipeline, the expected cost of furnishing the pipeline would be roughly 40-45 percent of the total unit cost, with installation accounting for the remainder. Valves and appurtenances are to be added.

Using the above data and other information as a guide, LFM's conceptual estimate of probable costs of pipeline construction for about 3,600 ft of mutual support pipeline are as indicated below:

| Pipeline Item | Unit Cost, $/l.f. 10" Dia. | 12" Dia. | Concept. Constr. Cost (3,600 ft) 10" Diameter | 12" Diameter |
|---|---|---|---|---|
| Temporary | | | | |
| Furnish | 37 | 41 | | |
| Install | 33 | 39 | | |
| Total* | 70 | 80 | $252,000 | $288,000 |
| Permanent | | | | |
| Furnish | 37 | 41 | | |
| Install | 43 | 49 | | |
| Total* | 80 | 90 | $288,000 | $324,000 |

*Includes pipeline but does not specifically includes valves and appurtenances. All construction costs are conceptual and consider steel pipe. (Some economies might be realized with PVC Pipe under some circumstances.) No pumping facilities are included.

**Project Capital Costs**

An additional 35 percent or more should be added to the conceptual construction costs to allow for engineering, geotechnical work, surveys, legal work, inspection, administration, and contingencies. Such allowances would probably need to be increased to cover right-of-way and permitting costs, should these prove to be significant.

**RECOMMENDATION**

The matter of main extensions by VVCSD, for any purpose, is to be determined by policies set by the Board of Directors. Within the context of this water system reliability report, prudence would suggest that such possibilities be included with other courses of action to ensure a reliable water system for the benefit of VVCSD constituents.

* * * * *

4/16/91

To: Harry Gaskell, SAIC

Fm: Roger Brett, VVCSD

Subj:
1) Local Project Cost
2) Combined Project Cost
3) Current Project Description
4) Future Project Description

1) Local Project Cost = $95,000 (estimate for cost of vault, meter, valves)

2) Combined Project Cost = $1,951,000 - This figure includes "Rough" cost of project @ $1,728,000 + 7½% contingencies, + $93,000 engineering (5%)

| | | |
|---|---|---|
| "Rough" Project | 1,728,000 | |
| Contingencies | 129,600 | (7½%) |
| Proj. Total | 1857,600 | |
| Engineering | 93,000 | |
| Total | 1951,000 | |

3) Current Proj. Desc. - From Coastal Br Terminus, construct 36,000' of 24" PVC Pipe + Appurtenances.

4) Future Proj. Desc. - From Vault, construct 4500' of 8" PVC to existing distribution system.

PUBLIC NOTICE

NOTICE TO ENGINEERS

The Vandenberg Village Community Services District (DISTRICT) is seeking proposals for an emergency water tie-in between the DISTRICT and the Mission Hills Community Services District. It is desired that the entire project be sized and designed, and will consist of an approximate 4500 foot section of an 8 to 10 inch line, a 1500 foot section of 14 inch line, metering devices, control valves, pressure reducing valves if required, a vault and necessary appurtenances. It is anticipated that this facility will be manually activated.

If your firm is interested in submitting a proposal contact the DISTRICT office at (805)733-3417, or write to; DISTRICT, 3757 Constellation Rd., Lompoc, CA 93436, and a Request For Proposal will be mailed to you. All proposals must be received no later than 10:00 AM on March ~~12~~ 25, 1991.

The ~~DISTRICT~~ hereby notifies all bidders that it will affirmatively insure that any contract entered into pursuant to this advertisement, minority business enterprises will be afforded full opportunity to submit bids in response to this invitation and will not be discriminated against on grounds of race, creed, color, national origin, ancestry, sexual orientation, political affiliation, or beliefs, sex, age, physical handicap, medical condition, marital status, or pregnancy.

The DISTRICT reserves the right to reject any/all bids in the best interest to the DISTRICT.

GENERAL MANAGER
VANDENBERG VILLAGE COMMUNITY
SERVICES DISTRICT
ROGER W. BRETT

FEBRUARY 1991

REQUEST FOR PROPOSAL: EMERGENCY WATER TIE-IN BETWEEN THE VANDENBERG VILLAGE COMMUNITY SERVICES DISTRICT AND THE MISSION HILLS COMMUNITY SERVICES DISTRICT

Gentlemen:

The Vandenberg Village Community Services District (VVCSD) is soliciting proposals for the design of a new emergency water connection to the Mission Hills Community Services District, (MHCSD) located east of and adjacent to the VVCSD. This connection will be located on Burton Mesa Boulevard, at the intersection of Harris Grade Road, on the southwest corner. It is desired that the entire project be sized and designed, and will consist of (approximately) a (4500) four thousand five hundred foot section of an (8) eight to (10) ten inch line, a (1500) one thousand five hundred foot section of (14) fourteen inch line, metering devices, control valves, pressure reducing valves if required, a vault and necessary appurtenances. It is anticipated that this facility will be manually activated.

## SCOPE OF WORK

1) Evaluate the proposed route and site to determine if it is the most appropriate, making note of all other utilities encountered, impacts on biological resources, etc.

2) Review hydraulic data from both systems to determine if pressure reduction facilities are required.

3) Prepare preliminary construction cost estimates, to include engineering support services and field engineering services during construction, and system testing where necessary. This section should also address construction timetable.

4) Prepare detailed plans, specifications and bid documents necessary to obtain formal bids for construction. These documents shall be prepared in accordance with the VVCSD'S competitive bidding rules and Affirmative Action Policy.

5) Provide assistance to the VVCSD in obtaining bids and make recommendations on award of contracts.

6) Review shop drawings and material submittals.

7) Provide assistance in obtaining all necessary permits from government agencies for the construction of the entire project.

8) Determine what environmental review is necessary. All costs for the preparation thereof shall be included in the proposal.

RFP - EMERGENCY WATER TIE-IN

If your firm is interested in performing this work, your proposal must be delivered to the General Manager of the VVCSD at 3757 Constellation Road, Lompoc, CA 93436, not later than 10:00 AM on March 25, 1991.

The proposal must contain the following information:

A. Your general qualifications in addition to your specific qualifications for this project.

B. A list of the project team members to be used with their qualifications and experience in this type of work and their position in your organization.

C. A list of the work of the same or similar nature which your firm has performed for other clients with a brief description of the project.

D. An indication of the time you feel will be necessary to complete the work.

E. An itemized estimate of cost for all work listed.

ADDITIONAL INFORMATION

The VVCSD will furnish any data available upon request, such as plans of existing sites and piping. It will be necessary for the consultant to coordinate with the MHCSD as to the portion of the line/appurtenances located within their jurisdiction.

The consultant selected will be required to execute a contract with the VVCSD. The contract will contain, among others, the following provisions:

1. INDEMNIFICATION:

The consultant shall indemnify, hold harmless and defend the VVCSD, its Board of Directors and each and every member thereof, and every officer, employee and representative of the VVCSD, from any and all loss, liability, damage, suits or claims, including attorneys' fees as a result of actions or omissions of its principals, agents or subcontractors while engaged in the performance of this contract, or from the use of the District's premises or facilities by the consultant, its employees, agents or subcontractors. Should additional engineering or design services be required to remedy deficiencies in the engineering services provided above, the consultant shall be responsible for the cost thereof.

2. INSURANCE:

Before the VVCSD signs the contract, the consultant shall furnish to the VVCSD certificates of Automobile and General Liability insurance in which the VVCSD is named as an additional insured with the consultant. The Automobile and General Liability policies shall each provide a minimum coverage of ($1,000,000.00) one million dollars combined single limit bodily injury and property damage. The General Liability Policy shall include completed operations coverable. Contractor's Protective Coverage is also required if subcontractors are to be used.

Before the VVCSD signs the contract, the consultant shall also furnish to the VVCSD a certificate evidencing Professional Liability ("Errors and Omissions") Insurance providing a minimum coverage of ($250,000.00) two hundred fifty thousand dollars.

Each liability insurance certificate shall state that the coverage afforded therein is primary and shall bear endorsements which provide that the VVCSD be given at least (30) thirty calendar days written notice before any material change or cancellation of such policies for any reason. No certificate will be approved if it contains "best effort" modifiers or if it relieves the insurer from the responsibility to give notice.

The cost of all insurance required by this section shall be included in the consultant's fees.

End of request for proposal.

**VANDENBERG VILLAGE**
**COMMUNITY SERVICES DISTRICT**
3757 Constellation Road • Vandenberg Village, California 93436
(805)733-2475

*Pride In Community Involvement*

November 19, 1990

Mr. John Lewis
MISSION HILLS COMMUNITY SERVICE DISTRICT
1320 East Burton Mesa Blvd.
Lompoc, CA 93436

SUBJECT: REVIEW OF REQUEST FOR PROPOSAL - EMERGENCY TIE LINE

Dear John:

Enclosed for your perusal is the draft RFP for the project we have discussed with your district.

Please review and forward your comments to me for revision(or call).

Sincerely,

Roger W. Brett

cc: Water Committee

July 27, 1990

TO: MHCSD Board of Directors

FROM: District Manager

SUBJECT: Tie-In of Water System with Vandenberg Village CSD

Earlier this month I met with Roger Brett, manager of VVCSD, to discuss the possibility of connecting the water systems of the two Districts. The preliminary purpose of such a connection is for emergency purposes and to be able to flow water in either direction. The locations selected for tie-in are:

1) Junction of Burton Mesa Blvd. and Harris Grade Road, and
2) The North-West corner of the Wye-Area.

Location #1 was selected as the first choice being the common connection to the State Water Project - Coastal Aqueduct, and closest to existing water lines.

Location #2 was selected on the basis of a back-up connection and eventual looping of the two distribution systems. Although this location is closest to the VVCSD water treatment plant, it is unknown at this time how the distribution system within the Wye-Area will be designed.

The facilities required at each tie-in point would consist of a valve vault to control the flow of water, metering to monitor the flow in either direction and pressure regulators to equalize the system pressures due to the higher elevation of the proposed storage tanks in Vandenberg Village.

The same facilities would be required at location #1 should the State Water Project proceed and this District become a participant in the Coastal Aqueduct or a Regional Desalination Treatment Plant.

The estimated cost to extend the existing 14" water main from the north end of Courtney Drive to the Harris grade Road along Burton Mesa Blvd., together with the above mentioned facilities would be $95,225. This estimate consists of the following:

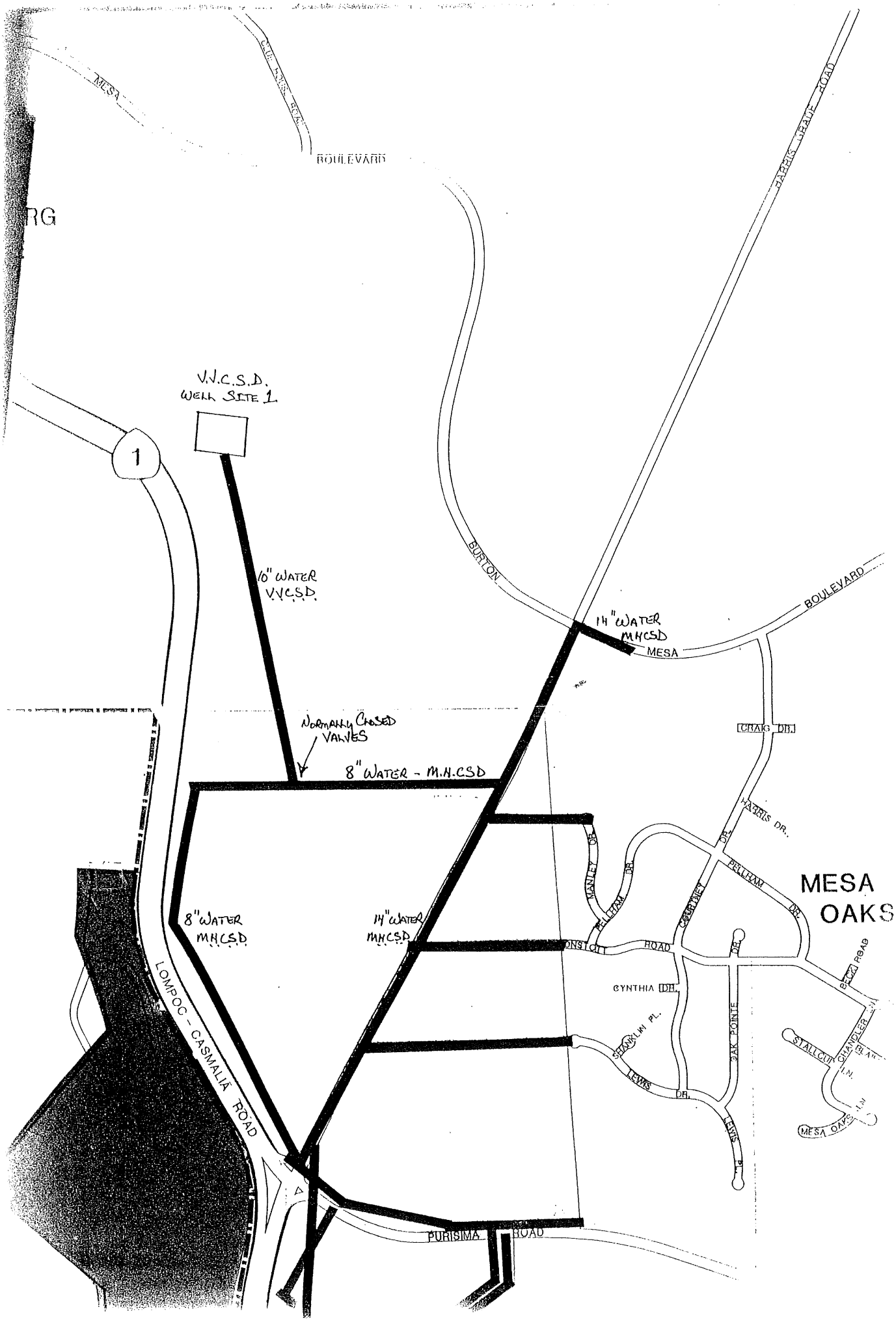
| | |
|---|---|
| 1,450 linear foot of 14" AC pipe | $44,225 |
| Cast in place concrete valve vault | 35,000 |
| Valves, meter & pressure regulator | 6,500 |
| Engineering, surveys & inspection | 9,500 |
| TOTAL | $95,225 |

Respectfully submitted,

John W. Lewis

John W. Lewis
District Manager

Route/File
XC-Jack
Roger F.
Ron B
ORIG- Incoming


MESA
BOULEVARD
RG
V.V.C.S.D.
WELL SITE 1
1
10" WATER
V.V.C.S.D.
BURTON
HARRIS GRADE ROAD
14" WATER
M.H.C.S.D
MESA
BOULEVARD
NORMALLY CLOSED
VALVES
8" WATER - M.H.C.S.D
CRAIG DR.
HARRIS DR.
MANLEY DR.
PELHAM DR.
CAMBRIDGE DR.
PELHAM DR.
MESA
OAKS
8" WATER
M.H.C.S.D
14" WATER
M.H.C.S.D
ROAD
CYNTHIA DR.
BECKI ROAD
OAK POINTE
SHANKLIN PL.
LEWIS DR.
LEWIS PL.
STALLCUP
CHANDLER
PLACE
LN.
MESA OAKS
LOMPOC - CASMALIA ROAD
PURISIMA ROAD