CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
SAN DIEGO REGION

STAFF REPORT

Proposed Administrative Civil Liability
Contained in Complaint No. R9-2009-0040
City of Laguna Beach
Sewage Collection System

Noncompliance with
State Water Resources Control Board
Order No. 2006-0003-DWQ, Statewide General Waste Discharge Requirements for Sanitary Sewer Systems

August 18, 2009

By

Joann Cofrancesco, Water Resource Control Engineer
and
Rebecca Stewart, Sanitary Engineering Associate
Compliance Assurance Unit

1. INTRODUCTION

This report provides a summary of factual and analytical evidence that form the basis for findings to support an administrative assessment of civil liability in the amount of $70,680 against the City of Laguna Beach (Discharger) for violation of State Board Order No. 2006-0003-DWQ, *Statewide General Waste Discharge Requirements* (hereinafter the "State Board Order"), as alleged in Complaint No. R9-2009-0040.

2. BACKGROUND

The Discharger owns and operates approximately 99.5 miles of sewer lines, including the Bluebird SOCWA Lift Station, located near the intersection of Calliope Street and Glenneyre Street, Laguna Beach, California. The Discharger is required to operate and maintain its sewage collection system to prevent Sanitary Sewer Overflows (SSOs) in compliance with requirements of both the State Board Order and the Regional Board Order No. R9-2007-0005, *Waste Discharge Requirements for Sewage Collection Systems San Diego Region.*

State Board Order Prohibition C.1 states "Any SSO that results in a discharge of untreated or partially treated wastewater to waters of the United States is prohibited." State Board Order Prohibition C.2 states "Any SSO that results in a discharge of untreated or partially treated wastewater that creates a nuisance as defined in California Water Code (CWC) Section 13050(m) is prohibited."

Section 301 of the Clean Water Act (33 U.S.C. § 1311) and CWC Section 13376 prohibit the discharge of pollutants to surface waters except in compliance with a National Pollutant Discharge Elimination System (NPDES) permit. State Board Order No. 2006-0003-DWQ is not an NPDES permit.

The 2005 California Ocean Plan designates the beneficial uses of ocean waters to include industrial water supply; water contact and non-contact recreation, including aesthetic enjoyment; navigation; commercial and sport fishing; mariculture; preservation and enhancement of designated Areas of Special Biological Significance; rare and endangered species; marine habitat; fish migration; fish spawning and shellfish harvesting.

On October 29, 2008, the Discharger reported a 591,000-gallon SSO from the Bluebird SOCWA Lift Station. The Discharger estimates that 591,000-gallons spilled, and approximately 590,000 gallons of untreated sewage discharged into the Pacific Ocean (see Attachment 1 for location map). The Pacific Ocean is a water of the United States.

On October 29, 2008, Regional Board staff conducted an inspection of the spill site (Attachment 2). The Discharger retained a consultant to determine the cause of the flood in the dry well of the Bluebird SOCWA Lift Station. The Discharger submitted the consultant's report to the Regional Board on November 13, 2008 (Attachment 3) and also certified the on-line California Integrated Water Quality System (CIWQS) SSO report (Attachment 4).

On, November 19, 2008, the Discharger submitted their November 18, 2008 Agenda Bill, listing the sewage collection system projects completed and describing the emergency response and repairs performed due to the October 29, 2008 SSO (Attachment 5). In emails between the Regional Board and the Discharger dated December 19, 2008, January 7, 2009, and February 26, 2009 and an interview conducted on February 13, 2009, the Discharger answered follow-up questions regarding the overflow (Attachments 6-9).

3. ALLEGATIONS

The Discharger violated Prohibitions C.1 and C.2 of Order No. 2006-0003-DWQ, Section 301 of the Clean Water Act and CWC section 13376 by discharging a reported 590,000 gallons of untreated sewage to the Pacific Ocean, a water of the State of California and a water of the United States, on October 29, 2008, from the Bluebird SOCWA Lift Station, located near the intersection of Calliope Street and Glenneyre Street, Laguna Beach, California, without authorization under an NPDES permit or waste discharge requirements.

4. DETERMINATION OF ADMINISTRATIVE CIVIL LIABILITY

Administrative civil liability (ACL) may be imposed pursuant to the procedures described in CWC Section 13323. The complaint alleges the act or failure to act that constitutes a violation of law, the provision of law authorizing civil liability to be imposed, and the proposed civil liability.

Persons or entities that discharge wastes to waters of the United States in violation of waste discharge requirements are subject to civil liability pursuant to CWC Section 13385 in an amount not to exceed the sum of both of the following: (1) ten thousand dollars ($10,000) for each day in which the violation occurs; and (2) up to ten dollars ($10) per gallon discharged and not cleaned up minus the first 1,000 gallons.

The SSO occurred on one day for a maximum of ten thousand dollars ($10,000) in administrative civil liability. Additionally, the SSO discharged 591,000 gallons of sewage, 590,000 gallons of which entered the waters of the United States, for a maximum per gallon administrative civil liability of five million eight hundred ninety thousand dollars ($5,890,000). Therefore, the statutory maximum administrative civil liability amount for this alleged violation based on the one day of violation and

the volume of discharge and not cleaned up in excess of 1,000 gallons (590,000 at $10/gallon minus 1,000 gallons) is $5,900,000.

CWC Section 13385(e) requires the Regional Board to consider several factors when determining the amount of civil liability to impose. These factors include: "...the nature, circumstances, extent, and gravity of the violation or violations, whether the discharge is susceptible to cleanup or abatement, the degree of toxicity of the discharge, and, with respect to the violator, the ability to pay, the effect on its ability to continue its business, any voluntary cleanup efforts undertaken, any prior history of violations, the degree of culpability, economic benefit or savings, if any, resulting from the violation, and other matters that justice may require. At a minimum, liability shall be assessed at a level that recovers the economic benefits, if any, derived from the acts that constitute the violation."

4.1 Nature, Circumstance, Extent, and Gravity of the Untreated Sewage Discharge

Bluebird SOCWA Lift Station

In 1981, Aliso Water Management Agency built and started operation of the Bluebird SOCWA Lift Station. In 1988, the City of Laguna Beach and as Discharger took over operations and maintenance of the lift station which is located approximately 600 feet from the Pacific Ocean.

At the lift station, sewage from the gravity sewer line is discharged into the wet well. One of the four pumps in the dry well delivers sewage from the wet well through four miles of force main to the South Orange County Wastewater Authority's (SOCWA) Coastal Treatment Plant. On the discharge side of each pump, there is a 12-inch check valve, a 12-inch diameter spool, a Uni-Flange, and a shutoff gate valve (12-inch resilient wedge gate valve) (See Figure 1).

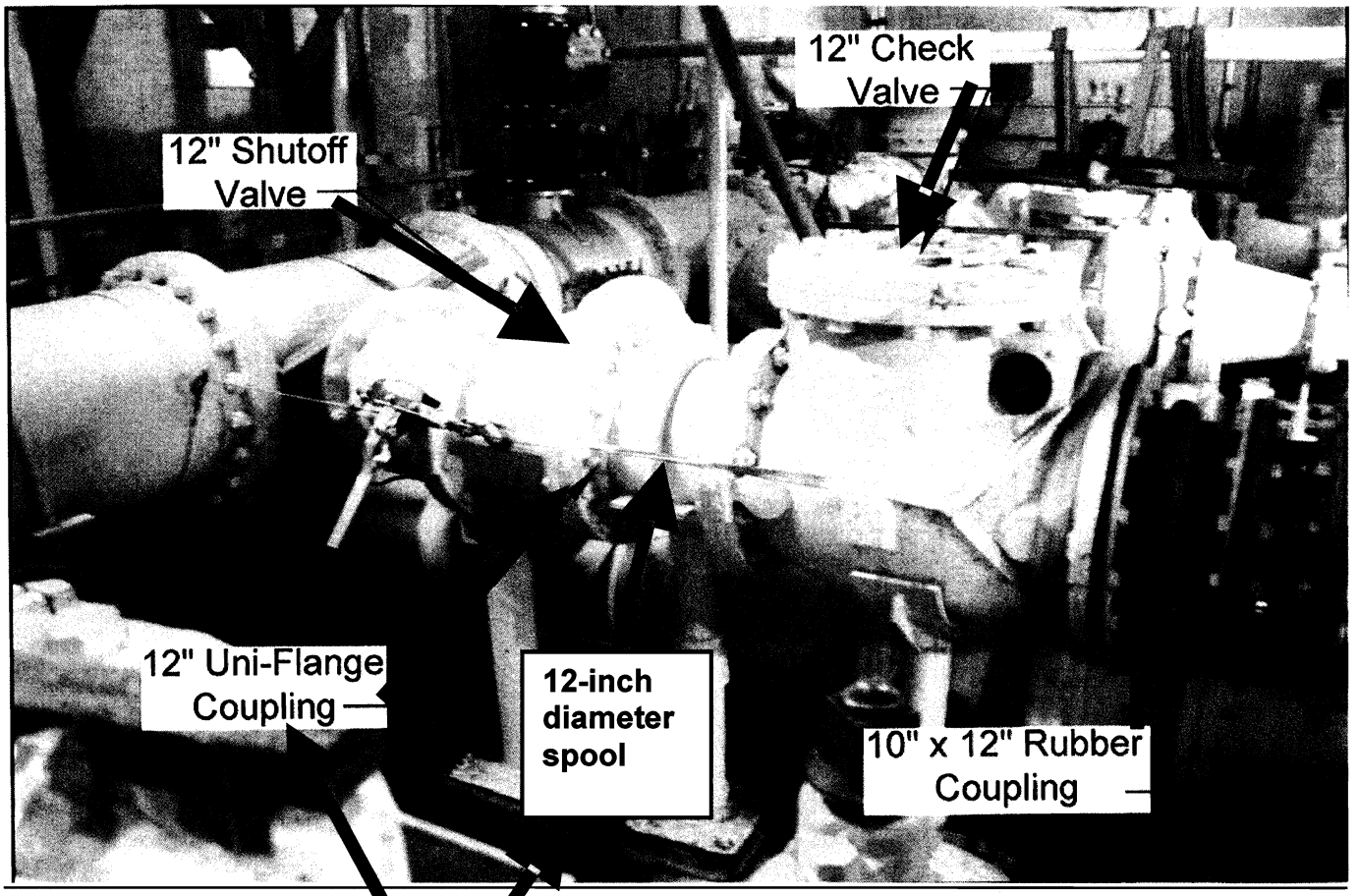
In 1993, the Uni-Flange and shutoff gate valve were installed by contractors working for the Discharger.

In April 2008, the Discharger conducted repairs on the force main for the Bluebird SOCWA Lift Station. In order to conduct the repairs, the Discharger backed up the wet well. It was at this time, the Discharger discovered that electrical chases located on the ceiling of the wet well had corroded and allowed sewage to flow into them when the water level in the wet well was near the ceiling. This incident prompted the Discharger to develop a rehabilitation project for the Bluebird SOCWA Lift Station, which included replacement of the influent pipe to the wet well, addition of a lift station bypass, and a new loading dock for the dry well.

Events Leading up to Sewage Overflow

One of the upgrades to the lift station included in the rehabilitation project was replacement of two of the four pumps in the dry well (Pump Nos. 1 and 2). On October 22, 2008, Pump Nos. 1 and 2 were isolated from the force main by closing the shutoff gate valve (12-inch resilient wedge gate valve) on the discharge side. The shutoff gate valve was closed by turning the valve until it stoped. There were no other checks to ensure the shutoff gate valve was closed. The Discharger ensured that the pump was isolated from the check valve by draining the pressure from the pump. After isolation, the two pumps were removed. On October 28, 2008, one of the new pumps (Pump No. 2) was installed and tested at various rates. The other new pump (Pump No. 1) was in place, but not connected to the discharge side (i.e. there was still a gap between the new Pump No. 1 and the check valve on the discharge side of Pump No. 1) (see Figure 1 – Note 1).

Figure 1: Dry Well – typical layout of the discharge side of each pump



NOTE 2: On October 29, 2008, the SSO flowed out of a crack between the coupling and spool.

10" x 12" Rubber Coupling
NOTE 1: October 28, 2008, this coupling was not yet installed for Pump No. 1, creating a gap here, between the new Pump No. 1 and the check valve on the discharge side of Pump No. 1.

Events During Overflow

On October 29, 2008, at 1:07 am, the Discharger's emergency on-call staff received an alarm from the dry well of the Bluebird SOCWA Lift Station. The dry well alarm was triggered by a leak in the lift station. (The location of the leak was not determined until a few hours later and was caused by a separation between the 12-inch diameter Uni-Flange coupling and the 12-inch diameter spool on the discharge side of Pump No. 1, the inactive pump. (See Figure 1 – Note 2.) At approximately 1:30 am, the emergency on-call staff member arrived at the lift station. At approximately 1:37 am, one of the three active pumps failed in the dry well. By 1:56 am, all three active pumps had failed.

According to the Discharger, its staff initially tried to pump the dry well down, but the overflow rate into the dry well was reportedly too high. By 2:20 am, the raw sewage in the dry well was overflowing out of the lift station and into a storm drain located on Galen Drive, directly behind the lift station. The storm drain is tributary to Bluebird Beach and Pacific Ocean, which are approximately two blocks/ 600 feet away.

In order to gain control of the lift station, at 4:30 am, the Discharger reportedly pumped the raw sewage from the dry well and wet well into the Galen Drive storm drain. When the water level was low enough, the Discharger was able to determine the location of the overflow (separation between a 12-inch diameter Uni-Flange coupling and the 12-inch diameter spool - See Figure 1 – Note 2). The Discharger also re-established operation of one of the pumps, removed the 12-inch diameter Uni-Flange coupling, and installed a blind flange on the shutoff gate valve to stop the spill at approximately 10:00 am.

According to the CIWQS SSO Report, on October 29, 2008, the City notified the Regional Board, State of California Office of Emergency Services, and the County health agency between 3:00 am and 3:10 am.

Results of the Sewage Overflow

The Discharger has estimated that approximately 591,000 gallons of sewage overflowed into the storm drain. A storm drain diversion facility located at the end of the storm drain could not alleviate a discharge to the Pacific Ocean during the SSO because the diversion facility is designed to direct flows back to the Bluebird SOCWA Lift Station. Only after the cause of the SSO was identified and repaired was the diversion facility able to prevent an estimated 1,000 gallons of sewage from discharging to the ocean.

The discharge of a large quantity of raw sewage into waters of the United States adversely affected beneficial uses of the Pacific Ocean, including water contact and non-contact recreation. Impacts from sanitary sewer overflows include: a risk to public health, adverse effects to aquatic organisms, public nuisance resulting from exposure of raw sewage along streets and beaches, and economic losses resulting from beach closures.

From October 29 to October 30, 2008, the beach area was closed for four miles, from Crescent Bay to Carmel Point. This area includes the Heisler Park Ecological Reserve, which is an Area of Special Biological Significance. Water sample results indicated that the sewage did not reach Heisler Park Ecological Reserve (See Attachment 10 for the water sample results). On October 31, 2008, the beach closure was reduced to 2.5 miles, from Hotel Laguna to Moss Point. All beach closures terminated on November 3.

Factors Leading to the SSO

The Prosecution Staff has identified the following factors as contributing to the SSO:

1. In 1993, the Uni-Flange for Pump No. 1 was not properly attached to the 12-inch diameter spool. This is the first factor allowing lateral movement of the check valve and spool away from Uni-Flange and discharge shutoff gate valve.

2. The gap between the Pump No. 1 and the check valve is the second factor allowing lateral movement of the check valve and spool away from Uni-Flange and discharge shutoff gate valve.

3. Prior to the removal of the old Pump No. 1, the discharge shutoff gate valve was not fully closed (95% closed). The Discharger reported that debris (small rocks) in the seat of the valve prevented the gate from fully closing and this is a common problem. This opening allowed the sewage to seep through the shutoff gate valve and push on the check valve, causing lateral movement of the check valve and spool away from Uni-Flange and discharge shutoff gate valve.

As a result, the sewage seeped through the shutoff gate valve and pushed on the check valve. This caused lateral movement of the check valve and spool, away from the improperly installed Uni-Flange and the shutoff gate valve. The sewage spilled out of the crack between the spool and the Uni-Flange. (See Figure 1 above)

The Discharger also suggests that the overnight "draw-fill" states and pressure surges from the new pump also may have contributed to the SSO (Attachment 5).

4.2 Susceptibility to Cleanup or Abatement

Due to the large amount of untreated sewage within the lift station and force main and the lack of a working/accessible force main isolation valve and/or lift station bypass, the untreated sewage overflowed and was pumped by the Discharger directly into the storm drain. From the storm drain, untreated sewage flowed directly onto the beach and into the Pacific Ocean, limiting opportunities for cleanup.

When the leak at the lift station was isolated and a temporary repair was installed, approximately 1,000 gallons of sewage was captured within the storm drain diversion facility and sent back to the sewage collection system.

4.3 Degree of Toxicity

The high degree of toxicity in untreated sewage posed a threat to beneficial uses. Untreated sewage is composed of, but not limited to, high concentrations of pathogenic bacteria, biochemical oxygen demand (BOD) due to organic and inorganic materials, nutrients, ammonia, heavy metals, emulsions and other toxins. These pollutants adversely affect the quality of water needed to support and sustain the beneficial uses of surface waters in the Pacific Ocean, particularly impacting the aquatic life beneficial uses and limiting contact and non-contact recreation.

4.4 Degree of Culpability

The Discharger has a moderate degree of culpability for this spill. Accordingly, this penalty factor weighs in favor of imposing a moderate penalty. There are at least four measures that could have been implemented to prevent or reduce the volume of the SSO. The following are the four measures:

1. The Uni-Flange that failed was installed by a contractor hired by the Discharger. As the owner and operator of the Bluebird SOCWA Lift Station, the Discharger is ultimately responsible for ensuring proper pump and valve installation. With more oversight, the faulty installation might have been identified and corrected at the time of installation in 1993.

2. The aged shutoff gate valves could have been replaced sooner. According to the Discharger's report, the shutoff gate valve was "aged." Subsequent to the SSO, the Discharger replaced all the aged shutoff gate valves in the Bluebird SOCWA Lift Station with DeZurik eccentric plug valves, which are "newer technology valves and less prone to have similar problems develop".

3. Prior to removing the pump, the Discharger should have taken more steps to ensure debris was not preventing the gate valve from closing. The Discharger acknowledges that debris is a common problem in the resilient wedge gate valve. The only indication that the Discharger used to ensure the valve was closed was turning the valve until it stopped. Common steps used by other agencies include

counting and tracking the number of turns to close the shutoff gate valve during maintenance and looking through the check valve to ensure the shutoff gate valve was fully closed. They also acknowledged that they could have bled the area between the check valve and discharge shutoff gate valve to ensure the discharge shutoff gate valve was closed.

4. The Discharger lacked an adequate emergency plan in the event of a major failure at the SOCWA Bluebird Lift Station. The combination of the following two factors prevented the Discharger from isolating the failure at the SOCWA Bluebird Lift Station.

   a) In order to route the sewage from the wet well of the lift station to the 10-inch bypass pumping connection (passing the dry well and lift station pumps), the wet well water level needs to be raised to the ceiling. If the wet well water level is at the ceiling, the electrical chases on the ceiling of the wet well become submerged. Since the electrical chases were corroded, the sewage can flow into the chases and enter the dry well. The Discharger discovered the corroded chases in April 2008 during maintenance.

   b) The 16-inch shutoff gate valve on the discharge header (valve that isolates the SOCWA Bluebird Lift Station from the forcemain) had been in the stuck position for an unknown amount of time. This stuck valve and lack of another accessible valve prevented the Discharger from isolating the large amount of sewage in the forcemain from flowing back to the leak in the lift station.

The Discharger is solely responsible for ensuring proper installation of all equipment in the lift station, ensuring the shutoff gate valve is fully closed when isolating the pump, fully testing the new pump, planning adequate emergency plans in the event of a major failure, and ensuring a backup emergency plan is in place.

4.5 Voluntary Cleanup Efforts

The Discharger reported recovering 1,000 gallons of sewage from the storm drain and cleaning the street and beach of overflow residuals following to the spill.

4.6 Prior History of Violation

Prior to October 2008, the Discharger's records indicate that there were no previous problems in the Bluebird SOCWA Lift Station's discharge manifold.

The number of spills and beach closures caused by the Discharger has been reduced since 2003, when 22 sewage overflows and six beach closures were reported. In 2008, there were four overflows and two beach closures. See Attachment 11 for more details. The Discharger attributes this improvement to its sewage collection system improvements that were implemented in 2003 to reduce

SSOs. Due to the lack of SSOs at the lift stations, the Bluebird SOCWA Lift Station was not included in the 2003 collection system improvement plans.

Since the Discharger has had a significant reduction in SSOs in the last six years, the penalty factor weighs in favor of a reduction from the statutory maximum penalty amount.

4.7 Economic Benefit or Savings

According to the Discharger, the amount of time it would have taken to bleed the area between the check valve and discharge shutoff gate valve (to ensure the discharge shutoff gate valve was closed) was half an hour. The economic benefit of not implementing the cleaning program is minimal compared to the cost of cleanup and repairs as a result of the SSO.

Following the SSO incident, the Discharger identified the shutoff gate valve as "aged" and "not working properly" in its November 19, 2008 Agenda Bill (Attachment 5). The Discharger also acknowledged that the shutoff gate valve was prone to debris preventing full closure. As a result these problems, the shutoff gate valve was replaced with a new DeZurick eccentric plug valve ("newer technology and less prone to have similar problems develop" to the old shutoff gate valve). The cost of one of the valves was $3,757. The valve replacement was not included in the Bluebird SOCWA Lift Station Rehabilitation Project prior to the SSO. The Discharger spent approximately $210,000 on the cleanup and repairs of the lift station, which includes the cost of the DeZurick eccentric plug valve.

4.8 Other Matters as Justice May Require

Newly-installed valves and a bypass system should prevent spills in the future. Since the discovery of the corroding electrical chases in April 2008, the Discharger is planning to upgrade the Bluebird SOCWA Lift Station.

According to the Agenda Bill (Attachment 5) and General Ledger provided by the Discharger on February 13, 2008 (Attachment 9), the Discharger spent $210,000 on recovery and repair due to this overflow.

Regional Board costs for investigating this SSO incident and preparing ACL Complaint have been $18,464 to date. The Regional Board will incur additional costs related to resolution of the Complaint.

4.9 Ability to Pay and Ability to Continue in Business

It is not anticipated that the recommended liability would cause a financial hardship for the Discharger. As noted in the Agenda Bill provided by the Discharger on November 19, 2008 (Attachment 5), the Discharger has a sewer fund balance of $400,000. In addition, other financing options are available to the Discharger.

Accordingly, this penalty factor does not weigh either for or against a substantial penalty.

5. Administrative Civil Liability

5.1 Maximum Civil Liability

Based on CWC Section 13385, the one day SSO has a maximum of ten thousand dollars ($10,000) in administrative civil liability. Additionally, the SSO discharged 591,000 gallons of sewage, 590,000 gallons of which entered the waters of the United States, for a maximum per gallon administrative civil liability of five million eight hundred ninety thousand dollars ($5,890,000). Therefore, the statutory maximum administrative civil liability amount for this alleged violation based on the one day of violation and the volume of discharge and not cleaned up in excess of 1,000 gallons (590,000 minus 1,000 gallons times $10) is $5,900,000.

5.2 Proposed Civil Liability Per Violation

Based on the factors considered above, the proposed civil liability in this matter is $70,680. The liability is calculated based on $0.12 per gallon for 589,000 gallons untreated sewage discharged but not cleaned up (590,000 gallons minus the first 1,000 gallons discharged) and $10,000 per day for one day of continued untreated sewage discharge.

The proposed civil liability is appropriate for this untreated sewage discharge based on the following reasons:

1. The discharge of a large quantity of raw sewage into waters of the United States adversely affected beneficial uses of the Pacific Ocean, including water contact and non-contact recreation.

2. The high degree of toxicity in untreated sewage posed a threat to beneficial uses.

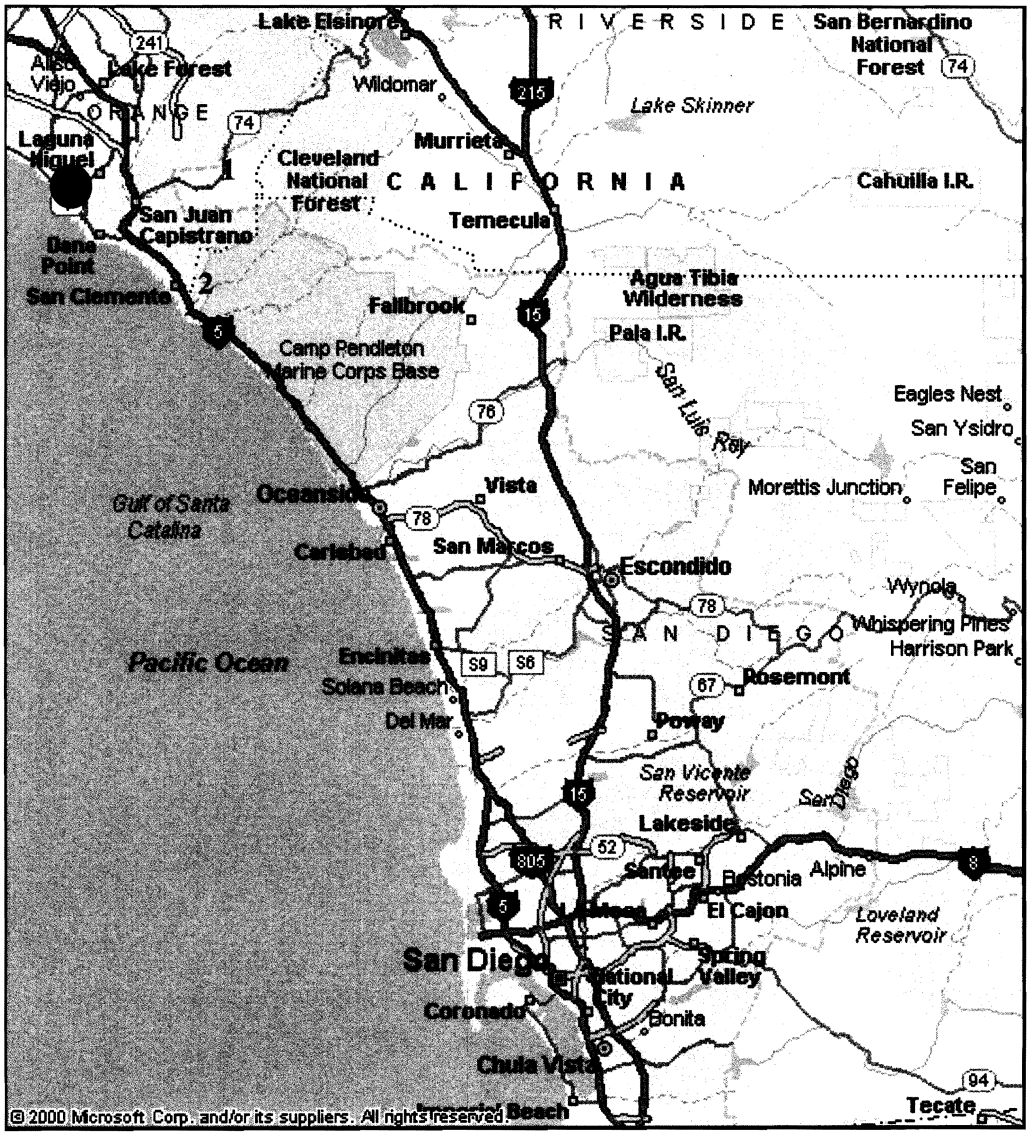
3. The City failed to implement upgrades, improvements, and procedures in a timely manner at the Bluebird SOCWA Lift Station that would have prevented or reduced the amount of the SSO.

4. The proposed civil liability assessment is sufficient to recover costs incurred by staff of the Regional Water Board and State Water Board, and it serves as deterrent for future negligent violations.

5. The City has implemented corrective actions intended to prevent spills at this lift station.

Attachment 1

Attachment 1



Location of SSO at Bluebird SOCWA Lift Station,
Laguna Beach, California

Attachment 2

October 29, 2008

At approximately 3:15am, Graham Wright of the City of Laguna Beach (949-922-8746) left a voicemail with the San Diego Regional Board (RB), informing the RB of a sewage spill from their largest lift station. The spill was in the thousands of gallons and was located at 1509 Glenneyre Street.

At 7:15am, Will Holman of City of Laguna Beach left a voicemail with Joann Cofrancesco, also to inform the RB about the failure at Bluebird Lift Station. The spill was going into the ocean.

At 9am, Cofrancesco received the above voicemails and called them back for more information.

At 10am, Cofrancesco started to drive up to Laguna Beach to investigate the spill, per Mark Alpert's order.

At 11:30am, Cofrancesco arrived at the scene of the sewage spill and interviewed Graham Wright and Will Holoman (11:30am-1:10pm).

- The sewage spill was a result of a discharge from the manifold that separated in the dry well at Birdbird Lift Station (figure 1), possibly due to a water hammer. The sewage spill flooded the dry well and caused all the pumps to stop.
- At 1:07am, they received a call from the SCADA alarm system.
- One of the four pumps in the dry well was out for repairs (figure 2).
- By 1:36am, one of the pumps in the dry well failed due to the flooding in the dry well.
- By 1:56am, all three pumps failed due to the flooding in the dry well..
- By 2:20am, the dry well was overflowing, down into an alley way and storm drain (figures 3-6).
- At 4:30am, they started pumping the sewage in the dry well into the storm drain. They also started pumping the sewage in the wet well into another storm drain, which is upstream of the other storm drain inlet (figures 7-8).
- At 10am, the spill was stopped. They were able to start the pumps in the wet well and they were in manual mode.
- At this time, the estimated volume of the spill was 220,000-260,000 gallons.
- The end of the storm drain is partially blocked by wood (figure 9 and 10), holding some of the sewage back. At approximately 11:30am, the diversion in this storm drain was used to pump the sewage back to the Bluebird Lift Station (figure 11).
- During the inspection, some sewage was still standing in the storm drain and leaking a little from the bottom of the blockage (figure 12 and 13).
- The beach was closed from Cresent Bay to Carmel Point, which includes the Area of Special Biological Concern. Water samples are being taken.

- Contractor were working on creating a Lift Station Bypass with two pumps (figure 14 – 17).

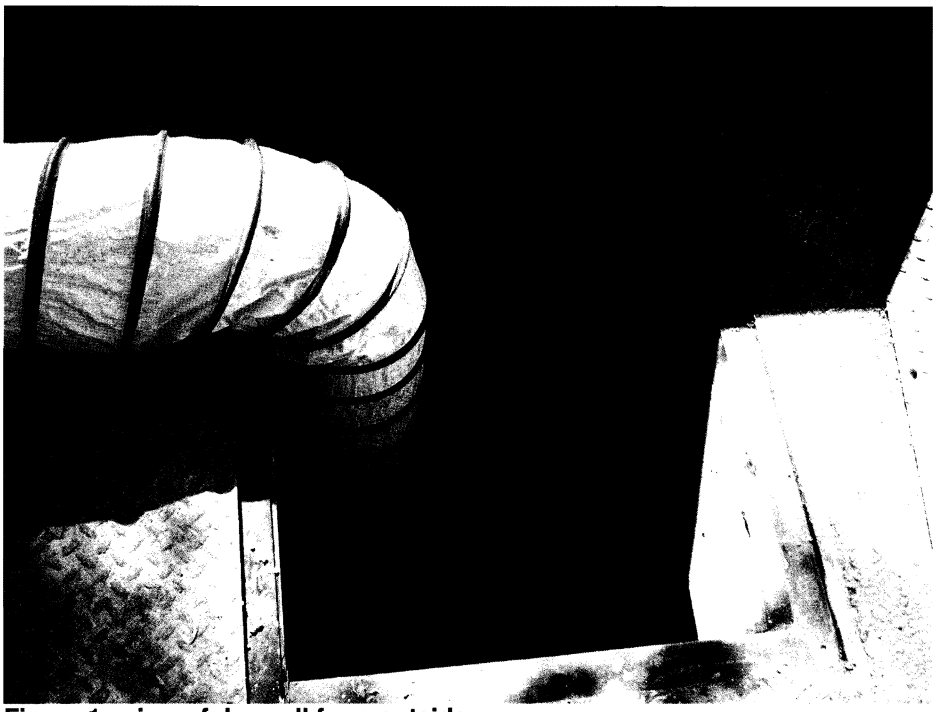


Figure 1 - view of dry well from outside

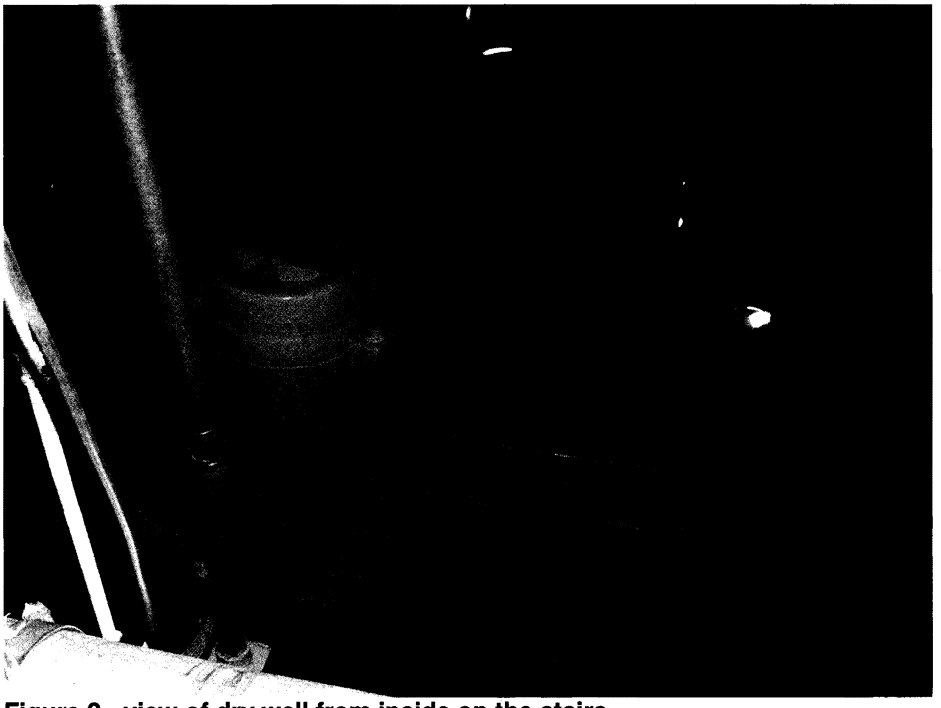


Figure 2 - view of dry well from inside on the stairs

Figure 3 – The far end of the yellow hose is inside the dry well. The sewage flowed out of the door and to the left down into the alleyway (shown in next figure).

Figure 4 - Lift station and dry well is to the right. The sewage flowed down the landscape, into the storm drain in this alleyway.

Figure 5 - close up view of landscape in Figure 4, right side of stairs

Figure 6 - close up view of landscape in Figure 4, left side of stairs

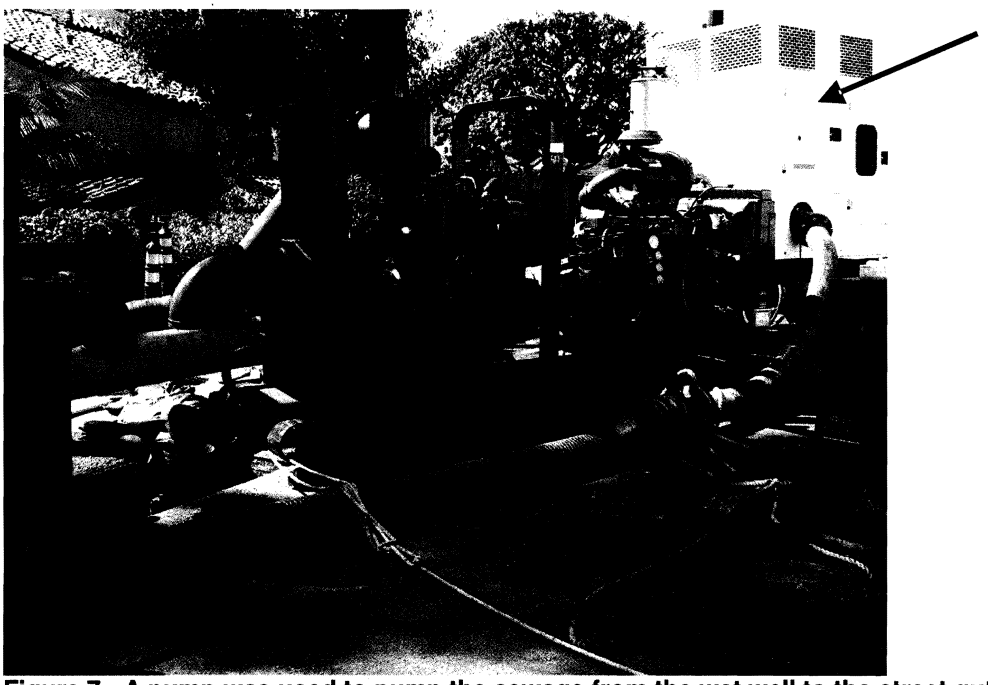


Figure 7 - A pump was used to pump the sewage from the wet well to the street gutter storm drain. The wet well is under the sidewalk.

Figure 8 - The sewage from the wet well was pumped to this storm drain, upstream from the alleyway/ storm drain shown in figure 4.

Figure 9 - Outlet of the storm drain, on to the beach, at the end of Bluebird Canyon Drive

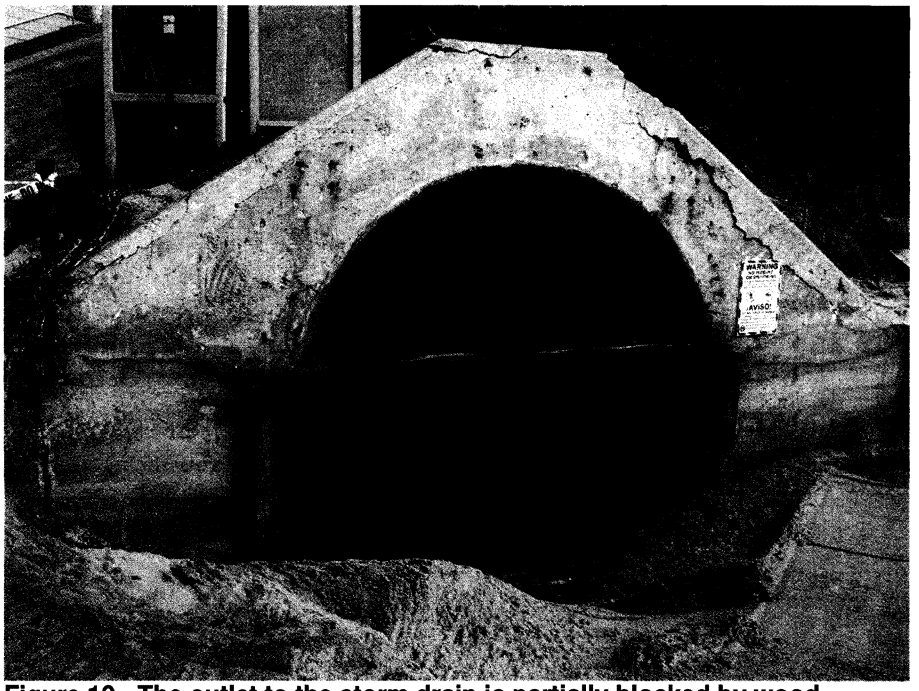


Figure 10 - The outlet to the storm drain is partially blocked by wood.

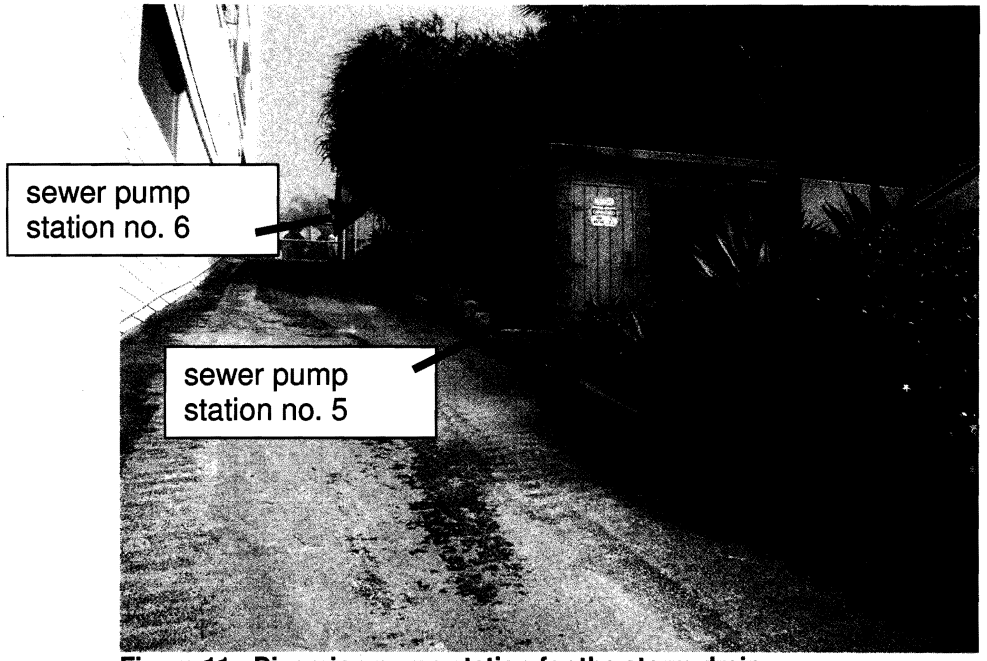


Figure 11 - Diversion pump station for the storm drain.

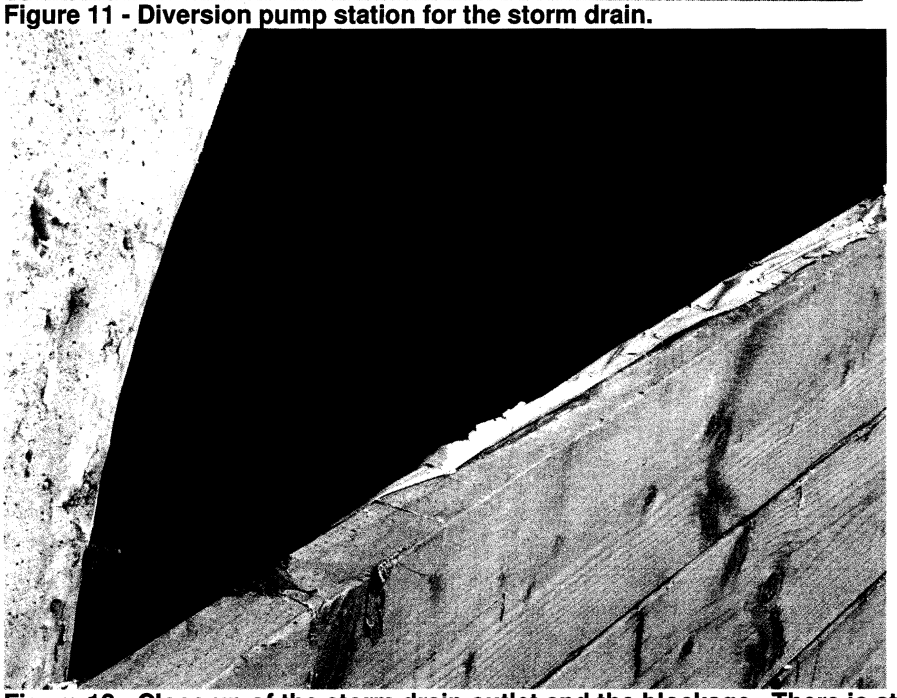


Figure 12 - Close up of the storm drain outlet and the blockage. There is still some water inside.

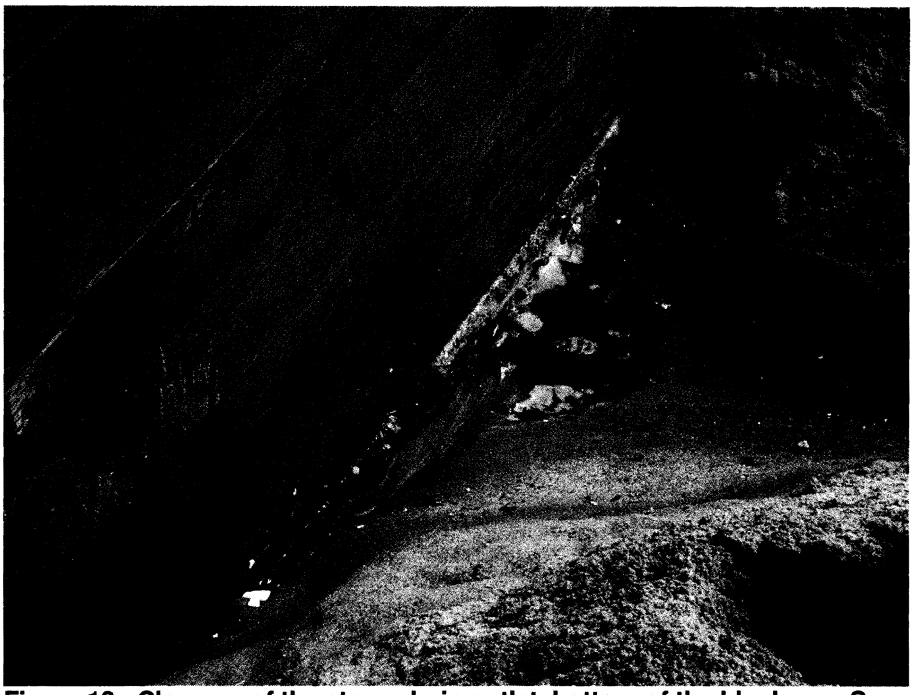


Figure 13 - Close up of the storm drain outlet, bottom of the blockage. Some water is seeping out of the bottom.

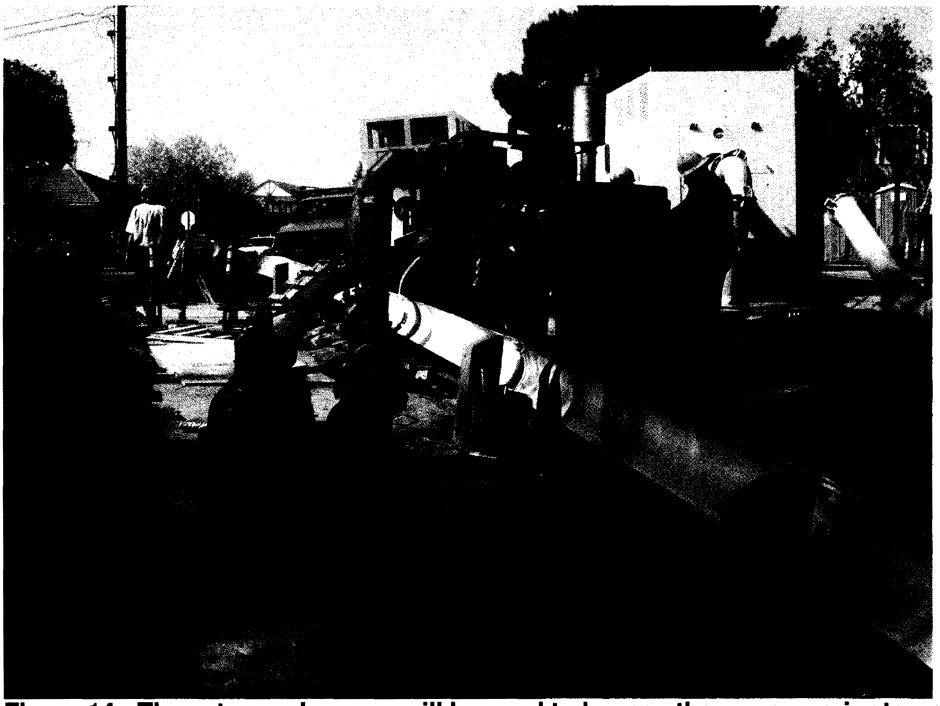


Figure 14 - These two red pumps will be used to bypass the sewage prior to entering the wet well, if the lift station pumps fail again.

Figure 15 - Piping was being put together for the Lift Station bypass.

Figure 16 - Piping was being put together for the Lift Station bypass.

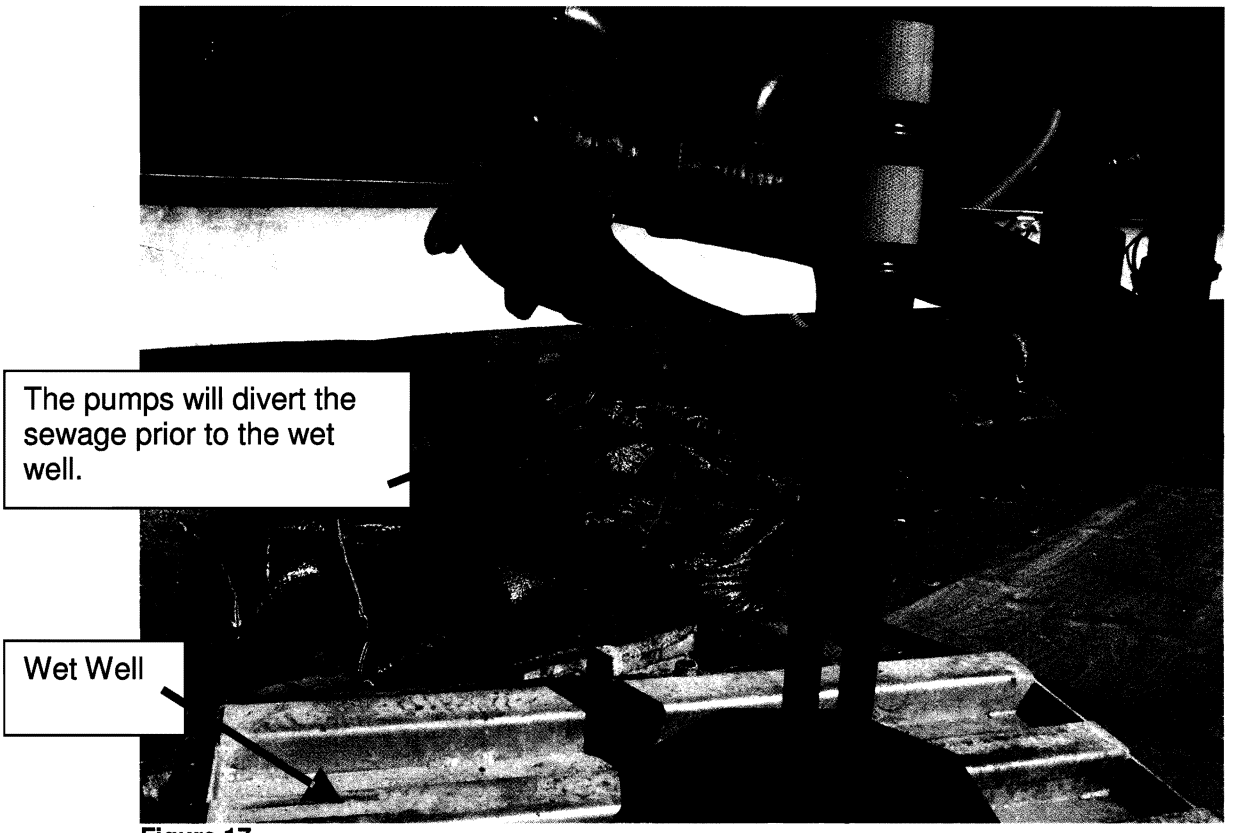

The pumps will divert the sewage prior to the wet well.
Wet Well

Figure 17

Attachment 3

BLUEBIRD SOCWA SEWAGE PUMP STATION

REPORT CONCERNING
FLOODING INCIDENT ON OCTOBER 29, 2008

Prepared For:

CITY OF LAGUNA BEACH

505 FOREST AVENUE
LAGUNA BEACH, CALIFORNIA 92651

Prepared By:

DUDEK

750 SECOND STREET
ENCINITAS, CAIFORNIA 92024

NOVEMBER 12, 2008

CITY OF LAGUNA BEACH
BLUEBIRD SOCWA SEWAGE PUMP STATION
(November 12, 2008)

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1.0 EXISTING PUMP STATION

1.1 General

The existing Bluebird SOCWA Sewage Pump Station was constructed in 1977. This pump station, located near the intersection of Calliope Street and Glenneyre Street, at the north end of Galen Drive, in the City of Laguna Beach, is a cast-in-place concrete structure with plan view dimensions that are 32 feet by 36 feet (outside measurements). It has two stories extending from elevation 33.08 feet (Dry Well floor) to top of Wet Well access shaft at elevation 65.0 feet (approximate); with the highest point on the roof structure being at elevation 67 feet. The intermediate floor is at elevation 50.0 feet.

The pump station's major features are:

- A wet well which receives influent sewage from a 15-inch diameter gravity sewer and from a 30-inch diameter gravity sewer. The City's Laguna Beach sewage pump station discharges into the gravity sewer system upstream of the Bluebird SOCWA sewage pump station. The wet well's inside dimensions are approximately 7.58 feet by 33.0 feet by 17 feet high (to top of ceiling). Key elevations are: bottom elevation is 33.08 feet; influent sewer invert elevations are 43.75 feet (30-inch sewer) and 45.25 feet (15-inch sewer); wet well ceiling soffit elevation is 48.83 feet; and top of wet well access shaft elevation is approximately elevation 65.0 feet. Pump control levels are:
  - High Water Alarm: 11 feet depth (elevation 44.08 feet)
  - Variable Speed Lead Pump ON: 9.4 feet depth (elevation 42.48 feet)
  - Variable Speed Lag Pump #1 ON: 9.9 feet depth (elevation 42.98 feet)
  - Constant Speed Lead Pump ON: 10.4 feet depth (elevation 43.48 feet)
  - Constant Speed Lag Pump ON: 10.9 feet depth (elevation 43.98 feet)
  - Low Water Alarm: 3.8 feet depth (elevation 36.88 feet)
- A Dry Well (also referred to as the Pump Room) which houses four drypit vertical non-clog sewage pumps (150 horsepower each), and a surge tank (to control hydraulic transient surge pressures). Pump centerline is at approximate elevation 36.2 feet (or 3.0 feet above floor level). Approximate Dry Well inside dimensions are: 20.92 feet by 33.0 feet by 17 feet high (to top of ceiling), not including the separate surge tank room which measures 10 feet by 10 feet (inside dimensions; plan view) with access via a doorway that was cut into the Dry Well wall after its original construction.
- A motor control room (approximate floor elevation is elevation 50.0 feet). Approximate inside dimensions of this room are: 5.83 feet by 19.33 feet by 12 feet high.
- A room that contains standby power and odor control equipment (approximate floor elevation is elevation 50.0 feet). Approximate inside dimensions of this

room are: 16.5 feet by 21.67 feet (for the main portion of this room; not including an alcove that contains a portion of the engine generator set).

- Ground elevation at the entrance to the second story is approximately elevation 50.0 feet.
- Ground level at the north side of the pump station (immediately adjacent to Glenneyre Street) is approximately elevation 65 feet.
- Paving elevation at the end of Galen Drive is approximately elevation 46 feet.
- A concrete stairway provides access from the Galen Drive to the pump station entrance on the south side of the pump station structure.
- A concrete stairway provides access from the pump station entrance to Glenneyre Street which is nearly 15 higher than the pump station entrance. The north wall of the pump station retains a portion of the embankment for that street.

The bottom floor of this two-story structure contains the pumps, and the upper floor contains the electrical gear, standby power generator, and odor control equipment. A stairway, which originates at the east end of the MCC Room, provides access to the Dry Well (on the lower floor where the pumps reside). The Wet Well is adjacent to the Dry Well, and they share a common wall along their 33.0 feet length. The Wet Well height is approximately one-half that of the Dry Well (not including the height of the wet well access shaft that extends from the wet well top slab to grade).

Photos #1, #2 and **#3** show the Pump Station exterior prior to the October 29 event.

1.2 Sewage Inflow Rate

Sewage inflow to this pump station is approximately as indicated below:

- Minimum inflow: 400 gpm (0.58 million gallons per day).
- Average Daily inflow: 1,667 gpm (2.4 million gallons per day
- Daily Maximum inflow: 2,500 gpm (3.6 million gallons per day).
- Peak inflow: 3,000 gpm (4.32 million gallons per day).

Note: "gpm" is the abbreviation for "gallons per minute".

1.3 Pump Operation, Pumping Capacity and System Redundancy

The pump station has four pumps in the Dry Well. Each pump has a rated capacity that exceeds the peak inflow rate from the gravity sewer system. Thus, the pumps operate as Operating, Standby #1, Standby #2, and Standby #3. The pump station also has standby power that can maintain the pumps in operation should there be a loss of utility power. Having three permanently-installed standby pumps and a permanently-installed onsite standby power generator are key features for this facility because it lacks onsite emergency storage (to provide short term storage of inflow should the station lose pumping capacity due to mechanical or electrical failure). **Photo #4** shows the constrained layout of pumps and piping inside the Dry Well.

Pumps #1 and #2 operate at variable speed, and Pumps #3 and #4 operate at constant speed. Pump #1 is the most westerly pump, and Pump #4 is the most easterly pump (nearest the stairway landing), with pumps sequentially numbered between them.

The design operating pressure with one pump ON (at full-speed), is approximately 40 to 45 pounds per square inch (psi).

A bubbler system measures the depth of sewage in the wet well, and provides an analog signal (4 to 20 mA) to the Pump Control Panel, which has a programmable logic controller (PLC) and software that starts, stops and varies pump speed according to the depth of sewage in the wet well.

1.4 Flow Meter

A strap-on ultra-sonic flow meter, manufactured by Greyline Instruments, Inc., is installed at the eastern end of the header, just prior to this piping exiting the Dry Well. This flow meter provides an analog signal (4 to 20 mA) that is sent to a circular chart recorder located in the MCC Room on the upper level. This flow meter also provides a control signal to the ECO2 odor control system that regulates the production and injection of oxygen into the buried force main immediately downstream of the pump station. **Photo #5** shows this flow meter and the 16-inch shutoff valve on the discharge header.

1.5 Piping

1.5.1 General

Pump "suction" and "discharge" piping is ductile iron, of sizes as indicated below:

- Suction piping is 14-inch diameter.
- Discharge piping is 12-inch diameter.
- Discharge header is 20-inch diameter (reducing to 16" diameter just prior to exiting the Dry Well).

The suction and discharge piping is rated for at least 150 psi operating pressure.

Photo #6 shows the suction piping for Pump #2, which is a typical layout for all four of the pumps.

Photo #7 shows the discharge piping for Pump #2. That piping layout is typical only for Pumps #1 and #2 (the two new pumps).

Photo #8 shows the fabricated steel expander that connects the 8" pump discharge to the 12" check valve, for Pump #3 and #4, only.

1.5.2 Joint Connections

Almost all of the pipe and valve connections are flanged. The exceptions to flanged connections occurs at:

- A short 16-inch diameter spool that is immediately upstream of the flow meter. This spool includes a Victaulic coupling that facilitates disassembly of the piping system at that location. It is important to note that Victaulic couplings are thrust restrained; that is to say, the piping system cannot pull apart there unless the coupling is removed (which requires loosening and removing four bolts).

- A short 12-inch diameter spool on the discharge piping for each pump, that is between the shutoff valve and check valve. This spool is flanged-by-plain end, and connects to the shutoff valve (at its downstream end) by stabbing into the collar of a Uni-Flange flanged coupling adaptor (see Paragraph 1.7 below for further discussion of this coupling) that is bolted to the upstream flange of the shutoff valve. This coupling provides restrained against the spool pulling out of its collar by set screws that extend through the coupling's collar, and bite into the outside of the spool. When properly installed, this coupling provides a restrained joint. If the set screws are not properly installed, the coupling may not resist pull-out forces exerted on that spool (by water pressure acting against the check valve flapper in its closed position).

- New Pumps #1 and #2 will be installed, per the pump manufacturer's recommendations, with a rubber coupling between the pump discharge flange and the upstream end of the check valve. This coupling could be furnished with tie-rods that preclude lateral displacement, but such restraint is not being provided. We understand the reason that is the case is Cornell (the pump manufacturer) wants to de-couple their pump from the "stiffness" inherent in the downstream piping system. The piping system's stiffness could impact the resonant frequency characteristics of their pumps, thereby causing vibration problems when the pumps operate at variable speed. This rubber coupling is flanged on both ends, however its design allows a limited amount of movement (axial, lateral, and angular displacement). Other benefits from having a rubber coupling near the pump discharge flange are: (a) it accommodates slight mis-alignment of the pump to the downstream piping system; and (b) it provides a convenient location to disassemble the piping system to facilitate pump removal.

The fact that almost all joints are flanged, with the only exceptions as noted above, indicates the piping system is stable if properly installed. That is to say, there should be no concern about the piping system "coming apart" due to operating pressures.

1.6 Valving

Valves are provided on the piping as indicated below:

- Suction piping: 14-inch resilient wedge gate valve for Pumps #1 and #2, and a non-lubricated plug valve for Pumps #3 and #4. These valves are flange-by-flange, and securely bolt to the piping elements at both ends.
- Discharge piping: 12-inch resilient wedge gate valve, and spring-assisted external-lever 12-inch check valve, for each of the four pumps. These valves are flange-by-flange, and securely bolt to the piping elements at both ends.
- Discharge header: 16-inch resilient wedge gate valve (note: the 20-inch diameter header reduces to 16-inch diameter upstream of the flow meter spool which is immediately upstream of the gate valve). This valve is located just prior to the discharge header exiting the Dry Well through a penetration in the below-grade wall. This valve is flange-by-flange, and bolts securely to the piping elements at both ends.
- Surge tank inlet/outlet line: 18-inch non-lubricated plug valve valve. This valve is flange-by-flange, and bolts securely to the piping elements at both ends.

The valving is rated for at least 150 psi operating pressure. Flanges are Class 125 cast iron rated for 175 psi (per ANSI B16.1, Class 125, Class "A" cast iron).

City Staff have reported the 16-inch gate valve on the discharge header is inoperable. It is stuck "open".

As a result of the flooding incident on October 29, City Staff are now aware the 12-inch gate valve for Pump #1 discharge piping is not shut tight. We do not know how far this valve is open, but it is partially open.

Photo #7 shows how the valving is supported for each pump's discharge piping. A separate pipe support is furnished beneath the shutoff valve, spool with Uni-Flange coupling, and check valve. Each of these pipe supports are bolted to the floor. There are differences, however, in how each support is connected to the piping element it is supporting:

- The pipe support for the shutoff valve is bolted to the valve's downstream flange. Thus, movement of the valve laterally would require the pipe support to "bend"; which is not likely to occur.

- The pipe support for the pipe spool (with Uni-Flange) is connected to the spool by means of a U-Bolt that has a "friction hold" against the outside diameter of that spool (for half of its circumference). If that U-bolt is not sufficiently tight, the spool could move laterally and pull out of the Uni-Flange coupling).

- The pipe support for the check valve is simply a gravity support. A saddle is placed against the bottom of that valve, and there is nothing inherent in that support system that would preclude that valve from moving laterally. This is a heavy valve (weighing several hundred pounds), so its mass would tend to resist unbalanced forces that might be pushing against it due to hydraulic pressure. The magnitude of the force that could be successfully resisted due to this valve's weight is not known to Dudek, but we anticipate it could not resist the several thousand pounds of force that would be associated with 40 psi acting against the internal components of a 12-inch check valve.

1.7 Uni-Flange Coupling on Pump Discharge Piping

In the last fifteen years the original knife gate valves, which isolate each pump from the discharge header, were replaced with resilient wedge gate valves. To make up the difference in pipe lengths, a short ductile iron spool was installed between the discharge line shutoff valve and the check valve. That spool is connected to the upstream end of the shutoff valve by a 12-inch Uni-Flange Series 200 restrained joint flanged coupling adaptor. That coupling is intended to connect plain end pipe to flanged pipe or valving. That coupling has 12 each set screws that are tightened down so that they "bite" into the outside of the plain end pipe. When properly installed, this coupling is able to prevent the plain end pipe from slipping out of the coupling for operating pressures up to 175 psi. That coupling is also rated to be leak-free for pressures up to that pressure.

Photo #9 shows the Uni-Flange coupling on the discharge piping for Pump #3.

Photo #10 shows the Uni-Flange coupling on the discharge piping for Pump #2.

1.8 Force Main

Within a short distance after exiting the Dry Well, the 16-inch diameter discharge header increases to 27-inch diameter and transitions to asbestos cement pipe. This sewage force main extends along Galen Drive, then turns west to Highway 101, and then turns south, extending more than sixteen thousand feet to a point of discharge into the South Orange County Wastewater Authority's Coastal Treatment Plant.

1.9 Bypass Pumping

A 10-inch bypass pumping connection is provided on the force main approximately 100 feet south of the pump station. Portable engine-driven pumps (that can be temporarily installed within the south lane of Glenneyre Street) can be connected to two 10-inch pipes that provide suction to the influent sewer system (upstream of the pump station wet well), and those pumps can discharge through temporary piping installed on top of the ground, to the bypass pumping connection. When portable pumps and temporary piping is provided in this configuration, all inflow can be routed around the pump station. However, the configuration of the bypass suction piping requires the wet well water level to be substantially raised to limit the suction lift for those temporary pumps. When the wet well water level is raised to that elevation, the wet well is flooded to its ceiling, which submerges electrical "chases that are attached to the wet well ceiling. The water integrity of those chases is compromised due to corrosion of the concrete which forms those structural features. If the wet well floods to that elevation, then the chases will fill with sewage, and sewage then flows into the Dry Well via those electrical chases which penetrate and terminate at the common wall between the Wet Well and the Dry Well.

2.0 IN-PROGRESS REHABILITATION PROJECT

In July 2008, Dudek was retained to provide engineering services for certain improvements to the Bluebird SOCWA sewage pump station. Those improvements include:

- Replacing the influent pipe configuration into the wet well. This involves constructing three new manholes within Glenneyre Street, and constructing several short segments of replacement gravity sewer. This improvement addresses a severe wet well ragging problem, facilitates a permanent bypass system, assists with improving odor control by installing double-sealed manhole lids on those new sewer manholes, and is consistent with the City's Strategic Plan which has identified these particular manholes as a priority for rehabilitation or replacement.
- Rehabilitating the wet well; restoring deteriorated concrete, and providing a new corrosion-resistant lining. This improvement addresses the wet well walls and ceiling as well as the electrical chases that are affixed to the wet well ceiling.
- Providing a new bypass pumping configuration that will provide permanently-installed suction piping, and a means to isolate the wet well from inflow.

- A new wet well level sensing system and new pump control panel. This system will use two pressure transmitters located in the Dry Well (with taps to the wet well through the common wall with the Dry Well).
- A new bridge crane system for the Dry Well.
- Re-installing all wiring that is presently located in the electrical chases. This new wiring will be placed in PVC conduits that will be added to the re-constructed electrical chases, and then the chases will be filled with light-weight concrete to ensure they remain watertight in the future.
- Adding a motor-operated hoist to the exterior monorail system.
- Constructing a new loading dock, with associated concrete apron, to facilitate moving heavy equipment from the monorail area outside the pump station building, to trucks that park at the end of Galen Drive.
- Replacing the wet well access hatch that is located within the sidewalk along the southside of Glenneyre Street. The design of this new hatch will provide greater than normal performance in regards to being odor tight. This improvement provides added odor control for this pumping facility.

The design phase of this project, which was developed by City Staff as part of a continuing effort to upgrade the Bluebird SOCWA sewage pump station, is expected to be completed by April 2009.

3.0 NEW PUMPS #1 AND #2

Pumps #1 and #2 have been out-of-service for several months due to a protracted effort to replace them with new Pumps. The ESSCO pumps originally purchased as the replacement pumps were ultimately rejected and removed. The City subsequently purchased two Cornell pumps, which were recently delivered for installation. Schuler Engineering (a General Contractor) was retained by the City to install those new pumps. Pump installation involved removing an existing steel spool which expanded the pipe size from the 8-inch diameter pump discharge flange to the 12-inch diameter check valve, and using a rubber coupling to achieve the required pipe size expansion. We understand the pump manufacturer (Cornell) recommended use of a rubber coupling where their pump connects to the existing discharge piping. The rubber coupling is intended to limit the transmission of mechanical vibration from the pumps to the discharge piping, and to avoid the discharge piping from impacting the resonant frequency of the pumps due to the "stiffness" they might add to the combined pump/piping system.

During October 2008, the Contractor was in the process of installing the two new Cornell Pumps (Pumps 1 and 2). By the week of October 27, Pump #2 had been completely installed, and Pump #1 was partially installed. The remaining work for Pump #1 was:

- The rubber coupling was pending installation.
- The steel spool between the pump discharge nozzle and the rubber coupling was pending installation.

With the piping elements not yet installed, the discharge piping system between Pump #1 and the discharge header was not continuous. This is not a problem if the piping

components that are under pressure do not leak and are properly restrained so that they do not separate at a joint. The shutoff valve and check valve were supported by pipe stands.

Photo #11 shows those two new pumps in their installed condition on October 30.

4.0 DRY WELL FLOODING ON OCTOBER 29, 2008

In the early morning hours of Wednesday, October 29, the pump station Dry Well flooded. Automatic alarms sent by telemetry notified City Staff that a pump station failure had occurred, and the first responder was on-site within 20 minutes. This responder saw sewage filling the Dry Well. Initial efforts were made to setup small portable pumps to empty the Dry Well, but this effort did not succeed because the rate of inflow into the Dry Well was too great. Eventually, the Dry Well filled to the second story level, at which point sewage flowed out of the building onto Galen Drive. The storm drain inlet at the end of Galen Drive allowed sewage to flow into the storm drain system, conveying sewage directly to Bluebird Beach and causing contamination of the Pacific Ocean.

Within the first hour of the spill, City staff engaged assistance from the South Coast Water District. SCWD staff immediately mobilized to furnish and install two portable engine-driven pumping units (with all appurtenances), which allowed the Dry Well to be drawn down sufficiently to allow visual observation of where the sewage was entering the Dry Well. The problem was seen to be partial separation of the Uni-Flange Coupling that is between the shutoff valve and check valve for Pump #1. Sewage was observed by City Staff to be pouring out of the bottom half of where the spool fits into the Uni-Flange coupling. The water-tight seal in the bottom half of that coupling had been compromised by the bottom portion of the spool pulling slightly away from its intended orientation inside the coupling's collar.

City Staff were eventually able to install a blind flange on the upstream side of the Pump #1 shutoff valve, which stopped inflow to the Dry Well. During the remainder of October 29, the Dry Well was then emptied, and both the inside of the Dry Well and outside of the pump station, were substantially cleaned.

Dudek was retained by the City to observe the Dry Well and piping system, and to make an independent determination of what we believed caused the Dry Well to flood. Dale Gruel and Jeff Pape from Dudek's Encinitas office visited that pump station, at City request, on the morning of October 30. The remainder of this report provides Dudek's findings, conclusions and recommendations. The use of the pronoun "we" or "our" in this report refers to Dale Gruel's and Jeff Pape's opinions or observations.

5.0 FLOODING CAUSATION

5.1 Uni-Flange Coupling for Pump #1

The Uni-Flange coupling for Pump #1 had been removed by City Staff prior to Dudek arriving onsite on October 30. This coupling had been removed because it interfered with installing the blind flange on the upstream side of the shutoff valve. We noted that only two significant "scratches" on the outside of the ductile iron pipe spool that had been stabbed into this Uni-Flange Coupling, and those scratches were not as deep as we would have expected if the set screws had been properly installed. City Staff informed us that they had not changed how the set screws were installed; they had simply placed the already dislodged coupling, on the floor. We noted that most of the set screws (10 of 12 set screws) had not been screwed down sufficiently to even touch the outside of the pipe that they were intended to restrain. The remaining two set screws had very limited extension past the coupling collar. The set screws had been previously painted, and because that paint was not broken, we concluded the set screws had not been adjusted (tightened or loosened) by City Staff or by the Contractor.

The fact that this Uni-Flange had been improperly installed would not have caused that pipe spool to separate, except for the fact that the shutoff valve was found to be leaking.

Uni-Flange coupling set screws, which extend above the coupling collar, are properly installed when torqued to a force recommended by the coupling manufacturer. Once they are so torqued, the coupling is properly installed, and the outside appearance of the set screws would not be noticeably different then if they had not been properly torqued. Neither City Staff nor the Contractor could have been expected to know that the set screws were not sufficiently torqued by visual observation alone. This condition would have been confirmed only by using a torque wrench to check the setting of each set screw.

Photos #12 through **#15** show the "failed" Uni-Flange coupling after it was taken off the end of the pipe spool for Pump #1. This removal occurred after the Dry Well had flooded, as part of the City's efforts to stop inflow through the dis-lodged spool where it fit into the Uni-Flange coupling. We understand none of the set screws were adjusted to allow the coupling to be removed. The coupling was simply slid off the end of the pipe spool by City Staff.

5.2 Shutoff Valve for Pump #1

The shutoff valve for Pump #1 does not completely seal. This means that discharge header pressure (approximately 40 psi) presses against the check valve flapper. Without that thrust force being resisted by a fixed object (such as pump that is bolted to the Dry Well floor), there is a force (perhaps as much as 4,000 pounds) that acts against the check valve, and would tend to cause the pipe spool to pull out of the Uni-Flange. The fact that this may not have happened previously may be indicative that the check valve may have been bumped, thereby slightly shifting the position of the pipe spool within the Uni-

Flange coupling. This slight shift may have caused decreased resisting force (against spool pull-out) by the Uni-Flange coupling. Another explanation may be that the shutoff valve was operated to ensure it was functional, and it was then unable to re-seal because something became lodged between the bottom of the gate and the valve body.

Another possibility is that testing of the newly-installed Pump #2 may have caused cyclic pressure surges that were not remediated by the surge tank, and those pressure spikes caused pressures that had not been previously experienced by the piping system (though still well within the pressure rating of the piping system), and these slightly increased thrust forces exceeded the capability of the improperly installed Uni-Flange coupling to resist them.

Photo #16 shows the shutoff valve and check valve for Pump #1 (note: the Uni-Flange coupling is not present; this photo was taken after the October 29 event).

5.3 Dry Well Flooding

For reasons we cannot determine, the piping system became unstable, and the unresisted thrust force caused by hydrostatic pressure in the Pump #1 piping system, led to separation of the pipe spool at the Uni-Flange coupling. This allowed sewage to flow into the Dry Well. Once the pump motors were submerged, they eventually quit working, and that allowed the wet well level to rise to the elevation at which water could enter the electrical chases, which exacerbated the Dry Well flooding situation by causing the electrical chases and associated electrical conduits to fill with sewage.

Once the bypass pumping system was hooked up, and the blind flange installed at the upstream end of the Pump #1 shutoff valve, inflow to the Dry Well was stopped, and repairs could commence.

6.0 CITY EMERGENCY RESPONSE

Dudek Staff (Jeff Pape and Dale Gruel) were onsite by 9:00 a.m. on October 30 (approximately 30 hours after the Dry Well flooded). There were no odors outdoors, and the exterior grounds were relatively dry, and were free of sewage solids (organic or other solids such as plastics or paper products). **Photo #17** shows the pump station exterior on October 30. The exterior ground was substantially dry and free of sewage debris. Subsequent to this photo being taken, City Staff spread sand on this area to further restore it to a clean and walkable condition.

The interior of the pump station was virtually odor free, dry, and substantially clean of sewage debris. In hard-to-access areas of the walls and ceiling, paper products were not completely removed. Nevertheless, the environment inside the pump station was conducive to pump station operation and maintenance. We spent several hours inside the Dry Well taking photos and making field observations concerning the potential factors leading to the pump station failure, without having to deal with an offensive environment.

A bypass pumping system was in-place and functioning. It was able to handle the full-range of influent sewage rates. This system was comprised of two engine-driven pumping units, with separate fuel tanks, battery packs, and sound attenuation curtains. All of the temporary discharge piping was 10-inch diameter high density polyethylene (HDPE). The system was able to handle all influent sewage. Suction piping for these temporary pumps was completely contained within the area cordoned off by the sound attenuation curtains. The discharge piping extended above-grade from these pumps, along a portion of the sidewalk, and then down the slope within the City's property, to a point of connection (to a 10-inch diameter riser connected to the force main) that is located near the driveway of a home near the pump station site.

Photos #18 through **#22** show the bypass pumping system as installed on October 29.

Traffic cones had been setup to block off the southerly lane of Glenneyre Street from its intersection with Calliope Street, for several hundred feet south along Glenneyre Street. Sand bags had also been placed to preclude sewage flow from flowing down unprotected side slopes of the street embankment. **Photo #23** shows traffic control features and surface drainage features that were installed by Griffin Dewatering and City Staff on October 29, along a portion of Glenneyre Street.

Because the street elevation (at which the temporary pumps were installed) is approximately 65.0 feet, and the wet well water surface is typically at, or below, elevation 44.0 feet, the suction lift for those pumps is approximately 22 feet, which is excessive. Thus, the wet well level must be raised to reduce the suction lift so that the pumps can operate at their intended capacity of 3,500 gpm (peak pumping rate). If the wet well is raised to within 18 inches of the wet well ceiling, the electrical chases will become submerged. The wet well ceiling soffit elevation is at elevation 48.83 feet; thus electric chase submergence begins when the water level rises to elevation 47.33 feet. Even at that water surface elevation, the pump suction lift is nearly 18 feet.

Because the electric chases are deteriorated (a condition that will be resolved when the improvements being addressed by the City's current improvement project as described in Paragraph 2.0 above, are constructed) and leak, raising the wet well water level to the extend described above will cause those chases to fill with sewage. When that occurs, sewage will flood into the pump station via the chase openings into the Dry Well. Operating the bypass pumps at the level of Glenneyre Street is therefore problematic as wet well level must be carefully controlled to reduce pump suction lift while avoiding submergence of the electric chases that are attached to the wet well ceiling.

Our observations on September 30 indicated City Staff were successfully operating the bypass pumping within the wet well water level restrictions mentioned above, because the Dry Well was dry and accessible.

7.0 RECOMMENDATIONS

7.1 Phase 1 Repairs or Improvements (there repairs or improvements are intended to occur within one month of the October 29 event)

A. Clean and sanitize the Dry Well and other interior surfaces contaminated from contact with sewage. (status: accomplished by A-1 Restoration)

B. Open electrical boxes and convenience outlet boxes to allow sewage to drain out. (status: accomplished)

C. Meggar test the electrical system to identify if there are "shorts" that might endanger workers, or might lead to failure of motors, or to failure of other electrical devices. (status: accomplished by RVF Electric)

D. Replace interior lighting fixtures damaged by submergence. (status: accomplished by RVF Electric)

E. Exercise existing valves inside the Dry Well to restore them to service (so that they are verified to open, and close drip-tight). (status: The City hired iWater to exercise "stuck" valves and return them to service; this effort was made without success)

F. Restore the ECO2 super-oxygenation to service. (status: accomplished by Pacific Technical)

G. Install tie-rods across the ductile iron spool that spans between the shutoff valve and the check valve, for each pump. These tie-rods will prevent separation of the pipe spool from the Uni-Flange coupling regardless of the torque applied to its set screws. (status: accomplished for Pumps #2, #3 and #4; Tie rods for Pump #1 will installed in conjunction with replacement of its shutoff valve).

Photo #24 shows one of the two tie-rods that were installed across the Uni-Flange coupling-restrained spool for Pump #3.

H. Check and adjust set screw torque for each Uni-Flange coupling. Contact the coupling manufacturer to learn the required set screw torque. (status: not yet done)

I. Relocate the temporary pumps from Glenneyre Street to the north end of Galen Drive. Suction for the relocated pumps will be taken from the suction pipe to Pump #3. The pump centerline elevation will then be at approximately 49.0 feet. Given the key elevations listed in Paragraph 1.1 above, the required suction lift is therefore considerably reduced (to a magnitude less than 10 feet, which is a desirable suction lift condition). HDPE piping would be extended from the suction line to Pump #3, with that temporary piping extending through the Dry Well access hatch that is in the sidewalk adjacent to the south entrance to this building. That piping would then extend through the concrete wall that borders that walkway, and be placed at grade

to the new location for the bypass pumps (adjacent to a corner of the adjacent apartment complex. (status: accomplished by Griffin Dewatering)

Taking suction for the bypass pumps using the suction line from Pump #3 precludes that pump from operating unless suction piping changes are made; including the addition of a valve between Pump #3 and the bypass pumps.

J. Re-install the line stop valve at the end of Galen Drive, so that it can be used as a new point of bypass pumping connection that allows force main pressure to be taken off of the pump station discharge header. Once the sewage within the force main from this line stop valve to the pump station discharge header is emptied, it would then be possible to remove and replace valving within the Dry Well (which would be implemented as part of the longer-term improvements described below). (status: not yet done).

Both City Staff and Dudek personnel met with Mr. Jeff Maichel (International Flow Technologies) on October 10, to discuss re-use of the Line Stop his company previously installed near the intersection of Galen Drive and Blue Bird Canyon Drive. A valve can be re-installed in that Line Stop, to allow bypass pumping to occur while blocking pressure back to the pump station discharge header.

K. Install (and bury within Galen Drive) 10-inch diameter HDPE piping from the proposed location for bypass pumps (per Dudek's design; see Paragraph 2.0) to the vicinity of the re-installed line stop valve at the end of Galen Drive (see Item "G" above). This buried piping, in conjunction with permanently buried suction piping that will be installed per Dudek's design (see Paragraph 2.0) will facilitate bypass pump operation for: (1) planned outages of the pump station to construct repairs or improvements, and (2) responding to unplanned emergencies when there is loss of pumping capacity. (status: not yet done)

L. Test and verify all alarms are being collected and properly transmitted by the onsite SCADA system. (status: not yet done)

M. Restore Pumps #2 and #4 to automatic control and operation. This entails providing each of these pumps with a re-furbished motor. Pump #2 is normally controlled by a variable frequency drive (VFD), and Pump #4 is normally controlled by an electronic soft starter. For this proposed operating configuration, a temporary power cable (SO Cable) will be extended from Pump #1's VFD to Pump #4, thereby allowing Pump #4 to operate at variable speed. This temporary configuration will enable two pumps to operate (as Operating and 100% Standby). (status: accomplished)

N. Replace the 12-inch shutoff valve for Pump #1, and complete the discharge piping installation for this pump by installing the steel spool and rubber coupling between the check valve and the pump discharge flange. This cannot occur until Items "G" and "H" are accomplished. (status: not yet done)

City Staff have ordered this valve for expedited delivery, and anticipate it will be available for installation within two weeks (by late-November).

O. Restore the existing Dry Well monorail hoist motor to service so that it can aid in the construction of other improvements or pump station maintenance activities. This is a small horsepower motor and could be readily accomplished. (status: not yet done)

P. Restore the discharge header flow meter to service. (status: not yet done)

7.2 Phase 2 Repairs or Improvements (these repairs or improvements are anticipated to occur within two or three months of the October 29 event)

A. Restore Pump #1 to service by installing a new immersible motor (suitable for short-term submergence) to be obtained from Cornell Pumps. (status: this new motor is already on "order" and delivery is expected soon)

B. Replace the refurbished motor on Pump #2 with a new immersible motor to be obtained from Cornell Pumps. Retain the refurbished motor offsite for immediate access and re-installation on one of the pumps at this facility in the event a motor fails. (status: this new motor is already on "order" and delivery is expected soon)

C. Install the valve cluster immediately upstream of the existing Line Stop. This valve cluster will comprise a permanent point of connection for future bypass pumping. Once this valve cluster is installed, and the HDPE piping that will convey sewage to it from the temporary pumps is installed, the Line Stop can be removed from service. (status: the concept of how this new bypass pumping connection has been discussed with City Staff, IFT personnel, and Dudek Staff. Once there is complete agreement on how this new connection will be configured, the valves, fittings, piping, and vault should be purchased by the City for expedited delivery and installation as part of Phase 2.

We anticipate the City will authorize Schuler Engineering to construct this new bypass. To expedite implementation, we recommend the City consider having this construction performed without the plans and specifications that are typically prepared for municipal projects.

D. Complete the design of pump station improvements as previously authorized by the City (see Paragraph 2.0). Those improvements are summarized below:
    - Revise the influent sewer to the wet well (along with two or three new manholes).
    - Rehabilitate the wet well (including replacing its access hatch, and restoring the electrical chases, and restoring damaged concrete).
    - Provide a means to bypass the wet well, and convey flow to bypass pumps located near the end of Galen Drive, using permanently installed suction piping.
    - Provide two new pressure transmitters and a new pump control panel/scheme/software.

- Provide a new bridge crane for lifting and transporting equipment inside the Dry Well.
- Adding an electric hoist to the exterior monorail system.
- Constructing a loading dock and concrete apron that will facilitate loading equipment onto trucks for transport to offsite locations, or for unloading equipment to be installed at this pump station.

E. Modify the design drawings and specifications associated with Task "D" above, to incorporate additional improvements recommended as a result of the October 29 event, as summarized below:
   - A different manhole and piping configuration for the gravity sewer system immediately upstream of the wet well. This configuration will eliminate a manhole and provide further separation between an existing water line and the new gravity sewer lines.
   - A different sewer bypass layout at the north end of Galen Drive, to create more space for temporary pumps, and to allow use of straight piping segments of short length, for the above-grade suction and discharge piping.
   - A new permanent bypass pumping connection near the existing Line Stop that is at the south end of Galen Drive, along with buried piping from the new temporary pump location.
   - Replacing valves and piping in the Dry Well as deemed appropriate to ensure an additional 20 years (minimum) of service.
   - With City concurrence, design a backup control system that will provide float control for one or more of the permanent pumps located in the Dry Well.
   - With City concurrence, design a permanently-installed engine-driven bypass pump that is subject to automatic startup in the event of pump station failure (as indicated by an abnormally high wet well water level).
   - Repainting all piping and valving inside the Dry Well, to ensure future corrosion will be noticeable, and to ensure those items are well-protected from deterioration by external corrosion.

7.3 Phase 3 Repairs or Improvements (these repairs or improvements are anticipated to occur within six to eight months of the October 29 event)

This phase concerns construction of the improvements included in the design documents prepared as part of Phase 2, Tasks "D" and "E".

Photo #1: Pump Station Exterior

Photo #2: Pump Station Exterior

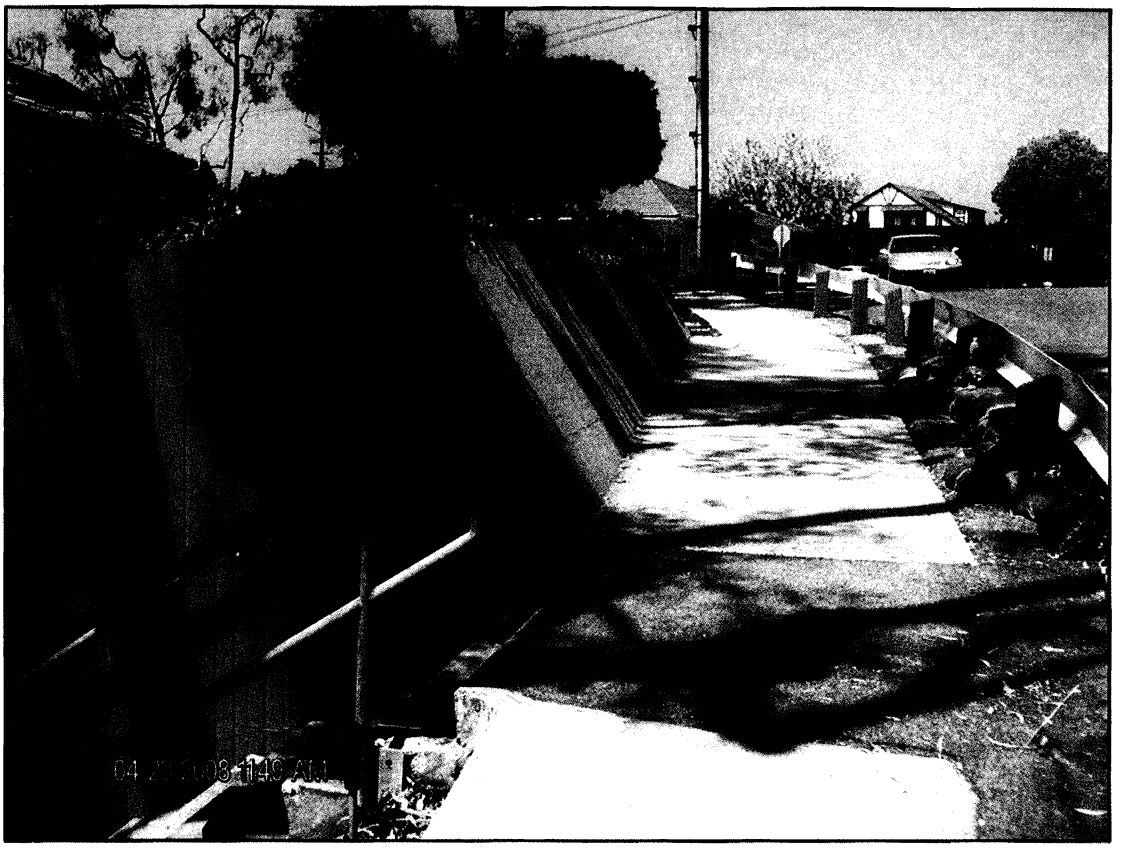


Photo #3: Pump Station Exterior (Adjacent to Glenneyre St.)

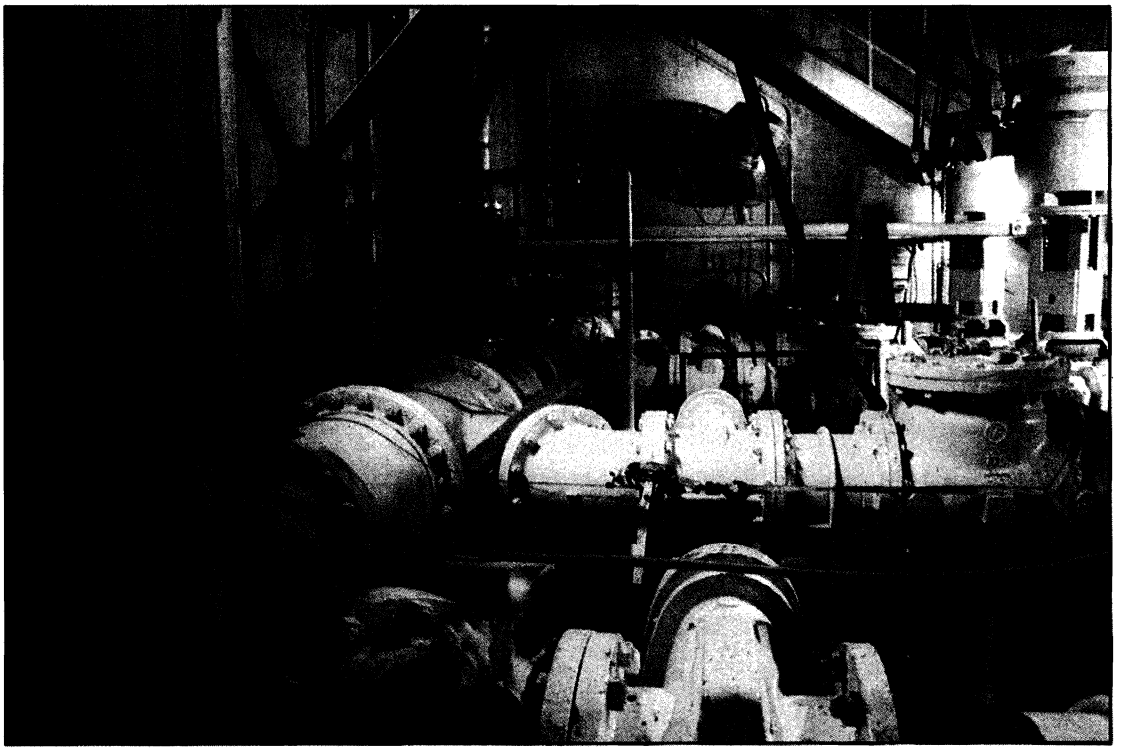


Photo #4: Dry Well Interior

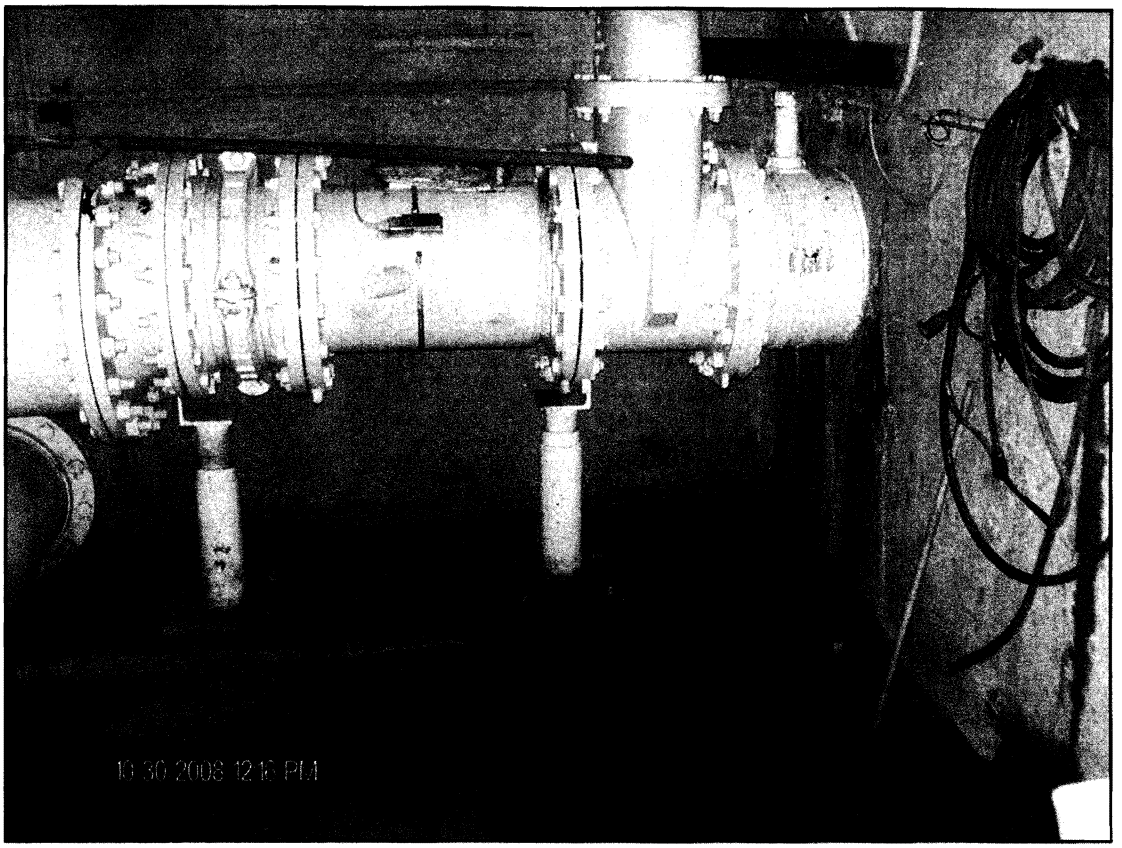


Photo #5: Discharge Header: Strap-on Flow Meter and 16" Shutoff Valve

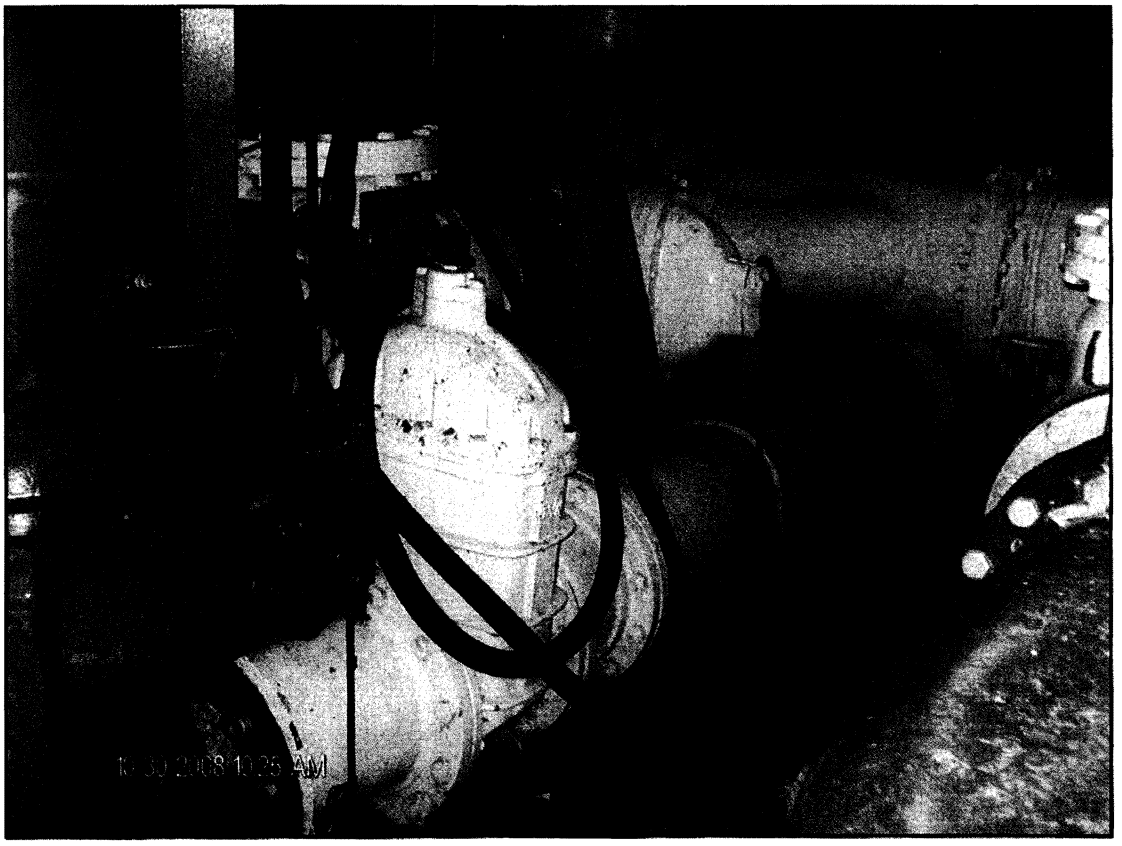


Photo #6: Pump #2 Suction Piping

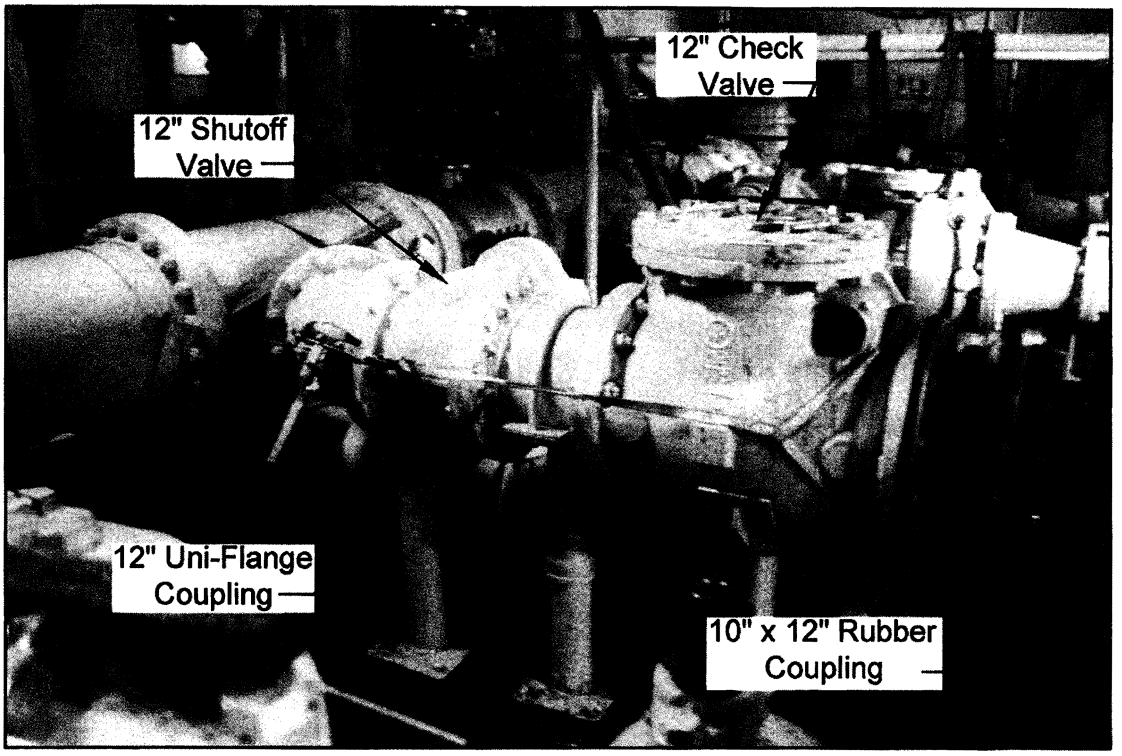


Photo #7: Pump #2 Discharge Piping

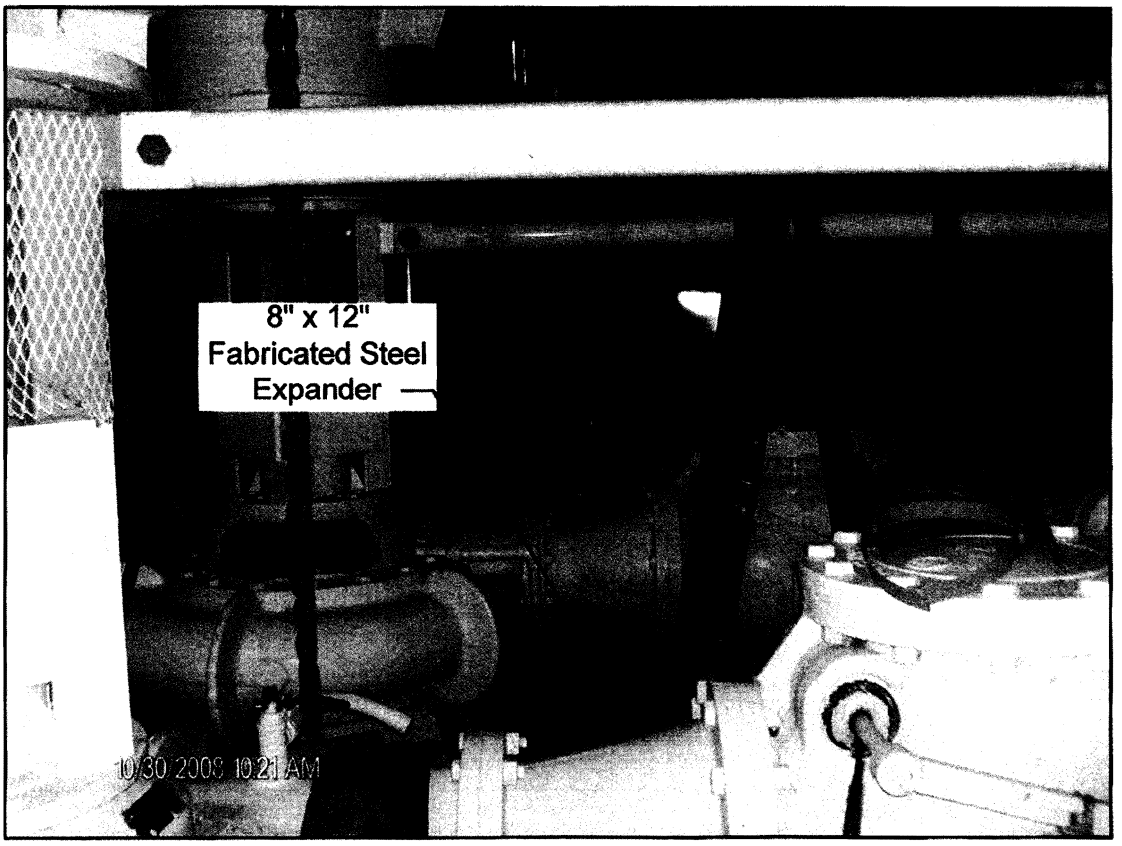


Photo #8: Pump #3 & Pump #4 8"X 12" Expander on Discharge Piping

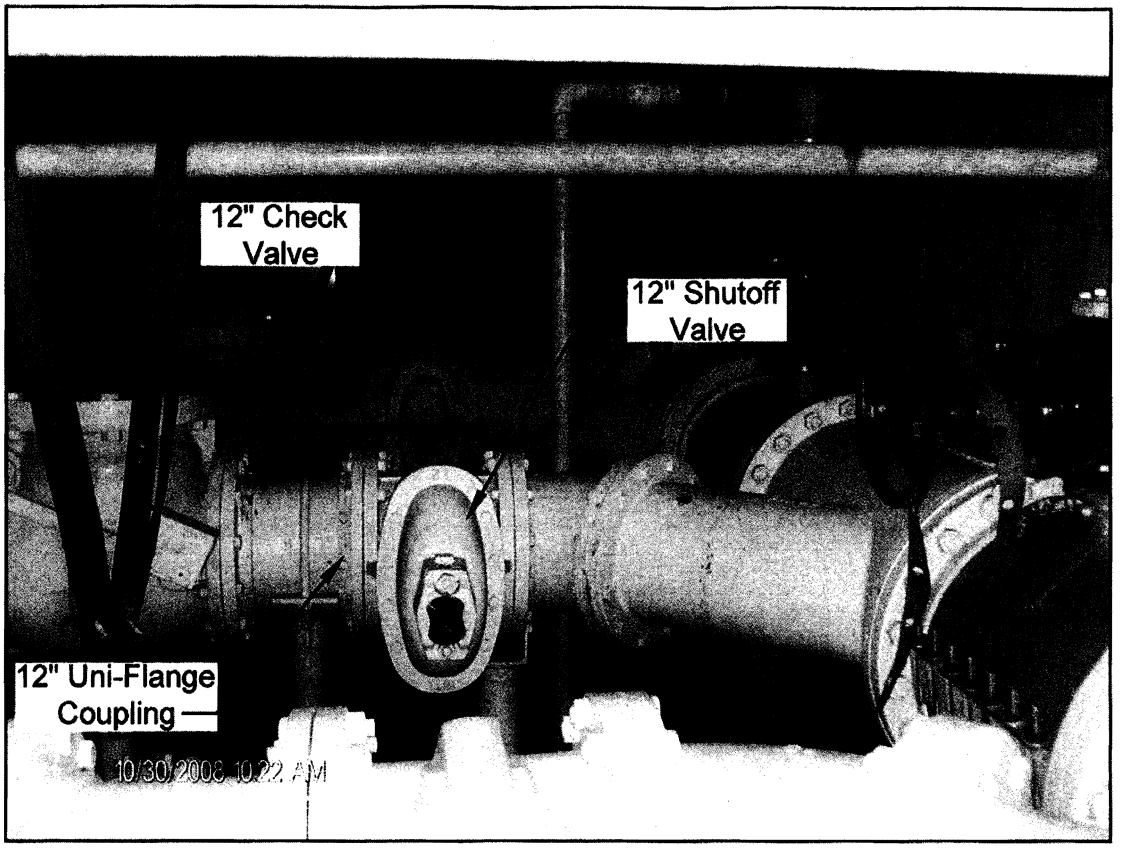


Photo #9: Pump #3 Uni-Flange Coupling on Discharge Piping

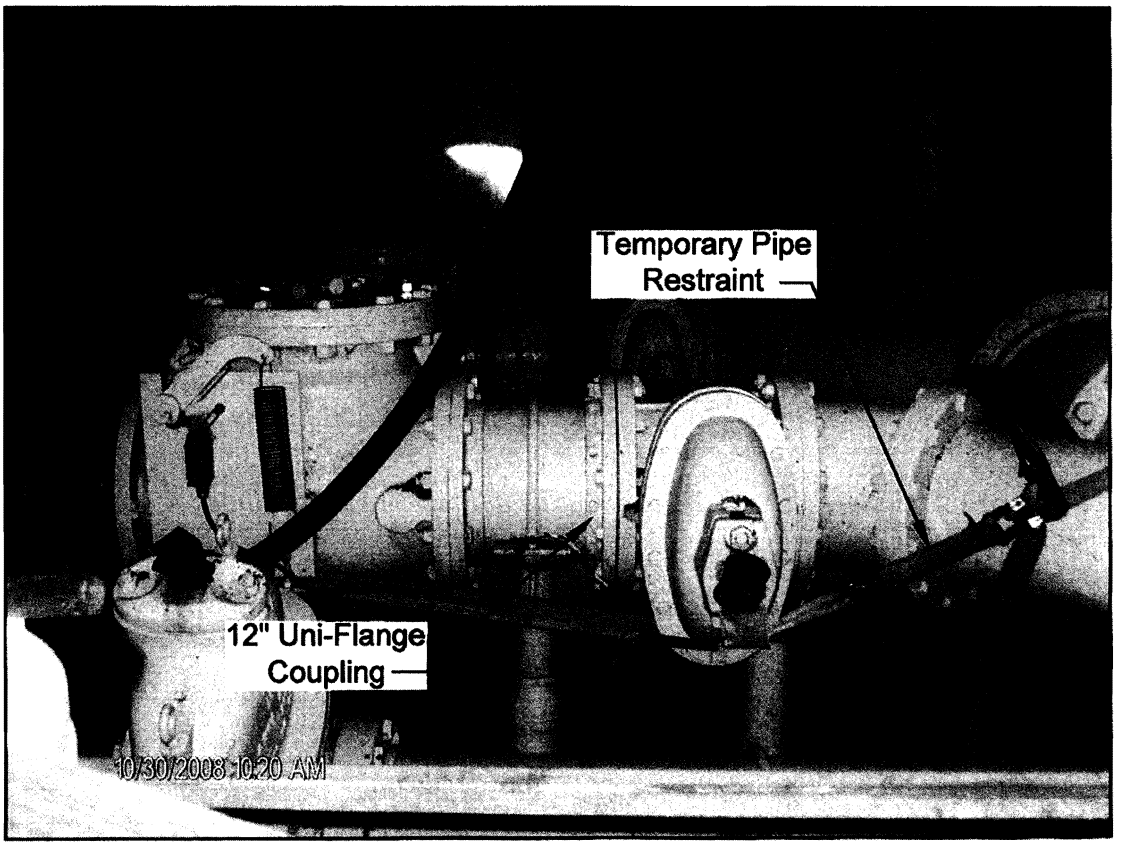


Photo #10: Pump #2 Uni-Flange Coupling on Pump #2

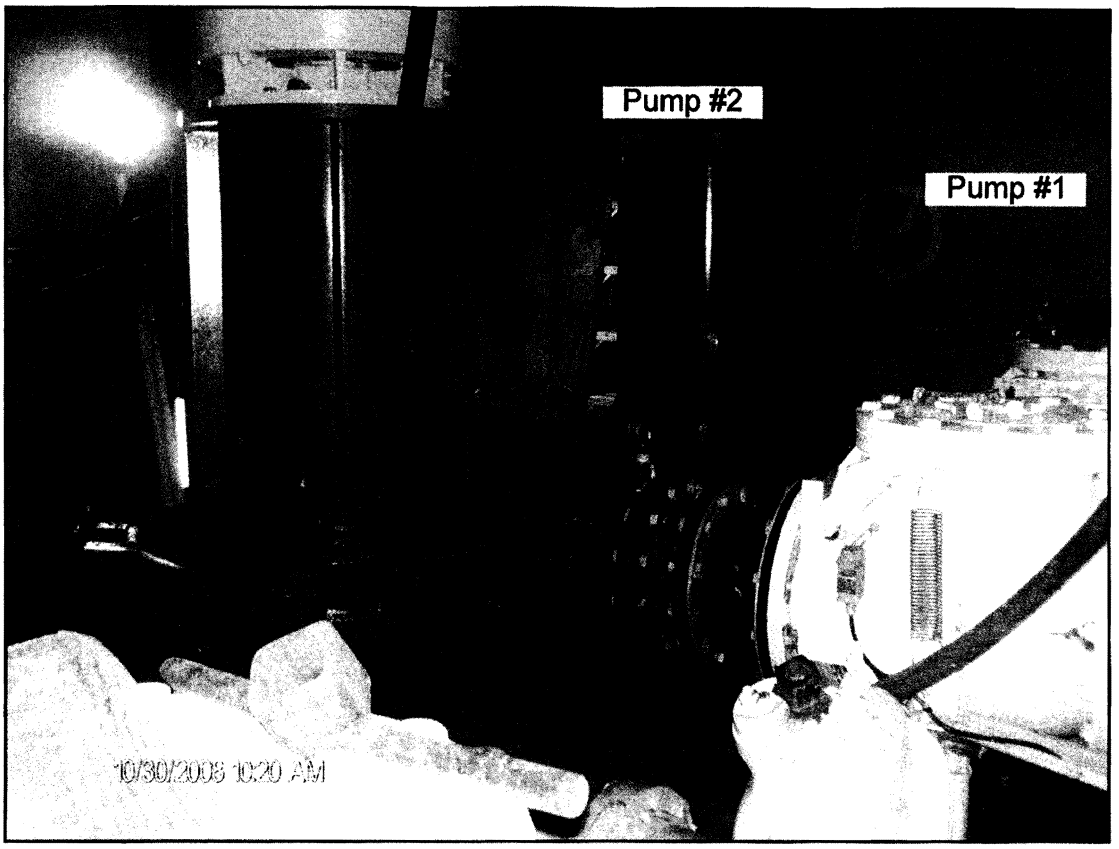


Photo #11: New Pumps #1 and #2

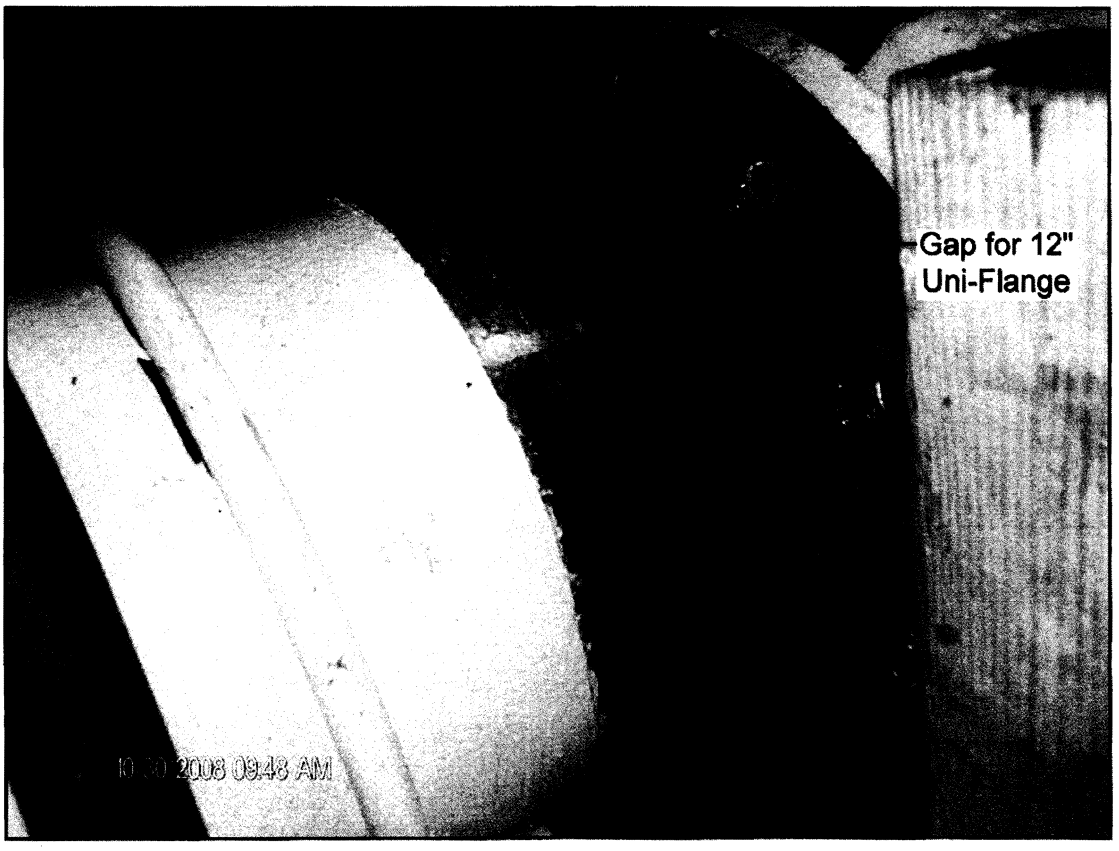


Photo #12: Gap where Uni-Flange Coupling would be for Pump #1 Discharge Piping

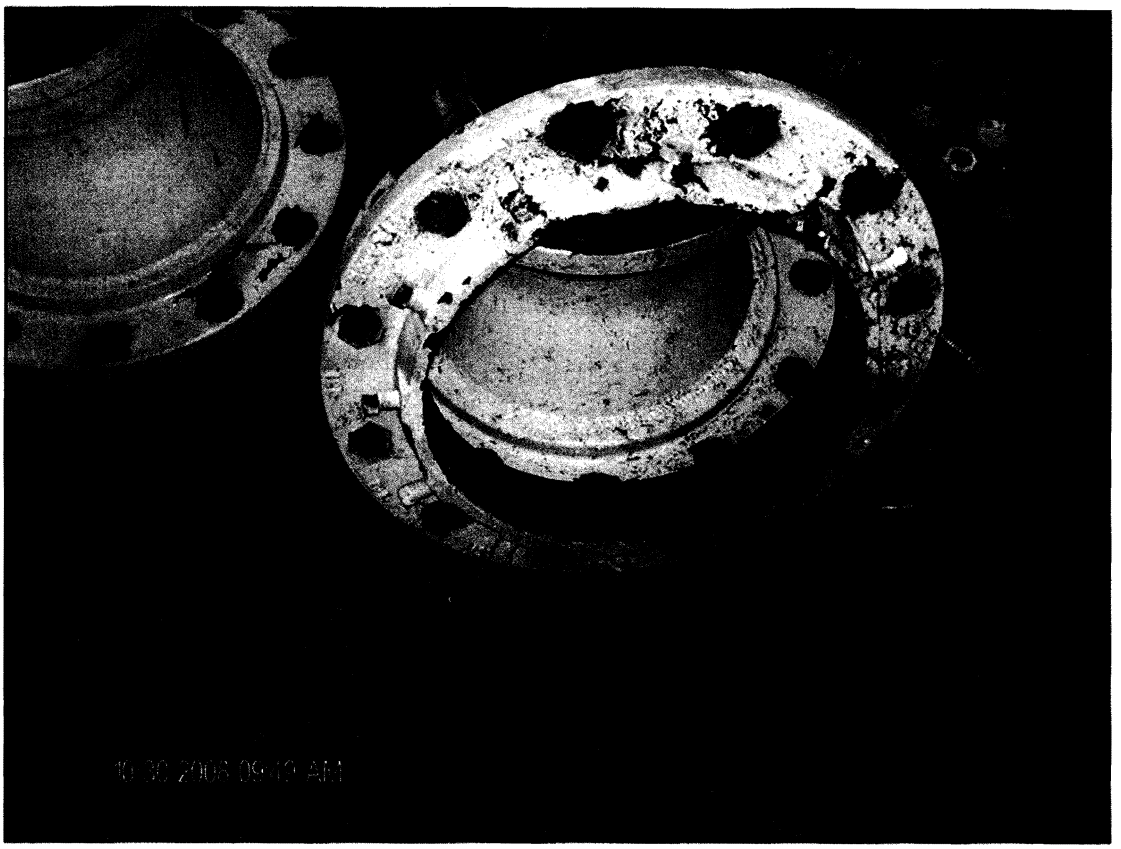


Photo #13: Pump #1 Uni-Flange Coupling

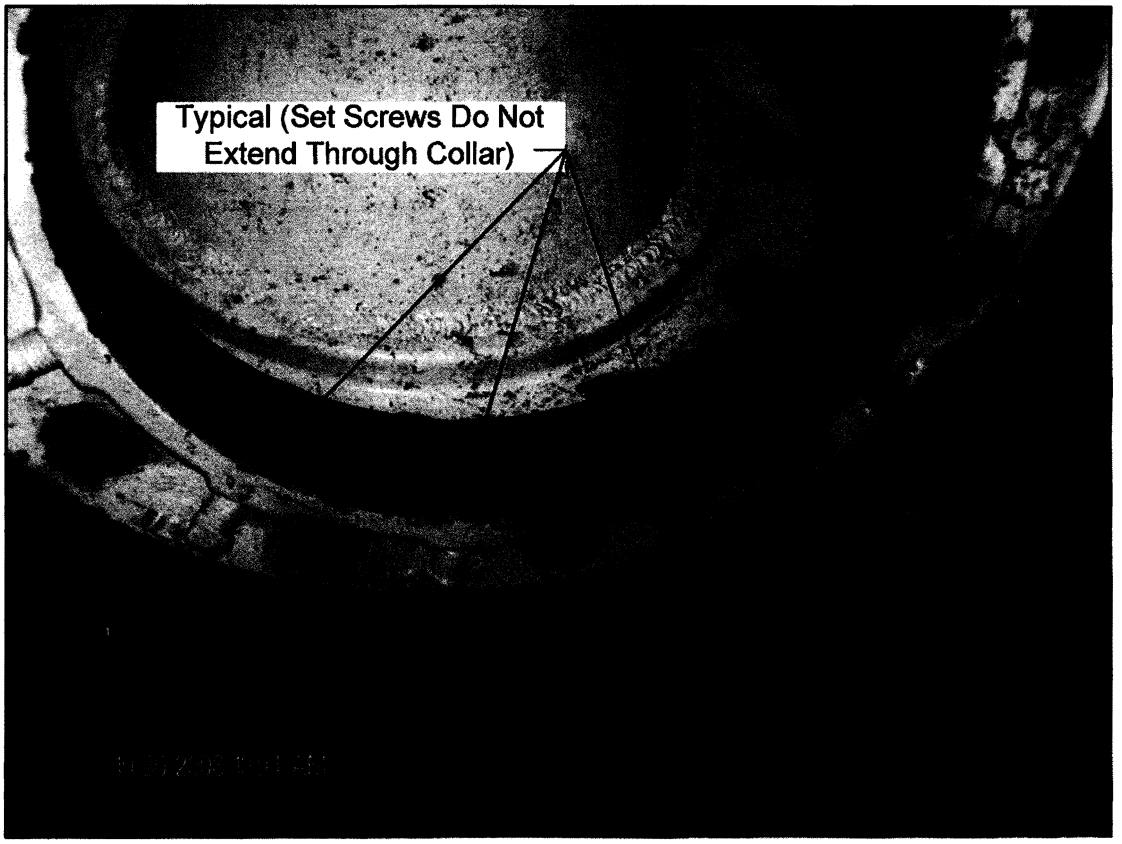


Photo #14: Pump #1 Uni-Flange Coupling (Set Screws Do Not Extend Through Collar of Coupling)

Photo #15: Pump #1 Uni-Flange Coupling (Paint on Set Screws Is Not Disturbed)

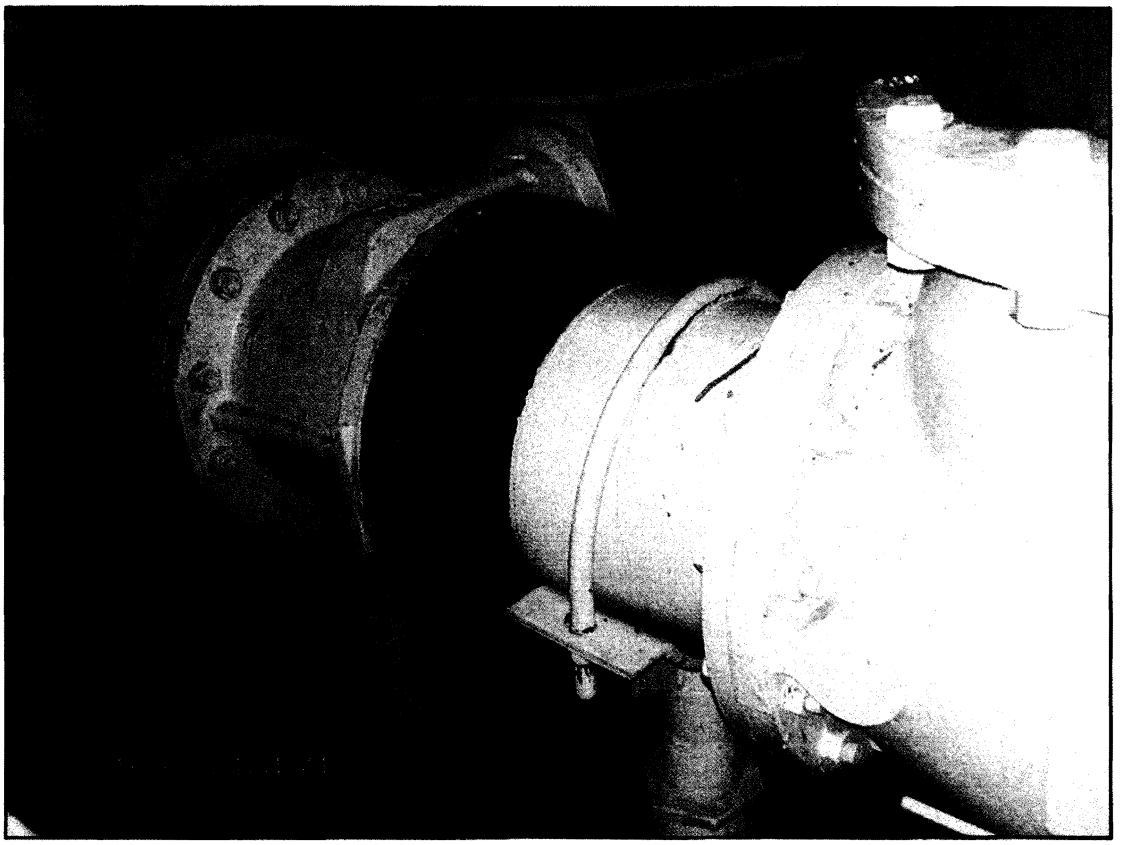


Photo #16: Pump #1 Discharge Piping (With Uni-Flange Coupling Removed and Blind Flange Temporarily Installed on Shut-Off Valve)

Photo #17: Pump Station Exterior (October 30th)

Photo #18: Bypass Pumps on Glenneyre Street (October 30th)

Photo #19: Bypass Pump Discharge Piping (October 30th)

Photo #20: Bypass Pump Discharge Piping (October 30th)

Photo #21: Bypass Pump Discharge Piping (October 30th)

Photo #22: Bypass Pump Discharge Connection (October 30th)

Photo #23: Traffic Control on Glenneyre Street (October 30th)

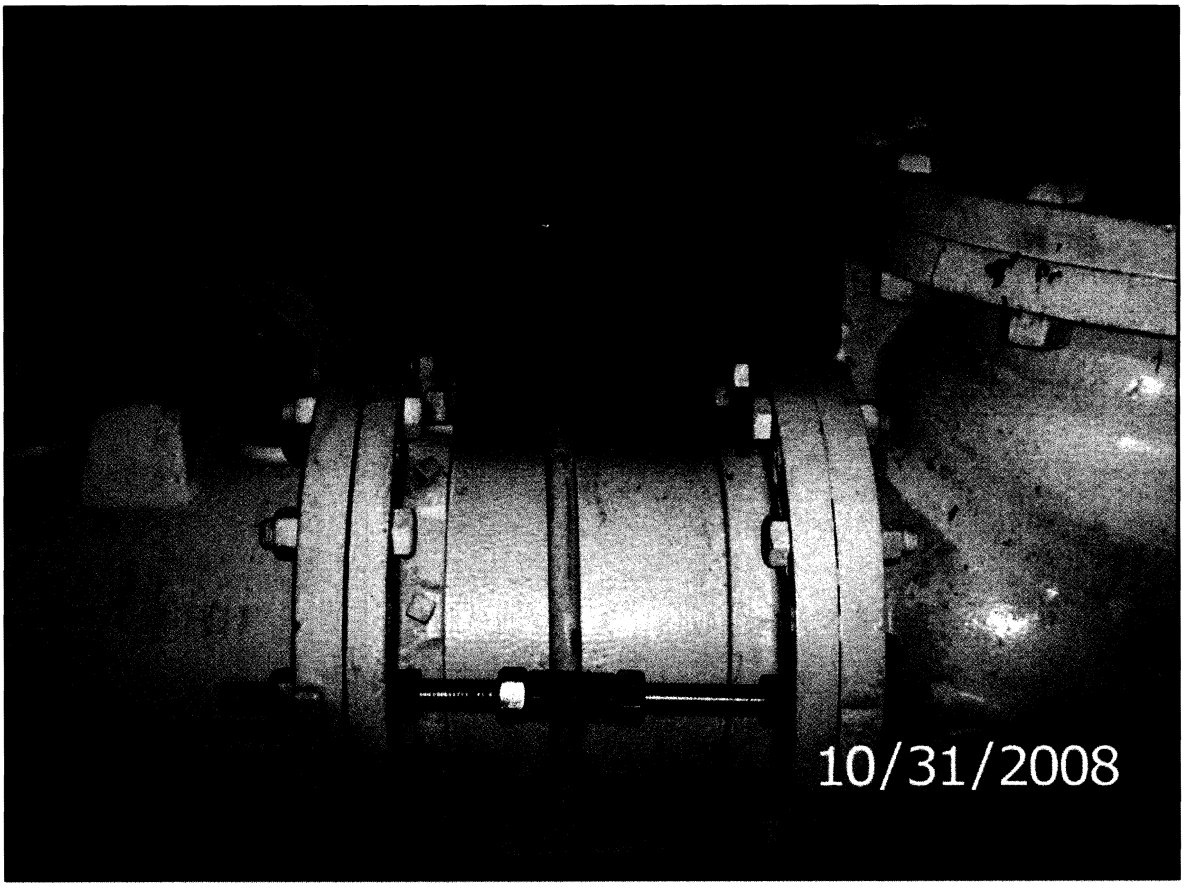


Photo #24: New Tie-Rods Installed Across each Uni-Flange Coupling

Attachment 4

CIWQS

You are logged-in as: PUBLIC.

SSO - General Information

SSO Event ID:	728787	**Regional Water Board:**	9
Spill Location Name:	Bluebird SOCWA Lift Station	**Agency:**	Laguna Beach City
		Sanitary Sewer System:	City Of Laguna Beach CS

General Info

Note: Questions with "" are required to be answered to certify this report.*

SSO Type: Category 1

Version: Certified

Physical Location Details

***Spill location name:** Bluebird SOCWA Lift Station

*** Latitude of spill location:** 33

*** Longitude of spill location:** 117

Address: 1509 Glenneyre

City: Laguna Beach **State:** CA **Zip:** 92651

*** County:** Orange

Spill location description: The spill occurred at the Bluebird SOCWA Lift Station's drywell.

*** Regional Water Quality Control Board:** 9

Spill Details

*** Spill appearance point:** Building or structure

Spill appearance point explanation: The drywell of the Bluebird lift station became submerged

(Required if spill appearance point is "Other")	and the first point of spill appearance was from the front door of the lift station.
*** Did the spill discharge to a drainage channel and/or surface water?**	Yes
*** Did the spill reach a storm drainpipe?**	Yes
*** If spill reached to a storm drainpipe, was all of the wastewater fully captured and returned to the sanitary sewer system?**	No
*** Private lateral spill?**	No
Name of responsible party (for private lateral spill only, if known):	
*** Final spill destination:** (Hold Ctrl key to Select Multiple answers from the list)	Beach;Storm drain;Surface water
Explanation of final spill destination: (Required if final spill destination is "Other")	The spill was controlled and contained into a large storm drain pipe directing the flow to Bluebird Beach and directly into the Pacific Ocean. A diversion facility is located at the end of the storm drain and was placed back on-line after lift station operation was re-established. Therefore an amount was recovered but has not been estimated at the time of this draft report.
*** Estimated spill volume:**	591000 gallons
*** Estimated volume of spill recovered:**	1000 gallons
*** Estimated volume of spill that reached surface water, drainage channel, or not recovered from a storm drain:**	590000 gallons
Estimated current spill rate (if applicable):	0 gallons per minute
***Estimated spill start date/time:**	2008-10-29 02:30:00.0
*** Date and time sanitary sewer system agency was notified of or discovered spill:**	2008-10-29 01:30:00.0
*** Estimated Operator arrival date/time:**	2008-10-29 01:50:00.0
*** Estimated spill end date/time:**	2008-10-29 10:00:00.0
	Pump station failure

*** Spill cause:**	
Spill cause explanation: (Required if spill Cause is "Other")	It has been determined that the likely cause of the spill was due to the incorrect installation of a mechanical pipe fitting performed when the lift station was retrofitted approximately 15 years ago. A uniflange coupling was pushed apart in the drywell. A full report is being prepared by a third party engineering review.
Where did failure occur?	Other (specify below)
Explanation of Where failure occured: (Required if where failure occur is "Other")	Drywell on discharge end of the pump no. 1.
If spill caused by wet weather, choose size of storm:	
Diameter of sewer pipe at the point of blockage or spill cause (if applicable):	0
Material of sewer pipe at the point of blockage or spill cause (if applicable):	
Estimated age of sewer pipe at the point of blockage or spill cause (if applicable):	0
Description of terrain surrounding the point of blockage or spill cause (if applicable):	
*** Spill response activities:** (Hold Ctrl key to Select Multiple answers from the list)	Cleaned-up (mitigated effects of spill);Returned all or portion of spill to sanitary sewer system
Explanation of spill response activities: (Required if spill response activities is "Other")	A full mobilization of City staff, South Coast Water District staff, and an emergency bypass contractor were immediately engaged. Approximately 40 emergency responders were on-scene within the first hour and as many as 60 may have been actively working on spill containment, repairs, and recovery in the first four hours. The emergency protocols put into action and implemented with the utmost efficiency.
*** Spill response completion date:**	2008-10-29 10:00:00.0
Visual inspection results from impacted receiving water:	The Pacific Ocean was polluted by the spill and recreational use was prohibited by on-scene Marine Safety staff.
*** Health warnings posted?**	Yes
*** Name of impacted beach(es) (enter NA if not**	The initial closure established by Orange County was from

applicable):	Camel Point as the southerly limits to Cresent Bay as the northerly limit. As of 10/31/08 the closure was reduced approximately 2.5 miles from Moss Point as the southerly limit to the northerly projection of Hotel Laguna as the northerly limit.
*** Name of impacted surface water(s) (enter NA if not applicable):**	Pacific Ocean
*** Is there an ongoing investigation?**	Yes
*** Water quality samples analyzed for:** (Hold Ctrl key to Select Multiple answers from the list)	Other (specify below)
Explanation of water quality samples analyzed for: (Required if water quality samples analyzed for is "Other chemical indicator(s)", "Biological indicator(s)", or "Other")	Total Coliform, Fecal Coliform, and Enterococcus performed by the Orange County Health Agency
*** Water quality sample results reported To:** (Hold Ctrl key to Select Multiple answers)	None of the above
Explanation of water quality sample results reported to: (Required if water quality sample results reported to is "Other")	Orange County Health reports the sampling results per the prescribed protocols.
*** Spill corrective action taken:** (Hold Ctrl key to Select Multiple answers from the list)	Other (specify below)
Explanation of spill corrective action taken: (Required if spill corrective action is "Other")	It has been determined that the likely cause of the spill was due to the incorrect installation of a mechanical pipe fitting performed when the lift station was retrofitted with gate valves approximately 15 years ago. A uniflange coupling was pushed apart in the drywell. Once the flooded drywell was pumped down the pumps were evaluated and one was able to regain operation. Concurrently, an emergency bypass was constructed and will remain in place until the lift station operations can be secured with multiple redundancy.
Overall Spill Description:	
Notification Details	
OES Control Number (Required for **Category 1** spill report if estimated spill volume	087786

>= 1000 Gals and spill reached surface water or storm drainpipe):	
OES Called Date/Time (Required for **Category 1** spill report if estimated spill volume >= 1000 Gals and spill reached surface water or storm drainpipe):	2008-10-29 03:00:00.0
*** County health agency notified:**	yes
County health agency notified date/time: (required if County health agency notified is "Yes")	2008-10-29 02:30:00.0
Regional Water Quality Control Board notified date/time:	2008-10-29 03:10:00.0
Other Agency Notified:	South Coast Water District
Was any of this spill report information submitted via fax to the Regional Water Quality Control Board?	no
Date and time spill report information was submitted via fax to the Regional Water quality Control Board: (required if spill report information submitted via fax to Regional Water Board is "Yes")	

NOTE: questions with "" are required to be answered to certify this report.*

Attachment 5

Department of Water Quality

November 17, 2008

Mark Alpert, P.E.
Senior Engineering Geologist
California Regional Water Quality Control Board – San Diego Region
9174 Sky Park Court, Suite 100
San Diego, CA 92123-4340

Re: City of Laguna Beach October 29, 2008 Sewer Spill Incident Report

Dear Mark:

The City of Laguna Beach experienced a sewer spill on October 29, 2008. Thank you for taking the time to meet with our Senior Water Quality Analyst, Will Holoman, and me last Thursday to discuss the nature of the spill. The City has already completed an investigation to determine the cause of the spill. You have received a hard copy of the Dudek investigation report and an electronic copy is attached. The evidence of the cause of the spill is strongly compelling. In summary, neither the City staff nor the contractor installing new pumps could have contemplated the failure of the pipe joint.

Through our meeting we hoped to provide a preponderance of evidence of the City's commitment to rehabilitating the lift station, inform you of the amount of work done to upgrade the City's sewer collection system as well as exhibiting the City's track record of progress and continued commitment to making the improvements necessary to further reduce sewer spills. The November 18, 2008 City Council agenda bill is attached and has with it the list of projects completed since 2001. As stated the EPA issued the Order of Compliance in 2001 and terminated the Order in May 2005. Since then the City has perpetuated the programs and improved on the elements of the Order.

If you require further information or wish to review some of our progress on the Water Quality Department's website call me at (949) 497-0328 or visit www.clbwq.net.

Regards,

David Shissler, P.E.
Director of Water Quality
cc: Jeremy Haas, Environmental Scientist Compliance Assurance Unit
Joann Cofrancesco, WRC Engineer Compliance Assurance Unit

505 FOREST AVE. • LAGUNA BEACH, CA 92651 • TEL (949) 497-0378 • FAX (949) 494-1864

City of Laguna Beach
AGENDA BILL

No. 16
Meeting Date: 11/18/08

SUBJECT: EMERGENCY RECOVERY AND REPAIRS TO BLUEBIRD SOCWA LIFT STATION

SUMMARY OF THE MATTER:

On Wednesday, October 29, 2008 the Bluebird SOCWA lift station suffered a pipe joint failure causing the pump room to be flooded and the electrical systems to be compromised. The operation of the lift station was temporarily lost resulting in a sewer spill into the Pacific Ocean. The Bluebird SOCWA lift station is a 27 year old wastewater facility that pumps approximately 2.4 million gallons per day to the South Orange County Wastewater Authority's Coastal Treatment Plant. As requested by the Mayor and the Mayor Pro-Tem an investigation was conducted by experts in lift station operations. After obtaining references from the Orange County Sanitation District and gaining counsel by their experts it was recommended that staff from Dudek Engineering's Civil Engineering and District Management divisions would be the most capable to conduct the investigation. The Dudek investigation and their conclusions are included in Attachment 1.

From the investigation it was determined that a pipe joint (called a uniflange) was discovered to have been left improperly tightened. It is not certain when this pipe fitting error occurred. The joints had been painted over and the uniflange was obscured from inspection. It had been ten years or more since work on those pipe joints had occurred. The uniflange, if installed correctly, is rated to function well within the normal operating pressures of the station. For months prior, there were no signs of a problem and no protocols necessitating the addition of restraints.

On the day before the lift station failed, the first of two new pumps was installed, tested at various speeds, and run at top speed for short periods of time to determine the pump's range of performance. It is speculated that the increase in pressures experienced in the piping manifold may have contributed to a chain of events causing the joint to be pushed apart. In the early hours of the morning, when flows are low, the station operates differently than it does during the day. The pump controls are programmed to run only when enough wastewater is collected in the wetwell. This "draw-fill" state results in pressure surges in the station each time the pumps are shut off. While this is a normal condition the cumulative

(continued)

RECOMMENDATION: It is recommended that the City Council: 1) appropriate $210,000 from the Sewer Fund balance to cover the expenses incurred by the emergency response, repair, and recovery work associated with the October 29, 2008 pipe joint failure and the associated recovery and improvements to the Bluebird SOCWA lift station and 2) authorize the City Manager to award the contracts and purchase orders necessary to support that effort.

Appropriations Requested: $ 210,000

Submitted by: David Shissler, Director of Water Quality

Fund: Sewer

Coordinated with: Gavin Curran, Director of Finance and IT

Attachments: 1 – Dudek Lift Station Investigation
A - Work Accomplished Since 2001
B – Reduction in sewer spills since 2001

Approved: City Manager

changes (a) of pressure from the new pump, (b) the surges over night, and (c) an aged gate valve which was closed but which was apparently not working properly, appears to have exposed the ill-restrained pipe joint to pressures that could not be sustained. The Dudek report has concluded that "neither the City staff nor the contractor could have expected to know that the" pipe joint was improperly installed.

The pipe fitting failure in the Bluebird SOCWA lift station is entirely unrelated to the circumstances of the April 2008 air/vacuum release valve clamp failure on the North Coast Interceptor.

To the City's extreme fortune one of the pump motors, that had been recently refurbished and had just been put into service, was able to survive hours of immersion in the flooded drywell and operate to regain tenuous operation of the station. The motor was able to operate long enough for two other motors to be sent out, reconditioned, and installed the Saturday following the incident.

Status of Station Operations and Emergency Repairs – As of the time of November 13, the Bluebird SOCWA lift station is operating with two pumps and with an emergency bypass system serving as a redundant backup. Efforts required to initially recover and reinstate operations from the incident have included:

1. Immediate installation of heavy metal restraints to eliminate the remote possibility of the same flanges in other parts of the piping manifold from separating.
2. Installation (and subsequent removal) of traffic control on Glenneyre Street;
3. Installation of a short-term emergency bypass system on Glenneyre and an extended term installation at Galen Drive. This serves to eliminate traffic congestion, provide odor control, and provide the means to maintain facility operations during pipe fitting replacements.
4. Emergency motor refurbishing and reinstating operations of two pumps;
5. Beach cleanup, street wash down and sanitizing the lift station from the residuals of the spill;
6. Replacement of electrical fittings, outlets, lights, and drying out all systems;
7. Engaging a plan for permanently repairing the failed pipe section and the isolation valve necessary to separate the Pump No.1 discharge pipe from pressurized portions of the pumping system.

The actions listed are essential to regain a serviceable level of operations until the rehabilitation project for the lift station can be implemented.

City Staff and Mutual Aid – Reinstating the operations of the lift station required hard work from Water Quality, Public Works, Police, Fire, and the Marine Safety Departments. Further, it is important to recognize and commend the emergency wastewater operations staff from the South Coast Water District. Their immediate response included installing portable pump systems that were instrumental in expediting the operations necessary to regain control of the station.

Bluebird SOCWA Lift Station Rehabilitation Plans – The emergency repair operations in April resulted in a structural breach in the ceiling of the Bluebird SOCWA wet well. After the successful recovery in April, rehabilitation plans were immediately begun. Dudek engineering has nearly completed the plans; however, in light of the recommendations submitted in their post-incident investigation, operational elements are being added and are expected to be completed within the next 30 days. Those added elements include an expanded bypass capability to isolate both the lift station and the North Coast Interceptor downstream to the Coastal Treatment Plant.

Emergency Expenditures and Recovery Cost Estimate – In response to the emergency and to initiate recovery from the damages sustained at the Bluebird SOCWA lift station, a team of professionals, contractors, and suppliers were called in to immediately effect repairs, check failure points, and participate in the recovery actions. These contacts are:

- Kisling Construction
- Griffin Dewatering
- Swains Electric
- Henry's Crane
- Schuler Engineering
- RVF Electric
- Dudek Engineering
- Pacific Technical
- iWater
- Coastal Traffic Systems
- Andy Gump
- El Toro Materials
- Tekdraulics (pumps & motors)
- CS-AMSCO (valves)
- International Flow Technologies

In accordance with emergency purchasing policy, the City Manager has authorized several emergency purchase orders for equipment and contractors to complete immediate repairs. The costs for the immediate recovery efforts are not fully known. The list below only reflects an estimated range of costs. A contingency has been added.

Table of Estimated Emergency Response and Recovery Costs

Contractors, Equipment, & Supplies	$190,000
Contingency	$20,000
Total	$210,000

The $210,000 will cover the recovery and repair costs essential to regain a serviceable level of operations until the rehabilitation project for the lift station can be implemented. It is recommended that the $210,000 be appropriated from the available sewer fund balance which is currently over $400,000.

Improvements to the Sewer System – The City's wastewater collection is comprised of 95 miles of collection pipelines, 25 lift stations, and a sewer treatment plant. In 2001 the City adopted a comprehensive plan to improve the sewer system. Since that time the City has spent over $15 million making substantial improvements to its sewer system. Attachment A is a summary listing of these improvements. As a result of these efforts, the number of sewer spills has greatly decreased.

Recommendation - To complete repairs as quickly as possible, staff recommends that the City Council authorize the City Manager to sign the necessary agreements and purchase orders for a cumulative amount not to exceed $210,000 and appropriate this amount from the available Sewer Fund balance.

ATTACHMENT A

Wastewater System Improvements

Since 2001

1. Created modified work schedules to have sewer crews on 7 days a week.
2. Increased the sewer crews by adding three people.
3. Increased cleaning frequency by 500% - now at 640,000 feet per year.
4. Conducted 52 emergency spot repairs to sewer lines identified through videoing.
5. Implemented the Fats, Oils, and Grease program in cooperation with food establishments.
6. Implemented the Private Sewer Lateral program.
7. Created a Water Quality Department headed by a civil engineer.
8. Since 2001 the City Council has increased sewer fees by 40% to pay for improvements to the sewer system.
9. Authorized $11 million in low interest loans to fund improvements - $7 million which has been borrowed.
10. Rehabilitated 16 Miles of Sewer Lines with cast in place lining.
11. Reconstructed extremely inaccessible sewer pipes at 25 locations.
12. Replaced main lines at the Miller and Pearl Street lift stations.
13. Replaced the electrical system at the Victoria I lift station.
14. Added one new Vactor Truck and one new mini jetter.
15. Added one addition portable generator.
16. Repaired and lined old pipe in the Rockledge area of town.
17. Replaced the pump and emergency generator controls at Laguna and Bluebird SOCWA Lift Stations.
18. Upgraded electrical service upgrade to Laguna SOCWA lift station.
19. Installed Superoxygenation System at Bluebird SOCWA.
20. Replaced pumps at Laguna SOCWA.
21. Replaced Surge Tanks at Bluebird and Laguna SOCWA lift stations.
22. Reconstructed portions of the NCI at Nyes Place.
23. Reconstructed 2500 feet of sewer mains in the downtown.
24. Refitted all lift stations with quick-connect emergency generator power outlets.
25. Repaired Irvine Cove force main.
26. Implemented a computerized sewer maintenance Management system.
27. Upgraded the sewer alarm system (SCADA System).
28. Installed emergency power to the Nyes Place, and Victoria I & II lift stations
29. Reconstructed Shaws Cove lift station and providing emergency power to Fisherman's Cove lift station.

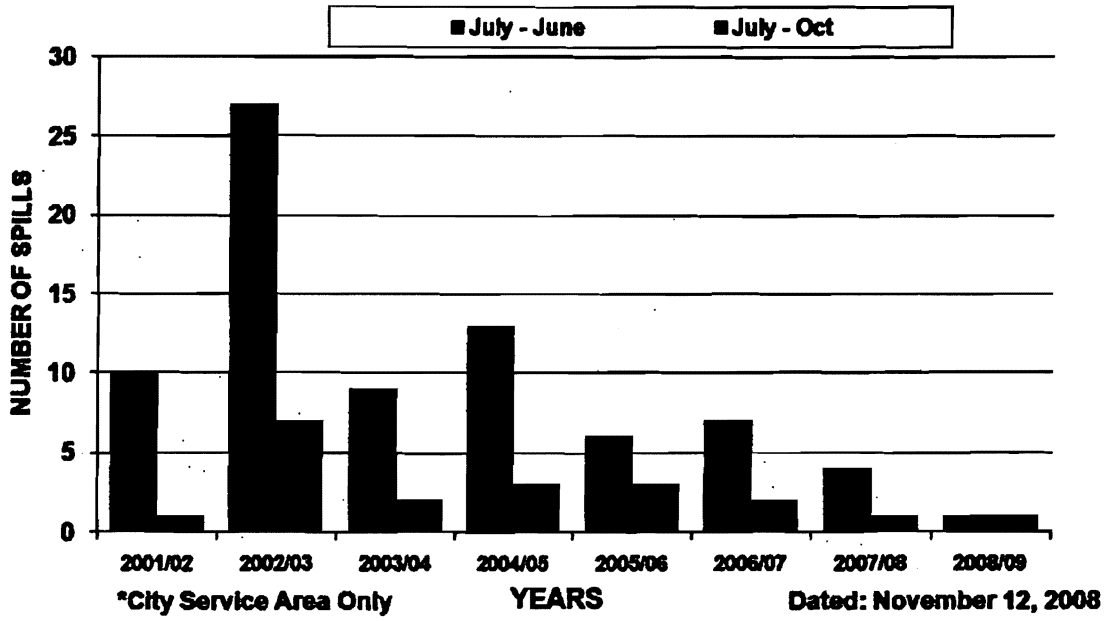
On-Going Projects Include:

30. Replacing the Rockledge sewer main system and sewer lift station
31. Rehabilitating manholes in Coast Highway per Strategic Plan
32. Installing emergency power pedestal with quick-connects at Irvine Cove to facilitate installation of portable generators during power outages.

ATTACHMENT B

CHART 1

CITY OF LAGUNA BEACH
ANALYSIS OF *CITY* SEWER SPILLS*
FY 2001/02 - FY 2008/09(October 31)**

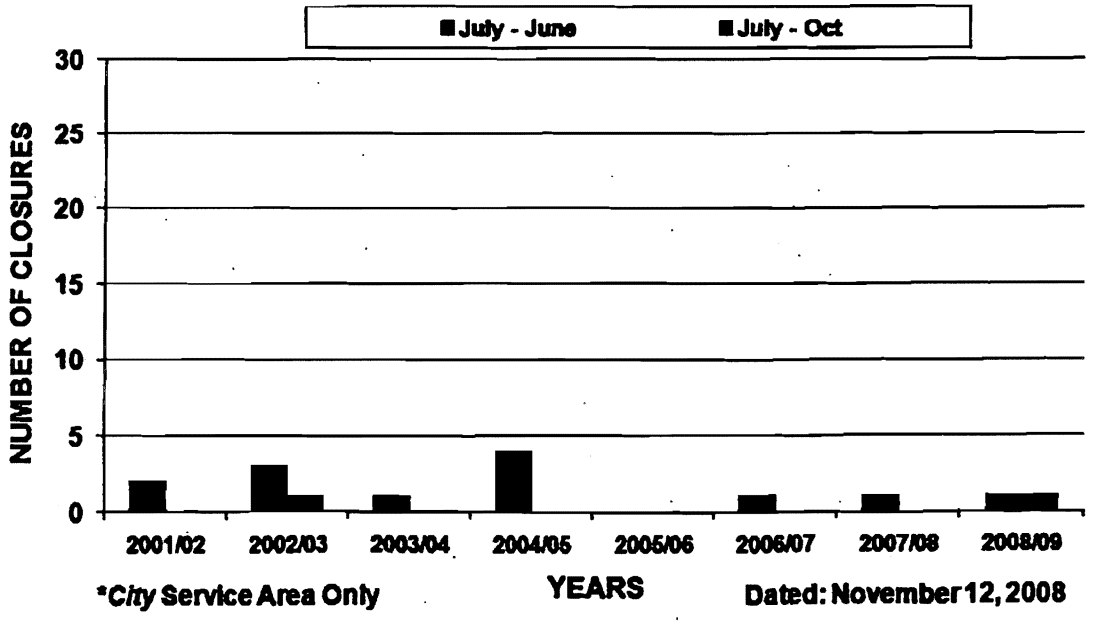


*City Service Area Only

Dated: November 12, 2008

Chart 2

CITY OF LAGUNA BEACH
ANALYSIS OF *CITY* SEWER SPILLS
BEACH CLOSURES*
FY 2001/02 - FY 2008/09 (October 31)**



*City Service Area Only

Dated: November 12, 2008

Attachment 6

From: "Shissler, David WQ" <dshissler@lagunabeachcity.net>
To: "Joann Cofrancesco" <JCofrancesco@waterboards.ca.gov>
CC: "Holoman, Will WQ" <wholoman@lagunabeachcity.net>, "Jeremy Haas" <JHaas@...
Date: 12/19/2008 11:14 AM
Subject: RE: Bluebird Lift Station October 29th Sewer Spill Incident Follow-up Questions

Joann,
As requested the City of Laguna Beach is providing answers to the Regional Board's questions from their review of the subject incident report.
Paraphrasing your questions, I've separated your questions into twelve distinct responses.

Question 1) I am assuming that the Pump and check valve required periodic maintenance. Was the maintenance kept up according to the manufacturer recommendations;

CLB Answer: The pumps in all of our 25 lift stations receive routine maintenance. The pump in question was being installed. It was replacing a decommissioned pump. The check valve is checked daily. It was functioning properly.

Question 2) does the maintenance require isolating it from the discharge manifold?

CLB Answer: Yes

Question 3) If yes to 1 & 2, why was a leak in the gate valve not noticed at other times?

CLB Answer: The gate valve was fully operational. All conditions of the gate valve indicated that the gate was fully seated. After the incident occurred the gate valve was found to have a rock and small debris wedged in the seat where the gate seals against the valve body. This is common in wastewater operations and why we have ordered seventeen new DeZurick eccentric plug valves that are newer technology and less prone to have similar problems develop.

Question 4) Also, for the gate valve, was the maintenance kept up according to the manufacturer recommendations?

CLB Answer: Yes; By nature of the operations of the Bluebird SOCWA lift station our staff encounters frequent ragging problems in the pumps. Pump number one is one of two primary pumps in operation. As such, it requires de-ragging on a frequent basis. The gate valve is closed ever time the pump is de-ragged. There was never any recent concerns that the valve was inoperable.

Question 5) Are there any methods used to ensure the valve is closed (example - counting the number of turns)?

CLB Answer: The 12-inch gate valve was a "32 turn" valve. City staff and iWater staff both exercised the valve closed to 32 turns and was subsequently found to have a problem seating. After replacing the valve, it was apparent that the gate was unable to fully seat; a small rock and debris was discovered to be preventing the gate to properly seat. The gate valve was routinely exercised. To replace the old pump the gate valve had been closed. The check valve was also closed. That completed, a bleeder or venting tube was opened to drain the pressure from the pump; this ensuring that the system was isolated. That having been accomplished, the old pump was removed, and the new pump was in the process of being installed.

Question 6) How much was the Pump 1 Gate Valve closed (50%, 75%, 95% closed)? Did you determine why it was not completely shut?

CLB Answer: The 12-inch gate valve was 95% closed. By appearance it was fully closed. After replacing the valve, it was apparent that the gate was unable to fully seat against debris lodge in the gate seat of the valve body.

Question 7) Which alarm triggered the calls to staff? Were there any alarms in the dry well to indicate flooding?

CLB Answer: The first alarm received was a High Dry Well alarm.

Question 8) When the first staff responder arrived at the LS, what was the level in the dry well?

CLB Answer: Approximately six to seven feet deep.

Question 9) Why were you unable to pump the sewage from the dry well to the 10-inch diameter riser connected to the force main, instead of the storm drain?

CLB Answer: The initial priority to the emergency response was to regain the operations of the pumping facilities. Gaining access to the point of failure was determined to be the best approach to minimize the down time of the pumping operations. Setting up a connection to the 10-inch blind flange downstream of the lift station was not considered for several reasons:

The pump used for draining the dry well was used at its absolute limits. It would not be capable or connecting to a system with the discharge side having over 40 psi operational head. The net positive suction head would have been exceeded and rendering the pump unusable.

If we could have connected to the 10-inch bypass blind flange we would only accomplish pumping in a circle. That is to state that what would be pumped out of the dry well would be re-circulated back into the dry well.

The time spent piping to the 10-inch connection would have been lost time critical to restoring operations of the pumps. The incident occurred at the lowest flow period of the day. The best course of action was to get the dry well emptied as fast as possible to give us the best chance of drying out the pump motors and electrical systems and re-establishing operations before entering into the peak flow period of the day. If the motors would have been submerged any longer then they were, they may have never been able to function. In retrospect, another course of action could have caused the City to fully lose operation of the lift station; it was the correct approach.

Question 10) Why were you unable to pump the sewage from the wet well to the 10-inch diameter riser connected to the force main, instead of the storm drain? I understand that the suction lift was too high, but you were still able to pump it out to the street level.

CLB Answer: See answer in previous question.

Question 11) When did the contractor start and finish the bypass from the influent to the pump station to the 10-inch diameter riser connected to the force main? Was the suction lift a problem?

CLB Answer: The bypass contractor was called into action in the first hour after receiving alarms from the station. Griffin Dewatering was mobilizing by 3:00 a.m. to respond to the incident. Their bypass was operational by 6:30 p.m. that evening. City staff was successful in re-establishing operations of one pump by 10:00 a.m. that morning. The suction lift for any pumps is limited to approximately 22 feet. The initial setup for the emergency bypass was drafting from the wetwell. This was not optimum as the suction lift was

near the limits of the pumps. Subsequently, the bypass was moved to a configuration at the bottom of Galen Drive that allowed the suction end to remain in a flooded state which was optimum for the pumps.

Question 12) Why was iWater unable to return the existing valves inside the dry well back to service (why were they stuck)?

CLB Answer: Opinions received from iWater are that the valve of this age and type should not have any problems closing. They suspect that loosening the packing gland nuts would allow the large 16-inch valve to close. However, the risk of flooding the dry well was viewed to be too high to attempt this operation. The City has been actively working on the design plans for rehabilitating the entire lift station. To bring it up to the most current standards the City has included replacing all of the valves with eccentric plug valves. During the rehabilitation project coming in the Spring of 2009 the lift station will be bypassed and at that time what is preventing the large isolation valves to be closed will be determined.

If you have any follow-up questions we'll be happy to provide additional information.

Happy Holidays!

Regards,

David Shissler, P.E.
Director of Water Quality
City of Laguna Beach, CA 92651
(949) 497-0328
www.clbwq.net

-----Original Message-----
From: Shissler, David WQ
Sent: Tuesday, December 16, 2008 5:09 PM
To: 'Joann Cofrancesco'
Cc: Holoman, Will WQ; Jeremy Haas
Subject: RE: Bluebird Lift Station October 29th Sewer Spill Incident Follow-up Questions

Joann,
I'll ask our staff to assist in the responses. From a brief review of your questions I'm confident there are straight forward answers to all of your questions. We'll have it sent back to you by the end of the week.

Thank you,

David Shissler, P.E.
Director of Water Quality
City of Laguna Beach, CA 92651
(949) 497-0328
www.clbwq.net

-----Original Message-----
From: Joann Cofrancesco [mailto:JCofrancesco@waterboards.ca.gov]
Sent: Tuesday, December 16, 2008 3:39 PM
To: Shissler, David WQ
Cc: Holoman, Will WQ; Jeremy Haas
Subject: Bluebird Lift Station

Hi Dave,

We've reviewed the information you've provided to date. Your report offers much of the information we would ordinarily request in an investigative order following a spill of that magnitude. However, it doesn't answer a few questions that we consider crucial to our assessment of the spill and response. Feel free to reply by email or letter, but please do so promptly.

I am assuming that the Pump and check valve required periodic maintenance. Was the maintenance kept up according to the manufacturer recommendations and does the maintenance require isolating it from the discharge manifold? If yes to both, why was a leak in the gate valve not noticed at other times?

Also, for the gate valve, was the maintenance kept up according to the manufacturer recommendations? Are there any methods used to ensure the valve is closed (example - counting the number of turns)? How much was the Pump 1 Gate Valve closed (50%, 75%, 95% closed)? Did you determine why it was not completely shut?

Which alarm triggered the calls to staff? Were there any alarms in the dry well to indicate flooding?

When the first staff responder arrived at the LS, what was the level in the dry well?

Why were you unable to pump the sewage from the dry well to the 10-inch diameter riser connected to the force main, instead of the storm drain?

Why were you unable to pump the sewage from the wet well to the 10-inch diameter riser connected to the force main, instead of the storm drain? I understand that the suction lift was too high, but you were still able to pump it out to the street level.

When did the contractor start and finish the bypass from the influent to the pump station to the 10-inch diameter riser connected to the force main? Was the suction lift a problem?

Why was iWater unable to return the existing valves inside the dry well back to service (why were they stuck)?

Thanks,
Joann

--

Water Resource Control Engineer

Regional Water Quality Control Board - San Diego Region
Compliance Assurance Unit
9174 Sky Park Court, Suite 100
San Diego, CA 92123
858-637-5589 (direct line)
858-571-6972 (fax)
jcofrancesco@waterboards.ca.gov

Attachment 7

From: "Shissler, David WQ" <dshissler@lagunabeachcity.net>
To: "Joann Cofrancesco" <JCofrancesco@waterboards.ca.gov>
CC: "Jeremy Haas" <JHaas@waterboards.ca.gov>, "Wright, Graham WQ" <gwright@l...
Date: 1/7/2009 1:55 PM
Subject: Responses to Follow-up Questions re: October 29th Incident - Second Round
Attachments: RE: Bluebird Lift Station October 29th Sewer Spill IncidentFollow-up Questi ons

Joann,
The responses provided below are to answer additional follow up questions. I've copied the questions from the comments and kept them in reference to the original numbered questions and responses:

Follow-up to Question #3 Response: -

How long have the gate valves been in place?

The valves were replaced approximately 15 years; Original Knife Valve replaced with Resilient Wedge Gate Valve.

Prior to the spill, were rocks or small debris ever found wedged in the seat of the gate valve?

In the past gate valves have been found to be blocked by debris preventing the gate from seating. The discharge gate valve is placed in the system in order to isolate the pump and the check valve that function throughout daily operations. During the course of typical pump replacement procedures the gate valve is closed, and the pressure between the check valve and the pump is released by opening a bleeder valve located on the pump body. The check valve is never opened to check the gate valve for being sealed; especially when the gate valve turns freely and all indicators show the valve to have seated properly.

How long have you know that this was a problem in wastewater operation?

Debris such as, rocks, sediment, towels (beach cities especially), concrete, and other forms of trash are commonly encountered in any wastewater operation. Debris is frequently removed from pumps, valves, elbows, etc.

When was a corrective action added to the capital improvement plan?

A valve replacement was ordered after discovering that the valve was not fully closed. At that point in time it was prudent to assume that the gate valve was either worn or damage and required replacement. After determining that the gate valve was in serviceable condition, it was concluded that upgrading the valves would further serve to improve the performance and reliability of the lift station.

When was the new DeZurick eccentric plug valves ordered?

The first DeZurick valve was ordered within a week after October 29th.

Follow-up to Question #5 Response: -

Do they count the number of turns every time the close the valve, including the time prior to the spill to remove Pump No. 1?

The field crews use the number of turns as a guide. They rely more on the point of refusal to close the gate valve.

Follow-up to Question #6 Response: -

...and by turning it 32 times?

From all indications the valve was fully closed but we also continue to turn the valve until the gate refuses further movement. That stated the check valve closure was tested for full closure prior to working on the pump. Since there's no practical means or, in normal conditions, necessity to open the check valve to test the closed condition of the gate valve, the procedure to bleed off pressure to safely work on the pump is sufficient.

Follow-up to Question #7 Response: -
At what water level was the alarm set at in the dry well?

Dry Well Alarm is set at 6 to 10 inches off the floor of the dry well.

Follow-up to Question #8 Response: -
What time did the alarm go off?

The first alarm was received at 1:07 a.m.

What time did the first responder arrive?

The emergency on-call staff member arrived at approximately 1:30 a.m.

Follow-up to Question #9 Response: -
Is the 16-inch gate valve, that was stuck and under water, the only isolation valve between the 10-inch diameter riser and the dry well?

Yes.

I thought it was the 12-inch gate valves on the discharge side of each pump that were stuck. Was it only the 16-inch valve that was stuck? What other valves were stuck?

No the 12-inch gate valves were not stuck. It was only the 16-inch valve that was stuck open. No other valves were stuck.

Follow-up to Question #12 Response: -
Is this is a result of the October 2008 overflow? Or was this planned prior to the overflow. I do not see it in the Rehabilitation Project plans.

The stuck condition of the 16-inch valve was unrelated to the overflow. Again, iWater believes that the valve packing may only need to be serviced. However, because of the October incident we are seizing the opportunity to make improvements to the entire lift station including the valves. The 16-inch valve is not the type that most agencies have kept in service simply because the eccentric plug valve performs better. Changing all the valves out to the same manufacture's valve is also beneficial for maintaining stock of replacement parts and for simplifying training to personnel for maintenance and operations of the valves.

The final plan set is includes the valve replacements for 10 valves in the Bluebird SOCWA lift station and another 7 valves that comprise the added bypass manifold system.

Bids will be opened on January 15th and a contract awarded on January 27th. The work will be completed no later than June 2009.

Additional Question #13) Explain why the Rehabilitation was not planned and completed sooner.

Concerted effort to upgrade and replaces mission critical equipment has been ongoing at the Bluebird SOCWA lift station since 2003. Some of the most significant replacements include the

following:
1. Replacement of the Stainless Steel Surge Tank (at both SOCWA stations)
2. Replacement of the Emergency Generator Control Systems (at both SOCWA stations)
3. Replacement of the Variable Frequency Drives for the primary pumps (at both SOCWA stations)
4. Replacement of the discharge flow meter
5. Replacement of the primary pumps
6. Rehabilitation of the two secondary pumps
7. Upgrade added of odor and corrosion control equipment

The full rehabilitation was triggered in April when damage was sustained to the lift station's electrical chases located above the wet well. Immediately after the damage was discovered a contract was awarded for the design plans. Until the April event there was no immediate need to pursue the full rehabilitation project.

If you would like to discuss our responses please feel free to call.

Thank you,

David Shissler, P.E.
Director of Water Quality
City of Laguna Beach, CA 92651
(949) 497-0328
www.clbwq.net

-----Original Message-----
From: Joann Cofrancesco [mailto:JCofrancesco@waterboards.ca.gov]
Sent: Wednesday, December 24, 2008 10:05 AM
To: Shissler, David WQ
Subject: RE: Bluebird Lift Station October 29th Sewer Spill IncidentFollow-up Questions

David,
I have a few more questions. Please see the comments and yellow highlights in the attachment.
Thanks and happy holidays!
Joann

On 12/19/2008 at 11:13 AM, in message <230705E13AAE554AAA0466B399FB0B2202F3C0D5@exch2k3.clbnet.local>, "Shissler, David WQ" <dshissler@lagunabeachcity.net> wrote:
> Joann,
> As requested the City of Laguna Beach is providing answers to the
> Regional Board's questions from their review of the subject incident
> report.
> Paraphrasing your questions, I've separated your questions into twelve

> distinct responses.
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> periodic maintenance. Was the maintenance kept up according to the

> manufacturer recommendations;
> CLB Answer: The pumps in all of our 25 lift stations receive
> routine maintenance. The pump in question was being installed.
> It was replacing a decommissioned pump. The check valve is checked
> daily. It was functioning properly.
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> Question 2) does the maintenance require isolating it from the
> discharge manifold?
> CLB Answer: Yes
> Question 3) If yes to 1 & 2, why was a leak in the gate valve not
> noticed at other times?
> CLB Answer: The gate valve was fully operational. All conditions
> of the gate valve indicated that the gate was fully seated.
> After the incident occurred the gate valve was found to have a rock
> and small debris wedged in the seat where the gate seals against the
> valve body. This is common in wastewater operations and why we have
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> according to the manufacturer recommendations?
> CLB Answer: Yes; By nature of the operations of the Bluebird SOCWA
> lift station our staff encounters frequent ragging problems in the
> pumps. Pump number one is one of two primary pumps in operation. As
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> closed ever time the pump is de-ragged. There was never any recent
> concerns that the valve was inoperable.
> Question 5) Are there any methods used to ensure the valve is closed
> (example - counting the number of turns)?
> CLB Answer: The 12-inch gate valve was a "32 turn"
> valve. City staff and iWater staff both exercised the valve closed to
> 32 turns and was subsequently found to have a problem seating. After
> replacing the valve, it was apparent that the gate was unable to fully

> seat; a small rock and debris was discovered to be preventing the gate

> to properly seat. The gate valve was routinely exercised. To replace

> the old pump the gate valve had been closed. The check valve was also

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> the pressure from the pump; this ensuring that the system was isolated.
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> in the gate seat of the valve body.
> Question 7) Which alarm triggered the calls to staff? Were there
> any alarms in the dry well to indicate flooding?

> CLB Answer: The first alarm received was a High Dry
> Well alarm.
> Question 8) When the first staff responder arrived at the LS, what
> was the level in the dry well?
> CLB Answer: Approximately six to seven feet deep.
> Question 9) Why were you unable to pump the sewage from the dry well
> to the 10-inch diameter riser connected to the force main, instead of
> the storm drain?
> CLB Answer: The initial priority to the emergency
> response was to regain the operations of the pumping facilities.
> Gaining access to the point of failure was determined to be the best
> approach to minimize the down time of the pumping operations. Setting

> up a connection to the 10-inch blind flange downstream of the lift
> station was not considered for several reasons:
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absolute
> limits. It would not be capable or connecting to a system with the
> discharge side having over 40 psi operational head. The net positive
> suction head would have been exceeded and rendering the pump unusable.
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> would be pumped out of the dry well would be re-circulated back into
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> and re-establishing operations before entering into the peak flow
> period of the day. If the motors would have been submerged any longer

> then they were, they may have never been able to function. In
> retrospect, another course of action could have caused the City to
> fully lose operation of the lift station; it was the correct approach.
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wet well
> to the 10-inch diameter riser connected to the force main, instead of
> the storm drain? I understand that the suction lift was too high, but

> you were still able to pump it out to the street level.
> CLB Answer: See answer in previous question.
>
> Question 11) When did the contractor start and finish the
bypass from
> the influent to the pump station to the 10-inch diameter riser
> connected to the force main? Was the suction lift a problem?
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> action in the first hour after receiving alarms from the station.
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> incident. Their bypass was operational by 6:30 p.m. that evening.
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> approximately 22 feet. The initial setup for the emergency bypass was

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> to a configuration at the bottom of Galen Drive that allowed the
> suction end to remain in a flooded state which was optimum for the
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> valve of this age and type should not have any problems closing. They

> suspect that loosening the packing gland nuts would allow the large
> 16-inch valve to close. However, the risk of flooding the dry well
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> been actively working on the design plans for rehabilitating the
> entire lift station. To bring it up to the most current standards the

> City has included replacing all of the valves with eccentric plug
> valves. During the rehabilitation project coming in the Spring of
> 2009 the lift station will be bypassed and at that time what is
> preventing the large isolation valves to be closed will be determined.
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> If you have any follow-up questions we'll be happy to provide
> additional information.
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> Happy Holidays!
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> Regards,
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> David Shissler, P.E.
> Director of Water Quality
> City of Laguna Beach, CA 92651
> (949) 497-0328
> www.clbwq.net
>
>
>
> -----Original Message-----
> From: Shissler, David WQ
> Sent: Tuesday, December 16, 2008 5:09 PM
> To: 'Joann Cofrancesco'
> Cc: Holoman, Will WQ; Jeremy Haas
> Subject: RE: Bluebird Lift Station October 29th Sewer Spill Incident
> Follow-up Questions
>
> Joann,
> I'll ask our staff to assist in the responses. From a brief review of

> your questions I'm confident there are straight forward answers to all

> of your questions. We'll have it sent back to you by the end of the

> week.
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> Thank you,
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> David Shissler, P.E.
> Director of Water Quality
> City of Laguna Beach, CA 92651
> (949) 497-0328
> www.clbwq.net
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>
>
> -----Original Message-----
> From: Joann Cofrancesco [mailto:JCofrancesco@waterboards.ca.gov]
> Sent: Tuesday, December 16, 2008 3:39 PM
> To: Shissler, David WQ
> Cc: Holoman, Will WQ; Jeremy Haas
> Subject: Bluebird Lift Station
>
> Hi Dave,
>
> We've reviewed the information you've provided to date. Your report
> offers much of the information we would ordinarily request in an
> investigative order following a spill of that magnitude. However, it
> doesn't answer a few questions that we consider crucial to our
> assessment of the spill and response. Feel free to reply by email or
> letter, but please do so promptly.
>
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> maintenance. Was the maintenance kept up according to the
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> 10-inch diameter riser connected to the force main, instead of the
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> to the pump station to the 10-inch diameter riser connected to the
> force main? Was the suction lift a problem?
>
> Why was iWater unable to return the existing valves inside the dry
> well back to service (why were they stuck)?
>
> Thanks,
> Joann

<<RE: Bluebird Lift Station October 29th Sewer Spill IncidentFollow-up Questions>>

Attachment 8

From: "Shissler, David WQ" <dshissler@lagunabeachcity.net>
To: "Joann Cofrancesco" <JCofrancesco@waterboards.ca.gov>
CC: "Wright, Graham WQ" <gwright@lagunabeachcity.net>, <JHaas@waterboards.ca...
Date: 2/26/2009 12:13 PM
Subject: Clarification Responses 2-26-09
Attachments: ole0.bmp

Joann,
To clarify our previous discussion we provide the following to confirm the timeline of installing the new pumps and motors at the Bluebird SOCWA Lift Station:

* On October 22nd the rejected pump bases, from ESCCO, were removed from the discharge piping system; in positions 1 and 2.
* On October 23rd the work required to prep the bases for the installation of new Cornell pumps was begun.
* On October 24th the new pump bases for both pumps were connected to the suction lines. The contractor began dry packing the Pump #2 base and the motor was installed.
* On October 27th the bases were leveled, the dry packing completed, and the custom eccentric discharge spool was fitted and installed on Pump #2.
* On October 28th Pump #2 was prepared for startup testing. The motor rotation was verified (electrical wiring), and the pump was cycled through several draw-fill tests. The draw-fill tests were done to determine if the pump met the specifications as ordered. Once the pump was found to meet the specifications then it was placed on-line to run as the primary pump on variable frequency.

As the primary pump, Pump #2 operated through the day with no problems. The motor control center is programmed to save energy, and reduce the wear on the pumps, by switching from variable frequency to a draw-fill operation. This saves approximately 4 hours of electrical power use overnight.

On that evening Pump #1 had been installed, was connected to the suction side of the manifold, and was pending the custom fabrication of the eccentric discharge spool in order to be fitted to the discharge side of the manifold and placed into service after testing. After cycling Pump #2 that day there was no indication that a problem was imminent at the uniflange fitting. The uniflange fitting had been in the same state, with no problems since October 22nd ; having experienced the draw-fill of the older pumps 3 and 4 for that period.

JC = Day before the October 29, 2008 SSO, on October 28, 2008, the new pump for Pump No. 2 was installed and tested (Agenda Bill, third paragraph). On October 28, 2008 various speeds were tested, but "draw-fill" state/ new surge pressures were not tested.

The new Pump #2 was tested in a draw-fill state at various starting points (developed depths) in the wetwell. The test was primarily centered around discharge volume capabilities and observing any adverse vibrations developing through various speeds. Pressures were not tested. The pumps performance was as designed which is indicative that the calculated conditions of the pump are/were within normal operating parameters.

Subsequently pressures were tested on December 4th for

unrelated design considerations. The pressure readings were measured and never exceeded 51 psi. As stated previously, the lift station was recently upgraded with a new stainless steel surge tank to absorb typical water hammer experienced during the draw-fill periods of operation.

JC = You did not provide much for the O&M for the lift station (only the table of contents). From this I am assuming the O&M has not been updated since 1983.

At your visit it was discussed if you would prefer to have a copy of the large O&M manual. If you would like a copy of it we can have a copy made. The table of contents was provided to give an overall view of its content. The basic operations of lift station have not substantively change since its construction. The original O& M manual is a reference manual and is accompanied by more detailed O&M manuals for specific components of the lift station, such as the variable frequency drives, the new pumps, the oxygenation system, generator controller, and flow meter.

Maintaining O&M manuals for a facility that is routinely maintained and upgraded is supported by both City staff and outside contract services. The original O&M manual is old but it is still useful and relevant for reference. The supplemental manuals are kept along with all of the other lift station information.

JC = You also did not provide training records, but provided information about the alarms instead. I am assuming then that you do not provide regular training.

Every Thursday the Wastewater Division holds a safety and training meeting. The training is done by discussion, by video tapes shared from the Laguna Beach Water District, and by using a mach up control panel for electrical systems troubleshooting. The training covers many aspects of our Division's operations. It is centered on real-life operational concerns. We do not record the contents of every meeting. While all of our employees are trained to safely work within the lift stations, hands-on training includes one employee serving a two month training period with the Maintenance Supervisor. This rotating two month assignment provides all of the Wastewater Division employees hands-on training on routine operations, maintenance, and troubleshooting on each of the twenty-five lift stations within the City's service area.

Lastly there are three points that are important to reiterate:

1. The pumps are routinely checked and are frequently worked on to be "de-ragged". Whenever a pump is de-ragged, the gate valves are inspected and closed. With the current valving configuration of the lift station's discharge manifold, there is no safe way isolate the check valve to expose the gate seat and perform maintenance. All of our staff have been trained in techniques that clear valve seats from lodged debris. This is a common development with all twenty-five or our lift station operations.
2. We maintain an emergency on-call staff all of which are fully trained to respond to any of our twenty-five lift stations. Because we maintain so many lift stations, all of our field staff are assigned routine duty to support operations.

3. Finally, as a follow-up to other discussion about the resilient-wedge gate valve on the discharge side of pump #1: We are still seeking to retrieve the photo, that has apparently been misfiled, showing the close-up of the flat rock found to be wedged in the seat of the resilient-wedge gate valve. However we are including the picture of the valve in the closed position as it was found subsequent to the uniflange failure. As you can see it is was closed and nearly tight but it wasn't fully seated to isolate the flow to the fully operational check valve.

<<Picture (Device Independent Bitmap)>>

If you have any questions we are happy to provide additonal information.

Thank you,

David Shissler, P.E.
Director of Water Quality
City of Laguna Beach, CA 92651
(949) 497-0328
www.clbwq.net

-----Original Message-----
From: Joann Cofrancesco [mailto:JCofrancesco@waterboards.ca.gov]
Sent: Thursday, February 19, 2009 3:24 PM
To: Shissler, David WQ
Subject: clarification needed

I want to make sure I have the time line correct based on info you provided in the interview and submitted papers.

Two weeks before the October 29, 2008 SSO, Pump Nos. 1 and 2 were isolated and taken offline.
Day before the October 29, 2008 SSO, on October 28, 2008, the new pump for Pump No. 2 was installed and tested (Agenda Bill, third paragraph).
On October 28, 2008 various speeds were tested, but "draw-fill" state/ new surge pressures were not tested.

You did not provide much for the O&M for the lift station (only the table of contents). From this I am assuming the O&M has not been updated since 1983.

You also did not provide training records, but provided information about the alarms instead. I am assuming then that you do not provide regular training.

Thanks,
Joann
--

Water Resource Control Engineer
Regional Water Quality Control Board - San Diego Region
Compliance Assurance Unit
9174 Sky Park Court, Suite 100
San Diego, CA 92123
858-637-5589 (direct line)
858-571-6972 (fax)
jcofrancesco@waterboards.ca.gov

Attachment 9

Meeting with City of Laguna Beach
Friday, February 13, 2009
Location: 505 Forest Avenue, Laguna Beach, CA 92651

Attendees:
David W. Shissler (Director of Water Quality, City of Laguna Beach)
Graham Wright (Senior Field Supervisor Wastewater Division, City of Laguna Beach)
Jeremy Haas (Senior Environ Scientist, Compliance Assurance Unit, RWQCB – San Diego)
Joann Cofrancesco (WRCE, Compliance Assurance Unit, RWQCB – San Diego)

1. Built by SOCWA? – **The Bluebird SOCWA Lift Station was built by Aliso Water Management Agency (AWMA). Records were not well maintained by AWMA.**
2. The report states that the LS was built in 1977, but the Agenda Bill states that it is 27 years old (1981). Why the difference? - **The design for Bluebird SOCWA Lift Station started in 1977. The lift station was completed in August 1983.**
3. When did the City of Laguna Beach take over the Bluebird SOCWA LS? – **The City of Laguna Beach took over in 1988.**
4. When was the 12-inch Uni-Flange and resilient wedge gate valve installed? – **These parts were installed in 1993. The City oversaw the contractor who performed the work.**
5. Efforts to control SSOs - **In March 2002, a matrix of improvements (formal actions) was adopted. In 2003, they started to implement the improvements. Eighty percent of the improvements were gravity lines. The Bluebird SOCWA Lift Station was not included.**
6. Maintenance in the Lift Station
    a. **During the annual maintenance of the check valves, they bleed the area between the check valve and the isolation gate valve. If the bleeding does not stop, the gate valve is not completely closed. The bleeding takes approximately 30 minutes.**
    b. **The isolation gate valve is cleaned using the force of the water flow to push the debris out of the valve. The velocity of the flow is increased by partially closing the isolation gate valve.**
    c. **They use a machine to close the gate valve. The machines count the number of turns. The original number of turns to close the valve was 32. The turns are not tracked, but has increased over time. Currently it takes more than 34 turns.**
    d. **They are unsure how long the 16-inch gate valve on the discharge header has been in the stuck position.**
7. Review of procedures for isolating pumps
    a. **When the pump is isolated from the discharge side, the check valve is used as a secondary isolation valve.**
    b. **The isolation gate valve is closed by turning till it stops.**

8. What year were the damages to the electrical chases located on the ceiling of the wet well. What was the cause?
    a. **In May 2007, in the process of repairing a portion of the force main for the Bluebird SOCWA Lift Station, they backed up the wet well. They did not have any problems with the electrical chases on the ceiling of the wet well at that time.**
    b. **In April 2008, in the process of repairing a portion of the force main for the Bluebird SOCWA Lift Station, they backed up the wet well and discovered that the electrical chases were corroded, allowing water to seep into them and flow to the dry well.**
    c. **Due to the discovery of the corrosion of the electrical chases, they decided to develop a plan to rehabilitate the lift station.**
9. What was the flow into the wet well during the spill? **Not available**
10. What was the flow into the dry well? **Not available**
11. Events after the spill - **iWater was hired after the SSO to evaluate the problems with the isolation gate valve on Pump No. 1 and the 16-inch gate valve on the discharge header.**
12. Any changes to procedure of isolating the pump, after this incident? – **None, since the procedure has worked for 25 years.**
13. How did you calculate the total overflow amount? – **This was not available at the time. They will provide later.**
14. All the gate valves in the Bluebird SOCWA LS are being replaced with the DeZurik eccentric plug valves? **Yes, except for one valve to the surge tank, which is new.** This is a result of this overflow? **Yes, the replacement was triggered by the SSO.** Does your other LS have the same gate valves? **No, at this time there are no plans to change the valves in the other lift stations.**

Attachment 10

	Total Coliform	Fecal Coliform	Enterococcus
Crescent Bay			
10/29/2008	<10	<10	<2
10/30/2008	<40	10	6
Laguna Main Beach			
10/29/2008	10	10	10
10/30/2008	10	10	<2
Hotel Laguna			
10/29/2008	<10	<10	<2
10/30/2008	<10	<10	6
10/31/2008	80	50	6
11/1/2008	30	10	2
11/2/2008	<10	<10	<2
Sleepy Hollow			
10/29/2008	10	<10	8
10/30/2008	40	10	110
10/31/2008	10	<10	<2
11/1/2008	40	<10	2
11/2/2008	20	10	4
Thalia St.			
10/29/2008	<10	<10	2
10/30/2008	130	<10	2
10/31/2008	120	10	<2
11/1/2008	10	<10	2
11/2/2008	10	<10	<2
Cress St.			
10/29/2008	10	<10	<2
10/30/2008	850	<10	4
10/31/2008	1150	10	<2
11/1/2008	20	<10	<2
11/2/2008	20	<10	<2
Mid Surf & Sand			
10/29/2008	100	<10	10
10/30/2008	13,000	110	68
10/31/2008	4000	20	22
11/1/2008	830	10	24
11/2/2008	110	10	2
Bluebird Canyon			
10/29/2008	4,000	320	800
10/30/2008	2,200	70	44
10/31/2008	680	<10	<2
11/1/2008	3600	170	180
11/2/2008	110	<10	4
Agate St.			
10/29/2008	9,200	300	400
10/30/2008	<130	<10	8

10/31/2008	190	<10	<2
11/1/2008	80	10	6

Pearl St.

10/29/2008	2,000	100	295
10/30/2008	>=80	10	10
10/31/2008	8400	10	10
11/1/2008	60	<10	<2

Moss St.

10/29/2008	20	<10	10
10/30/2008	<10	<10	4
10/31/2008	60	<10	2
11/1/2008	10	<10	<2

Dumond Dr.

10/29/2008	<10	<10	10
10/30/2008	<10	<10	4

Goff Island Beach

10/29/2008	<10	<10	<2
10/30/2008	<10	<10	<2

Treasure Island Beach

10/29/2008	<10	<10	<2
10/30/2008	20	<10	2

Aliso - North

10/29/2008	<10	<10	<2
10/30/2008	10	<10	<2

Aliso - Middle

10/29/2008	50	<10	20
10/30/2008	60	<10	6

Aliso - Concession

10/29/2008	20	10	10
10/30/2008	20	<10	2

Aliso - South

10/29/2008	<10	10	<2
10/30/2008	<10	<10	<2

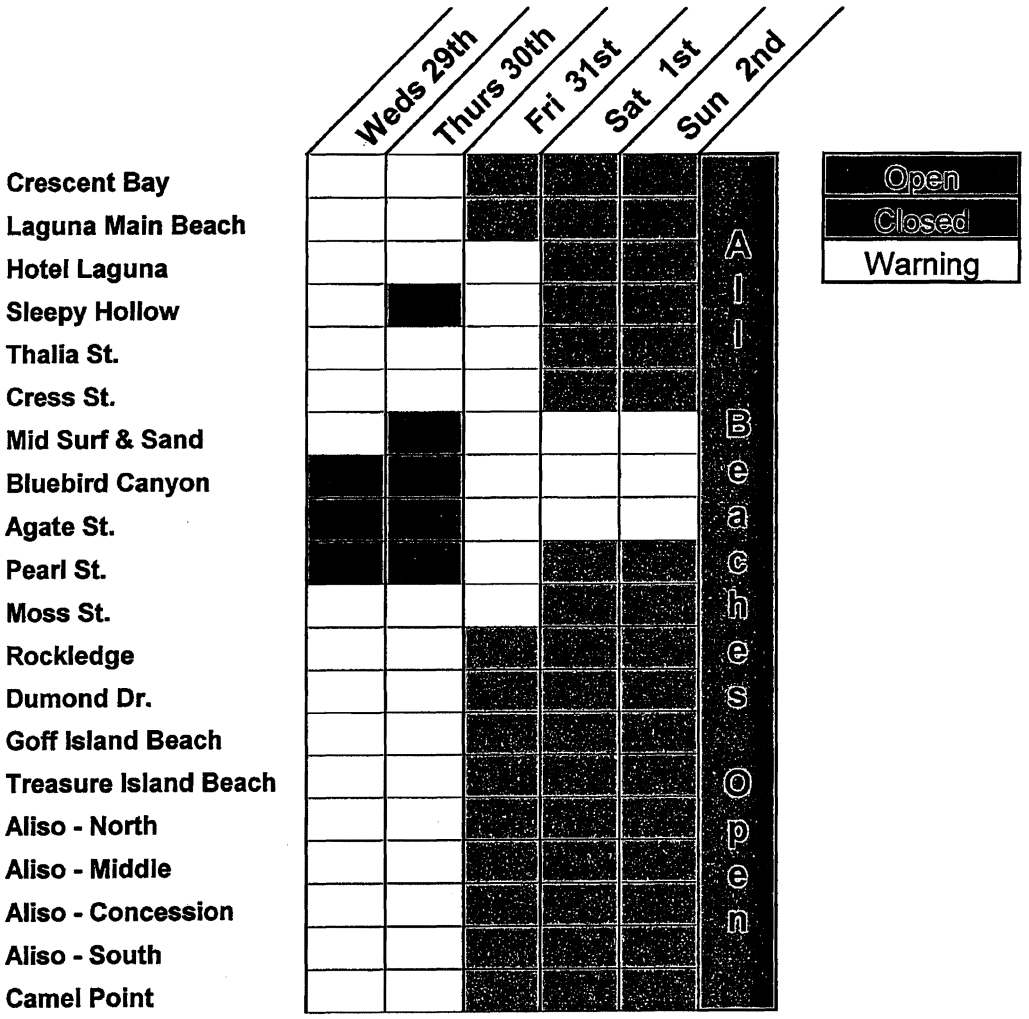
Camel Point

10/29/2008	10	<10	<2
10/30/2008	10	10	22

State Standards	Total Coliform	Fecal Coliform	Enterococcus
	<=10,000	<=400	<=104

n/s = not sampled

TNTC = Too Numerous To Count


Weds 29th
Thurs 30th
Fri 31st
Sat 1st
Sun 2nd
Crescent Bay
Laguna Main Beach
Hotel Laguna
Sleepy Hollow
Thalia St.
Cress St.
Mid Surf & Sand
Bluebird Canyon
Agate St.
Pearl St.
Moss St.
Rockledge
Dumond Dr.
Goff Island Beach
Treasure Island Beach
Aliso - North
Aliso - Middle
Aliso - Concession
Aliso - South
Camel Point
All Beaches Open
Open
Closed
Warning

Laguna Beach Closures by Date

	10/29/2008	10/30/2008	10/31/2008	11/1/2008	11/2/2008	
Crescent Bay	X	X				
Laguna Main Beach	X	X				
Hotel Laguna	X	X	X			A
Sleepy Hollow	X	X	X			l
Thalia St.	X	X	X			l
Cress St.	X	X	X			
Mid Surf & Sand	X	X	X	X	X	B
Bluebird Canyon	X	X	X	X	X	e
Agate St.	X	X	X	X	X	a
Pearl St.	X	X	X			c
Moss St.	X	X	X			h
Rockledge	X	X				e
Dumond Dr.	X	X				s
Goff Island Beach	X	X				
Treasure Island Beach	X	X				O
Aliso - North	X	X				p
Aliso - Middle	X	X				e
Aliso - Concession	X	X				n
Aliso - South	X	X				
Camel Point	X	X				

X = Exceeded Standards

Beach Closure Date	Limits
10/29/2008	Crescent Bay to Camel Point
10/30/2008	Crescent Bay to Camel Point
10/31/2008	Hotel Laguna to Moss St.
11/1/2008	300' N of Bluebird Canyon to Agate St.
11/2/2008	300' N of Bluebird Canyon to Agate St.

Shissler, David WQ

From: Honeybourne, Larry [LHoneybourne@ochca.com]
Sent: Friday, October 31, 2008 4:10 PM
To: Shissler, David WQ
Cc: Sanchez, Richard; Fennessy, Michael; Yokoyama, Dan; Halle, Tami
Subject: Laguna Beach Closure sample results.XLS
Attachments: Laguna Beach Closure sample results.XLS

Dave,
Per our conversation, attached are the results of the most recent water quality monitoring. Based on the recent data HCA has implemented a partial reopening of the closure area. The closure has been reduced to 11/2 miles from 4 miles. The closure area is now from Hotel Laguna to Moss Street. Samples were collected this morning and will be collected again tomorrow morning. Friday's sample results will be available sometime after noon on Saturday. Mike Fennessy is on call and will be in touch with the results. If you have any questions please feel free to call me.
Larry Honeybourne
County of Orange
Health Care Agency
714 433 6015

Attachment 11

General Ledger
Detailed Trial Balance

User: leahh
Printed: 02/11/2009 - 3:33
Period 1 to 12, 2009

Account Number	Description	Budget	Beginning Balance	Debit This Period	Credit This Period	Ending Balance
137	Sewer					
EXPENSE						
137-37	Water Quality					
137-37-3302-9712	Bluebird Station Sewer Spill	210,000.00				
11/06/2008 PR 05 000006	Computer Batch 2008 11 910			10,020.80	0.00	
11/14/2008 AP 05 000017	LBPCF - CLB Petty Cash Finance	Ck# 325463		45.00	0.00	
11/14/2008 AP 05 000017	LBPCF - CLB Petty Cash Finance	Ck# 325463		51.70	0.00	
11/14/2008 AP 05 000020	R.V.F. - R.V.F. Electric, Inc.	Ck# 325521		15,771.66	0.00	
11/14/2008 AP 05 000024	Ralphs - Ralphs Grocery Company	Ck# 325523		85.28	0.00	
11/20/2008 PR 05 000036	Computer Batch 2008 11 911			3,953.74	0.00	
11/21/2008 AP 05 000039	PacTech - Pacific Technical Support Svcs	Ck# 325605		505.47	0.00	
11/21/2008 AP 05 000039	PacTech - Pacific Technical Support Svcs	Ck# 325605		1,083.15	0.00	
11/26/2008 AP 05 000066	Tekd - Tekdraulics	Ck# 325867		8,854.31	0.00	
11/26/2008 AP 05 000069	LB Rev - CLB Revolving Fund	Ck# 325752		164.84	0.00	
11/26/2008 AP 05 000069	LB Rev - CLB Revolving Fund	Ck# 325752		220.57	0.00	
11/26/2008 AP 05 000070	CoastaTS - Coastal Traffic Systems	Ck# 325657		1,060.00	0.00	
11/26/2008 AP 05 000072	D M Ki - D M Kisling Construction	Ck# 325671		1,015.20	0.00	
11/26/2008 AP 05 000073	Swains - Swains Electric Motor Service	Ck# 325863		8,433.73	0.00	
11/26/2008 AP 05 000074	ElToMa - El Toro Materials co.	Ck# 325683		1,065.50	0.00	
11/26/2008 AP 05 000074	Ganahl - Ganahl Lumber Company	Ck# 325702		123.05	0.00	
11/26/2008 AP 05 000074	GriffiD - Griffin Dewatering Corporation	Ck# 325712		72,991.79	0.00	
12/04/2008 PR 06 000017	Computer Batch 2008 12 912			2,341.07	0.00	
12/12/2008 AP 06 000072	R.V.F. - R.V.F. Electric, Inc.	Ck# 326107		14,209.23	0.00	
12/12/2008 AP 06 000073	ConsolR - Consolidated Reprographics	Ck# 325956		100.48	0.00	
12/12/2008 AP 06 000074	Dudek - Dudek & Associates	Ck# 325967		2,820.00	0.00	
12/12/2008 AP 06 000074	GriffiD - Griffin Dewatering Corporation	Ck# 325994		40,045.39	0.00	
12/12/2008 AP 06 000074	Gump - Andy Gump, Inc.	Ck# 325997		205.00	0.00	
12/12/2008 AP 06 000074	IntFlow - International Flow Technologie	Ck# 326012		12,655.00	0.00	
12/12/2008 AP 06 000076	Larrys - Larry's Building Materials	Ck# 326029		5,981.10	0.00	
12/12/2008 AP 06 000076	PacTech - Pacific Technical Support Svcs	Ck# 326091		6,500.00	0.00	
12/24/2008 AP 06 000095	SartV - Sartell Valves, Inc	Ck# 326408		867.90	0.00	
12/24/2008 AP 06 000098	R.V.F. - R.V.F. Electric, Inc.	Ck# 326391		9,358.17	0.00	
12/24/2008 AP 06 000099	SCWD3 - South Coast Water District	Ck# 326418		3,136.00	0.00	

Account Num	Description		Budget	Beginning Balance	Debit This Period	Credit This Period	Ending Balance
12/24/2008 AP 06 000099	ShisD - David Shissler		Ck# 326424		90.36	0.00	
12/24/2008 AP 06 000101	Emerge4 - Emergency Service Restoration		Ck# 326267		2,812.80	0.00	
12/24/2008 AP 06 000102	GriffiD - Griffin Dewatering Corporation		Ck# 326284		5,441.70	0.00	
12/24/2008 AP 06 000102	Gump - Andy Gump, Inc.		Ck# 326285		295.55	0.00	
12/24/2008 AP 06 000102	iWat - iWater		Ck# 326308		750.00	0.00	
12/24/2008 AP 06 000103	LBPCF - CLB Petty Cash Finance		Ck# 326329		18.69	0.00	
12/24/2008 AP 06 000104	W W Gr - Grainger Inc.		Ck# 326465		695.76	0.00	
01/09/2009 AP 07 000008	OCAud2 - O C Auditor Controller		Ck# 326583		499.18	0.00	
01/09/2009 AP 07 000010	Dudek - Dudek & Associates		Ck# 326517		16,107.16	0.00	
01/23/2009 AP 07 000031	DeZurik - DeZURIK Water Controls		Ck# 326743		2,603.10	0.00	
01/23/2009 AP 07 000031	DeZurik - DeZURIK Water Controls		Ck# 326743		1,154.27	0.00	
01/23/2009 AP 07 000034	W W Gr - Grainger Inc.		Ck# 326966		0.00	274.15	
01/23/2009 AP 07 000038	OCAud1 - O C Auditor Controller		Ck# 326850		248.99	0.00	
02/06/2009 AP 08 000013	SchuEng - Schuler Engineering Corporatio		Ck# 327200		49,324.69	0.00	
137-37-3302-9712 Totals:		Var: -93,433.23	210,000.00	0.00	303,707.38	274.15	303,433.23
137-37 EXPENSE Totals:			210,000.00	0.00	303,707.38	274.15	303,433.23
EXPENSE Totals:			210,000.00	0.00	303,707.38	274.15	303,433.23
137 Totals:			(210,000.00)	0.00	303,707.38	274.15	303,433.23
Report Totals:			(210,000.00)	0.00	303,707.38	274.15	303,433.23