

Santa Barbara City Fire Department - Standard Operating Procedures Apparatus and Equipment Operations		Code: A-XIII-2
Hydro Pneumatic Zones		
Chpt: XIII Hydrants and Water System	Revised: 4/4/08	Pages: 11

I. PUMPING STATIONS

A. The purpose of a pump station is to pump water to a designated reservoir at a higher elevation which in turn supplies water to a specific zone/zones via gravity feed. Each pump station employs 3 electric pumps, 2 of which are used to maintain reservoir levels during normal and peak consumer demand. The 3rd pump is designated solely as a fire pump and in most applications has a greater capacity than the other 2 pumps combined. During normal and extreme periods of water usage, such as firefighting operations, the sensors in the system will automatically trigger the appropriate pumps. Each pump station has a back- up generator of sufficient power to run all pumps. In the event of both electrical and generator failure, either external generators or external pumps may be applied to the system. The Water Department has the following equipment available for this purpose and can be utilized by “638” after hours: one 100 KW truck mounted generator, one 200 KW truck mounted generator and one 1250 GPM truck mounted centrifugal pump. The water department also has the ability to open some valves from remote locations to alter reservoir levels as needed. These abilities are integrated with their Supervisory Control and Data Acquisition System (SCATA) and rely on radio transmission rather than phone or cellular technology.

B. Each pump station is designed to allow for an external pump or generator to be hooked-up to the water system in order to feed the reservoir it serves should electrical power fail and water levels fall to minimum or dangerous levels. It is possible for the Fire Department to perform this function should the need arise. Generally speaking, the procedure consists of making a hose hook-up connecting the fire apparatus’ supply side pump inlet to the water system fitting painted red. The fire apparatus will then supply water to the system fitting painted green being careful not to exceed the posted maximum pressures. The water department is currently reevaluating and remarking the fittings for the appropriate pressures (2/08). Tank to pump valves should be closed and the pump and hoses flushed prior to pressurizing system. This will reduce contamination of post treated water systems. Each engine company should familiarize themselves with the location, access and procedures associated with each pump station location within their district. Should questions arise concerning procedure or access, contact the Water Resources Department directly or the Fire Departments Water Resource Liaison Officer. Pictures of each system are available on the server in the Everyone folder under Water Resources.

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Pump Stations	Flow (Rated)	From Zone	To Zone
Northridge	500 GPM	Sheffield	Northridge
Hope Lift	500 GPM	Low Level	Hope
Tunnel Road	880 GPM	El Cielito	Upper Tunnel
Bothin	2100 GPM	Sheffield	Bothin
Skofield	600 GPM	El Cielito	Skofield
Campanil	1225 GPM	Hope	Campanil
Rocky Nook	1200 GPM	Lauro	El Cielito
El Cielito	3300 GPM	Sheffield	El Cielito
Escondido	2400 GPM	Lauro	Escondido/La Coronilla
Sheffield	3000 GPM	Lauro	Sheffield
La Coronilla	645 GPM	Lauro	Escondido/La Coronilla

II. HYDROPNEUMATIC ZONES

A. Hydropneumatic zones are those isolated topographical areas where water supplies and pressures are less than optimal. A series of pumps, valves, pressure tanks and other related devices are utilized to provide normal service. Generally speaking, these areas within a pressure zone are too high in elevation to receive adequate pressure and volume from gravity feed alone. Fire hydrants may fail to supply adequate water during extraordinary situations where demand exceeds the capacity of the normally operating system.

B. Water is pumped up to a holding tank (looks like a 12' long elevated propane tank) which is pressurized with compressed air to maintain an even system pressure. The pumps are triggered automatically when holding tank supply falls to a specified level thus refill the holding tank. Should demand exceed system abilities or power failures occur, all hydropneumatic zones are designed to facilitate by-pass or pump-around procedures. This means an external pump can be connected in the system to take the place of the zone pump or an auxiliary generator may be hooked into the system to provide electrical power to either the pumps or air compressors. The Fire Department may be called upon to pump into these zones under emergency situations. Water Resources has installed

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suction and discharge/intake fitting at each hydropneumatic booster station. Fire personnel should familiarize themselves with Booster station locations, access and procedures within their areas.

C. Guidelines for Fire Department Booster Station Operations:

1. If possible, have a Water Resources representative available for advice and guidance. 638 is the afterhours contact for these functions and dispatch can call back the appropriate personnel when needed.
2. Fire Department personnel are responsible for ensuring that the maximum pressures are labeled on the discharge outlet on each system. Additionally, each discharge outlet needs to be painted green and the suction intake red. Procedure calls for taking water from the red suction intake and discharging into the green connection.
3. DO NOT EXCEED posted pump pressure maximums as many hydro-pneumatic zones are closed systems and excess pressure may cause damage.
4. All hydrants within a hydropneumatic zone should be marked with a red circle of tape just above the upper cap and stem area. This was an intent that never came to fruition. The department is in the process of integrating a GIS overlay into the MDC system that will allow Fire Department personnel to determine whether or not a hydrant in question is within a zone that can be augmented.
5. Procedural questions by engine company personnel should be clarified before an emergency situation occurs so smooth emergency operation is possible.

D. There are 7 zones within Santa Barbara's water system that can be augmented by hydropneumatic systems.

1. Campanil Hills (Zone 740) Booster Station located at Hope Reservoir across from 825 Centinela Lane. All hydrants on Centinela Lane and Campanil Drive are supplied by a hydropneumatic system at this location. The system has a 1,666 gallon tank fed by the reservoir. Connect fire apparatus pump to the 4" connection of the (red)



wharf head hydrant in front of Hope Reservoir and pump through two or three 2 ½" lines into the nearest hydrant. A pump pressure of 90 PSI should not be exceeded. This is the only hydropneumatic zone not supplemented by a backup generator. A generator is in the 2009 budget.

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2. Escondido/ La Coronilla (Zone 640) Booster Station is the largest and perhaps most critical area served by a hydropneumatic system. It services much of the upper elevations of the Mesa. It is located at the Escondido Reservoir with access at Skyline Way and Skyline Circle. Access and turnaround capabilities are excellent. All booster connections at Vic Trace Reservoir are no longer utilized to augment this zone. Fire Department pumper must be spotted to take suction from 4" male fitting, painted RED adjacent to the hydropneumatic tank outside the building. Pump into the GREEN 4" male fitting in the same area. A pump pressure of 115 PSI should not be exceeded. The reservoir is no longer used but passes over a major transmission line. The Hydro pneumatic zone is in service.



3. Bothin (Zone 780) Booster Station is located at East Reservoir on Crestview Road. Access is across from 60 Crestview. There is plenty of room to turn around if an engine pulls in forward. This station serves the area from Aleeda Lane to North and South Sierra Vista and parts of Nicholas Lane and Barker Pass Road above Chase Drive. Suction is taken from the RED 4" male fitting between the hydropneumatic tank and the reservoir and discharged into the GREEN 4" male fitting near the same location. Do Not Exceed 110 PSI. This is a closed system and maximum pressure is critical.



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4. Northridge (Zone 750) Booster Station is located approximately half way up Northridge Road. The booster station is located behind a wooden fence, uphill from 306 Northridge. This is a closed system with a 3567 gallon pressurized holding tank. The system serves the remaining hydrants further up the hill. Both suction and discharge connections are located within the booster station enclosure. A pump pressure of 175 PSI should not be exceeded. This lift station is scheduled to be eliminated (by Summer 2008) by the installation of a new Pressure Reduction valve (PRV) that transverses from Ontare Road. .



5. Tunnel- located at the Northern end of Tunnel Road. This station will boost pressure to areas of Mission Canyon along both Tunnel and Mission Canyon Roads. There is a 4" green gate valve to pump into and a red Jones hydrant to get water from.



Follow the posted pump pressures. The picture above shows incorrectly colored equipment and is being changed.

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6. St. Mary's Seminary at 1964 Las Canoas Road has a small, private system that requires special knowledge in order to ensure adequate fire flow on the campus should the need arise. Water supply at the top of the hill is limited to



approximately 275 GPM without Fire Department argumentation. The flow may be increased to approximately 475 GPM using the following procedure; Connect to the hydrant at the bottom of the hill at the driveway entrance and pump into the fire department connection located above the large rock near the hydrant. Open the OS&Y valve and pump. Do not exceed 200 PSI and be careful not to collapse the soft suction.

7. Lincolnwood- Corner of Hope and Lincoln Road. This is a private system that augments water pressure for Lincoln Road, Lincolnwood Place and Lincolnwood Lane. Water supply is from the hydrant at 426 North Hope on the Southeast corner and water is pumped into the FDC directly next to the hydrant. The FDC is marked 60 and this is the maximum PSI to add to this system. The system is maintained by the home owners association.



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III. EMERGENCY WATER

A. Reservoirs, pump stations and hydropneumatic zones.

1. Most reservoirs have either a 2 ½” or 1 ½” Fitting to get water from. They are located in various locations, some within the fence area and some outside. Water can be obtained at any Hydropneumatic zone or pump station from the suction side (red). Crews should familiarize themselves with all water sources in their districts.

2. Pump station locations, access and details. There are more pictures of access and valving in the Everyone files.

3. Hope Lift Station, also known as Calle Las Calleras located on the corner at 3408 Cliff Drive, nearest cross street is Sea Ledge. Pump from the yellow city hydrant into the green hydrant at the posted pressure. Sole function is to transmit water to Hope Reservoir on Centinela Lane.



a. Rocky Nook Pump Station, located and accessed directly behind Santa Barbara County Fire Station 15.

There is a red hydrant to get water from and a green 4 “ fitting behind the roll up door to pump into.

The door can be opened with the current water department combination



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- b. Sheffield Pump Station , located down the long access to the left as you enter the Tennis Club, 2375 Foothill Road. Water is transferred from Lauro Transmission lines to Sheffield reservoirs from this location



- c. Ceilito Pump Station. Located downhill from Station 7 just prior to 2434 Stanwood Drive. Access through gates with water department combination. All fittings are next to pumphouse. Water is transferred from here to Ceilito Reservoir just past 2110 Mount Calvary Road



- d. Skofield Pump Station, located at Ceilito reservoir. Pumps water to Skofield reservoir.



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4. Reservoir locations

- a. Sheffield, across from station 7. Water can be obtained at Ceilto Pump station from red fitting. Site contains two 6.5 million gallon underground tanks, typically one on line at a time.



- b. Vic Trace. Accessed next to 1633 La Coronilla. Water can be obtained from red fitting within pump house or from a 2 ½ “ wharf head hydrant to the right of reservoir access gate.



- c. Skofield Reservoir. Accessed immediately to the right when entering Mount Calvary from Gibraltar Road. Access road is narrow and has many switchbacks. There is an 1 ½” attachment on the reservoir. Standard engines may have difficulty approaching and recommendation is to bring 1 ¾” or 1 ½” hose down from reservoir to Gibraltar Road with an in line shut off in place. Distance from tank to Gibraltar is approximately 300’.



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- d. Reservoir #1 located next to 142 Cedar Lane. Mislabeled on many Fire department maps as #2. This reservoir is currently being rebuilt and will have a capacity of 1 MG when complete.



- e. Reservoir #2 located next to the Old Mission. Access is down first driveway to the left past the Mission on Mission Canyon Road just prior to APS turnoff. Reservoir is also mislabeled and misplaced on many Fire Department maps East of Mission canyon. Capacity 1 MG



- f. La Vista reservoir. This water source is under ground and can be accessed through the chained driveway at 1030 la Vista Road.



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g. Lauro Reservoir.

Located at the end of San Roque Road just past Cater Filtration Plant. There are not fire department hook ups at Cater although water could be obtained at various locations



there. Direct access to the reservoir for drafting or educting can be made through the gate at the Northwest fork of the reservoir.