City of Santa Barbara

Sewer Extension Conceptual Design Study

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CHAPTER 1 – INTRODUCTION

Background

The City of Santa Barbara owns and maintains a sewer collection system and treatment plant serving customers in and nearby to the City. Some existing homes within the City sewer service area currently utilize private septic systems. The City anticipates the majority of these homes will eventually connect to the City's collection system, as existing septic tanks fail or for other environmental concerns.

The City has requested a conceptual design study be conducted to determine requirements to connect homes to the existing sewer collection system in four distinct locations. The four study locations are depicted in Figure 1 on the following page. These study locations are within reasonable range to the existing collection system; however, they are challenging to connect to the system due to topographical constraints, other existing utilities, and narrow right-of-way limitations. Some parcels will require easements and/or lift stations to transfer flows to the gravity collection system. The City prefers easements over lift stations, and private lift stations over City owned neighborhood lift stations.

Purpose

This report documents the conceptual design study conducted to connect four neighborhoods within the City service area to the existing sewer collection system. The goals of the study are to:

- Identify viable alternatives for each study location to connect to the collection system.
- Estimate cost for each study location. These cost estimates are intended to be used by the City for budgeting and feasibility for septic to sewer conversion in each separate location.
- Identify recommended inspections of the existing system to verify connection point and downstream functionality.

Study Areas

1. Veronica Springs

87 parcels currently on septic systems, located just South of Hwy 101 and east of Las Positas Road (Hwy 225).

- Potential utility conflicts. Both potable and recycled water mains exist in Veronica Springs Road. The majority of this area is served by Goleta Water District.
- Topographical constraints. Homes on La Senda and La Entrada will require easements and/or force mains.
- County ROW. Both La Senda and La Entrada are owned by the County and will require County permitting and Work approval.

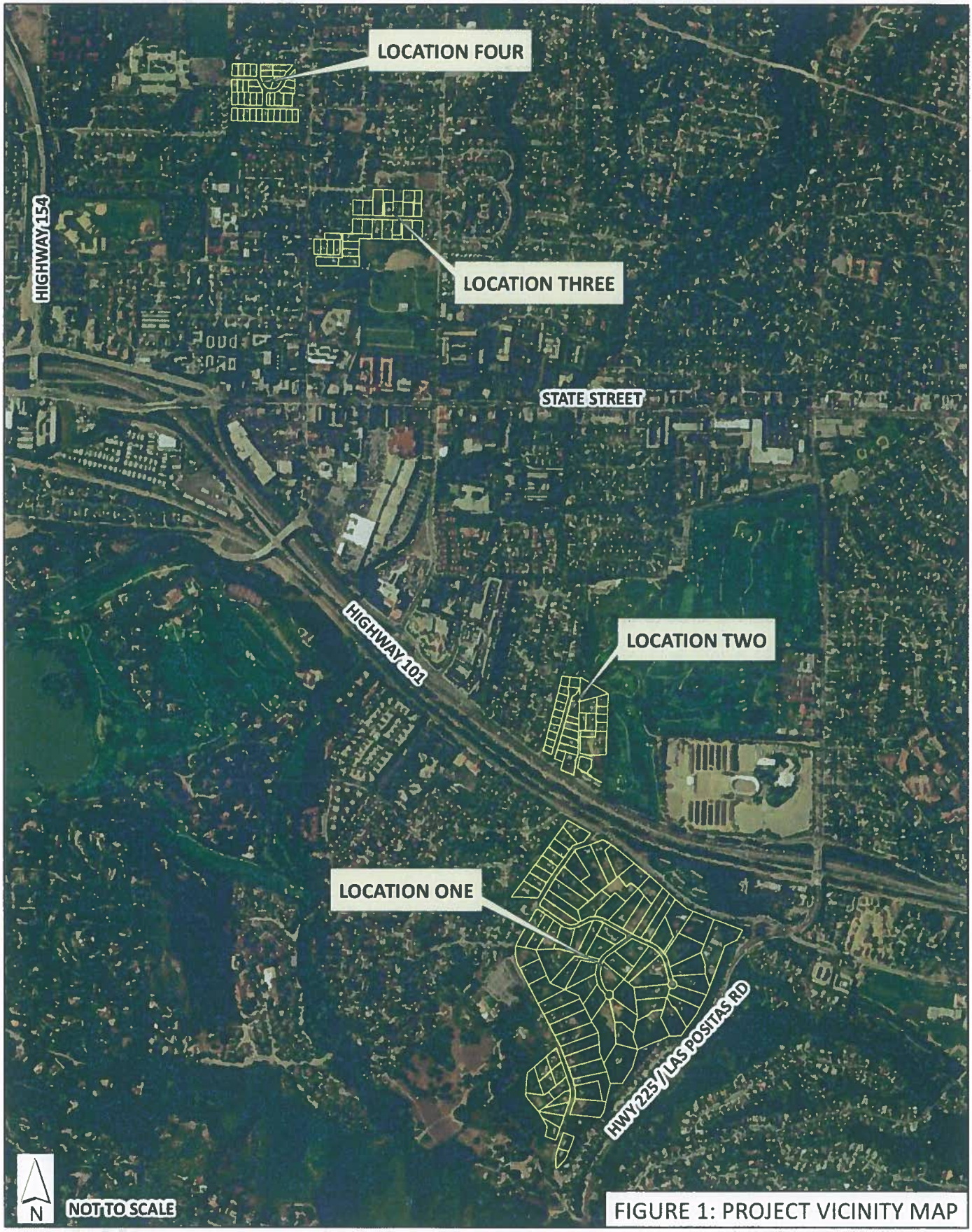

FIGURE 1: PROJECT VICINITY MAP

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2. *Northview Road and Vista Vallejo*

31 parcels currently on septic systems, located just north of Hwy 101 next to the Santa Barbara Community Golf Course.

- County ROW. Both Northview Rd and Vista Vallejo are owned by the County and will require County permitting and Work approval. These roads may require significant repair after construction activities.
- Topographical constraints. Vista Vallejo is narrow with very steep portions up to approximately 20% slope.
- Potential utility conflicts. An existing cathodic protection station for the water system may limit construction area. Goleta Water District provides service in this location.

FIGURE 2. VISTA VALLEJO, LOOKING NORTH

3. *Sunset Road and Fairfax Road*

28 parcels currently on septic systems, located between La Cumbre Road and Hope Avenue north of State Street.

- Topographical constraints. A low point in Sunset Road prevents gravity flow to the existing collection system. Fairfax Road has a narrow right-of-way with some parcels lower than the street grade.
- County ROW. Both Sunset Road and Fairfax Road are owned by the County and will require County permitting and Work approval.
- Potential utility conflicts. The anticipated new sewer alignment in Fairfax Road is in very close proximity to an existing gas main. Gas service is provided by The Gas Company.

4. *Calle Cita, Carol Avenue, and Carol Way*

38 parcels currently on septic systems, located between Primavera Road and La Cumbre Road, north of State Street.

- Topographical constraints. All streets slope away from existing sewer to a low point in Calle Cita.
- Potential utility conflicts. An abandoned-in-place waterline in Calle Cita may need to be removed. Goleta Water District provides water service to this study area.
- County ROW. All streets in this area are owned by the County and will require County permitting and Work approval.

FIGURE 3. CALLE CITA, LOOKING EAST

CHAPTER 2 – EXISTING SEWER COLLECTION SYSTEM

Infrastructure Data Collection

The City provided digital AutoCAD drawings of both the existing water and sewer systems. These drawings include data such as pipe size, material, and original date of installation. The City recently completed an effort to model their existing sewer collection system using a GIS compatible hydraulic modeling program. Results from this model in the form of a paper map showing existing peak flow depths through sewer pipes was provided to P&S (see Appendix D).

The most recent parcel map and roads data available through the Santa Barbara County Enterprise Geographic Information System (GIS) was utilized. County GIS data was compared with the City's GIS data available to view through the City of Santa Barbara Online Map. In the case of a discrepancy between the County and City's GIS data, the City's data was utilized.

1. Dry Utilities

Public utility information including gas, electric, cable, and telephone was requested through the utilities serving the study areas. Atlas maps provided by the utility companies were utilized to identify potential conflicts with existing underground service lines and proposed sewer locations. In the case that existing utilities are located above ground, atlas maps were not analyzed for conflicts. No major conflicts were identified, however, further coordination is recommended during final design and construction.

2. Existing Utility Easements

Available public records were researched to identify and locate existing utility easements within the four study areas. In some cases, the City may be able to utilize existing easements for new sewer construction. Easement information specific to each location is discussed further in the description of identified sewer extension alternatives.

Sewer Duty Factors

Current sewer duty factors utilized by the City are listed in Table 1. Flow rates are listed in units of gallons per day (gpd). Design flow for connection to the City's system is peak wet weather flow. Peak wet weather flow is equal to average day flow multiplied by the peaking factor.

Category	*Unit*	*Flow Factor*
Average Flow, Single Family Residential	Dwelling Unit	280 gpd/unit
Average Flow , Multiple Family Residential	Dwelling Unit	200 gpd/unit
Average Flow, Commercial	Acre	1,750 gpd/acre
Peaking Factor, Population less than 500	Unitless	3.50
Peaking Factor, Population 500 to 1,000	Unitless	2.75
Peaking Factor, Population 1,000 to 5,000	Unitless	2.50
Peaking Factor, Population Greater than 5,000	Unitless	2.00

TABLE 1. CITY OF SANTA BARBARA SEWER DUTY FACTORS

Commercial peaking factors are calculated from the following equation:

$$Q_p = 1.84 x Q_a^{0.92}$$ Equation One

Where: Q_p is peak flow and Q_a is average flow, both in units of cubic feet per second (cfs).

All residential connections were assumed to be single family homes. In the case that multiple homes exist on one parcel, each home was assigned flow for a single family home. For planning purposes, empty parcels located in the study areas were assumed to contribute single family flow. Each planning area contributes fewer than 500 new sewer connections; the peaking factor in each case is equal to 3.5. Therefore, peak flow estimation for each new residential connection equates to 980 gpd.

Location One includes a parcel on Modoc Road owned by Las Positas Mutual Water Company and used for water storage. This lot may have the potential to be upgraded by the current owner to include amenities such as an office with restrooms. Peak flow for this lot was assumed to be equal to a single family residential unit. Location Two includes a single commercial user, La Cumbre Feed-Roeser Milling, at the corner of Vista Vallejo and Calle Real. Peak flow from this user was calculated to be 3,031 gpd based on the City's commercial usage factors.

CHAPTER 3 – SEWER EXTENSION CONCEPTS

Individual Service Connections

Parcels that are able to flow by gravity to proposed gravity sewer can connect utilizing a standard gravity lateral per the City's construction standards. Parcels that are located below street grade or slope away from the frontage street may require individual pump systems to connect to the gravity sewer. In some cases, parcels may be above street grade, but street topography prohibits sewer flow by gravity to the existing collection system. In this case, an individual pump station may also be utilized to connect each parcel to a shared low pressure force main in the street. Exhibits of each alternative for all four locations are presented in Appendix A.

The recommended individual pump system is the grinder pump package manufactured by Environment One Corporation (E/One). The pump system is available in either a simplex or duplex model. Duplex means that each grinder pump system has two pumps installed that alternate for each pumping cycle; this allows for the use of a single pump if one of the pumps requires maintenance. In the case that a simplex (single pump) unit is installed, the homeowner must rely on the storage capacity of their grinder pump system if the pump requires maintenance. It is recommended that homeowners with a simplex pump station have spare parts readily available, to expedite repairs in the case of a malfunction and minimize impact to water using activities. Both the simplex and duplex units require the same power source, a dedicated 30 Amp four-wire service connection. Electrical upgrades at the homeowner's meter box may be necessary to power the pump system. Additional information on the E/One grinder pump system is included in Appendix E.

Location One: Veronica Springs

This area includes 87 parcels with 85 homes, located just South of Hwy 101 and East of Hwy 225. Parcel 049-072-010, owned by Las Positas Mutual Water Company and in use for water storage, was included in the analysis. Parcel 049-140-026, located at the end of La Senda, is currently unimproved. Both La Senda and La Entrada are County owned and maintained.

1. Topographical Constraints

Both La Entrada and La Senda slope away from the existing sewer system and require easements through private property to flow by gravity or pumps to pressure flow back to the gravity system in Veronica Springs Road. Existing vegetation would increase difficulty of routing a gravity sewer through private easements. In each alternative identified Veronica Springs and Modoc Road flow by gravity to the existing collection system. Some

FIGURE 4. LA ENTRADA, LOOKING EAST

parcels on La Senda, La Entrada, and along the east side of Veronica Springs slope away from the street; in the case that septic tanks are located behind homes a grinder pump may be required to connect to the new gravity main.

2. *Potential Utility Conflicts*

Veronica Springs Road has both a 12-inch water transmission main and a 16-inch recycled water line. Approximately 250 feet of Veronica Springs Road near Veronica Place includes an 8-inch waterline in addition to the above two listed waterlines. New sewer may need to be of special construction to meet State requirements for sewer-water separation with horizontal clearance less than 10 feet in the locations where more than one waterline exists within the roadway. Water service to the majority of homes in this study location is provided by Goleta Water District. Additional underground utilities include gas mains owned by The Gas Company.

3. *Sewer Connection Alternatives (see Appendix A for graphical representations)*

Alternative A: All Gravity Flow

- Both La Entrada and La Senda routed east via private easements
- Most difficult for construction
- 1,725 linear feet of easement required
- Depths of gravity main up to 20 feet

Alternative B: Both Gravity and Pumped Flow

- La Entrada pumped to La Senda via private grinder pumps
- La Entrada routed east via private easement
- 770 linear feet of easement required
- Depths of gravity main up to 20 feet

Alternative C: Both Gravity and Pumped Flow

- La Entrada and La Senda pumped to Veronica Springs via private grinder pumps
- Easiest for design and construction
- No easements required

4. *Recommended Alternative*

Alternative B is recommended for first consideration, as it minimizes the length of public easements and cross-country construction required to gravity flow the majority of the study area. This alternative does require deep construction through La Senda but the empty parcels

in this area should allow for adequate construction clearance. In the case that easements cannot be obtained then Alternative C, utilizing private grinder pumps for all parcels on La Entrada and La Senda, must be constructed. Also, if a large number of parcels on La Senda and La Entrada are found to have septic tanks in the rear of the property, Alternative C is recommended as these homes would most likely require grinder pumps.

Location Two: Northview Road and Vista Vallejo

This area includes 31 parcels with 36 homes currently on septic systems, located just north of Highway 101 next to the Santa Barbara Community Golf Course.

1. Topographical Constraints

Both Northview Road and Vista Vallejo could gravity flow south to the existing collection system in Calle Real. Portions of Vista Vallejo are very steep, with street slopes up to 20 percent. A drop manhole design could be utilized to decrease required slope of the gravity sewer through the steep sections. Construction area in Vista Vallejo is limited by the narrow right-of-way and existing utilities.

2. Potential Utility Conflicts

Homes on Northview Road obtain water service from a water main located in Vista Vallejo. Water services may be deeper than typical due to cross country construction. New sewer may need to be of special construction to meet State requirements for sewer-water separation with horizontal clearance less than 10 feet. A cathodic protection anode bed on the southeast corner of Vista Vallejo and Calle Real may limit available construction area at this intersection. Goleta Water District provides service to this location. Additional underground utilities include gas mains owned by The Gas Company.

3. Sewer Connection Alternatives (see Appendix A for graphical representations)

Alternative A: All Gravity Flow Within Existing Right-of-Way

- New manhole required on existing 18-inch VCP pipe in Calle Real
- Potential conflict with waterlines (2) in Vista Vallejo

Alternative B: All Gravity Flow and New Easement

- Alignment through private property to avoid existing water and provide connection to existing manhole in Calle Real
- 110 linear feet of easement required

4. Recommended Alternative

Alternative A is recommended for first consideration as it does not require obtaining new utility easements. The cost to obtain an easement would most likely be much greater than the cost to

both construct a new manhole in Calle Real and utilize special sewer main construction for sewer-water separation requirements. Also, the proposed easement could diminish the potential for future use of the affected property because the easement is not aligned with the property line; a drainage facility at the southeast corner of the parcel makes it infeasible to follow the property line for new gravity main construction.

Location Three: Sunset Road and Fairfax Road

This area includes 28 parcels with 31 homes currently on septic systems, located between La Cumbre Road and Hope Avenue north of State Street.

1. Topographical Constraints

A low point at the east end of Sunset Road prevents five parcels from flowing by gravity; in each alternative identified these homes utilize private grinder pumps to pressure flow to Hope Avenue. Pressure flow to La Cumbre Road is less desirable, as La Cumbre flows to the Via Lucero Lift Station and these flows would be "double-pumped". The remainder of homes on Sunset could gravity flow west to Sunset Road. Homes on the easterly side of Fairfax Road are below street grade and may require individual pump stations to force to the proposed gravity collection line in Fairfax. Estimated required sewer depths are approximate and may change depending on actual location of existing septic tanks.

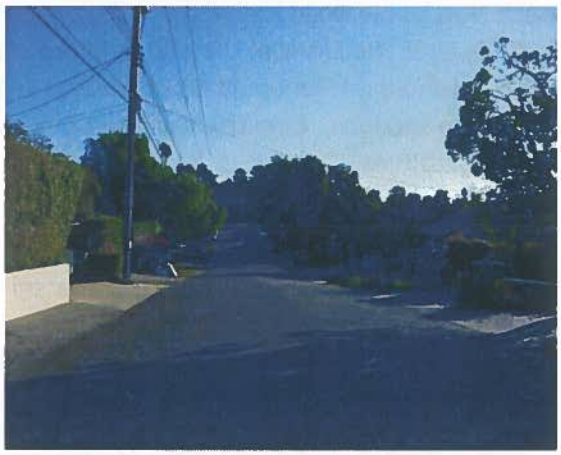


FIGURE 5. SUNSET ROAD, LOOKING EAST

2. Potential Utility Conflicts

Fairfax is an extremely narrow road with existing landscaping extending to the pavement edge. Dependent on actual location of the existing water main, new sewer may need to be of special construction to meet State requirements for sewer-water separation with horizontal clearance less than 10 feet. Goleta Water District provides service to this location. Additional underground utilities include gas mains owned by The Gas Company. Existing gas and water mains are shown on opposite sides of Fairfax Road per utility atlas sheets, further limiting construction area in this narrow street. It is likely that the gas main in Fairfax will need to be exposed and supported in place to construct the new sewer.

3. Sewer Connection Alternatives (see Appendix A for graphical representations)

Alternative A: Both Gravity and Pumped Flow, Gravity Main up to 18 feet Deep

- Deep gravity main to accommodate low parcels in Fairfax Road

- One home on Fairfax pumped to new gravity main via private grinder pump

Alternative B: Both Gravity and Pumped Flow, Gravity Main up to 12 feet Deep

- Two homes on Fairfax pumped to new gravity main via private grinder pumps

4. Recommended Alternative

Alternative B is recommended for first consideration, as deep construction would be very difficult on Fairfax Road. Required construction equipment for deep trenching is significantly larger than equipment utilized for standard sewer main construction. The combination of narrow right-of-way and multiple existing underground utilities severely limits the clearance available for construction equipment, and may make deep construction infeasible.

Location Four: Calle Cita, Carol Avenue, Carol Way

This location includes 38 parcels with 41 homes currently on septic systems, located between Primavera Road and La Cumbre Road north of State Street.

1. Topographical Constraints

All streets in this study area slope away from the existing gravity sewer system to a low point in Calle Cita. Either easements or pumped flow are required to connect these homes to the sewer collection system. Flows routed west would flow to the La Colina lift station, flows routed east would flow to the Via Lucero lift station. Some parcels on the south side of Calle Cita are lower than street grade and may require private grinder pumps depending on location of the septic systems.

2. Potential Utility Conflicts

Both an active and an abandoned-in-place water main exist in Calle Cita. The active water main alignment appears to jog to avoid the pipe that was abandoned. Dependent on actual location of the active water main, new sewer may need to be of special construction to meet State requirements for sewer-water separation with horizontal clearance less than 10 feet, or the abandoned waterline may need to be removed to facilitate new sewer construction. An existing cathodic protection station at the intersection of Russell Way and Calle Cita may limit construction area at this location. Goleta Water District provides service to this area. Additional underground utilities include gas mains owned by The Gas Company.

3. Sewer Connection Alternatives (see Appendix A for graphical representations)

Alternative A: All Gravity Flow

- Gravity flow routed to low point in Calle Cita
- Flow routed south via new private easement
- Unknown condition of sewer in southerly property (private)

- 170 feet of easement required

Alternative B: All Pumped Flow

- Flow routed to La Cumbre Road via private grinder pumps
- Easiest for design and construction

Alternative C: Both Gravity and Pumped Flow

- Homes on Carol Way gravity flow west via new private easement
- Homes on Carol Avenue, Russel Way, and Calle Cita routed to La Cumbre Road via private grinder pumps
- 200 feet of easement required

Alternative D: Gravity Flow and Lift Station

- Gravity flow routed to low point in Calle Cita
- Public lift station constructed underground in new easement
- Most difficult for design

4. Recommended Alternative

Both Alternatives A and D are recommended for first consideration. Alternative A may have a higher up-front cost to purchase easements and ownership of a private sewer line but it would minimize future maintenance and utility costs for the City. If Alternative A is not feasible due to the inability to obtain easements, Alternative D is recommended. This alternative minimizes the length of required force main and disturbance on individual parcels. However, if a large number of homes on the Southerly side of Calle Cita are found to have septic tanks at the rear of the lot and are too low to connect to a new main by gravity, Alternative B may end up being the most cost-effective.

CHAPTER 4 – DOWNSTREAM IMPACTS

Impacts to Existing Downstream Pipes

Existing collection system capacity downstream from the study locations was reviewed based on data provided by the City. Pipes immediately downstream of the four locations were analyzed for capacity and their ability to accept the additional flows. Information was obtained from the City and extracted from the City's recently completed sewer model. This information included pipe size, existing d/D, and manhole depths. The d/D map provided is included with Appendix D for reference. As the individual users connect to the City system, it will be important to update the model with these additional flows. The two pipes that will potentially be negatively impacted by the additional flows are listed below on State Street and Castillo Street.

State Street: La Cumbre Road to Hope Avenue

The existing 8-inch and 10-inch VCP gravity mains flow with an existing peak depth to diameter (d/D) ratio of 0.55 to 0.57. This piping is downstream from both the La Colina and Via Lucero Lift Station. Therefore, the only increase in flow to this area is generated from the 6 homes in Area 3 that would not flow to either of the above mentioned Lift Stations; it is recommended these 6 homes connect to the existing sewer in Hope Avenue via individual grinder pumps. Increase of peak flow with the addition of 6 homes is calculated to be 5,880 gpd. Based on the small increase in flow, it is recommended that this pipe be monitored and flushed on a regular maintenance schedule.

It is noted also that this piping is upstream of the 10-inch gravity siphon routed below Arroyo Burro Creek just east of Hope Avenue. Downstream from the siphon at Hitchcock Way the gravity main increases in size to 18-inches and peak d/D drops to 0.35.

Castillo Street: West Mason Street to West Cabrillo Boulevard

A single pipe segment of 24-inch PVC flows with a peak d/D of 0.70. Immediate upstream and downstream gravity main flows with a peak d/D between 0.57 and 0.49. Similar to the existing gravity system in State Street, the only additional peak flow contribution would be generated by the six homes on Sunset Road in Location 3 that require grinder pumps. Due to the travel time to reach the 24-inch pipe in Castillo Street the increase in peak flow would be greatly reduced from the instantaneous peak flow from the 6 new connections. To be conservative, the peak instantaneous flow of 5,880 gpd was utilized to analyze downstream pipe capacity. Due to the existing conditions in this pipe, it is recommended that this location be analyzed as part of the City's capital improvement program. The additional flows from this study area represent only a minor percentage of the overall pipe capacity, and have a negligible effect on the d/D ratio.

Impacts to Existing Downstream Lift Stations

The majority of parcels included in this study ultimately flow to existing lift stations once connected to the City sewer system. These lift stations were analyzed for capacity to accept the additional estimated flow contribution. The calculations presented in this report represent a simple flow capacity estimation based on the existing system. Pump efficiency, wet well size, electrical usage, and pumping controls are not included as part of this analysis. It is noted that the addition of new flow to a lift station would not change lift station flowrate; rather, the duration of pumping would increase. Therefore, unless a lift station is upgraded with higher capacity pumps, flows routed to existing lift stations would not create any increase in peak flow depth downstream from the lift station. As a result, impacts to downstream piping are minor as the majority of new flow to the sewer collection system would be directed to existing lift stations. Based on the existing data provided by the City, and the calculations presented in Appendix D, all lift stations affected by the additional flows have sufficient capacity to accept these additional flows.

Braemar Lift Station

The Braemar Lift Station is located at the corner of Cliff Drive and Alan Road. A similar study completed by Penfield & Smith in 2006 found that this lift station transfers an average of approximately 221,000 gallons per day (gpd) and has a maximum capacity of 2.88 million gallons per day (mgd). Location One would flow, via existing pipes, to Braemar Lift Station if connected to the existing sewer system and increase the flow to the Braemar Lift Station by 85,260 gpd. The 2006 study identified a potential increase in flow to the Braemar Lift Station of 206,544 gpd. Calculations from the 2006 study are included in Appendix D for reference. The total increase in flow as a result of both potential connections would be 291,804 gpd. When combined with the existing flow of 221,000 gpd, the lift station would pump an average of 512,804 gpd, or 18% of the capacity.

Via Lucero Lift Station

The majority of Location Three and all or a portion of Location Four may flow to the Via Lucero Lift Station. The worst case scenario was analyzed, routing a majority of Location Three and all of Location Four to the Via Lucero Lift Station. Location Three contributed an additional flow of 26,460 gpd and Location Four contributed an additional flow of 40,180 gpd for a total potential increase in flow to the Via Lucero Lift Station of 66,640 gpd. The existing average daily flow at this lift station is 78,636 gpd (see Appendix D for calculation sheet). Maximum capacity for this lift station is 1.15 mgd. With the potential additional flows, the combined flows total 145,276 gpd, or 13% of the capacity.

La Colina Lift Station

All or a portion of Location Four would flow to La Colina Lift Station if connected to the existing system. For purposes of calculations, it was assumed that all of flows from Location Four would flow to La Colina Lift Station. Therefore, Location Four would contribute a total of 40,180 gpd to this Lift Station. The existing average daily flow at this lift station is 182,044 gpd (see

Appendix D for calculation sheet). Maximum capacity for this lift station is 1.15 mgd. With the potential additional flows, the combined flows total 222,224 gpd, or 19% of the capacity.

CHAPTER 5 – COST ESTIMATES

Public Improvement Construction Unit Costs

Preliminary construction cost estimates include all materials and labor; unit cost for gravity and force main include trenching, surface restoration, and manholes installed at required intervals, as well as lump sum items such as mobilization and traffic control.

Description	*Unit*	*Unit Cost*
8inch PVC gravity main	LF	$265
8inch PVC gravity main, deep construction	LF	$345
3inch PVC force main	LF	$190
4inch PVC force main	LF	$210
New Manhole on existing gravity main	EA	$6,000

TABLE 2. PUBLIC IMPROVEMENT CONSTRUCTION UNIT COSTS

Additional Project Unit Costs

Total project cost includes many supplementary items above and beyond construction cost, such as environmental review and permitting, public agency coordination, engineering design, and construction administration. These costs are difficult to determine at a preliminary level. Typical non-construction costs expressed as a percentage of total construction cost have been estimated based on actual values for prior projects in and near to Santa Barbara County. However, these costs can vary greatly between agencies, and within the same agency, dependent on complexity and location of construction.

Description	*Unit*	*Unit Cost*
Construction Administration	%	15%
Geotechnical Investigation & Testing	%	5%
Final Engineering & Agency Approval	%	20%
Environmental Review & Mitigation	%	6%
Legal Fees	%	4%
Private Property Coordination	%	2%
Contingency	%	15%

Bond Issuance & Reserves	%	20%

TABLE 3. PUBLIC IMPROVEMENT NON-CONSTRUCTION UNIT COSTS

Easements and Cross-Country Construction

The cost of obtaining underground utility easements is highly variable and dependent on both current and future land use. For the purpose of alternative cost comparisons and as a starting point to easement evaluation, cost to purchase an easement may be estimated based on assessed land value of the affected parcel and the total square footage of the required easement.

Construction through unimproved land areas can be significantly more difficult than construction in paved areas. In some cases, recommended sewer alignments may not be feasible due to biological or environmental constraints. A separate unit cost for cross-country gravity main construction was not estimated, as the factors affecting this cost are highly variable and beyond the scope of this study.

Private Improvement Costs

Private improvement costs have been identified for both "best-case" and "worst-case" scenarios. Best case represents anticipated cost for a parcel to connect with a gravity lateral to a new gravity sewer. Worst case represents anticipated cost for a parcel to connect with an individual grinder pump to either a gravity main or low pressure force main. Cost for the grinder pump has been included assuming the use of a duplex system. Estimated cost for a simplex pumping unit is $5,290, while the estimated cost for a duplex unit is $9,815. Cost for the pump station includes sales tax and the E/One startup fee; it *does not* include potential shipping charges.

Description	*Unit*	*Quantity*	*Unit Cost*	*Extended Cost*
4-inch PVC gravity lateral	LF	40	$85	$3,400
Lateral connection & cleanout	EA	1	$600	$600
Septic tank abandonment	LS	1	$2,300	$2,300
Subtotal				**$6,300**
Contingency	%	1	15%	$945
Bond Issuance & Reserves	%	1	20%	$1,449
City Connection Fee	LS	1	$3,145	$3,145
Total				**$11,839**

TABLE 4. PRIVATE IMPROVEMENT COST PER CONNECTION, BEST CASE

Description	Unit	Quantity	Unit Cost	Extended Cost
4-inch PVC gravity lateral	LF	15	$85	$1,275
Package duplex pump station	EA	1	$9,815	$9,815
Pump installation	LS	1	$2,100	$2,100
Electrical upgrade & connection	LS	1	$1,600	$1,600
2-inch HDPE pressure lateral	LF	100	$70	$7,000
Lateral connection & cleanout	EA	1	$600	$600
Septic tank abandonment	LS	1	$2,300	$2,300
Subtotal				**$24,690**
Contingency	%	1	15%	$3,704
Bond Issuance & Reserves	%	1	20%	$5,679
City Connection Fee	LS	1	$3,145	$3,145
Total				**$37,217**

TABLE 5. PRIVATE IMPROVEMENT COST PER CONNECTION, WORST CASE

Extension Alternatives Cost Summary

The following table summarizes estimated cost for each alternative per location. Estimated construction costs *do not* include the cost of obtaining private easements. Detailed cost breakdowns for each alternative are presented in Appendix B. Total cost at the time of construction must account for inflation. These estimates are considered valid for the second half of year 2009. The "best-case" parcel cost represents cost to connect to the system with a gravity lateral, the "worst-case" parcel cost represents cost to connect to the system via a private duplex grinder pump.

Sewer Extension Concept	*Public Improvement Cost per Parcel*	*Total Cost per Parcel*	
		Best Case	*Worst Case*
Location One: Veronica Springs			
Alternative A	$51,900	$63,740	$89,120
Alternative B	$47,354	$59,194	$85,574
Alternative C	$40,341	$52,181	$77,561
Location Two: Northview Road & Vista Vallejo			
Alternative A	$29,850	$41,690	$67,070
Alternative B	$29,444	$41,284	$66,664
Location Three: Sunset Road & Fairfax Road			
Alternative A	$27,272	$39,112	$64,492
Alternative B	$26,023	$37,863	$63,243
Location Four: Calle Cita, Carol Avenue, Carol Way			
Alternative A	$25,851	$37,691	$63,071
Alternative B	$22,098	$33,938	$59,318
Alternative C	$17,955	$29,795	$55,175
Alternative D	$34,771	$46,611	$71,991

TABLE 6. EXTENSION CONCEPT COST ESTIMATE SUMMARY

Factors Affecting Homeowner Participation

1. City of Santa Barbara Sewer Buy-in Fee

The City's new sewer connection fee is currently $3,145. The City has a program in place that reduces the connection fee for septic to sewer conversions to $2,025; per the City's website, this program is expected to expire June 30, 2009. If this program is extended beyond the current expiration date to accommodate homeowners included in this study it could increase the likelihood that owners would agree to buy-in to the conversion program.

2. Proposed State Water Resources Control Board Requirements

The California State Water Resources Control Board (WRCB) is expected to begin implementation of proposed regulations for onsite wastewater treatment systems in July 2010, in accordance with State Assembly Bill 885 (AB885). These new regulations could increase the burden of septic tank ownership, potentially increasing the likelihood that homeowners would buy-in to a septic-to-sewer conversion. Proposed regulations require all owners of septic tanks to have inspections performed and documented with the WRCB a minimum of once every five years. In addition, parcels within 600 feet of affected waterbodies would be required to undergo additional septic tank inspection and potential retrofit if the existing septic tank was found to be contributing to water body impairment. According to WRCB documentation, cost to retrofit a single septic tank is estimated to be $45,000. Affected waterbodies within the Santa Barbara area identified by WRCB documentation include Arroyo Burro Creek, Mission Creek, and the Goleta Slough. Preliminary spatial analysis indicates that 62 of the 185, or 34%, of the parcels within the scope of this study could be mandated to retrofit existing septic tanks, based on proximity to the above listed waterbodies or direct tributaries to these waterbodies.

CHAPTER 6 – ADDITIONAL CONSIDERATIONS

Determination of Existing Septic Tank Location

It is recommended that as a first course of action during the final engineering phase the City work with homeowners to accurately map and record septic tank location for all affected parcels. Multiple parcels included in this analysis slope away from the frontage street and may therefore have a septic tank located to the rear of the property. In some cases, this may mean these parcels must utilize a grinder pump in order to connect to the proposed sewer system. The need to install grinder pumps may determine the best sewer connection alternative for final design. Determining actual septic tank location is beyond the scope of this study.

Assessment District Formation

Part of the implementation of these improvements may involve the formation of one or more Assessment Districts. The costs associated with this step can vary greatly from one project to the next, and should be factored into the per parcel cost of the improvements. Cost estimates presented in this study show potential fees on a percentage basis, and are based on recent similar projects. These values may vary greatly and should be finalized as the individual projects are being designed.

Phasing Construction Activities

Proposed sewer improvements within each study area may be broken up into phases or individual projects. This could enhance the potential for construction to be completed quickly, and further refine cost sharing per parcel. For example, Location 3 contains two distinctly different modes of connecting to the existing sewer: parcels on the east portion of Sunset will connect by grinder pump to the east, the remainder parcels will flow by gravity or private grinder pump to the west. The sewer force main on Sunset flowing east could be constructed completely separate from the improvements flowing west. However, phasing construction could incur additional costs, such as mobilization or higher unit costs due to smaller quantities in each phase. This could especially be true if phases were broken up into distinct projects and bid separately.

Utility Provider Coordination

With the exception of natural gas service, the majority of dry utilities existing in the four study locations are overhead. Coordination with utility providers may be required if the proposed sewer alignment is in close proximity to existing overhead utility poles. In most cases, narrow right-of-way limits construction clearance and constrains possible alignments for new sewer. Close coordination with utility providers is recommended during final design and construction.

CHAPTER 7 – CONCLUSIONS AND RECOMMENDATIONS

Location One: Veronica Springs

This location contains a total of 87 parcels to be added to the existing collection system. The preferred alternative for this location is Alternative B, as shown in Appendix A. This concept best utilizes existing easements, minimizes the number of homes on a lift station, and provides 90% of the homes with a standard gravity main connection. The total additional flow from Location One to the City's system is 85,260 gpd.

Location Two: Northview Road and Vista Vallejo

This location contains a total of 31 parcels to be added to the existing collection system. The preferred alternative for this location is Alternative A, as shown in Appendix A. This concept provides all homeowners with a conventional gravity sewer main as a means of connecting to the City's system. The total additional flow from Location Two to the City's system is 35,280 gpd.

Location Three: Sunset Road and Fairfax Road

This location contains a total of 28 parcels to be added to the existing collection system. The preferred alternative for this location is Alternative B, as shown in Appendix A. This alternative minimizes the number of homes on a lift station and provides a conventional gravity sewer main to 75% of the homeowners as a means of connecting to the City's system. The total additional flow from Location Three to the City's system is 30,380 gpd.

Location Four: Calle Cita, Carol Avenue, Carol Way

This location contains a total of 38 parcels to be added to the existing collection system. The preferred alternatives for this location are Alternative A and D, as shown in Appendix A. Alternative A presents a solution that will provide a conventional gravity sewer for all parcels in this study area. An easement over private property is required to accomplish this solution. Should this easement not be feasible, Alternative D proposes a public lift station accept the flows for all parcels, and a force main be connected to the existing gravity main in La Cumbre Road. The total additional flow from Location Four to the City's system is 40,180 gpd.

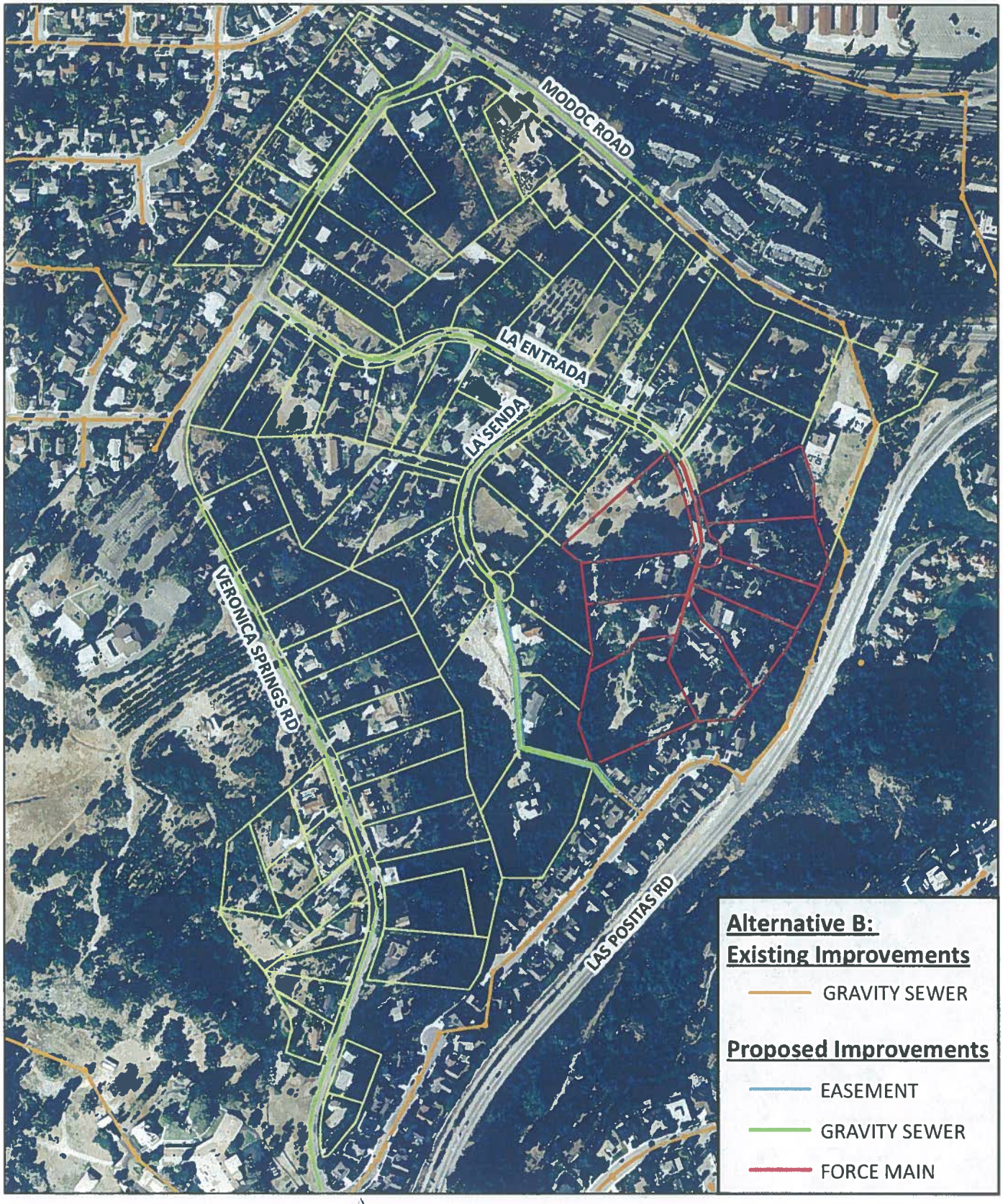
Additional Recommendations

Each alternative presented in this study has distinct advantages. As design is finalized, all factors affecting cost should be weighed to create the most cost effective solution. Although preferred alternatives are presented as part of this study, these may change as certain variables such as septic tank location and easement costs are determined.

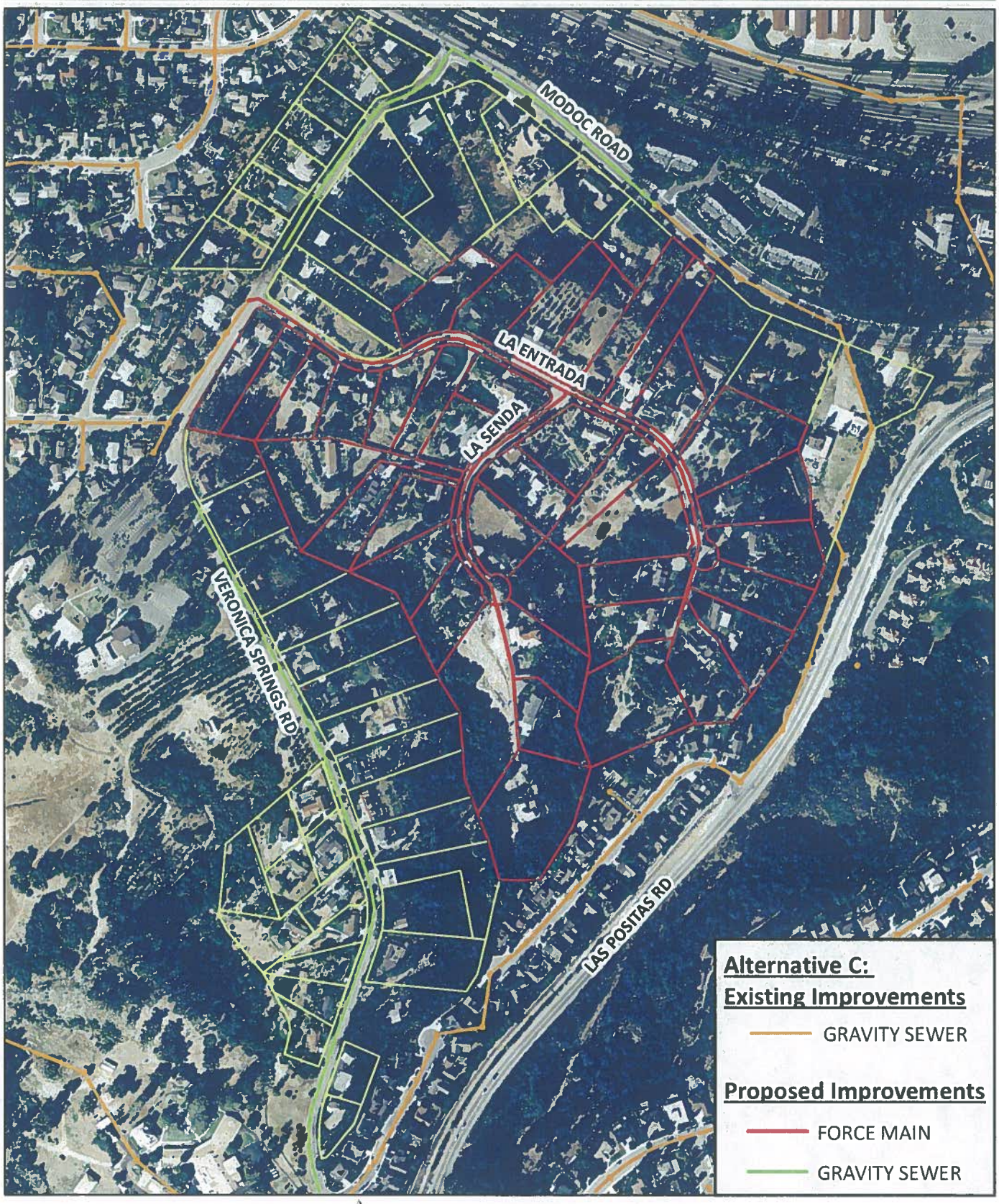
APPENDIX A

Extension Concept Exhibits

Location One



Location One



Location One

Location Two

Location Two

Location Three

Location Three

Location Four

Location Four

Location Four

Location Four

APPENDIX B

Cost Estimates

WASTEWATER COLLECTION PRELIMINARY COST ESTIMATE				
PROJECT	Sewer Main Extension Conceptual Design Study			
LOCATION	Santa Barbara, CA			Penfield & Smith Engineers Inc.
CLIENT	City of Santa Barbara			210 E. Enos Drive Suite A
W.O.	16743.02			Santa Maria, CA 93454
				Ph: (805)925-2345
CALC'D BY	VGD			
CHECKED BY	BMD			
DATE	20-Mar-09			
LOCATION 1: VERONICA SPRINGS ROAD				
No. Parcels	87			
UNIT PRICES				
Item	**Unit**	**Unit Cost**		
8-inch PVC	LF	$265		
8-inch PVC deep construction	LF	$345		
3-inch PVC force main	LF	$190		
4-inch PVC force main	LF	$210		
New MH on existing main	EA	$6,000		
Non-Construction Cost	%	52%		
Contingency	%	15%		
Bond Issuance & Reserves	%	20%		
ALTERNATIVE A: ALL GRAVITY FLOW				
Description	**Item**	**Quantity**	**Cost**	
Gravity Main	8-inch	7500	$1,987,500	
Deep Gravity Main	8-inch	450	$155,250	
	CONSTRUCTION SUBTOTAL		**$2,142,750**	
	Non-Construction Cost		$1,114,230	
		Easements		
	Resolution of Utiity Conflicts		$15,000	
		SUBTOTAL	$3,271,980	
		Contingency	$490,797	
		TOTAL	$3,762,777	
	Bond Issuance & Reserves		$752,555	
	TOTAL BONDED AMOUNT		**$4,515,332**	
PUBLIC IMPROVEMENT SHARE PER PARCEL			**$51,900**	
TOTAL COST PER PARCEL, BEST CASE			**$63,740**	
TOTAL COST PER PARCEL, WORST CASE			**$89,120**	

WASTEWATER COLLECTION PRELIMINARY COST ESTIMATE				
PROJECT	Sewer Main Extension Conceptual Design Study			
LOCATION	Santa Barbara, CA			Penfield & Smith Engineers Inc.
CLIENT	City of Santa Barbara			210 E. Enos Drive Suite A
W.O.	16743.02			Santa Maria, CA 93454
				Ph: (805)925-2345
CALC'D BY	VGD			
CHECKED BY	BMD			
DATE	20-Mar-09			
LOCATION 1: VERONICA SPRINGS ROAD				
ALTERNATIVE B: BOTH GRAVITY AND PUMPED FLOW				
Description	**Item**	**Quantity**	**Cost**	
Gravity Main	8-inch	6430	$1,703,950	
Deep Gravity Main	8-inch	450	$155,250	
Force Main	3-inch	500	$95,000	
	CONSTRUCTION SUBTOTAL		**$1,954,200**	
	Non-Construction Cost		$1,016,184	
	Easements			
	Resolution of Utiity Conflicts		$15,000	
	SUBTOTAL		$2,985,384	
	Contingency		$447,808	
	TOTAL		$3,433,192	
	Bond Issuance & Reserves		$686,638	
	TOTAL BONDED AMOUNT		**$4,119,830**	
PUBLIC IMPROVEMENT SHARE PER PARCEL			**$47,354**	
TOTAL COST PER PARCEL, BEST CASE			**$59,194**	
TOTAL COST PER PARCEL, WORST CASE			**$84,574**	
ALTERNATIVE C: BOTH GRAVITY AND PUMPED FLOW				
Description	**Item**	**Quantity**	**Cost**	
Gravity Main	8-inch	3950	$1,046,750	
Force Main	3-inch	3245	$616,550	
	CONSTRUCTION SUBTOTAL		**$1,663,300**	
	Non-Construction Cost		$864,916	
	Easements			
	Resolution of Utiity Conflicts		$15,000	
	SUBTOTAL		$2,543,216	
	Contingency		$381,482	
	TOTAL		$2,924,698	
	Bond Issuance & Reserves		$584,940	
	TOTAL BONDED AMOUNT		**$3,509,638**	
PUBLIC IMPROVEMENT SHARE PER PARCEL			**$40,341**	
TOTAL COST PER PARCEL, BEST CASE			**$52,181**	
TOTAL COST PER PARCEL, WORST CASE			**$77,561**	

WASTEWATER COLLECTION PRELIMINARY COST ESTIMATE				
PROJECT	Sewer Main Extension Conceptual Design Study			
LOCATION	Santa Barbara, CA			Penfield & Smith Engineers Inc.
CLIENT	City of Santa Barbara			210 E. Enos Drive Suite A
W.O.	16743.02			Santa Maria, CA 93454
				Ph: (805)925-2345
CALC'D BY	VGD			
CHECKED BY	BMD			
DATE	20-Mar-09			
LOCATION 2: NORTHVIEW ROAD & VISTA VALLEJO				
No. Parcels	31			
UNIT PRICES				
Item	**Unit**	**Unit Cost**		
8-inch PVC	LF	$265		
8-inch PVC deep construction	LF	$345		
3-inch PVC force main	LF	$190		
4-inch PVC force main	LF	$210		
New MH on existing main	EA	$6,000		
Non-Construction Cost	%	52%		
Contingency	%	15%		
Bond Issuance & Reserves	%	20%		
ALTERNATIVE A: ALL GRAVITY FLOW				
Description	**Item**	**Quantity**	**Cost**	
Gravity Main	8-inch	1580	$418,700	
Calle Real Connection	New MH	1	$6,000	
	CONSTRUCTION SUBTOTAL		**$424,700**	
		Non-Construction Cost	$220,844	
		Easements		
		Resolution of Utiity Conflicts	$25,000	
		SUBTOTAL	$670,544	
		Contingency	$100,582	
		TOTAL	$771,126	
		Bond Issuance & Reserves	$154,225	
		TOTAL BONDED AMOUNT	**$925,351**	
		PUBLIC IMPROVEMENT SHARE PER PARCEL	**$29,850**	
		TOTAL COST PER PARCEL, BEST CASE	**$41,690**	
		TOTAL COST PER PARCEL, WORST CASE	**$67,070**	

WASTEWATER COLLECTION PRELIMINARY COST ESTIMATE				
PROJECT	Sewer Main Extension Conceptual Design Study			
LOCATION	Santa Barbara, CA			Penfield & Smith Engineers Inc.
CLIENT	City of Santa Barbara			210 E. Enos Drive Suite A
W.O.	16743.02			Santa Maria, CA 93454
				Ph: (805)925-2345
CALC'D BY	VGD			
CHECKED BY	BMD			
DATE	20-Mar-09			
LOCATION 2: NORTHVIEW ROAD & VISTA VALLEJO				
ALTERNATIVE B: ALL GRAVITY FLOW WITH EASEMENT				
Description	**Item**	**Quantity**	**Cost**	
Gravity Main	8-inch	1580	$418,700	
	CONSTRUCTION SUBTOTAL		**$418,700**	
	Non-Construction Cost		$217,724	
		Easements		
	Resolution of Utiity Conflicts		$25,000	
		SUBTOTAL	$661,424	
		Contingency	$99,214	
		TOTAL	$760,638	
	Bond Issuance & Reserves		$152,128	
	TOTAL BONDED AMOUNT		**$912,765**	
PUBLIC IMPROVEMENT SHARE PER PARCEL			**$29,444**	
TOTAL COST PER PARCEL, BEST CASE			**$41,284**	
TOTAL COST PER PARCEL, WORST CASE			**$66,664**	

WASTEWATER COLLECTION PRELIMINARY COST ESTIMATE				
PROJECT	Sewer Main Extension Conceptual Design Study			
LOCATION	Santa Barbara, CA			Penfield & Smith Engineers Inc.
CLIENT	City of Santa Barbara			210 E. Enos Drive Suite A
W.O.	16743.02			Santa Maria, CA 93454
				Ph: (805)925-2345
CALC'D BY	VGD			
CHECKED BY	BMD			
DATE	20-Mar-09			

LOCATION 3: SUNSET ROAD & FAIRFAX ROAD

No. Parcels 28

UNIT PRICES

Item	Unit	Unit Cost
8-inch PVC	LF	$265
8-inch PVC deep construction	LF	$345
3-inch PVC force main	LF	$190
4-inch PVC force main	LF	$210
New MH on existing main	EA	$6,000
Non-Construction Cost	%	52%
Contingency	%	15%
Bond Issuance & Reserves	%	20%

ALTERNATIVE A : BOTH GRAVITY AND PUMPED FLOW, GRAVITY MAIN UP TO 18 FT DEEP

Description	Item	Quantity	Cost
Gravity Main	8-inch	850	$225,250
Deep Gravity Main	8-inch	225	$77,625
Force Main	3-inch	270	$51,300
	CONSTRUCTION SUBTOTAL		**$354,175**
		Non-Construction Cost	$184,171
		Easements	
		Resolution of Utiity Conflicts	$15,000
		SUBTOTAL	$553,346
		Contingency	$83,002
		TOTAL	$636,348
		Bond Issuance & Reserves	$127,270
		TOTAL BONDED AMOUNT	**$763,617**
		PUBLIC IMPROVEMENT SHARE PER PARCEL	**$27,272**
		TOTAL COST PER PARCEL, BEST CASE	**$39,112**
		TOTAL COST PER PARCEL, WORST CASE	**$64,492**

WASTEWATER COLLECTION PRELIMINARY COST ESTIMATE				
PROJECT	Sewer Main Extension Conceptual Design Study			
LOCATION	Santa Barbara, CA			Penfield & Smith Engineers Inc.
CLIENT	City of Santa Barbara			210 E. Enos Drive Suite A
W.O.	16743.02			Santa Maria, CA 93454
				Ph: (805)925-2345
CALC'D BY	VGD			
CHECKED BY	BMD			
DATE	20-Mar-09			
LOCATION 3: SUNSET ROAD & FAIRFAX ROAD				
ALTERNATIVE B: BOTH GRAVITY AND PUMPED FLOW, GRAVITY MAIN UP TO 12 FT DEEP				
Description	**Item**	**Quantity**	**Cost**	
Gravity Main	8-inch	1080	$286,200	
Force Main	3-inch	270	$51,300	
	CONSTRUCTION SUBTOTAL		**$337,500**	
	Non-Construction Cost		$175,500	
Length of Easement	Easements			
	Resolution of Utiity Conflicts		$15,000	
	SUBTOTAL		$528,000	
	Contingency		$79,200	
	TOTAL		$607,200	
	Bond Issuance & Reserves		$121,440	
	TOTAL BONDED AMOUNT		**$728,640**	
PUBLIC IMPROVEMENT SHARE PER PARCEL			**$26,023**	
TOTAL COST PER PARCEL, BEST CASE			**$37,863**	
TOTAL COST PER PARCEL, WORST CASE			**$63,243**	

WASTEWATER COLLECTION PRELIMINARY COST ESTIMATE				
PROJECT	Sewer Main Extension Conceptual Design Study			
LOCATION	Santa Barbara, CA			Penfield & Smith Engineers Inc.
CLIENT	City of Santa Barbara			210 E. Enos Drive Suite A
W.O.	16743.02			Santa Maria, CA 93454
				Ph: (805)925-2345
CALC'D BY	VGD			
CHECKED BY	BMD			
DATE	20-Mar-09			
LOCATION 4: CALLE CITA, CAROL AVENUE, RUSSEL WAY				
No. Parcels	38			
UNIT PRICES				
Item	**Unit**	**Unit Cost**		
8-inch PVC	LF	$265		
8-inch PVC deep construction	LF	$345		
3-inch PVC force main	LF	$190		
4-inch PVC force main	LF	$210		
New MH on existing main	EA	$6,000		
Non-Construction Cost	%	52%		
Contingency	%	15%		
Bond Issuance & Reserves	%	20%		
ALTERNATIVE A: ALL GRAVITY FLOW				
Description	**Item**	**Quantity**	**Cost**	
Gravity Main	8-inch	1730	$458,450	
	CONSTRUCTION SUBTOTAL		**$458,450**	
		Non-Construction Cost	$238,394	
		Easements		
		Resolution of Utiity Conflicts	$15,000	
		SUBTOTAL	$711,844	
		Contingency	$106,777	
		TOTAL	$818,621	
		Bond Issuance & Reserves	$163,724	
		TOTAL BONDED AMOUNT	**$982,345**	
		PUBLIC IMPROVEMENT SHARE PER PARCEL	**$25,851**	
		TOTAL COST PER PARCEL, BEST CASE	**$37,691**	
		TOTAL COST PER PARCEL, WORST CASE	**$63,071**	

WASTEWATER COLLECTION PRELIMINARY COST ESTIMATE				
PROJECT	Sewer Main Extension Conceptual Design Study			
LOCATION	Santa Barbara, CA			Penfield & Smith Engineers Inc.
CLIENT	City of Santa Barbara			210 E. Enos Drive Suite A
W.O.	16743.02			Santa Maria, CA 93454
				Ph: (805)925-2345
CALC'D BY	VGD			
CHECKED BY	BMD			
DATE	20-Mar-09			
LOCATION 4: CALLE CITA, CAROL AVENUE, RUSSEL WAY				
ALTERNATIVE B: BOTH GRAVITY AND PUMPED FLOW				
Description	**Item**	**Quantity**	**Cost**	
Gravity Main	8-inch	570	$151,050	
Force Main	3-inch	1260	$239,400	
	CONSTRUCTION SUBTOTAL		**$390,450**	
	Non-Construction Cost		$203,034	
		Easements		
	Resolution of Utiity Conflicts		$15,000	
		SUBTOTAL	$608,484	
		Contingency	$91,273	
		TOTAL	$699,757	
	Bond Issuance & Reserves		$139,951	
	TOTAL BONDED AMOUNT		**$839,708**	
PUBLIC IMPROVEMENT SHARE PER PARCEL			**$22,098**	
TOTAL COST PER PARCEL, BEST CASE			**$33,938**	
TOTAL COST PER PARCEL, WORST CASE			**$59,318**	
ALTERNATIVE C: ALL PUMPED FLOW				
Description	**Item**	**Quantity**	**Cost**	
Force Main	3-inch	1660	$315,400	
	CONSTRUCTION SUBTOTAL		**$315,400**	
	Non-Construction Cost		$164,008	
		Easements		
	Resolution of Utiity Conflicts		$15,000	
		SUBTOTAL	$494,408	
		Contingency	$74,161	
		TOTAL	$568,569	
	Bond Issuance & Reserves		$113,714	
	TOTAL BONDED AMOUNT		**$682,283**	
PUBLIC IMPROVEMENT SHARE PER PARCEL			**$17,955**	
TOTAL COST PER PARCEL, BEST CASE			**$29,795**	
TOTAL COST PER PARCEL, WORST CASE			**$55,175**	

WASTEWATER COLLECTION PRELIMINARY COST ESTIMATE				
PROJECT	Sewer Main Extension Conceptual Design Study			
LOCATION	Santa Barbara, CA			Penfield & Smith Engineers Inc.
CLIENT	City of Santa Barbara			210 E. Enos Drive Suite A
W.O.	16743.02			Santa Maria, CA 93454
				Ph: (805)925-2345
CALC'D BY	VGD			
CHECKED BY	BMD			
DATE	20-Mar-09			
LOCATION 4: CALLE CITA, CAROL AVENUE, RUSSEL WAY				
ALTERNATIVE D: GRAVITY FLOW & PUBLIC LIFT STATION				
Description	**Item**	**Quantity**	**Cost**	
Gravity Main	8-inch	1590	$421,350	
Lift Station	50 gpm min	1	$100,000	
Force Main	4-inch	470	$98,700	
	CONSTRUCTION SUBTOTAL		**$620,050**	
	Non-Construction Cost		$322,426	
		Easements		
	Resolution of Utiity Conflicts		$15,000	
		SUBTOTAL	$957,476	
		Contingency	$143,621	
		TOTAL	$1,101,097	
	Bond Issuance & Reserves		$220,219	
	TOTAL BONDED AMOUNT		**$1,321,317**	
PUBLIC IMPROVEMENT SHARE PER PARCEL			**$34,771**	
TOTAL COST PER PARCEL, BEST CASE			**$46,611**	
TOTAL COST PER PARCEL, WORST CASE			**$71,991**	

APPENDIX C

Sewer Demand Calculations

WASTEWATER PEAK FLOW CALCULATION

PROJECT	Sewer Main Extension Conceptual Design Study
LOCATION	Santa Barbara, CA
CLIENT	City of Santa Barbara
W.O.	16743.02
CALC'D BY	VGD
CHECKED BY	BMD
DATE	13-Mar-09

Penfield & Smith Engineers Inc.
210 E. Enos Drive Suite A
Santa Maria, CA 93454
Ph: (805)925-2345

RESIDENTIAL FLOW CONTRIBUTION

Average Day Usage Factor	280	gpd per unit
Peaking Factor	3.5	peak wet weather flow
Peak Flow Usage Factor	980	gpd per unit

Study Area	Road	No. Lots	No. Units	No. Empty Lots	Peak Flow Contribution [gpd]
1	Veronica Springs Rd	42	42	0	41,160
	Modoc Road	7	6	1	6,860
	La Entrada/ La Senda	38	37	1	37,240
	TOTAL	**87**	**85**	**2**	**85,260**
2	Northview Road	19	21	0	20,580
	Vista Vallejo	12	15	0	14,700
	TOTAL	**31**	**36**	**0**	**35,280**
3	Fairfax Road	10	10	0	9,800
	Sunset Road	18	21	0	20,580
	TOTAL	**28**	**31**	**0**	**30,380**
4	Calle Cita	20	22	0	21,560
	Carol Ave/Carol Way	18	19	0	18,620
	TOTAL	**38**	**41**	**0**	**40,180**

COMMERICAL FLOW CONTRIBUTION

Studay Area 2: Vista Vallejo (one lot)

APN	051-263-005	
Parcel Area	0.56	Acres
Commerical Flow Factor	1750	gpd/Acre
Average Flow	980	gpd
Average Flow	0.00152	cfs
Peak Flow	0.00469	cfs
Peak Flow	3031	gpd

APPENDIX D

Sewer Capacity Calculations

- 11/28/05 thru 12/27/05 (29 days)

  52.9 + 54.4 = 107.3 hrs

  $1000 \frac{gal}{min}\left(\frac{60 min}{hr}\right)(107.3 hrs) = 6,438,000 gal$

  $222,000 \frac{gal}{day}$

- 12/27/05 thru 1/23/06 (27 days)

  38.9 + 41.2 = 80.1 hrs

  $1000 \frac{gal}{min}\left(\frac{60 min}{hr}\right)(80.1 hrs) = 4,806,000 gal$

  $178,000 \frac{gal}{day}$

* Maximum Flow of Pump Station

$1000 \frac{gal}{min}\left(\frac{60 min}{hr}\right)\left(\frac{24 hrs}{day}\right) \times 2 pumps = 2,880,000 \frac{gal}{day}$

$= 2.88 MGD$

CITY OF SANTA BARBARA
VIA LUCERO LIFT STATION

Date 7-21-09
W.O. No. 16743.02
Sheet 1 of
By BMD Ck. By

VIA LUCERO EXISTING PUMPS

FLOW RATE: 400 gpm (per City)

- 8/29/07 (1 day)

$101.55 + 100.8 = 202.35$ min

$400 \frac{gal}{min} (202.35 min) = 80,940$ gal/day

- 3/15/03 (1 day)

$400 \frac{gal}{min} (190.83 min) = 76,332$ gal/day

⇒ AVE DAILY FLOW: 78,636 gal/day AVE

⇒ MAX. DAILY FLOW:

$\left(400 \frac{gal}{min}\right)\left(60 \frac{min}{hr}\right)\left(24 \frac{hr}{day}\right) \times 2$ pumps $= 1,152,000$

⇒ 1,152,000 gpd MAX

Braemar Ranch Existing Pumps

1000 gpm (per pump station plans)

- 8/1/05 thru 8/29/05 (29 days)

  51.3 + 52.4 = 103.7 hrs — 214,552 gal/day

  $1000 \frac{gal}{min}\left(\frac{60 min}{hr}\right)(103.7 hrs) = 6,222,000 gal$

- 8/29/05 thru 10/3/05 (35 days)

  76.9 + 78 = 154.9 hrs — 265,543 gal/day

  $1000 \frac{gal}{min}\left(\frac{60 min}{hr}\right)(154.9 hrs) = 9,294,000 gal$

- 10/3/05 thru 10/31/05 (28 days)

  38.7 + 40 = 78.7 hrs — 168,643 gal/day

  $1000 \frac{gal}{min}\left(\frac{60 min}{hr}\right)(78.7 hrs) = 4,722,000 gal$

- 10/31/05 thru 11/28/05 (28 days)

  64.7 + 64.9 = 129.6 hrs — 277,714 gal/day

  $1000 \frac{gal}{min}\left(\frac{60 min}{hr}\right)(129.6 hrs) = 7,776,000 gal$

CITY OF SANTA BARBARA
LA COLINA LIFT STATION

Date 7-21-09
W.O. No. 16743.02
Sheet 2 of
By BMD Ck. By

LA COLINA EXISTING PUMPS

FLOW RATE: 400 gpm (PER CITY)

- 8/29/07 (1 day)

  336.78 + 70.43 = 407.21 min

  $400 \frac{gal}{min} (407.21 \text{ min}) = 162,884 \text{ gal/day}$

- 3/15/03 (1 day)

  224.68 + 278.33 = 503.01 min

  $400 \frac{gal}{min} (503.01 \text{ min}) = 201,204 \text{ gal/day}$

⇒ AVE DAILY FLOW: 182,044 gal/day AVE

⇒ MAX DAILY FLOW

$400 \frac{gal}{min} \left(60 \frac{min}{hr}\right)\left(24 \frac{hr}{day}\right) \times 2 \text{ pumps} = 1,152,000$

⇒ 1,152,000 gal/day MAX

inspection. Manholes installed prior to 1960 are constructed of brick and mortar. Manholes installed after 1960 are constructed of precast concrete rings. As with manholes, clean-outs are used for maintenance cleaning and inspection of the wastewater main. Clean-outs are generally sized the same as the main they are connected to and are placed at the end of the line in place of a full manhole.

Wastewater Lift Stations

ANDANTE LIFT STATION

- Location: 980 Andante Road
- Date of construction: 1986
- Number of lots served: 8
- Type of station: Grinder Pumps
- Pump make: Hydromatic
- Pump size: 2"; Number of pumps: 2
- Flow rate: 43 GPM
- Motor: Aurora; 3 HP
- Wet Well: H 12' x DIA 4'; 1127 GAL
- Average inflo: 2.6 GPM; Date: 7/30/03; Time: 10:00 a.m.
- Detention time: 7.5 hrs
- Station control: Floats
- Emergency generator: NA
- Fuel consumption: NA
- Waterway potentially affected by failure: Mission Creek
- Force main: 2" P.V.C.; Length: 470'; Year: 1986

BRAEMER LIFT STATION

- Location: 1 Alan Road
- Date of construction: 1962
- Number of lots served: 870
- Type of station: Centrifugal Pumps
- Pump make: Smith and Loveless
- Pump size: 8"; Number of pumps: 2
- Flow rate: 1000 GPM
- Motor: Marathon Motors; 100 HP
- Wet well: L 15' x W 8' x H 17'; 15,259 GAL
- Average inflo: 368 GPM; Date: 7/31/03; Time: 9:00 a.m.
- Detention time: 42 min
- Station control: SCADA, Bubbler, Probe
- Emergency generator: Caterpillar; 350 kW
- Fuel consumption: 200 GAL tank; runs 7.5 hr
- Emergency pump bypass: yes
- Waterway potentially affected by failure: Arroyo Burro Creek
- Force main: 10" P.V.C; Length: 3100; Year: 1962
- Force main: 10' steel; Length: 3164; Year: 1994

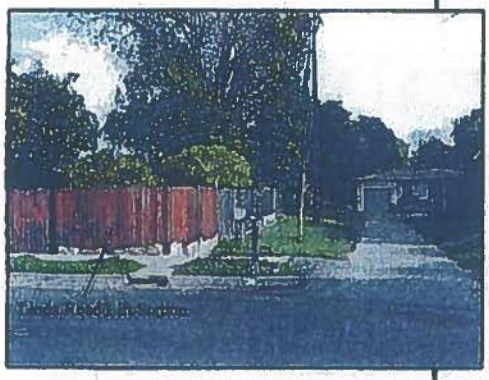
EL CAMINO DE LA LUZ LIFT STATION

- Location: 1901 El Camino de la Luz
- Date of construction: 1975
- Number of lots served: 24
- Type of station: Centrifugal Pumps
- Pump make: Fairbanks and Morse
- Pump size: 4"; Number of pumps: 2
- Flow rate: 150 GPM
- Motor: Marathon; 3 HP
- Wet well: H 15'9" x DIA 5'; 2348 GAL
- Average inflo: 98 GPM; Date: 7/31/03; Time: 8:00 a.m.
- Detention time: 2 hrs 25 min
- Station control: S.C.A.D.A., transducers, floats
- Emergency generator: Caterpillar 60 kw
- Fuel consumption: 105 gal; Run time: 19.5 hrs
- Emergency pump bypass: yes
- Waterway potentially affected by failure: Lighthouse Creek
- Force main: 4" D.I.P; Length: 98'; Year: 1975

LA COLINA LIFT STATION

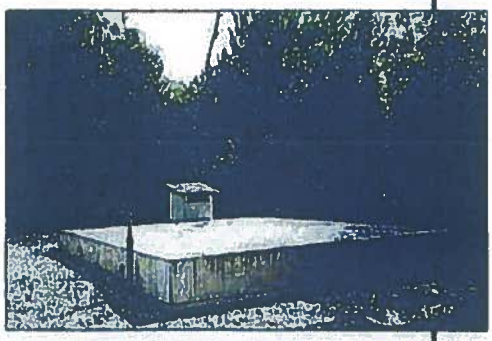
- Location: 4001 La Colina Road
- Date of construction: 1957
- Number of lots served: 140
- Type of station: Centrifugal Pumps
- Pump make: Smith and Loveless
- Pump size: 4"; Number of pumps: 2
- Flow rate: 400 GPM
- Motor: Smith and Loveless; 25 HP
- Wet Well: L 17'9" x W 7' x H 11'; 10,315 GAL
- Average inflo: 95 GPM; 7/31/03; 11:00 a.m.
- Detention time: 2 hrs
- Station control: S.C.A.D.A., transducers, floats
- Emergency Generator: Caterpillar; 60 kW; 100 GAL
- Fuel Consumption: 105 GAL tank; runs 19.5 hrs
- Emergency pump bypass: yes
- Waterway potentially affected by failure: Cieneguitas Creek
- Force main: 8" D.I.P.; Length: 3,175'; Year: 1957

LINDA ROAD LIFT STATION



- Location: 312 Linda Road
- Date of construction: 2002
- Number of lots served: 141
- Type of station: Submersible
- Pump make: Vaughan
- Pump size: 4"; Number of pumps: 2
- Flow rate: 150 GPM
- Motor: Reliance; 5 HP
- Wet well: H 15' x DIA 6'; 3,382 GAL
- Average inflo: 2.8 GPM; Date: 7/31/03; 8:27 a.m.
- Detention time: 3 hrs
- Station control: S.C.A.D.A., transducers, floats
- Emergency generator: Caterpillar 60 kw
- Fuel consumption: 105 gal; Run time: 19.5 hrs
- Emergency pump bypass: yes
- Waterway potentially affected by failure: Arroyo Burro Creek
- Force main: 4" H.D.P.E.; Length: 555'; Year: 2002

MIRADERO LIFT STATION



- Location: 190 Miradero drive
- Date of construction: 1986
- Never placed in service due to gravity flow by-pass.

SAN MARCOS LIFT STATION #1

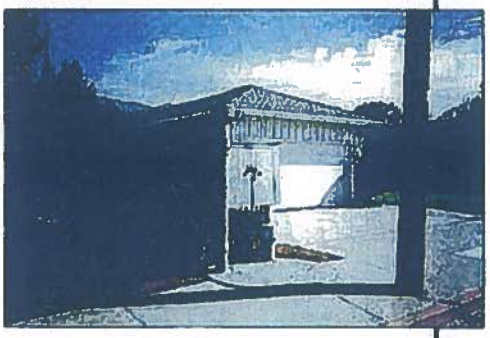
- Location: 308 Rosario Drive
- Date of construction: 1964
- Number of lots served: 57
- Type of station: Pneumatic Ejector
- Pump make: Yeoman
- Pump size: 4"; Number of pumps: 1
- Compressor make/model: By-Bon/HBp-113
- Flow rate: 75 GPM
- Motor: Baldor; 3 HP
- Pot Size: H 2'4" x DIA 2'11"; 116 GAL
- Average Inflo: 6.96 GPM; 5/17/90; 9:00 a.m.
- Detention time: 4 hrs
- Station control: Electrical probes
- Emergency generator: NA
- Fuel consumption: NA
- Emergency pump bypass: yes
- Waterway potentially affected by failure: Badger Canyon Creek
- Force main: 6" D.I.P; Length: 656'; Year: 1958

SAN MARCOS LIFT STATION #2

- Location: 308 Rosario Drive
- Date of construction: 1964
- Number of lots served: 57
- Type of station: Pneumatic Ejector
- Pump make: Yeoman
- Pump size: 4"; Number of pumps: 1
- Compressor make/model: Quincey/240
- Flow rate: 90 GPM
- Motor: Lima; 5 HP
- Pot Size: H 2'4" x DIA 2'6"; 85 GAL
- Average inflo: 2.5 GPM; 7/30/03; 8:00 a.m.
- Detention time: 4 hrs
- Station control: Electrical probes
- Emergency generator: NA
- Fuel consumption: NA
- Emergency pump bypass: yes
- Waterway potentially affected by failure: Badger Canyon Creek
- Force main: 6" D.I.P.; Length: 656' Year: 1958

SKOFIELD LIFT STATION

- Location: 1891 Las Canoas Road
- Date of construction: 1967
- Number of lots served: 7
- Type of station: Centrifugal Pumps
- Pump make: Fairbanks and Morse
- Pump size: 4"; Number of pumps: 2
- Flow rate: 250 GPM
- Motor: U.S. Motor ; 30 HP
- Wet well: H 9;5" x DIA 5'; 1379 GAL
- Average inflo: 12 GPM; Date: 7/30/03; Time: 9:00 a.m.
- Detention time: 1.9 hrs
- Station control: S.C.A.D.A., transducers, floats
- Emergency generator: NA
- Fuel consumption: NA
- Emergency pump bypass: yes
- Waterway potentially affected by failure: Mission Creek

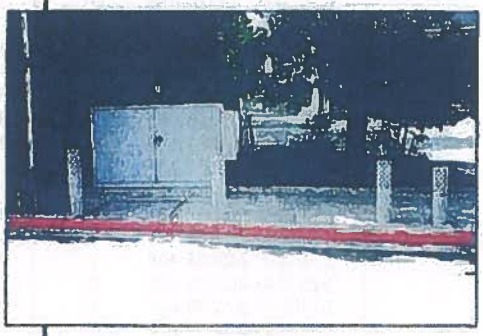


TALLANT LIFT STATION

- Location: 524 Tallant Road
- Date of construction: 1999 (originally constructed in 1956)
- Number of lots served: 6
- Type of station: Submersible
- Pump make: Flyght
- Pump size: 2"; Number of pumps: 2
- Flow rate: 100 GPM
- Motor: Flyght; 1.9 HP
- Wet well: H 8' x DIA 4'; 751 GAL
- Average inflo: 2.5 GPM; 17/31/03; 9:30 a.m.
- Detention time: 5 hrs
- Station control: S.C.A.D.A., transducers, floats
- Emergency generator: NA
- Fuel consumption: NA
- Emergency pump bypass: yes
- Waterway potentially affected by failure: Mission Creek
- Force main: 2" H.D.P.E.; Length: 190'; Year: 1999

VIA LUCERO LIFT STATION

- Location: 3959 Via Lucero
- Date of construction: 1962
- Number of lots served: 239
- Type of station: Centrifugal Pumps
- Pump make: Smith and Loveless
- Pump size: 4"; Number of pumps: 2
- Flow rate: 400 GPM
- Motor: General Electric; 15 HP
- Wet Well: H 13'6" x DIA 8'; 5073 GAL
- Average inflo: 124 GPM; 7/31/03; 11:00 a.m.
- Detention time: 1 hr
- Station control: S.C.A.D.A., bubbler
- Emergency pump bypass: yes
- Waterway potentially affected by failure: San Roque Creek
- Force main: 6" C.I.P.; Length: 182'; Year: 1962



VISTA ELEVADA LIFT STATION

- Location: 2826 Vista Elevada
- Date of construction: 1986
- Number of lots served: 11
- Type of station: Grinder Pumps
- Pump make: Hydromatic
- Pump size: 2"; Number of pumps: 2
- Flow rate: 43 GPM
- Motor: Aurora; 3 HP
- Wet Well: H 12' x DIA 4'; 1127 GAL
- Average inflow: 2.5 GPM; Date: 7/30/03; Time: 9:30 a.m.
- Detention time: 7.5 hrs
- Station control: Floats
- Emergency generator: NA
- Fuel consumption: NA
- Waterway potentially affected by failure: Mission Creek
- Force main: 2" P.V.C. Length: 296'; Year: 1986

Camino De La Luz			
Pump 1		Pump 2	
3/15/2003 12:02:04 AM	1	3/15/2003 12:08:04 AM	1
3/15/2003 12:03:19 AM	0	3/15/2003 12:09:49 AM	0
3/15/2003 12:14:19 AM	1	3/15/2003 12:20:50 AM	1
3/15/2003 12:15:34 AM	0	3/15/2003 12:22:05 AM	0
3/15/2003 12:26:19 AM	1	3/15/2003 12:32:19 AM	1
3/15/2003 12:27:34 AM	0	3/15/2003 12:33:19 AM	0
3/15/2003 12:38:04 AM	1	3/15/2003 12:44:20 AM	1
3/15/2003 12:39:19 AM	0	3/15/2003 12:45:34 AM	0
3/15/2003 12:50:19 AM	1	3/15/2003 12:57:19 AM	1
3/15/2003 12:51:19 AM	0	3/15/2003 12:58:34 AM	0
3/15/2003 1:05:20 AM	1	3/15/2003 1:12:35 AM	1
3/15/2003 1:06:20 AM	0	3/15/2003 1:13:50 AM	0
3/15/2003 1:20:35 AM	1	3/15/2003 1:28:20 AM	1
3/15/2003 1:22:20 AM	0	3/15/2003 1:29:35 AM	0
3/15/2003 1:35:20 AM	1	3/15/2003 1:43:50 AM	1
3/15/2003 1:36:20 AM	0	3/15/2003 1:45:35 AM	0
3/15/2003 1:51:50 AM	1	3/15/2003 1:58:05 AM	1
3/15/2003 1:53:05 AM	0	3/15/2003 1:59:20 AM	0
3/15/2003 2:04:05 AM	1	3/15/2003 2:10:05 AM	1
3/15/2003 2:05:20 AM	0	3/15/2003 2:11:50 AM	0
3/15/2003 2:15:50 AM	1	3/15/2003 2:22:05 AM	1
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3/15/2003 2:42:50 AM	1	3/15/2003 2:49:36 AM	1
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3/15/2003 3:14:36 AM	1	3/15/2003 3:18:36 AM	1
3/15/2003 3:16:21 AM	0	3/15/2003 3:20:21 AM	0
3/15/2003 3:22:51 AM	1	3/15/2003 3:27:06 AM	1
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3/15/2003 3:31:21 AM	1	3/15/2003 3:34:51 AM	1
3/15/2003 3:33:06 AM	0	3/15/2003 3:37:21 AM	0
3/15/2003 3:39:36 AM	1	3/15/2003 3:43:21 AM	1
3/15/2003 3:40:51 AM	0	3/15/2003 3:45:51 AM	0
3/15/2003 3:48:22 AM	1	3/15/2003 3:51:51 AM	1
3/15/2003 3:49:36 AM	0	3/15/2003 3:53:51 AM	0
3/15/2003 3:56:06 AM	1	3/15/2003 3:59:51 AM	1
3/15/2003 3:58:06 AM	0	3/15/2003 4:02:21 AM	0
3/15/2003 4:04:37 AM	1	3/15/2003 4:08:21 AM	1
3/15/2003 4:06:36 AM	0	3/15/2003 4:11:21 AM	0
3/15/2003 4:13:06 AM	1	3/15/2003 4:17:06 AM	1
3/15/2003 4:15:21 AM	0	3/15/2003 4:20:51 AM	0
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3/15/2003 4:24:21 AM	0	3/15/2003 4:29:07 AM	0
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3/15/2003 4:58:52 AM	0	3/15/2003 5:03:07 AM	0
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3/15/2003 5:17:52 AM	0	3/15/2003 5:21:52 AM	0
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3/15/2003 5:50:22 AM	1	3/15/2003 5:54:23 AM	1

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3/15/2003 5:59:08 AM	1	3/15/2003 6:02:38 AM	1
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3/15/2003 6:16:23 AM	1	3/15/2003 6:19:53 AM	1
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3/15/2003 6:34:53 AM	0	3/15/2003 6:39:38 AM	0
3/15/2003 6:41:23 AM	1	3/15/2003 6:45:23 AM	1
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3/15/2003 2:19:10 PM	0	3/15/2003 2:54:22 PM	0
3/15/2003 2:24:33 PM	1	3/15/2003 3:03:23 PM	1
3/15/2003 2:30:10 PM	0	3/15/2003 3:05:59 PM	0
3/15/2003 2:36:10 PM	1	3/15/2003 3:13:59 PM	1
3/15/2003 2:40:22 PM	0	3/15/2003 3:15:59 PM	0
3/15/2003 2:46:10 PM	1	3/15/2003 3:24:00 PM	1
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3/15/2003 4:48:50 PM	1	3/15/2003 5:23:52 PM	1
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3/15/2003 4:58:38 PM	1	3/15/2003 5:33:51 PM	1
3/15/2003 5:02:26 PM	0	3/15/2003 5:35:27 PM	0
3/15/2003 5:08:51 PM	1	3/15/2003 5:43:28 PM	1
3/15/2003 5:11:27 PM	0	3/15/2003 5:45:28 PM	0
3/15/2003 5:17:51 PM	1	3/15/2003 5:53:52 PM	1
3/15/2003 5:20:51 PM	0	3/15/2003 5:55:04 PM	0
3/15/2003 5:27:39 PM	1	3/15/2003 6:03:52 PM	1
3/15/2003 5:31:15 PM	0	3/15/2003 6:05:16 PM	0
3/15/2003 5:38:03 PM	1	3/15/2003 6:14:05 PM	1
3/15/2003 5:41:40 PM	0	3/15/2003 6:15:29 PM	0
3/15/2003 5:47:52 PM	1	3/15/2003 6:23:41 PM	1
3/15/2003 5:50:52 PM	0	3/15/2003 6:25:29 PM	0
3/15/2003 5:58:04 PM	1	3/15/2003 6:34:05 PM	1
3/15/2003 6:00:28 PM	0	3/15/2003 6:35:05 PM	0
3/15/2003 6:07:41 PM	1	3/15/2003 6:43:30 PM	1
3/15/2003 6:10:53 PM	0	3/15/2003 6:45:18 PM	0
3/15/2003 6:17:53 PM	1	3/15/2003 6:53:42 PM	1
3/15/2003 6:21:05 PM	0	3/15/2003 6:55:30 PM	0
3/15/2003 6:27:53 PM	1	3/15/2003 7:03:54 PM	1
3/15/2003 6:31:05 PM	0	3/15/2003 7:05:07 PM	0
3/15/2003 6:38:17 PM	1	3/15/2003 7:14:19 PM	1
3/15/2003 6:40:42 PM	0	3/15/2003 7:15:42 PM	0
3/15/2003 6:47:42 PM	1	3/15/2003 7:23:55 PM	1
3/15/2003 6:51:18 PM	0	3/15/2003 7:25:43 PM	0
3/15/2003 6:57:54 PM	1	3/15/2003 7:33:31 PM	1
3/15/2003 7:01:18 PM	0	3/15/2003 7:35:19 PM	0
3/15/2003 7:08:07 PM	1	3/15/2003 7:44:43 PM	1
3/15/2003 7:11:19 PM	0	3/15/2003 7:45:56 PM	0
3/15/2003 7:18:19 PM	1	3/15/2003 7:54:20 PM	1
3/15/2003 7:21:31 PM	0	3/15/2003 7:55:32 PM	0
3/15/2003 7:28:07 PM	1	3/15/2003 8:04:20 PM	1
3/15/2003 7:31:43 PM	0	3/15/2003 8:05:32 PM	0
3/15/2003 7:37:55 PM	1	3/15/2003 8:14:45 PM	1
3/15/2003 7:42:19 PM	0	3/15/2003 8:15:57 PM	0
3/15/2003 7:48:20 PM	1	3/15/2003 8:24:33 PM	1
3/15/2003 7:51:56 PM	0	3/15/2003 8:25:57 PM	0
3/15/2003 7:58:44 PM	1	3/15/2003 8:34:09 PM	1
3/15/2003 8:01:20 PM	0	3/15/2003 8:35:21 PM	0
3/15/2003 8:09:08 PM	1	3/15/2003 8:43:45 PM	1
3/15/2003 8:12:20 PM	0	3/15/2003 8:44:57 PM	0
3/15/2003 8:18:56 PM	1	3/15/2003 8:53:58 PM	1
3/15/2003 8:21:33 PM	0	3/15/2003 8:55:09 PM	0
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3/15/2003 8:32:09 PM	0	3/15/2003 9:04:58 PM	0
3/15/2003 8:37:45 PM	1	3/15/2003 9:13:34 PM	1
3/15/2003 8:41:22 PM	0	3/15/2003 9:15:23 PM	0
3/15/2003 8:47:34 PM	1	3/15/2003 9:24:35 PM	1
3/15/2003 8:51:22 PM	0	3/15/2003 9:26:22 PM	0
3/15/2003 8:58:10 PM	1	3/15/2003 9:35:47 PM	1
3/15/2003 9:00:46 PM	0	3/15/2003 9:36:59 PM	0
3/15/2003 9:07:59 PM	1	3/15/2003 9:46:35 PM	1
3/15/2003 9:10:35 PM	0	3/15/2003 9:47:47 PM	0
3/15/2003 9:18:22 PM	1	3/15/2003 9:56:48 PM	1

3/15/2003 9:21:35 PM	0	3/15/2003 9:58:12 PM	0
3/15/2003 9:30:11 PM	1	3/15/2003 10:07:48 PM	1
3/15/2003 9:32:35 PM	0	3/15/2003 10:09:12 PM	0
3/15/2003 9:40:47 PM	1	3/15/2003 10:19:36 PM	1
3/15/2003 9:43:23 PM	0	3/15/2003 10:20:48 PM	0
3/15/2003 9:50:47 PM	1	3/15/2003 10:30:01 PM	1
3/15/2003 9:53:11 PM	0	3/15/2003 10:31:49 PM	0
3/15/2003 10:01:48 PM	1	3/15/2003 10:40:37 PM	1
3/15/2003 10:03:48 PM	0	3/15/2003 10:42:13 PM	0
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3/15/2003 10:37:13 PM	0	3/15/2003 11:15:50 PM	0
3/15/2003 10:45:37 PM	1	3/15/2003 11:24:50 PM	1
3/15/2003 10:48:01 PM	0	3/15/2003 11:26:02 PM	0
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3/15/2003 11:19:14 PM	1	3/15/2003 11:58:39 PM	1
3/15/2003 11:21:26 PM	0	3/15/2003 11:59:51 PM	0
3/15/2003 11:30:03 PM	1		
3/15/2003 11:32:27 PM	0		
3/15/2003 11:40:39 PM	1		
3/15/2003 11:43:03 PM	0		
3/15/2003 11:51:39 PM	1		
3/15/2003 11:54:03 PM	0		

Via Lucero Lift Station		
Pump 1		**Pump 2**
3/15/2003 12:05:58 AM	1	
3/15/2003 12:07:10 AM	0	
3/15/2003 12:23:04 AM	1	
3/15/2003 12:23:32 AM	0	
3/15/2003 12:36:44 AM	1	
3/15/2003 12:37:20 AM	0	
3/15/2003 12:49:56 AM	1	
3/15/2003 12:51:08 AM	0	
3/15/2003 1:07:11 AM	1	
3/15/2003 1:08:23 AM	0	
3/15/2003 1:25:48 AM	1	
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3/15/2003 1:41:15 AM	1	
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3/15/2003 1:48:45 AM	1	
3/15/2003 1:49:49 AM	0	
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3/15/2003 2:52:14 AM	0	
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3/15/2003 3:11:54 AM	0	
3/15/2003 3:17:54 AM	1	
3/15/2003 3:18:30 AM	0	
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3/15/2003 3:25:06 AM	0	
3/15/2003 3:30:57 AM	1	
3/15/2003 3:32:09 AM	0	
3/15/2003 3:37:42 AM	1	
3/15/2003 3:38:18 AM	0	
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3/15/2003 4:09:13 AM	1	
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3/15/2003 4:15:40 AM	1	
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3/15/2003 4:29:28 AM	0	
3/15/2003 4:36:31 AM	1	
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3/15/2003 10:59:56 PM	1	
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3/15/2003 11:09:18 PM	0	
3/15/2003 11:17:17 PM	1	
3/15/2003 11:17:57 PM	0	
3/15/2003 11:25:47 PM	1	
3/15/2003 11:26:57 PM	0	
3/15/2003 11:35:38 PM	1	
3/15/2003 11:36:47 PM	0	
3/15/2003 11:46:18 PM	1	
3/15/2003 11:46:57 PM	0	
3/15/2003 11:56:08 PM	1	
3/15/2003 11:56:47 PM	0	

Breamar Lift Station			
Pump 1		**Pump 2**	
3/15/2003 12:01:28 AM	1	3/15/2003 12:07:10 AM	1
3/15/2003 12:01:55 AM	0	3/15/2003 12:07:46 AM	0
3/15/2003 12:13:01 AM	1	3/15/2003 12:18:52 AM	1
3/15/2003 12:13:37 AM	0	3/15/2003 12:19:29 AM	0
3/15/2003 12:24:07 AM	1	3/15/2003 12:29:05 AM	1
3/15/2003 12:24:43 AM	0	3/15/2003 12:29:41 AM	0
3/15/2003 12:33:43 AM	1	3/15/2003 12:39:35 AM	1
3/15/2003 12:34:56 AM	0	3/15/2003 12:40:11 AM	0

3/15/2003 11:56:03 AM	1	3/15/2003 11:59:21 AM	1
3/15/2003 11:57:24 AM	0	3/15/2003 12:00:33 PM	0
3/15/2003 12:02:21 PM	1	3/15/2003 12:05:21 PM	1
3/15/2003 12:03:33 PM	0	3/15/2003 12:06:33 PM	0
3/15/2003 12:08:21 PM	1	3/15/2003 12:11:03 PM	1
3/15/2003 12:09:24 PM	0	3/15/2003 12:12:15 PM	0
3/15/2003 12:14:39 PM	1	3/15/2003 12:17:39 PM	1
3/15/2003 12:15:24 PM	0	3/15/2003 12:18:15 PM	0
3/15/2003 12:20:40 PM	1	3/15/2003 12:23:40 PM	1
3/15/2003 12:21:51 PM	0	3/15/2003 12:24:52 PM	0
3/15/2003 12:26:39 PM	1	3/15/2003 12:29:40 PM	1
3/15/2003 12:27:51 PM	0	3/15/2003 12:30:52 PM	0
3/15/2003 12:33:16 PM	1	3/15/2003 12:35:49 PM	1
3/15/2003 12:33:52 PM	0	3/15/2003 12:37:01 PM	0
3/15/2003 12:38:58 PM	1	3/15/2003 12:41:58 PM	1
3/15/2003 12:40:10 PM	0	3/15/2003 12:43:19 PM	0
3/15/2003 12:45:52 PM	1	3/15/2003 12:49:01 PM	1
3/15/2003 12:46:28 PM	0	3/15/2003 12:49:46 PM	0
3/15/2003 12:52:19 PM	1	3/15/2003 1:02:04 PM	1
3/15/2003 12:53:04 PM	0	3/15/2003 1:03:16 PM	0
3/15/2003 12:59:04 PM	1	3/15/2003 1:08:13 PM	1
3/15/2003 12:59:40 PM	0	3/15/2003 1:09:34 PM	0
3/15/2003 1:05:14 PM	1	3/15/2003 1:15:08 PM	1
3/15/2003 1:06:26 PM	0	3/15/2003 1:15:43 PM	0
3/15/2003 1:12:07 PM	1	3/15/2003 1:21:53 PM	1
3/15/2003 1:12:44 PM	0	3/15/2003 1:22:29 PM	0
3/15/2003 1:18:16 PM	1	3/15/2003 1:28:38 PM	1
3/15/2003 1:19:28 PM	0	3/15/2003 1:29:14 PM	0
3/15/2003 1:24:53 PM	1	3/15/2003 1:35:14 PM	1
3/15/2003 1:26:05 PM	0	3/15/2003 1:35:50 PM	0
3/15/2003 1:31:38 PM	1	3/15/2003 1:42:00 PM	1
3/15/2003 1:32:50 PM	0	3/15/2003 1:42:44 PM	0
3/15/2003 1:38:14 PM	1	3/15/2003 1:48:54 PM	1
3/15/2003 1:39:35 PM	0	3/15/2003 1:49:36 PM	0
3/15/2003 1:45:19 PM	1	3/15/2003 1:55:15 PM	1
3/15/2003 1:46:31 PM	0	3/15/2003 1:56:25 PM	0
3/15/2003 1:52:05 PM	1	3/15/2003 2:02:35 PM	1
3/15/2003 1:53:25 PM	0	3/15/2003 2:03:15 PM	0
3/15/2003 1:58:45 PM	1	3/15/2003 2:07:55 PM	1
3/15/2003 2:00:05 PM	0	3/15/2003 2:09:06 PM	0
3/15/2003 2:05:35 PM	1	3/15/2003 2:14:45 PM	1
3/15/2003 2:06:16 PM	0	3/15/2003 2:15:56 PM	0
3/15/2003 2:11:05 PM	1	3/15/2003 2:21:56 PM	1
3/15/2003 2:12:16 PM	0	3/15/2003 2:22:35 PM	0
3/15/2003 2:18:16 PM	1	3/15/2003 2:28:46 PM	1
3/15/2003 2:19:35 PM	0	3/15/2003 2:29:55 PM	0
3/15/2003 2:25:37 PM	1	3/15/2003 2:36:26 PM	1
3/15/2003 2:26:16 PM	0	3/15/2003 2:37:46 PM	0
3/15/2003 2:32:56 PM	1	3/15/2003 2:44:06 PM	1
3/15/2003 2:33:36 PM	0	3/15/2003 2:45:16 PM	0
3/15/2003 2:40:06 PM	1	3/15/2003 2:51:06 PM	1
3/15/2003 2:41:26 PM	0	3/15/2003 2:52:17 PM	0
3/15/2003 2:47:56 PM	1	3/15/2003 2:58:28 PM	1
3/15/2003 2:48:36 PM	0	3/15/2003 2:59:36 PM	0
3/15/2003 2:54:47 PM	1	3/15/2003 3:05:48 PM	1
3/15/2003 2:55:56 PM	0	3/15/2003 3:06:56 PM	0
3/15/2003 3:01:56 PM	1	3/15/2003 3:13:08 PM	1
3/15/2003 3:03:06 PM	0	3/15/2003 3:14:17 PM	0
3/15/2003 3:09:27 PM	1	3/15/2003 3:21:16 PM	1
3/15/2003 3:10:36 PM	0	3/15/2003 3:21:56 PM	0
3/15/2003 3:16:57 PM	1	3/15/2003 3:28:07 PM	1
3/15/2003 3:18:08 PM	0	3/15/2003 3:29:27 PM	0
3/15/2003 3:24:27 PM	1	3/15/2003 3:35:17 PM	1
3/15/2003 3:25:47 PM	0	3/15/2003 3:36:37 PM	0
3/15/2003 3:31:49 PM	1	3/15/2003 3:42:27 PM	1
3/15/2003 3:32:57 PM	0	3/15/2003 3:43:37 PM	0
3/15/2003 3:38:59 PM	1	3/15/2003 3:50:17 PM	1
3/15/2003 3:40:07 PM	0	3/15/2003 3:50:58 PM	0
3/15/2003 3:46:47 PM	1	3/15/2003 3:57:57 PM	1
3/15/2003 3:47:28 PM	0	3/15/2003 3:58:27 PM	0

3/15/2003 3:54:08 PM	1	3/15/2003 4:05:08 PM	1
3/15/2003 3:54:47 PM	0	3/15/2003 4:06:18 PM	0
3/15/2003 4:01:29 PM	1	3/15/2003 4:13:08 PM	1
3/15/2003 4:02:37 PM	0	3/15/2003 4:14:28 PM	0
3/15/2003 4:09:28 PM	1	3/15/2003 4:20:38 PM	1
3/15/2003 4:09:58 PM	0	3/15/2003 4:21:48 PM	0
3/15/2003 4:16:49 PM	1	3/15/2003 4:28:39 PM	1
3/15/2003 4:18:08 PM	0	3/15/2003 4:29:48 PM	0
3/15/2003 4:24:58 PM	1	3/15/2003 4:36:38 PM	1
3/15/2003 4:25:39 PM	0	3/15/2003 4:37:58 PM	0
3/15/2003 4:32:58 PM	1	3/15/2003 4:45:08 PM	1
3/15/2003 4:33:39 PM	0	3/15/2003 4:45:48 PM	0
3/15/2003 4:41:09 PM	1	3/15/2003 4:52:38 PM	1
3/15/2003 4:41:49 PM	0	3/15/2003 4:53:49 PM	0
3/15/2003 4:49:09 PM	1	3/15/2003 5:00:58 PM	1
3/15/2003 4:49:51 PM	0	3/15/2003 5:01:40 PM	0
3/15/2003 4:56:20 PM	1	3/15/2003 5:08:40 PM	1
3/15/2003 4:57:39 PM	0	3/15/2003 5:09:59 PM	0
3/15/2003 5:04:49 PM	1	3/15/2003 5:16:21 PM	1
3/15/2003 5:05:29 PM	0	3/15/2003 5:17:39 PM	0
3/15/2003 5:13:10 PM	1	3/15/2003 5:24:19 PM	1
3/15/2003 5:13:49 PM	0	3/15/2003 5:25:29 PM	0
3/15/2003 5:20:39 PM	1	3/15/2003 5:32:21 PM	1
3/15/2003 5:21:20 PM	0	3/15/2003 5:33:29 PM	0
3/15/2003 5:28:39 PM	1	3/15/2003 5:40:10 PM	1
3/15/2003 5:29:50 PM	0	3/15/2003 5:40:49 PM	0
3/15/2003 5:36:29 PM	1	3/15/2003 5:48:10 PM	1
3/15/2003 5:37:10 PM	0	3/15/2003 5:48:51 PM	0
3/15/2003 5:44:00 PM	1	3/15/2003 5:56:40 PM	1
3/15/2003 5:45:10 PM	0	3/15/2003 5:57:20 PM	0
3/15/2003 5:52:20 PM	1	3/15/2003 6:05:00 PM	1
3/15/2003 5:53:40 PM	0	3/15/2003 6:06:21 PM	0
3/15/2003 6:01:00 PM	1	3/15/2003 6:13:11 PM	1
3/15/2003 6:01:42 PM	0	3/15/2003 6:13:51 PM	0
3/15/2003 6:09:30 PM	1	3/15/2003 6:21:32 PM	1
3/15/2003 6:10:00 PM	0	3/15/2003 6:22:10 PM	0
3/15/2003 6:17:01 PM	1	3/15/2003 6:29:31 PM	1
3/15/2003 6:18:20 PM	0	3/15/2003 6:30:51 PM	0
3/15/2003 6:26:01 PM	1	3/15/2003 6:38:01 PM	1
3/15/2003 6:26:31 PM	0	3/15/2003 6:39:11 PM	0
3/15/2003 6:33:42 PM	1	3/15/2003 6:46:51 PM	1
3/15/2003 6:34:52 PM	0	3/15/2003 6:47:31 PM	0
3/15/2003 6:42:51 PM	1	3/15/2003 6:55:12 PM	1
3/15/2003 6:43:21 PM	0	3/15/2003 6:55:52 PM	0
3/15/2003 6:51:01 PM	1	3/15/2003 7:03:32 PM	1
3/15/2003 6:51:41 PM	0	3/15/2003 7:04:21 PM	0
3/15/2003 6:59:21 PM	1	3/15/2003 7:12:23 PM	1
3/15/2003 7:00:31 PM	0	3/15/2003 7:12:52 PM	0
3/15/2003 7:08:01 PM	1	3/15/2003 7:20:32 PM	1
3/15/2003 7:08:31 PM	0	3/15/2003 7:21:12 PM	0
3/15/2003 7:16:02 PM	1	3/15/2003 7:28:32 PM	1
3/15/2003 7:17:22 PM	0	3/15/2003 7:29:42 PM	0
3/15/2003 7:24:51 PM	1	3/15/2003 7:37:01 PM	1
3/15/2003 7:25:33 PM	0	3/15/2003 7:38:22 PM	0
3/15/2003 7:33:22 PM	1	3/15/2003 7:45:43 PM	1
3/15/2003 7:34:02 PM	0	3/15/2003 7:46:13 PM	0
3/15/2003 7:41:22 PM	1	3/15/2003 7:53:33 PM	1
3/15/2003 7:42:03 PM	0	3/15/2003 7:54:43 PM	0
3/15/2003 7:49:52 PM	1	3/15/2003 8:01:43 PM	1
3/15/2003 7:50:23 PM	0	3/15/2003 8:02:23 PM	0
3/15/2003 7:57:52 PM	1	3/15/2003 8:09:32 PM	1
3/15/2003 7:58:23 PM	0	3/15/2003 8:10:13 PM	0
3/15/2003 8:05:22 PM	1	3/15/2003 8:17:33 PM	1
3/15/2003 8:06:33 PM	0	3/15/2003 8:18:03 PM	0
3/15/2003 8:13:24 PM	1	3/15/2003 8:25:43 PM	1
3/15/2003 8:14:03 PM	0	3/15/2003 8:26:54 PM	0
3/15/2003 8:21:24 PM	1	3/15/2003 8:33:43 PM	1
3/15/2003 8:22:24 PM	0	3/15/2003 8:34:24 PM	0
3/15/2003 8:29:53 PM	1	3/15/2003 8:42:15 PM	1
3/15/2003 8:30:33 PM	0	3/15/2003 8:43:35 PM	0

Skofield Lift Station			
Pump 1		Pump 2	
3/15/2003 2:30:10 AM	1		
3/15/2003 2:31:41 AM	0		
3/15/2003 7:23:59 AM	1		
3/15/2003 7:25:20 AM	0		
3/15/2003 8:07:03 AM	1		
3/15/2003 8:08:51 AM	0		
3/15/2003 10:06:21 AM	1		
3/15/2003 10:07:42 AM	0		
3/15/2003 1:32:32 PM	1		
3/15/2003 1:33:26 PM	0		
3/15/2003 2:05:43 PM	1		
3/15/2003 2:06:53 PM	0		
3/15/2003 4:20:36 PM	1		
3/15/2003 4:22:05 PM	0		
3/15/2003 6:09:58 PM	1		
3/15/2003 6:11:18 PM	0		
3/15/2003 8:52:01 PM	1		
3/15/2003 8:53:42 PM	0		
3/15/2003 11:46:54 PM	1		
3/15/2003 11:48:06 PM	0		

Tallant Rd. Lift Station			
Pump 1		Pump 2	
3/15/2003 2:05:21 AM	1	3/15/2003 3:30:31 AM	1
3/15/2003 2:06:59 AM	0	3/15/2003 3:33:34 AM	0
3/15/2003 4:03:26 AM	1	3/15/2003 5:05:58 AM	1
3/15/2003 4:06:00 AM	0	3/15/2003 5:09:28 AM	0
3/15/2003 5:47:16 AM	1	3/15/2003 6:12:42 AM	1
3/15/2003 5:50:04 AM	0	3/15/2003 6:18:04 AM	0
3/15/2003 6:26:00 AM	1	3/15/2003 6:38:22 AM	1
3/15/2003 6:29:02 AM	0	3/15/2003 6:42:48 AM	0
3/15/2003 6:53:18 AM	1	3/15/2003 7:05:40 AM	1
3/15/2003 6:56:20 AM	0	3/15/2003 7:09:52 AM	0
3/15/2003 7:21:46 AM	1	3/15/2003 7:33:26 AM	1
3/15/2003 7:24:06 AM	0	3/15/2003 7:39:44 AM	0
3/15/2003 7:47:54 AM	1	3/15/2003 7:57:28 AM	1
3/15/2003 7:50:56 AM	0	3/15/2003 8:02:51 AM	0
3/15/2003 8:10:19 AM	1	3/15/2003 8:20:21 AM	1
3/15/2003 8:13:49 AM	0	3/15/2003 8:26:39 AM	0
3/15/2003 8:35:30 AM	1	3/15/2003 8:46:01 AM	1
3/15/2003 8:37:51 AM	0	3/15/2003 8:51:36 AM	0
3/15/2003 9:00:42 AM	1	3/15/2003 9:11:27 AM	1
3/15/2003 9:03:02 AM	0	3/15/2003 9:15:53 AM	0
3/15/2003 9:24:16 AM	1	3/15/2003 9:35:29 AM	1
3/15/2003 9:28:01 AM	0	3/15/2003 9:40:36 AM	0
3/15/2003 9:48:05 AM	1	3/15/2003 9:58:35 AM	1
3/15/2003 9:50:39 AM	0	3/15/2003 10:03:57 AM	0
3/15/2003 10:12:07 AM	1	3/15/2003 10:24:01 AM	1
3/15/2003 10:15:09 AM	0	3/15/2003 10:28:13 AM	0
3/15/2003 10:36:23 AM	1	3/15/2003 10:46:39 AM	1
3/15/2003 10:39:25 AM	0	3/15/2003 10:51:19 AM	0
3/15/2003 11:00:11 AM	1	3/15/2003 11:10:41 AM	1
3/15/2003 11:02:45 AM	0	3/15/2003 11:15:35 AM	0
3/15/2003 11:24:55 AM	1	3/15/2003 11:39:23 AM	1
3/15/2003 11:27:57 AM	0	3/15/2003 11:43:07 AM	0
3/15/2003 11:55:43 AM	1	3/15/2003 12:11:21 PM	1
3/15/2003 11:58:03 AM	0	3/15/2003 12:14:51 PM	0
3/15/2003 12:31:39 PM	1	3/15/2003 12:49:51 PM	1
3/15/2003 12:33:31 PM	0	3/15/2003 12:53:49 PM	0
3/15/2003 1:05:15 PM	1	3/15/2003 1:19:02 PM	1
3/15/2003 1:07:49 PM	0	3/15/2003 1:22:31 PM	0
3/15/2003 1:39:06 PM	1	3/15/2003 1:55:55 PM	1
3/15/2003 1:41:39 PM	0	3/15/2003 1:59:35 PM	0
3/15/2003 2:17:12 PM	1	3/15/2003 2:38:28 PM	1

3/15/2003 2:19:35 PM	0	3/15/2003 2:41:35 PM	0
3/15/2003 3:04:31 PM	1	3/15/2003 3:30:11 PM	1
3/15/2003 3:07:05 PM	0	3/15/2003 3:33:41 PM	0
3/15/2003 3:58:04 PM	1	3/15/2003 4:15:41 PM	1
3/15/2003 4:00:27 PM	0	3/15/2003 4:19:32 PM	0
3/15/2003 4:39:20 PM	1	3/15/2003 5:06:07 PM	1
3/15/2003 4:41:54 PM	0	3/15/2003 5:09:25 PM	0
3/15/2003 5:33:38 PM	1	3/15/2003 6:03:10 PM	1
3/15/2003 5:36:01 PM	0	3/15/2003 6:07:01 PM	0
3/15/2003 6:36:10 PM	1	3/15/2003 7:04:58 PM	1
3/15/2003 6:38:12 PM	0	3/15/2003 7:09:12 PM	0
3/15/2003 7:30:28 PM	1	3/15/2003 8:00:33 PM	1
3/15/2003 7:32:51 PM	0	3/15/2003 8:03:40 PM	0
3/15/2003 8:24:34 PM	1	3/15/2003 8:53:11 PM	1
3/15/2003 8:26:24 PM	0	3/15/2003 8:56:51 PM	0
3/15/2003 9:28:46 PM	1	3/15/2003 10:09:40 PM	1
3/15/2003 9:30:36 PM	0	3/15/2003 10:13:09 PM	0
3/15/2003 10:46:43 PM	1	3/15/2003 11:27:37 PM	1
3/15/2003 10:49:06 PM	0	3/15/2003 11:31:06 PM	0

Linda Rd. Lift Station			
Pump 1		**Pump 2**	
3/15/2003 12:26:34 AM	1	3/15/2003 1:26:49 AM	1
3/15/2003 12:31:04 AM	0	3/15/2003 1:31:04 AM	0
3/15/2003 2:27:05 AM	1	3/15/2003 3:28:50 AM	1
3/15/2003 2:31:50 AM	0	3/15/2003 3:33:05 AM	0
3/15/2003 4:09:06 AM	1	3/15/2003 4:46:21 AM	1
3/15/2003 4:13:51 AM	0	3/15/2003 4:51:06 AM	0
3/15/2003 5:25:21 AM	1	3/15/2003 5:57:37 AM	1
3/15/2003 5:30:07 AM	0	3/15/2003 6:02:52 AM	0
3/15/2003 6:23:37 AM	1	3/15/2003 6:50:38 AM	1
3/15/2003 6:28:52 AM	0	3/15/2003 6:55:53 AM	0
3/15/2003 7:16:08 AM	1	3/15/2003 7:42:23 AM	1
3/15/2003 7:21:23 AM	0	3/15/2003 7:47:23 AM	0
3/15/2003 8:04:23 AM	1	3/15/2003 8:24:23 AM	1
3/15/2003 8:11:38 AM	0	3/15/2003 8:29:39 AM	0
3/15/2003 8:42:54 AM	1	3/15/2003 9:00:24 AM	1
3/15/2003 8:49:24 AM	0	3/15/2003 9:06:54 AM	0
3/15/2003 9:20:24 AM	1	3/15/2003 9:38:54 AM	1
3/15/2003 9:26:54 AM	0	3/15/2003 9:45:24 AM	0
3/15/2003 9:55:39 AM	1	3/15/2003 10:13:40 AM	1
3/15/2003 10:04:09 AM	0	3/15/2003 10:21:02 AM	0
3/15/2003 10:29:02 AM	1	3/15/2003 10:45:32 AM	1
3/15/2003 10:37:32 AM	0	3/15/2003 10:54:32 AM	0
3/15/2003 11:03:17 AM	1	3/15/2003 11:20:02 AM	1
3/15/2003 11:12:17 AM	0	3/15/2003 11:28:47 AM	0
3/15/2003 11:36:33 AM	1	3/15/2003 11:54:33 AM	1
3/15/2003 11:43:47 AM	0	3/15/2003 12:01:47 PM	0
3/15/2003 12:13:48 PM	1	3/15/2003 12:31:18 PM	1
3/15/2003 12:20:18 PM	0	3/15/2003 12:37:18 PM	0
3/15/2003 12:49:33 PM	1	3/15/2003 1:06:48 PM	1
3/15/2003 12:56:18 PM	0	3/15/2003 1:13:18 PM	0
3/15/2003 1:26:33 PM	1	3/15/2003 1:47:04 PM	1
3/15/2003 1:32:03 PM	0	3/15/2003 1:53:47 PM	0
3/15/2003 2:06:00 PM	1	3/15/2003 2:26:37 PM	1
3/15/2003 2:12:12 PM	0	3/15/2003 2:32:00 PM	0
3/15/2003 2:46:13 PM	1	3/15/2003 3:11:01 PM	1
3/15/2003 2:52:13 PM	0	3/15/2003 3:16:02 PM	0
3/15/2003 3:38:38 PM	1	3/15/2003 4:02:39 PM	1
3/15/2003 3:44:15 PM	0	3/15/2003 4:07:51 PM	0
3/15/2003 4:24:17 PM	1	3/15/2003 4:46:04 PM	1
3/15/2003 4:30:40 PM	0	3/15/2003 4:51:05 PM	0
3/15/2003 5:09:17 PM	1	3/15/2003 5:34:30 PM	1
3/15/2003 5:14:54 PM	0	3/15/2003 5:40:06 PM	0
3/15/2003 6:00:07 PM	1	3/15/2003 6:26:20 PM	1
3/15/2003 6:04:55 PM	0	3/15/2003 6:31:44 PM	0
3/15/2003 6:53:21 PM	1	3/15/2003 7:17:22 PM	1

3/15/2003 6:58:57 PM	0	3/15/2003 7:23:22 PM	0
3/15/2003 7:38:34 PM	1	3/15/2003 7:57:35 PM	1
3/15/2003 7:44:22 PM	0	3/15/2003 8:03:47 PM	0
3/15/2003 8:22:47 PM	1	3/15/2003 8:48:24 PM	1
3/15/2003 8:27:48 PM	0	3/15/2003 8:53:36 PM	0
3/15/2003 9:11:13 PM	1	3/15/2003 9:35:50 PM	1
3/15/2003 9:17:25 PM	0	3/15/2003 9:41:38 PM	0
3/15/2003 10:03:14 PM	1	3/15/2003 10:33:52 PM	1
3/15/2003 10:08:39 PM	0	3/15/2003 10:38:51 PM	0
3/15/2003 11:03:40 PM	1	3/15/2003 11:35:53 PM	1
3/15/2003 11:08:40 PM	0	3/15/2003 11:40:42 PM	0

Camino De La Luz			
Pump 1		Pump 2	
8/29/2007 12:00:00 AM	0	8/29/2007 12:00:00 AM	0
8/29/2007 12:03:31 AM	1	8/29/2007 12:16:46 AM	1
8/29/2007 12:05:02 AM	0	8/29/2007 12:18:17 AM	0
8/29/2007 12:32:40 AM	1	8/29/2007 12:51:12 AM	1
8/29/2007 12:33:25 AM	0	8/29/2007 12:51:57 AM	0
8/29/2007 1:13:09 AM	1	8/29/2007 1:36:14 AM	1
8/29/2007 1:15:02 AM	0	8/29/2007 1:36:59 AM	0
8/29/2007 1:54:46 AM	1	8/29/2007 2:23:09 AM	1
8/29/2007 1:55:31 AM	0	8/29/2007 2:25:25 AM	0
8/29/2007 2:51:54 AM	1	8/29/2007 3:16:07 AM	1
8/29/2007 2:52:40 AM	0	8/29/2007 3:16:53 AM	0
8/29/2007 3:47:54 AM	1	8/29/2007 4:17:48 AM	1
8/29/2007 3:49:25 AM	0	8/29/2007 4:19:19 AM	0
8/29/2007 4:43:09 AM	1	8/29/2007 5:10:24 AM	1
8/29/2007 4:43:54 AM	0	8/29/2007 5:11:54 AM	0
8/29/2007 5:38:46 AM	1	8/29/2007 6:02:37 AM	1
8/29/2007 5:39:32 AM	0	8/29/2007 6:03:22 AM	0
8/29/2007 6:17:45 AM	1	8/29/2007 6:29:06 AM	1
8/29/2007 6:18:30 AM	0	8/29/2007 6:30:37 AM	0
8/29/2007 6:38:33 AM	1	8/29/2007 6:46:07 AM	1
8/29/2007 6:38:56 AM	0	8/29/2007 6:46:53 AM	0
8/29/2007 6:55:13 AM	1	8/29/2007 7:03:32 AM	1
8/29/2007 6:55:58 AM	0	8/29/2007 7:04:17 AM	0
8/29/2007 7:09:35 AM	1	8/29/2007 7:15:39 AM	1
8/29/2007 7:11:06 AM	0	8/29/2007 7:16:24 AM	0
8/29/2007 7:21:19 AM	1	8/29/2007 7:27:22 AM	1
8/29/2007 7:22:04 AM	0	8/29/2007 7:28:30 AM	0
8/29/2007 7:33:48 AM	1	8/29/2007 7:41:45 AM	1
8/29/2007 7:34:34 AM	0	8/29/2007 7:42:30 AM	0
8/29/2007 7:46:17 AM	1	8/29/2007 7:51:35 AM	1
8/29/2007 7:47:48 AM	0	8/29/2007 7:52:21 AM	0
8/29/2007 7:56:30 AM	1	8/29/2007 8:00:18 AM	1
8/29/2007 7:58:01 AM	0	8/29/2007 8:01:48 AM	0
8/29/2007 8:04:05 AM	1	8/29/2007 8:09:22 AM	1
8/29/2007 8:05:35 AM	0	8/29/2007 8:10:08 AM	0
8/29/2007 8:15:03 AM	1	8/29/2007 8:20:21 AM	1
8/29/2007 8:15:48 AM	0	8/29/2007 8:21:06 AM	0
8/29/2007 8:24:08 AM	1	8/29/2007 8:27:55 AM	1
8/29/2007 8:24:53 AM	0	8/29/2007 8:29:03 AM	0
8/29/2007 8:33:35 AM	1	8/29/2007 8:37:22 AM	1
8/29/2007 8:34:21 AM	0	8/29/2007 8:39:16 AM	0
8/29/2007 8:43:03 AM	1	8/29/2007 8:49:06 AM	1
8/29/2007 8:43:48 AM	0	8/29/2007 8:49:51 AM	0
8/29/2007 8:54:24 AM	1	8/29/2007 9:01:12 AM	1
8/29/2007 8:55:09 AM	0	8/29/2007 9:02:43 AM	0
8/29/2007 9:08:24 AM	1	8/29/2007 9:15:35 AM	1
8/29/2007 9:09:55 AM	0	8/29/2007 9:16:21 AM	0
8/29/2007 9:22:47 AM	1	8/29/2007 9:28:50 AM	1
8/29/2007 9:25:03 AM	0	8/29/2007 9:30:21 AM	0
8/29/2007 9:34:53 AM	1	8/29/2007 9:39:26 AM	1
8/29/2007 9:36:24 AM	0	8/29/2007 9:41:42 AM	0
8/29/2007 9:45:52 AM	1	8/29/2007 9:52:40 AM	1
8/29/2007 9:46:37 AM	0	8/29/2007 9:53:26 AM	0
8/29/2007 9:59:29 AM	1	8/29/2007 10:06:18 AM	1
8/29/2007 10:00:14 AM	0	8/29/2007 10:07:48 AM	0
8/29/2007 10:16:08 AM	1	8/29/2007 10:24:27 AM	1
8/29/2007 10:16:53 AM	0	8/29/2007 10:25:58 AM	0
8/29/2007 10:33:32 AM	1	8/29/2007 10:42:14 AM	1
8/29/2007 10:35:03 AM	0	8/29/2007 10:43:00 AM	0
8/29/2007 10:49:03 AM	1	8/29/2007 10:56:37 AM	1
8/29/2007 10:50:34 AM	0	8/29/2007 10:57:22 AM	0
8/29/2007 11:04:11 AM	1	8/29/2007 11:12:30 AM	1
8/29/2007 11:05:42 AM	0	8/29/2007 11:14:02 AM	0
8/29/2007 11:21:58 AM	1	8/29/2007 11:31:48 AM	1
8/29/2007 11:22:44 AM	0	8/29/2007 11:32:34 AM	0
8/29/2007 11:37:52 AM	1	8/29/2007 11:44:40 AM	1
8/29/2007 11:38:37 AM	0	8/29/2007 11:45:26 AM	0

8/29/2007 11:52:14 AM	1	8/29/2007 12:00:34 PM	1
8/29/2007 11:53:00 AM	0	8/29/2007 12:01:42 PM	0
8/29/2007 12:10:01 PM	1	8/29/2007 12:19:06 PM	1
8/29/2007 12:10:47 PM	0	8/29/2007 12:19:52 PM	0
8/29/2007 12:30:27 PM	1	8/29/2007 12:41:03 PM	1
8/29/2007 12:31:13 PM	0	8/29/2007 12:41:48 PM	0
8/29/2007 12:50:31 PM	1	8/29/2007 1:01:06 PM	1
8/29/2007 12:51:16 PM	0	8/29/2007 1:01:52 PM	0
8/29/2007 1:11:42 PM	1	8/29/2007 1:21:10 PM	1
8/29/2007 1:12:50 PM	0	8/29/2007 1:21:55 PM	0
8/29/2007 1:32:31 PM	1	8/29/2007 1:45:00 PM	1
8/29/2007 1:33:16 PM	0	8/29/2007 1:45:45 PM	0
8/29/2007 1:56:21 PM	1	8/29/2007 2:08:05 PM	1
8/29/2007 1:57:06 PM	0	8/29/2007 2:08:50 PM	0
8/29/2007 2:20:11 PM	1	8/29/2007 2:30:02 PM	1
8/29/2007 2:20:57 PM	0	8/29/2007 2:31:55 PM	0
8/29/2007 2:41:00 PM	1	8/29/2007 2:55:23 PM	1
8/29/2007 2:41:46 PM	0	8/29/2007 2:56:08 PM	0
8/29/2007 3:05:13 PM	1	8/29/2007 3:15:26 PM	1
8/29/2007 3:06:44 PM	0	8/29/2007 3:16:11 PM	0
8/29/2007 3:26:02 PM	1	8/29/2007 3:37:45 PM	1
8/29/2007 3:26:47 PM	0	8/29/2007 3:39:16 PM	0
8/29/2007 3:46:50 PM	1	8/29/2007 3:56:18 PM	1
8/29/2007 3:47:36 PM	0	8/29/2007 3:57:04 PM	0
8/29/2007 4:04:37 PM	1	8/29/2007 4:16:44 PM	1
8/29/2007 4:05:23 PM	0	8/29/2007 4:17:52 PM	0
8/29/2007 4:26:12 PM	1	8/29/2007 4:35:16 PM	1
8/29/2007 4:26:57 PM	0	8/29/2007 4:36:02 PM	0
8/29/2007 4:45:07 PM	1	8/29/2007 4:55:42 PM	1
8/29/2007 4:46:37 PM	0	8/29/2007 4:56:28 PM	0
8/29/2007 5:03:39 PM	1	8/29/2007 5:11:13 PM	1
8/29/2007 5:05:10 PM	0	8/29/2007 5:11:58 PM	0
8/29/2007 5:18:24 PM	1	8/29/2007 5:26:21 PM	1
8/29/2007 5:19:55 PM	0	8/29/2007 5:27:07 PM	0
8/29/2007 5:34:18 PM	1	8/29/2007 5:41:52 PM	1
8/29/2007 5:35:03 PM	0	8/29/2007 5:42:37 PM	0
8/29/2007 5:46:47 PM	1	8/29/2007 5:52:05 PM	1
8/29/2007 5:47:33 PM	0	8/29/2007 5:52:50 PM	0
8/29/2007 5:58:08 PM	1	8/29/2007 6:05:43 PM	1
8/29/2007 5:59:16 PM	0	8/29/2007 6:06:50 PM	0
8/29/2007 6:13:40 PM	1	8/29/2007 6:20:28 PM	1
8/29/2007 6:15:55 PM	0	8/29/2007 6:21:13 PM	0
8/29/2007 6:27:16 PM	1	8/29/2007 6:33:20 PM	1
8/29/2007 6:28:02 PM	0	8/29/2007 6:34:05 PM	0
8/29/2007 6:41:39 PM	1	8/29/2007 6:49:13 PM	1
8/29/2007 6:42:25 PM	0	8/29/2007 6:49:59 PM	0
8/29/2007 6:57:56 PM	1	8/29/2007 7:06:38 PM	1
8/29/2007 6:58:41 PM	0	8/29/2007 7:07:23 PM	0
8/29/2007 7:15:42 PM	1	8/29/2007 7:24:02 PM	1
8/29/2007 7:16:28 PM	0	8/29/2007 7:24:47 PM	0
8/29/2007 7:31:13 PM	1	8/29/2007 7:39:33 PM	1
8/29/2007 7:31:59 PM	0	8/29/2007 7:40:18 PM	0
8/29/2007 7:45:59 PM	1	8/29/2007 7:52:02 PM	1
8/29/2007 7:46:44 PM	0	8/29/2007 7:52:47 PM	0
8/29/2007 7:58:51 PM	1	8/29/2007 8:05:39 PM	1
8/29/2007 7:59:36 PM	0	8/29/2007 8:06:25 PM	0
8/29/2007 8:13:13 PM	1	8/29/2007 8:20:25 PM	1
8/29/2007 8:13:59 PM	0	8/29/2007 8:21:10 PM	0
8/29/2007 8:27:13 PM	1	8/29/2007 8:33:39 PM	1
8/29/2007 8:27:59 PM	0	8/29/2007 8:34:25 PM	0
8/29/2007 8:41:36 PM	1	8/29/2007 8:50:18 PM	1
8/29/2007 8:42:21 PM	0	8/29/2007 8:51:04 PM	0
8/29/2007 8:57:52 PM	1	8/29/2007 9:06:12 PM	1
8/29/2007 8:58:38 PM	0	8/29/2007 9:07:42 PM	0
8/29/2007 9:12:38 PM	1	8/29/2007 9:19:49 PM	1
8/29/2007 9:13:23 PM	0	8/29/2007 9:20:34 PM	0
8/29/2007 9:27:23 PM	1	8/29/2007 9:36:28 PM	1
8/29/2007 9:28:31 PM	0	8/29/2007 9:37:13 PM	0
8/29/2007 9:44:25 PM	1	8/29/2007 9:51:59 PM	1
8/29/2007 9:45:10 PM	0	8/29/2007 9:52:44 PM	0

8/29/2007 9:59:55 PM	1	8/29/2007 10:09:01 PM	1
8/29/2007 10:01:49 PM	0	8/29/2007 10:09:46 PM	0
8/29/2007 10:16:35 PM	1	8/29/2007 10:23:23 PM	1
8/29/2007 10:17:20 PM	0	8/29/2007 10:24:54 PM	0
8/29/2007 10:31:20 PM	1	8/29/2007 10:38:09 PM	1
8/29/2007 10:32:06 PM	0	8/29/2007 10:38:54 PM	0
8/29/2007 10:51:23 PM	1	8/29/2007 10:59:43 PM	1
8/29/2007 10:52:09 PM	0	8/29/2007 11:00:28 PM	0
8/29/2007 11:06:54 PM	1	8/29/2007 11:13:20 PM	1
8/29/2007 11:07:39 PM	0	8/29/2007 11:14:06 PM	0
8/29/2007 11:20:31 PM	1	8/29/2007 11:29:36 PM	1
8/29/2007 11:21:40 PM	0	8/29/2007 11:30:22 PM	0
8/29/2007 11:38:41 PM	1	8/29/2007 11:51:10 PM	1
8/29/2007 11:39:26 PM	0	8/29/2007 11:51:56 PM	0

Via Lucero Lift Station			
Pump 1		**Pump 2**	
8/29/2007 12:00:00 AM	0	8/29/2007 12:00:00 AM	0
8/29/2007 12:07:54 AM	1	8/29/2007 12:20:19 AM	1
8/29/2007 12:08:36 AM	0	8/29/2007 12:21:01 AM	0
8/29/2007 12:31:43 AM	1	8/29/2007 12:43:47 AM	1
8/29/2007 12:32:26 AM	0	8/29/2007 12:45:31 AM	0
8/29/2007 12:57:37 AM	1	8/29/2007 1:11:25 AM	1
8/29/2007 12:58:18 AM	0	8/29/2007 1:12:05 AM	0
8/29/2007 1:26:56 AM	1	8/29/2007 1:41:25 AM	1
8/29/2007 1:27:37 AM	0	8/29/2007 1:42:48 AM	0
8/29/2007 1:56:36 AM	1	8/29/2007 2:10:45 AM	1
8/29/2007 1:57:38 AM	0	8/29/2007 2:12:08 AM	0
8/29/2007 2:26:37 AM	1	8/29/2007 2:41:28 AM	1
8/29/2007 2:27:39 AM	0	8/29/2007 2:42:50 AM	0
8/29/2007 2:55:36 AM	1	8/29/2007 3:09:25 AM	1
8/29/2007 2:56:17 AM	0	8/29/2007 3:11:08 AM	0
8/29/2007 3:56:00 AM	1	8/29/2007 3:41:30 AM	1
8/29/2007 3:56:41 AM	0	8/29/2007 3:42:11 AM	0
8/29/2007 4:31:53 AM	1	8/29/2007 4:14:17 AM	1
8/29/2007 4:32:54 AM	0	8/29/2007 4:15:19 AM	0
8/29/2007 5:07:04 AM	1	8/29/2007 4:50:30 AM	1
8/29/2007 5:08:27 AM	0	8/29/2007 4:51:33 AM	0
8/29/2007 5:34:20 AM	1	8/29/2007 5:20:32 AM	1
8/29/2007 5:35:22 AM	0	8/29/2007 5:21:34 AM	0
8/29/2007 5:58:50 AM	1	8/29/2007 5:47:27 AM	1
8/29/2007 5:59:51 AM	0	8/29/2007 5:49:52 AM	0
8/29/2007 6:15:44 AM	1	8/29/2007 6:08:09 AM	1
8/29/2007 6:16:25 AM	0	8/29/2007 6:08:50 AM	0
8/29/2007 6:30:13 AM	1	8/29/2007 6:23:19 AM	1
8/29/2007 6:31:37 AM	0	8/29/2007 6:25:04 AM	0
8/29/2007 6:41:37 AM	1	8/29/2007 6:36:26 AM	1
8/29/2007 6:43:20 AM	0	8/29/2007 6:37:08 AM	0
8/29/2007 6:53:21 AM	1	8/29/2007 6:47:49 AM	1
8/29/2007 6:54:03 AM	0	8/29/2007 6:48:31 AM	0
8/29/2007 7:04:44 AM	1	8/29/2007 6:59:13 AM	1
8/29/2007 7:05:25 AM	0	8/29/2007 6:59:54 AM	0
8/29/2007 7:14:44 AM	1	8/29/2007 7:09:54 AM	1
8/29/2007 7:15:26 AM	0	8/29/2007 7:10:36 AM	0
8/29/2007 7:23:01 AM	1	8/29/2007 7:18:32 AM	1
8/29/2007 7:23:45 AM	0	8/29/2007 7:20:57 AM	0
8/29/2007 7:31:59 AM	1	8/29/2007 7:27:10 AM	1
8/29/2007 7:33:23 AM	0	8/29/2007 7:28:54 AM	0
8/29/2007 7:40:17 AM	1	8/29/2007 7:36:28 AM	1
8/29/2007 7:42:00 AM	0	8/29/2007 7:37:10 AM	0
8/29/2007 7:49:35 AM	1	8/29/2007 7:45:06 AM	1
8/29/2007 7:50:37 AM	0	8/29/2007 7:46:30 AM	0
8/29/2007 7:59:57 AM	1	8/29/2007 7:54:26 AM	1
8/29/2007 8:01:20 AM	0	8/29/2007 7:56:09 AM	0
8/29/2007 8:10:39 AM	1	8/29/2007 8:05:07 AM	1
8/29/2007 8:11:20 AM	0	8/29/2007 8:06:51 AM	0
8/29/2007 8:20:39 AM	1	8/29/2007 8:15:07 AM	1

8/29/2007 8:21:20 AM	0	8/29/2007 8:16:10 AM	0
8/29/2007 8:31:42 AM	1	8/29/2007 8:26:10 AM	1
8/29/2007 8:33:25 AM	0	8/29/2007 8:26:52 AM	0
8/29/2007 8:43:25 AM	1	8/29/2007 8:37:54 AM	1
8/29/2007 8:44:06 AM	0	8/29/2007 8:38:35 AM	0
8/29/2007 8:55:30 AM	1	8/29/2007 8:50:19 AM	1
8/29/2007 8:57:13 AM	0	8/29/2007 8:51:01 AM	0
8/29/2007 9:07:14 AM	1	8/29/2007 9:01:43 AM	1
8/29/2007 9:08:37 AM	0	8/29/2007 9:03:27 AM	0
8/29/2007 9:19:59 AM	1	8/29/2007 9:13:06 AM	1
8/29/2007 9:20:41 AM	0	8/29/2007 9:13:47 AM	0
8/29/2007 9:33:48 AM	1	8/29/2007 9:26:53 AM	1
8/29/2007 9:34:29 AM	0	8/29/2007 9:27:35 AM	0
8/29/2007 9:45:53 AM	1	8/29/2007 9:39:39 AM	1
8/29/2007 9:46:54 AM	0	8/29/2007 9:42:05 AM	0
8/29/2007 9:58:59 AM	1	8/29/2007 9:53:07 AM	1
8/29/2007 9:59:40 AM	0	8/29/2007 9:53:51 AM	0
8/29/2007 10:10:22 AM	1	8/29/2007 10:05:11 AM	1
8/29/2007 10:12:06 AM	0	8/29/2007 10:05:55 AM	0
8/29/2007 10:22:27 AM	1	8/29/2007 10:16:35 AM	1
8/29/2007 10:23:29 AM	0	8/29/2007 10:17:16 AM	0
8/29/2007 10:34:52 AM	1	8/29/2007 10:40:23 AM	1
8/29/2007 10:36:16 AM	0	8/29/2007 10:41:47 AM	0
8/29/2007 10:46:15 AM	1	8/29/2007 10:52:28 AM	1
8/29/2007 10:47:18 AM	0	8/29/2007 10:53:10 AM	0
8/29/2007 10:58:20 AM	1	8/29/2007 11:04:33 AM	1
8/29/2007 11:00:04 AM	0	8/29/2007 11:06:58 AM	0
8/29/2007 11:10:46 AM	1	8/29/2007 11:17:39 AM	1
8/29/2007 11:11:26 AM	0	8/29/2007 11:18:21 AM	0
8/29/2007 11:25:15 AM	1	8/29/2007 11:32:51 AM	1
8/29/2007 11:25:56 AM	0	8/29/2007 11:33:32 AM	0
8/29/2007 11:39:03 AM	1	8/29/2007 11:45:59 AM	1
8/29/2007 11:40:26 AM	0	8/29/2007 11:46:40 AM	0
8/29/2007 11:54:13 AM	1	8/29/2007 12:01:50 PM	1
8/29/2007 11:54:56 AM	0	8/29/2007 12:02:31 PM	0
8/29/2007 12:10:27 PM	1	8/29/2007 12:18:03 PM	1
8/29/2007 12:11:08 PM	0	8/29/2007 12:18:44 PM	0
8/29/2007 12:24:56 PM	1	8/29/2007 12:32:32 PM	1
8/29/2007 12:26:20 PM	0	8/29/2007 12:33:13 PM	0
8/29/2007 12:39:47 PM	1	8/29/2007 12:47:44 PM	1
8/29/2007 12:41:33 PM	0	8/29/2007 12:48:25 PM	0
8/29/2007 12:54:37 PM	1	8/29/2007 1:01:31 PM	1
8/29/2007 12:55:19 PM	0	8/29/2007 1:02:13 PM	0
8/29/2007 1:07:43 PM	1	8/29/2007 1:14:38 PM	1
8/29/2007 1:09:07 PM	0	8/29/2007 1:15:19 PM	0
8/29/2007 1:21:32 PM	1	8/29/2007 1:28:26 PM	1
8/29/2007 1:22:14 PM	0	8/29/2007 1:29:08 PM	0
8/29/2007 1:36:02 PM	1	8/29/2007 1:43:57 PM	1
8/29/2007 1:36:43 PM	0	8/29/2007 1:44:39 PM	0
8/29/2007 1:50:32 PM	1	8/29/2007 1:57:25 PM	1
8/29/2007 1:51:33 PM	0	8/29/2007 1:58:27 PM	0
8/29/2007 2:04:19 PM	1	8/29/2007 2:11:33 PM	1
8/29/2007 2:05:21 PM	0	8/29/2007 2:12:15 PM	0
8/29/2007 2:19:50 PM	1	8/29/2007 2:27:26 PM	1
8/29/2007 2:20:33 PM	0	8/29/2007 2:28:07 PM	0
8/29/2007 2:33:38 PM	1	8/29/2007 2:41:14 PM	1
8/29/2007 2:34:21 PM	0	8/29/2007 2:42:17 PM	0
8/29/2007 2:48:11 PM	1	8/29/2007 2:57:06 PM	1
8/29/2007 2:49:31 PM	0	8/29/2007 2:58:52 PM	0
8/29/2007 3:07:07 PM	1	8/29/2007 3:14:43 PM	1
8/29/2007 3:08:10 PM	0	8/29/2007 3:15:45 PM	0
8/29/2007 3:21:57 PM	1	8/29/2007 3:29:32 PM	1
8/29/2007 3:22:39 PM	0	8/29/2007 3:30:14 PM	0
8/29/2007 3:36:28 PM	1	8/29/2007 3:44:23 PM	1
8/29/2007 3:37:08 PM	0	8/29/2007 3:45:04 PM	0
8/29/2007 3:50:15 PM	1	8/29/2007 3:58:11 PM	1
8/29/2007 3:51:58 PM	0	8/29/2007 3:58:53 PM	0
8/29/2007 4:05:05 PM	1	8/29/2007 4:12:40 PM	1
8/29/2007 4:06:28 PM	0	8/29/2007 4:14:05 PM	0
8/29/2007 4:19:34 PM	1	8/29/2007 4:25:06 PM	1

8/29/2007 4:20:57 PM	0	8/29/2007 4:26:28 PM	0
8/29/2007 4:30:17 PM	1	8/29/2007 4:34:45 PM	1
8/29/2007 4:30:58 PM	0	8/29/2007 4:36:29 PM	0
8/29/2007 4:49:15 PM	1	8/29/2007 4:44:46 PM	1
8/29/2007 4:50:58 PM	0	8/29/2007 4:45:27 PM	0
8/29/2007 4:59:57 PM	1	8/29/2007 4:54:47 PM	1
8/29/2007 5:01:44 PM	0	8/29/2007 4:55:28 PM	0
8/29/2007 5:12:22 PM	1	8/29/2007 5:06:09 PM	1
8/29/2007 5:14:06 PM	0	8/29/2007 5:07:11 PM	0
8/29/2007 5:27:33 PM	1	8/29/2007 5:19:37 PM	1
8/29/2007 5:28:15 PM	0	8/29/2007 5:21:00 PM	0
8/29/2007 5:39:18 PM	1	8/29/2007 5:33:46 PM	1
8/29/2007 5:40:41 PM	0	8/29/2007 5:34:27 PM	0
8/29/2007 5:49:39 PM	1	8/29/2007 5:44:48 PM	1
8/29/2007 5:51:01 PM	0	8/29/2007 5:45:29 PM	0
8/29/2007 6:00:20 PM	1	8/29/2007 5:54:48 PM	1
8/29/2007 6:01:02 PM	0	8/29/2007 5:55:31 PM	0
8/29/2007 6:12:25 PM	1	8/29/2007 6:06:12 PM	1
8/29/2007 6:13:06 PM	0	8/29/2007 6:07:14 PM	0
8/29/2007 6:24:29 PM	1	8/29/2007 6:18:37 PM	1
8/29/2007 6:25:52 PM	0	8/29/2007 6:19:19 PM	0
8/29/2007 6:35:11 PM	1	8/29/2007 6:30:01 PM	1
8/29/2007 6:36:34 PM	0	8/29/2007 6:31:26 PM	0
8/29/2007 6:45:53 PM	1	8/29/2007 6:40:42 PM	1
8/29/2007 6:47:16 PM	0	8/29/2007 6:42:46 PM	0
8/29/2007 6:56:35 PM	1	8/29/2007 6:52:05 PM	1
8/29/2007 6:58:18 PM	0	8/29/2007 6:52:47 PM	0
8/29/2007 7:18:19 PM	1	8/29/2007 7:01:25 PM	1
8/29/2007 7:20:03 PM	0	8/29/2007 7:03:11 PM	0
8/29/2007 7:30:44 PM	1	8/29/2007 7:13:08 PM	1
8/29/2007 7:31:26 PM	0	8/29/2007 7:13:50 PM	0
8/29/2007 7:42:48 PM	1	8/29/2007 7:24:32 PM	1
8/29/2007 7:43:30 PM	0	8/29/2007 7:25:54 PM	0
8/29/2007 7:53:52 PM	1	8/29/2007 7:35:55 PM	1
8/29/2007 7:55:35 PM	0	8/29/2007 7:36:36 PM	0
8/29/2007 8:04:33 PM	1	8/29/2007 8:00:04 PM	1
8/29/2007 8:05:57 PM	0	8/29/2007 8:00:46 PM	0
8/29/2007 8:15:15 PM	1	8/29/2007 8:09:44 PM	1
8/29/2007 8:16:38 PM	0	8/29/2007 8:11:27 PM	0
8/29/2007 8:26:17 PM	1	8/29/2007 8:20:46 PM	1
8/29/2007 8:27:40 PM	0	8/29/2007 8:22:30 PM	0
8/29/2007 8:36:18 PM	1	8/29/2007 8:31:29 PM	1
8/29/2007 8:38:01 PM	0	8/29/2007 8:32:30 PM	0
8/29/2007 8:47:20 PM	1	8/29/2007 8:42:09 PM	1
8/29/2007 8:48:02 PM	0	8/29/2007 8:42:51 PM	0
8/29/2007 8:58:03 PM	1	8/29/2007 8:52:52 PM	1
8/29/2007 8:59:04 PM	0	8/29/2007 8:53:33 PM	0
8/29/2007 9:09:46 PM	1	8/29/2007 9:03:34 PM	1
8/29/2007 9:10:27 PM	0	8/29/2007 9:05:37 PM	0
8/29/2007 9:22:11 PM	1	8/29/2007 9:15:17 PM	1
8/29/2007 9:23:55 PM	0	8/29/2007 9:17:01 PM	0
8/29/2007 9:34:16 PM	1	8/29/2007 9:28:45 PM	1
8/29/2007 9:35:59 PM	0	8/29/2007 9:29:26 PM	0
8/29/2007 9:48:24 PM	1	8/29/2007 9:41:31 PM	1
8/29/2007 9:49:06 PM	0	8/29/2007 9:42:33 PM	0
8/29/2007 10:02:57 PM	1	8/29/2007 9:55:39 PM	1
8/29/2007 10:03:35 PM	0	8/29/2007 9:56:21 PM	0
8/29/2007 10:17:45 PM	1	8/29/2007 10:10:30 PM	1
8/29/2007 10:18:26 PM	0	8/29/2007 10:11:11 PM	0
8/29/2007 10:33:37 PM	1	8/29/2007 10:25:21 PM	1
8/29/2007 10:34:19 PM	0	8/29/2007 10:26:01 PM	0
8/29/2007 10:49:09 PM	1	8/29/2007 10:40:51 PM	1
8/29/2007 10:50:11 PM	0	8/29/2007 10:41:54 PM	0
8/29/2007 11:05:42 PM	1	8/29/2007 10:56:44 PM	1
8/29/2007 11:06:23 PM	0	8/29/2007 10:57:47 PM	0
8/29/2007 11:24:21 PM	1	8/29/2007 11:14:40 PM	1
8/29/2007 11:25:01 PM	0	8/29/2007 11:15:22 PM	0
8/29/2007 11:45:23 PM	1	8/29/2007 11:55:45 PM	1
8/29/2007 11:46:25 PM	0	8/29/2007 11:57:28 PM	0

Breamar Lift Station			
Pump 1		Pump 2	
8/29/2007 12:00:00 AM	0	8/29/2007 12:00:00 AM	0
8/29/2007 12:23:06 AM	1	8/29/2007 12:02:24 AM	1
8/29/2007 12:24:50 AM	0	8/29/2007 12:04:06 AM	0
8/29/2007 1:06:14 AM	1	8/29/2007 12:42:45 AM	1
8/29/2007 1:08:17 AM	0	8/29/2007 12:44:30 AM	0
8/29/2007 2:08:20 AM	1	8/29/2007 1:34:31 AM	1
8/29/2007 2:09:43 AM	0	8/29/2007 1:36:35 AM	0
8/29/2007 3:10:06 AM	1	8/29/2007 2:39:45 AM	1
8/29/2007 3:12:10 AM	0	8/29/2007 2:41:28 AM	0
8/29/2007 4:07:23 AM	1	8/29/2007 3:40:49 AM	1
8/29/2007 4:08:46 AM	0	8/29/2007 3:42:53 AM	0
8/29/2007 5:02:35 AM	1	8/29/2007 4:33:36 AM	1
8/29/2007 5:04:40 AM	0	8/29/2007 4:35:20 AM	0
8/29/2007 6:11:15 AM	1	8/29/2007 5:37:47 AM	1
8/29/2007 6:12:38 AM	0	8/29/2007 5:39:51 AM	0
8/29/2007 6:51:38 AM	1	8/29/2007 6:35:45 AM	1
8/29/2007 6:54:03 AM	0	8/29/2007 6:37:29 AM	0
8/29/2007 7:14:44 AM	1	8/29/2007 7:04:44 AM	1
8/29/2007 7:16:49 AM	0	8/29/2007 7:06:48 AM	0
8/29/2007 7:33:23 AM	1	8/29/2007 7:24:45 AM	1
8/29/2007 7:35:47 AM	0	8/29/2007 7:26:28 AM	0
8/29/2007 7:49:35 AM	1	8/29/2007 7:42:00 AM	1
8/29/2007 7:52:21 AM	0	8/29/2007 7:44:25 AM	0
8/29/2007 8:06:10 AM	1	8/29/2007 7:57:31 AM	1
8/29/2007 8:08:34 AM	0	8/29/2007 8:00:41 AM	0
8/29/2007 8:23:03 AM	1	8/29/2007 8:14:47 AM	1
8/29/2007 8:25:28 AM	0	8/29/2007 8:16:51 AM	0
8/29/2007 8:38:57 AM	1	8/29/2007 8:30:19 AM	1
8/29/2007 8:41:23 AM	0	8/29/2007 8:33:25 AM	0
8/29/2007 8:56:32 AM	1	8/29/2007 8:47:34 AM	1
8/29/2007 8:58:36 AM	0	8/29/2007 8:49:40 AM	0
8/29/2007 9:14:07 AM	1	8/29/2007 9:05:30 AM	1
8/29/2007 9:16:12 AM	0	8/29/2007 9:07:57 AM	0
8/29/2007 9:32:25 AM	1	8/29/2007 9:23:06 AM	1
8/29/2007 9:34:29 AM	0	8/29/2007 9:25:11 AM	0
8/29/2007 9:50:01 AM	1	8/29/2007 9:40:42 AM	1
8/29/2007 9:52:26 AM	0	8/29/2007 9:43:07 AM	0
8/29/2007 10:09:00 AM	1	8/29/2007 9:59:20 AM	1
8/29/2007 10:11:04 AM	0	8/29/2007 10:01:24 AM	0
8/29/2007 10:27:58 AM	1	8/29/2007 10:18:18 AM	1
8/29/2007 10:30:03 AM	0	8/29/2007 10:20:23 AM	0
8/29/2007 10:47:59 AM	1	8/29/2007 10:37:59 AM	1
8/29/2007 10:50:03 AM	0	8/29/2007 10:40:23 AM	0
8/29/2007 11:07:39 AM	1	8/29/2007 10:57:39 AM	1
8/29/2007 11:10:04 AM	0	8/29/2007 11:00:04 AM	0
8/29/2007 11:29:03 AM	1	8/29/2007 11:17:39 AM	1
8/29/2007 11:31:07 AM	0	8/29/2007 11:19:43 AM	0
8/29/2007 11:51:10 AM	1	8/29/2007 11:39:45 AM	1
8/29/2007 11:52:51 AM	0	8/29/2007 11:41:28 AM	0
8/29/2007 12:11:50 PM	1	8/29/2007 12:01:08 PM	1
8/29/2007 12:13:33 PM	0	8/29/2007 12:03:12 PM	0
8/29/2007 12:33:13 PM	1	8/29/2007 12:21:50 PM	1
8/29/2007 12:34:59 PM	0	8/29/2007 12:23:54 PM	0
8/29/2007 12:55:19 PM	1	8/29/2007 12:44:37 PM	1
8/29/2007 12:57:02 PM	0	8/29/2007 12:45:59 PM	0
8/29/2007 1:18:46 PM	1	8/29/2007 1:06:42 PM	1
8/29/2007 1:20:30 PM	0	8/29/2007 1:08:25 PM	0
8/29/2007 1:43:57 PM	1	8/29/2007 1:30:30 PM	1
8/29/2007 1:46:01 PM	0	8/29/2007 1:32:55 PM	0
8/29/2007 2:11:33 PM	1	8/29/2007 1:57:04 PM	1
8/29/2007 2:13:38 PM	0	8/29/2007 1:59:08 PM	0
8/29/2007 2:39:10 PM	1	8/29/2007 2:25:02 PM	1
8/29/2007 2:41:14 PM	0	8/29/2007 2:26:44 PM	0
8/29/2007 3:05:02 PM	1	8/29/2007 2:52:17 PM	1
8/29/2007 3:06:46 PM	0	8/29/2007 2:54:01 PM	0

8/29/2007 3:31:40 PM	1	8/29/2007 3:18:10 PM	1
8/29/2007 3:33:42 PM	0	8/29/2007 3:20:13 PM	0
8/29/2007 4:00:16 PM	1	8/29/2007 3:45:46 PM	1
8/29/2007 4:01:59 PM	0	8/29/2007 3:47:50 PM	0
8/29/2007 4:29:35 PM	1	8/29/2007 4:14:27 PM	1
8/29/2007 4:32:02 PM	0	8/29/2007 4:16:28 PM	0
8/29/2007 4:57:32 PM	1	8/29/2007 4:44:04 PM	1
8/29/2007 4:59:57 PM	0	8/29/2007 4:46:30 PM	0
8/29/2007 5:24:27 PM	1	8/29/2007 5:11:00 PM	1
8/29/2007 5:26:10 PM	0	8/29/2007 5:12:43 PM	0
8/29/2007 5:51:42 PM	1	8/29/2007 5:38:35 PM	1
8/29/2007 5:54:08 PM	0	8/29/2007 5:40:41 PM	0
8/29/2007 6:16:34 PM	1	8/29/2007 6:04:49 PM	1
8/29/2007 6:18:37 PM	0	8/29/2007 6:06:12 PM	0
8/29/2007 6:39:41 PM	1	8/29/2007 6:28:17 PM	1
8/29/2007 6:41:23 PM	0	8/29/2007 6:30:43 PM	0
8/29/2007 7:02:27 PM	1	8/29/2007 6:51:24 PM	1
8/29/2007 7:04:30 PM	0	8/29/2007 6:53:28 PM	0
8/29/2007 7:22:48 PM	1	8/29/2007 7:13:08 PM	1
8/29/2007 7:25:13 PM	0	8/29/2007 7:15:13 PM	0
8/29/2007 7:43:30 PM	1	8/29/2007 7:33:10 PM	1
8/29/2007 7:45:35 PM	0	8/29/2007 7:35:13 PM	0
8/29/2007 8:03:51 PM	1	8/29/2007 7:53:52 PM	1
8/29/2007 8:05:57 PM	0	8/29/2007 7:56:16 PM	0
8/29/2007 8:23:53 PM	1	8/29/2007 8:14:34 PM	1
8/29/2007 8:26:17 PM	0	8/29/2007 8:16:38 PM	0
8/29/2007 8:43:32 PM	1	8/29/2007 8:33:53 PM	1
8/29/2007 8:45:58 PM	0	8/29/2007 8:35:37 PM	0
8/29/2007 9:05:17 PM	1	8/29/2007 8:54:14 PM	1
8/29/2007 9:07:21 PM	0	8/29/2007 8:56:39 PM	0
8/29/2007 9:26:20 PM	1	8/29/2007 9:16:00 PM	1
8/29/2007 9:28:45 PM	0	8/29/2007 9:18:23 PM	0
8/29/2007 9:48:24 PM	1	8/29/2007 9:37:43 PM	1
8/29/2007 9:50:50 PM	0	8/29/2007 9:39:27 PM	0
8/29/2007 10:11:11 PM	1	8/29/2007 9:59:48 PM	1
8/29/2007 10:12:54 PM	0	8/29/2007 10:01:32 PM	0
8/29/2007 10:34:19 PM	1	8/29/2007 10:22:14 PM	1
8/29/2007 10:36:43 PM	0	8/29/2007 10:24:18 PM	0
8/29/2007 11:02:36 PM	1	8/29/2007 10:47:25 PM	1
8/29/2007 11:03:58 PM	0	8/29/2007 10:50:11 PM	0
8/29/2007 11:31:35 PM	1	8/29/2007 11:16:24 PM	1
8/29/2007 11:33:39 PM	0	8/29/2007 11:18:28 PM	0
		8/29/2007 11:48:09 PM	1
		8/29/2007 11:49:52 PM	0

La Colina Lift Station			
Pump 1		**Pump 2**	
8/29/2007 12:00:00 AM	0	8/29/2007 12:00:00 AM	0
8/29/2007 12:20:50 AM	1	8/29/2007 1:27:26 AM	1
8/29/2007 12:29:08 AM	0	8/29/2007 1:30:32 AM	0
8/29/2007 2:27:29 AM	1	8/29/2007 3:52:01 AM	1
8/29/2007 2:34:23 AM	0	8/29/2007 3:54:25 AM	0
8/29/2007 5:04:29 AM	1	8/29/2007 6:01:45 AM	1
8/29/2007 5:12:04 AM	0	8/29/2007 6:04:52 AM	0
8/29/2007 6:31:47 AM	1	8/29/2007 6:55:14 AM	1
8/29/2007 6:43:10 AM	0	8/29/2007 6:59:03 AM	0
8/29/2007 7:08:21 AM	1	8/29/2007 7:34:56 AM	1
8/29/2007 7:27:40 AM	0	8/29/2007 7:38:43 AM	0
8/29/2007 7:48:43 AM	1	8/29/2007 8:15:18 AM	1
8/29/2007 8:03:34 AM	0	8/29/2007 8:19:05 AM	0
8/29/2007 8:30:49 AM	1	8/29/2007 8:53:56 AM	1
8/29/2007 8:42:33 AM	0	8/29/2007 8:57:44 AM	0
8/29/2007 9:09:07 AM	1	8/29/2007 9:36:02 AM	1
8/29/2007 9:19:49 AM	0	8/29/2007 9:38:48 AM	0
8/29/2007 9:52:16 AM	1	8/29/2007 10:19:31 AM	1
8/29/2007 10:01:55 AM	0	8/29/2007 10:22:37 AM	0
8/29/2007 10:37:48 AM	1	8/29/2007 11:05:03 AM	1
8/29/2007 10:48:30 AM	0	8/29/2007 11:08:10 AM	0

8/29/2007 11:25:46 AM	1	8/29/2007 11:53:22 AM	1
8/29/2007 11:35:47 AM	0	8/29/2007 11:56:29 AM	0
8/29/2007 12:13:23 PM	1	8/29/2007 12:38:55 PM	1
8/29/2007 12:23:02 PM	0	8/29/2007 12:43:03 PM	0
8/29/2007 12:56:51 PM	1	8/29/2007 1:25:09 PM	1
8/29/2007 1:08:15 PM	0	8/29/2007 1:28:16 PM	0
8/29/2007 1:47:34 PM	1	8/29/2007 2:18:59 PM	1
8/29/2007 1:58:17 PM	0	8/29/2007 2:22:06 PM	0
8/29/2007 2:43:29 PM	1	8/29/2007 3:13:50 PM	1
8/29/2007 2:55:34 PM	0	8/29/2007 3:16:57 PM	0
8/29/2007 3:33:51 PM	1	8/29/2007 4:04:55 PM	1
8/29/2007 3:46:16 PM	0	8/29/2007 4:07:40 PM	0
8/29/2007 4:24:14 PM	1	8/29/2007 4:55:59 PM	1
8/29/2007 4:39:25 PM	0	8/29/2007 4:59:05 PM	0
8/29/2007 5:14:36 PM	1	8/29/2007 5:45:20 PM	1
8/29/2007 5:28:04 PM	0	8/29/2007 5:48:26 PM	0
8/29/2007 6:04:39 PM	1	8/29/2007 6:34:19 PM	1
8/29/2007 6:19:49 PM	0	8/29/2007 6:37:26 PM	0
8/29/2007 6:53:18 PM	1	8/29/2007 7:26:04 PM	1
8/29/2007 7:09:51 PM	0	8/29/2007 7:28:50 PM	0
8/29/2007 7:44:01 PM	1	8/29/2007 9:16:50 PM	1
8/29/2007 8:06:06 PM	0	8/29/2007 9:19:56 PM	0
8/29/2007 8:40:57 PM	1	8/29/2007 11:12:05 PM	1
8/29/2007 9:03:23 PM	0	8/29/2007 11:15:12 PM	0
8/29/2007 9:35:49 PM	1		
8/29/2007 9:53:04 PM	0		
8/29/2007 10:29:18 PM	1		
8/29/2007 10:50:41 PM	0		
8/29/2007 11:37:58 PM	1		
8/29/2007 11:53:50 PM	0		

Skofield Lift Station			
Pump 1		Pump 2	
8/29/2007 12:00:00 AM	0	8/29/2007 12:00:00 AM	0

Tallant Rd. Lift Station			
Pump 1		Pump 2	
8/29/2007 12:00:00 AM	0	8/29/2007 12:00:00 AM	0
8/29/2007 7:10:05 AM	1	8/29/2007 6:32:06 AM	1
8/29/2007 7:13:20 AM	0	8/29/2007 6:36:48 AM	0
8/29/2007 9:44:54 AM	1	8/29/2007 7:33:36 AM	1
8/29/2007 9:47:04 AM	0	8/29/2007 7:37:34 AM	0
8/29/2007 4:26:46 PM	1	8/29/2007 2:11:52 PM	1
8/29/2007 4:28:56 PM	0	8/29/2007 2:15:28 PM	0
8/29/2007 7:36:18 PM	1	8/29/2007 5:56:50 PM	1
8/29/2007 7:38:29 PM	0	8/29/2007 6:00:27 PM	0
		8/29/2007 8:46:07 PM	1
		8/29/2007 8:50:49 PM	0

Linda Rd. Lift Station			
Pump 1		Pump 2	
8/29/2007 12:00:00 AM	0	8/29/2007 12:00:00 AM	0
8/29/2007 1:26:44 AM	1	8/29/2007 3:45:36 AM	1
8/29/2007 1:33:33 AM	0	8/29/2007 3:52:02 AM	0
8/29/2007 5:51:37 AM	1	8/29/2007 6:23:01 AM	1
8/29/2007 5:58:48 AM	0	8/29/2007 6:31:20 AM	0
8/29/2007 6:49:53 AM	1	8/29/2007 7:15:14 AM	1
8/29/2007 6:58:58 AM	0	8/29/2007 7:25:04 AM	0
8/29/2007 7:43:59 AM	1	8/29/2007 8:13:30 AM	1
8/29/2007 7:52:42 AM	0	8/29/2007 8:21:50 AM	0

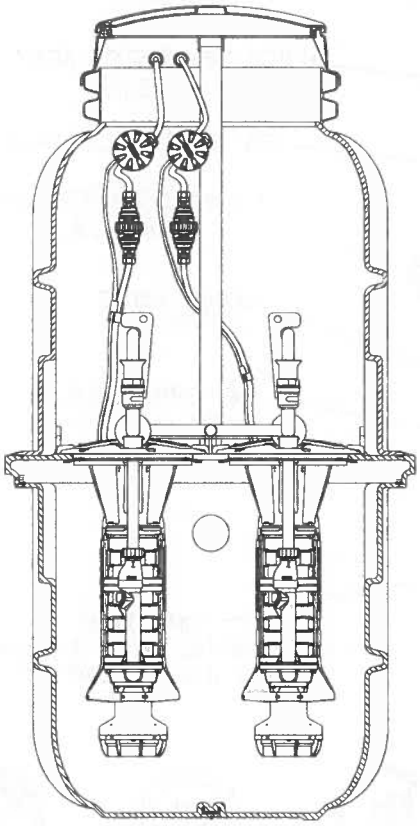
8/29/2007 8:43:46 AM	1	8/29/2007 9:10:38 AM	1
8/29/2007 8:52:29 AM	0	8/29/2007 9:18:58 AM	0
8/29/2007 9:46:36 AM	1	8/29/2007 10:24:48 AM	1
8/29/2007 9:53:24 AM	0	8/29/2007 10:31:37 AM	0
8/29/2007 11:04:54 AM	1	8/29/2007 11:46:33 AM	1
8/29/2007 11:13:37 AM	0	8/29/2007 11:54:06 AM	0
8/29/2007 12:23:14 PM	1	8/29/2007 1:02:58 PM	1
8/29/2007 12:30:48 PM	0	8/29/2007 1:11:17 PM	0
8/29/2007 1:45:44 PM	1	8/29/2007 2:28:51 PM	1
8/29/2007 1:52:55 PM	0	8/29/2007 2:35:40 PM	0
8/29/2007 3:15:24 PM	1	8/29/2007 4:14:04 PM	1
8/29/2007 3:22:58 PM	0	8/29/2007 4:20:52 PM	0
8/29/2007 4:54:32 PM	1	8/29/2007 5:30:29 PM	1
8/29/2007 5:01:22 PM	0	8/29/2007 5:38:03 PM	0
8/29/2007 6:02:17 PM	1	8/29/2007 6:34:03 PM	1
8/29/2007 6:10:36 PM	0	8/29/2007 6:42:45 PM	0
8/29/2007 7:05:05 PM	1	8/29/2007 7:34:13 PM	1
8/29/2007 7:13:25 PM	0	8/29/2007 7:42:32 PM	0
8/29/2007 8:07:31 PM	1	8/29/2007 8:37:47 PM	1
8/29/2007 8:15:51 PM	0	8/29/2007 8:46:29 PM	0
8/29/2007 9:06:56 PM	1	8/29/2007 9:37:58 PM	1
8/29/2007 9:15:15 PM	0	8/29/2007 9:45:31 PM	0
8/29/2007 10:08:36 PM	1	8/29/2007 10:49:06 PM	1
8/29/2007 10:16:33 PM	0	8/29/2007 10:55:31 PM	0
8/29/2007 11:29:58 PM	1		
8/29/2007 11:36:23 PM	0		

APPENDIX E

Individual Pump Station Cut Sheets

E/ONE EXTREME SERIES

DH152



Patent Numbers: 5,752,315
5,562,254 5,439,180

* Discharge data includes loss through check valve, which is minimal.

NA0052P01

General Applications

The size, efficiency and operating economy of the DH152 make it an ideal choice for multiple dwellings, waterfront property, subdivision developments and marinas. The DH152 is ideally suited for both new and existing communities.

General Features

The DH152 grinder pump station is a complete unit that includes: two grinder pumps with check valves, HDPE (high density polyethylene) tank and controls. The DH152 is packaged into a single complete unit, ready for installation.

All solids are ground into fine particles, allowing them to pass easily through the pump, check valve and small-diameter pipelines. Even objects that are not normally found in sewage, such as plastic, rubber, fiber, wood, etc., are ground into fine particles.

The 1 1/4-inch discharge connection is adaptable to any piping materials, thereby allowing it to meet local code requirements.

The tank is made of tough corrosion-resistant HDPE. The optimum tank capacity of 150 gallons is based on computer studies of water usage patterns. A single DH152 is ideal for up to four average, single-family homes, and can also be used for up to 12 average, single-family homes with the consent of the factory. This model can accommodate flows of 3000 GPD.

The internal check valve assembly, located in each grinder pump, is custom-designed for non-clog, trouble-free operation.

The grinder pump is automatically activated and runs infrequently for very short periods. The annual energy consumption is typically that of a 40-watt light bulb.

Units are available for indoor and outdoor installations. Outdoor units are designed to accommodate a wide range of burial depths.

Operational Information

Motor

1 hp, 1,725 rpm, high torque, capacitor start, thermally protected, 120/240V, 60 Hz, 1 phase

Inlet Connections

4-inch inlet grommet standard for DWV pipe. Other inlet configurations available from the factory.

Discharge Connections

Pump discharge terminates in 1 1/4-inch NPT female thread. Can easily be adapted to 1 1/4-inch PVC pipe or any other material required by local codes.

*Discharge**

15 gpm at 0 psig (per pump)

11 gpm at 40 psig (per pump)

7.8 gpm at 80 psig (per pump)

Control Panel

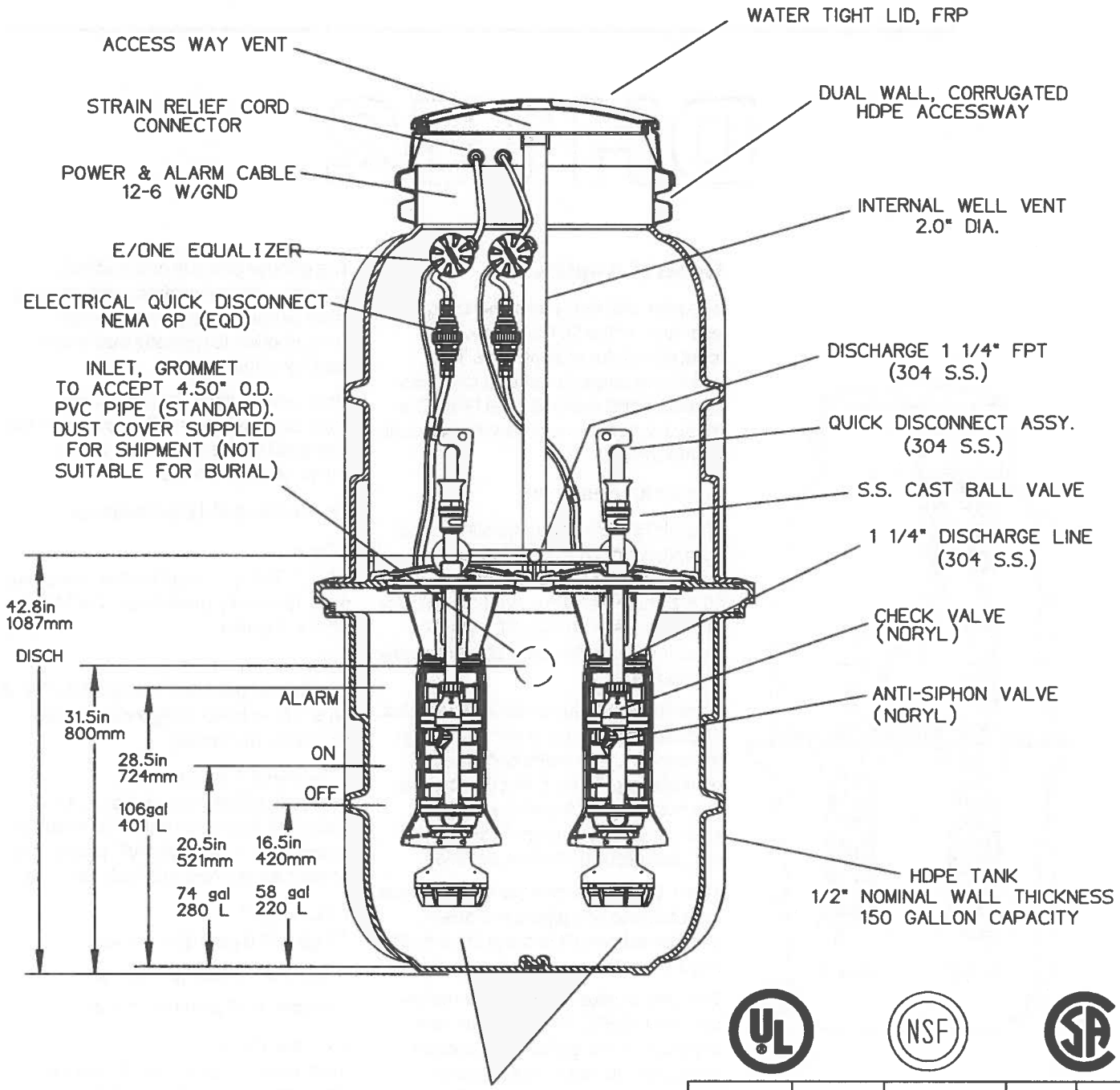
This station is designed to use the Alternating Control Panel, MOD T260.

Overload Capacity

The maximum pressure that the pump can generate is limited by the motor characteristics. The motor generates a pressure well below the rating of the piping and appurtenances. The automatic reset feature does not require manual operation following overload.

DH152

FIELD JOINT REQUIRED
FOR MODELS
DH152-129 & DH152-160



SEMI-POSITIVE DISPLACEMENT TYPE PUMP
EACH DIRECTLY DRIVEN BY A 1 HP MOTOR

BALLAST REQUIREMENTS

A CONCRETE ANCHOR IS REQUIRED
ON ALL OUTDOOR MODEL DH152 STATIONS

SPECIFIC CONCRETE DIMENSIONS ARE REQUIRED
TO ACHIEVE NECESSARY BALLAST EFFECT

SEE INSTALLATION INSTRUCTIONS FOR FURTHER DETAILS

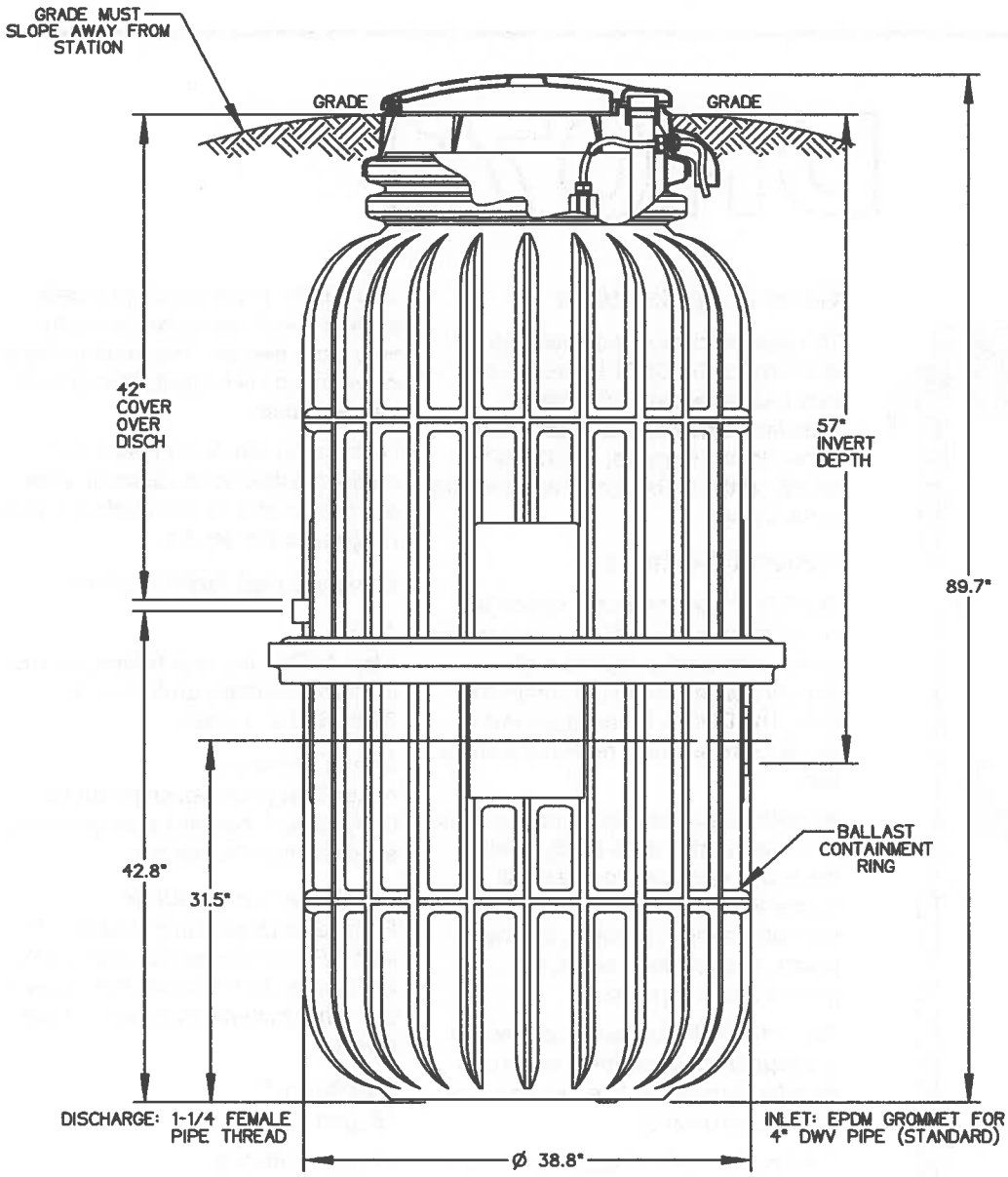
LNT	GAE	04/24/07	—	
DR BY	CHK'D	DATE	ISSUE	SCALE

e one
SEWER SYSTEMS

MODEL DH152
DETAIL SHEET

NA0052P02

DH152-93



BALLAST REQUIREMENTS

A CONCRETE ANCHOR IS REQUIRED ON ALL MODEL DH152-93 STATIONS

SPECIFIC CONCRETE DIMENSIONS ARE REQUIRED TO ACHIEVE NECESSARY BALLAST EFFECT

SEE INSTALLATION INSTRUCTIONS FOR FURTHER DETAILS

AD	CAH	4/25/07	-	1/16
DR BY	CHK'D	DATE	ISSUE	SCALE

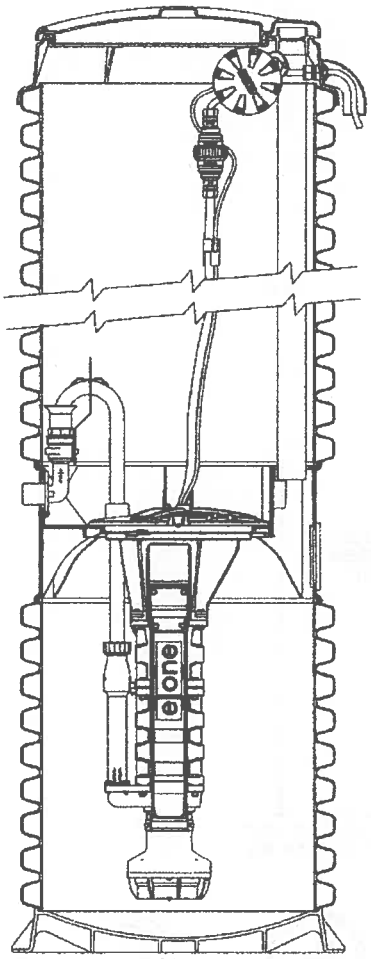
eone SEWER SYSTEMS

MODEL DH152-93

NA0052P04

E/ONE EXTREME SERIES

DH071



Patent Numbers: 5,752,315
5,562,254 5,439,180

* Discharge data includes loss through check valve, which is minimal.

NA0050P01

General Applications

The size, efficiency and operating economy of the DH071 make it your best choice for single dwellings, waterfront property, subdivision developments and marinas. The DH071 is ideally suited for both new and existing communities.

General Features

The DH071 grinder pump station is a complete unit that includes: the grinder pump, check valve, HDPE (high density polyethylene) tank and controls. The DH071 is packaged into a single complete unit, ready for installation.

All solids are ground into fine particles, allowing them to pass easily through the pump, check valve and small diameter pipelines. Even objects not normally found in sewage, such as plastic, rubber, fiber, wood, etc., are ground into fine particles.

The 1 1/4-inch discharge connection is adaptable to any piping materials, thereby allowing us to meet your local code requirements.

The tank is made of tough corrosion-resistant HDPE. The optimum tank capacity of 70 gallons is based on computer studies of water usage patterns. A single DH071 is ideal for one, average single-family home and can also be used for up to two average single-family homes where codes allow and with consent of the factory. This model can accommodate flows of 700 GPD.

The internal check valve assembly, located in the grinder pump, is custom-designed for non-clog, trouble-free operation.

The grinder pump is automatically activated and runs infrequently for very short periods. The annual energy consumption is typically that of a 40-watt light bulb.

Units are available for indoor and outdoor installations. Outdoor units are designed to accommodate a wide range of burial depths.

Operational Information

Motor
1 hp, 1,725 rpm, high torque, capacitor start, thermally protected, 120/240V, 60 Hz, 1 phase

Inlet Connections
4-inch inlet grommet standard for DWV pipe. Other inlet configurations available from the factory.

Discharge Connections
Pump discharge terminates in 1 1/4-inch NPT female thread. Can easily be adapted to 1 1/4-inch PVC pipe or any other material required by local codes.

*Discharge**
15 gpm at 0 psig

11 gpm at 40 psig

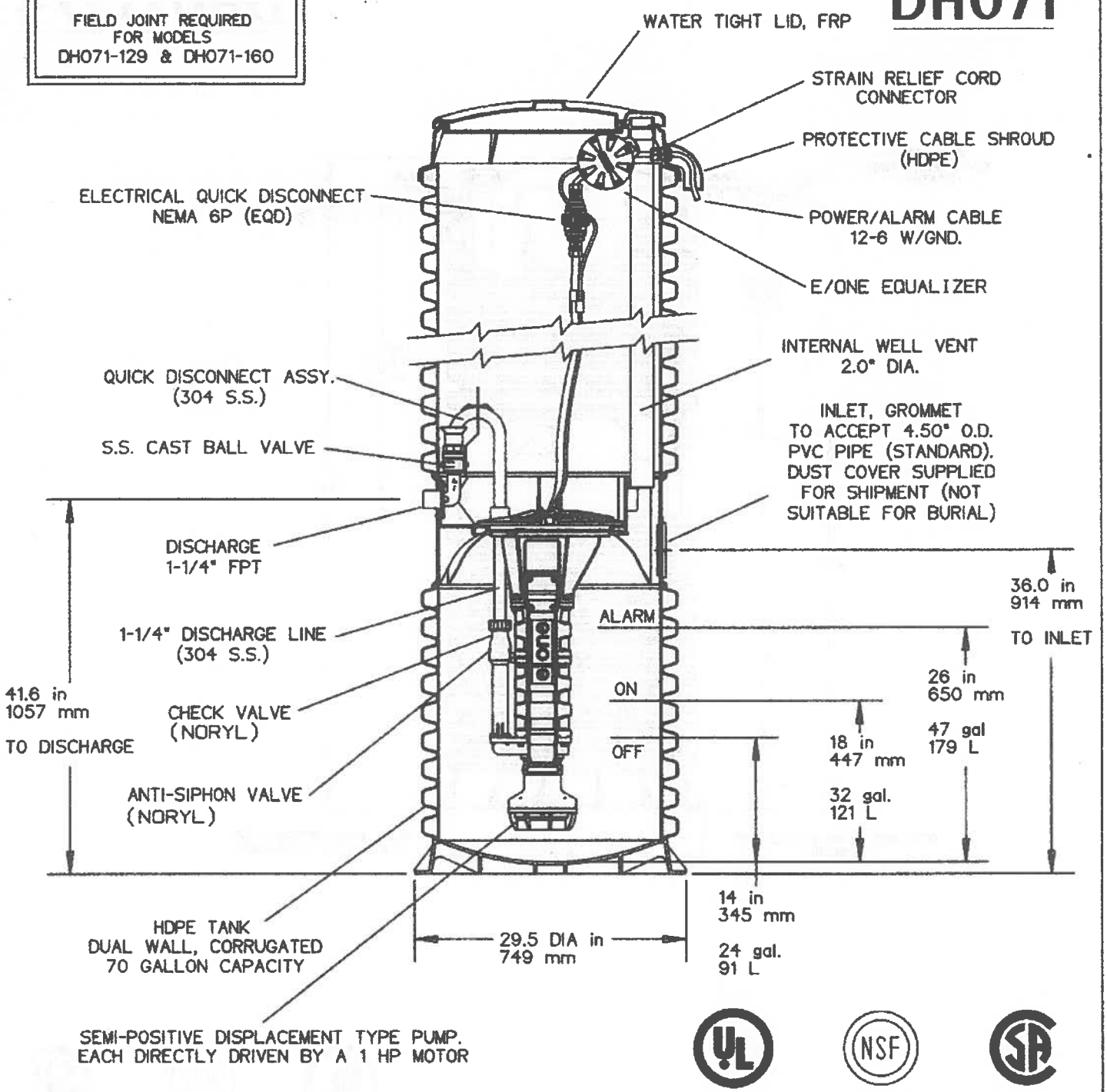
7.8 gpm at 80 psig

Overload Capacity

The maximum pressure that the pump can generate is limited by the motor characteristics. The motor generates a pressure well below the rating of the piping and appurtenances. The automatic reset feature does not require manual operation following overload.

DH071

FIELD JOINT REQUIRED
FOR MODELS
DH071-129 & DH071-160



BALLAST REQUIREMENTS

A CONCRETE ANCHOR IS REQUIRED
ON ALL OUTDOOR MODEL DH071 STATIONS

SPECIFIC CONCRETE DIMENSIONS ARE REQUIRED
TO ACHIEVE NECESSARY BALLAST EFFECT

SEE INSTALLATION INSTRUCTIONS FOR FURTHER DETAILS

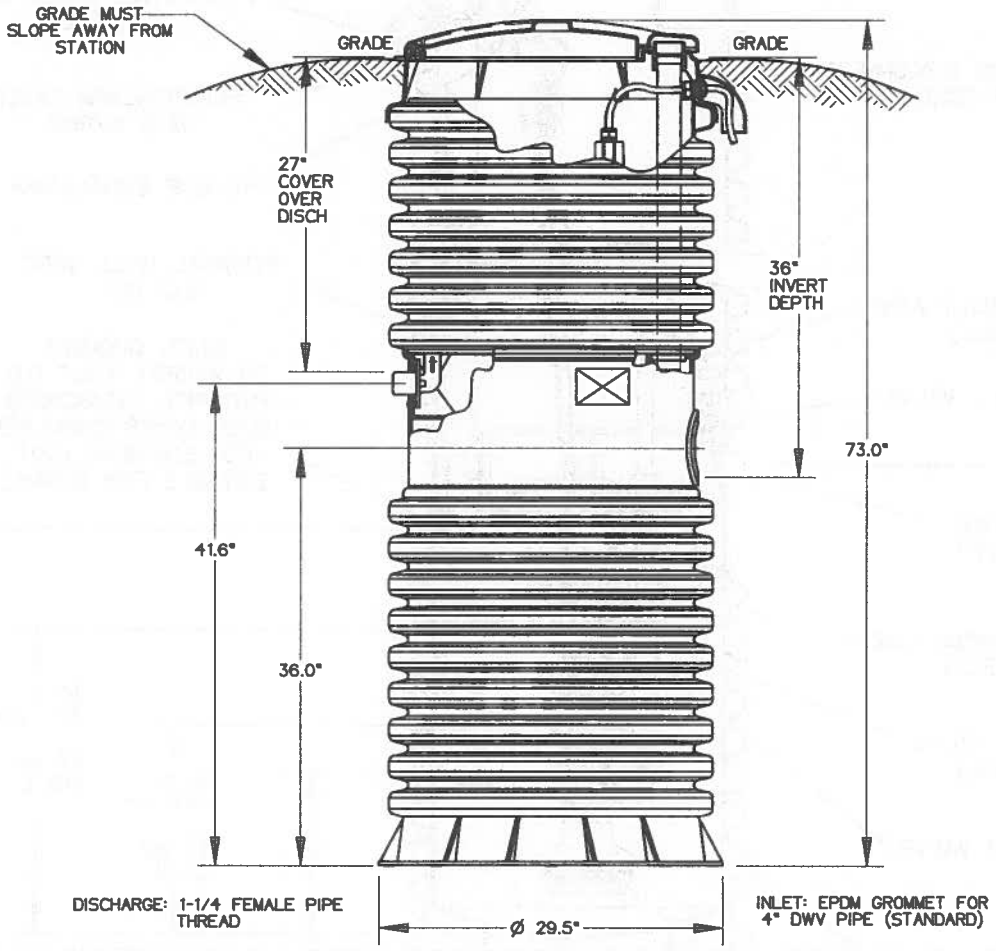
LNT	GAE	04/24/07	-	
DR BY	CHK'D	DATE	ISSUE	SCALE

e/one SEWER SYSTEMS

MODEL DH071
DETAIL SHEET

NA0050P02

DH071-74



BALLAST REQUIREMENTS

A CONCRETE ANCHOR IS REQUIRED
ON ALL MODEL DH071-74 STATIONS

SPECIFIC CONCRETE DIMENSIONS ARE REQUIRED
TO ACHIEVE NECESSARY BALLAST EFFECT

SEE INSTALLATION INSTRUCTIONS FOR FURTHER DETAILS

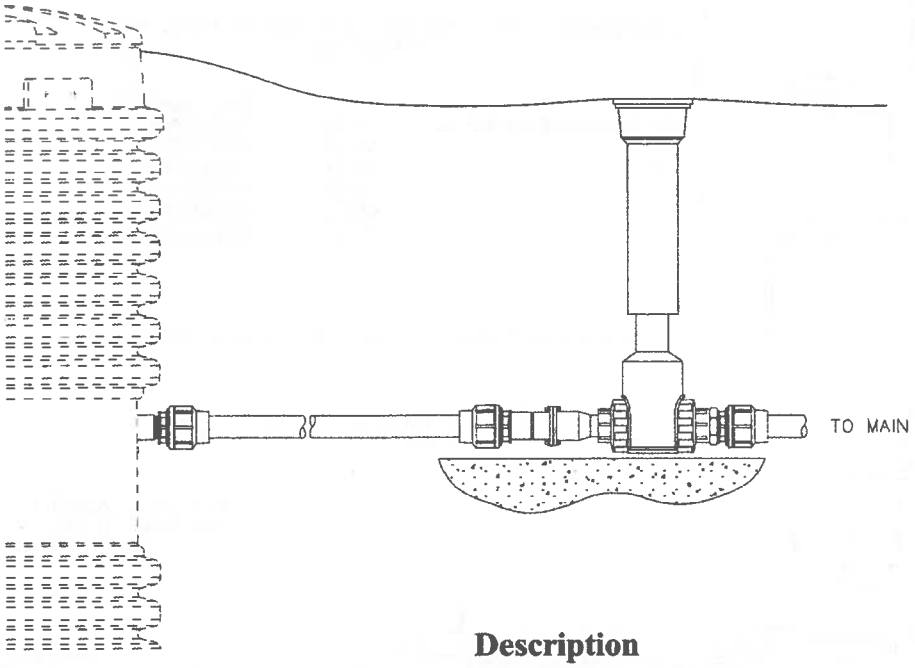
AD	CAH	04/25/07	-	1/16
DR BY	CHK'D	DATE	ISSUE	SCALE

SEWER SYSTEMS

MODEL DH071-74

NA0050P05

Forced Sewer Main Service Lateral Kits SDR 11 HDPE Pipe featuring Engineered Thermoplastic Valves and Fittings



Thank you for considering E/One's Forced Sewer Main Lateral Kits. As you review the following information, please note that we have included order instructions on the last page of this section for your convenience.

Description

These kits feature all components commonly needed to connect an Environment One Series 2000 grinder pump station to the corporation stop/ saddle tap on a sewer main. The kit is designed to be used with SDR 11 HDPE pipe, high density polyethylene pipe (provided by others) and includes compression fittings for fast, easy field installation. The curb stop assembly integrates a robust polypropylene ball valve curb stop and Environment One's field-proven redundant check valve. Curb boxes are supplied in Arch pattern with support plate included.

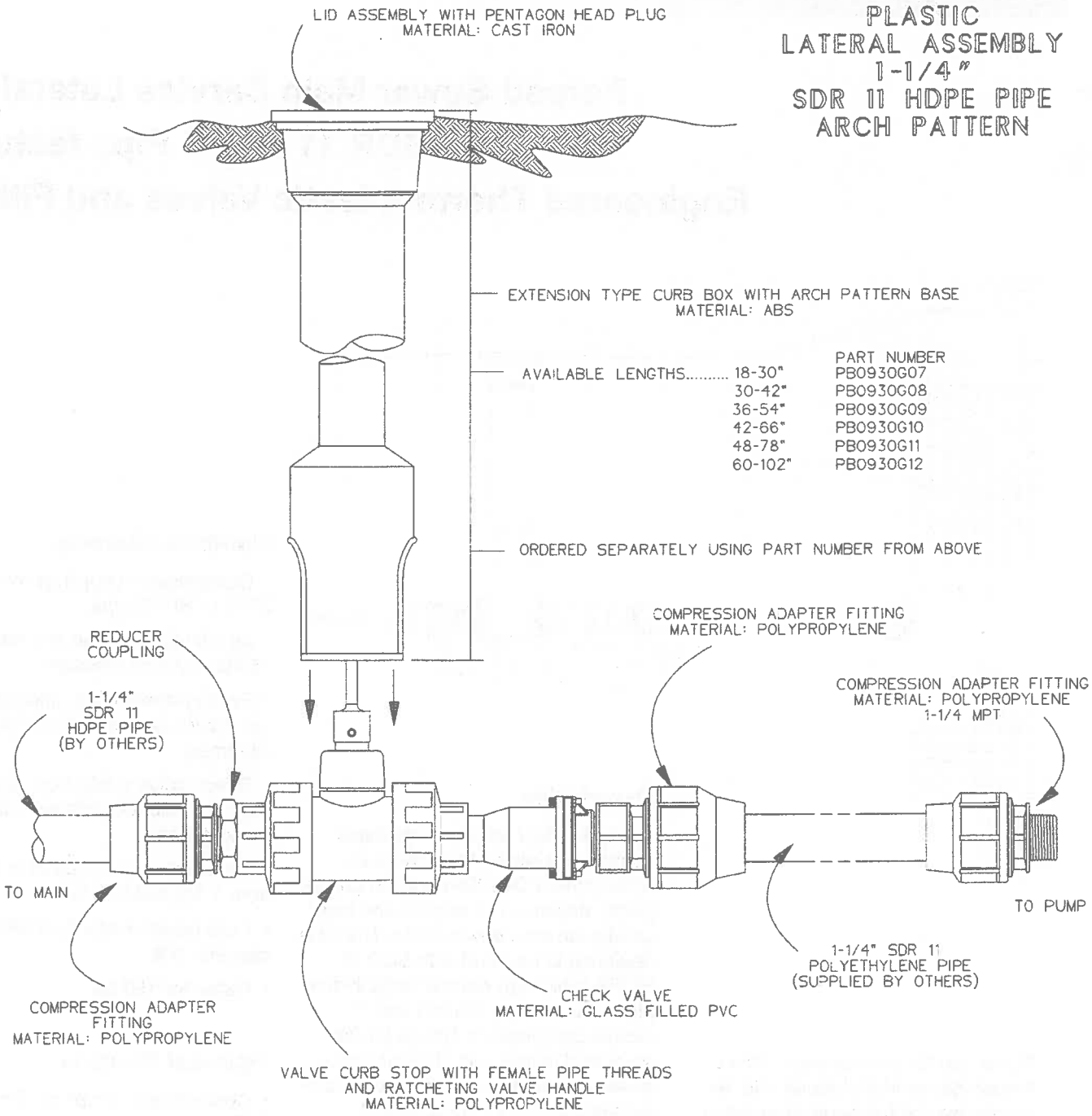
Standard Features

- Compression couplings for 1 1/4" SDR 11 HDPE pipe
- All fittings designed and tested to 150 psi service pressure
- Factory-assembled, integrated ball valve curb stop and check valve assembly
- Check valve made from glass-filled PVC with fabric-reinforced elastomeric flapper
- Arch pattern curb boxes in heights from 1 1/2 feet to 7 feet
- Curb boxes made from ABS with cast iron lids
- Rated for 150 psi

Optional Features

- Compression couplings for 1 1/2" SDR 11 HDPE pipe
- Curb boxes for 1 1/2" SDR 11 HDPE pipe
- Curb boxes available in several sizes

PLASTIC LATERAL ASSEMBLY 1-1/4" SDR 11 HDPE PIPE ARCH PATTERN



AVAILABLE LENGTHS.....	PART NUMBER
18-30"	PB0930G07
30-42"	PB0930G08
36-54"	PB0930G09
42-66"	PB0930G10
48-78"	PB0930G11
60-102"	PB0930G12

PRESSURE RATING: 150 psi

ASSEMBLY TO BE USED WITH 1-1/4" SDR 11 PIPE ONLY

TO ORDER LATERAL ASSEMBLY SHOWN, USE PART NUMBER PC0645G21.

ORDER CURB BOX SEPERATE; SEE ABOVE.

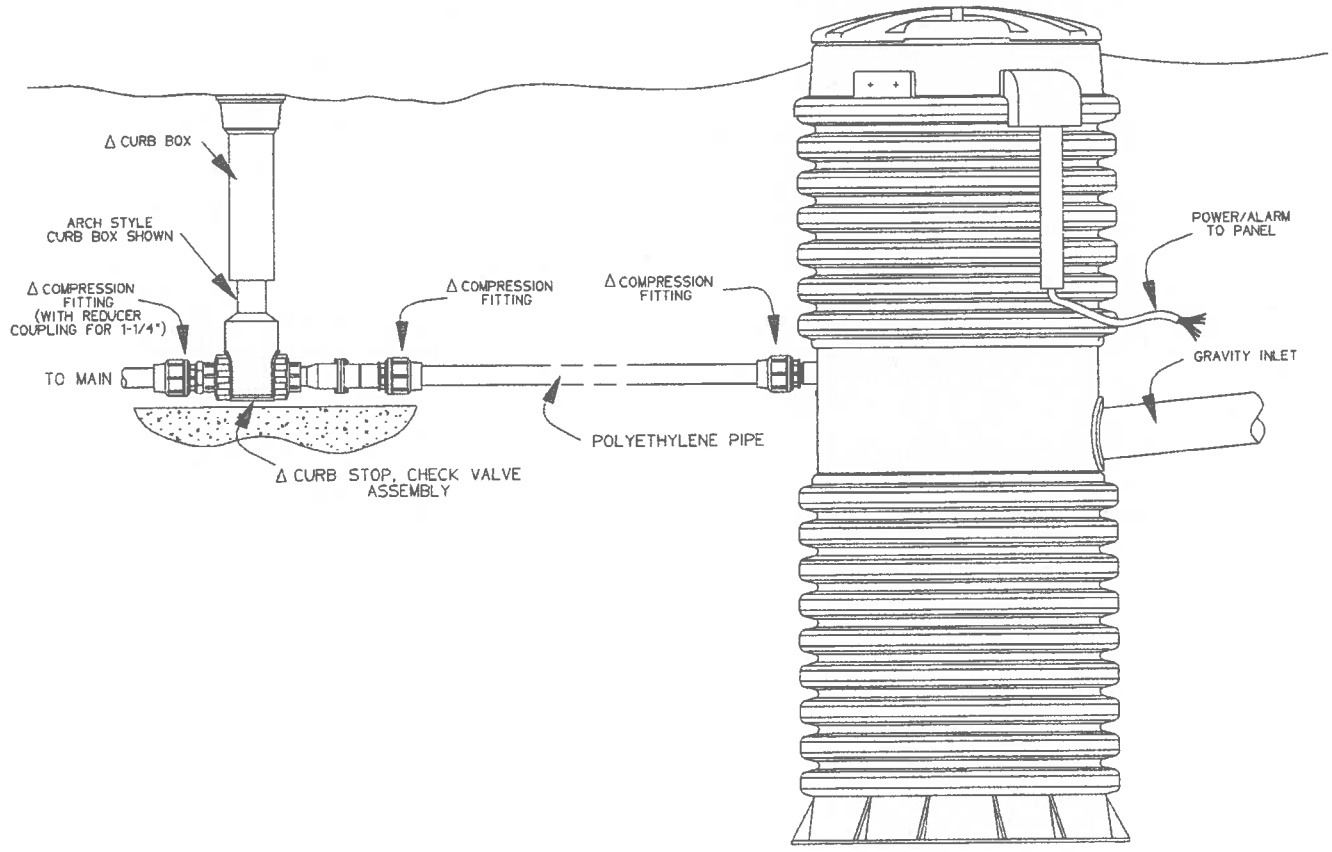
AD	SFG	12/16/04	-	3/16
DR BY	CHK'D	DATE	ISSUE	SCALE

SEWER SYSTEMS

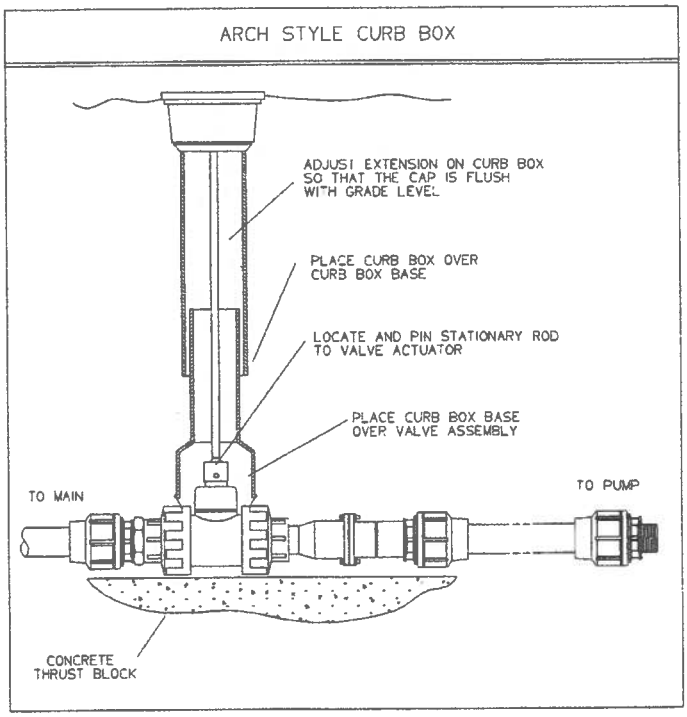
PLASTIC LATERAL ASSEMBLY
1-1/4" SDR 11 HDPE PIPE ARCH PATTERN

PA1997P01

TYPICAL PLASTIC
LATERAL INSTALLATION, SDR 11 HDPE PIPE



MODEL 2010
(NOTE: BALLAST NOT SHOWN)



INSTALL ALL UNDER GROUND PIPING PER ASTM D 2321-89

INSTALL GRINDER PUMP STATION PER GRINDER PUMP INSTALLATION INSTRUCTIONS

Δ - INCLUDED IN LATERAL KIT

APS	CH	09/21/01	D	1/16
DR BY	CHK'D	DATE	ISSUE	SCALE

SEWER SYSTEMS

TYPICAL PLASTIC LATERAL INSTALLATION
SDR 11 HDPE PIPE, ARCH STYLE

PA1333P03