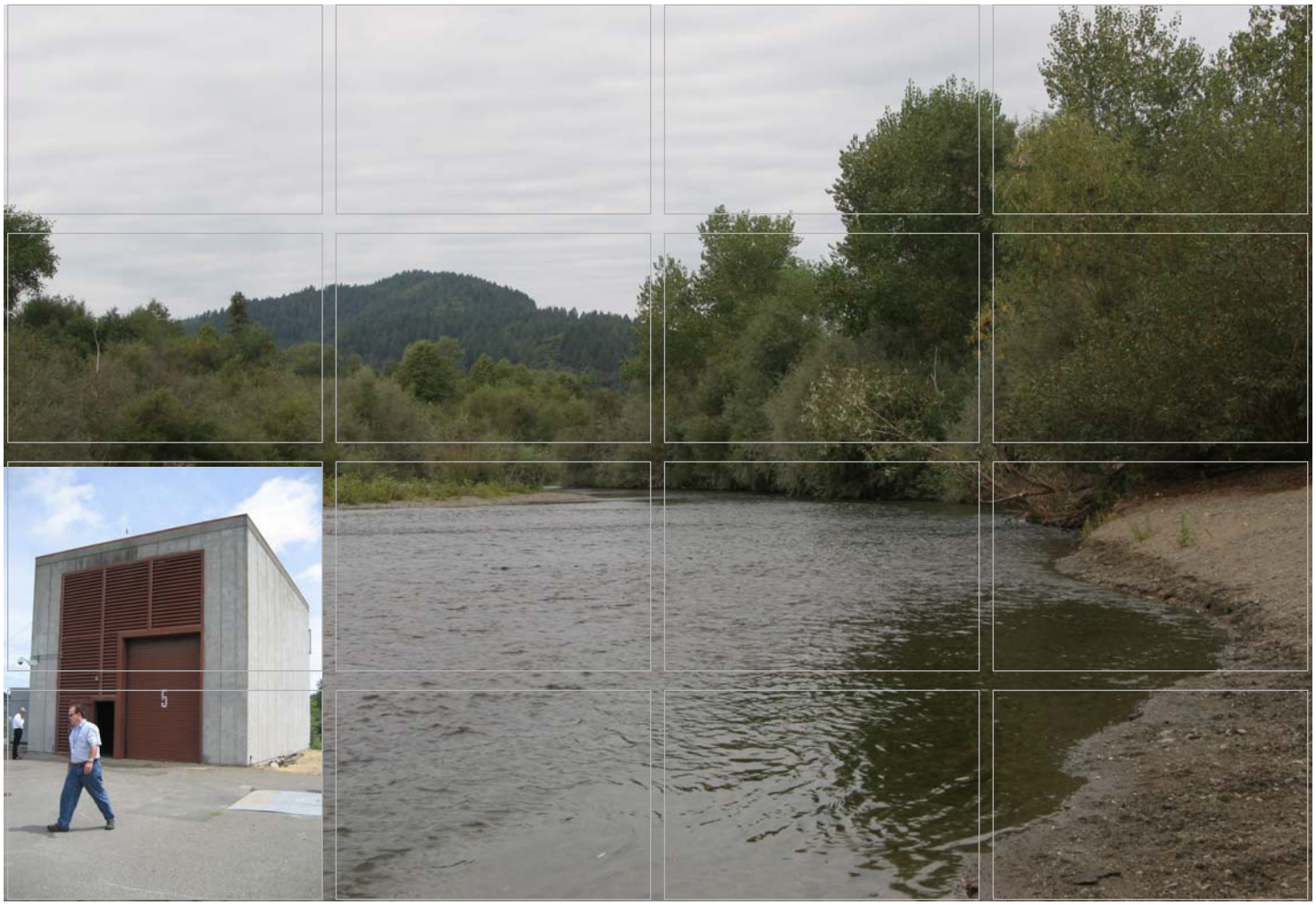

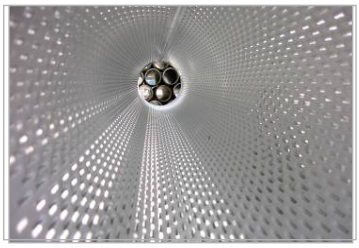

Prepared for:

Capacity Analysis of Sonoma County Water Agency Mirabel Radial Collector Wells 3, 4, and 5

Santa Rosa, California

September 2011

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September 2011

Project No. 0090596

Ernie Williams
Project Geologist

Michael Shea
Technical Director

John Lucio, P.G.
Project Manager

Jim Warner, P.G.
Principal-In-Charge

ERM-West, Inc.
1277 Treat Blvd., Suite 500
Walnut Creek, CA 94597
T: 925 946 0455
F: 925 946 9968

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LIST OF ACRONYMS

amsl	above mean sea level
BOA	Bottom of Aquifer
Brechtel	Brechtel Radial Collector Wells, LLC
CWI	Collector Wells International, Inc.
DD	Drawdown
DO	Dissolved Oxygen
ERM	ERM-West, Inc.
gpm	gallons per minute
gpm/ft	gallons per minute per foot of drawdown
gpm/lft	gallons per minute per linear foot of lateral
HASPs	Health and Safety Plans
HP	Horsepower
mgd	million gallons per day
mg/L	milligram per liter
mS/cm	millisiemens per centimeter
NTU	nephelometric turbidity units
ORP	Oxygen Reduction Potential
PWL	Pumping Water Level
RRWF	Russian River Well Field
SCWA	Sonoma County Water Agency
SWL	Static Water Level
TDS	Total Dissolved Solids
USGS	United States Geological Survey

EXECUTIVE SUMMARY

The Sonoma County Water Agency (SCWA or the Agency) provides water to several municipalities and water districts in Sonoma and Marin Counties. These entities include the cities of Santa Rosa, Sonoma, Cotati, Rohnert Park, and Petaluma, in addition to the Forestville Water District, Valley of the Moon Water District, North Marin Water District, and Marin Municipal Water District. The SCWA water system serves approximately 570,000 people and has a peak water production capacity in excess of 100 million gallons per day (mgd).

ERM-West, Inc. (ERM) and Brechtel Radial Collector Wells, LLC (Brechtel) were contracted by the SCWA to provide a groundwater production capacity analysis of radial collector wells located along the Russian River west of Santa Rosa, California. This report documents the field procedures, data, and results of the study.

The objectives of this project included the following:

- Document a repeatable program to test and evaluate the capacities of the SCWA collector wells on a regular basis to establish the expected lifespan and possible maintenance improvements for each collector; and
- Implement this program on SCWA collector wells to demonstrate its effectiveness and document the current physical conditions and capacities of the collectors, as well as compare current capacities to estimated past capacities.

The collector wells are located along the Russian River in the Wohler area (Collectors 1, 2, and 6) and the Mirabel area nearby to the south (Collectors 3, 4, and 5). These collector wells provide the majority of SCWA's water supply, although the Agency also operates conventional vertical wells. Collectors 1 through 5 were constructed between 1959 and 1982, whereas Collector 6 was constructed in 2002 and began operation in 2006. This project was initially planned to include testing all six of SCWA's collector wells in 2008. The testing was subsequently modified to include the Wohler Collectors in 2008 and the Mirabel Collectors in 2010. This report presents an evaluation of the test results for Mirabel Collectors 3, 4 and 5.

Over time, the water production capacities of Collectors 1 through 5 appear to have declined, although consistent records have not been kept. In 1998, SCWA contracted Collector Wells International, Inc. (CWI) to

evaluate the magnitude and potential cause(s) of the capacity declines. This inspection concluded that the capacities of Collectors 1 through 5 had declined significantly relative to when they were first constructed. The declines were estimated to range from 24% to 77%, with the largest decrease observed in Collectors 1 and 2. Data evaluation, however, was hindered by hydraulic interferences related to the operation of nearby collectors during the testing.

Potential causes of collector capacity declines include the following:

- Clogging of the lateral well screens;
- Clogging of the aquifer adjacent to the lateral well screens;
- Compaction of the alluvial aquifer material due to long term pumping;
- Problems with the equipment in the collectors, including pumps, piping, and valves;
- Decreased recharge from the ponds and/or river due to silt/organic material build up or changes in the operation of the inflatable dam at Mirabel; and
- Regional declines in ground water levels due to changes in precipitation, river discharge, and/or ground water extraction.

SCWA initiated an effort to develop a repeatable evaluation program to better understand the magnitude, rate, and cause(s) of the loss of capacity in each collector over time. The testing included the following: pumping cessation/recovery test; visual diver inspection; lateral casing thickness measurements; constant rate pumping test; lateral video inspection; lateral flowmeter measurements; and water quality monitoring. The results were compared to previous capacity testing and will be used as a baseline for comparison to future testing.

The 2008 Wohler study was completed between 2 October and 10 November 2008 and evaluated Collectors 1, 2 and 6. The results of the testing are summarized in the *Capacity Analysis of Sonoma County Water Agency Wohler Radial Collector Wells 1, 2, and 6* (Brechtel/ERM, 2008). The field methods developed for this program were demonstrated to be effective for evaluating the conditions of the collectors, specific capacities, and flow in the laterals and the aquifer. These methods provide a valid basis for evaluating future changes in the capacities of the collectors. The field methods were also efficient, allowing for the completion of significantly more lateral inspections and flow testing than planned within the project budget. None of the tests reached full steady-state conditions; however, the results are valid for the capacity comparisons.

A preliminary conclusion of the 2008 Wohler study was that the apparent loss in capacity in Collectors 1 and 2 since 1959 maybe attributed in large part to lower water levels and less saturated thickness during the 2008 testing period, when compared to 1959. Aquifer compaction, differences in the timing of the 1959 test (May – river bed more scoured and better recharge) and 2008 test (November – silt and biological material buildup inhibit recharge), and the recent introduction of pumping in Collector 6 are also possible factors leading to the apparent capacity declines in Collector 1 and 2.

The 2010 Mirabel study was completed between 23 September and 9 December 2010 and implemented the field methods developed as part of a repeatable program and used for the Wohler study. Similar with the Wohler study, the field methods were also efficient, allowing for the completion of significantly more lateral inspections and flow testing than planned within the project budget. None of the tests reached full steady-state conditions; however, the results are valid for the capacity comparisons.

The inspection of Collector 3 indicated that the caisson and underwater structures appear to be in good condition. The specific capacity calculated for Collector 3 at 48 hours of pumping in 2010 was 696 gpm/ft, which is 20% higher than that calculated during the 1975 evaluation (580 gpm/ft) following the construction of the well and over twice the capacity calculated during the 1998 testing (297 gpm/ft), although the 1998 value was influenced by the operation of Collector 4. The results indicate that the capacity of Collector 3 has not diminished since its construction in 1975.

The inspection of Collector 4 indicated that the caisson and underwater structures are generally in good condition. The inspection of the carbon steel laterals indicates that a number of the laterals showed signs of scale and encrustation in the outer portions of the laterals. Collector 4 had a specific capacity of 492 gpm/ft after 48 hours of pumping, which is a 18% decline from the value obtained during initial testing in 1975 (597 gpm/ft) and approximately 150% of the capacity obtained during the 1998 testing (328 gpm/ft) although this value was impacted due to interference from Collector 3 which was also in operation. The specific capacity results suggest a decline in the capacity of Collector 4 since it was constructed in 1975. The reduction in performance could suggest that the encrustation and other signs of potential blockage observed in some of the laterals may be causing some reduction in the well's efficiency.

The inspection of Collector 5 indicated that the caisson and underwater structures appear to be in good condition. The results of the testing

indicate that Collector 5 has a specific capacity of 539 gpm/ft at 24 hours of pumping, which is 13% higher than capacity obtained in 1982 after construction. The 1998 study evaluated the well after 2 to 3 hours of pumping and did not provide a basis for meaningful comparison with the 2010 results. The overall capacity of Collector 5 does not appear to have declined appreciably since its construction and is comparable to that determined when the well was originally constructed

1.0 INTRODUCTION

ERM-West, Inc. (ERM) and Brechtel Radial Collector Wells, LLC (Brechtel) were contracted by the Sonoma County Water Agency (SCWA or the Agency) to provide a capacity analysis of radial collector wells located along the Russian River west of Santa Rosa, California (Figures 1 and 2). This report documents the field procedures, data, and results of the evaluation. This project was completed in accordance with the workplan entitled *Capacity Analysis Operations Plan for Selected Sonoma County Water Agency Radial Collector Wells – Mirabel Area* (Operations Plan) (ERM, 2010), which is provided as Appendix A.

1.1 DOCUMENT ORGANIZATION

This report is divided into the following sections:

- Section 1 – Provides the project objectives and background;
- Section 2 – Summarizes the field methods;
- Section 3 – Presents the results of the testing and evaluation of the data;
- Section 4 – Provides conclusions and recommendations; and
- Section 5 – Lists the references used in preparing this document.

Figures and tables referenced in the text are included after Section 5. Appendices A through I follow the tables, including:

- Appendix A – Capacity Analysis Operations Plan;
- Appendix B – Water Level Monitoring Data;
- Appendix C – Collector Inspection Photographs;
- Appendix D – Collector Inspection Videos;
- Appendix E – Capacity Testing Photographs;
- Appendix F – Lateral Inspection Videos;
- Appendix G – Collector Operation and System Data;
- Appendix H – Collector 3 Capacity Evaluation Field Data;
- Appendix I - Collector 4 Capacity Evaluation Field Data; and
- Appendix J - Collector 5 Capacity Evaluation Field Data.

1.2 *PROJECT OBJECTIVES*

The objectives of this project included the following:

- Document a repeatable program to test and evaluate the specific capacities of the SCWA collector wells on a regular basis to establish the expected lifespan and possible maintenance improvements for each collector; and
- Implement this program for Collectors 3, 4, and 5 to demonstrate its effectiveness and document the current physical conditions and capacities of the collectors, as well as compare current capacities to estimated past capacities.

This project was initially planned to include testing all six of SCWA's collector wells in 2008. The testing was subsequently modified to include three wells in 2008 (Wohler Collectors 1, 2, and 6) and three wells in 2010 (Mirabel Collectors 3, 4, and 5). The schedule was modified to ensure that the testing protocols would meet the project goals before all of the collectors were evaluated. This report presents an evaluation of the test results for Collectors 3, 4 and 5 and provides recommendations concerning test protocols and evaluation methods for long-term capacity monitoring.

1.3 *PROJECT BACKGROUND*

Sonoma County Water Agency provides water to several municipalities and water districts in Sonoma and Marin Counties. These entities include the cities of Santa Rosa, Sonoma, Cotati, Rohnert Park, and Petaluma, in addition to the Forestville Water District, Valley of the Moon Water District, North Marin Water District, and Marin Municipal Water District. The SCWA water system serves approximately 570,000 people and has an estimated peak production capacity of 112 million gallons per day (mgd).

Water production for SCWA is concentrated along the Russian River west of Santa Rosa (Figures 1 and 2). In this area, the Agency operates six radial collector wells and seven conventional vertical wells. The conventional wells are referred to as the Russian River Well Field (RRWF). SCWA also operates three conventional vertical wells along the Cotati Intertie Pipeline.

As seen in Figure 2, the collector wells are located in two areas along the Russian River. Collectors 1, 2, and 6 are on the east bank of the Russian River north of the Wohler Bridge, referred to as the Wohler area. Collectors 3, 4, and 5 are approximately one mile south on the north bank of the river, referred to as the Mirabel area (Figure 2). The ages of Collectors 1 and 2

(1959), Collectors 3 and 4 (1975), Collector 5 (1982), and Collector 6 (2006) span 40 years. The focus of this second phase of the project is the radial collector wells in the Mirabel area (Collectors 3, 4, and 5; Figure 3). Similar testing in the Wohler area for Collectors 1, 2, and 6 was completed in 2008. The results of the 2008 testing were presented in *Capacity Analysis of Sonoma County Water Agency Wohler Radial Collector Wells 1, 2, and 6* (Brechtel and ERM, 2008).

In the Mirabel area, SCWA operates an inflatable dam and four infiltration ponds (Mirabel Ponds 1 through Pond 4) (Figure 3). The dam, which was installed in the mid-1970s, is inflated during the dry portion of the year (Summer and Fall) to divert water to the ponds and raise water levels in the aquifer by increasing recharge from the river. Backwater from the dam extends approximately 1 mile upstream of Collector 6 near the McLaughlin Pond in Riverside Park. Based on historic data collected by SCWA, with the dam inflated, the total sustained capacity of the collector wells increases significantly, from approximately 50 to more than 90 mgd.

Over time, the water production capacities of Collectors 1 through 5 appear to have declined, although consistent records have not been kept. In 1998, SCWA contracted Collector Wells International, Inc. (CWI) to evaluate the magnitude and potential cause(s) of the capacity declines. The results of this study are presented in *Inspection of Collector Wells 1 and 2 at Wohler and 3, 4, and 5 at Mirabel* (CWI Report), dated November 1998. This inspection concluded that the capacities of Collectors 1 through 5 had declined significantly relative to when they were first constructed. The declines were estimated to range from 24% to 77%, with the largest decreases observed in Collectors 1 and 2. Due to hydraulic interferences related to operation of nearby Collectors during the inspection and a lack of consistent data over time, SCWA would like to confirm and better understand the magnitude, rate, and cause(s) of the declines in each collector.

Some potential causes of collector capacity declines include the following:

- Clogging of the lateral well screens;
- Clogging of the aquifer adjacent to the lateral well screens;
- Compaction of the alluvial aquifer material due to long term pumping;
- Problems with the equipment in the collectors, including pumps, piping, and valves;
- Decreased recharge from the ponds and/or river due to long term silt/organic material build up or changes in the operation of the inflatable dam; and

- Regional declines in ground water levels due to changes in precipitation, river discharge, and/or ground water extraction.

Based on the apparent declines, SCWA requested the development of a repeatable evaluation program to better understand the magnitude, rate, and cause(s) of the loss of capacity in each collector over time.

The results of the 2008 Wohler area testing suggested that the decline in capacity observed in Collectors 1 and 2 may be attributable to lower water levels and less saturated thickness during the testing period, relative to when the wells were first installed. Additional factors leading to the capacity declines observed in Collectors 1 and 2 may include aquifer compaction over time, seasonal timing of the testing period (which affects recharge), and the recent introduction of pumping in Collector 6 within the Wohler area.

1.4 COLLECTOR 3 BACKGROUND

Collector 3 is located south of Westside Road, adjacent to the Russian River, and was constructed in 1975 by Ranney Method Western Corporation (Ranney, 1975). The construction information presented herein was taken from the 1998 Ranney Method report entitled *Inspection of Collector Wells 1 and 2 at Wohler and 3, 4 and 5 at Mirabel* (CWI, 1998). The lateral information is summarized in Table 1 and Figure 4 contains a well diagram with a schematic of the lateral orientations for this well.

The well consists of a 13-foot inside diameter (16-foot outside diameter) steel reinforced concrete caisson, 111 feet in total length from the top slab to the bottom of the caisson. The well configuration consists of six 10-inch diameter mild steel laterals that range in length from 134 to 173.5 feet. The laterals are equipped with 10-inch diameter valves from different manufacturers and project into the aquifer from approximately 42 inches above the caisson floor. The well is equipped with two vertical turbine pumps with 1,250 horsepower (HP) motors.

Initial performance testing of Collector 3 was done following installation in 1975. The results of the tests indicated an apparent specific capacity of 595 gallons per minute per foot of drawdown (CWI, 1998). A subsequent evaluation was completed by CWI in November 1998 and summarized in *Inspection of Collector Wells 1 and 2 at Wohler and 3, 4 and 5 at Mirabel* (CWI, 1998). This evaluation indicated a 50% decline in the apparent specific capacity of the well when compared with its initial performance testing. The report indicates that steady-state conditions had not been reached during the

Collector 3 evaluation as the pumping water level was still declining at the time of the measurements and that the actual decline is most likely greater than specified.

1.5 COLLECTOR 4 BACKGROUND

Collector 4 is located south of Westside Road approximately 825 feet upstream (east) of Collector 3, adjacent to the Russian River, and was constructed in 1975 by Ranney Method Western Corporation (Ranney, 1975). The construction information presented herein was taken from the 1998 Ranney Method report entitled *Inspection of Collector Wells 1 and 2 at Wohler and 3, 4 and 5 at Mirabel* (CWI, 1998). The lateral information is summarized in Table 1 and Figure 5 contains a well diagram with a schematic of the lateral orientations for this well.

The well consists of a 13-foot inside diameter (16-foot outside diameter) steel reinforced concrete caisson, 114 feet in total length from the top slab to the bottom of the caisson. The well configuration consists of seven 10-inch diameter mild steel laterals that range in length from 96.5 to 172.5 feet. The laterals are equipped with 10-inch diameter valves from different manufacturers and project into the aquifer from approximately 32 inches above the caisson floor. The well is equipped with two vertical turbine pumps with 1,250 HP motors.

Initial performance testing of Collector 4 was done following installation in 1975. The results of the tests indicated an apparent specific capacity of 609 gallons per minute per foot of drawdown (CWI, 1998). A subsequent evaluation was completed by CWI in November 1998 and summarized in *Inspection of Collector Wells 1 and 2 at Wohler and 3, 4 and 5 at Mirabel* (CWI, 1998). This evaluation indicated a 46% decline in the apparent specific capacity of the well when compared with its initial performance testing. The report indicates that steady-state conditions had not been reached during the Collector 4 evaluation due to possible interference from Collector 3 and that the actual decline is most likely greater than specified.

1.6 COLLECTOR 5 BACKGROUND

Collector 5 is located south of Westside Road approximately 1,090 feet upstream (east) of Collector 4, adjacent to the Russian River, and was constructed in 1982 by Ranney Method Western Corporation (Ranney, 1982). The construction information presented herein was taken from the 1998 CWI report entitled *Inspection of Collector Wells 1 and 2 at Wohler and 3,*

4, and 5 at Mirabel (CWI, 1998). The lateral information is summarized in Table 1 and Figure 6 contains a well diagram with a schematic of the lateral orientations for this well.

The well consists of a 13-foot inside diameter (16-foot outside diameter), steel-reinforced concrete caisson, 99 feet in total length from the top slab to the bottom of the caisson. The well configuration consists of ten, 10-inch-diameter, mild steel laterals that range in length from 70 to 175 feet. The laterals are equipped with 10-inch-diameter valves from different manufacturers and project into the aquifer from approximately 42 inches above the caisson floor. The well is equipped with two vertical turbine pumps with 1,250-horsepower motors.

Initial performance testing of Collector 5 was done following installation in 1982. The results of the tests indicated an apparent specific capacity of 572 gallons per minute per foot of drawdown (CWI, 1998). A subsequent evaluation was completed by CWI in November 1998 and summarized in *Inspection of Collector Wells 1 and 2 at Wohler and 3, 4, and 5 at Mirabel* (CWI, 1998). This evaluation indicated a 24 percent decline in the apparent specific capacity of the well when compared with its initial performance testing. The report indicates that steady-state conditions had not been reached during the Collector 5 evaluation due to interference from Collector 4 and that the actual decline is most likely greater than specified.

2.0 *EVALUATION PROCEDURES*

The following is a summary of the scope of work completed by ERM and Brechtel to document the conditions and evaluate the capacities of Collector Wells 3, 4, and 5. These procedures were outlined in the 1 October 2010 Operations Plan, which is presented as Appendix A. Professional scuba diver services were provided by Aqua-Tech Company. In addition, Pipe Eye Video Inspection Services was contracted to provide video inspection services for the laterals.

2.1 *PRE-TEST PROCEDURES*

ERM and Brechtel developed a detailed scope of work to address SCWA's stated objectives for the site. This scope of work was presented in the Operations Plan, which documented the equipment, procedures, and schedule for the evaluation. This document was prepared to provide a template for a repeatable program to periodically assess the condition of the collector wells. The Operations Plan also included Health and Safety Plans (HASPs) that were developed to address the field activities completed as part of the evaluation. ERM's HASP addresses the installation of the water level data loggers and water quality testing activities. Brecthtel's HASP addresses additional activities including oversight of diver inspection of the well, videotaping and flow testing, as well as assisting the divers with equipment and ingress/egress to and from the well caisson. The HASPs were presented as Appendices A (ERM HASP) and B (Brechtel HASP) in the Operations Plan.

The consultant team met with representatives of SCWA and Aqua-Tech to coordinate the activities, roles, and schedules of the various tasks. The goal of this coordination was to ensure that the field work was performed safely, did not disrupt water supply operations, and resulted in proper data collection.

2.2 *CAPACITY TEST PROCEDURES*

The following subsections document the procedures that were implemented to complete the capacity test evaluation.

2.2.1 *Recovery Test Procedures*

A recovery test was completed at each collector well prior to capacity testing to document the recovery of ground water levels to stable or near-stable conditions following pre-test shutdown. The collector wells were shut off approximately 1 week before the initiation of the constant rate test to allow for recovery. Prior to shutdown, ERM and SCWA installed pressure transducers with data loggers (ERM - In-Situ Mini-Troll Pro 30 psi; SCWA – Schlumberger Mini and Micro Divers with ranges from 10 to 100 meters H_2O) within the locations specified for the test, as outlined in Table 2 and shown on Figure 3. In addition, SCWA installed a pressure transducer within the Russian River between Collector 3 and Collector 4 and south of the inflatable dam. The transducer was secured along the river bank to limit transducer movement and provided the magnitude of changes in river stage. The transducer was removed on 20 October 2010 due to the forecast for heavy rains in the region and the potential for having the transducer swept down river due to the projected increased flow. The pressure transducer was not reinstalled in the river during the remainder of the test period.

As seen in Table 3, SCWA installed transducers in Mirabel Infiltration Ponds 2 and 3 on 23 September 2010. These were the only ponds that were in operation during the testing period. Pond 2 (Appendix E – Photograph 16) was monitored through 9 November 2010 and Pond 3 was monitored through 8 November 2010 when the pond went dry at the monitoring location.

The pressure transducers were installed in wells approximately 4 days prior to shutdown to allow for background pumping water levels to be monitored. The data loggers were installed into Collector 3, 4, and 5 monitoring points on 23 September 2010. Data collection intervals were programmed into the data loggers following the schedules presented in Table 2. Appendix B provides the raw water level data collected during the capacity test evaluation of the Mirabel collectors.

At the completion of background monitoring and immediately prior to pump shutdown, ERM downloaded the background data, ensured that all of the data loggers were operating, and programmed the data loggers with the appropriate data collection schedule. The internal data logger clocks were synchronized with the clock of the In-Situ Rugged Reader and pump shutdown was based on this clock to ensure that the initiation of the data collection and pump shutdown coincided. The pump shutdown time was coordinated between SCWA and ERM, and SCWA shutdown the pumps at the agreed upon time to start the recovery tests.

2.2.2 *Caisson Inspection and Pump Basket Installation*

To evaluate the underwater condition of each well, a professional diver entered Collectors 3, 4, and 5 to conduct a visual inspection prior to the initiation of capacity testing activities. Prior to diving in each of the collectors for inspection and testing, chlorination of the collector water was temporarily ceased as a health and safety consideration during the evaluation period. Chlorination occurred at the River Road facility during the test period to compensate for the cessation of chlorination in the collector well being evaluated. In addition, prior to entry into the collectors, the divers underwent a disinfection procedure. Visual inspections for Collectors 3, 5, and 4 were completed on 1 October 2010, 15 October 2010, and 5 November 2010, respectively. The items that were inspected included but were not limited to the bottom floor and interior walls of the caisson, pump intakes, gate valves, and stem riser assemblies, if present. The diver numbered each lateral using a temporary identification tag attached to each gate valve for identification purposes during the inspection and testing. The conditions of the collector wells were documented with still photographs and video. The photographs are provided in Appendix C and the inspection videos are provided as Appendix D.

During the inspection dives, temporary wire pump baskets were installed over the pump intakes. This precaution was undertaken to ensure a safe working environment for the divers during subsequent underwater activities.

2.2.3 *Lateral Structural Integrity Determination*

A Cygnus 1 underwater ultrasonic digital thickness gauge was used by the diver to estimate the wall thickness of each of the lateral screens in Collectors 3, 4, and 5. The gauge was calibrated on 7 June 2010 and the manufacturer's accuracy of the gauge is specified as $\pm$ 0.002 inches. This evaluation was completed as part of the pre-capacity test inspection in Collectors 3, 4 and 5. The diver inserted the gauge into the section of the lateral nearest the caisson and obtained thickness measurements at the 12:00, 3:00, 6:00, and 9:00 positions within the lateral. Thickness data was relayed topside and recorded. The data is presented in tables in subsequent sections.

2.2.4 *Constant Rate Capacity Test*

To evaluate capacity, Collector Wells 3, 4, and 5 were separately pumped continuously for a period of approximately 5 days. The Collector 3 test was completed during the week of 4 October 2010; Collector 5 was tested during

the week of 18 October 2010; and Collector 4 testing was completed during the week of 8 November 2010.

Following the recovery period and prior to the initiation of pumping, the background data was downloaded from the data loggers and the data loggers were reprogrammed with the appropriate collection schedule for the pump startup. At the completion of the data logger activities, the collector well undergoing testing was placed back on-line at a controlled pumping rate roughly comparable to typical operating conditions. Start-up of each collector was monitored by ERM and Brechtel personnel. Periodic manual measurements of water levels within the collector and site monitoring wells were taken by ERM and Brechtel personnel using an electric tape accurate to within 0.01 foot to check the transducer data. Appendix B provides the raw water level data collected during the capacity testing.

Water production was limited to the Wohler area during the Mirabel evaluation. During the evaluation period, well operation in the Mirabel area was limited to the well being evaluated, with the other two Mirabel collectors remaining offline. SCWA maintained a constant pumping rate from the operating collector well within the Mirabel area. At the completion of an evaluation period, the pump within the operating collector well was shut down to allow for recovery in the Mirabel area prior to the initiation of the constant rate test on the next collector well. Daily records of pumping rates, water level, and production were maintained by SCWA personnel on each collector during the duration of the project. River stage data was obtained from the United States Geological Survey (USGS) for gages maintained at Healdsburg and Guerneville (Hacienda Bridge) for the test period. In addition, the river elevation on the upstream side of the inflatable dam (Appendix E – Photograph 17) was obtained from SCWA for the duration of the test period.

2.2.5 *Lateral Flow Testing*

Following the initiation of pumping in the collector well, a diver entered the well to conduct additional testing. The initial testing completed at each collector involved measuring total flow from each of the collector well laterals. To determine flow, the diver held a mechanical flow meter (Gurley Price Type AA flow meter – See Appendix E Photographs 10 and 11) at the mouth of each lateral for a minimum of 1 minute. Data was subsequently transmitted to the surface, where it was read by a geologist using a Gurley Model 110 digital indicator (Appendix E – Photograph 8). Once the data was recorded, the diver was instructed to move to the next lateral where the process was repeated until measurements at all laterals were completed.

Videos of the process at each collector are provided in Appendix D. Photographs of the equipment and relative lateral flow testing activities are provided in Appendix E.

2.2.6 *Initial Video Inspection of Laterals*

Upon completion of the lateral flow testing, an underwater video camera was inserted into the first 10 feet of every lateral within each of the collector wells to provide preliminary information on the condition of the laterals (Appendix E – Photograph 14). Based on the results of the initial video inspection and the flow testing, laterals were prioritized for full-accessible length video inspection and lateral flow profiling. The resulting initial video inspections, as well as the subsequent videos documenting the inspections of the entire accessible lengths of the laterals, are provided in Appendix D.

2.2.7 *Lateral Video Inspection and Flow Profiling*

Upon completion of the flow evaluation and the video inspection of each lateral, the data was evaluated and the laterals were prioritized for video inspection and flow profiling along the entire accessible length. Laterals were prioritized based on relative flow rates, length, direction, and condition. The number of laterals for full-accessible length testing was a function of the amount of dive time available to the diver given the pumping water level prevalent during each test. Video inspection and lateral flow testing was completed in a total of 20 laterals within the three collector wells, including six of six in Collector 3 (Laterals 1 through 6), six of seven in Collector 4 (Laterals 2 through 5 and 7 through 8), and 8 of 10 in Collector 5 (Laterals 2 through 6 and 8 through 10). The number of laterals inspected and profiled for flow in each collector during the evaluation was greater than stated in the Operations Plan, where we projected the inspection and flow profiling of a minimum of 3 laterals per collector. Due to problems with the remote video camera, the video inspection and flow profiling of a number of the Collector 4 laterals could not be completed during the constant rate capacity testing for this collector in November 2010. This work was completed on 8 and 9 December 2010.

To complete this task, a Gurley Price Type AA (Appendix E – Photograph 10) was attached to the video camera vehicle. Photographs of the vehicle and the flow meter are provided in Appendix E (Photographs 10 through 13). The video camera vehicle was controlled remotely and was used to position the flow meter within the lateral and flow velocity was measured and recorded at 10-foot increments along the accessible length of the lateral. The flow meter remained at each position within the lateral for a minimum

of 1 minute and the data was transmitted to the surface and read by a Brechtel geologist using a Gurley Model 110 digital indicator (Appendix E – Photograph 9). In high velocity laterals, an aluminum bull float rod approximately 7 feet in length was used in conjunction with a cable and slip-fit ring to hold the flow meter and camera vehicle in place. The lateral flow rate data for the collectors is presented in tables in subsequent sections. The results of the video inspection are presented in Appendix F.

2.2.8 *Water Quality Monitoring*

Water quality data was collected during the collector well capacity testing to document parameters that may be useful for evaluating capacity changes. Data was collected using a YSI Model 6920 with a downhole probe that transmits data in real time to the surface via a cable (Appendix E – Photographs 18 and 19). The diver inserted the probe into each lateral, where it was allowed to equilibrate for approximately 3 minutes. The parameters measured included pH, oxygen reduction potential (ORP), dissolved oxygen (DO), conductivity, salinity, total dissolved solids (TDS), and temperature. The YSI unit was rented from Equipco Services of Concord, California and was calibrated by Equipco the day before each sampling event.

To test for turbidity, samples were collected in each lateral by the divers using 250 mL poly containers The samples were brought to the surface and analyzed for turbidity using a Hach 2100P turbidity meter (Appendix E – Photograph 20) provided by SCWA. The Hach turbidity meter was calibrated before each sampling event.

The accuracy of the water quality parameters are as follows:

- pH - ± 0.2 units;
- ORP - ± 20 millivolts;
- DO - ± 0.1 milligram per liter;
- Conductivity - ± 0.5% of reading plus 0.001 millisiemens per centimeter;
- Salinity - ± 0.1 parts per thousand;
- TDS – Internally calculated based on conductivity readings using algorithms found in 1989 edition of *Standard Methods for the Examination of Water and Wastewater* (American Public Health Association, 1989);
- Turbidity - ± 0.01 Nephelometric Turbidity Units; and
- Temperature - + 0.15 degrees Celsius.

These parameters were measured for each lateral and at the pump intake of each collector. The data is presented in tables in subsequent sections.

3.0 EVALUATION RESULTS

This section presents relevant hydrologic information, as well as the results of the inspections, capacity testing, and lateral flow profiling for each of the collector wells within the Mirabel area. The primary goal of the evaluation was to establish a standardized procedure and baseline data set that will allow for comparison with the results of future testing and identify potential changes in well production. We have also compared the results with previous testing dating back to the original construction of the collector wells. Prior testing on the Mirabel collector wells was not conducted in the same manner as the 2010 protocols; however, the comparison with previous evaluations provides a meaningful assessment of overall capacity changes since the collectors were installed.

3.1 PRECIPITATION AND RIVER STAGE DURING TEST PERIOD

Precipitation and river stage data were obtained for the test period and are presented to identify potential influences on collector capacity. The goal of this task was to track potential short-term changes in recharge conditions and ground water elevations that may account for changes in collector capacities. For example, a sustained drought and ground water declines could cause collector capacities to decrease.

Figure 7 provides precipitation and Russian River stage data collected during the test period (1 September through 9 December 2010). The precipitation data was collected at the Santa Rosa airport weather station and the river stage data was collected at two USGS monitoring stations at Healdsburg (Station # 11464000), approximately 10.5 miles upriver from the Mirabel area, and Guerneville (Hacienda Bridge Station # 11467000), approximately 2.5 miles downriver from the Mirabel area. As seen in Figure 7, there were several rain events that occurred during capacity testing.

A major rain event occurred during the Collector 5 capacity test (between 21 and 25 October 2010) and collectively provided almost 5 inches of precipitation to the area. Following this event, the river stage at Healdsburg rose approximately 2.4 feet from approximately 2.1 to 4.5 feet. The rise in river stage began on 23 October 2010, peaked on 25 October 2010, and returned to near pre-storm levels by approximately 28 October 2010. Further down river, the river stage at Guerneville rose approximately 6 feet from 2.9 to 9 feet. The rise in river stage at the Guerneville station began on

23 October 2010, peaked on 25 October 2010, and eventually stabilized approximately 1.6 feet above the pre-storm level by 29 October 2010 before rising again due to additional 0.79 inches of precipitation between 28 and 30 October 2010. During this event, the river stage at Healdsburg rose approximately 1.7 feet from 2.3 to 4 feet. The rise in river stage began on 29 October 2010, peaked on 30 October 2010, and returned to pre-precipitation levels by 3 November 2010. The river stage at Guerneville rose approximately 2.9 feet from 4.5 to 7.4 feet. The rise in river stage at the Guerneville station began on 29 October 2010, peaked on 30 October 2010, and returned to pre-storm levels by approximately 2 November 2010.

Two additional periods of precipitation occurred just before and during the Collector 4 testing period. The first of these provided approximately 0.92 inches of precipitation on 7 November 2010 and the second event provided approximately 0.12 inches of precipitation on 9 November 2010. During these consecutive rain events, the river stage at Healdsburg rose approximately 1 foot from 2.2 to 3.2 feet. The rise in river stage began on 7 November 2010, peaked on 8 November 2010, and returned to pre-storm levels by the end of the test period 15 November 2010. The river stage at Guerneville rose approximately 2.5 feet from 3. 6 to 6.1 feet. The rise in river stage began on 7 November 2010, peaked on 8 November 2010, and eventually returned to pre-storm levels by approximately 17 November 2010.

Figure 7 also shows a slight rise in river level between rain events on 13 October 2010. The river stage at Healdsburg rose approximately 0.7 feet from 1.9 to 2.60 feet and the river stage at Guerneville rose approximately 1.8 feet from 2.2 to approximately 4.0 feet. This increase was due to a planned dam release from Lake Mendocino on 12 October 2010.

The relative river level (not absolute elevation) monitored during the Collectors 3, 4, and 5 capacity tests also show a rise of approximately 1.65 feet in the river level adjacent to the collectors following the upriver dam release on 12 October 2010 as shown in Figure 8. The SCWA pressure transducer used to gauge river levels near the Mirabel collectors was removed on 20 October in anticipation of an upcoming heavy precipitation event to ensure that the transducer would not be washed away and was not reinstalled for the remainder of the evaluation period.

River elevation is also monitored by SCWA along the upriver side of the inflatable dam in the Mirabel area (Figure 2). Figure 9 shows the river elevation at the inflatable dam during the duration of the Mirabel collector evaluation period, as well as the river elevations at the Healdsburg and Guerneville stations. As seen on Figure 9, the water level behind the dam shows a slight increase due to the heavy precipitation between 21 October

and 25 October 2010, with river levels increasing from approximately 38.4 feet above mean sea level (amsl) on 23 October 2010 to 40.3 feet amsl on 25 October 2010 before returning to near pre-precipitation levels by 27 October 2010. In addition, Figure 9 shows a drop in river elevation at the inflatable dam beginning on 27 October 2010 due to the deflation of the inflatable dam in anticipation of predicted heavy rain events. The deflation of the dam caused the river elevation at this location to lower more than 8 feet from approximately 39 to 30.6 feet. The inflatable dam was re-inflated on 1 November 2010, causing the river elevation at this location to rise approximately to pre-deflation levels by 3 November 2010.

The rain events that occurred on 7 and 9 November 2010 within the Collector 4 testing period (between 7 and 15 November 2010) caused a rise in river elevation at the inflatable dam of approximately 0.10 feet from 38.1 to 39.1 feet. The water level rise behind the inflatable dam began on 7 November 2010, peaked on 8 November 2010, and returned to near pre-precipitation levels by 15 November 2010.

As seen in Figure 8, ground water monitoring wells were monitored in the Mirabel area as part of the capacity testing protocol. A review of this figure shows that, following the period of heavy precipitation (up to 5 inches) between 21 and 25 October 2010, a number of the wells showed a rise in water levels of up to 0.9 feet. The water level rises in these wells began either late on 23 October 2010 or early 24 October 2010 and peaked between 25 and 26 October 2010. The ground water level changes due to the precipitation and the operation of the inflatable dam are minor compared with the ground water level changes related to testing. Therefore, these minor changes in ground water levels due to rainfall did not compromise the data collected during the 2010 Mirabel evaluations.

It is recommended that future testing will be completed in August and September, where possible, to minimize the potential for rainfall to influence the test results. It will be important to evaluate the relative elevations of the water table when comparing the recent tests with future tests to account for changes in the saturated thickness of the aquifer, which is hydraulically connected with the river.

3.2 MIRABEL COLLECTOR WELL OPERATION

The expected schedule for the general operation of the collector wells during the capacity test was presented in the Operations Plan. With the exception of a short safety shutdown during the Collector 3 evaluation, the operation schedule was completed as specified in the Operations Plan

schedule. The slightly modified operational schedule did not adversely affect the test results. Figure 10 presents the operational history of the Mirabel collector wells during the capacity testing period. In addition, the figure also shows the operational history of the 54-inch intertie valve during the capacity testing period. During the Collector 3 and Collector 4 evaluations, the 54-inch intertie valve was open for the entire test period. During the Collector 5 evaluation, the intertie was initially open during the first three days (through approximately 4PM on 21 October 2010) and then was closed for approximately 32 hours (through approximately 12AM on 23 October 2010) before being mostly opened for remainder of the test period. The raw data used to create Figure 10 is presented in Appendix G.

3.3 COLLECTOR WELL RESULTS

This section presents the results of the capacity test evaluations for the Mirabel collector wells. This includes the results of the visual inspection of the caisson and laterals, as well as the capacity and lateral flow testing.

3.3.1 Collector 3 Results

The Collector 3 caisson inspection was completed on 1 October 2010. The capacity testing portion of the evaluation was conducted between 4 October and 11 October 2010.

3.3.1.1 Caisson and Lateral Condition

Based on the results of the 1 October 2010 inspection, the caisson of Collector 3 appeared to be in good structural condition. Still photographs documenting the caisson, lateral gate valves, and pump equipment conditions are provided in Appendix C. There is no evidence of fracturing or spalling in the caisson, and the floor is predominantly clean, with only incidental gravel debris. In general, all underwater structures appeared to be in relatively good condition, although there was some rust (iron oxide) observed on several valve stem risers and brackets, and on the ladder. The pump columns are clean and in good condition.

Viewed from the interior of the caisson, the six original carbon steel laterals installed in Collector 3 in 1975 appear to be in reasonably good condition. Other than some rusty discoloration, the internal steel pipe surfaces and screen slots are generally clean and open. To further assess the condition of the lateral screens, a video camera was advanced along the accessible lengths in all six laterals. Distances accessed by the video camera in each lateral are included in Table 5. Three of the laterals (Laterals 2, 4 and 5)

were fully accessible; Laterals 1, 3 and 6 contained piles of sand and gravel debris near the ends of the laterals, beyond which the camera could not pass.

The video inspections indicate that, in general, the laterals are in reasonable condition for wells of this age, with minimal to moderate buildup of encrustations along the pipe interior or within the slot openings. Other than the debris piles restricting access to the outermost 6.5 feet of Lateral 1; 3.5 feet of Lateral 3; and 11 feet of Lateral 6, the interior area of each lateral was fully open for flow. The debris piles in Laterals 1, 3 and 6 appear to be sand and fine gravels originating from the digging heads at the end of each lateral. These incidental occurrences of sand and fine gravel are not uncommon near the outer ends of laterals, until the progressive development of flow within the lateral exceeds the threshold velocity for lifting and transporting sediments that entered during installation. Beyond 155 feet in Lateral 1, the slot openings were not as clean as observed elsewhere among the laterals of the Mirabel Collectors. In Lateral 2, small amounts of sand were observed lying along the bottom of the screen pipe beginning at about 142 feet, but this did not prevent further access by the video camera. Nevertheless, the screen slots beyond this point were not as visibly open. Beyond 110 feet in Lateral 6, a greater build-up on the interior surface of the screen was observed, in addition to the debris blocking camera access beyond 123 feet.

The diver obtained measurements of metal thickness of the carbon-steel lateral screens just beyond the gate valves, which are summarized in Table 3. Although the exact construction of the pipe-based screen used for the original laterals was not reported, it is assumed from similar projects of this era that the carbon-steel screen used in Collector 3 had an original wall thickness of approximately 0.322 inches. The average thickness of the screen metal in the laterals during this most recent inspection ranged from approximately 0.18 inches to 0.33 inches. Although these data indicate some thinning of the screens, the data do not suggest that the thinning is compromising the competency of the laterals.

3.3.1.2 *Specific Capacity and Lateral Flow Testing*

Figure 10 presents the pumping schedule for the duration of the tests. On 4 October 2010, following nearly a week of recovery, Pump #6 of Collector 3 was placed on-line at approximately 10:00 am at a pumping rate of approximately 13.95 mgd (9,687 gpm). Other than a brief shutdown for approximately two hours on the afternoon of 6 October 2010 to replace a basket around the intake of Pump #6, the well continued in operation until 10:00 am on 11 October 2010, for a total pumping period of 7 days (168

hours). Nearby Collectors 4 and 5 had also been removed from operation on the evening of 26 September 2010 to allow a minimum week-long recovery period for the entire Mirabel wellfield prior to the start of testing at Collector 3.

The static water level of the aquifer prior to the start of pumping had risen to as high as +30.70 feet amsl, and at the time Pump #6 was placed on-line the static water level in Collector 3 was +30.20 feet amsl. This static water level elevation was 47.85 feet below the top slab/pump floor. The hydrographs of water levels in Collector 3 and adjacent wells are shown on Figure 8. Static and pumping water level elevations at 24-hour increments during the first four days of testing of Collector 3 are presented on Figure 11. In addition, Figure 11 presents the potentiometric surface in the area around Collector 3 prior to capacity testing. In the vicinity of Collector 3, pre-test ground water flow was in general southwestward toward the Russian River, with a gradient of about 0.0055 feet per foot. At the end of the test, a cone of depression had developed around the well, similar to that shown in Figure 12 after four days of pumping. As apparent from Figure 8, drawdown in Collector 3 and surrounding wells had not yet stabilized at the completion of the test period, but the rate of change had been decreasing. Accordingly, pumping conditions in the aquifer were sufficiently developed to allow for a representative capacity evaluation.

Specific Capacity Evaluation

The specific capacities of Collector 3 corresponding to various durations of pumping are shown in Table 4, which also provides the specific capacities determined for the 1975 and 1998 testing. Previous evaluations at Collector 3 determined its performance after a period of operation of about 2 days (48 hours for the initial testing in 1975 and "*at least 30 hours*" of operation as described in the 1998 inspection report). Therefore, the best pumping duration to allow for direct comparison of the well's current performance with past performance is at the 2-day duration. Comparisons with future testing should rely on the data from the end of the test at 168 hours assuming a similar protocol is followed in the future. For a pre-test static water level of +30.20 feet amsl and a pumping level at elevation +16.17 feet amsl after 2 days operation, the observed drawdown was 14.03 feet. With a pumping rate of 9,759 gpm (14.053 mgd) at the time of that drawdown measurement, the observed specific capacity for Collector 3 after 2 days duration is 696 gpm per foot of drawdown (gpm/ft). As shown below, this specific capacity is about 20 percent better than the original specific capacity of 580 gpm/ft observed at the end of the 2-day performance test immediately after construction in 1975 and is more than double the reported specific capacity of 297 gpm/ft observed after a comparable

duration during the 1998 inspection. Nevertheless, as shown on Figure 8, the drawdown in Collector 3 had not stabilized by the end of the 7-day test period. In addition, as shown in Table 4, specific capacity was continuing to decrease (from decreases of approximately 29 gpm/ft between Day 1 and Day 2 to decreases of approximately 5 gpm/ft per day at the end of the test period), although at a progressively slower trend.

During the initial performance testing after construction in 1975, Collector Well 3 was reportedly pumped at rates between 21.5 to 20.0 mgd and remained substantially stable at a rate of 14,100 gpm (20.3 mgd) for the last portion of the test. The static water level elevation prior to the start of the test was +29.02 feet amsl and the Russian River elevation was reportedly +29.53 feet amsl. At the end of the 48-hour performance test period, the pumping water level in Collector 3 was +4.73 feet amsl, for an observed drawdown of 24.29 feet, resulting in an observed specific capacity of 580 gpm/ft.

For the 1998 evaluations, static water levels were not collected from the individual collector wells and the static water level was assumed to be the elevation of the Russian River adjacent to each collector site because the other nearby collectors had been pumping. Furthermore, the elevation of the Russian River in 1998 was estimated rather than being based on survey data. The 1998 results are presented herein to be as thorough as possible; however, these data are not as accurate as the 1975 and 2010 results.

During the 1998 inspection of Collector Well 3 (9 November 1998), the reported pumping rate was 12.8 mgd (8,888 gpm) and the well had been in operation for "at least 30 hours" prior to the inspection. The measured pumping level was at elevation -0.85 feet amsl and, for an assumed river elevation of +29.05 feet amsl (i.e., approximately 49 feet below the pump floor), the apparent drawdown was 29.9 feet. This corresponds to an apparent specific capacity of 297 gpm/ft. It should be noted, however, that Collector Well 4 also was in operation at this time and there would undoubtedly have been interference between the two wells. During the most recent 2010 testing, Collector 4 produced interference at Collector 3 of 4.49 feet (0.31 feet per mgd) after 24 hours and 5.53 feet (0.39 feet per mgd) after 48 hours. Assuming a period of operation on the order of 30 to 40 hours, interference at Collector 3 in 1998 might have been about 0.35 feet per mgd, which for a pumping rate of 14.8 mgd at Collector 4 would have produced a total interference at Collector 3 of about 5 feet. Based on these considerations of interference, the adjusted drawdown would be 24.9 feet and a revised apparent specific capacity of Collector 3 in 1998 would have been on the order of approximately 357 gpm/ft. This revised estimate of specific capacity in 1998, although improved somewhat from the value

reported previously, is still less than the initial 1975 performance as well as that observed in the most recent 2010 testing.

Variations in aquifer thickness, pumping rate, drawdown, and duration of testing can affect the apparent specific capacity and may result in misleading interpretations of well performance when comparing specific capacities from different testing events and conditions. It is readily apparent, for example, that in unconfined aquifers a higher static water level increases the aquifer thickness and transmissivity, and also provides greater available drawdown, thus improving potential pumping capacity. Also, where pumping level has not stabilized, the variations in drawdown versus duration of pumping are commonly recognized as influential and well performance must be compared accordingly for similar periods of pumping.

The specific capacity of a well decreases as the pumping level lowers and the aquifer progressively dewaters. This effect is caused by the reduction in average aquifer thickness, and therefore reduction in effective aquifer transmissivity, as the drawdown progressively dewaters the aquifer. Because of this dewatering effect, a well tested at a lower pumping rate with less observed drawdown will have a larger apparent specific capacity than if it had been tested at a higher pumping rate with greater drawdown. This is a commonly observed characteristic of step tests, also known as variable rate tests, where a well is tested at three or four incrementally increasing pumping rates. Similarly, a well tested when the static water level is higher will have initially greater aquifer thickness and transmissivity, which is obviously beneficial. Therefore, in order to compare well performance from different test events with dissimilar static water level, aquifer thickness and drawdown, the observed specific capacities must be adjusted to meet the same assumed baseline conditions.

Specifically, for each test event and its observed conditions, the static water level, initial aquifer thickness and drawdown are used to calculate the average aquifer thickness. With this average aquifer thickness, the observed specific capacity for that test event can then be normalized to baseline conditions, using the average aquifer thickness corresponding to the assumed baseline conditions and a proportionality relationship. This process of normalizing observed test data to baseline conditions allows differences in well performance related solely to changes in aquifer conditions to be distinguished from those related to variations in well efficiency, plugging, etc. It is quite possible, for example, to have a well that has lost some of its efficiency nevertheless operate at a higher specific capacity than when it was previously tested, because of an increased average aquifer thickness, thereby obscuring its loss of efficiency.

The proportionality relationship used to normalize specific capacities to assumed baseline conditions is as follows:

$$(gpm/ft)_{ac} = (gpm/ft)_{obs} \times M_{ac}/M_{obs}$$

where:

M = Average dewatered aquifer thickness: (SWL – BOA) – DD/2

SWL = Static Water Level Elevation

BOA = Bottom of Aquifer Elevation

PWL = Pumping Water Level Elevation

DD = Drawdown: i.e. (SWL – PWL)

and the subscripts "obs" and "ac" represent observed conditions and assumed conditions, respectively.

Based on information provided in the 1975 reports of aquifer testing and cutting shoe elevation for the caisson, as well as presented in the 1998 inspection report, the elevation of the bottom of the aquifer (BOA) is taken to be -35.0 feet amsl. Assumed conditions for static water level and pumping water level can be variously selected, but for purposes of this comparison it is assumed that the static water level is +30.0 feet amsl representing low river conditions. This results in an assumed initial non-dewatered aquifer thickness of 65 feet [+30 – (-35) = 65 feet]. Pumping water level elevation is assumed to be +5.0 feet amsl to be comparable to the 1975 performance testing (+4.73 ft amsl). This value also falls within the overall range of +16.17 feet amsl observed in 2010 and -0.85 feet amsl observed in the 1998 inspection. Accordingly, the assumed drawdown for Collector 3 is 25.0 feet [+30 – (+5) = 25 feet]. Similarly, the assumed average aquifer thickness is 52.5 feet [65 – 25/2 = 52.5 feet].

For the 2010 testing, using similar calculations, the observed initial aquifer thickness was 65.2 feet, the observed drawdown at 48 hours was 14.03 feet, and the adjusted average aquifer thickness was 58.19 feet [65.2 – 14.03/2 = 58.19 feet]. With these values as input, the adjusted baseline specific capacity for assumed conditions is determined as 696 x 52.5/58.19 = 628 gpm/ft. For the 1975 original performance test, the initial observed aquifer thickness was 64.53 feet and the observed drawdown was 24.29 feet, resulting in an average dewatered aquifer thickness of 52.39 feet and an adjusted baseline specific capacity of 581 gpm/ft. For the 1998 inspection,

the initial observed aquifer thickness was (based on assumed static water level of +29.05 feet amsl) 64.05 feet; the observed full drawdown including the 5 feet of interference was 29.9 feet, resulting in an average dewatered aquifer thickness of 49.1 feet. Assuming the revised estimated specific capacity of about 357 gpm/ft is used in consideration of interference from Collector 4, the adjusted baseline specific capacity for the 1998 inspection is 382 gpm/ft.

To summarize, placing all the testing data within the same assumed conditions for initial aquifer thickness, pumping level, and average dewatered aquifer thickness results in revised baseline specific capacities for Collector 3 of 628 gpm/ft in 2010; 581 gpm/ft in the initial 1975 testing; and 382 gpm/ft at the time of the 1998 inspection. Based on these results, it appears that Collector 3 is currently performing as well as or better than when it was initially installed and 64 percent better than observed during the 1998 inspection. This would suggest that even though some portions of several of the collector laterals showed slight to moderate evidence of encrustation and blockage within the slot openings, redevelopment and treatment of the well will probably not produce any significant improvement in the well's performance. However, the well's condition should be regularly monitored to detect any progressive increase in encrustation and plugging, or any further deterioration in the well's performance.

Lateral Flow Testing

This section documents the flows that were measured near the mouths of the laterals where they connect with the caisson. The relative distribution of flow among Collector 3 laterals as determined during the 2010 evaluation is shown in Table 5 and on Figure 13. Table 5 also presents the results from the 1998 inspection for comparison. During the 2010 evaluation the relative flow percentages ranged between 12.1% (Lateral 4) to 20.6% (Laterals 1 and 2). The three laterals with the largest percentages of flow (Laterals 1, 2 and 3) are closest to the river and presumably better positioned to intercept recharge moving toward the well. The three landward laterals (Laterals 4, 5 and 6) improved their relative percentage of flow by approximately 5 percent compared to the 1998 testing. These changes in relative percentage flow may represent the influence of recharge from Infiltration Ponds 2 and 3 northeast and east of Collector 3. The 1998 report suggests that the infiltration ponds were not filled at the time of their 9 November 1998 inspection, which may explain the improvement of Laterals 4, 5 and 6 in the October 2010 testing when water was being diverted to the infiltration ponds.

Table 5 also provides gpm per lineal foot (gpm/lft) for the six laterals. As shown in Table 5, gpm/lft ranges between 6.7 (Lateral 4) and 11.5 (Lateral 1). Landward Laterals 4 and 5 had the least unit flow whereas riverward Laterals 1 and 2 had the most. Lateral 3, more or less parallel to the river, and Lateral 6, toward Infiltration Pond 2, had intermediate unit flows. These trends are similar to those reported from the 1998 inspection. The video inspection of Laterals 1 and 2, which had the highest percentage flows and unit flows, and generally larger oxidation potentials, observed somewhat greater buildup of encrustation and plugging in the outer 20 or 30 feet of each line.

The results shown in Table 5 clearly indicate that lateral orientation rather than lateral length is most influential in lateral performance for Collector Well 3. Five of the six collector well laterals have practically the same length and yet their percentage flows vary from 12.1% to 20.6% and their unit flows vary from 6.7 to 11.5 gpm/lft. Moreover, the shortest lateral (Lateral 6) has a greater unit flow than longer Laterals 4 and 5.

Lateral Flow Profiling

This section presents the results of flow measurements collected along the lengths of the laterals at different distances from the caisson. The data evaluation began with converting meter readings of the flow meter impeller to flow. Based on meter readings within each lateral where it connects to the caisson, the relative flow of an individual lateral as a proportion (percentage) of the total well pumping rate was used to assign a flow rate for the lateral. These total flow estimates were presented for each lateral in the preceding section. Because of tortuous flow disturbances related to entrance effects, valve shape irregularities and diver influence, the initial meter readings were measured in each lateral at a distance of 10 feet from the end of the pipe at the caisson. Thereafter, the meter was inserted through the accessible length of the lateral, with meter readings recorded at 10-foot intervals or as imposed by termination at the outer ends. These meter readings were converted to a flow rate at each monitored point by converting the impeller revolutions per 30 second interval to gpm using a unit flow in gpm per revolution, which was determined using the total flow at the mouth of each lateral divided by the number of revolutions measured at the mouth during a 30 second interval.

The data collected during the lateral profiling portion of the testing was evaluated to assess flow variability along the lateral, water production in relation to proximity to the caisson, and to assess the end-of-the-lateral effects. The results of this evaluation are presented in the paragraphs below. This is the first time this type of information has been collected in

the Mirabel wellfield collector wells to assess the relative flow along their laterals. Comparisons with similar data in the future may use similar approaches to those described below, or may be subsequently modified to best meet future test conditions and results.

Flow Variability Along Laterals—The tabulated average meter readings and associated flow for portions of the tested laterals of Collector 3 are presented in Table 6. The value of gpm/ft shown on the table represents the flow at that location in the lateral divided by the distance from the measuring point to the outer end of the lateral. It is comparable to the derivation of gpm/ft listed for the entire length of lateral as presented in Table 5, but by beginning at the outermost end of the lateral and moving progressively toward the caisson.

For any given interval of the lateral, the incremental flow is represented by the difference in flow for two individual monitoring locations within a lateral. For example, in Lateral 1, the incremental flow for the 10 to 50 foot interval (from the caisson) is equal to the difference in flow measured at 10 feet (1893 gpm) and that measured at 50 feet (1302 gpm), which would be a flow of 591 gpm. Within that specific interval, the unit flow would be 14.78 gpm/lft (i.e., 591 gpm/40 feet). Flow contribution for each increment in each of the tested laterals is graphically presented in Figure 14. Flow at different distances along the laterals is depicted in Figure 15.

The tables and figures illustrate variations in flow contributions along the laterals. Although these data are only a snapshot of a transient condition, they provide an overview of the general intervals of greater production versus lesser production. The measured flow variations could be the result of individual or combined influences related to lateral orientation and length, geologic heterogeneity, gradient variations, plugging of the aquifer or lateral screens, or measurement variability.

Water Production and Proximity to Caisson—Table 7 provides three approaches to evaluate production from the Collector 3 laterals by distance from the caisson and by segment. The first approach (top portion of Table 7) presents total flow (gpm) and normalized flow (gpm/lft of screen) contribution versus distance from the caisson for 50-foot sections of the laterals. For the second approach (middle portion of Table 7), a quasi-radius of 60 feet was used to compare flow from inside that radius with outside that radius. This quasi-radius of 60 feet can be visualized as a surrogate for an effective well radius concept. A third approach (bottom portion of Table 7) was derived for each lateral based on proportions of its own individual length, by using inner-middle-outer thirds to see how laterals compared. The length of each one of these thirds varies with the

length of lateral, being 45-foot increments in Lateral 6 (134 feet total length) and 58-foot increments for the four laterals of 173.5 feet total length. This third approach normalizes end effects and near-caisson effects. None of these approaches by itself stands alone to give the complete perspective of how a lateral is performing relative to the other laterals. Rather, it is our opinion that they must be viewed collectively to get a balanced assessment.

The following observations can be made from the Collector 3 data presented in Table 7:

- Top Portion of Table – The outermost ends of the laterals are the most productive segment for all the laterals, with 31% of the overall total production obtained beyond a distance of 150 feet and 57% of the overall production of the tested laterals beyond a distance of 100 feet. Even Lateral 6, the shortest lateral of 134 feet in length, produces 43.4% (589 gpm) of its total capacity in the 34 feet of lateral beyond 100 feet, with an average unit flow of 17.32 gpm. In contrast, with the notable exception of Lateral 5 and Lateral 6, the flow obtained in the segment from 50 feet to 100 feet from the caisson appears to be the least productive, furnishing only 17.9% of the overall total production. The segment closest to the caisson, between distances of 0 to 50 feet, produces better (25.2%) than the segment from 50 to 100 feet.

- Middle Portion of Table – Overall only about one-fourth (27.6%) of the total capacity of Collector 3 is obtained within 60 feet of the caisson and the remaining 72.4% of the flow is obtained beyond 60 feet. Average unit flow capacity for all the laterals within this interval is 7.38 gpm/lft. This trend varies, however, among the laterals. For example, the two laterals toward the river (Laterals 1 and 2) and in particular Lateral 1 produce a good portion of their flow (50.9% and 39.8% respectively) from within the 60-foot distance from the caisson. Lateral 2 produces at a unit flow rate of 16.85 gpm/lft. In contrast, landward Laterals 4 and 5 produce only 12.8% and 5.5% respectively within the 60-foot distance from the caisson, with unit flow capacities of only 2.47 and 1.27 gpm/lft.

- Bottom Portion of Table – By separating lateral production into the inner, middle, and outer thirds, it is again apparent that the outermost portions for most of the laterals are providing the greatest production. For all laterals, 56.1% of the total production from Collector 3 is obtained within the outer one-third of the lateral lengths. The innermost third of the lateral lengths is the next most productive and, as suggested above, the middle third is the least productive. This is comparable to the discussion above regarding production from the segment between distances of 50 to 100 feet from the caisson. In particular, Laterals 4 and

5 produce 72.6% and 65.9% respectively in their outermost third, and Laterals 6 and 3 produce only slightly less, with 60.9% and 57.9%. There is one notable exception to this observation. Lateral 2 produces 49.6% from its inner third versus 31.7% in its outer third: the middle third remains the least productive with only 18.6% of the flow. It should be noted also that Lateral 5, which obtains 65.9% of its flow in the outer third, provides only a meager 4.5% (62 gpm) of its flow in the inner third. For Laterals 3 and 6, their inner and middle thirds produce comparably, with little distinction in performance.

End of Lateral Effects – There are several graphical approaches for demonstrating the distribution of flow along the lateral lengths. Figure 15 shows the cumulative flow versus distance from the caisson for each individual lateral. For perfectly uniform flow along the lateral, the trend for each lateral would be a straight line beginning with zero gpm at the outer end of the lateral and concluding with the total flow for the lateral at zero distance, where it enters the caisson. However, none of the laterals follow this straight line trend of uniform distribution. Note for example the trends of flow for Laterals 4, 5 and 6, which display steeply upward trends in the outermost segments of their length where they are obtaining most of their flow. After these steep gains in flow in the outer segments, the remaining trends of flow while moving progressively closer to the caisson are more gradual because of the slower production in those segments. Somewhat more complicated trends are demonstrated for Laterals 1 and 2, where there are steep gains in flow in the outer portions of the lateral, following by relatively flatter trends where there is less production obtained, and then in the segments closest to the caisson the trends again move upward steeply because of additional large gains in production.

Brechtel has observed that the end of laterals have greater unit flow capacities in terms of gpm/lft, regardless of the overall length. This phenomena has been observed in unpublished, in-house research and development work for The Ranney Division of the Hydro Group Inc. completed by Ernie Williams in the 1980s on collector wells in Mankato, Minnesota, as well as by Brechtel personnel on similar work in Europe. A possible explanation for the higher flow rate at the lateral ends is that in a radial lateral pattern, there is less competition for water at the ends of the lateral. The typical flow pattern for a radial collector provided as Figure 16 also indicates greater flow at the ends of the lateral (Brechtel, personal communication).

Figure 17 shows the running average unit flow capacity of each lateral in gpm/lft. For this figure, the total cumulative flow measured at each position along the lateral is divided by the distance between that position

and the outer end of the lateral. In effect, it is a graphical representation of the tabulated results in Table 6. Here again note the considerably steeper trends near the outermost ends of the laterals, where there are large gains in production within only a relatively few feet. In these outermost few feet, unit flow capacities can approach or even exceed 100 gpm/lft. Thereafter, while moving along the lateral toward the caisson, the gains in flow become progressively less and the average unit flow capacity begins to assume a more consistent trend.

Figure 18 shows the progressive increase in percentage of flow for each lateral with distance starting from the outermost end of the lateral. The outermost end of the lateral begins with zero percent (%) flow and then increases progressively towards the caisson until 100% of the lateral's flow is achieved. By using percentage of flow instead of absolute flow rates in gpm or gpm/lft, this approach "normalizes" the flow distribution for any pumping rate at which the collector well is being operated. This approach further demonstrates the larger gains in flow originating from the outermost ends of the laterals. In Lateral 4 for example, 50% of its flow is obtained within the first 30 feet from the outer end of the lateral and 80% of its flow is obtained within the first 73 feet from the outer end of the lateral, which is 173.5 feet in total length.

Another way to evaluate this presentation is to consider percentage flow versus percentage length. In the case of the previous discussion for Lateral 4 (173.5 feet in total length), 50% of its flow is obtained with the outermost 17.3% of its length, and 80% of its flow is obtained with the outermost 42% of its length. In the first portion of this example, the 50% flow in Lateral 4 is nearly three times greater than the percentage of its length involved: in the second portion, the 80% flow is approximately double the percentage of its length involved. Obviously, from this example, the flow into Lateral 4 is not uniformly distributed along its length, but instead tends to be concentrated in its outermost portions.

In general, most of the laterals in Collector 3 demonstrate this end-of-lateral effect, although the relationship of percentage flow to distance and percent of length varies somewhat for each. It is also interesting to study the variations in trends of percentage flow for Laterals 2, 5 and 6. Note in Lateral 2 that following the quick gain in percentage of flow at the outermost end (20% in the initial 10 feet), the percentage gain follows a fairly consistent trend until it reaches about 113 feet from the end of the lateral (60.5 feet from the caisson), after which there are progressively greater gains in percentage flow in the portion of the lateral nearest the caisson. In Laterals 5 and 6, following initially steep gains in percentage flow at the outer ends of the laterals, the trends level off with relatively little

or no gain for 30 or 40 feet, followed by a resumption of steep gain in flow in the next segment. In Lateral 5, after this second steep gain in percentage of flow, which ended about 105 feet from the outer end of the lateral (68.5 feet from the caisson), there was essentially no further gain toward the caisson. A similar but less dramatic trend change was evident in Lateral 6.

Table 8 presents an analysis of flow within the final 30 feet of the profiled length of the Collector 3 laterals, as well as the change in unit flow rates within this interval. The following observations can be made from the data presented in Table 8:

- The overall percentage of flow produced in the outermost 30 feet of the Collector 3 laterals ranges from 26.9% (Lateral 2) to 64.9% (Lateral 5), and averages 40.8% from all laterals combined.
- Maximum unit flow rates at the last accessible measurement in the laterals ranged from 13.4 gpm/lft (Lateral 6) to 323 gpm/lft (Lateral 2), and averaged 117 gpm/lft for all six laterals. With the exception of the 13.4 gpm/lft at the end of Lateral 6, the unit flow rates at the end of the remaining five laterals averaged 137 gpm/lft.
- With the exception of Lateral 6, unit flow rates declined with increased distance from the measured end of the laterals. Unit flow rates at 30 feet from the measured end of the laterals ranged from 17.9 gpm/lft (Lateral 2) to 27.0 gpm/lft (Lateral 5), and averaged 21.0 gpm/lft.
- For Laterals 1 through 5, the unit flow rates within 30 feet from the last accessible measurement had decreased by 66.9% to as much as 94.5%. Lateral 6 is the only lateral in which the unit flow rate increased within the first 30 feet from the measured end. This increase in unit flow rate in Lateral 6 was 31.1% at a position 20 feet back, and 34.6% at a position 30 feet back. Despite this momentary increase in unit flow rate in Lateral 6, the flow rate ultimately begins to decrease like the other laterals at distances progressively closer to the caisson, as shown in Table 6.

3.3.1.3 Water Quality Characteristics

The results of the water quality testing conducted at Collector Well 3 are presented in Table 9. Parameters included pH, ORP, DO, conductivity, salinity, TDS, turbidity, and temperature. Data was collected within each open lateral, as well as at the pump intake. As seen in Table 9, there was generally little variation in the measured parameters collected from each of the laterals and the pump intake parameters. In addition, the measured parameters did not vary significantly between the laterals. Based on the data collected during this evaluation, there does not appear to be an

obvious relationship between water quality parameters and flow percentage, lateral orientation, and/or lateral length.

SCWA collects weekly water quality parameters from the collector wells including pH, temperature, conductivity, and turbidity. The data collected during the study were generally consistent with historical data for these parameters.

3.3.1.4 *Collector 3 Primary Observations*

The primary observations for the Collector 3 evaluation are:

- The test protocol proposed in the Operations Plan proved to be technically effective and efficient, allowing for data (video and flow) to be collected in the six additional laterals beyond the three laterals originally planned.
- The inspection indicated that the caisson and underwater structures are in relatively good condition. There is little if any accumulated debris on the bottom floor of the caisson and signs of rusting and oxidation of steel components were generally not significant.
- The condition of the original carbon steel lateral screens appears to be good for laterals of this age and use. Other than sand and fine gravel debris piles near the ends of some laterals, the video inspection indicates that the inner pipe diameters and slot openings are relatively open, with only minor to moderate signs of encrustation and potential plugging in some portions.
- The capacity testing occurred between 4 and 11 October 2010 at a pumping rate of approximately 13.8 mgd. At the conclusion of the test, the pumping levels in Collector 3 had not stabilized and steady-state conditions were not achieved; however, the rate of water level change had decreased and the test conditions are adequate for capacity evaluation. At the conclusion of this test pumping, Collector 3 was producing about 1 MGD per each foot of observed drawdown.
- The river stage and precipitation data collected during the test period suggest that the hydrogeologic system was relatively stable during this time period. The inflatable dam was in operation during the test period.
- The observed specific capacity of Collector 3 was 696 gpm/ft after 2 days of pumping, and 671 gpm/ft after one week of pumping. Adjusting these results and those from previous testing in 1975 and 1998 to all be on an equivalent basis of the same static water level, pumping water level and without interference from nearby wells in the Mirabel wellfield, the current performance of Collector 3 is 8% better than when

it was originally constructed and tested in 1975, and approximately 64% better than for the inspection in 1998.

- The relative distribution of flow from each of the laterals varied from 12.1% (Lateral 4) to 20.6% (Laterals 1 and 2). Laterals oriented towards the river (Laterals 1, 2, and 3) accounted for approximately 60% of the flow, with the landward laterals (Laterals 4, 5, and 6) accounting for the remaining 40%. The landward laterals accounted for approximately 5% more flow in 2010 compared to 1998, which may be due to the operation of the infiltration ponds.
- Laterals oriented toward the river produced more flow per lineal foot of lateral (about 11.5 gpm/lft) than those projected landward (6.69 to 7.87 gpm/lft). Because of the comparable lengths for 5 of the 6 laterals, variations in flow among the laterals appear to correlate more with lateral orientation than with lateral length.
- With only minor exceptions, the outer portions of the laterals are providing the greatest contribution to the laterals' flow. The outer third of the laterals provides the most flow, followed by the inner third closest to the caisson. In general, the middle third contributes the least to the laterals' production.

3.3.2 Collector 4 Results

The Collector 4 caisson inspection was completed on 5 November 2010. The capacity testing portion of the evaluation was completed between 8 November and 15 November 2010.

3.3.2.1 Caisson and Lateral Condition

Based on the results of the 5 November 2010 inspection, the caisson of Collector 4 appeared to be in relatively good structural condition. Still photographs documenting the caisson, lateral gate valves and pump equipment conditions are provided in Appendix C. The diver caisson inspection videos for this collector are provided in Appendix D. As seen in the photographs and video, there is no evidence of fracturing or spalling in the caisson, and the floor is predominantly clean, with only two rusted bolts observed lying loose on the floor. From the photographs, it appears that there may have been previous sealing and repair of the seam between the caisson wall and lower floor, presumably in response to leakage when the caisson is dewatered. In general, all other underwater structures appeared to be in relatively good condition, although rust was observed on several valve stem risers and brackets, and especially on the ladder. The pump columns are clean and in good condition.

Viewed from the interior of the caisson, the seven original carbon steel laterals installed in Collector 4 in 1975 still appear to be in reasonably good condition. Other than some rusty discoloration, particularly on Lateral 7, the internal steel pipe surfaces and screen slots appear to be generally clean and open. To further assess the condition of the lateral screens, a video camera was advanced along the accessible length in six of the seven laterals. A protective basket for the Pump #8 intake could not be installed for diver safety due to the fact that Pump #8 was too close to the caisson wall. As a result, it was necessary to use Pump #7 for test pumping. However, Pump #7 was in front of Lateral 1 and blocked access for fully inserting the flow meter and video camera. Accordingly, flow from Lateral 1 could be measured only directly within the mouth of the valve. The remaining six laterals were fully accessible to the video camera and flow meter assembly.

The video inspections indicate that, in general, the laterals are in reasonable condition for wells of this age, but portions of some laterals show evidence of moderate buildup of encrustations along the pipe interior and within the slot openings. In Lateral 2, some scale becomes apparent at about 60 feet from the caisson, although the slots openings are still visible. Beyond 90 feet, the slot openings become less visible. At about 145 feet, some sandy materials were encountered lying in the bottom of the screen pipe; this debris, along with more encrustation, is present from this point to the end of the lateral at 172.5 feet. In Lateral 3, some scale is present on the bottom of the screen pipe beginning at approximately 90 feet, but the slot openings otherwise appear to be clear. At 120 feet, the scale on the bottom of the pipe appears to be broader, and at 140 feet there is also some sand and fine gravel collected in the bottom of the pipe. These conditions persist for the remaining length of the lateral to the outer end at 172.5 feet.

In Lateral 4, sand and fine gravel were encountered from about 145 feet to the end of the lateral. Lateral 5 appears to have more significant encrustation, a brown to yellowish-brown hard scale that obscures most of the slot openings in the outer half of the lateral's length, and some of the slot openings closer to the caisson.

Lateral 7 contains a similar occurrence of encrustation as seen in Lateral 5. Beyond 90 feet, the slot openings became less visible and the amount of encrustation increased at 110 feet. Beginning at 160 feet, small iron oxide nodules were encountered extending down into the pipe. At 165 feet, an accumulation of sand was encountered on the bottom of the screen pipe, although the lateral was still fully accessible to the video and flow meter equipment. The last lateral, Lateral 8, was fully accessible, with no indications of any significant encrustation or blockage.

The sand and fine gravels observed in the laterals appear to be originating from the digging heads at the end of each lateral. These incidental occurrences of sand and fine gravel are not uncommon near the outer ends of laterals, until the progressive development of flow within the lateral exceeds the threshold velocity for lifting and transporting sediments that entered during installation.

The diver obtained measurements of metal thickness of the carbon-steel lateral screens just beyond the gate valves, which are summarized in Table 10. Although the exact construction of the pipe-based screen used for the original laterals was not reported, it is assumed from similar projects of this era that the carbon-steel screen used in Collector 4 had an original wall thickness of approximately 0.322 inches. The average thickness of the screen metal in the laterals during this most recent inspection ranged from approximately 0.221 inches to 0.286 inches. Although these data indicate some thinning of the screens, the data do not suggest that the thinning is compromising the competency of the laterals.

3.3.2.2 *Specific Capacity and Lateral Flow Testing*

On 8 November 2010, following more than seven days of recovery, Pump #7 of Collector 4 was placed on-line at approximately 10:02 am at a pumping rate of approximately 13.94 mgd (9,679 gpm). Nearby Collectors 3 and 5 also had been removed from operation and had been recovering for 12.4 and 13.1 days, respectively, to establish a static water level condition. In general, the recovery trends of Collector 4 and 5 peaked on the evening of 7 November 2010, the night before test pumping started, with highest static water level elevations of about +35.4 and +35.0 feet amsl, respectively, and then declined slightly before the start of test pumping at Collector 4. Figure 10 presents the collector operation for the duration of the tests.

At the start of pumping in Collector 4, its static water level was measured at 42.81 feet below the top slab/pump floor, equivalent to an elevation of +35.1 feet amsl. At Collector 5, the corresponding static water level was +34.6 feet amsl. Collector 3 continued to recover until the morning of the test and, at the time Collector 4 pumping began, the static water level was about +32.8 feet amsl. Figure 8 shows the hydrographs of water levels in Collector 4 and adjacent wells.

On the afternoon of 10 November 2010, during the evaluation of Collector 4, the video camera malfunctioned and the inspections of the remainder of the laterals were postponed until the camera could be repaired. Capacity testing of Collector 4 and monitoring of water levels continued for a full 7

days as planned, with monitoring discontinued at approximately noon on 15 November 2010.

Upon repair of the video camera, completion of the lateral inspections occurred on 8 and 9 December 2010. Preceding the second phase of lateral inspections, Collector 4 was turned off at 6:10 am on 4 December 2010 and allowed to recover for approximately 47 hours. The pump was restarted at approximately 5:05 am on 6 December 2010, a little more than 2 days prior to resuming the lateral inspections. Other than a brief shutdown for 9 minutes at 8:30 am on the morning of 8 December 2010 to switch from Pump #8 to the Pump #7, this pumping period was similar to the time that had elapsed in the first phase of the lateral inspections at the time the last lateral was profiled. The intent was to re-establish, to the extent possible, pumping levels and rates comparable to those prevailing at the time the first phase of inspection was postponed.

The pumping water level in Collector 4 was at about elevation +15.15 feet amsl during flow profiling of the last lateral evaluated in the first phase of the inspection. When inspections resumed on 8 December 2010, pumping water levels were several feet lower, at about elevation +9.0 feet amsl. This presumably was caused in part by the operation of Collector Well 4 in the interim weeks between the two phases of inspection, leading to less than full recovery of the aquifer. Prior to the first phase of the lateral inspection, Collector 4 had not been operational for a full month, allowing substantial time for recovery. In the month preceding the second phase of the inspection, Collector Well 4 was operational 23 days and off only 6 days prior to the start-up of inspection pumping. Additionally, Collector 3 was intermittently operated during the second phase of lateral inspections of Collector 4, causing interference that also contributed to a lower observed pumping level.

During the second phase of lateral inspections, Pump #7 was used and pumping rates were consistent with the first phase. Flow meter readings for the two laterals profiled in the first phase of inspection, Laterals 5 and 8, were double checked at a distance of 10 feet from the caisson in the second phase of lateral inspections, to compare differences in flow meter readings. This comparison indicated that the changes in pumping level and pumping rates between the first and second phases of the lateral inspections caused a deviation of flow meter readings of 2% or less. Accordingly, data obtained during flow profiling of laterals should be relatively consistent for both phases of the lateral inspections.

Figure 19 shows the ground water potentiometric surface in the area around Collector 4 prior to the start of pumping, along with static and pumping

water level elevations for monitored wells at 24-hour increments during the first four days of testing. In the vicinity of Collector 4, pre-test ground water flow was generally to the south-southwestward toward the Russian River, with a gradient of about 0.004 feet per foot. As seen in Figure 20, at the end of the test, a cone of depression had developed around Collector 4. As shown on Figure 8, the pumping level in Collector 4 had not completely stabilized at the completion of the test period, although the drawdown had established a relatively consistent, slightly downward trend. The data are sufficient for a meaningful capacity evaluation.

Specific Capacity Evaluation

The specific capacities of Collector 4 corresponding to various durations of pumping are shown in Table 4. Since the previous evaluations of Collector 4 determined its performance after a period of operation of approximately 2 days (48 hours for the initial testing in 1975 and "at least 50 hours" of operation for the 1998 inspection), this duration was chosen for direct comparison of the well's current performance with past performance. Comparisons with future testing should rely on the data from the end of the test at 168 hours assuming a similar protocol is followed in the future.

Based on a pre-test static water level at elevation +35.14 and a pumping level at elevation +15.29 feet amsl after 2 days operation, the observed drawdown was 19.85 feet. With a pumping rate of 9,774 gpm (14.075 mgd) at the time of that drawdown measurement, the observed specific capacity for Collector 4 following 2 days operation is 492 gpm/ft. As shown below, this specific capacity is about 17.5% less than the original specific capacity of 597 gpm/ft after construction in 1975, but 50% better than the reported specific capacity of 328 gpm/ft observed after a comparable duration during the 1998 inspection. However, as shown in Table 4, the drawdown in Collector 4 had not stabilized by the end of the 7-day test period and specific capacity was continuing to decrease, although at a progressively slower rate.

During the initial performance testing after construction in 1975, Collector 4 was reportedly pumped at rates between 21.0 and 20.2 mgd, but remained substantially stable at 20.2 mgd (14,030 gpm) during the last 12 hours of the test. The static water level prior to the start of the test was +29.01 feet amsl and the Russian River elevation was reportedly +30.33 feet amsl. At the end of the 48-hour performance test period, the pumping water level in Collector 4 was +5.50 feet amsl, for an observed drawdown of 23.51 feet, resulting in an observed specific capacity of 597 gpm/ft. This result was slightly better than the 580 gpm/ft observed during the contemporaneous testing of nearby Collector 3. During the test of Collector 4, the effect of

interference at Collector Well 3 was reportedly 4.64 feet, equivalent to 0.23 feet per mgd.

As previously discussed, static water levels were not collected from the individual collector wells during the 1998 evaluations and the static water level was assumed to be the elevation of the Russian River adjacent to each collector site because the other nearby collectors had been pumping. Furthermore, the elevation of the Russian River in 1998 was estimated rather than being based on survey data. The 1998 results are presented herein to be as thorough as possible; however, these data are not as accurate as the 1975 and 2010 results.

During the 1998 inspection of Collector 4 (10 November 1998), the reported pumping rate was 14.8 mgd (10,277 gpm) and the well had been in operation for "at least 50 hours" prior to the inspection. The measured pumping level was at elevation -2.3 feet amsl (80.25 feet below the pump floor) and was reportedly somewhat stabilized. For an assumed river elevation of +29.05 feet amsl (i.e., approximately 49 feet below the pump floor) the apparent drawdown was 31.35 feet, corresponding to an apparent specific capacity of 328 gpm/ft. It should be noted, however, that Collector 3 also was in operation at this time at a rate of 12.8 mgd, and there would undoubtedly have been interference between the two units.

During the most recent testing in 2010, Collector 3 produced about 1.75 feet of drawdown at Collector 4 while pumping at a rate of 14.05 mgd (9,759 gpm), equivalent to an interference of 0.124 feet per mgd. However, at 51 hours into the test of Collector 3 and before drawdowns had stabilized, it was necessary to shut down the pump for approximately 2.5 hours to remove a video cable caught near the pump intake. Although the test resumed immediately after the cable was free and the pump was determined to be unaffected, interference drawdown in nearby Collector 4 never re-established a reliable trend after the restart. Upon cessation of pumping in Collector 3, the recovery in Collector 4 was about 3 feet after 48 hours, equivalent to about 0.217 feet per mgd. As mentioned above, during the 1975 testing, the pumping of Collector 4 produced about 4.64 feet of interference at Collector 3 at 0.23 feet per mgd. Although it is difficult to select the most reliable value from these three, it can be reasonably assumed that, during the 1998 testing, the simultaneous pumping of Collector 3 probably caused on the order of 2.5 feet of interference at Collector 4. With that assumption, the adjusted drawdown is 28.85 feet and a revised apparent specific capacity for Collector 4 during the 1998 test would have been approximately 356 gpm/ft. This revised estimate of specific capacity in 1998, although improved somewhat from the value reported previously,

is still less than the initial 1975 performance as well as that observed in the most recent 2010 testing presented in this report.

Because of the effects of aquifer thickness and aquifer dewatering, a more meaningful comparison between various testing events is to consider the well's performance at comparable static water levels and pumping water levels, using a proportionality relationship, as presented previously in the discussion for Collector 3. Based on information provided in the 1975 report of aquifer testing and cutting shoe elevation for the caisson, as well as presented in the 1998 inspection report, the elevation of the bottom of the aquifer (BOA) is taken to be -38.0 feet amsl. Assumed conditions for static water level and pumping water level can be variously selected from within the reasonable range of expected values, based on previous observations. Previous static water levels ranged from +29.01 feet amsl (1975 test) and +29.05 feet amsl (assumed for 1998 inspection) to +35.14 feet amsl (observed after extended recovery in 2010 testing). The midpoint of this range is about elevation +32.0 feet amsl, which will be assumed for the following comparisons of specific capacity. This results in an assumed initial non-dewatered aquifer thickness of 70 feet [+32 – (-38) = 70 feet]. Pumping levels during previous tests ranged from elevation -2.30 feet amsl (1998 inspection) to +5.50 feet amsl (1975 test) and +15.29 feet amsl (2010 testing). The midpoint of the range from -2.30 feet amsl to +15.29 feet amsl is an elevation of approximately +6.5 feet amsl. Pumping water level elevation is herein assumed to be +7.0 feet amsl, resulting in a corresponding drawdown of 25 feet [+32.0 – (+7.0) = 25.0]. Therefore, average aquifer thickness for these assumed conditions is 57.5 feet [70 – 25/2 = 57.5].

For the 2010 testing, using similar calculations, the observed initial aquifer thickness was 73.14 feet, the observed drawdown at 48 hours was 19.85 feet, and the adjusted average aquifer thickness therefore was 63.22 feet [73.14 – 19.85/2 = 63.22]. With these values as input, the normalized specific capacity for assumed conditions is determined as 492 x 57.5/63.22 = 448 gpm/ft. Similarly, for the 1975 original performance test, the initial observed aquifer thickness was 67 feet and the observed drawdown was 23.51 feet, resulting in an average dewatered aquifer thickness of 55.25 feet and a normalized specific capacity of 621 gpm/ft. For the 1998 inspection, the initial observed aquifer thickness was (based on an assumed static water level of +29.05 feet amsl) 67.05 feet, the observed full drawdown including the 2.5 feet of interference was 31.35 feet, resulting in an average dewatered aquifer thickness of 51.38 feet. Assuming the revised estimated specific capacity of about 356 gpm/ft is used in consideration of interference from Collector 3, the normalized specific capacity for the 1998 inspection is 398 gpm/ft.

To summarize, placing all the testing data within the same assumed conditions for initial aquifer thickness, pumping level, and average dewatered aquifer thickness results in normalized specific capacities for Collector 4 of 448 gpm/ft in 2010; 621 gpm/ft in the original 1975 testing; and 398 gpm/ft in the 1998 inspection. Thus, the current performance of Collector 4 is about 13% better than it was in 1998 but only about 75% of its original performance in 1975.

In light of the normalization process, the apparent reduction in specific capacity could be due to a number of causes including clogging of the lateral screen, clogging of the aquifer in the vicinity of the laterals, compaction of the aquifer over time, and problems with the collector equipment. An assessment of each potential factor is provided below:

- Clogging of the lateral screen – Based on the results of the visual inspection, it is possible that the encrustation and other signs of potential blockage observed in some of the laterals may be causing some reduction in the well's efficiency and that redevelopment and treatment of the well should be evaluated.
- Clogging of the aquifer in the vicinity of the laterals - Although there is no direct evidence, it is likely that this is part of the cause of the decline in efficiency. This is a normal and expected process as finer grained formation materials migrate towards the lateral and fill the interstices of the aquifer material, thus reducing the permeability of the aquifer around the lateral.
- Compaction of the aquifer - It is possible that after many years of pumping within the Mirabel area that portions of the aquifer have been compacted, which would decrease the porosity, which in turn would decrease the permeability of the aquifer. The 1975 specific capacity of Collector 4 was most likely conducted before shifting of aquifer materials around the lateral well screens had occurred. This factor could account for the apparently high specific capacity in 1975. However, due to the apparent lack of decline in capacity in either Collector 3 or Collector 5 compared with the initial test results, this factor does not appear to be responsible for the decline in Collector 4.
- Problems with the collector equipment - It appears that the Collector 3 equipment is generally consistent with that used in the 1975 tests and the current equipment is well maintained. Therefore, we do not believe that this is responsible for the decline in Collector 3.

Lateral Flow Testing

This section documents the flows that were measured near the mouths of the laterals where they connect with the caisson. The relative distribution of flow among Collector 4 laterals as determined during the 2010 evaluation is shown in Table 11 and on Figure 21. Table 11 also presents the results from the 1998 inspection for comparison. During the 2010 evaluation the relative flow percentages ranged between 9.7% (Lateral 8) to 18.0% (Lateral 3). The three laterals with the largest percentages of flow are oriented toward the river (Laterals 1 and 2) and parallel downstream to the river (Lateral 3). The lateral with the smallest percentage of flow (Lateral 8) is oriented at approximately 45° angle towards the river; similar to Lateral 2, but it is also the shortest lateral. The three landward laterals projected towards the infiltration ponds collectively provided 38.2% of the well's total production.

Although Laterals 1 through 5 improved the relative percentages of their production slightly from the 1998 inspection, the most noticeable change was Lateral 7, a landward lateral, which decreased in production from 20.2% in 1998 to 14.8% in 2010. As mentioned above, the video inspection of Lateral 7 indicated a progressive build-up of apparent encrustation and potential plugging of the screen slot openings beyond 90 feet from the caisson, with iron oxide nodules extending into the screen beyond 160 feet. Landward Laterals 4 and 5, accounted for 23.5% of the 2010 production, up from 21.1% in 1998. The 1998 report implied that the ponds were not filled at the time of that inspection, whereas Infiltration Ponds 2 and 3, immediately north of Collector 4, were in operation during the 2010 testing. The increases of relative flow in Laterals 4 and 5 in the 2010 testing compared to the 1998 evaluation may be due to pond operations.

Table 11 also provides gpm/lft for the seven laterals. As shown in Table 11, gpm/lft ranges between 8.4 (Lateral 7) and 13.3 (Lateral 1). Landward Laterals 4, 5 and 7 had the least unit flow, whereas Lateral 1, oriented toward the river, and Lateral 3, oriented parallel to the river, had the most. Lateral 1 had the most unit flow in 1998 also, but the second largest unit flow at that time was observed in Lateral 7, which by 2010 had become the lateral with the least unit flow rate.

Based on the information obtained during the current evaluation, the orientation and lengths of the laterals appear to influence their performance. Lateral 1, which is oriented directly towards the river produces only slightly less flow than either Lateral 2 or Lateral 3, both of which are longer (172.5 feet versus 124.5 feet) and are oriented toward the river at an angle and parallel to the river, respectively. Lateral 8 and Lateral 2 have the same angled orientation towards the river, but longer Lateral 2

(172.5 feet) produces significantly more than shorter Lateral 8 (96.5 feet) although they both produce approximately the same flow per linear foot. Lateral 8 with a length of 96.5 feet and oriented on an angle toward the river produces less flow than slightly longer Lateral 5 (110.5) even though Lateral 5 is projected away from the river, but towards Infiltration Pond 2. Based on these observations, it appears that laterals oriented towards the river generally produce more flow per linear foot than those oriented inland and longer laterals generally produce higher flows.

Lateral Flow Profiling

This section presents the results of flow measurements collected along the lengths of the laterals at different distances from the caisson. The data collection and evaluation protocol were discussed in the Collector 3 results in Section 3.3.1.2.

Flow Variability Along Laterals **–** The tabulated average meter readings and associated flow for portions of the tested laterals of Collector 4 are presented as Table 12. Flow contribution for each increment in each of the tested laterals is graphically presented in Figure 22. Flow at different distances along the laterals is depicted in Figure 23.

The table and figures illustrate variations in flow contributions along the laterals. Although these data are only a snapshot of a transient condition, they provide an overview of the general intervals of greater production versus lesser production. The measured flow variations could be the result of individual or combined influences related to lateral orientation and length, geologic heterogeneity, gradient variations, plugging of the aquifer or lateral screens, or measurement variability.

Water Production and Proximity to Caisson **-** Table 13 provides three approaches to evaluate production from the Collector 4 laterals by distance from the caisson and by segment. An explanation of the three approaches has been previously presented in the discussion of results for Collector 3 in Section 3.3.1.2. The following observations can be made from the data presented in Table 13:

- Top Portion of Table - From the perspective of overall performance for all of the laterals collectively, there is reasonable balance from each of the 50-foot segments, which individually produce from 19.2% to 30.4% of the well's production. Moreover, about 54% of the production comes from the two segments within 100 feet of the caisson, and 46% comes from the two segments beyond 100 feet. However, even though the total production from beyond 150 feet provides the least of the four segments

at 19.2%, only three of the six laterals tested extend into this fourth segment, and for only 22.5 feet each. As a result, the unit flow capacity in the segment beyond 150 feet averages 23.2 gpm/lft.

Although there is balance collectively from the laterals, individually there are noticeable variations. For example, Laterals 5 and 7 produce only 84 gpm and 96 gpm respectively from their segment close to the caisson, to a distance of 50 feet. Unit flow capacities for these two laterals, at 1.68 and 1.92 gpm/lft respectively, also are far less than the average capacities of the other tested laterals. Note also that for Lateral 2, the segment from 50 to 100 feet contributes considerably less production (117 gpm) than the other three segments, which provide 556, 500 and 523 gpm.

- Middle Portion of Table – Overall, only about one-fourth (27.3%) of the total capacity of Collector 4 is obtained within 60 feet of the caisson; the remaining capacity is obtained from beyond 60 feet. This performance is almost identical to that observed at Collector 3, which produced 27.6% of its total capacity within 60 feet of the caisson. With the exception of Lateral 7, the other five laterals tested produced from 19.6% to 40.0% from inside 60 feet of the caisson. Lateral 7, however, provides only 6.6% of its capacity from within 60 feet of the caisson.

  Note also that for Lateral 5, the top portion of the table shows that its production was only 84 gpm within the first 50-foot segment, but the middle portion of the table shows there is 196 gpm furnished within 60 feet. The 10-foot section from 50 to 60 feet provided 112 gpm, more than the entire 50-foot length next to the caisson. Moreover, as shown in Table 12, each 10-foot section from 50 feet to 90 feet was very productive, furnishing from 107 to 196 gpm per each 10-foot segment. Laterals 5 and 7 had the smallest unit flow capacities of 3.23 and 1.60 gpm/lft, respectively; in the other four tested laterals, the unit flow varied from 5.60 to 9.40 gpm/lft, and the overall average was 6.19 gpm/lft.

- Bottom Portion of Table - By separating lateral production into the inner, middle, and outer thirds, it is again apparent that the outermost portions are providing the greatest production. This was observed for each of the six tested laterals. For all laterals, 54.9% of the total production from Collector 4 is obtained within the outer one-third of the lateral lengths. Overall, for all the laterals collectively, the middle third is the next most productive segment (25.7% vs.19.4%), but this varies among the laterals. For Laterals 2, 3, and 4, the inner third is the second most productive and, for Laterals 5, 7, and 8, the middle third is the second most productive. For Lateral 2, the inner third provides 31.4% whereas the middle third provides only 11.9%. For Laterals 5 and 7, the contrast is

even greater, with 4.1% for the inner third and 39.1% in the middle third for Lateral 5, and 6.6% for the inner third and 28.0% in the middle third for Lateral 7. The relative magnitude of performance for the inner and middle thirds in Lateral 8 is similar to those in Lateral 2, except in reverse order with 12.5% in the inner third and 29.1% in the middle third.

End of Lateral Effect - Several graphical approaches are provided to illustrate the distribution of flow along the lateral lengths. Figure 23 shows the cumulative flow versus distance from the caisson for each individual lateral. As discussed previously for Collector 3, perfectly uniform flow along a lateral would produce a straight line trend beginning with zero gpm at the outer end of the lateral and concluding with the total flow for the lateral at zero distance, where it enters the caisson. None of the laterals demonstrate this purely straight line trend of uniform distribution, although some deviate more than others. The three longest laterals, Laterals 2, 3 and 7, have steeply-upward, flow-gaining trends in the first 10 to 15 feet from their outer ends, after which they follow slightly more consistent trends, at least until approximately 70 feet from the caisson. At that distance, the trend for Lateral 2 briefly levels off and dips downward slightly, before again resuming an upward flow-gaining trend. The trend for Lateral 7 also levels off at a distance of 70 feet, but then maintains that relatively flat trend, signifying minimal gain in production for the remaining distance to the caisson.

Laterals 5 and 8 have similar but somewhat more subdued trends, showing initially upward flow-gaining sections starting at their outer ends, followed by relatively flatter and slower-gaining trends within 50 to 60 feet of the caisson. Lateral 5, in particular, shows relatively minimal gain in flow within 50 feet of the caisson. Although the trend for Lateral 4 is the probably the most consistent of all the laterals, even it has a flatter, less productive trend in the middle portion of its length, from about 30 to 70 feet from the caisson.

Figure 24 shows the running average unit flow capacity of each lateral in gpm/lft. For this figure, the total cumulative flow measured at each position along the lateral is divided by the distance between that position and the outer end of the lateral. In effect, it is a graphical representation of the tabulated results in Table 12. Figure 24 clearly illustrates the influence of flow toward the outermost end of the laterals, where unit flows may exceed several hundred gpm/lft in the first several feet of distance from the end. Thereafter, average unit flows decline rapidly to about 20 gpm/lft and then follow a slower, declining trend while getting progressively closer to

the caisson. Ultimately, average unit flow for the laterals is about 10 gpm/lft at the caisson.

Figure 25 shows the progressive increase in percentage of flow for each lateral, with zero percent beginning at the outermost end of the lateral and then increasing progressively towards the caisson until full flow (100%) is achieved. As mentioned in the discussion for Collector 3, this approach normalizes the flow distribution for any pumping rate at which the collector well is being operated, rather than calculating an absolute gpm/lft value. These graphs confirm the larger gains in flow originating from the outermost ends of the laterals in Collector 4. All of the laterals show initially steep, flow-gaining trends at their outermost ends. Four of the six laterals tested derived half of their flow within the outermost one-fourth of their length:

- In Lateral 2, 50% of the flow was obtained within its outer 45 feet (26% of total length);
- In Lateral 5, 50% of the flow was obtained within its outer 30 feet (27% of total length);
- In Lateral 7, 50% of the flow was obtained within its outer 42 feet (28% of total length); and
- In Lateral 8, 50% of the flow was obtained within its outer 27 feet (28% of total length).

Lateral 7 acquired 30% of its total flow within the outermost 10 feet of its length and most of the remaining laterals acquired 30% of their flow within their outermost 20 feet or less. Note that Lateral 5 produces 90% of its flow within 58 feet (about half of its total length). Lateral 8 also has steeply gaining production, although it is also the shortest lateral. Laterals 3 and 4, for which the end effects appear to be primarily restricted to their outermost 5 or 10 feet, otherwise have the most consistent flow producing trends throughout the remaining portions of their length

Table 14 presents an analysis of flow within the final 30 feet of the profiled length of the Collector 4 laterals, as well as the change in unit flow rates within this interval. The following observations can be made from the data presented in Table 14:

- The overall percentage of flow produced in the outermost 30 feet of the Collector 4 laterals ranges from 34.6% to 54.4%, and averages 40.6% from all tested laterals combined.
- Maximum unit flow rates at the last accessible measurement in the laterals ranged from 91.50 gpm/lft (Lateral 8) to 334.9 gpm/lft (Lateral

7), and averaged 189.9 gpm/lft for all six laterals tested. Overall, these unit flow rates are larger than encountered in the same intervals in the similarly aged and constructed Collector 3.

- Unit flow rates at 30 feet from the measured end of the laterals ranged from 15.05 gpm/lft to 21.18 gpm/lft, and averaged 18.42 gpm/lft. These unit flow rates at 30 feet from the measured end are slightly less than those measured in Collector 3.

For all of the six laterals tested, the unit flow rates within 30 feet from the last accessible measurement had decreased substantially, from 77.4% to 94.1%, with an average decrease of 87.7%, as the end of lateral flow effects progressively dissipated. Considering that the average percentage reduction in flow at 20 feet (86.1%) was only slightly less than at 30 feet, there was only a 1.6% reduction in that 10-foot interval. This small percentage change should not be misconstrued as an indication of the relative production from that 10-foot interval, but rather it mostly reflects the mathematical influence that the very large unit flow rates at the last accessible measurement have on the successive unit flow rates with progressive distance from the end of the lateral. The top portion of Table 14 clearly shows that each of these laterals was gaining production within the 10-foot interval between 20 feet and 30 feet from the end, with an average gain in flow of 120 gpm and an average percentage gain of 9.5%. Considering that this 10-foot interval represents from 5.8% to 10.4% of the Collector 4 laterals' individual lengths (depending on the total length of the lateral), the gain in production is comparable to the corresponding additional percentage of length. More specifically, the ratio of percentage gain in flow to percentage of lateral length for that 10-foot interval was greater than unity for every lateral except Lateral 4 (0.85) and averaged 1.27 for all 6 laterals tested.

To summarize, the percentage reduction in unit flow rates presented in Table 14 is just one other method of expressing the end of lateral flow effect and the larger values of percentage reduction indicate the greater end of lateral flow effect. A larger percentage reduction in flow does not imply lateral plugging or loss of performance in those sections.

3.3.2.3 *Water Quality Characteristics*

The results of the water quality testing conducted at Collector 4 are presented in Table 15. Parameters included pH, ORP, DO, conductivity, salinity, TDS, turbidity, and temperature. Data was collected within each open lateral, as well as at the pump intake. As shown in Table 15, there was generally very little variation in the measured parameters collected from

each of the laterals and the pump intake parameters. In addition, with the exception of DO and turbidity, the measured parameters did not vary significantly between the laterals.

Concentrations of DO ranged from 7.03 (Lateral 4) to 8.97 (Lateral 7) milligram per liter (mg/L). Concentrations of DO in six of the seven showed very little variation ranging from 7.03 to 7.53 mg/L, with the exception of Lateral 7, which is oriented towards the river. Turbidity in five of the laterals ranged from 0.1 to 0.14 nephelometric turbidity units (NTU). Two of the laterals, Lateral 1 and 8, had higher turbidity readings of 0.21 to 0.24 NTU, respectively. Both of these laterals are oriented to the south-southwest towards the river.

In addition, SCWA collects weekly water quality parameters from the collector wells including pH, temperature, conductivity, and turbidity. With the exception of conductivity and turbidity, the data collected during the study were generally consistent with historical data for these parameters. The conductivity data collected as part of the current evaluation, which ranged from 0.175 to 0.187 millisiemens per centimeter (mS/cm), were lower than historical data which ranged between 0.229 and 0.293 mS/cm in 2010. In addition, the higher turbidity seen in Laterals 1 and 8 were higher than historical turbidity readings for 2010 which ranged from 0.054 to 0.123 NTUs.

3.3.2.4 *Collector 4 Primary Observations*

The primary observations from the Collector 4 evaluation are:

- The testing program successfully collected operational data for evaluating the pumping performance of the collector well, and allowed for video and flow measurements through the accessible length of six of the well's seven laterals. Lateral 1 was blocked by the operating Pump #7 and was not accessible for video inspection or flow profiling.
- The inspection indicated that the caisson and underwater structures are sound and in reasonably good condition. There is little accumulated debris on the bottom floor of the caisson. There are signs of rust on valve stem risers, brackets and the ladder, although these components still appear to be structurally sound.
- The condition of the carbon steel lateral screens appears to be reasonable for laterals of this age and use. Most of the laterals show some signs of scale and encrustation in the outer half of their length, typically becoming more apparent beyond approximately 90 feet from the caisson. In Laterals 2, 5, and 7, this encrustation obscures many of the

slot openings and Lateral 7 has iron oxide nodules extending into the screen beyond a distance of 160 feet.

- After pumping for one week at an average rate of about 13.85 mgd, the pumping levels in Collector 4 had not stabilized and steady-state conditions were not achieved; however, the rate of water level change had decreased and the test conditions are adequate for capacity evaluation. At the conclusion of pumping, Collector 4 was producing about 0.6 mgd per each foot of observed drawdown.
- The observed specific capacity of Collector 4 was 492 gpm/ft after two days of pumping, and 402 gpm/ft after one week of pumping. By adjusting these results and those from previous testing in 1975 and 1998 to be on equivalent basis of the same static water level, pumping water level and without interference from nearby wells within the Mirabel wellfield, the current performance of Collector 4 is about 13% better than it was in 1998 but only approximately 75% of its original performance after construction in 1975. The apparent reduction in specific capacity could be due to a number of causes including clogging of the lateral screen, clogging of the aquifer in the vicinity of the laterals, and compaction of the aquifer.
- The relative distribution of flow from each of the laterals varied from 9.7% (Lateral 8) to 18.0% (Lateral 2). In general, with the exception of Lateral 7, the relative distribution of flow among the laterals has not changed substantially since 1998. Lateral 7, however, shows a noticeable decline in production, dropping from 20.2% in 1998 to 14.8% in 2010. Video inspection of Lateral 7 did indicate encrustation and scale in the outer half of its length.
- The four laterals oriented towards (Laterals 1, 2 and 8) and parallel (Lateral 3) to the river provided 62% of the wells' production. The landward laterals towards Infiltration Ponds 2 and 3 provided 38%. Landward Laterals 4 and 5, accounted for 23.5% of the 2010 production, up from 21.1% in 1998. The 1998 report implied that the ponds were not filled at the time of that inspection, whereas Infiltration Ponds 2 and 3, immediately north of Collector 4, were in operation during the 2010 testing. The increases of relative flow in Laterals 4 and 5 in the 2010 testing compared to the 1998 evaluation may be due to pond operations. Lateral 7 contributed 14.8% during the 2010 testing, which is a significant reduction from the 20.2% measured in 1998. This reduction in flow is most likely due to the significant amount of encrustation and rust seen in the outer half of the lateral during the visual inspection.
- At least in part, individual lengths of the Collector 4 laterals appear to influence their relative production. The three longest laterals (Laterals 2,

3 and 7), each 172.5 feet in length, have historically produced the three largest individual flows and largest unit flow capacities. In 2010, this was true for only two of those three laterals because of a significant decrease in production from Lateral 7, potentially related to development of encrustation and plugging in the outer half of the lateral. Nevertheless, Laterals 2 and 3 provided 1,696 gpm and 1,764 gpm, respectively, with unit flow capacities of 17.26 and 17.95 gpm/ft. The two shortest laterals, Laterals 8 and 5, with lengths of 96.5 feet and 110.5 feet respectively, provide the two lowest flows (less than 1000 gpm) and lowest unit flow capacities (9.73 and 10.16 gpm/ft). In particular, the lowest production and lowest unit flow capacity comes from Lateral 8, even though it is oriented towards the river. With respect to two laterals of intermediate lengths, Lateral 1, 124.5 feet in length and oriented towards the river, produced 1,658 gpm at a unit flow capacity of 16.87 gpm/ft compared with Lateral 4, 152.5 feet in length and oriented towards Infiltration Pond 2, which produced 1,303 gpm and 13.26 gpm/ft. Based on this data, it appears that the orientation of Lateral 1 towards the river was more influential than its somewhat shorter length compared with Lateral 4.

- All of the laterals in Collector 4 derived their production predominantly from the outer portions of their lengths. Production derived from the outermost 30 feet of their length provides a third to half of the total production of each lateral (Table 14), and unit flow capacities were consistently larger in the outer portions.

3.3.3 Collector 5 Results

The Collector 5 caisson inspection was completed on 15 October 2010. The capacity testing portion of the evaluation was conducted between 18 October 2010 and 25 October 2010.

3.3.3.1 Caisson and Lateral Condition

Based on the results of the 15 October 2010 inspection, the caisson of Collector 5 appeared to be in good structural condition. Still photographs documenting the caisson, lateral gate valves and pump equipment are provided in Appendix C. There is no evidence of fracturing or spalling in the caisson. The floor is clean with no signs of accumulating sand or debris, although there were a couple areas with shallow pitting, which may be the gouge noted in the 1998 inspection. Nevertheless, these gouges do not compromise the floor's structural integrity. With the exception of the ladder, all underwater structures, including valve stem risers, brackets, and pump columns, appeared to be in good condition with only minor rust

discoloration. The ladder, however, appeared to be significantly rusted in some portions below water, with some of the ladder rungs reduced in thickness by the rusting process.

Viewed from the interior of the caisson, the ten original carbon steel laterals installed in Collector 5 in 1982 appear to be in reasonably good condition for wells of this age. The interior surface of the lateral screens shows some discoloration but no signs of major encrustation or blockage. To further assess the condition of the lateral screens, a video camera was advanced along the accessible length in 9 of the 10 laterals. Because Pump #10 was to close to the valve for Lateral 7, this lateral could not be fully accessed by the camera/flow meter equipment assembly. Therefore, flow from Lateral 7 could be only be measured directly within the mouth of the valve. In addition, as will be discussed below, Lateral 1 was blocked by a pipe left behind after previous work on the lateral and could be only be accessed a short distance into the lateral.

The video inspections indicate that the laterals vary in condition from relatively clean to moderately encrusted. Lateral 2 was accessible for most of its 87 feet of length; however, sand and debris was encountered at 82 feet and subsequently blocked the camera/flow meter assembly at 84 feet. Similarly, Lateral 3, which has a length of 123 feet, contained sand and debris beginning at 107 feet and access of the camera/flow meter assembly was subsequently blocked at 120 feet. In addition, Lateral 3 showed signs of light to moderate encrustation. Lateral 4 was fully accessible and showed signs of light to moderate encrustation.

Laterals 5, 6, 8, 9 and 10 were relatively clean. The screen slots were open and visible, and no scale was observed through their entire lengths. Laterals 6, 9, and 10 did not contain any sand or debris, nor any signs of scale or encrustation. Although some sand and debris was observed in Lateral 5, beginning at 164 feet along the bottom of the pipe, the full length of the lateral was accessible to the camera/flow meter assembly. There was also some sand and debris in the last 3 or 4 feet of Lateral 8 but it was also fully accessible.

The debris piles observed in the laterals appear to be mostly sand and fine gravels originating from the digging heads at the end of each lateral. These incidental occurrences of sand and fine gravel are not uncommon near the outer ends of laterals, until the progressive development of flow within the lateral exceeds the threshold velocity for lifting and transporting sediments that entered during installation.

As mentioned above, the condition of Lateral 7 could not be inspected by the camera, because access to this lateral was blocked by Pump #10. Lateral 1 was initially accessible to the camera/flow meter equipment. However, at about 20 feet from the caisson, a small diameter pipe was encountered lying in the bottom of the lateral blocking further access by the camera/flow meter. This pipe appears to be of the type used to remove sand and gravel entering the lateral and transport it back to the caisson during lateral projection and subsequent development or cleaning. Referred to in the collector well industry as a "sand line", this pipe appears to have been left behind during previous work in the well.

The diver obtained measurements of metal thickness of the carbon steel lateral screens just beyond the gate valves, which are summarized in Table 16. Although the exact construction of the pipe-based screen used for the original laterals was not reported, it is assumed from similar projects of this era that the carbon-steel screen used in Collector Well 5 had an original wall thickness of approximately 0.322 inches. The average thickness of the screen metal in the laterals during this most recent inspection ranged from approximately 0.173 inches to 0.406 inches. Based on the results and the results of the visual inspection, it can be reasonably assumed that the thickness of the carbon-steel laterals has not appreciably decreased.

3.3.3.2 *Specific Capacity and Lateral Flow Testing*

On 18 October 2010, following more than three weeks of recovery, Pump #10 of Collector 5 was placed on-line at approximately 10:32 am at a pumping rate of approximately 13.43 mgd (9,329 gpm). Nearby Collector 4 had been removed from operation three weeks previously, and Collector 3 at the south end of the Mirabel well field had been recovering for 7 days following the conclusion of its testing. Figure 10 presents the pumping schedule for the duration of the tests.

Following the initial shutdown of all three collector wells in the Mirabel wellfield between 26 and 27 September 2010, the water level in Collector 5 recovered until mid-afternoon of 1 October 2010, at which point the non-pumping water level was at about elevation +34 feet amsl. Beginning with the evening of 1 October 2010, the water level in Collector 5 began to decline, even though all wells in the Mirabel well field remained off. By midday on 3 October 2010, after 1.65 feet of drawdown had occurred, the water level in Collector 5 began to rise and this recovery continued until the evening of 8 October 2010, several hours after test pumping of Collector 3 began. The water level in Collector 5 again started to draw down slightly, ultimately declining 0.23 feet by the end of test pumping at Collector 3. After cessation of pumping at Collector 3, the water level in Collector 5

began to rise and ultimately recovered to a static water elevation of +36.07 feet amsl (41.84 feet below the top slab/pump floor) at the time its own test pumping began. Figure 8 shows the hydrographs of water levels in Collector 5 and adjacent wells during the duration of the pump test.

Figure 26 presents the potentiometric surface in the area around Collector 5 prior to capacity testing, along with water level elevations at 24-hour increments during the first four days of testing. In the vicinity of Collector 5, pre-test ground water flow was southeastward towards the Russian River with a gradient of approximately 0.015 feet per foot, which is considerably steeper than pre-test gradients observed at Collectors 3 and 4. At the end of the test pumping, a cone of depression had developed around the well, similar to that shown in Figure 27 after four days of pumping. As apparent from Figure 8, drawdown in Collector 5 and surrounding wells had not yet stabilized at the completion of the test period. In contrast to other tests where water levels continue to drop, there was a rise in the pumping water level of about 1.3 feet beginning gradually during the evening of 23 October 2010, increasing more noticeably in the afternoon of 24 October 2010, and continuing until shortly after midnight, at which point the water level peaked and then began to fall again, which continued irregularly until shutdown of the pump at 6:30 am on 26 October 2010.

A review of the pumping records shows that there was no significant change in pumping rate during the period of this rising pumping water level in Collector 5. River stage information at the SCWA dam and the USGS gages at Healdsburg and Guerneville show a river rise and fall within this period due to the occurrence of significant rainfall (approximately 4.75 inches) in the area on 23 and 24 October 2010. The correlation between the peak times and magnitudes of change of the river stages versus the changes at Collector 5 is not readily apparent. The closest information to the wells' location is the SCWA dam. The river level at the dam and the water level in Collector 5 both peaked about midnight of 24 October with rises in level of 1.36 feet (elevation +39.75 feet amsl) at the dam and 1.33 feet in the well, respectively. Thereafter, their trends begin to diverge. At the dam, the river level fell 0.20 feet then rose another 0.74 feet to reach a second, higher peak at elevation +40.29 feet amsl (total rise of 1.90 feet) at 19:05 on 25 October. During that same period, after reaching its initial peak, the water level in Collector 5 began to decline, with a maximum decline of 1.80 feet at 19:00 on 25 October, the same time at which the river level at the dam reached its second, highest peak. Thus, the initial two rising peaks agree favorably, but the subsequent trends of rise/fall for the river and Collector 5 diverge. After peaking for the second time, the river level began a steady decline, while the pumping level in Collector 5 alternately rose and fell several times. Thus, it is not clear that the rising pumping level in Collector 5 is directly related to the rising river

level. However, the normalized drawdowns (i.e., adjusted for changes in pumping rate) for elapsed times of pumping of 3 days, 4 days and 7 days, which span both sides of the rising pumping level period, all form a uniform downward trend suitable for our interpretation of performance.

Specific Capacity Evaluation

The specific capacities of Collector 5 corresponding to various durations of pumping are shown in Table 4. Although previous evaluations of Collectors 3 and 4 involved pumping periods of 1.5 to 2 days, previous evaluations at Collector 5 involved shorter as well as more variable pumping periods. During the 48-hour test in 1982 after Collector 5 was constructed, the Russian River began a dramatic rise after only 27 hours of pumping, rising 13.2 feet in the last 21 hours of the test (from elevation +35.04 feet amsl to +48.23 feet amsl). As a result, the last reliable 1982 readings of drawdown and specific capacity are at the end of the 27 hour period. Subsequently, during the 1998 inspection, the performance of Collector 5 was evaluated after only 2.5 hours of pumping. Comparisons with future testing should rely on the data from the end of the test at 168 hours assuming a similar protocol is followed in the future.

For comparison with Collectors 3 and 4, the specific capacity of Collector 5 is evaluated initially for a comparable period of 2 days. In addition, in order to compare the 2010 performance of Collector 5 with its original performance in 1982 and its subsequent performance in 1998, specific capacity is also provided for pumping durations of 2.7 hours and 1 day. For a pre-test static water level at elevation +36.07 feet amsl and a pumping level at elevation +17.63 feet amsl after 2 days operation, the observed drawdown was 18.44 feet. At that time, pumping rate was 13.591 mgd (9,438 gpm) resulting in a corresponding specific capacity of 512 gpm/ft. After 2.7 hours operation, the pumping level was +21.67 feet amsl, resulting in an observed drawdown of 14.40 feet. The pumping rate at that time was 13.6509 mgd (9,480 gpm), resulting in a corresponding specific capacity of 658 gpm/ft. Finally, after a pumping period of 25 hours (listed as 1 day in Table 4), the pumping level was +19.13 feet amsl, resulting in an observed drawdown of 16.94 feet. The pumping rate at that time was 13.1516 mgd (9,133 gpm), resulting in a corresponding specific capacity of 539 gpm/ft.

Specific capacities for other durations of pumping also are provided in Table 4. As shown in this table, the specific capacity of Collector 5 continued to decline throughout the 7 day period of testing. Moreover, the magnitude of decline in specific capacity between 4 days and 7 days was 2 to 3 times greater for Collector 5 than for Collectors 3 and 4, both of which had shown a progressive lessening of their drawdown trends. Considering

the overall trends of Collectors 4 and 5 between durations of 2 days and 7 days, both show a similar decline in specific capacity (18.0 gpm/ft per day in Collector 4 and 18.6 gpm/ft per day in Collector 5). However, at Collector 4, the declining trend of specific capacity progressively changes from 91 gpm/ft per day (day 1 to day 2), to 34.5 gpm/ft/day to (day 2 to day 4), to 7 gpm/ft/day (day 4 to day 7). In contrast, at Collector 5, the decline in specific capacity is more consistent and steadier, changing from 27 gpm/ft/day to 21 gpm/ft/day to 17 gpm/ft/day for the same periods. Thus, Collector 4 shows greater initial declines and then a progressive leveling off of its trend, whereas Collector 5 has less initial decline but its decline remains more consistent. Both of these wells, however, show significantly greater decline than Collector 3 over the test period, which for comparable periods changed from a rate of 29 gpm/ft/day to 4.5 gpm/ft/day to 5.3 gpm/ft/day.

During the initial 1982 performance test, the pre-test river level was at elevation +35.04 feet amsl and the static ground water level was elevation +35.27 feet amsl. During the test, the pumping rate fluctuated between 20.4 mgd and 21.9 mgd (14,134 and 15,205 gpm), but remained substantially stable at 20.56 mgd (14,279 gpm) in the interval between 18 hours and 27 hours. This was also the period in which the lowest pumping level (+5.39 feet amsl) and maximum drawdown (29.88 feet) were observed. At that time, the Russian River began a dramatic rise of 13.2 feet (to an elevation of +48.23 feet amsl) by the end of the test period, with a corresponding decrease in the apparent drawdown. Accordingly, using the maximum drawdown of 29.88 feet in conjunction with the stable pumping rate of 14,279 gpm prior to the river rise at 27 hours, the 1982 specific capacity is determined to be 478 gpm/ft.

As mentioned above, the observed specific capacity of Collector 5 following one day of pumping during the 2010 test was 539 gpm/ft. This value is slightly better than the reported specific capacity of 478 gpm/ft from the original 1982 performance test following the well's construction. The specific capacity after 2.7 hours of pumping in the 2010 test (658 gpm/ft) is significantly greater than the reported specific capacity from the 1998 inspection (437 gpm/ft) for a comparable duration of time. However, as discussed previously for Collector 3 and 4, static water levels were not collected from the individual collector wells during the 1998 evaluations and the static water level was assumed to be the elevation of the Russian River adjacent to each collector site because the other nearby collectors had been pumping. Furthermore, the elevation of the Russian River in 1998 was estimated rather than being based on survey data. The 1998 results are presented herein to be as thorough as possible; however, these data are not as accurate as the 1975 and 2010 results.

To better compare performance of Collector 5 in 1998 and 2010, it is necessary to adjust the 1998 apparent specific capacity to remove the effects of well interference as well as to normalize each specific capacity on the basis of equivalent static water levels and pumping levels. Similar static water levels and pumping water levels will also be used to compare the 2010 performance with that in 1982.

For the 1998 inspection, Collector 5 was not pumping for "at least 24 hours" prior to the start of the inspection. However, the 1998 report notes that nearby Collector 4 was still running, and the observed pre-test non-pumping water level at Collector 5 was 54.66 feet below the pump floor, equivalent to a static water elevation of +23.25 feet amsl, and still declining. Based on the operation of nearby Collector 4 , this non-pumping water level is considerably below the observed static water levels prior to the 1982 and 2010 tests (+35.27 feet amsl and +36.07 feet amsl, respectively) and was also six or seven feet below the estimated river level, which they estimated to be about +29.5 feet amsl.

In the 1998 inspection, Collector 4 had been pumping for "at least 50 hours" at the time of the inspection of Collector 5. During the 2010 testing, with the river at a comparable stage, the interference drawdown in Collector 5 after 2 days and 3 days of pumping at Collector 4 was 4.62 feet (0.335 ft/mgd) and 5.72 feet (0.414 ft/mgd), respectively. Although Collector 4 was pumping at a slightly higher rate in 1998 (14.8 mgd) than in 2010 (averaging about 13.8 mgd during that same period), the anticipated interference at Collector Well 5 prior to the start of the 1998 inspection pumping would still not have been much more than approximately 5.5 feet, which remains substantially less than the magnitude of lowering actually observed in 1998 (about +/-12 feet or more). Thus, it appears that prior to the inspection pumping in 1998, the water level in Collector 5 was being influenced both by incomplete recovery as well as by interference from pumping at nearby Collector 4. Under those circumstances, and in conjunction with the short duration of pumping (2.5 hours) of Collector 5 during its 1998 inspection, it would be invalid to assume (as presented in the 1998 report) that sufficient diversion from the river allowed that river elevation to serve as the surrogate static water level.

During the 2010 evaluation, while the river level was at a similar minimum stage, Collectors 4 and 5 were initially shutdown on the evening of 26 September 2010 to allow recovery prior to 2010 testing. After 24 to 36 hours, the recovered water level in Collector 5 had risen to approximately +30.0 feet amsl in elevation. This was still six feet below the ultimately recovered static water level prior to testing at Collector Well 5, but it probably represents a reasonable estimate for what the "static water level" at Collector 5 might have been in 1998 after at least 24 hours recovery if

Collector 4 had not been pumping. As discussed above, if interference from Collector 4 was on the order of 5.0 to 5.5 feet, the calculated pre-test water level in 1998 would be between +25.0 to +24.5 feet amsl. These estimates of pre-test static water level in 1998 are only about 1.25 to 1.75 feet above the reported level at the time of the inspection (+23.25 feet amsl). While this alternative estimate of "static" conditions reasonably confirms their observation, it does imply that river level should not be used as the surrogate for static water level at this site when determining drawdowns, and that true static water levels will typically be higher than river level.

If we assume that the prevailing static water level at the time of the 1998 inspection was at elevation +30.0 feet amsl then, for the reported pumping water level of +7.75 feet amsl, the apparent drawdown would be 22.25 feet. However, to account for interference from Collector 4, 5.5 feet of this drawdown will be attributed to interference, resulting in a true drawdown of 16.75 feet related only to pumping of Collector 5. Accordingly, the revised specific capacity for Collector 5 in 1998 is estimated to be 568 gpm/ft.

By way of further comparison, the 1982 test pumping records were additionally reviewed for the performance of Collector 5 following 3 hours of pumping. Hourly measurements were collected in 1982 and at the end of the third hour the observed drawdown was 27.29 feet. The reported pumping rate at that time was 14,725 gpm, resulting in a corresponding specific capacity of 540 gpm/ft. This specific capacity is similar to but slightly less than the revised value for the 1998 inspection, suggesting that the performance of Collector 5 had not deteriorated significantly by 1998. Both values are less than the specific capacity observed for the same duration of pumping in 2010 (658 gpm/ft). This is believed to be attributable primarily to the more complete recovery of the ground water levels in the aquifer in 2010, in conjunction with the absence of interference from the other collector wells in the Mirabel well field.

Because aquifer thickness and aquifer dewatering can influence well performance and specific capacity, a more meaningful comparison between various testing events is to consider the well's performance at comparable static water levels and pumping water levels, using a proportionality relationship. This approach has been presented previously in this report for evaluation of Collectors 3 and 4. For Collector 5, the assumed conditions will be a static water level of +35.0 feet amsl, and a bottom of aquifer at -23 feet amsl (used previously in 1998 report), resulting in an initial aquifer thickness of 58 feet. Pumping water levels observed during the three test events, at a consistent period of pumping of about 2.5 to 3 hours, varied between +7.75 feet amsl and +21.67 feet amsl, with a midrange of about +14.71 feet amsl. For these calculations, assumed pumping water level will

be elevation +15.0 feet amsl, resulting in an assumed drawdown of 20 feet. Because of the various aquifer conditions and intervals of pumping considered for the three tests in 1982, 1998, and 2010, the results of adjusted specific capacities for the same assumed conditions is summarized in Table 17. As shown in this table, there has been relatively modest change in performance of Collector 5 since its original construction in 1982. The adjusted short-term specific capacities after 2.5 to 3 hours of pumping are relatively similar, especially the results for the 1998 and 2010 tests, which agree closely and both of which are about 5% better than for the 1982 testing. Comparison of the specific capacities for the 1 day period of pumping (in 1982 and 2010) suggest a slight 4% decline in performance since 1982, with specific capacity declining from 530 gpm/ft to 511 gpm/ft over the past 28 years. Overall, there does not appear to be any significant changes in the well's performance.

Lateral Flow Testing

This section documents the flows that were measured near the mouths of the laterals where they connect with the caisson. The relative distribution of flow among Collector 5 laterals as determined during the 2010 evaluation is shown in Table 18 and on Figure 28. Table 18 also presents the results from the 1998 inspection for comparison. During the 2010 evaluation the relative flow percentages ranged between 4% (Lateral 8) to 17.5% (Lateral 5). There is a significant disparity in distribution among the laterals. Five of the ten laterals individually produce 11.4% or more of the total capacity and average 14.9%. Four of the remaining five laterals individually produce 4.9% or less of the total capacity and average 4.4%. The remaining lateral is in the middle of these two distributions with 7.8% of the flow. This polarization of percentage flow distributions does not appear to favor any one orientation as three of the five highest producing laterals are oriented towards or parallel to the river and the other two are landward but towards Infiltration Pond No. 3. Two of the four lowest producing laterals also are oriented towards the river and two are landward.

Based on the data collected, the length of laterals in Collector 5 appears to contribute more to their production than their orientation. The four longest laterals (three at 175 feet and one at 168 feet) are four of the five highest producing laterals. And the three shortest laterals, with lengths of 70 feet, 74 feet and 87 feet, are also the three lowest producing laterals. The three remaining laterals are of intermediate lengths (123 feet, 124 feet and 133 feet) with flow percentages varying from 4.9% to 16.3%. This pattern extends also to the average unit flow capacities of each lateral, expressed as gallons per minute per lineal foot (gpm/lft). The range of average unit flow capacities is from 3.74 gpm/lft (Lateral 3) to 12.37 gpm/lft (Lateral 6), with

an average of 7.21 gpm/lft. Four of the five highest unit flow capacities, providing 6.12 gpm/lft or more, are associated with the four longest laterals and one intermediate length lateral. The shorter laterals all have among the lower average unit flow capacities. The lowest unit flow capacity, 3.74 gpm/lft, occurs in Lateral 3, which extends towards the river and is 123 feet in length.

Overall, the relative distribution of flow among the laterals is comparable to their performance in the 1998 inspection, with relatively minor changes in flow percentages. Changes in performance ranged from a loss of 2.3% (Lateral 1) to a gain of 2.7% (Lateral 6), which are relatively insignificant considering the inherent accuracy of the flow metering method. Infiltration Ponds Nos. 2 and 3 were filled at the time of the 2010 testing, but the report from the 1998 inspection suggests these infiltration ponds were not being used at the time of their evaluation. As mentioned above, Laterals 5 and 6 extend toward Infiltration Pond No. 3 and are two of the largest producing laterals. However, they were also two of the largest producing laterals in the 1998 inspection when the infiltration pond was apparently dry. During the 2010 testing, Laterals 5 and 6 improved slightly in performance, gaining 1.7% and 2.7%, respectively, whereas three of the four laterals oriented towards the river had flow percentages 1% to 2% lower than in 1998. This slight improvement in production from Laterals 5 and 6 may be attributable to recharge from the infiltration pond, although small changes of this magnitude could also be associated with the inherent accuracy of the flow metering method.

Lateral Flow Profiling

This section presents the results of flow measurements collected along the lengths of the laterals at different distances from the caisson. The data collection and evaluation protocol were discussed in Section 3.3.1.2. Only 8 of the 10 laterals could be profiled along their length: 1) Lateral 1 was blocked at a distance of approximately 20 feet by a pipe lying inside the lateral; and 2) the front of the valve on Lateral 7 was blocked by Pump #10, preventing access for the video camera/flow meter assembly.

Flow Variability Along Laterals—The tabulated average meter readings and associated flow for portions of the tested laterals of Collector 5 are presented in Table 19. Flow contributions for portions of the laterals are graphically presented in Figure 29. Flow at different distances along the laterals is depicted in Figure 30.

The table and figures illustrate variations in flow contributions along the laterals. Although these data are only a snapshot of a transient condition,

they provide an overview of the general intervals of greater production versus lesser production. The measured flow variations could be the result of individual or combined influences related to lateral orientation and length, geologic heterogeneity, gradient variations, plugging of the aquifer or lateral screens, or measurement variability.

Water Production and Proximity to Caisson—Table 20 provides three approaches to evaluate production from the Collector 5 laterals by distance from the caisson and by segment. An explanation of the three approaches has been previously presented in the discussion of results for Collector 3 in Section 3.3.1.2. The following observations can be made from the data presented in Table 20:

- Top Portion of Table—From the perspective of overall performance for all of the laterals collectively, there is reasonable balance from three of the four segments (19.5% to 23.3%), with the dissimilar segment from 100 to 150 feet from the caisson providing the most production (34.5%). About 42.8% comes from the two segments closest to the caisson: the remained 57.2% comes from the two segments beyond 100 feet from the caisson. However, the unit flow capacities for each segment give a clearer perspective of the distribution of flow versus length along the laterals. The two segments closest to the caisson have average unit flow capacities of 4.45 and 4.12 gpm/lft, whereas the two segments beyond 100 feet from the caisson have average unit flow capacities of 11.46 and 23.05 gpm/lft. This illustrates that a greater contribution of flow is coming from the outermost portions of the laterals.

  Individually, some of the laterals vary noticeably from the overall percentages of flow by segment. Lateral 3 produces only 47 gpm from the 50-foot segment closest to the caisson, with a unit flow capacity of less than 1 gpm/lft. In Laterals 4, 5, and 9, it is the segment from 50 feet to 100 feet from the caisson that has noticeably smaller production. In Lateral 4, this segment from 50 to 100 feet produces only 49 gpm with a unit flow capacity of less than 1 gpm/lft. In Laterals 5 and 9, this intermediate segment produces more than at Lateral 4 but still considerably less than their segments closer and farther from the caisson. In Lateral 5, the segment from 50 to 100 feet produces 112 gpm (versus 236, 436, and 857 gpm in its other three segments) with a unit flow capacity of 2.24 gpm/lft. In Lateral 9, the segment from 50 to 100 feet produces 108 gpm (versus 284 and 339 gpm in its innermost and outermost segments) with a unit flow capacity of 2.16 gpm/lft. In Lateral 8, which is only 74 feet in length, the outermost 24 feet (beyond 50 feet) produces only 73 gpm, with a unit flow capacity of 3.04 gpm/lft,

even though this outermost end of the lateral is where flows are typically larger.

- Middle Portion of Table—Overall, only about one-fourth (25.7%) of the total capacity of Collector 5 is obtained within 60 feet of the caisson: the remaining 75% of the capacity is obtained from beyond 60 feet. This performance is almost identical to that observed at Collectors 3 and 4, which produced 27.6% and 27.3% respectively of their total capacity within 60 feet of the caisson. Lateral 8, because of its short 74-foot length, produces 89.0% of its flow within 60 feet: this is related entirely to its shortness as it only contains 14 feet of lateral beyond 60 feet. Laterals 2, 4, and 9 with respective lengths of 87, 175, and 133 feet, also produce noticeably more flow within 60 feet than the overall average. In particular, Lateral 2 obtains 55.2% of its capacity within 60 feet of the caisson; however, it is only 87 feet in length. For longer Laterals 4 and 9, the production within 60 feet is 40.0% and 35.6% respectively, which slightly exceed the overall average. However, Laterals 5, 6, and 10, with lengths of 175 feet, 124 feet and 175 feet, respectively, produce considerably less within 60 feet of the caisson (ranging from 8.3% to 14.9%) than the overall average for all the laterals.
- Bottom Portion of Table—By separating lateral production into the inner, middle, and outer thirds, it is again apparent that the outermost portions are providing the greatest production. This was observed for all of the eight laterals profiled except for Lateral 8. The overall average for all laterals was 55.1% in the outer third of their lengths with 44.9% being produced from the inner and middle thirds combined. In particular, Laterals 5 and 6, 175 feet and 124 feet in length respectively, produced 75.9% and 81.7% of their total capacity solely from the outer third of their lengths. In contrast, shorter Lateral 8 (74 feet in length) produced 78.8% from its inner and middle thirds combined, and only 21.2% from its outer third.

End of Lateral Effects—Several graphical approaches are provided to illustrate the distribution of flow along the lateral lengths. Figure 30 shows the cumulative flow versus distance from the caisson for each individual lateral. As explained previously for Collectors 3 and 4, perfectly uniform flow along a lateral would produce a straight line trend beginning with zero gpm at the outer end of the lateral and concluding with the total flow for the lateral at zero distance, where it enters the caisson. None of the laterals demonstrate this purely straight line trend of uniform distribution, varying instead in accordance with their individual production characteristics.

The three longest laterals (Laterals 4, 5, and 10) each 175 feet in length, as well as Lateral 6 with a length of 124 feet, all display steeply gaining

production in the outermost portions of their length. Lateral 4 is steeply gaining in the outermost 20 feet, and then more gradually gaining for the next 35 feet. In the intermediate distance between 60 feet and 120 feet from the caisson, Lateral 4 displays a relatively flat, non-gaining trend, and then another gaining trend in the segment from 0 to 40 feet from the caisson. Lateral 5 is steeply gaining in the outermost 40 feet and then follows a more gradual but consistent production trend for the remaining distance to the caisson. Lateral 6 is also steeply gaining in its outermost 40 feet and then follows a more gradual but variable trend until about 20 feet from the caisson, at which point the trend flattens into a non-gaining segment for the remaining distance to the caisson. Lateral 10 is steeply gaining in its outermost 20 feet, but then the segment from the caisson out to a distance of 150 feet has a gradual but relatively consistent upward gaining trend.

Laterals 2 and 9 have similar but more subdued trends and lower productions. Both have moderately steeper upward-gaining trends in their outermost 30 feet and flatter, relatively smaller gaining intermediate trends. The intermediate trends involve a 20-foot segment in Lateral 2 (between distances of 20 to 40 feet from caisson) and a 60-foot segment in Lateral 9 (between distances of 40 to 100 feet from caisson). In their segments closest to the caisson, Lateral 2 and 9 again demonstrate upward gaining trends.

Laterals 3 and 8, with lengths of 123 feet and 74 feet respectively, have trends that differ from the other laterals. Both Laterals 3 and 8 have flat or relatively subdued production trends in their outermost 30 feet, but then begin to gain flow closer to the caisson. Lateral 3 gains more in its segment from 50 to 90 feet from the caisson, then becomes relatively flat with little gain in production in the 50-foot segment closest to the caisson. Lateral 8 gains production relatively consistently in the 40-foot segment closest to the caisson.

Figure 31 shows the running average unit flow capacity of each lateral in gpm/lft. For this figure, the total cumulative flow measured at each position along the lateral (such as shown in Figure 29) is divided by the distance between that position and the outer end of the lateral. In effect, it is a graphical representation of the tabulated results in Table 19. At zero distance where the lateral enters the caisson, the value of gpm/lft for the full length of the lateral is identical to that shown in Table 20.

Figure 31 clearly illustrates the influence of flow towards the outermost ends of most of the laterals, where unit flows in some cases exceed 80 gpm/lft in the first several feet of distance from the end. In particular, the unit flow trends in Laterals 4, 5, and 10 are very steep in their outermost 10 feet, and remain relatively steep at distances beyond about 150 feet from the

caisson. Lateral 6 has a similarly steep trend in the outermost 10 feet but it then follows a more gradual and progressively changing trend back towards the caisson. With the exception of Lateral 6, almost all of the laterals have relatively consistent, flat trends of unit flow capacity within 100 or 120 feet from the caisson. In these portions of the lateral lengths, the average unit flow capacity is relatively similar for all the laterals, with rates typically on the order of 5 to 10 gpm/lft.

Figure 32 shows the progressive increase in percentage of flow for each lateral, with zero percent beginning at the outermost end of the lateral and then increasing progressively towards the caisson until full flow (100%) is achieved. As previously mentioned, this approach "normalizes" the flow distribution for any pumping rate at which the collector well is being operated, rather than calculating an absolute gpm/lft value. These graphs confirm the larger gains in flow originating from the outermost ends of most of the laterals in Collector 5. Seven of the eight laterals tested derived 50% of their flow within their outermost 50 feet or less, with an average distance for achieving 50% flow at 36 feet from the end of the lateral.

Lateral 2 derived nearly half of its flow within the outermost 30 feet and maintained a relatively steep percentage gain trend for a distance of 45 feet, where it had accumulated about 75% of its total capacity. Lateral 3 derived 30% of its flow in the outermost 10 feet alone, and 50% of its flow within the outermost 38 feet, with its percentage gain trend remaining relatively steep for a distance of about 73 feet. Lateral 4 derived 33% of its production capacity in its outermost 15 feet and 50% within 45 feet. In the segment from about 50 feet to 120 feet from the outer end, Lateral 4 gains relatively little in flow (less than 10%). In the final 40 feet of its length closest to the caisson (distances of 135 feet to 175 feet from the outermost end), Lateral 4 again becomes more rapidly gaining, with about 38% of its production acquired in that segment.

Lateral 5 has a very steep gaining trend in its initial 5 feet, and subsequently accumulates 30% of its production within the outermost 23 feet and 70% of its production within 40 feet from the end. For the remaining distance to the caisson, Lateral 5 follows a relatively gradual but consistent gain in capacity. Lateral 6 has a similar performance as Lateral 5, deriving 50% of its production in the outermost 15 feet of length and 80% of its production in the outermost 40 feet. The remaining portion of the lateral (84 feet) provides the final 20% of its capacity.

Lateral 9 acquires 50% of its capacity in the outermost 45 feet and, with the exception of the intermediate segment between 60 feet and 90 feet from the outermost end, obtains the remaining 50% of its capacity with a relatively

consistent gaining trend in the remaining distance (88 feet) towards the caisson. Lateral 10 has a very steeply gaining percentage in the outermost several feet and derives 33% of its capacity within the outermost 15 feet. Thereafter, for the remaining distance to the caisson, Lateral 10 has a consistent gain in percentage until the final 20 feet closest to the caisson.

The trend of percentage flow for Lateral 8 is slightly different than for the other laterals. The outermost portion of the lateral length does not indicate a rapid gain in capacity, with only 10% of capacity derived in the outermost 15 feet and 50% derived in about 45 feet. That is, 50% of its flow was obtained within 61% of its length. This is the shortest lateral (74 feet) for which a flow profile was obtained (Lateral 7 at 70 feet was not accessible for flow profiling). The shape of the percentage flow trend is reasonably consistent throughout the entire length of Lateral 8 and suggests a relative uniform unit flow capacity.

Table 21 presents an analysis of flow within the final 30 feet of the profiled length of the Collector 5 laterals, as well as the change in unit flow rates within this interval. The following observations can be made from the data presented in Table 21:

- The overall percentage of flow produced in the outermost 30 feet of the Collector 5 laterals ranges from 28.9% to 72.7%, and averages 50.2% from all tested laterals combined. This is about 10% more capacity than obtained in the outer 30 feet of both Collectors 3 and 4.
- Maximum unit flow rates at the last accessible measurement in the laterals ranged from comparable lows of 4.36 gpm/lft (Lateral 8) and 4.83 gpm/lft (Lateral 2) to the highest value of 129.8 gpm/lft (Lateral 10), and averaged 52.6 gpm/lft for all tested laterals combined. Overall, these unit flow rates are considerably smaller than observed in Collector 3 and 4.
- Unit flow rates at 30 feet from the measured end of the laterals ranged from 3.84 gpm/lft (Lateral 8) to 35.47 gpm/lft, and averaged 15.65 gpm/lft for all laterals tested. These unit flow rates at 30 feet from the measured end have a broader range but a smaller average than those measured in Collector 3 and 4.
- With the exception of Lateral 2, all of the eight laterals tested had decreased unit flow rates at 30 feet from the last accessible measurement. This reduction of unit flow capacity within the outer 30 feet measured ranged from 25.4% to 86.9%, and averaged 56.7%. For Lateral 2, the unit flow capacity actually increased by 41.9% at 30 feet from the last accessible measurement. It should be noted also that although Lateral 8 shows an overall 11.9% decline in unit flow capacity within that 30-foot

segment, it actually declined in unit flow for only the first 10 feet and then began a steady increase in unit flow capacity for the next 40 feet back towards the caisson. The percentage decline in unit flow capacity in the first 30 feet from the measured end for Laterals 3, 4, and 5 was nearly identical with percentage declines of 71.2%, 71.2%, and 71.9%, respectively. Lateral 10 had the largest percentage decline in unit flow capacity at 86.9%. Clearly, these four laterals have very large end-of-lateral flow effects.

3.3.3.3 *Water Quality Characteristics*

Results of the water quality testing conducted at Collector 5 are presented in Table 23. Parameters included pH, ORP, DO, conductivity, salinity, TDS, turbidity, and temperature. Data was collected within each open lateral, as well as at the pump intake. As seen in Table 23, there was generally very little variation in the measured parameters collected from each of the laterals and the pump intake parameters. In addition, the measured parameters did not vary significantly between the laterals. Based on the data collected during this evaluation, there does not appear to be an obvious relationship between water quality parameters and flow percentage, lateral orientation, and/or lateral length.

In addition, SCWA collects weekly water quality parameters from the collector wells including pH, temperature, conductivity, and turbidity. The data collected during the study were generally consistent with historical data for these parameters.

3.3.3.4 *Collector 5 Primary Observations*

The primary observations for the Collector 5 evaluation are:

- The test protocol proposed in the Operations Plan proved to be technically effective and efficient, allowing for data (video and flow) to be collected in three additional laterals (for a total of eight laterals) beyond the three originally planned. Lateral 1 was blocked by a small pipe and access to Lateral 7 was blocked by Pump #10.
- The inspection indicated that the caisson and underwater structures are generally sound and in reasonably good condition. The floor is clean with no signs of accumulating sand or debris. Although there were a couple locations with gouges, the floor is structurally sound. With the exception of the ladder, all underwater structures, including valve stem risers, brackets and pump columns, appeared to be in good condition with only minor rust discoloration. The ladder, however, appears to be

significantly rusted in some portions below water, with some of the ladder rungs reduced in thickness by the rusting process.

- The condition of the carbon steel lateral screens appears to be reasonable for laterals of this age and use. The video inspections indicate that the laterals vary in condition from relatively clean to moderately encrusted. Some laterals had small piles of sand and debris near their outermost ends, but in general those laterals were open and accessible. However, a small diameter pipe typically used for sand and gravel removal during construction and development of laterals was encountered lying in the bottom of Lateral 1 approximately 20 feet from the mouth of the lateral. This pipe does not block flow from Lateral 1, but it did block access into the lateral by the camera/flow meter apparatus.
- The capacity testing occurred between 18 and 25 October 2010 and during this time there was a two day period of significant rainfall (4.75 inches) that led to a rise in the river stage during the test period. In contrast to the Collector 3 and 4 tests, there was a rise in pumping water level at Collector 5 following the rain event and the subsequent rise in the river level. It is likely that the rising pumping level was related to the rising river level although detailed water level changes do not directly correlate so it is possible that the operation of other water wells in the area may also be an influence. However, the normalized drawdowns (i.e., adjusted for changes in pumping rate) for elapsed times of pumping of 3 days, 4 days and 7 days, which span both sides of the rising pumping level period, all form a uniform downward trend suitable for our interpretation of performance.
- After pumping for one week at an average rate of about 13.6 mgd, the pumping levels in Collector 5 had not stabilized and steady-state conditions were not achieved. At the conclusion of this test pumping, Collector Well 5 was producing about 0.6 mgd per each foot of observed drawdown. However, the rate of water level change had decreased and the test conditions are adequate for capacity evaluations.
- The observed specific capacity of Collector 5 was 512 gpm per foot of drawdown (gpm/ft) after two days of pumping and 419 gpm/ft after one week of pumping. Previous test pumping and inspections at Collector 5 involved a variety of pumping durations, from as little as 2.5 hours to more customary periods of 1 or 2 days. By adjusting the 2010 testing results and those from previous testing in 1982 and 1998 to be on equivalent basis of pumping duration, static water level, pumping water level and without interference from nearby wells in the Mirabel well field, the current performance of Collector 5 is similar to previous test results. Based on comparison of test results in 2010 versus the original testing following construction in 1982, for a pumping duration of one

day, the performance of Collector 5 appears to have declined by no more than 4% since 1982.

- The relative distribution of flow from each of the accessible laterals varied from 4% (Lateral 8) to 17.5% (Lateral 5). In general, the distribution of flow observed in 2010 is comparable to that reported in the 1998 inspection, with relative changes in performance of individual laterals varying between -2.1% and +2.7%.
- There is a significant disparity in distribution among the laterals. Five of the ten laterals individually produce 11.39% or more of the total capacity and average 14.9%. Four of the remaining five laterals individually produce 4.89% or less of the total capacity and average 4.4%. This polarization of percentage flow distributions does not appear to favor any one orientation but instead appears to correlate with lateral length. The four longest laterals constitute four of the five highest producing laterals. In contrast, the three shortest laterals are also the three lowest producing laterals. This pattern extends also to the average unit flow capacities of each lateral. Four of the five largest unit flow capacities, providing 6.12 gpm/lft or more, are associated with the four longest laterals with the fifth lateral of intermediate length. The shortest laterals all have among the smallest average unit flow capacities. The smallest unit flow capacity, 3.74 gpm/lft, occurs in Lateral 3 (123 feet in length) even though it projects towards the river.
- Excluding Lateral 8, the tested laterals derive the majority of their production from their outermost ends. These laterals produced half of their flow within the outermost 15 to 53 feet and the average production within the outermost 30 feet was approximately 50.2%. Lateral 8, only 74 feet in length, has a more uniform distribution of its flow and derives half of its production within about 59% of its length (i.e., within the outermost 44 feet of its 74-foot length). This can be compared with similarly short Lateral 2, which is 87 feet in length, which produced half of its flow within 30 feet (i.e., within 34% of its length) and 70% of its flow within 43 feet (i.e., within 49% of its length). In spite of comparably short lengths, Lateral 2 derives more of its flow from the outermost portions of its length than does Lateral 8. Presumably Lateral 2 benefits from its orientation towards the river whereas Lateral 8 projects landward with no immediately proximate source of recharge.
- Lateral 5 and 6, oriented landward towards Infiltration Pond 3, show slight gains of 1.65% and 2.7%, respectively, compared to the 1998 results. This increase may be due to the operation of Infiltration Ponds 2 and 3, which were filled during the 2010 testing and not in the 1998 testing.

- Although the short-term testing performance of Collector 5 does not appear to have declined appreciably since its construction in 1982, and is comparable to that observed at nearby Collector 4, its declining trend of specific capacity near the end of the 2010 test is noticeably steeper than in the other Mirabel collector wells. Based on our review of previous reports and the data generated by this study, we believe that this declining performance trend with the prolonged duration of pumping may be related more to aquifer performance than well efficiency. Previous aquifer testing during the pre-installation 1970 hydrogeological investigation of the Mirabel area determined that the site near Collector 4 (Meredith Site) had more favorable characteristics and greater production potential than the site farther north (Ballard Site) near the SCWA dam. The report indicates that the Ballard Site had a shallower aquifer (about 9 feet shallower) with several small intervening clay layers and a reported aquifer transmissivity that was half of that derived at the Meredith Site. Collector 5, being the northernmost collector well in the Mirabel well field and the site closest to the SCWA dam, may have aquifer characteristics, recharge potential and/or barrier effects influenced by these less favorable conditions that apparently exist farther north near the Ballard site. As a result, the drawdown and performance trends of Collector 5 may vary from those observed at Collector 3 and 4 (Meredith Site). Longer periods of prolonged pumping and data collection at Collector 5 would be needed to further evaluate the potential differences at this site.

4.0 CONCLUSIONS AND RECOMMENDATIONS

This section presents the conclusions of the capacity testing. Recommendations are also provided for SCWA consideration in planning for future work.

4.1 CONCLUSIONS

This section presents general conclusions, followed by specific observations related to each collector well.

The following general conclusions are applicable to the testing performed in 2010:

- The field methods were demonstrated to be effective for evaluating the conditions of the collectors, specific capacities, and flow in the laterals and the aquifer. These methods provide a valid basis for evaluating future changes in the capacities of the collectors.
- The field methods were efficient, allowing for the completion of significantly more lateral inspections and flow testing than originally planned within the project budget.
- The pumping rates of the collector wells during the test period were consistent enough for the capacity evaluations and the testing did not disrupt water service.
- By documenting the significant precipitation and the associated variability of the river stage during the latter portion of the evaluation period, the data collected during the current evaluation allow us to compare with previous evaluations of the collector wells and, more importantly, will allow comparison with future evaluations.
- None of the tests reached steady-state conditions. The results are valid for the capacity comparisons; however, longer term testing would improve estimates of yield.
- The water quality data collected from the collector wells during the evaluation is consistent with historical results collected by SCWA and indicates that there is no obvious relationship between water quality parameters and flow percentage, lateral orientation, and/or lateral length.

Observations specific to each collector are presented below. Table 4 provides a summary of specific capacities for the Mirabel collectors based on current and previous tests.

Collector 3

The following results relate specifically to the Collector 3 testing:

- The inspection indicated that the caisson and underwater structures are in relatively good condition. The condition of the original carbon steel lateral screens appears to be good for laterals of this age and use. Other than sand and fine gravel debris piles near the ends of some laterals, the video inspection indicates that the inner pipe diameters and slot openings are relatively open, with only minor to moderate signs of encrustation and potential plugging in some portions.
- The observed specific capacity of Collector 3 was 696 gpm/ft after 2 days of pumping and 671 gpm/ft after one week of pumping. Adjusting these results and those from previous testing in 1975 and 1998 to all be on an equivalent basis of the same static water level, pumping water level and without interference from nearby wells in the Mirabel wellfield, the current performance of Collector 3 is 8% better than when it was originally constructed and tested in 1975 and approximately 64% better than for the inspection in 1998. However, the 1998 results are not as accurate as the 1975 and 2010 results due to the lack of a static level measurement in the well prior to testing and interference due to the operation of Collector 4.
- The relative distribution of flow from each of the laterals varied from 12.1% (Lateral 4) to 20.6% (Laterals 1 and 2). The percentages of flow determined in this 2010 evaluation are in general comparable to the percentages observed in the 1998 inspection, with only minor changes. Laterals oriented towards the river (Laterals 1, 2, and 3) accounted for approximately 60% of the flow, with the landward laterals (Laterals 4, 5, and 6) accounting for the remaining 40%. The landward laterals accounted for approximately 5% more flow in 2010 compared to 1998, which may be due to the operation of the infiltration ponds. Laterals oriented toward the river produced more flow per lineal foot of lateral (about 11.5 gpm/lft) than those projected landward (6.69 to 7.87 gpm/lft). Because of the comparable lengths for 5 of the 6 laterals, variations in flow among the laterals appear to correlate more with lateral orientation than with lateral length.
- The lateral flow profiling of Collector 3 reflects flow variability along the laterals. The measured flow variations could be the result of individual or combined influences related to geologic heterogeneity, gradient

variations, plugging of the aquifer or well screen, or measurement variability. With only minor exceptions, the outer portions of the laterals are providing the greatest contribution to the laterals' flow. The outer third of the laterals provides the most flow, followed by the inner third closest to the caisson. In general, the middle third contributes the least to the laterals' production.

Collector 4

The following are conclusions are based on the data generated during the current evaluation of Collector 4:

- The inspection indicated that the caisson and underwater structures are sound and in reasonably good condition. There are signs of rust and iron oxide nodules on valve stem risers, brackets and the ladder, although these components still appear to be structurally sound. The carbon steel lateral screens appear to be good condition for laterals of this age and use with most of the laterals showing some signs of scale and encrustation in the outer half of their length.
- The observed specific capacity of Collector 4 was 492 gpm/ft after two days of pumping, and 402 gpm/ft after one week of pumping. By adjusting these results and those from previous testing in 1975 and 1998 to be on equivalent basis of the same static water level, pumping water level and without interference from nearby wells in the Mirabel wellfield, the current performance of Collector 4 is about 13% better than it was in 1998 but only approximately 75% of its original performance after construction in 1975. The apparent reduction in specific capacity could be due to a number of causes including clogging of the lateral screen, clogging of the aquifer in the vicinity of the laterals, and compaction of the aquifer.
- The relative distribution of flow from each of the laterals varied from 9.7% (Lateral 8) to 18.0% (Lateral 2). In general, with the exception of Lateral 7, the relative distribution of flow among the laterals has not changed substantially since 1998. Lateral 7, however, shows a noticeable decline in production, dropping from 20.2% in 1998 to 14.8% in 2010. The current inspection showed significant encrustation and rust in the outer half of the Lateral 7 indicating that the drop in production from this lateral could be due to clogging of the lateral screen.
- The four laterals oriented towards (Laterals 1, 2 and 8) and parallel (Lateral 3) to the river provided 62% of the wells' production while the landward laterals towards Infiltration Ponds 2 and 3 provided 38%. Landward Laterals 4 and 5, accounted for 23.5% of the 2010 production, up from 21.1% in 1998. The 1998 report implied that the ponds were not

filled at the time of that inspection, whereas Infiltration Ponds 2 and 3, immediately north of Collector 4, were in operation during the 2010 testing. The increases of relative flow in Laterals 4 and 5 in the 2010 testing compared to the 1998 evaluation may be due to pond operations.

- The lengths of the Collector 4 laterals appear to influence their relative production. Two of the three longest laterals (Laterals 2 and 3), each 172.5 feet in length, produced the two highest individual flows and largest unit flow capacities. Lateral 7, which has historically produced one of the higher flows, showed a significant decrease in production in 2010, potentially related to development of encrustation and plugging in the outer half of the lateral.
- All of the laterals in Collector 4 derived their production predominantly from the outer portions of their lengths. Production derived from the outermost 30 feet of their length provides a third to half of the total production of each lateral and unit flow capacities were consistently larger in the outer portions of length.

Collector 5

The following are conclusions are based on the data generated during the current evaluation of Collector 5:

- The inspection indicated that the caisson and underwater structures are generally sound and in reasonably good condition. The carbon steel lateral screens appear to be good condition for laterals of this age and use. Lateral 1 contained a small diameter pipe typically used for sand and gravel removal during construction and development lying in the bottom of the lateral approximately 20 feet from the caisson.
- The observed specific capacity of Collector 5 was 512 gpm/ft after two days of pumping and 419 gpm/ft after one week of pumping. Previous test pumping and inspections at Collector 5 involved a variety of pumping durations, from as little as 2.5 hours to more customary periods of 1 or 2 days. Based on comparison of test results in 2010 versus the original testing following construction in 1982, for a pumping duration of one day, the performance of Collector 5 appears to have declined by no more than 4% since 1982.
- The relative distribution of flow from each of the accessible laterals varied from 4% (Lateral 8) to 17.5% (Lateral 5). In general, the distribution of flow observed in 2010 is comparable to that reported in the 1998 inspection.
- There is a significant disparity in distribution among the laterals. Five of the ten laterals individually produce 11.39% or more of the total capacity

and four of the remaining five laterals individually produce 4.89% or less of the total capacity.

- Lateral 5 and 6, oriented landward towards Infiltration Pond 3, show slight gains of 1.65% and 2.7%, respectively, compared to the 1998 results. This increase may be due to the operation of Infiltration Ponds 2 and 3, which were filled during the 2010 testing and not in the 1998 testing.
- Despite the fact that the short-term testing performance of Collector 5 does not appear to have declined appreciably since its construction in 1982 and is comparable to that observed at nearby Collector 4, its declining trend of specific capacity near the end of the test is noticeably steeper than in the other Mirabel collector wells. Based on our review of previous reports and the data generated by this study, we believe that the declining performance trend with the prolonged duration of pumping may be related more to aquifer performance than well efficiency.

4.2 RECOMMENDATIONS

The following recommendations are provided for SCWA consideration based on the results of the capacity testing.

- Due to the fact that none of the collector wells stabilized by the end of their week long testing period, it would be advantageous to monitor performance for longer periods of pumping. Where possible, coordinate normal operations of Collectors 3, 4 and 5 to perform monitoring that emulates a longer term capacity test (3 to 4 weeks). The tests should be conducted at a constant pumping rate and include water level monitoring in the collector wells, nearby observation wells, and river during periods of consistent collector operation and relatively stable river stage.

- A routine data collection program should be implemented to monitor collector well performance on a more regular basis. An example would be to collect monthly water levels, river stage, and collector operational records, combined with specific capacity determinations, to develop a data set to identify changes in performance.

- If monitoring identifies a distinct decline in the performance of a collector well, more intensive evaluation or testing should be considered. If monitoring does not identify any distinct declines in

capacity, the collector wells should still be inspected every 5 to 7 years to acquire more direct observation of the wells' condition and performance.

- The laterals in Collector 4 show evidence of encrustation, scale and plugging, particularly in the outermost portions of their length. Moreover, this collector well appears to have lost approximately 25% of its capacity since construction in 1975. SCWA may wish to consider cleaning and development of the Collector 4 laterals sometime in the future.

- Although the underwater structures in the collector wells in the Mirabel well field are in generally good condition, there is some evidence of the beginning stages of rusting and encrustation. In particular, some of the valve stem risers, brackets and ladders show rust discoloration, and in some cases scale and iron oxide nodules. Also of special note, the ladder in Collector 5 showed signs of more advanced stages of rusting near the bottom of the well. These structures should be monitored for any progressive worsening of their condition.

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Figures

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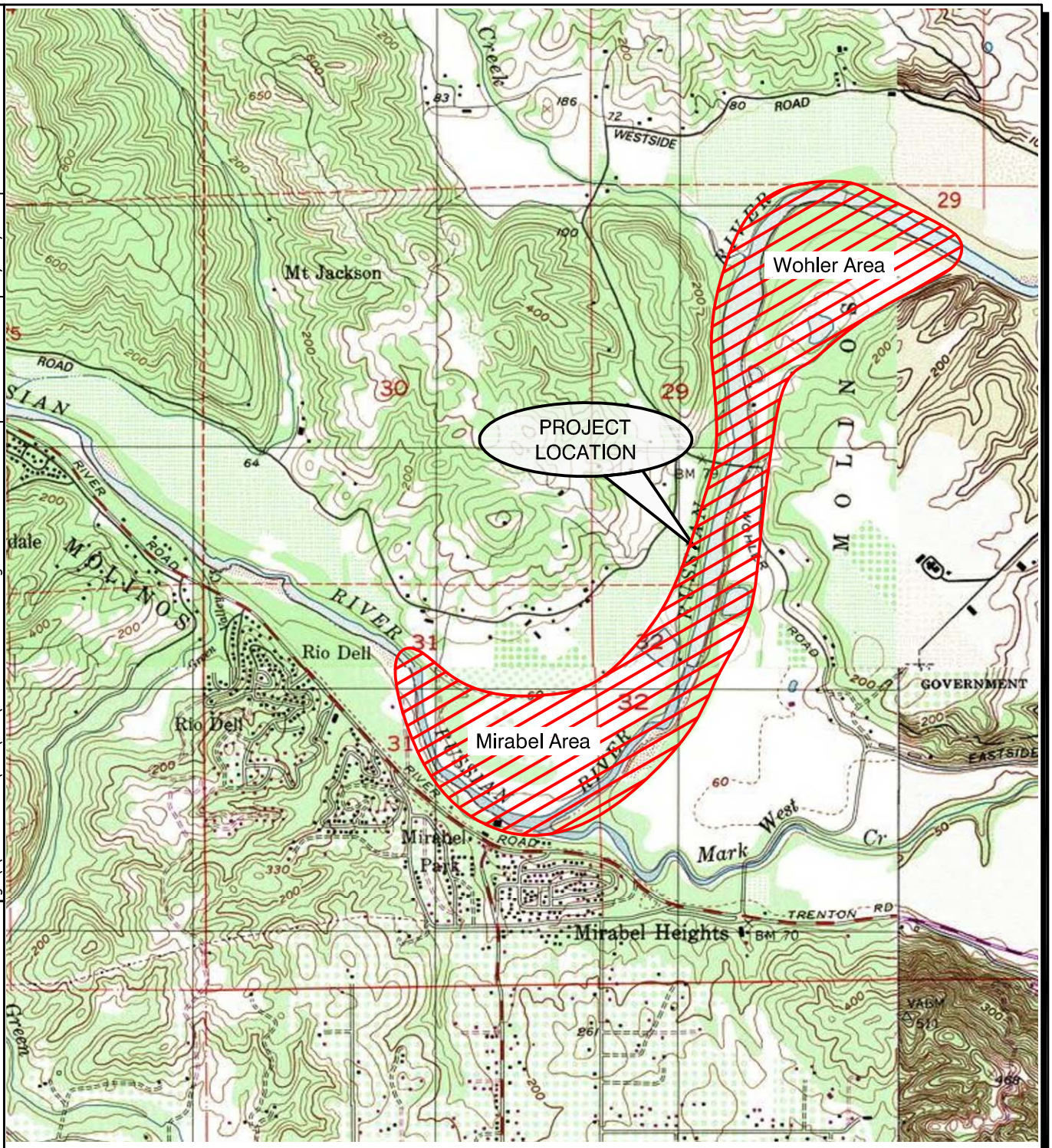

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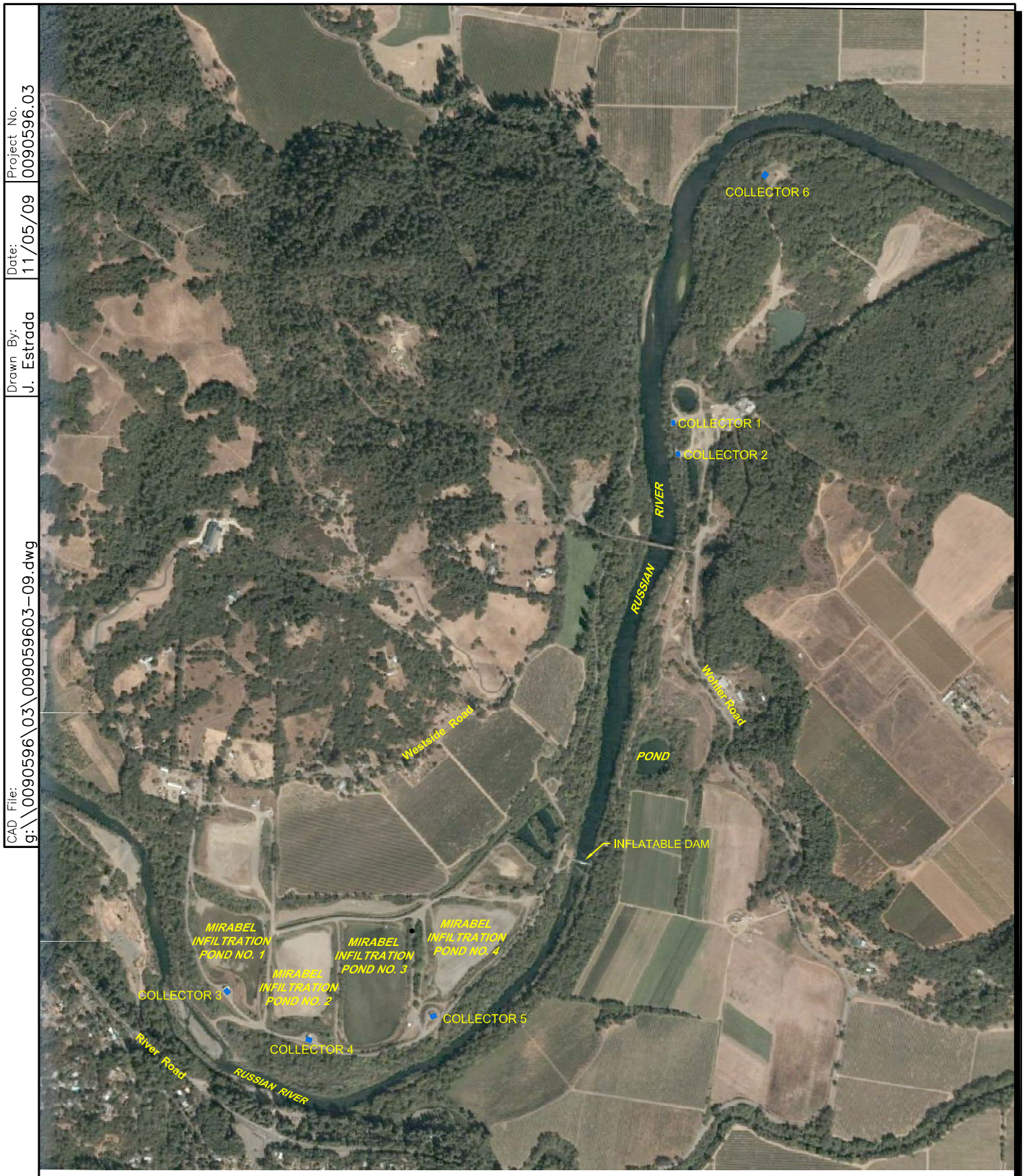
Figure 1
Project Location Map
Wohler and Mirabel Areas
Sonoma County Water Agency
Sonoma County, California

ERM 07/08



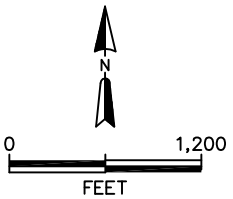


Figure 2
Project Area Map
Wohler and Mirabel Areas
Sonoma County Water Agency
Sonoma County, California

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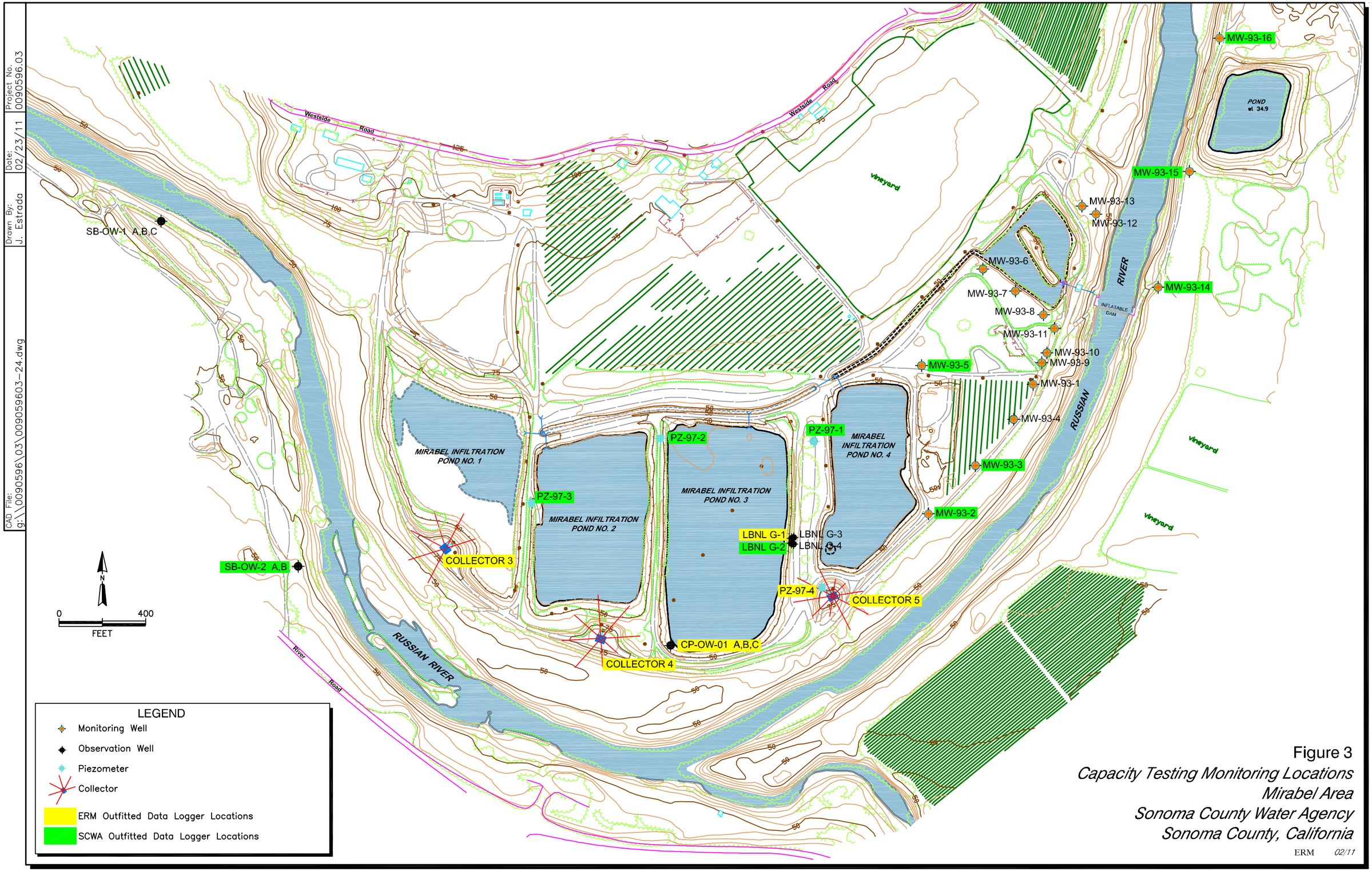

Figure 3

Capacity Testing Monitoring Locations

Mirabel Area

Sonoma County Water Agency

Sonoma County, California

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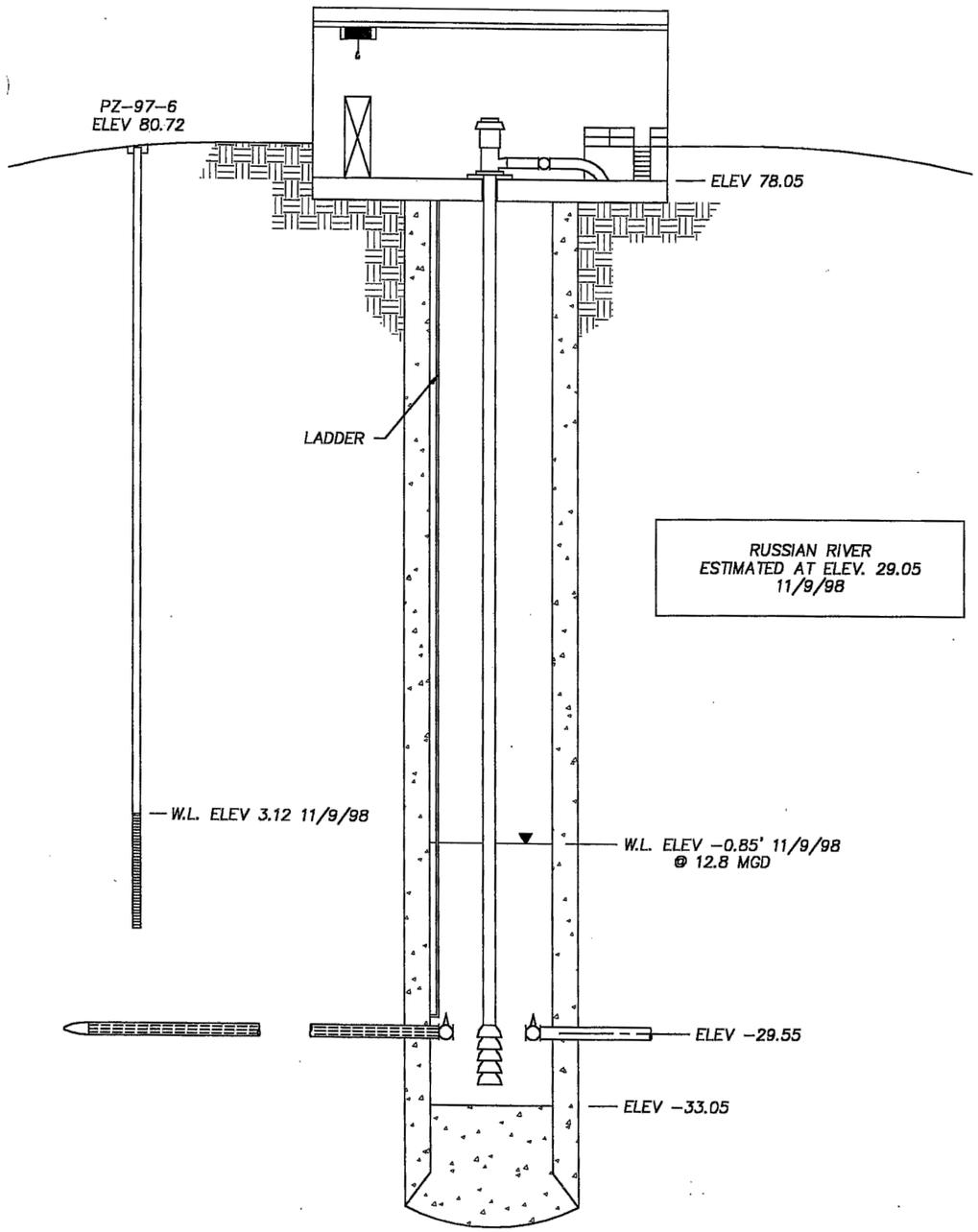

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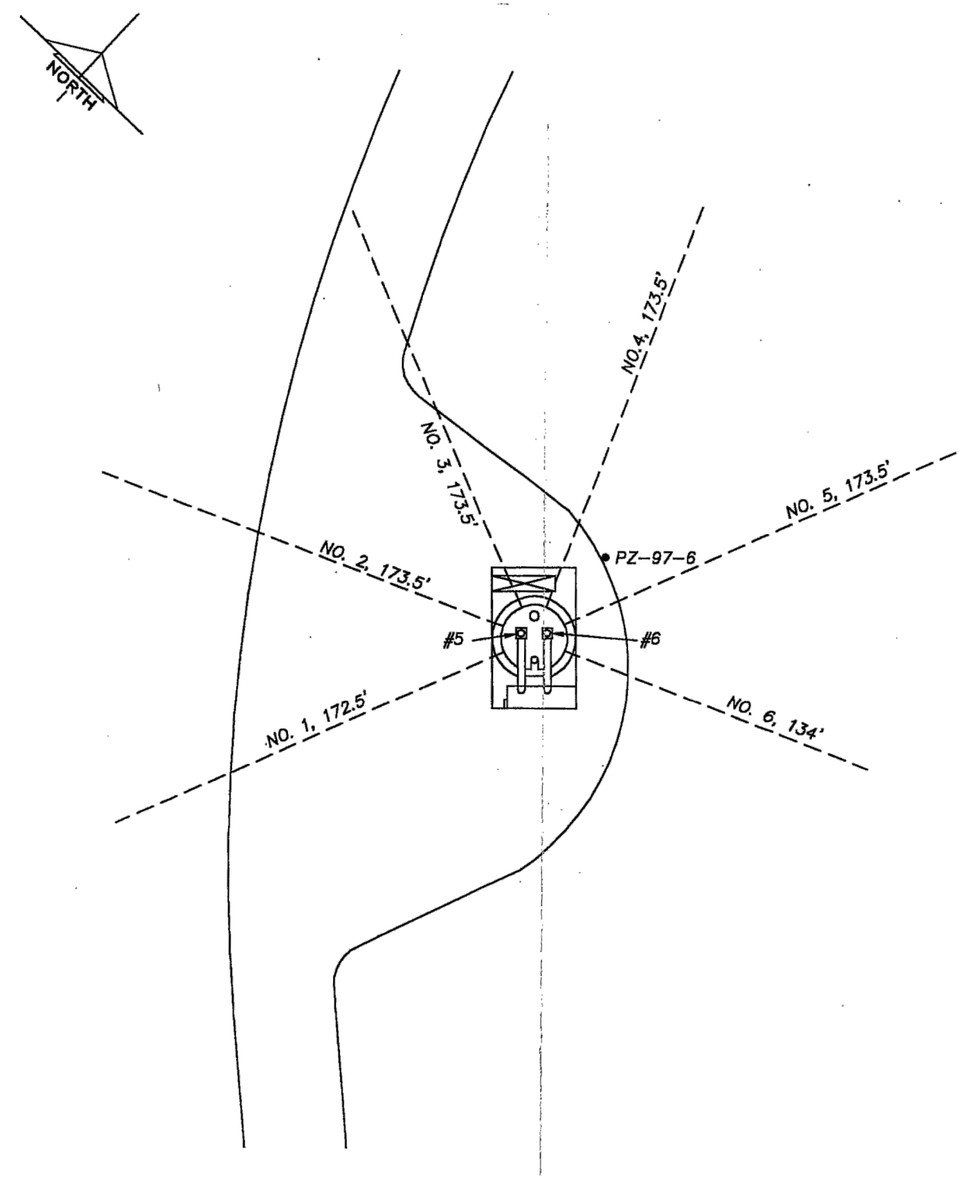
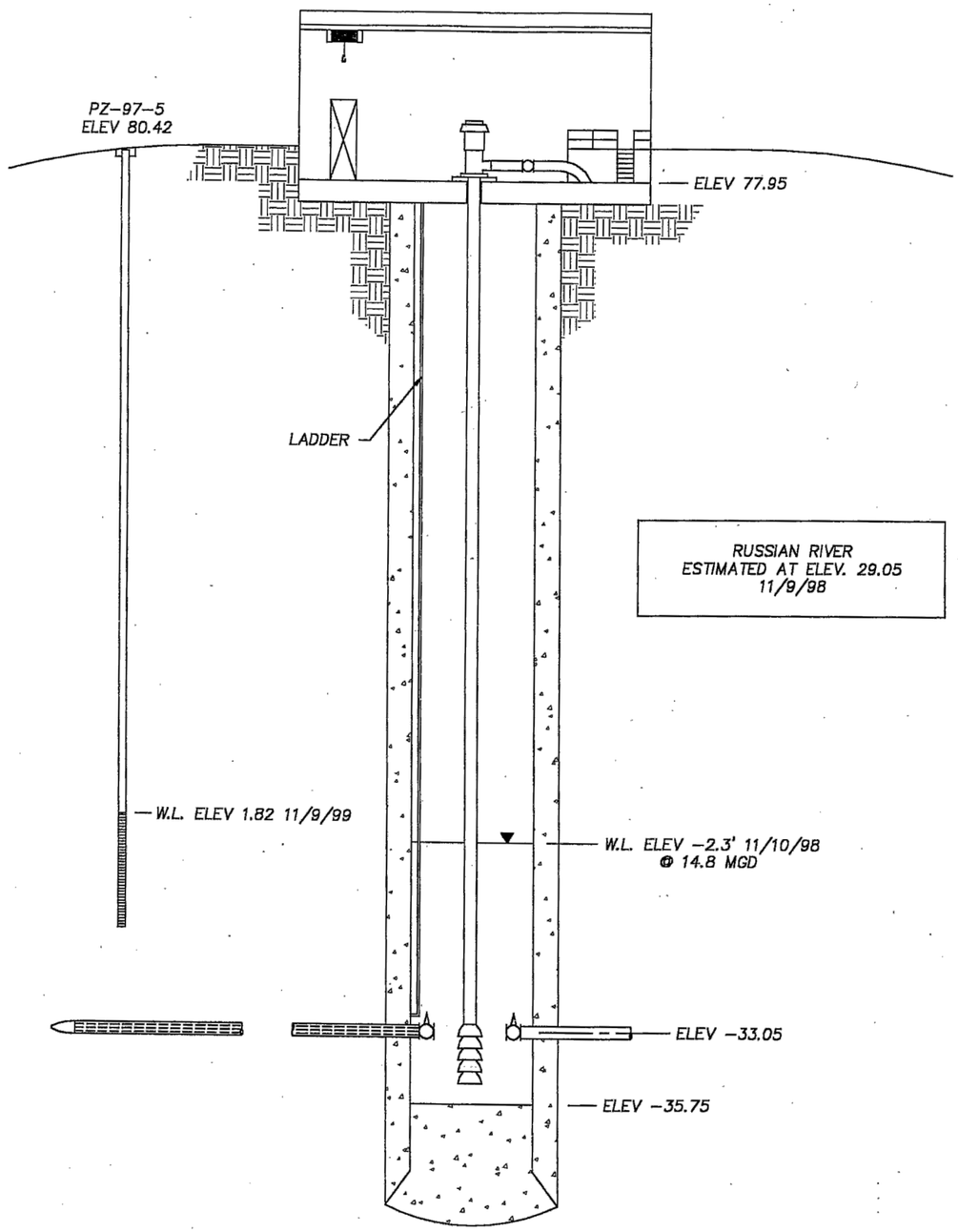


PLAN

Figure 4
Section and Plan View
Collector #3
Sonoma County Water Agency
Sonoma County, California

ERM 09/10



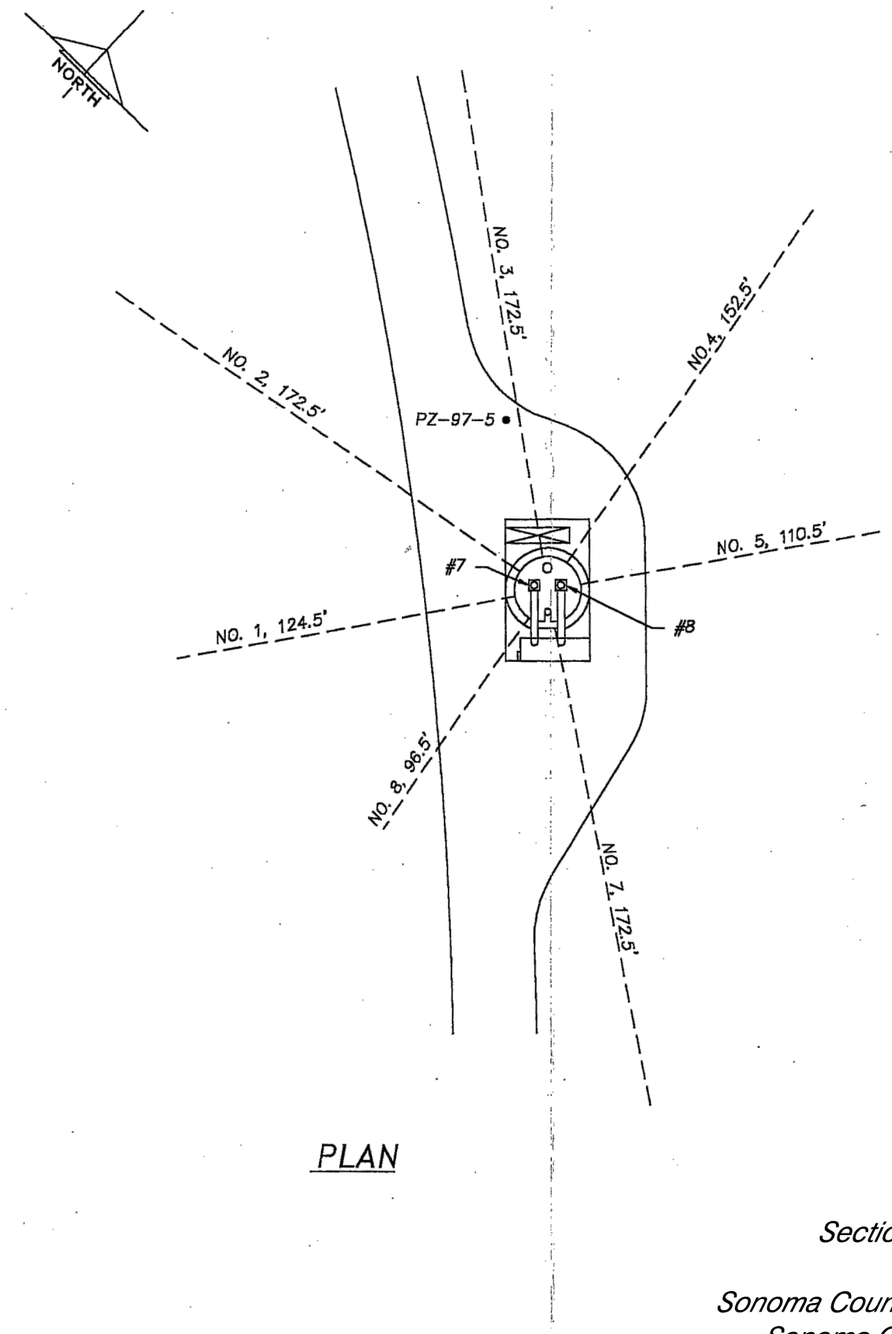


Figure 5
Section and Plan View
Collector #4
Sonoma County Water Agency
Sonoma County, California

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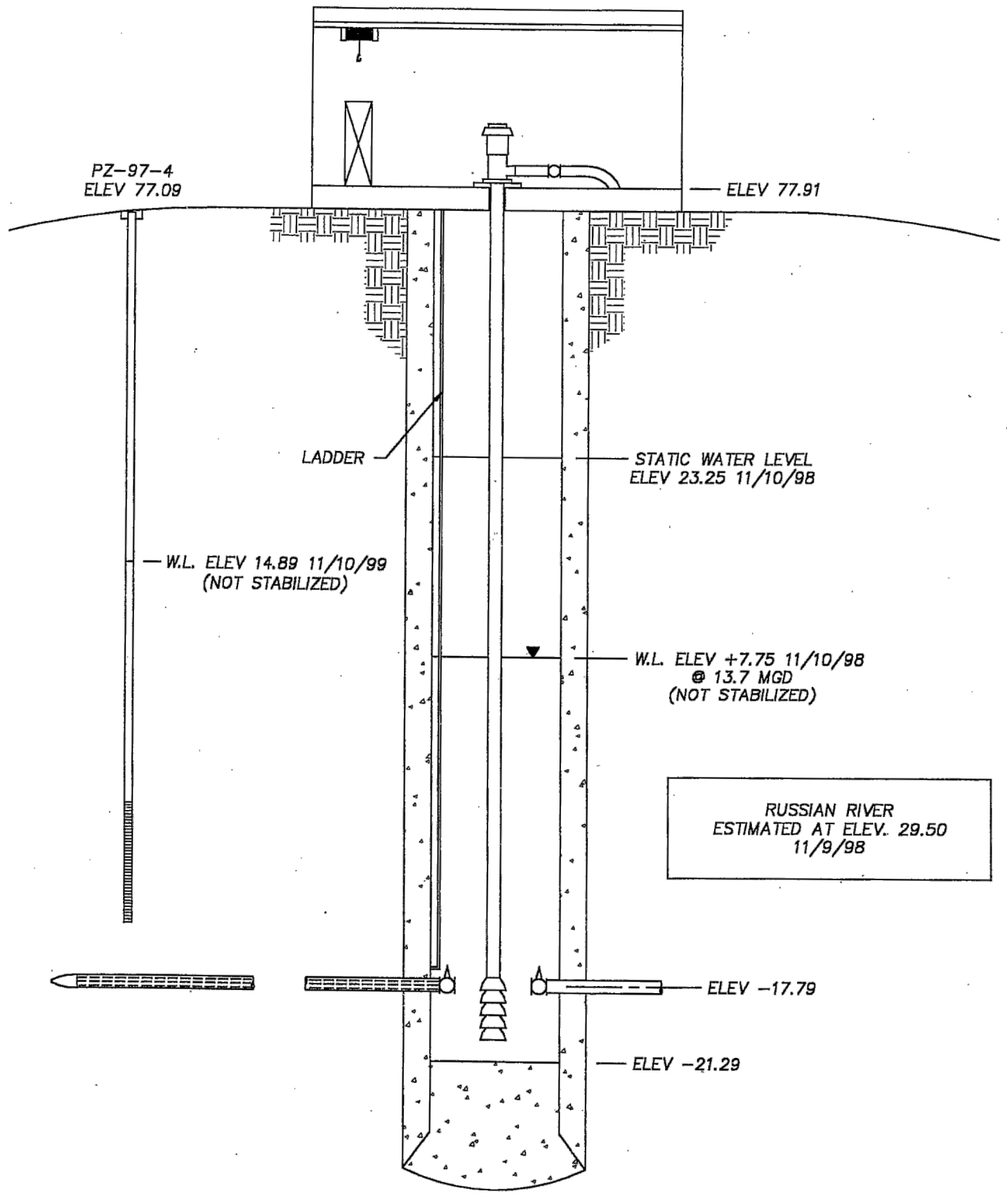

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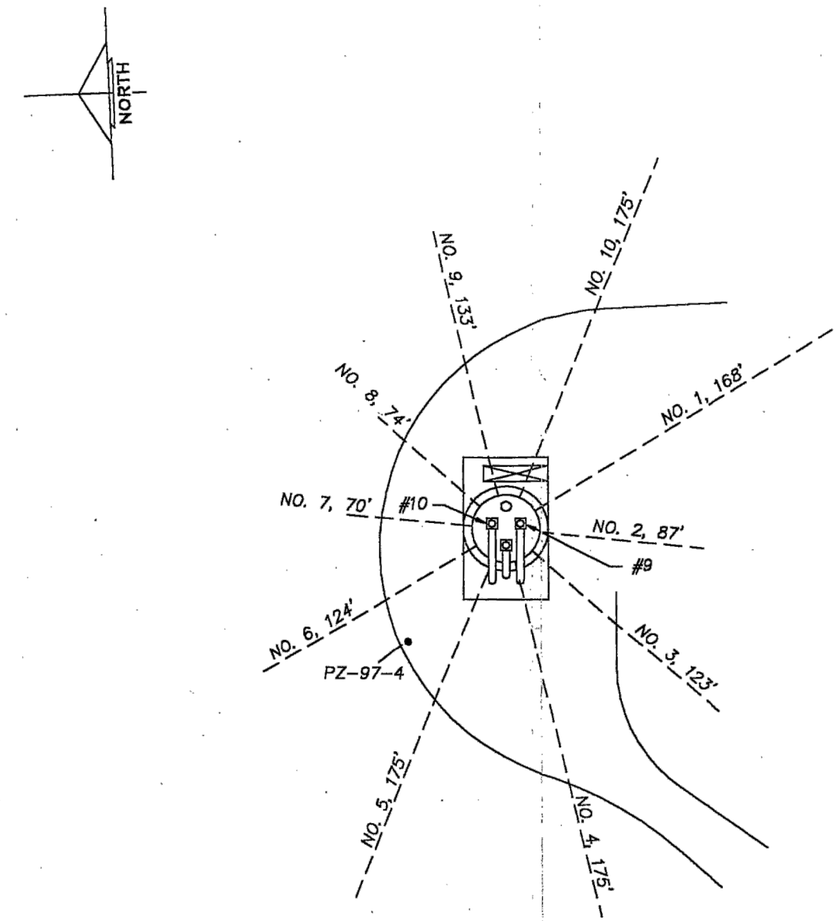

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Figure 6
Section and Plan View
Collector #5
Sonoma County Water Agency
Sonoma County, California

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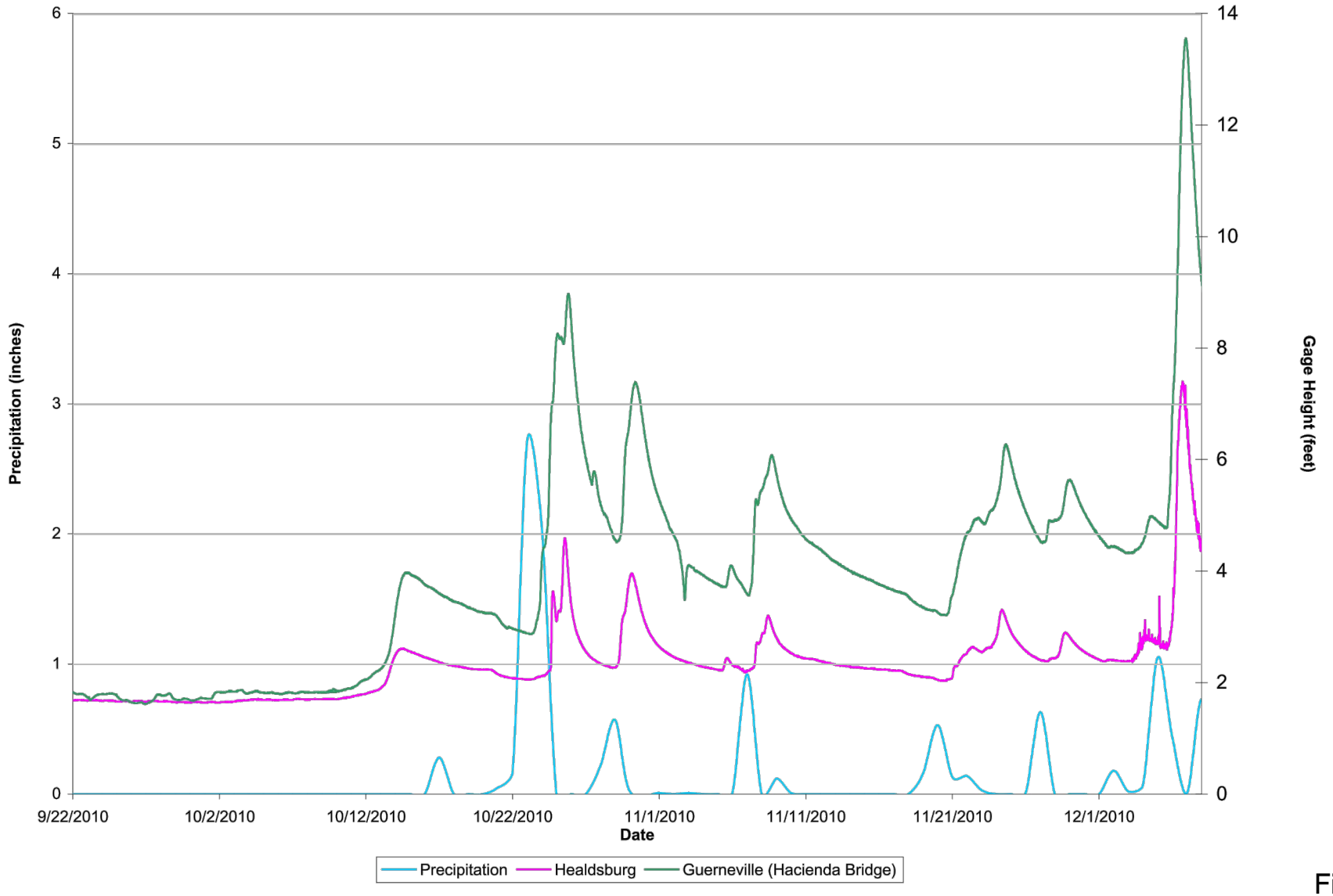
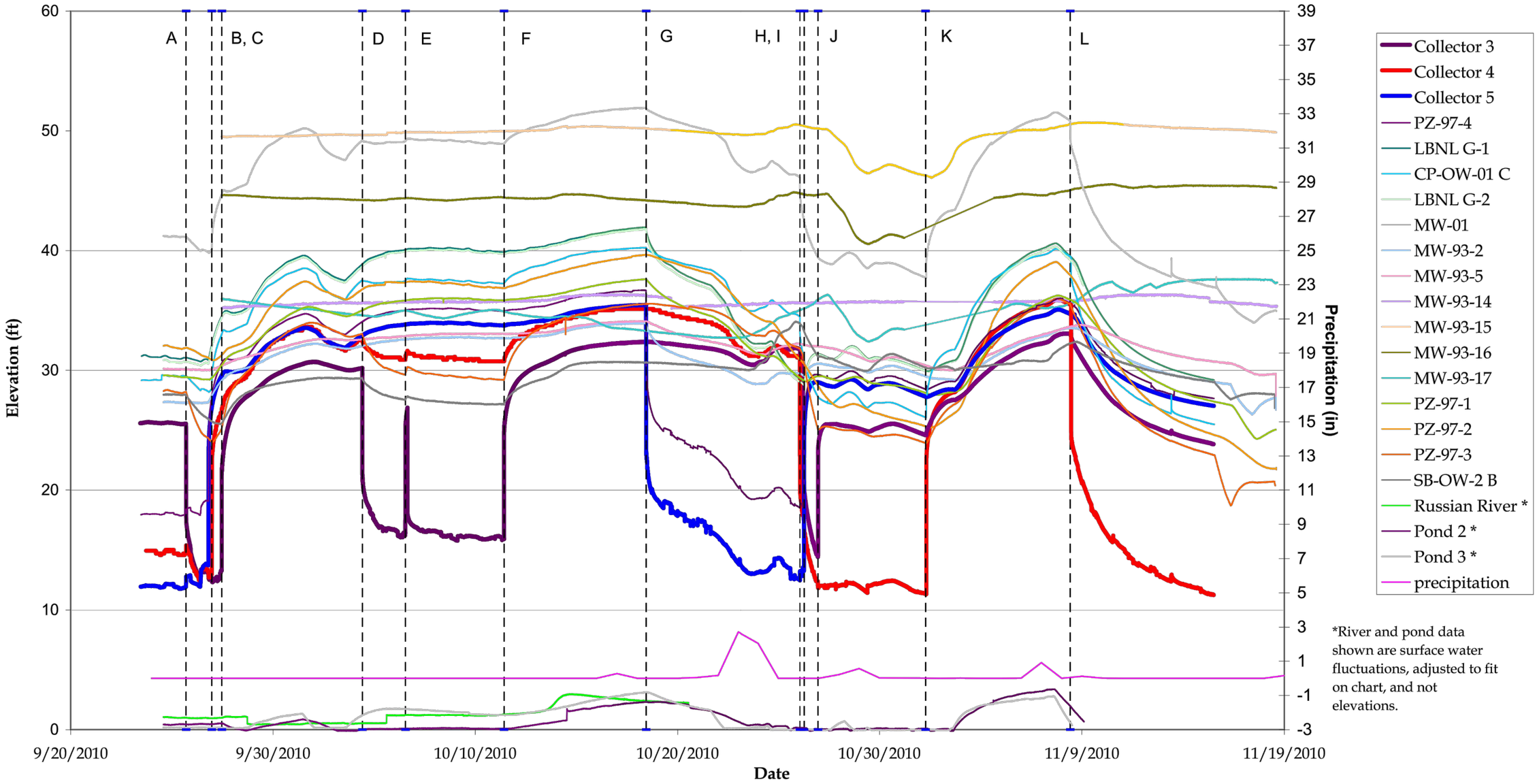


Figure 7

Precipitation and River Stage during Evaluation Period
Sonoma County Water Agency
Sonoma County, California

ERM *04/11*



NOTES:

A – Collector 3 startup on 9–25–10, 4:55 PM.

B – Collector 4 shutdown on 9–26–10, 11:30 PM.

C – Collector 3 shutdown on 9–27–10, 11:20 AM.

D – Collector 3 startup on 10–4–10, 10:00 AM.

E – Collector 3 shutdown briefly for safety check and started up again.

F – Collector 3 shutdown on 10–11–10, 10:05 AM.

G – Collector 5 startup on 10–18–10, 10:35 AM.

H – Collector 4 startup on 10–26–10, 1:40 AM.

I – Collector 3 startup on 10–26–10, 5:05 AM. Collector 5 shutdown on 10–26–10, 6:35 AM.

J – Collector 3 shutdown on 10–26–10, 11:05 PM.

K – Collector 4 shutdown on 11–1–10, 6:30 AM.

L – Collector 4 startup on 11–8–10, 10:10 AM.

Figure 8

Hydrograph of Collectors 3, 4, and 5 Capacity Testing
Sonoma County Water Agency
Sonoma County, California

ERM 06/11

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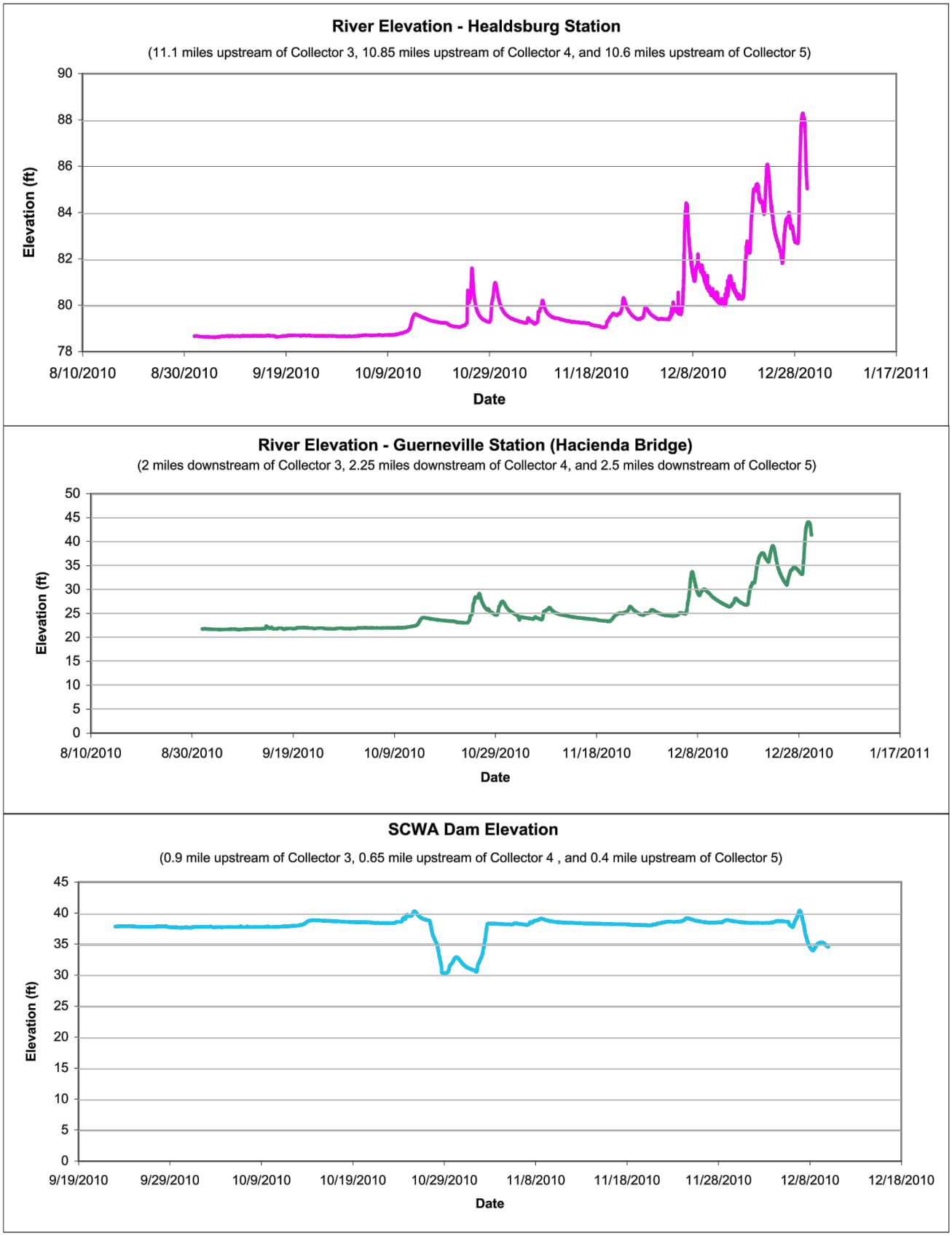

Figure 9

River Elevation during Evaluation Period
Sonoma County Water Agency
Sonoma County, California

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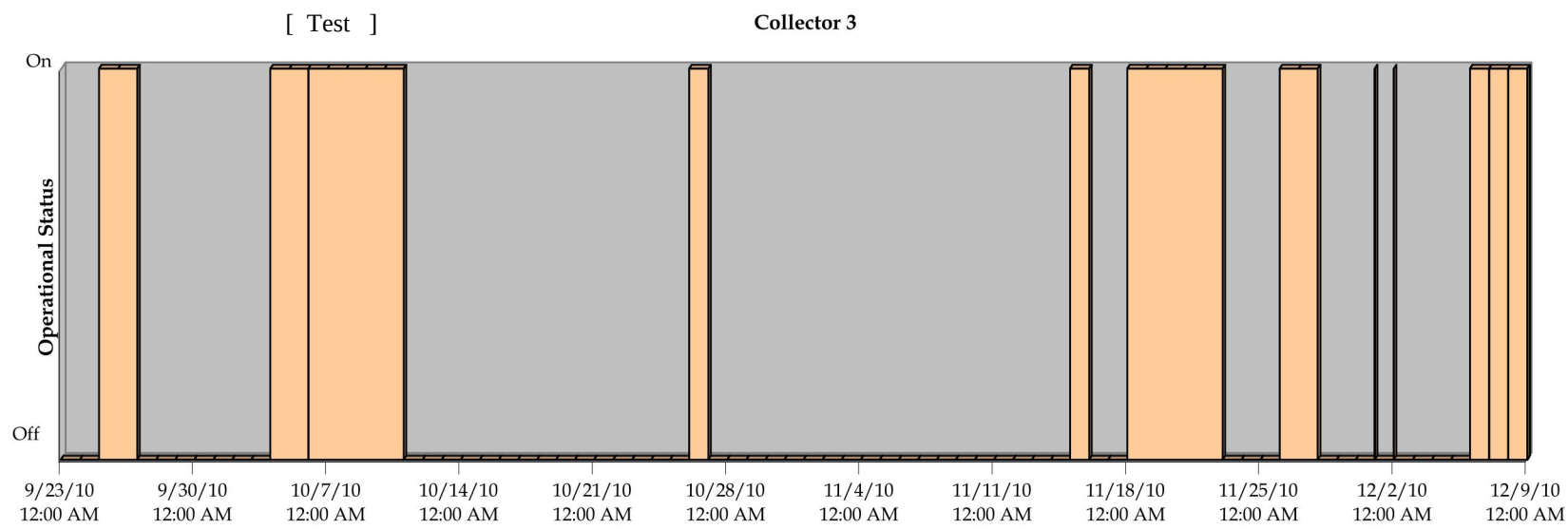
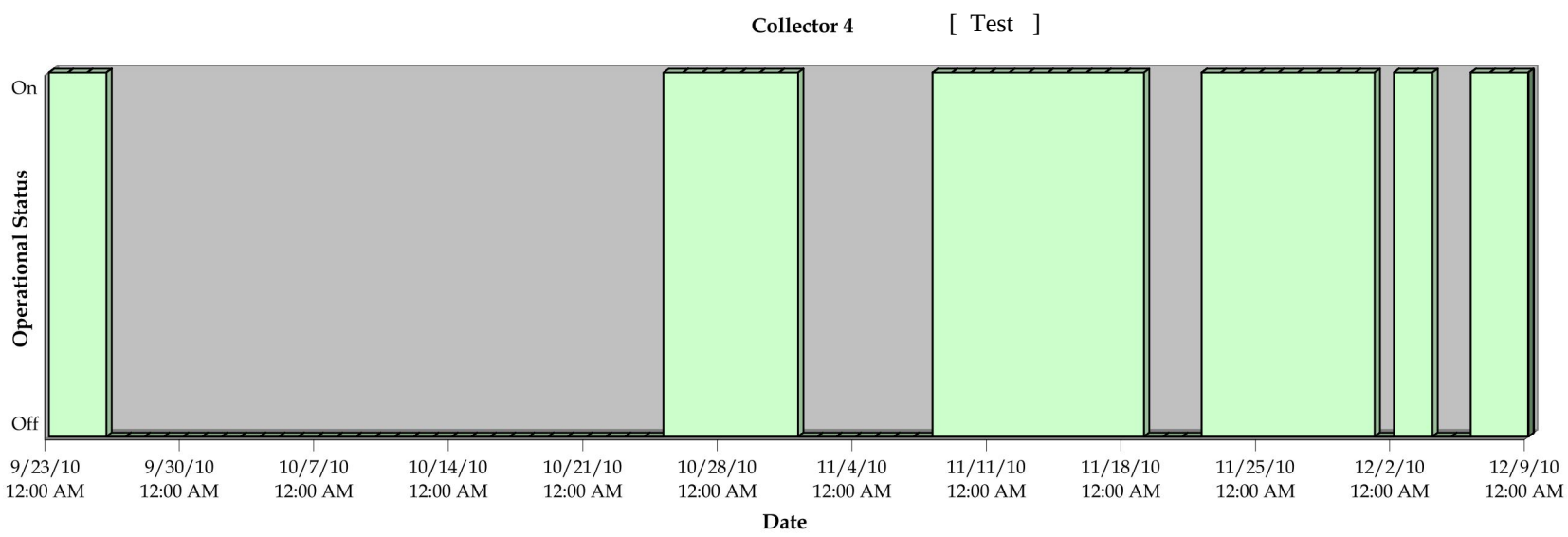
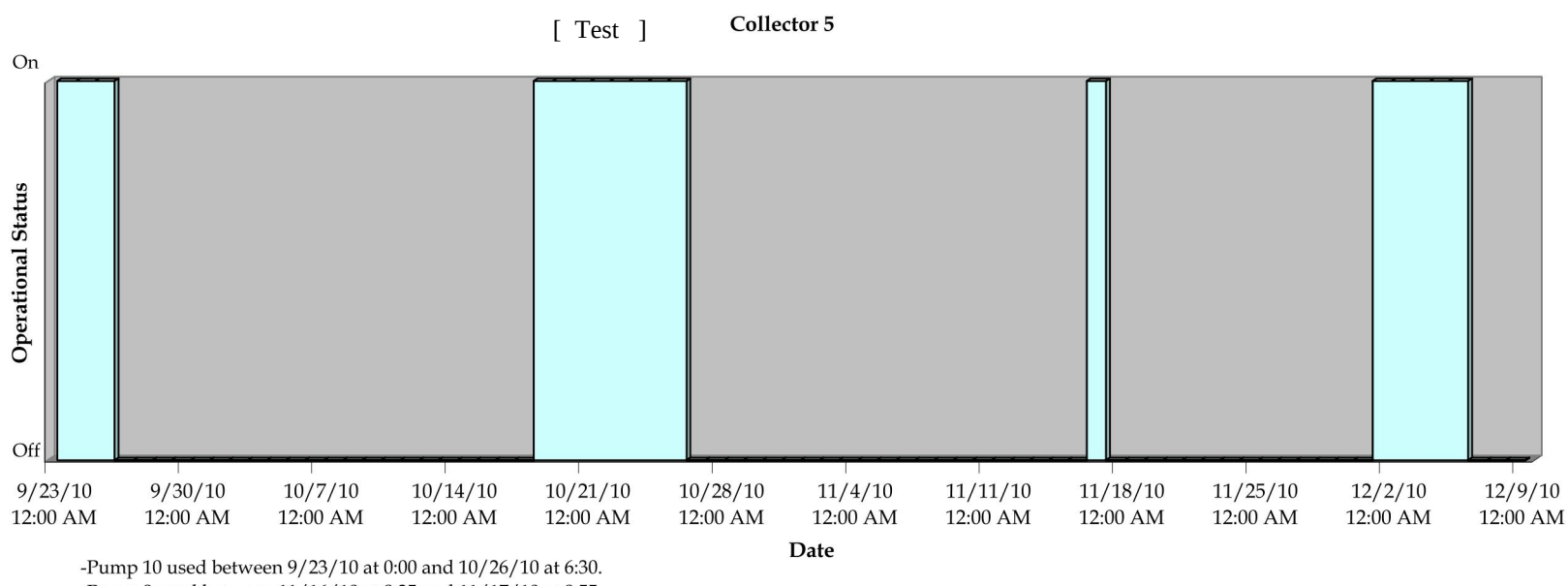


-Pump 5 used between 9/25/10 at 16:55 and 9/27/10 at 11:15.
-Pump 6 used between 10/4/10 at 10:00 and 10/26/10 at 23:00.
-Pump 5 used between 11/15/10 at 13:30 and 11/16/10 at 8:30.
-Pump 6 used between 11/18/10 at 12:20 and 11/23/10 at 8:25.
-Pump 5 used between 11/26/10 at 14:20 and 11/28/10 at 7:15.
-Pump 6 used between 12/1/10 at 9:20 and 12/1/10 at 14:40.
-Pump 5 used between 12/6/10 at 12:30 until the end of the test.



-Pump 7 used between 9/23/10 at 0:00 and 9/26/10 at 23:30.
-Pump 8 used between 10/26/10 at 1:40 to 11/1/10 at 6:30.
-Pump 7 used between 11/8/10 at 10:10 and 11/19/10 at 7:40.
-Pump 8 used between 11/22/10 at 6:45 until the end of the test.



-Pump 10 used between 9/23/10 at 0:00 and 10/26/10 at 6:30.
-Pump 9 used between 11/16/10 at 8:35 and 11/17/10 at 9:55.
-Pump 10 used between 12/1/10 9:05 until the end of the test.

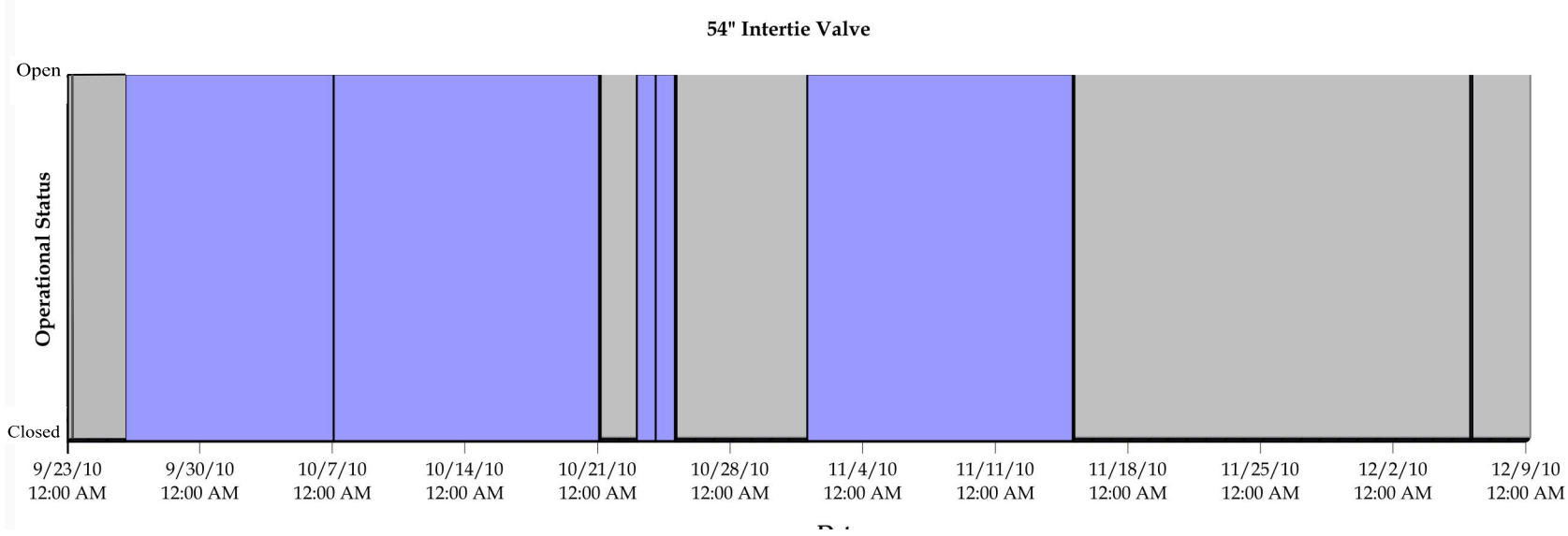
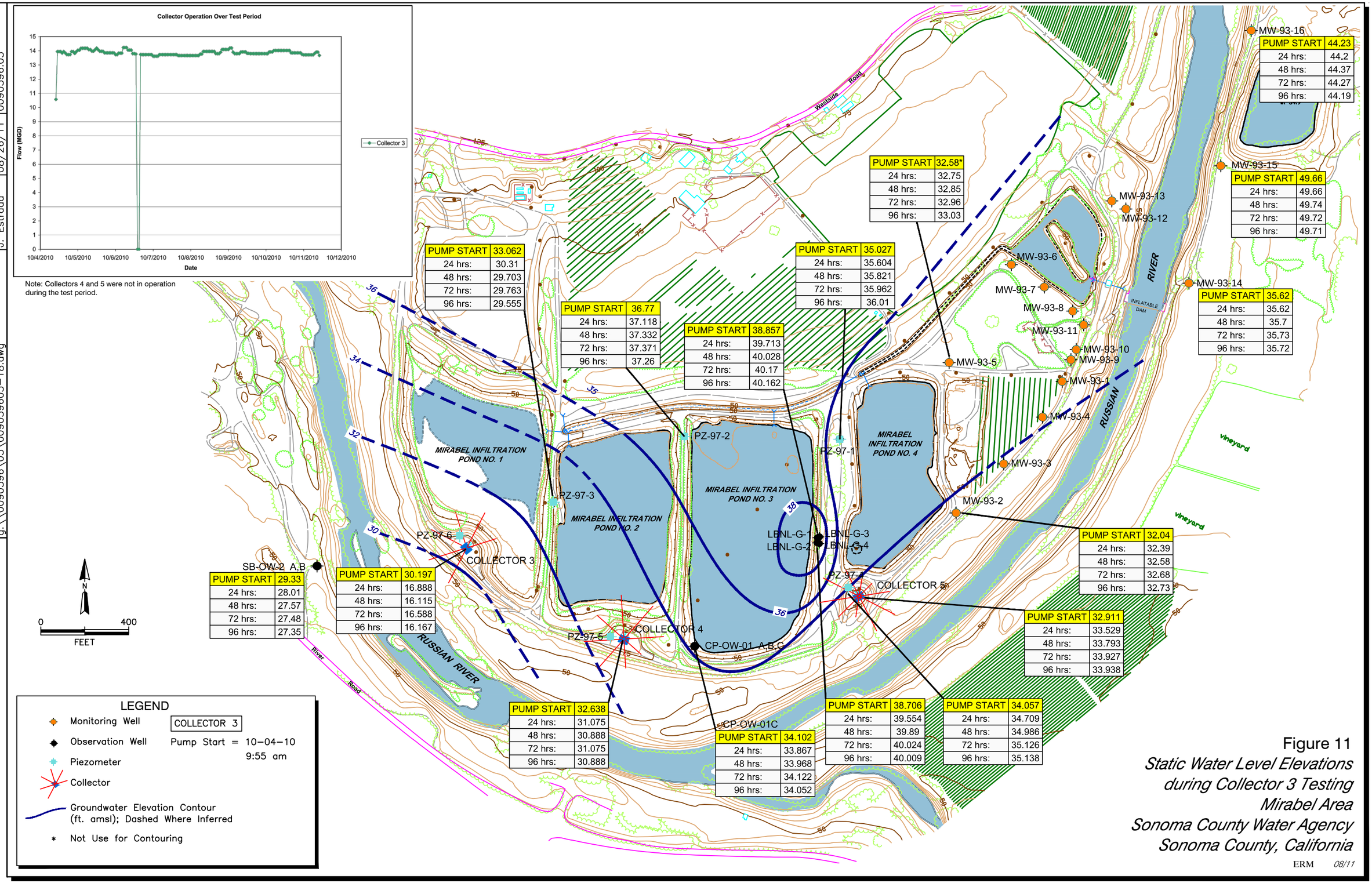


Figure 10
Collector Operation during the Test Period
Sonoma County Water Agency
Sonoma County, California

ERM *05/11*



PUMP START	33.062
24 hrs:	30.31
48 hrs:	29.703
72 hrs:	29.763
96 hrs:	29.555

PUMP START	36.77
24 hrs:	37.118
48 hrs:	37.332
72 hrs:	37.371
96 hrs:	37.26

PUMP START	38.857
24 hrs:	39.713
48 hrs:	40.028
72 hrs:	40.17
96 hrs:	40.162

PUMP START	35.027
24 hrs:	35.604
48 hrs:	35.821
72 hrs:	35.962
96 hrs:	36.01

PUMP START	32.58*
24 hrs:	32.75
48 hrs:	32.85
72 hrs:	32.96
96 hrs:	33.03

PUMP START	44.23
24 hrs:	44.2
48 hrs:	44.37
72 hrs:	44.27
96 hrs:	44.19

PUMP START	49.66
24 hrs:	49.66
48 hrs:	49.74
72 hrs:	49.72
96 hrs:	49.71

PUMP START	35.62
24 hrs:	35.62
48 hrs:	35.7
72 hrs:	35.73
96 hrs:	35.72

PUMP START	29.33
24 hrs:	28.01
48 hrs:	27.57
72 hrs:	27.48
96 hrs:	27.35

PUMP START	30.197
24 hrs:	16.888
48 hrs:	16.115
72 hrs:	16.588
96 hrs:	16.167

PUMP START	32.638
24 hrs:	31.075
48 hrs:	30.888
72 hrs:	31.075
96 hrs:	30.888

PUMP START	34.102
24 hrs:	33.867
48 hrs:	33.968
72 hrs:	34.122
96 hrs:	34.052

PUMP START	38.706
24 hrs:	39.554
48 hrs:	39.89
72 hrs:	40.024
96 hrs:	40.009

PUMP START	34.057
24 hrs:	34.709
48 hrs:	34.986
72 hrs:	35.126
96 hrs:	35.138

PUMP START	32.04
24 hrs:	32.39
48 hrs:	32.58
72 hrs:	32.68
96 hrs:	32.73

PUMP START	32.911
24 hrs:	33.529
48 hrs:	33.793
72 hrs:	33.927
96 hrs:	33.938

Figure 11
Static Water Level Elevations during Collector 3 Testing
Mirabel Area
Sonoma County Water Agency
Sonoma County, California

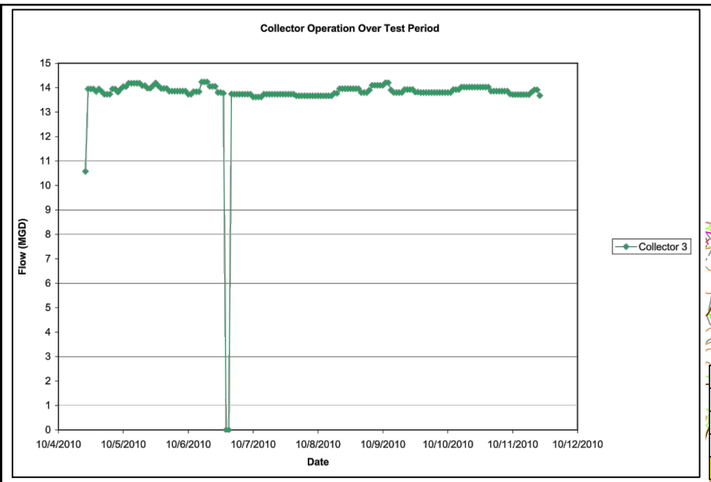
ERM 08/11

Project No. 0090596.03

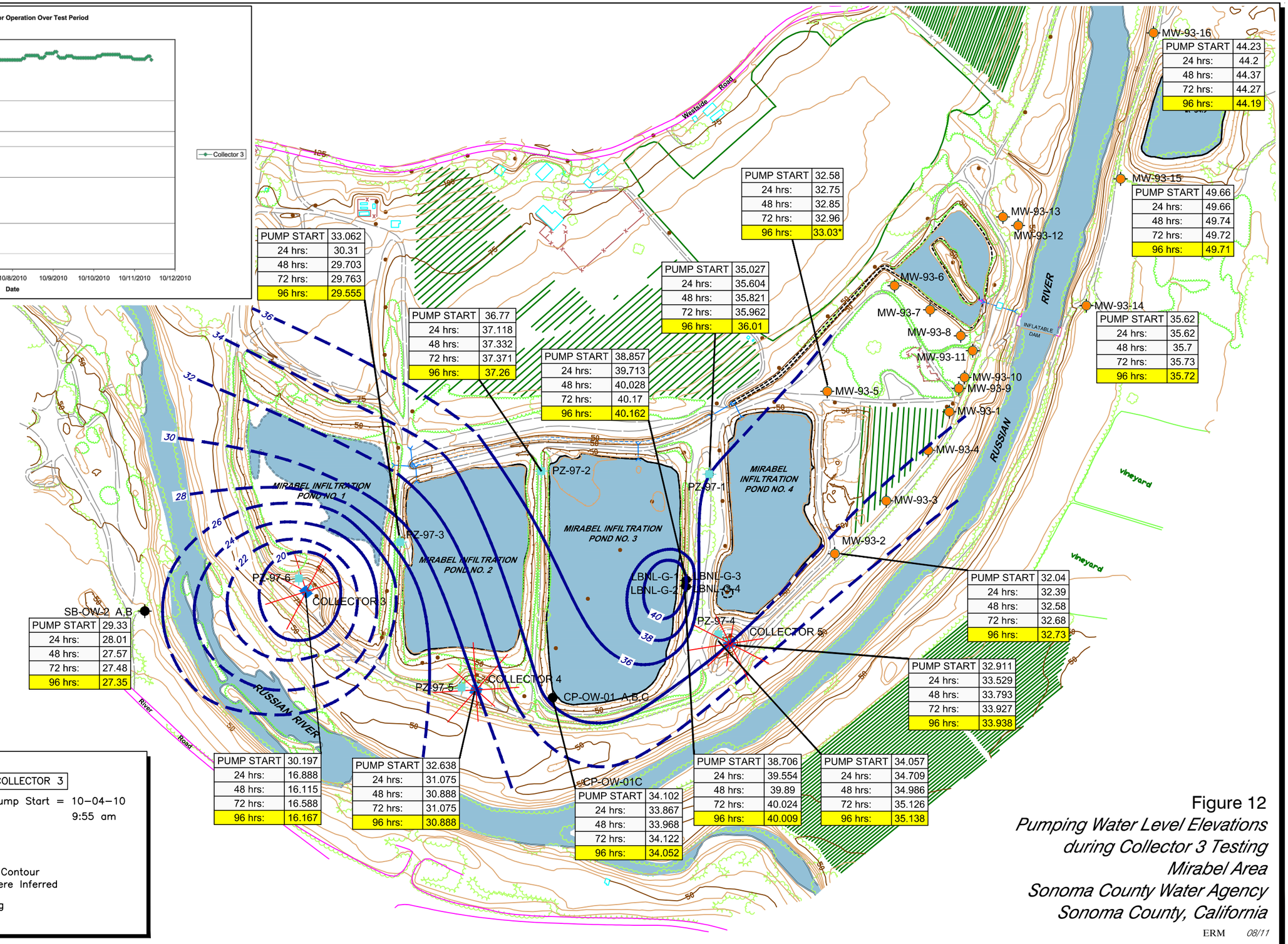
Date: 08/26/11

Drawn By: J. Estrada

CAD File: g:\0090596\03\009059603-19.dwg



Note: Collectors 4 and 5 were not in operation during the test period.



PUMP START	33.062
24 hrs:	30.31
48 hrs:	29.703
72 hrs:	29.763
96 hrs:	29.555

PUMP START	36.77
24 hrs:	37.118
48 hrs:	37.332
72 hrs:	37.371
96 hrs:	37.26

PUMP START	38.857
24 hrs:	39.713
48 hrs:	40.028
72 hrs:	40.17
96 hrs:	40.162

PUMP START	35.027
24 hrs:	35.604
48 hrs:	35.821
72 hrs:	35.962
96 hrs:	36.01

PUMP START	32.58
24 hrs:	32.75
48 hrs:	32.85
72 hrs:	32.96
96 hrs:	33.03*

PUMP START	44.23
24 hrs:	44.2
48 hrs:	44.37
72 hrs:	44.27
96 hrs:	44.19

PUMP START	49.66
24 hrs:	49.66
48 hrs:	49.74
72 hrs:	49.72
96 hrs:	49.71

PUMP START	35.62
24 hrs:	35.62
48 hrs:	35.7
72 hrs:	35.73
96 hrs:	35.72

PUMP START	32.04
24 hrs:	32.39
48 hrs:	32.58
72 hrs:	32.68
96 hrs:	32.73

PUMP START	32.911
24 hrs:	33.529
48 hrs:	33.793
72 hrs:	33.927
96 hrs:	33.938

PUMP START	29.33
24 hrs:	28.01
48 hrs:	27.57
72 hrs:	27.48
96 hrs:	27.35

PUMP START	30.197
24 hrs:	16.888
48 hrs:	16.115
72 hrs:	16.588
96 hrs:	16.167

PUMP START	32.638
24 hrs:	31.075
48 hrs:	30.888
72 hrs:	31.075
96 hrs:	30.888

CP-OW-01C

PUMP START	34.102
24 hrs:	33.867
48 hrs:	33.968
72 hrs:	34.122
96 hrs:	34.052

PUMP START	38.706
24 hrs:	39.554
48 hrs:	39.89
72 hrs:	40.024
96 hrs:	40.009

PUMP START	34.057
24 hrs:	34.709
48 hrs:	34.986
72 hrs:	35.126
96 hrs:	35.138

LEGEND

- Monitoring Well
- Observation Well
- Piezometer
- Collector
- Groundwater Elevation Contour (ft. amsl); Dashed Where Inferred
- * Not Use for Contouring

COLLECTOR 3

Pump Start = 10-04-10 9:55 am

Figure 12

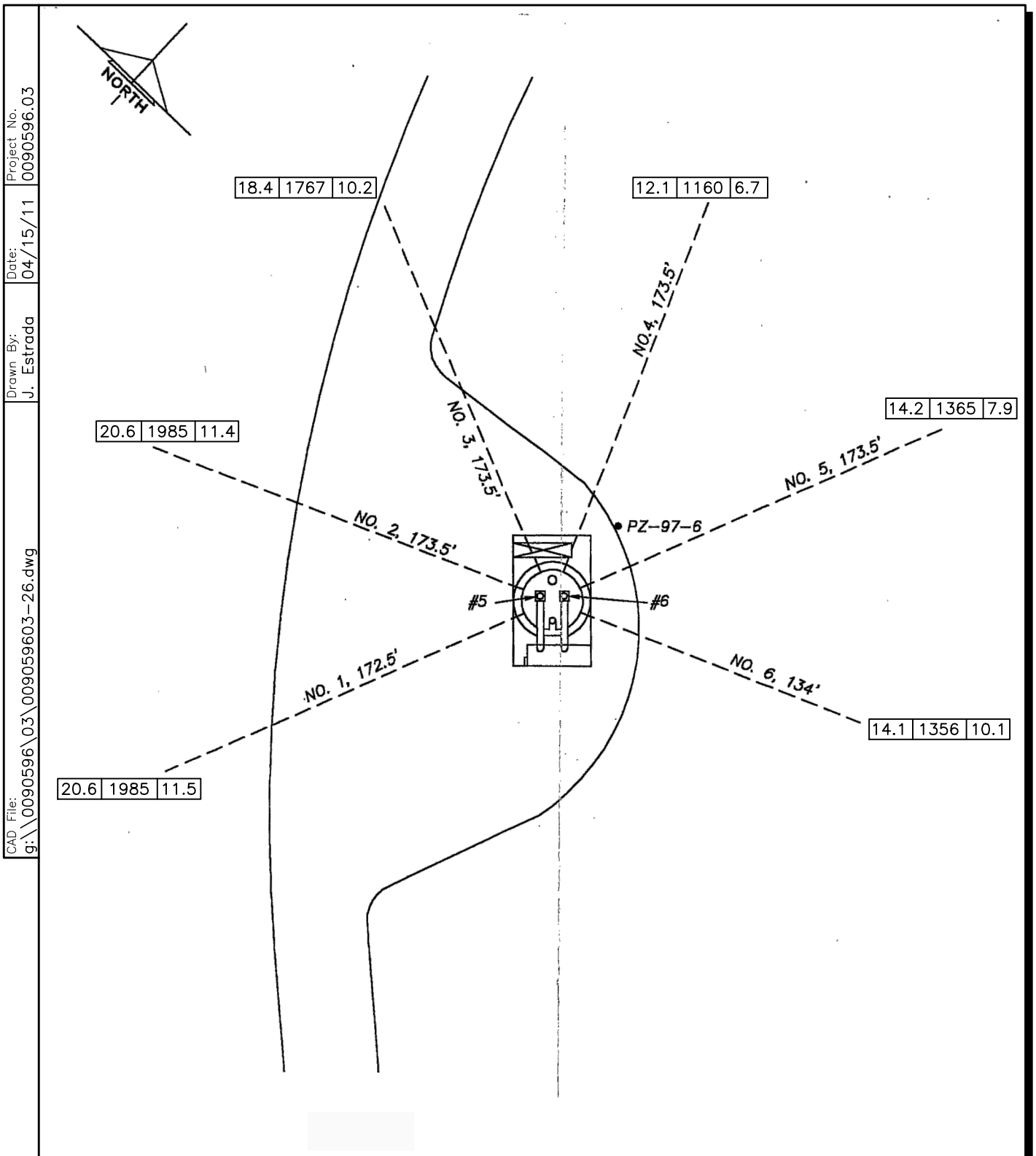
Pumping Water Level Elevations during Collector 3 Testing

Mirabel Area

Sonoma County Water Agency

Sonoma County, California

ERM 08/11



Note: Total flow in Collector 3 – 9,618 gpm.

LEGEND

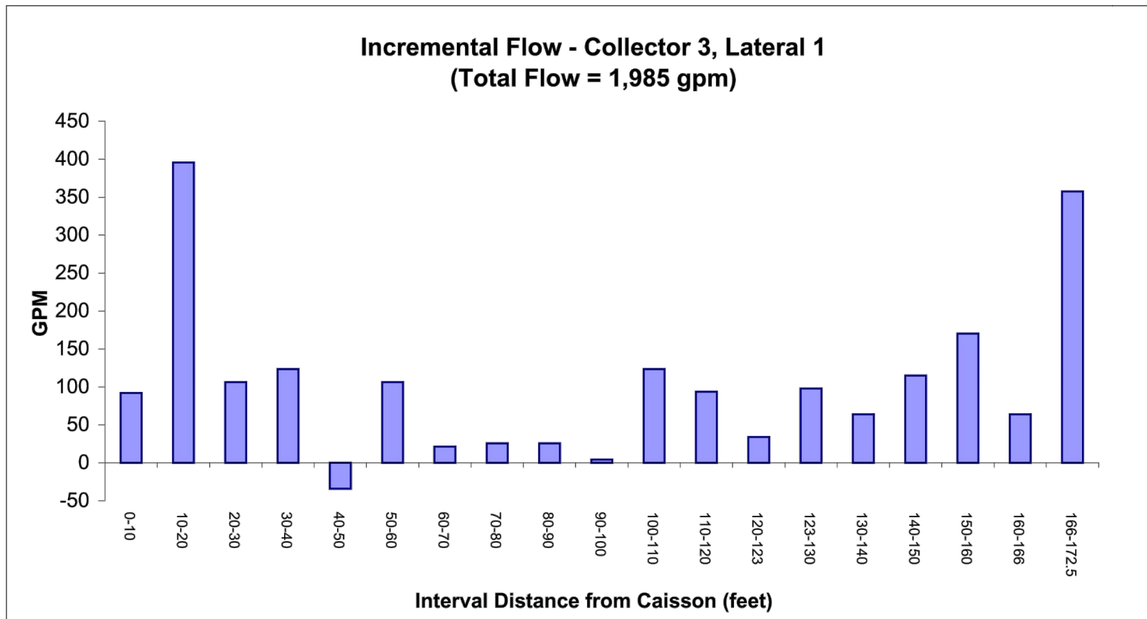
— — — — Existing Laterals

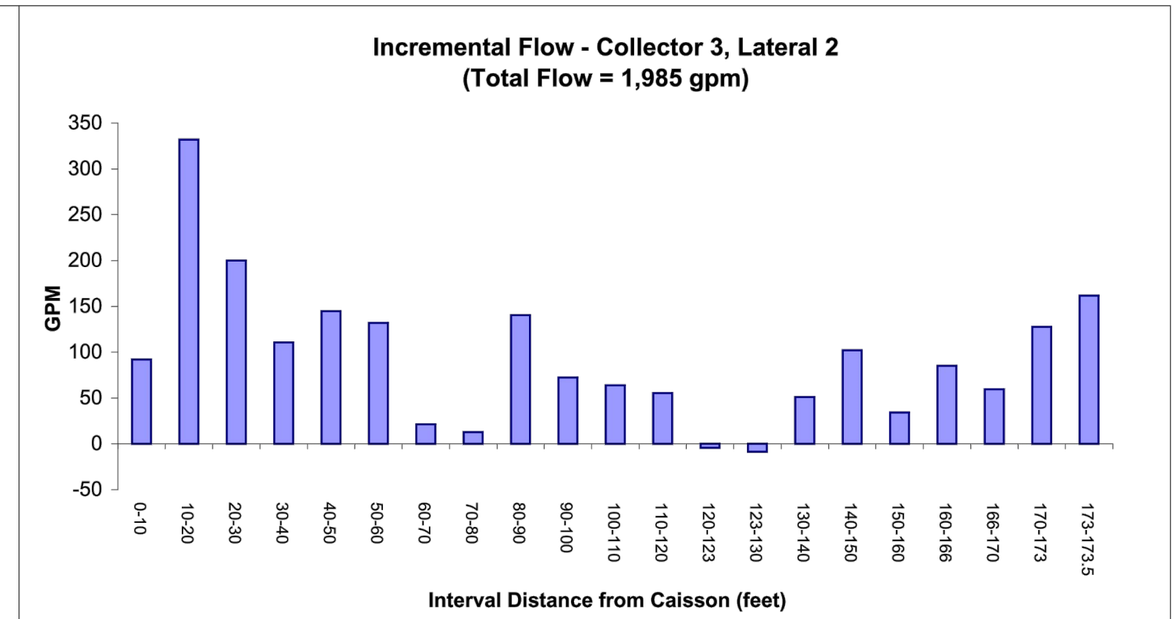
12.1 | 1160 | 3.7

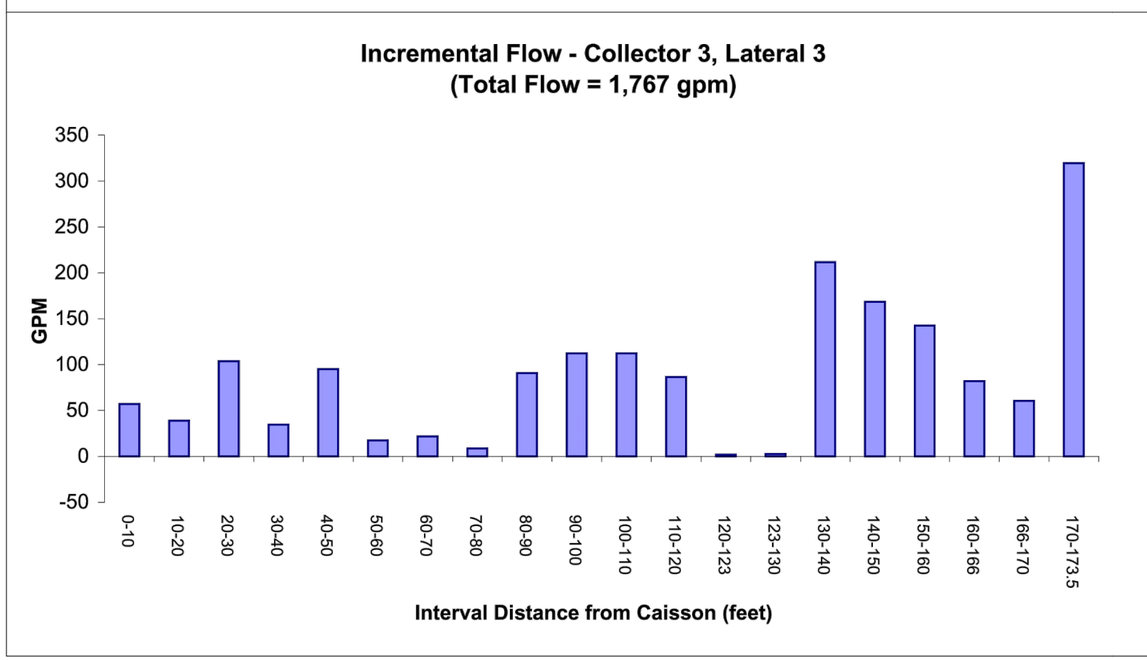
gpm/ft
gpm
%

Figure 13
Relative Lateral Flow Data
Collector #3
Sonoma County Water Agency
Sonoma County, California

ERM *04/11*







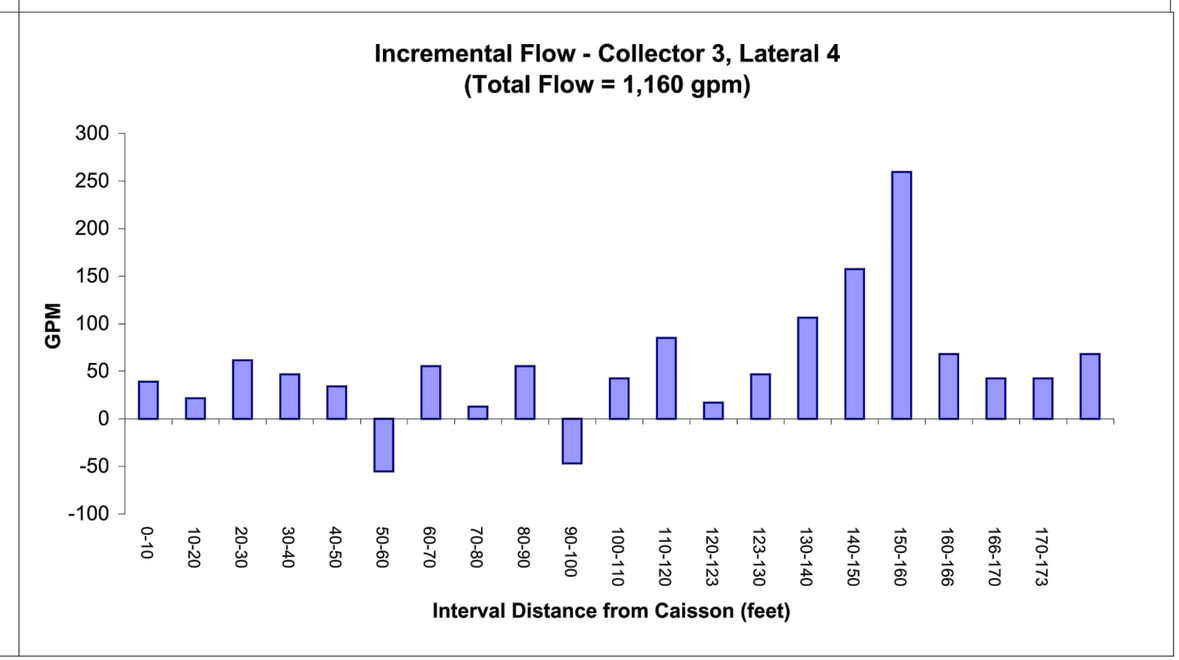
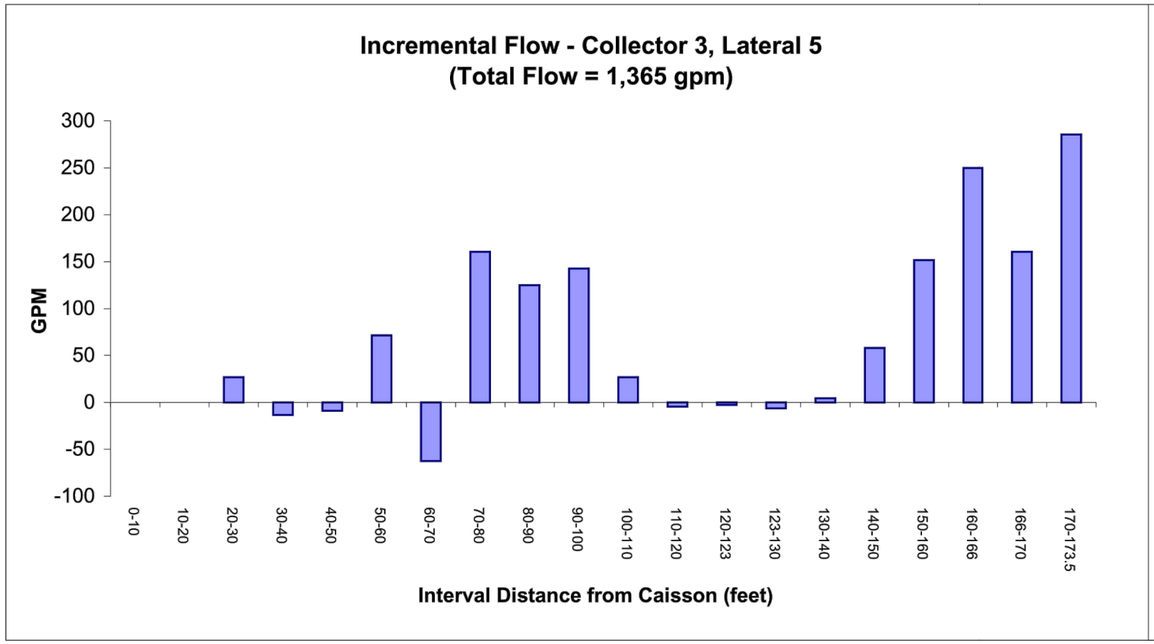


Figure 14a

Incremental Flow - Collector 3 Laterals
Sonoma County Water Agency
Sonoma County, California

ERM 05/11

CAD File: g:\000090596\03\00905960 3-29.dwg
Drawn By: J. Estrada
Date: 05/27/11
Project No. 0090596.03



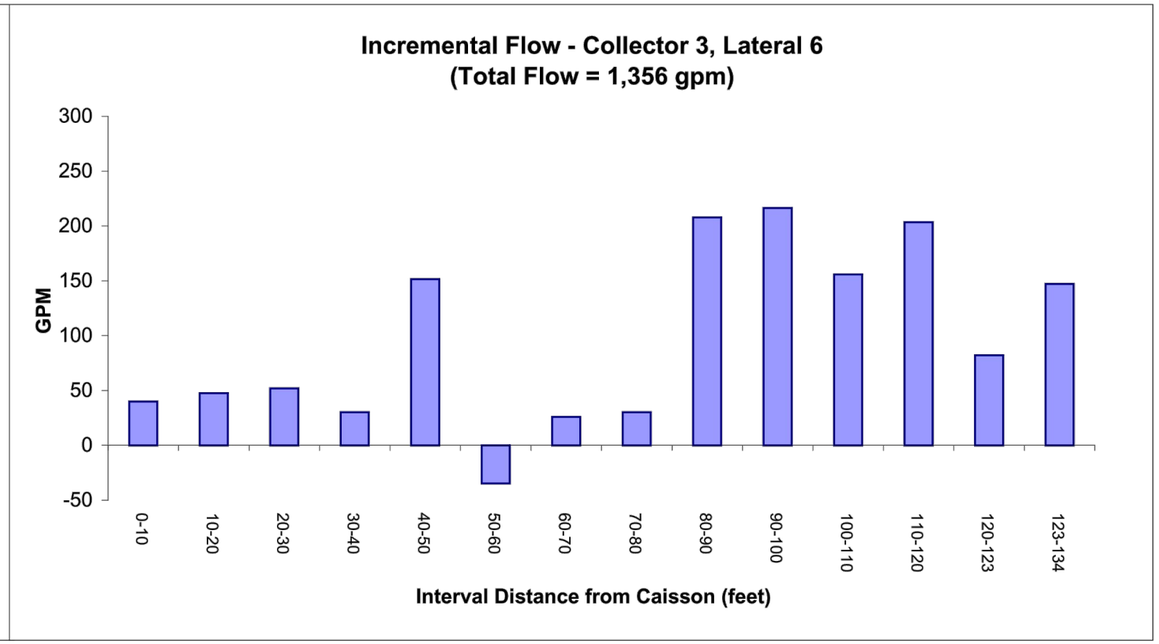


Figure 14b
Incremental Flow - Collector 3 Laterals
Sonoma County Water Agency
Sonoma County, California

ERM 05/11

CAD File: g:\0000090596\03\009059603-29.dwg
Drawn By: J. Estrada
Date: 05/27/11
Project No. 0090596.03

CAD File:	Drawn By:	Date:	Project No.
g:\\000090596\03\009059603-27.dwg	J. Estrada	06/30/11	0090596.03

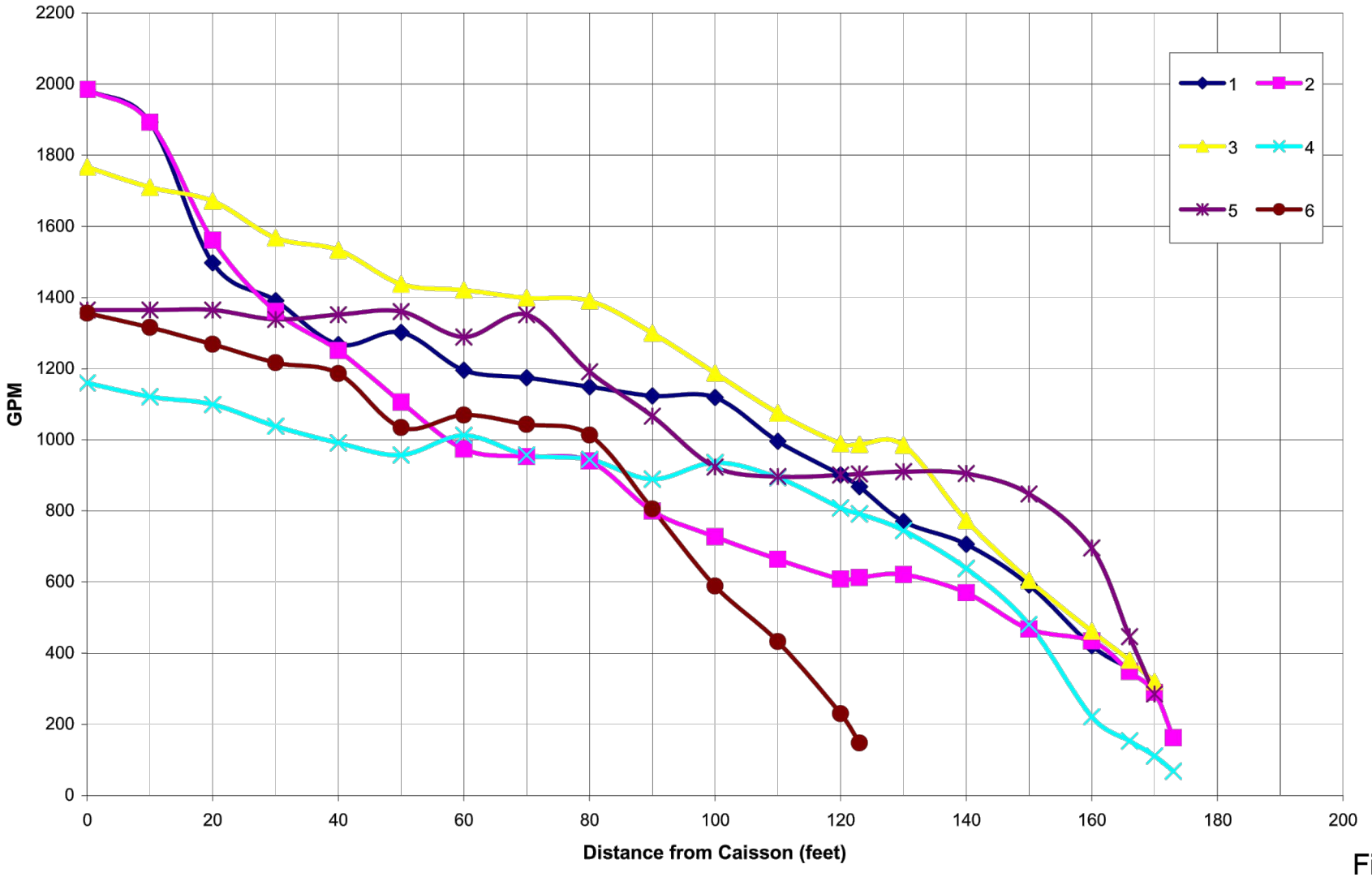


Figure 15

Flow versus Distance from Caisson
Collector 3 Laterals
Sonoma County Water Agency
Sonoma County, California

ERM *06/11*

CAD File:	Drawn By:	Date:	Project No.
g:\\0090596\009059603-25.dwg	J. Estrada	02/23/11	0090596.00

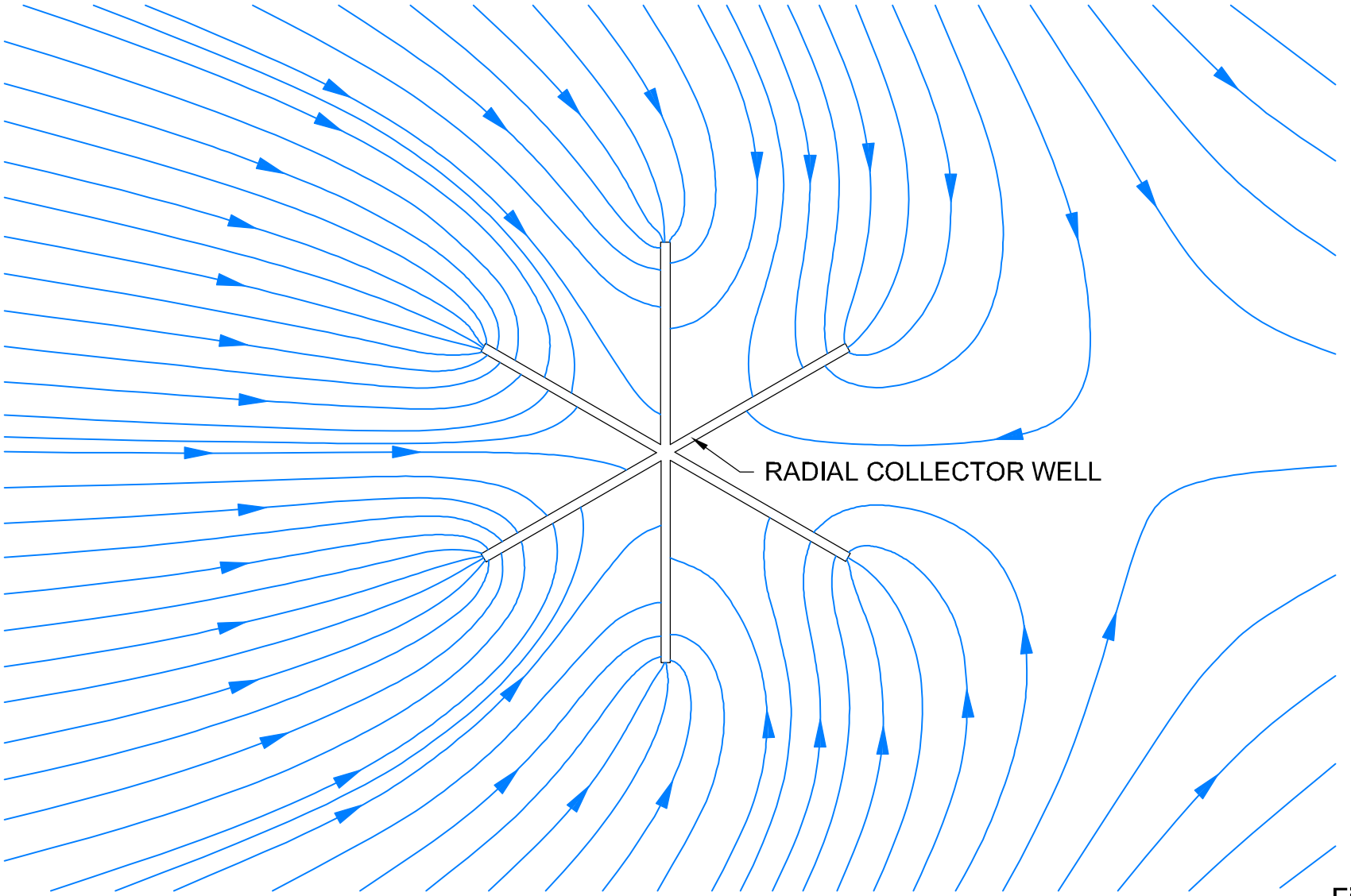


Figure 16

Flow Pattern for a Fully Penetrating Radial Collector Well
Sonoma County Water Agency
Sonoma County, California

Note: Planview representation of flow pattern for a fully penetrating radial collector well in a field of uniform flow is based on unpublished data provided by Brechtel.

ERM 02/11

CAD File:	Drawn By:	Date:	Project No.
g:\\000090596\03\009059603-27.dwg	J. Estrada	04/20/11	0090596.03

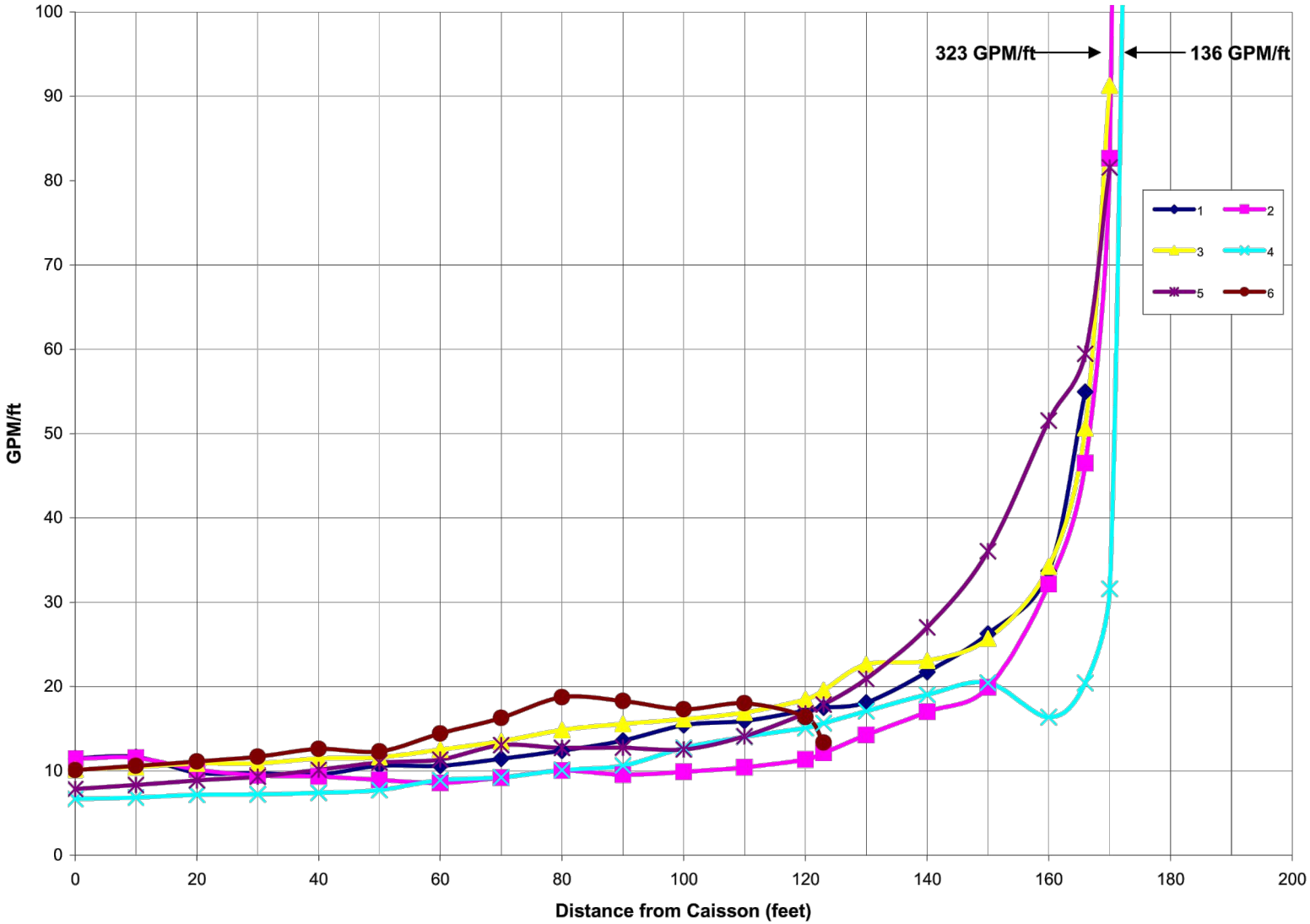


Figure 17

Flow/Screen Length at Distances from Caisson in Collector 3 Laterals

Sonoma County Water Agency

Sonoma County, California

ERM *04/11*

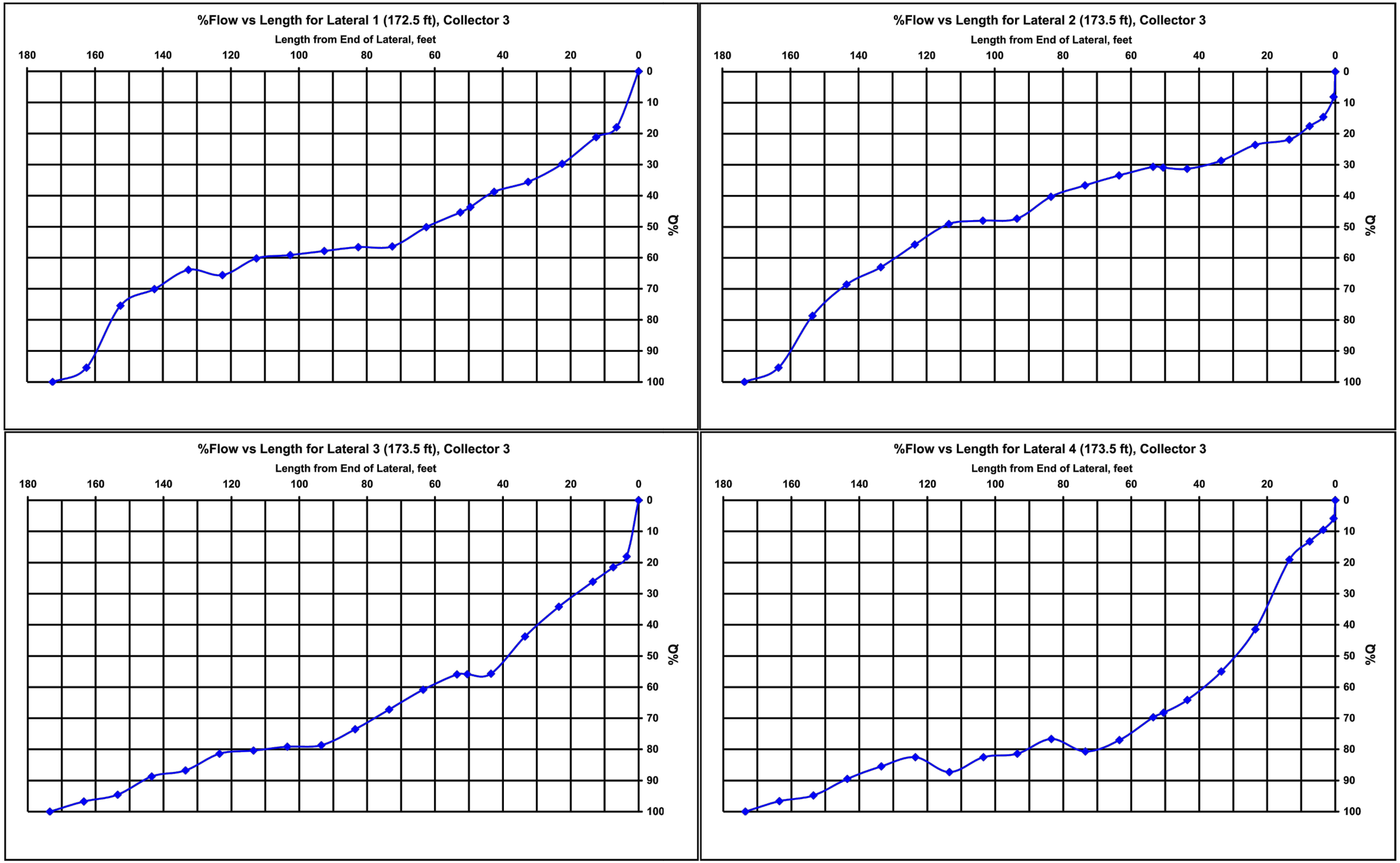


Figure 18a

Percent Flow (Q) vs Length - Collector 3 Laterals
Sonoma County Water Agency
Sonoma County, California

ERM 09/11

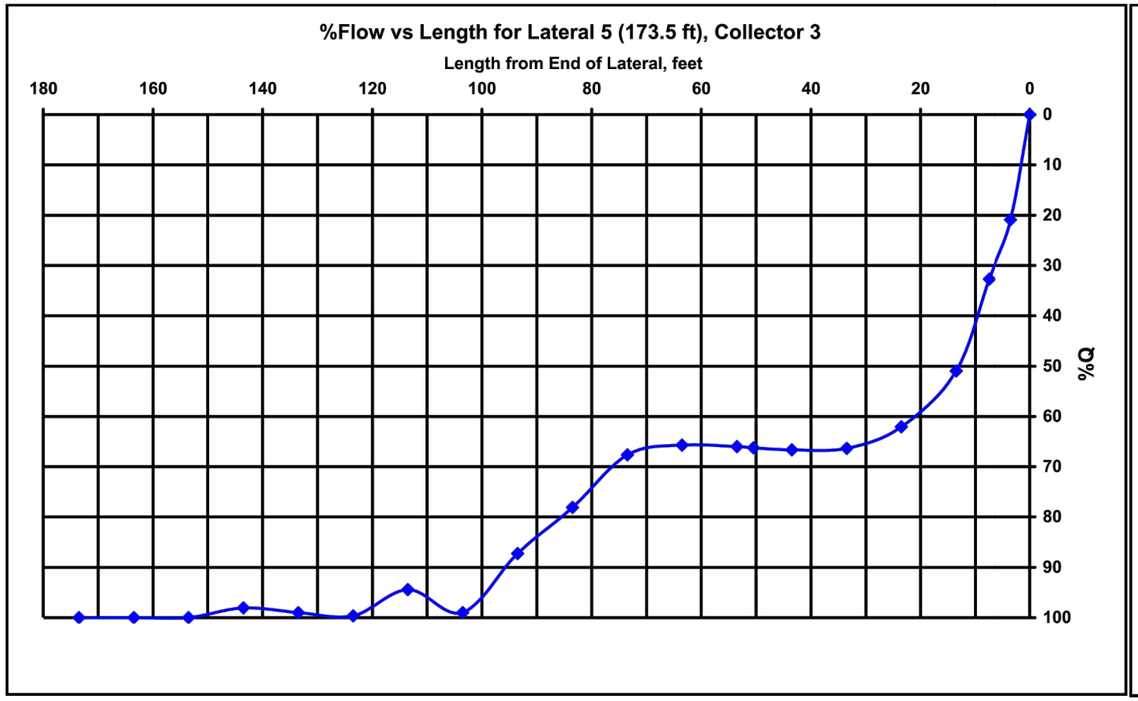
CAD File: g:\000090596\03\00905960 3-30.dwg
Drawn By: J. Estrada
Date: 09/02/11
Project No. 0090596.03

Project No. 0090596.03

Date: 09/02/11

Drawn By: J. Estrada

CAD File: g:\\00090596\03\0090596 03-30.dwg



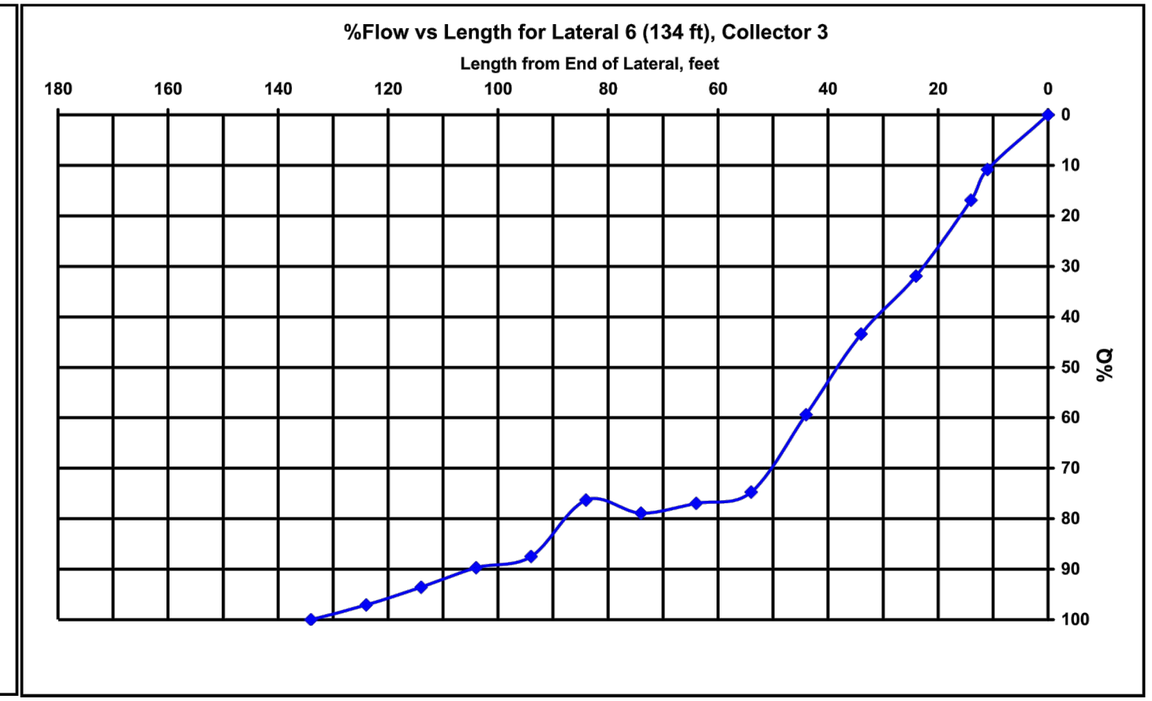


Figure 18b

Percent Flow (Q) vs Length - Collector 3 Laterals

Sonoma County Water Agency

Sonoma County, California

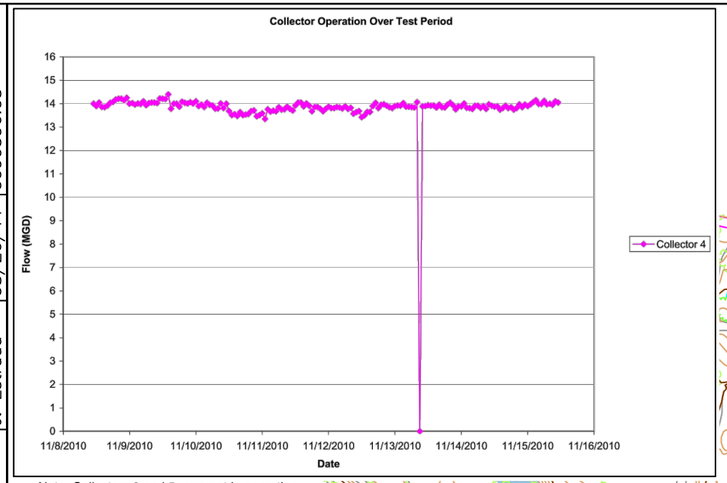
ERM 09/11

Project No. 0090596.03

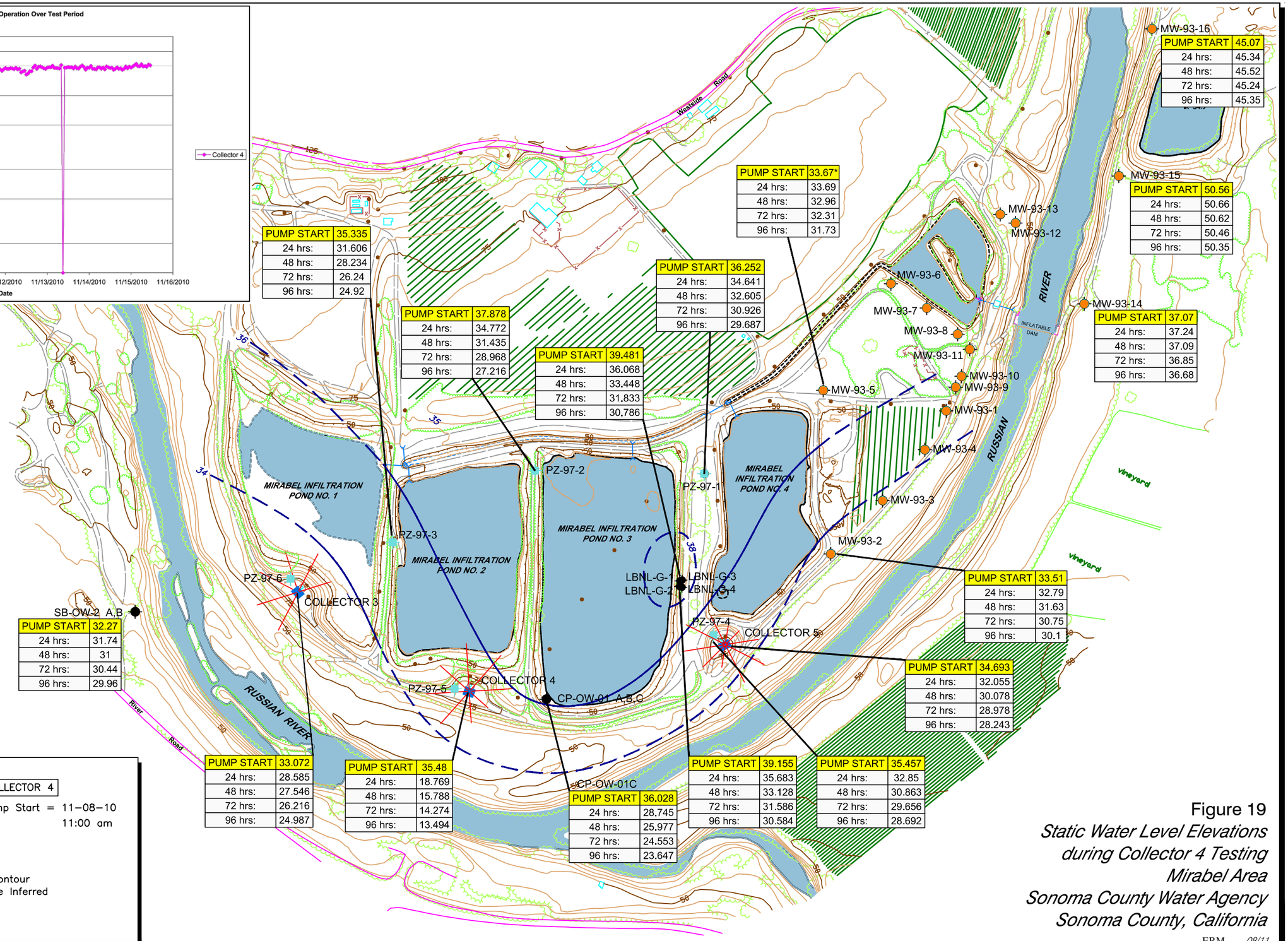
Date: 08/26/11

Drawn By: J. Estrada

CAD File: g:\0090596\03\009059603-21.dwg



Note: Collectors 3 and 5 were not in operation during the test period.



PUMP START	35.335
24 hrs:	31.606
48 hrs:	28.234
72 hrs:	26.24
96 hrs:	24.92

PUMP START	37.878
24 hrs:	34.772
48 hrs:	31.435
72 hrs:	28.968
96 hrs:	27.216

PUMP START	39.481
24 hrs:	36.068
48 hrs:	33.448
72 hrs:	31.833
96 hrs:	30.786

PUMP START	36.252
24 hrs:	34.641
48 hrs:	32.605
72 hrs:	30.926
96 hrs:	29.687

PUMP START	33.67*
24 hrs:	33.69
48 hrs:	32.96
72 hrs:	32.31
96 hrs:	31.73

PUMP START	45.07
24 hrs:	45.34
48 hrs:	45.52
72 hrs:	45.24
96 hrs:	45.35

PUMP START	50.56
24 hrs:	50.66
48 hrs:	50.62
72 hrs:	50.46
96 hrs:	50.35

PUMP START	37.07
24 hrs:	37.24
48 hrs:	37.09
72 hrs:	36.85
96 hrs:	36.68

PUMP START	33.51
24 hrs:	32.79
48 hrs:	31.63
72 hrs:	30.75
96 hrs:	30.1

PUMP START	34.693
24 hrs:	32.055
48 hrs:	30.078
72 hrs:	28.978
96 hrs:	28.243

PUMP START	32.27
24 hrs:	31.74
48 hrs:	31
72 hrs:	30.44
96 hrs:	29.96

PUMP START	33.072
24 hrs:	28.585
48 hrs:	27.546
72 hrs:	26.216
96 hrs:	24.987

PUMP START	35.48
24 hrs:	18.769
48 hrs:	15.788
72 hrs:	14.274
96 hrs:	13.494

PUMP START	36.028
24 hrs:	28.745
48 hrs:	25.977
72 hrs:	24.553
96 hrs:	23.647

PUMP START	39.155
24 hrs:	35.683
48 hrs:	33.128
72 hrs:	31.586
96 hrs:	30.584

PUMP START	35.457
24 hrs:	32.85
48 hrs:	30.863
72 hrs:	29.656
96 hrs:	28.692

LEGEND

- Monitoring Well
- Observation Well
- Piezometer
- Collector

COLLECTOR 4

Pump Start = 11-08-10 11:00 am

Groundwater Elevation Contour (ft. amsl); Dashed Where Inferred

* Not Use for Contouring

Figure 19

Static Water Level Elevations during Collector 4 Testing

Mirabel Area

Sonoma County Water Agency

Sonoma County, California

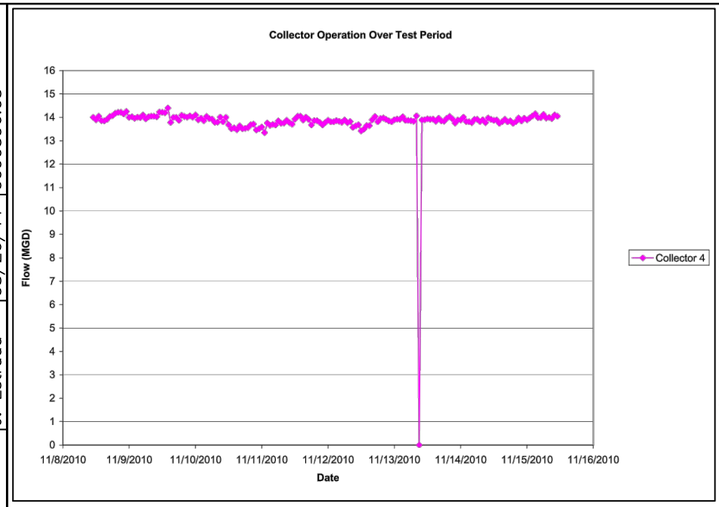
ERM 08/11

Project No. 0090596.03

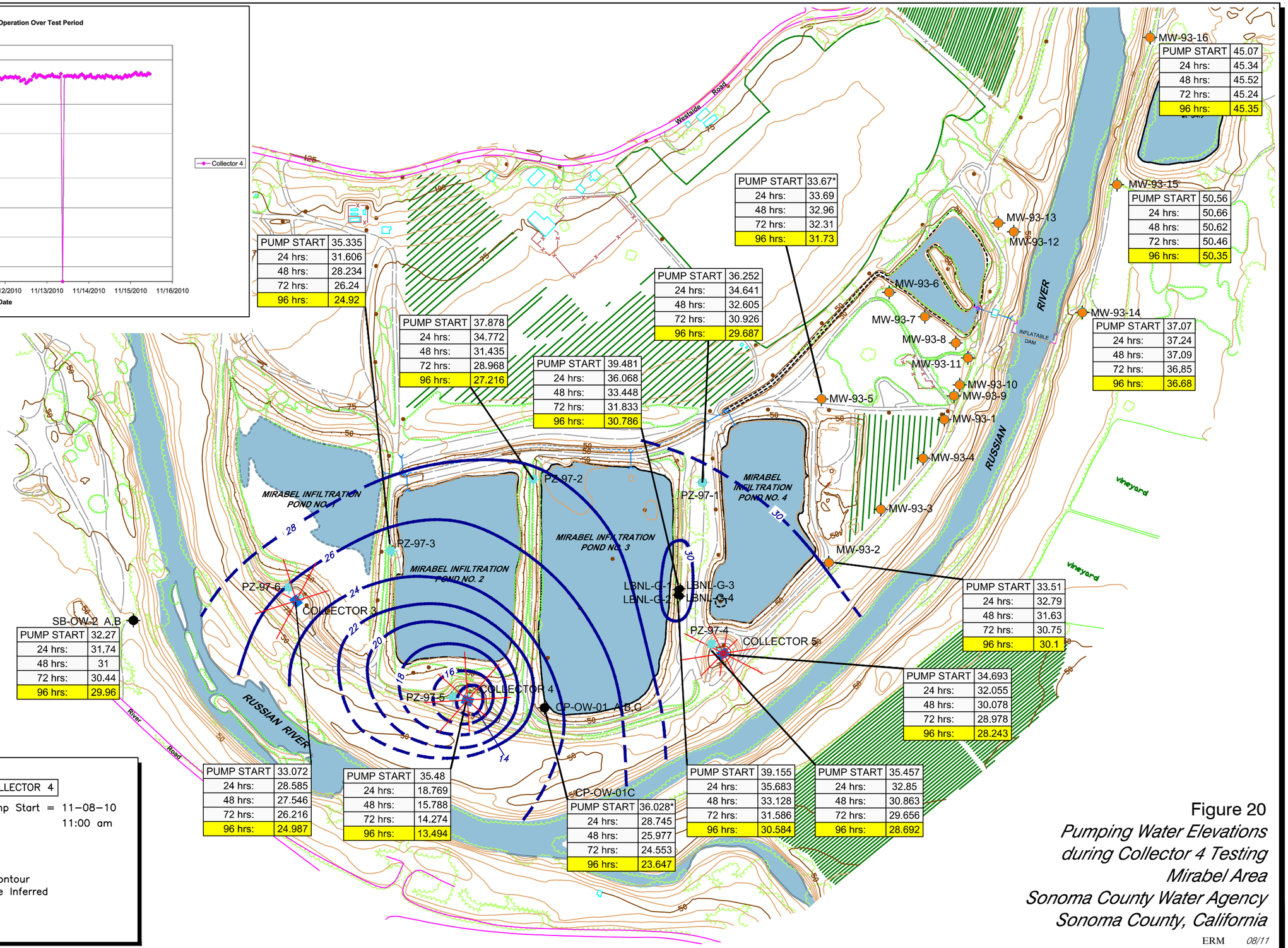
Date: 08/26/11

Drawn By: J. Estrada

CAD File: g:\0090596\03\009059603-20.dwg



Note: Collectors 3 and 5 were not in operation during the test period.



MW-93-16	
PUMP START	45.07
24 hrs:	45.34
48 hrs:	45.52
72 hrs:	45.24
96 hrs:	45.35

MW-93-15	
PUMP START	50.56
24 hrs:	50.66
48 hrs:	50.62
72 hrs:	50.46
96 hrs:	50.35

MW-93-14	
PUMP START	37.07
24 hrs:	37.24
48 hrs:	37.09
72 hrs:	36.85
96 hrs:	36.68

MW-93-13	
PUMP START	33.67*
24 hrs:	33.69
48 hrs:	32.96
72 hrs:	32.31
96 hrs:	31.73

MW-93-12	
PUMP START	36.252
24 hrs:	34.641
48 hrs:	32.605
72 hrs:	30.926
96 hrs:	29.687

MW-93-11	
PUMP START	35.335
24 hrs:	31.606
48 hrs:	28.234
72 hrs:	26.24
96 hrs:	24.92

MW-93-10	
PUMP START	37.878
24 hrs:	34.772
48 hrs:	31.435
72 hrs:	28.968
96 hrs:	27.216

MW-93-9	
PUMP START	39.481
24 hrs:	36.068
48 hrs:	33.448
72 hrs:	31.833
96 hrs:	30.786

MW-93-1	
PUMP START	33.51
24 hrs:	32.79
48 hrs:	31.63
72 hrs:	30.75
96 hrs:	30.1

MW-93-4	
PUMP START	34.693
24 hrs:	32.055
48 hrs:	30.078
72 hrs:	28.978
96 hrs:	28.243

SB-OW-2 A,B	
PUMP START	32.27
24 hrs:	31.74
48 hrs:	31
72 hrs:	30.44
96 hrs:	29.96

COLLECTOR 3	
PUMP START	33.072
24 hrs:	28.585
48 hrs:	27.546
72 hrs:	26.216
96 hrs:	24.987

COLLECTOR 4	
PUMP START	35.48
24 hrs:	18.769
48 hrs:	15.788
72 hrs:	14.274
96 hrs:	13.494

CP-OW-01C	
PUMP START	36.028*
24 hrs:	28.745
48 hrs:	25.977
72 hrs:	24.553
96 hrs:	23.647

COLLECTOR 5	
PUMP START	39.155
24 hrs:	35.683
48 hrs:	33.128
72 hrs:	31.586
96 hrs:	30.584

PZ-97-4	
PUMP START	35.457
24 hrs:	32.85
48 hrs:	30.863
72 hrs:	29.656
96 hrs:	28.692

LEGEND

- Monitoring Well
- Observation Well
- Piezometer
- Collector
- Groundwater Elevation Contour (ft. amsl); Dashed Where Inferred
- * Not Use for Contouring

COLLECTOR 4

Pump Start = 11-08-10 11:00 am

Figure 20

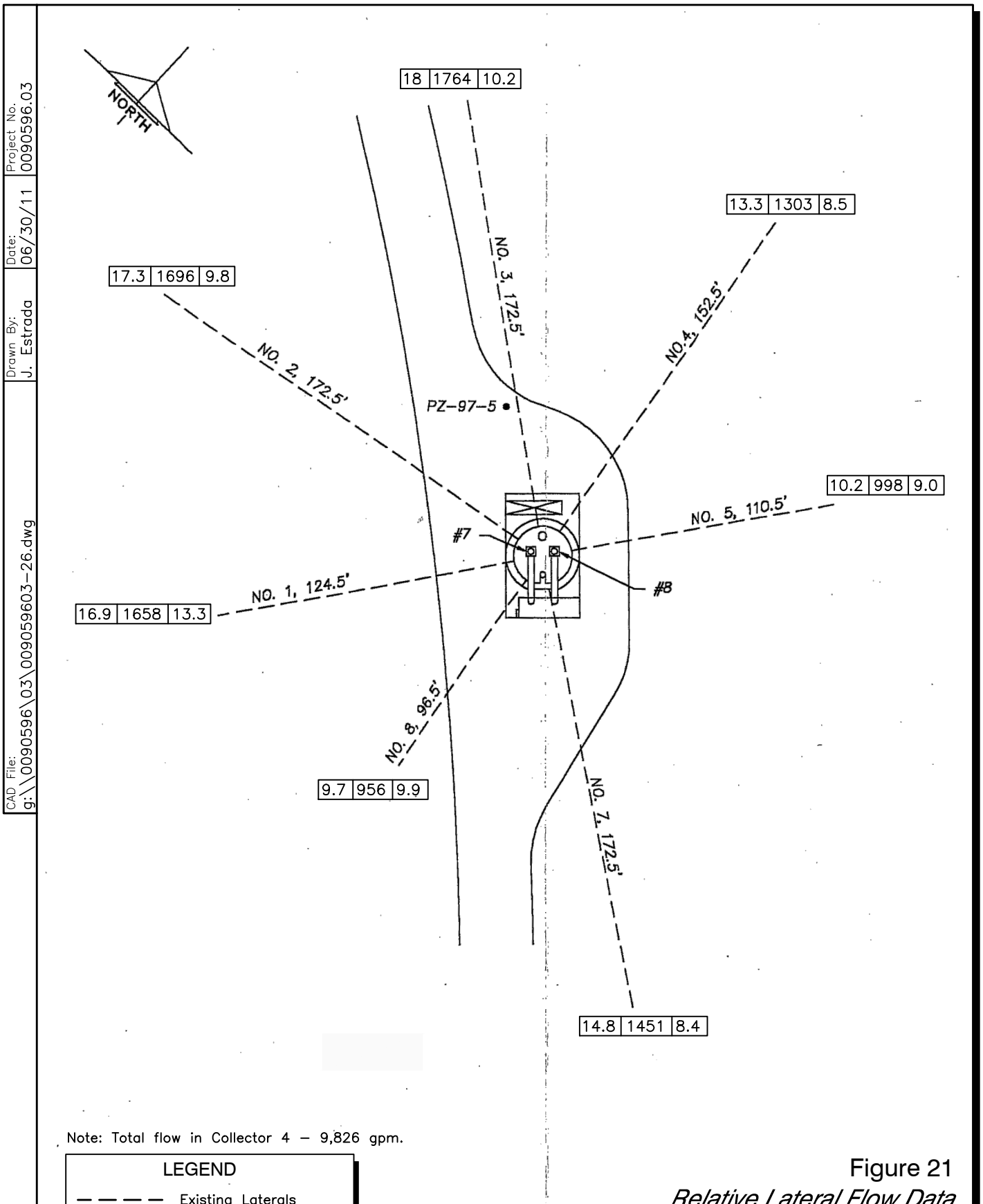
Pumping Water Elevations during Collector 4 Testing

Mirabel Area

Sonoma County Water Agency

Sonoma County, California

ERM 08/11



Note: Total flow in Collector 4 – 9,826 gpm.

LEGEND

— — — — Existing Laterals

16.9 | 1658 | 13.3
- 13.3 — gpm/ft
- 1658 — gpm
- 16.9 — %

Figure 21

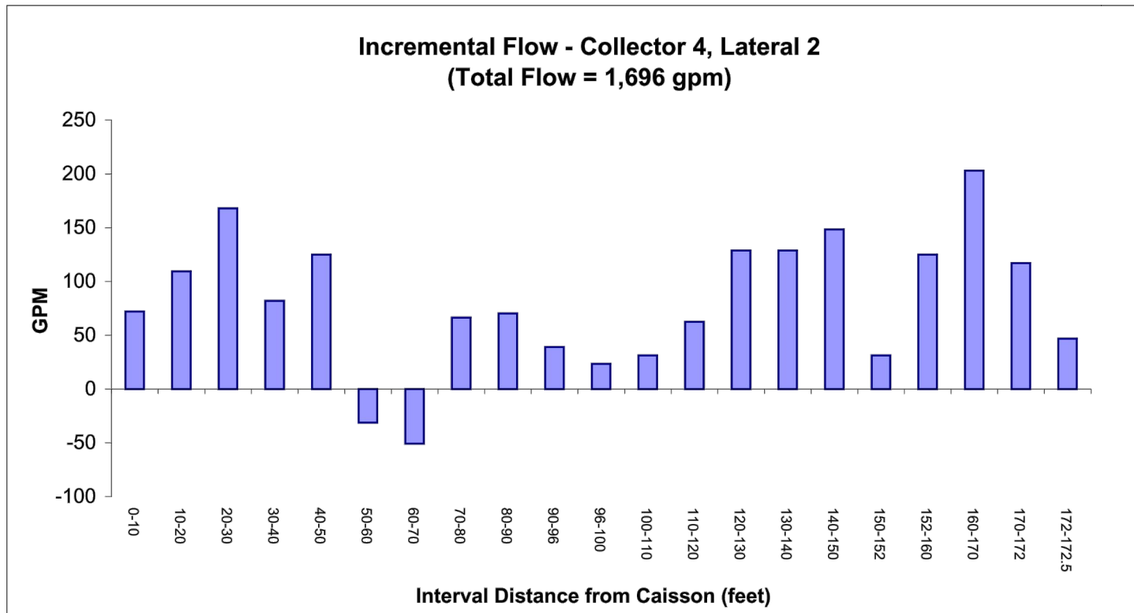
Relative Lateral Flow Data

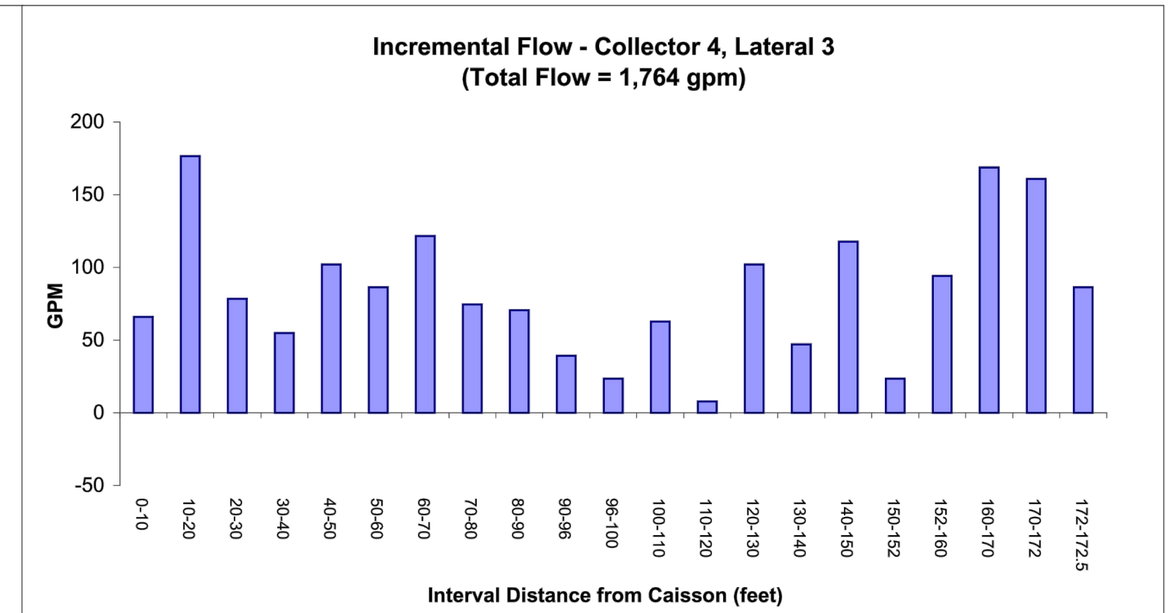
Collector #4

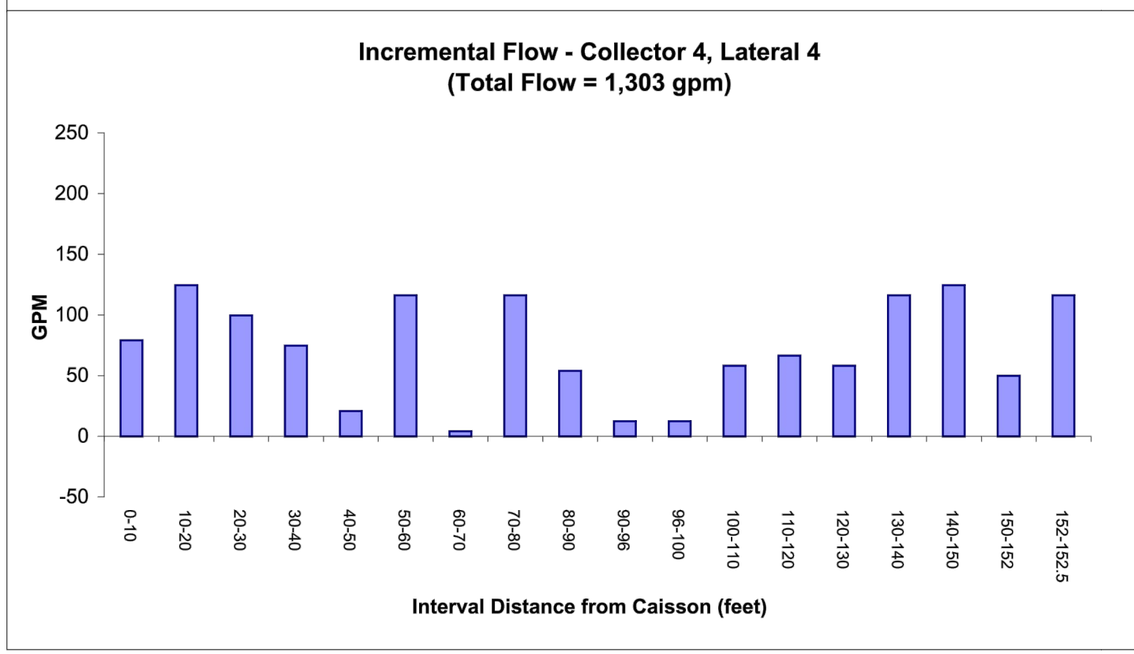
Sonoma County Water Agency

Sonoma County, California

ERM *06/11*







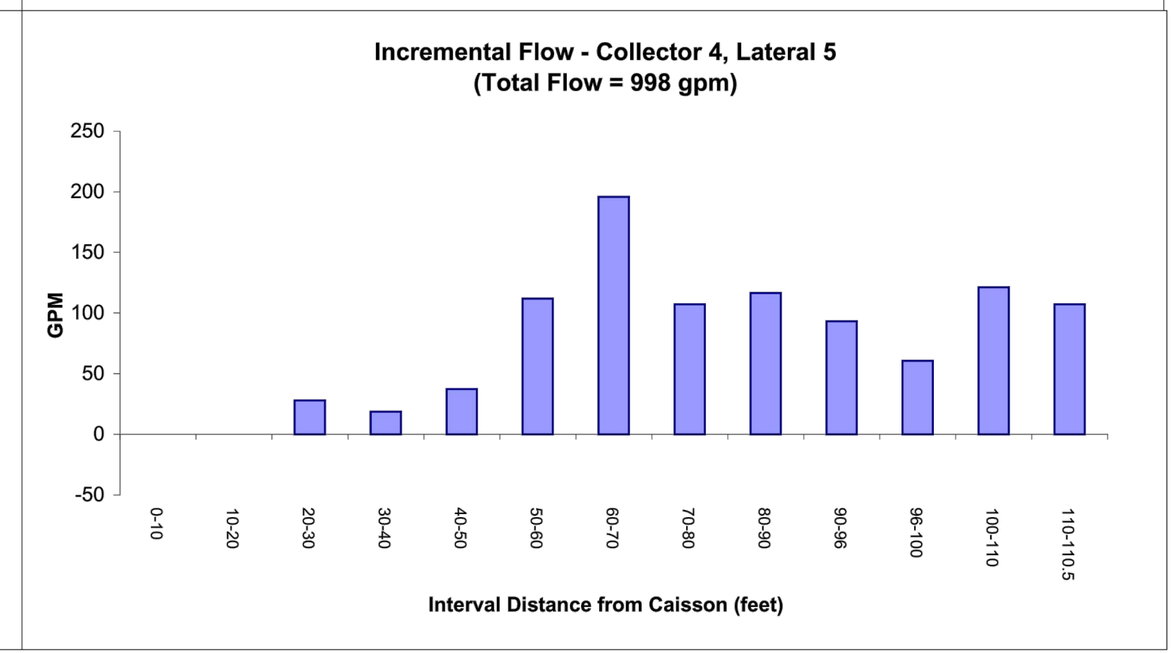
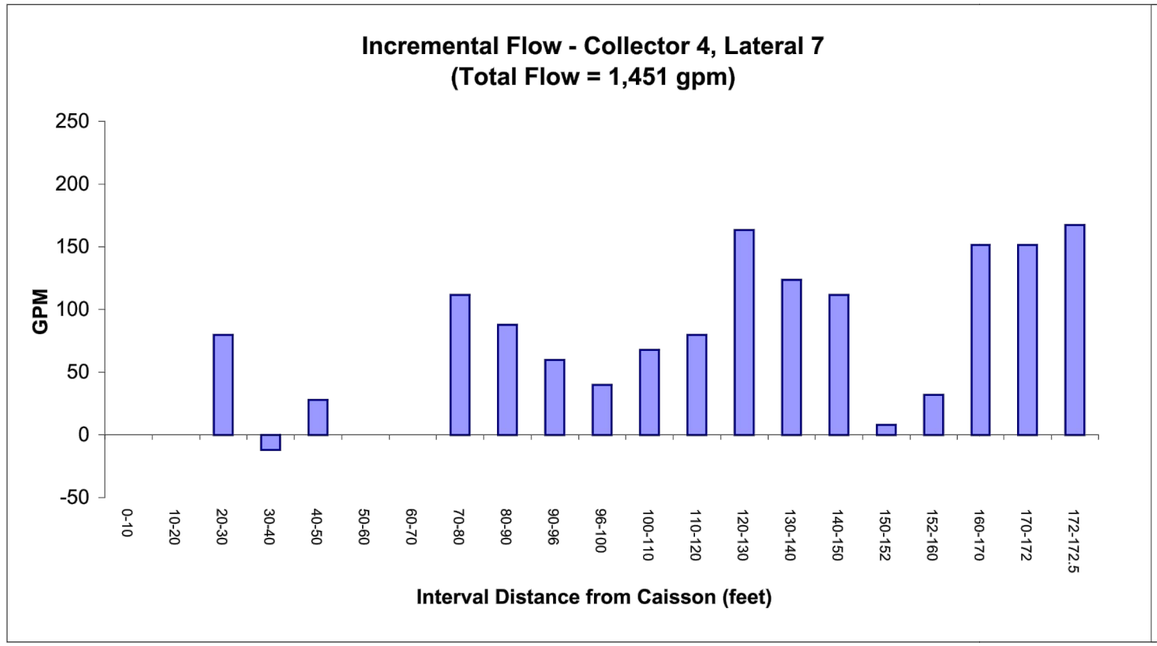


Figure 22a

Incremental Flow - Collector 4 Laterals
Sonoma County Water Agency
Sonoma County, California

ERM 06/11

CAD File: g:\000090596\03\00905960 3-29.dwg
Drawn By: J. Estrada
Date: 06/30/11
Project No. 0090596.03



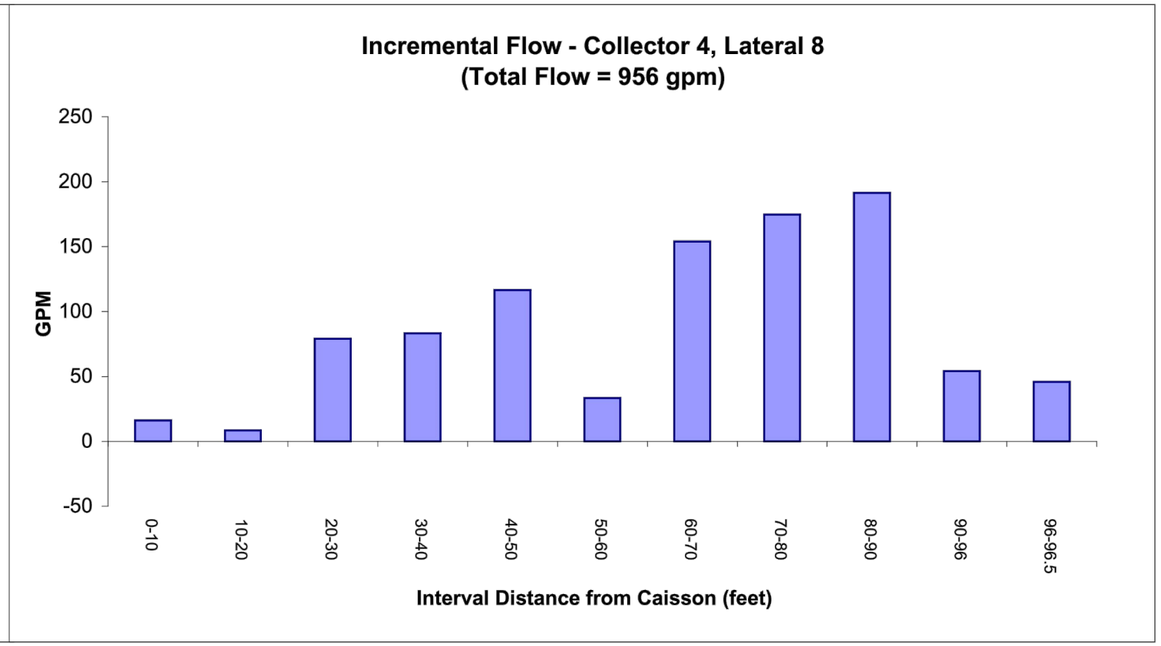


Figure 22b

Incremental Flow - Collector 4 Laterals

Sonoma County Water Agency

Sonoma County, California

ERM *06/11*

CAD File: g:\00009596\03\009059603-29.dwg

Drawn By: J. Estrada

Date: 06/30/11

Project No. 0090596.03

CAD File:	Drawn By:	Date:	Project No.
g:\\000090596\03\009059603-27.dwg	J. Estrada	06/30/11	0090596.03

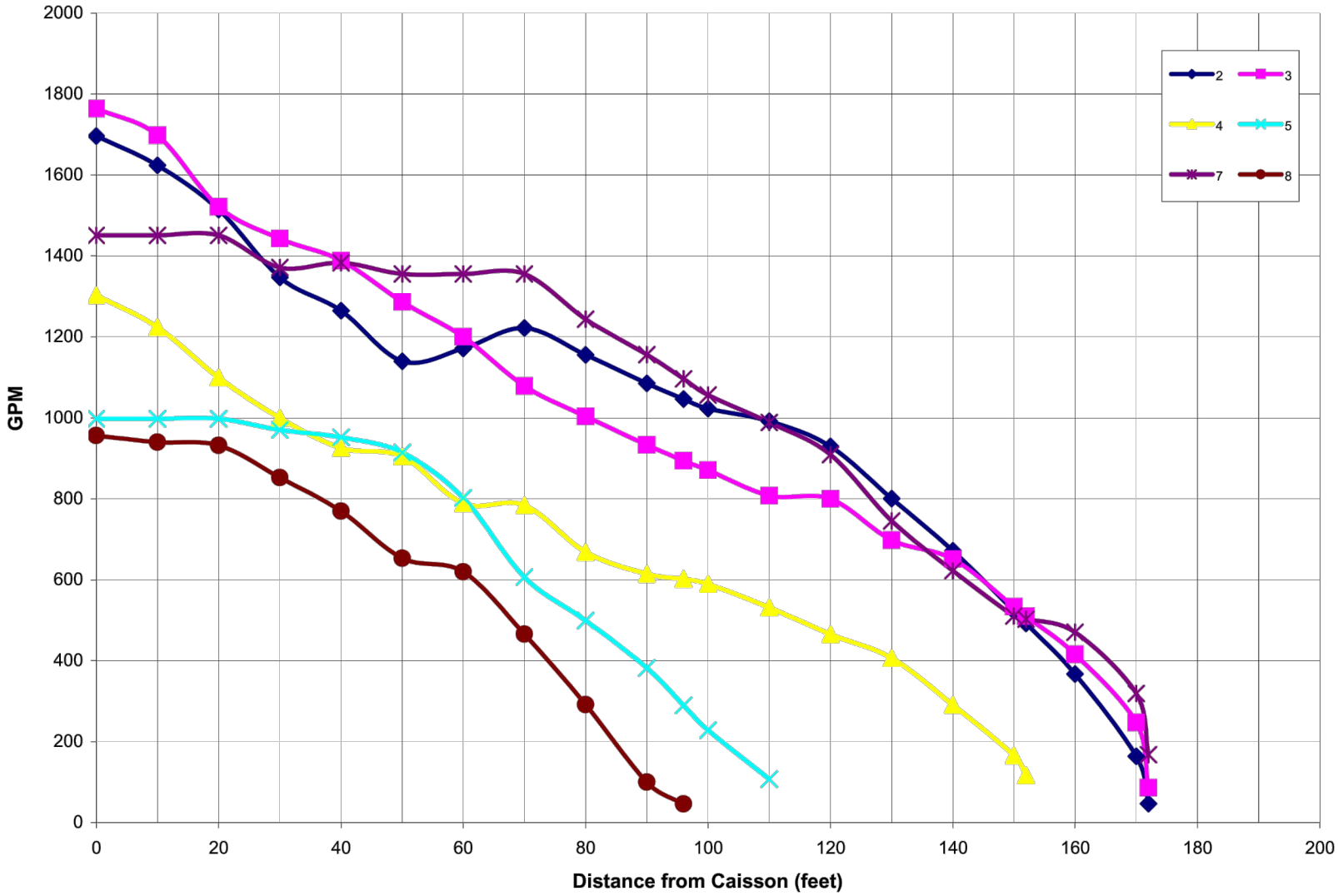


Figure 23

Flow versus Distance from Caisson
Collector 4 Laterals
Sonoma County Water Agency
Sonoma County, California

ERM *06/11*

CAD File:	Drawn By:	Date:	Project No.
g:\\000090596\03\009059603-27.dwg	J. Estrada	06/30/11	0090596.03

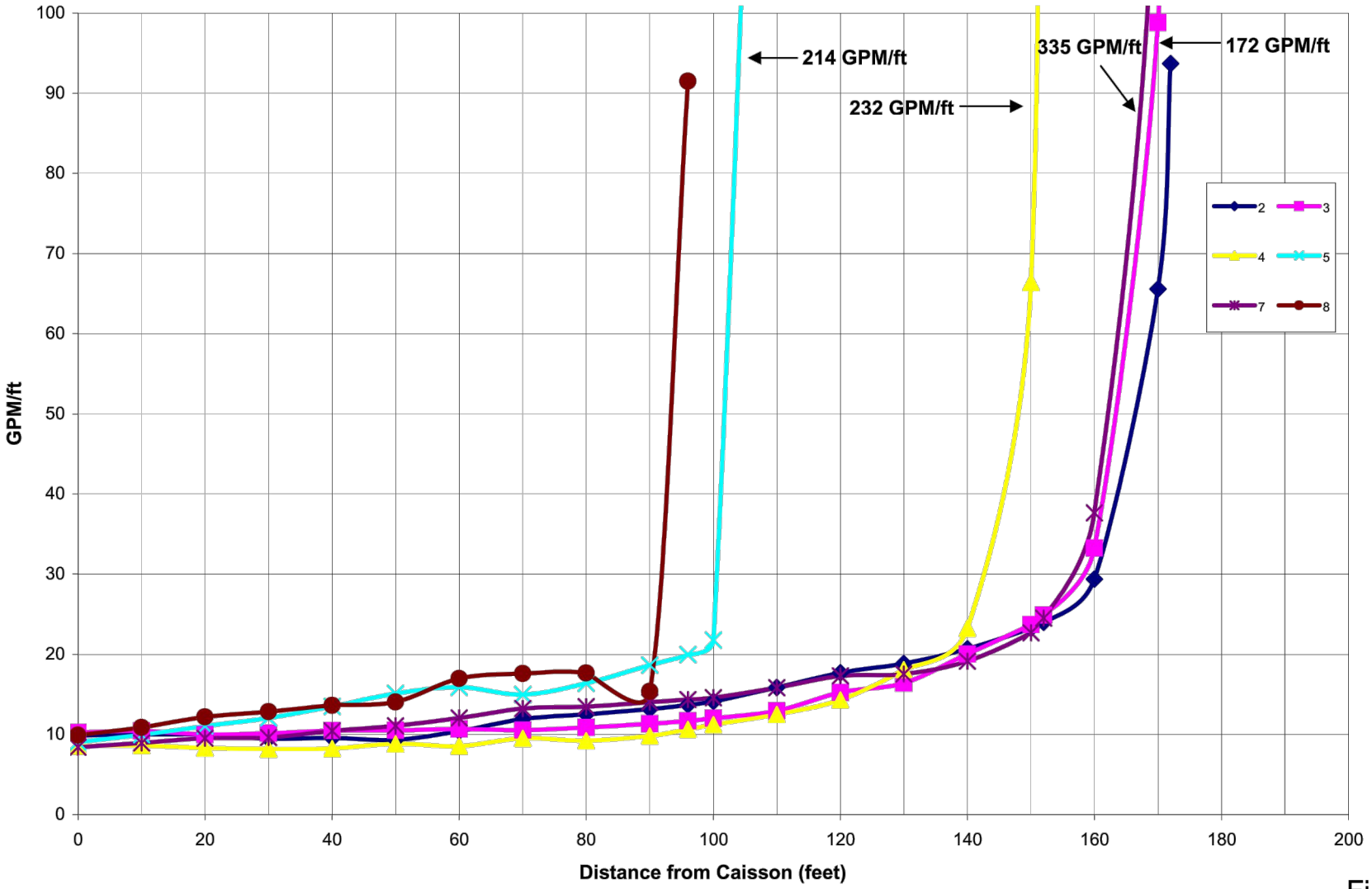


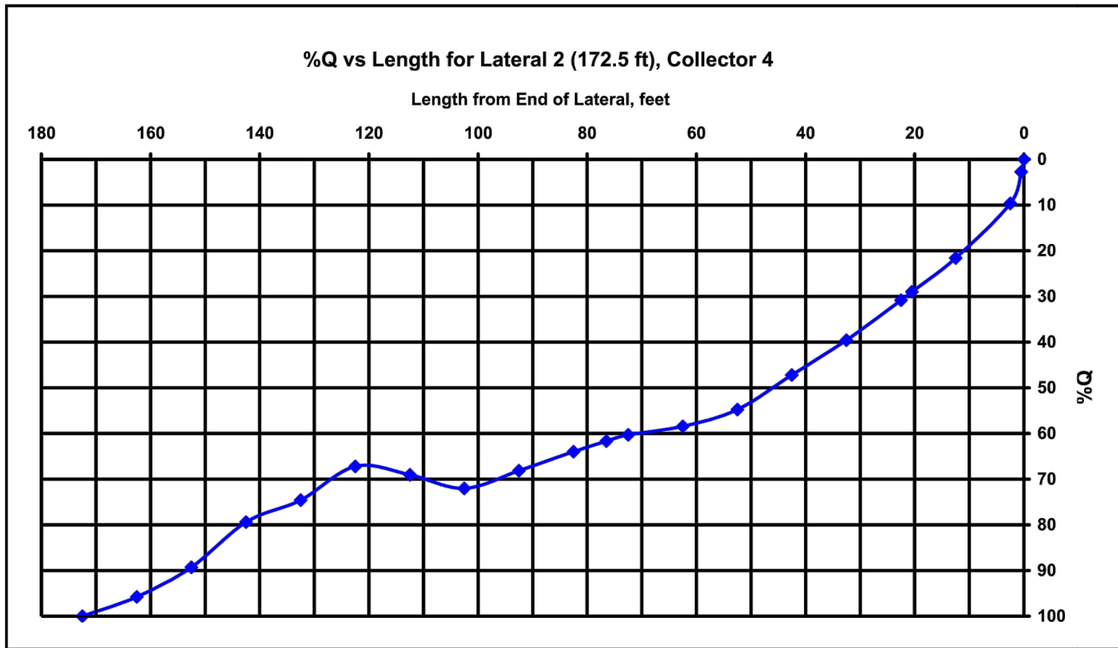
Figure 24

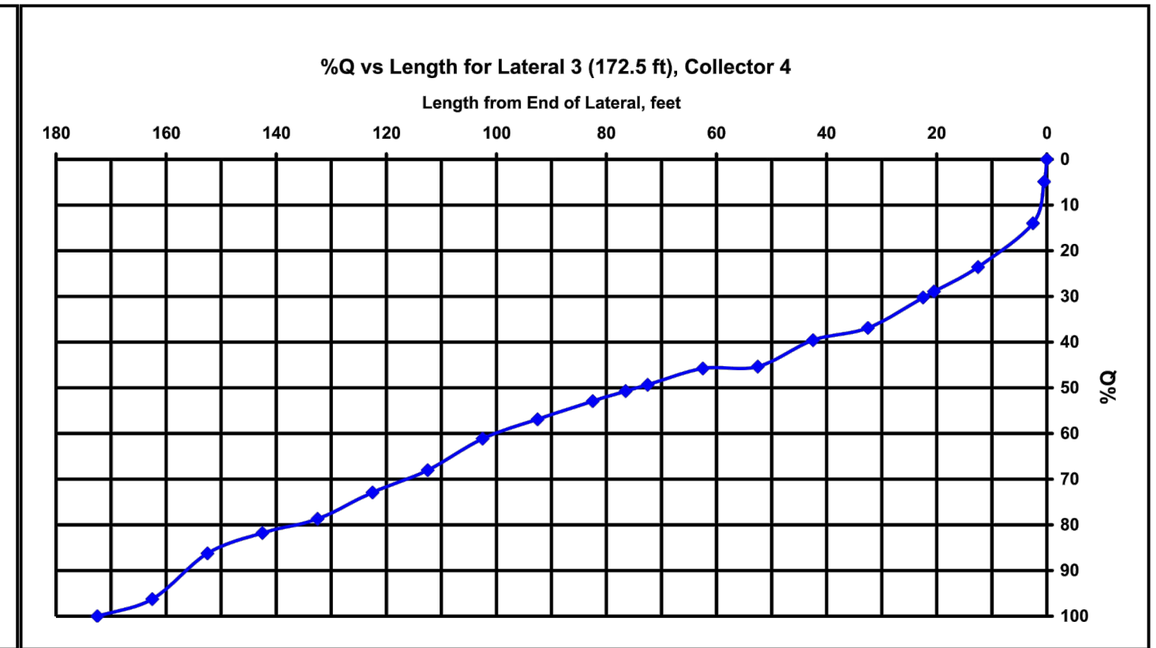
Flow/Screen Length at Distances from Caisson in Collector 4 Laterals

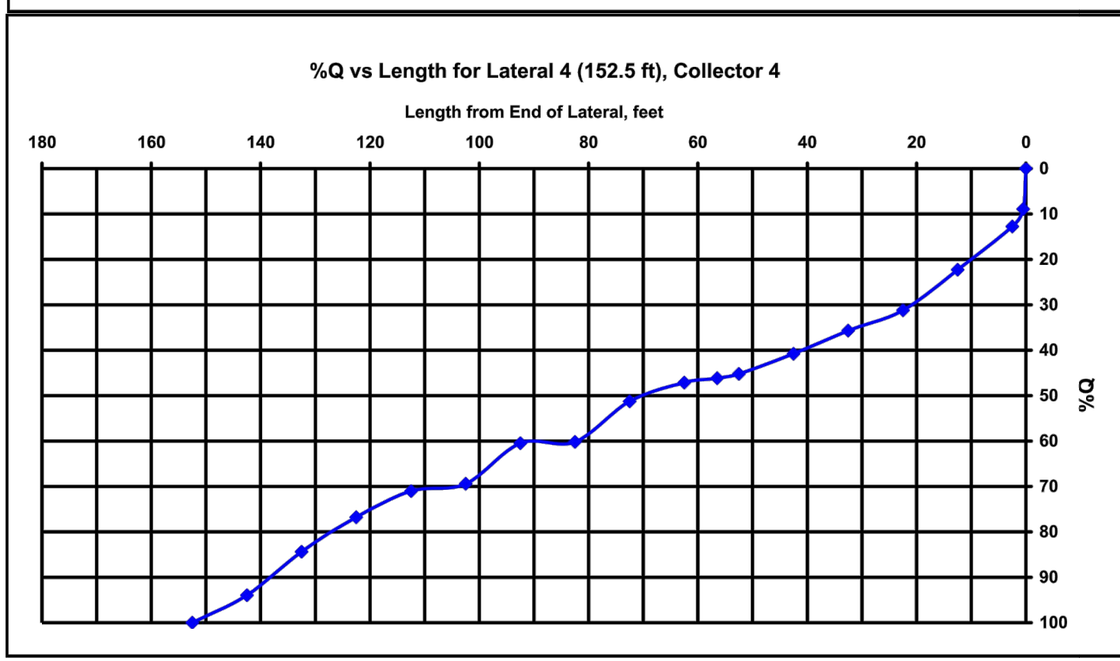
Sonoma County Water Agency

Sonoma County, California

ERM *06/11*







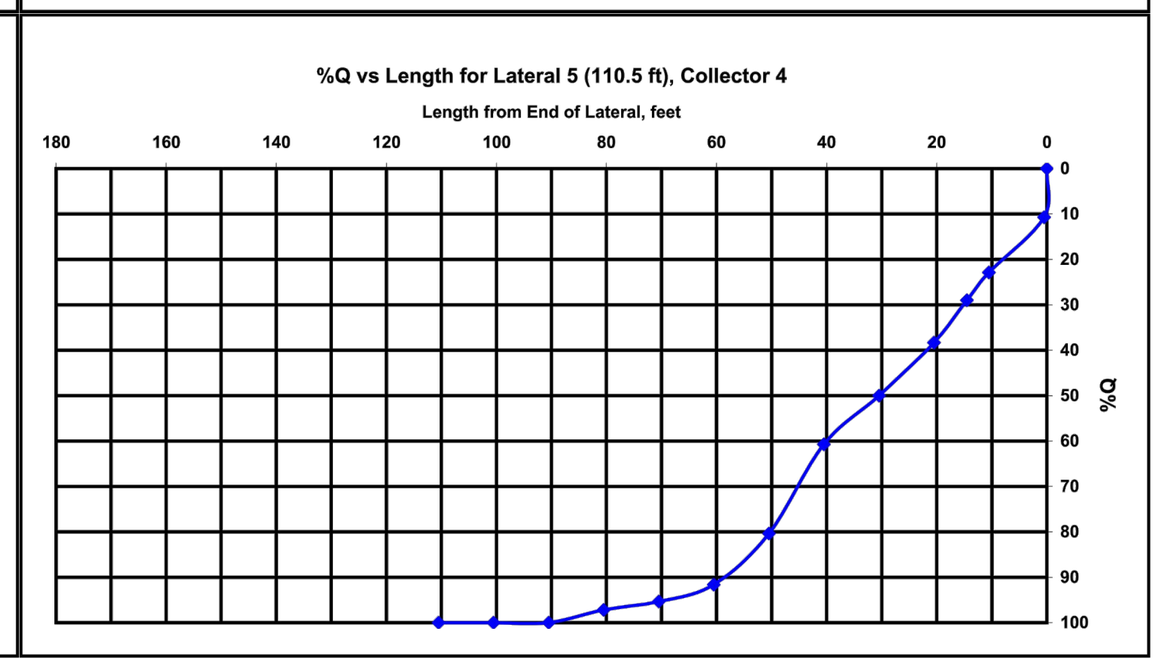
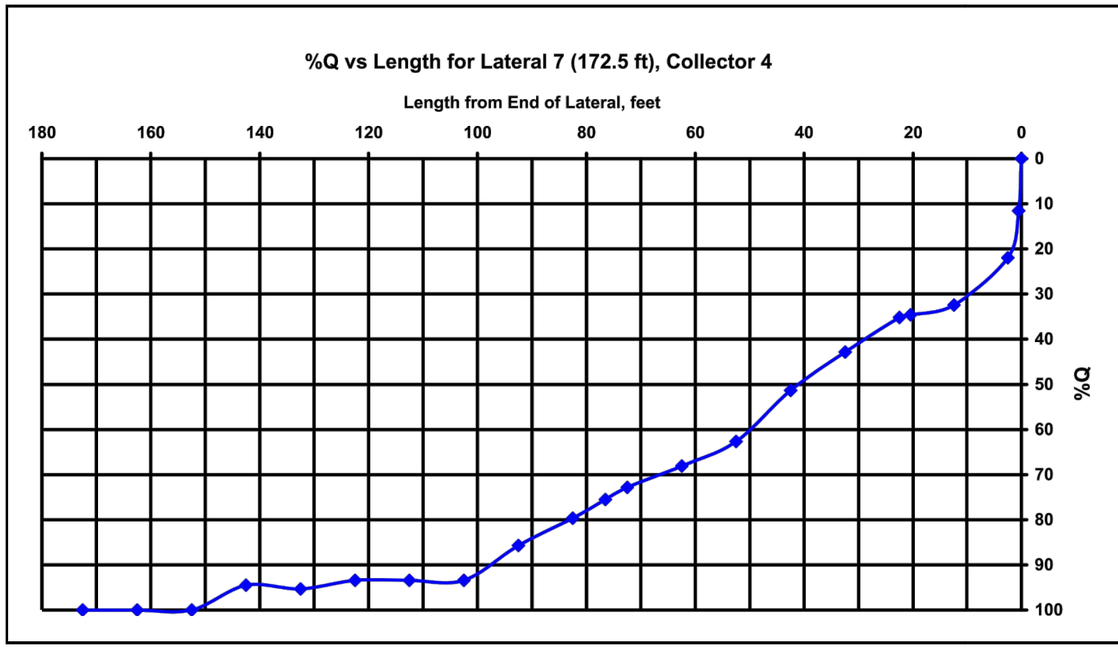


Figure 25a

Percent Flow (Q) vs Length - Collector 4 Laterals
Sonoma County Water Agency
Sonoma County, California

ERM 09/11

Project No. 0090596.03
Date: 09/02/11
Drawn By: J. Estrada
CAD File: g:\\00090596\03\00905960 3-30.dwg



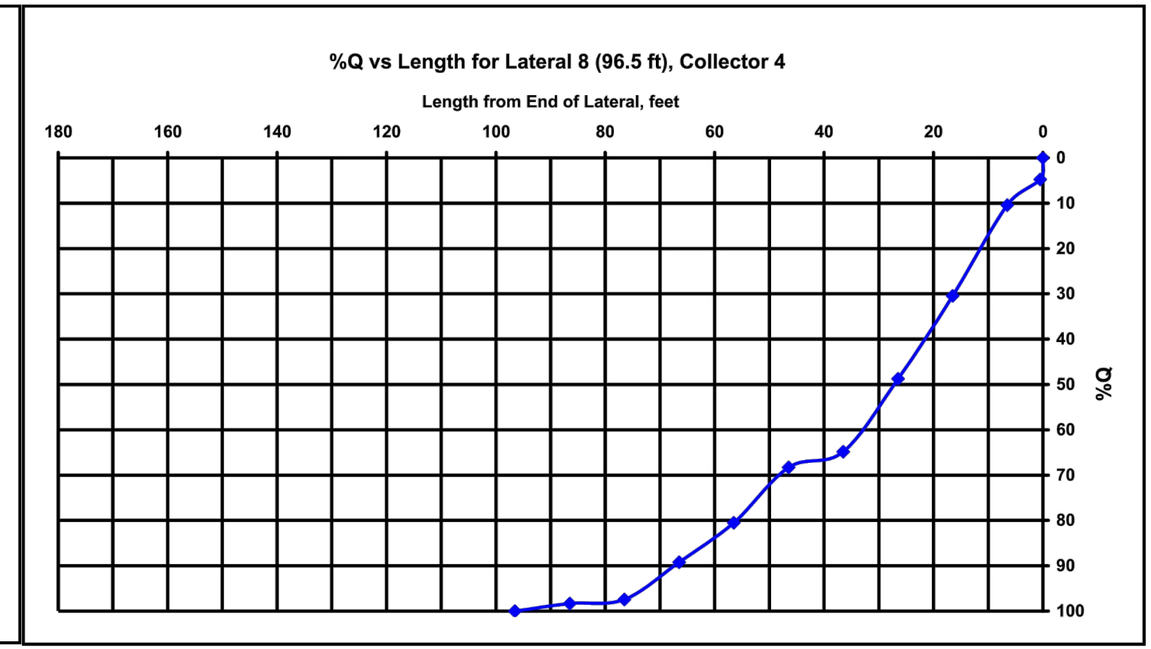


Figure 25b

Percent Flow (Q) vs Length - Collector 4 Laterals
Sonoma County Water Agency
Sonoma County, California

ERM 09/11

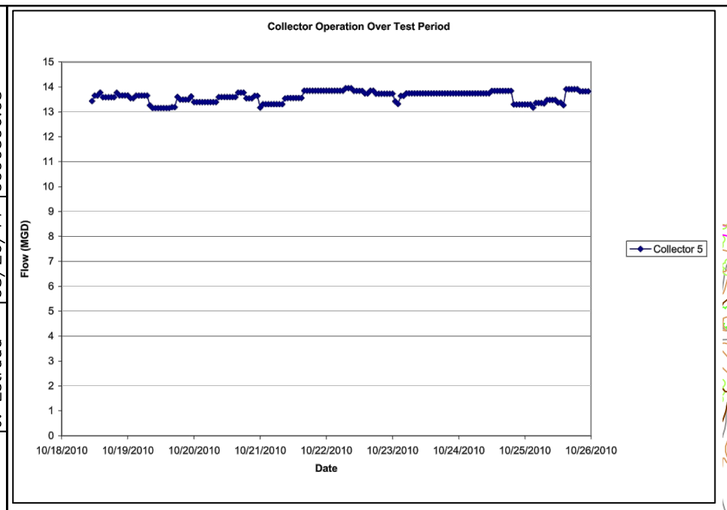
Project No. 0090596.03
Date: 09/02/11
Drawn By: J. Estrada
CAD File: g:\\000090596\03\009059603-30.dwg

Project No. 0090596.03

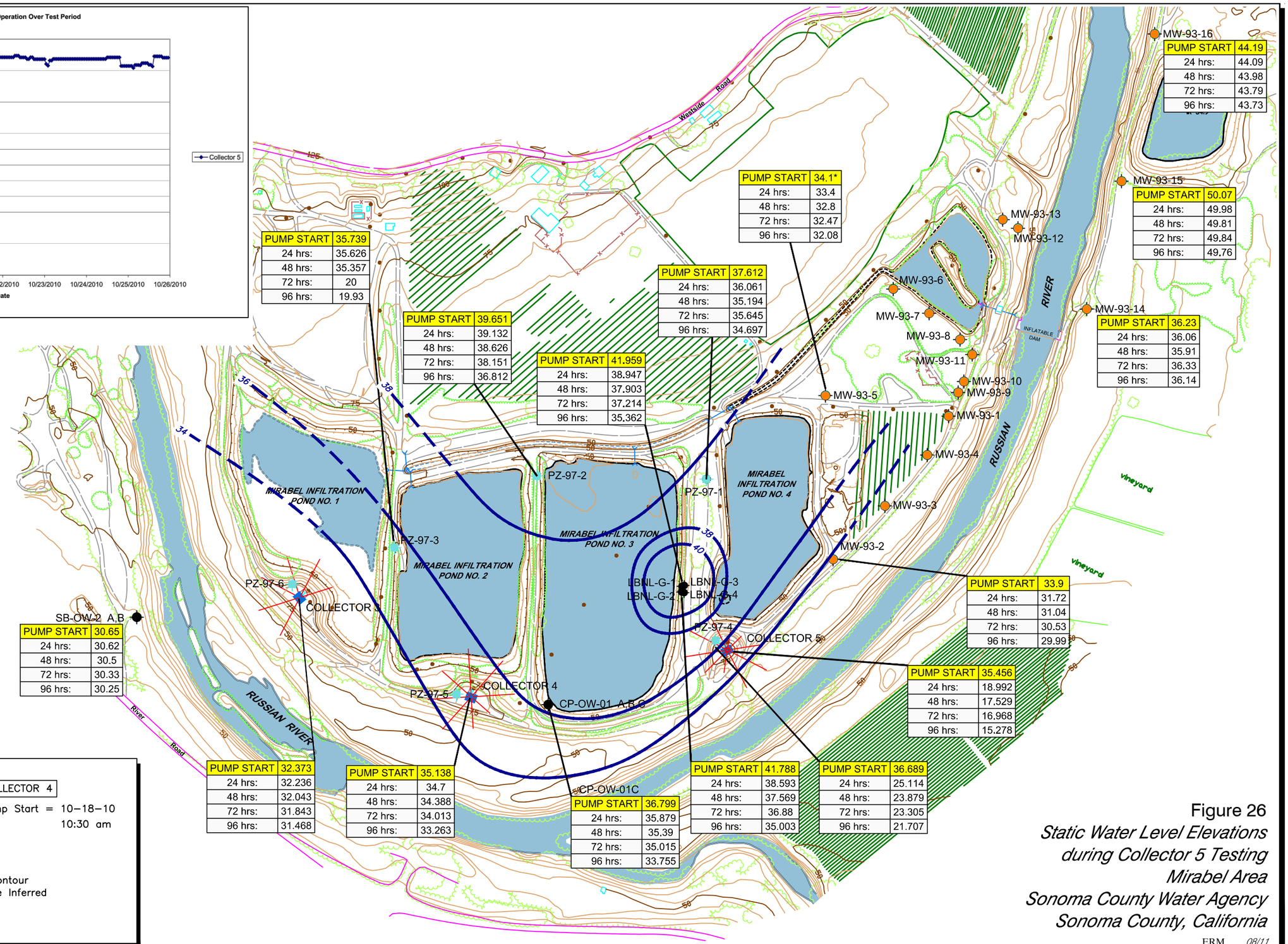
Date: 08/26/11

Drawn By: J. Estrada

CAD File: g:\0090596\03\009059603-22.dwg



Note: Collectors 3 and 4 were not in operation during the test period.



PUMP START	35.739
24 hrs:	35.626
48 hrs:	35.357
72 hrs:	20
96 hrs:	19.93

PUMP START	39.651
24 hrs:	39.132
48 hrs:	38.626
72 hrs:	38.151
96 hrs:	36.812

PUMP START	41.959
24 hrs:	38.947
48 hrs:	37.903
72 hrs:	37.214
96 hrs:	35.362

PUMP START	37.612
24 hrs:	36.061
48 hrs:	35.194
72 hrs:	35.645
96 hrs:	34.697

PUMP START	34.1*
24 hrs:	33.4
48 hrs:	32.8
72 hrs:	32.47
96 hrs:	32.08

PUMP START	44.19
24 hrs:	44.09
48 hrs:	43.98
72 hrs:	43.79
96 hrs:	43.73

PUMP START	50.07
24 hrs:	49.98
48 hrs:	49.81
72 hrs:	49.84
96 hrs:	49.76

PUMP START	36.23
24 hrs:	36.06
48 hrs:	35.91
72 hrs:	36.33
96 hrs:	36.14

PUMP START	33.9
24 hrs:	31.72
48 hrs:	31.04
72 hrs:	30.53
96 hrs:	29.99

PUMP START	35.456
24 hrs:	18.992
48 hrs:	17.529
72 hrs:	16.968
96 hrs:	15.278

PUMP START	30.65
24 hrs:	30.62
48 hrs:	30.5
72 hrs:	30.33
96 hrs:	30.25

PUMP START	32.373
24 hrs:	32.236
48 hrs:	32.043
72 hrs:	31.843
96 hrs:	31.468

PUMP START	35.138
24 hrs:	34.7
48 hrs:	34.388
72 hrs:	34.013
96 hrs:	33.263

CP-OW-01C PUMP START	36.799
24 hrs:	35.879
48 hrs:	35.39
72 hrs:	35.015
96 hrs:	33.755

PUMP START	41.788
24 hrs:	38.593
48 hrs:	37.569
72 hrs:	36.88
96 hrs:	35.003

PUMP START	36.689
24 hrs:	25.114
48 hrs:	23.879
72 hrs:	23.305
96 hrs:	21.707

LEGEND

- Monitoring Well
- Observation Well
- Piezometer
- Collector
- Groundwater Elevation Contour (ft. amsl); Dashed Where Inferred
- * Not Use for Contouring

COLLECTOR 4
Pump Start = 10-18-10 10:30 am

Figure 26
Static Water Level Elevations during Collector 5 Testing
Mirabel Area
Sonoma County Water Agency
Sonoma County, California

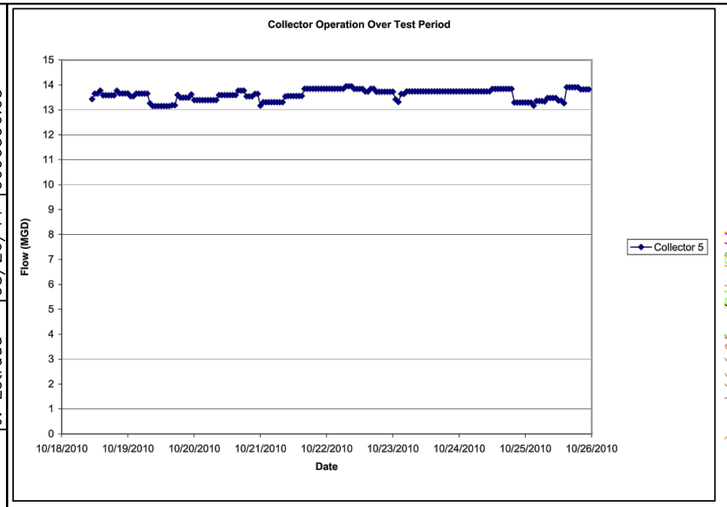
ERM 08/11

Project No. 0090596.03

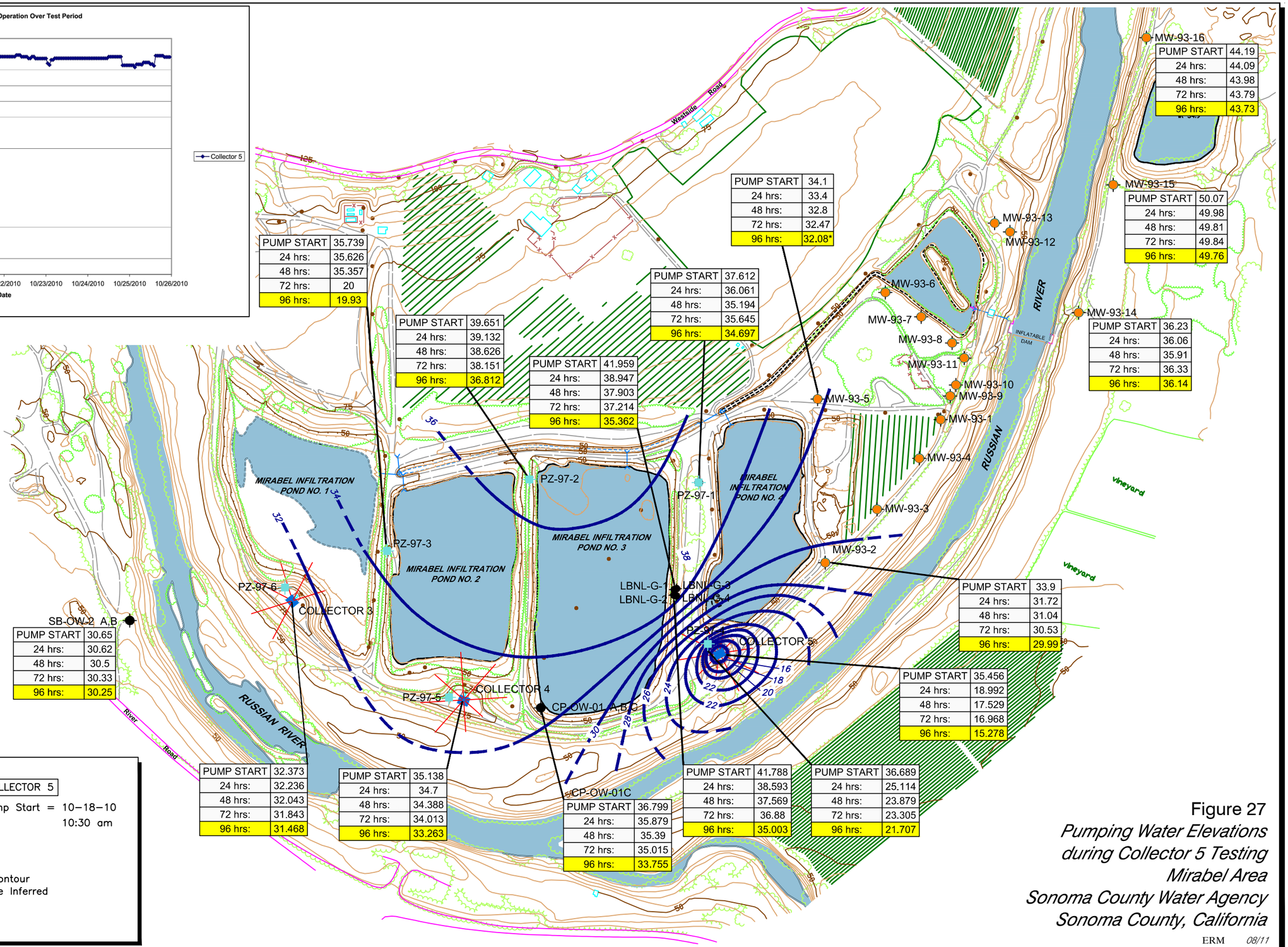
Date: 08/26/11

Drawn By: J. Estrada

CAD File: g:\0090596\03\009059603-23.dwg



Note: Collectors 3 and 4 were not in operation during the test period.



MW-93-16	
PUMP START	44.19
24 hrs:	44.09
48 hrs:	43.98
72 hrs:	43.79
96 hrs:	43.73

MW-93-15	
PUMP START	50.07
24 hrs:	49.98
48 hrs:	49.81
72 hrs:	49.84
96 hrs:	49.76

MW-93-14	
PUMP START	36.23
24 hrs:	36.06
48 hrs:	35.91
72 hrs:	36.33
96 hrs:	36.14

MW-93-13	
PUMP START	34.1
24 hrs:	33.4
48 hrs:	32.8
72 hrs:	32.47
96 hrs:	32.08*

MW-93-6	
PUMP START	37.612
24 hrs:	36.061
48 hrs:	35.194
72 hrs:	35.645
96 hrs:	34.697

MW-93-7	
PUMP START	35.739
24 hrs:	35.626
48 hrs:	35.357
72 hrs:	20
96 hrs:	19.93

MW-93-8	
PUMP START	39.651
24 hrs:	39.132
48 hrs:	38.626
72 hrs:	38.151
96 hrs:	36.812

MW-93-11	
PUMP START	41.959
24 hrs:	38.947
48 hrs:	37.903
72 hrs:	37.214
96 hrs:	35.362

MW-93-2	
PUMP START	33.9
24 hrs:	31.72
48 hrs:	31.04
72 hrs:	30.53
96 hrs:	29.99

PZ-97-1	
PUMP START	35.456
24 hrs:	18.992
48 hrs:	17.529
72 hrs:	16.968
96 hrs:	15.278

SB-OW-2 A,B	
PUMP START	30.65
24 hrs:	30.62
48 hrs:	30.5
72 hrs:	30.33
96 hrs:	30.25

PZ-97-6	
PUMP START	32.373
24 hrs:	32.236
48 hrs:	32.043
72 hrs:	31.843
96 hrs:	31.468

PZ-97-5	
PUMP START	35.138
24 hrs:	34.7
48 hrs:	34.388
72 hrs:	34.013
96 hrs:	33.263

CP-OW-01C	
PUMP START	36.799
24 hrs:	35.879
48 hrs:	35.39
72 hrs:	35.015
96 hrs:	33.755

PZ-97-2	
PUMP START	41.788
24 hrs:	38.593
48 hrs:	37.569
72 hrs:	36.88
96 hrs:	35.003

PZ-97-3	
PUMP START	36.689
24 hrs:	25.114
48 hrs:	23.879
72 hrs:	23.305
96 hrs:	21.707

LEGEND

- Monitoring Well
- Observation Well
- Piezometer
- Collector
- Groundwater Elevation Contour (ft. amsl); Dashed Where Inferred
- * Not Use for Contouring

COLLECTOR 5

Pump Start = 10-18-10 10:30 am

Figure 27

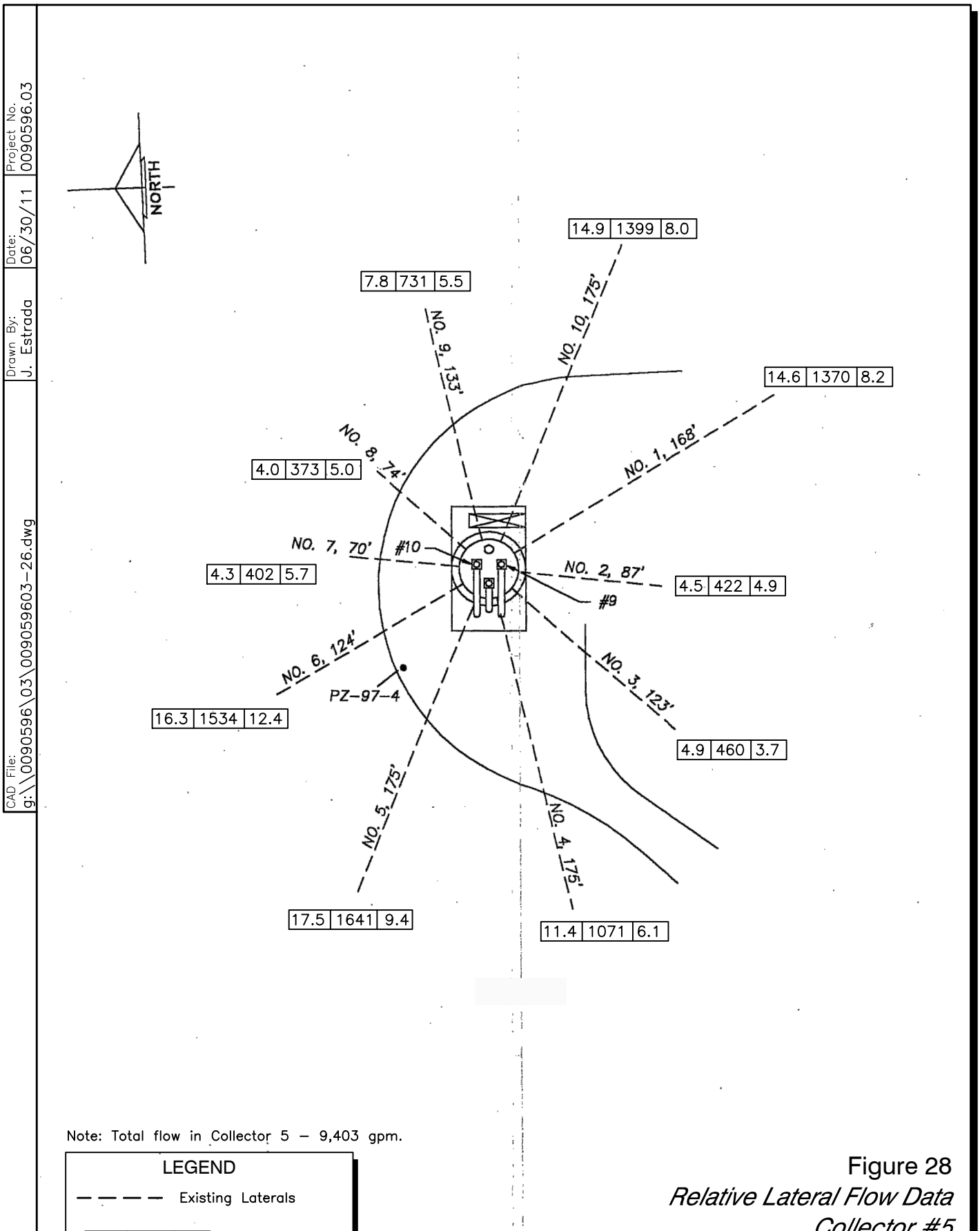
Pumping Water Elevations during Collector 5 Testing

Mirabel Area

Sonoma County Water Agency

Sonoma County, California

ERM 08/11



Project No. 0090596.03
Date: 06/30/11
Drawn By: J. Estrada
CAD File: g:\0090596\03\009059603-26.dwg

Note: Total flow in Collector 5 – 9,403 gpm.

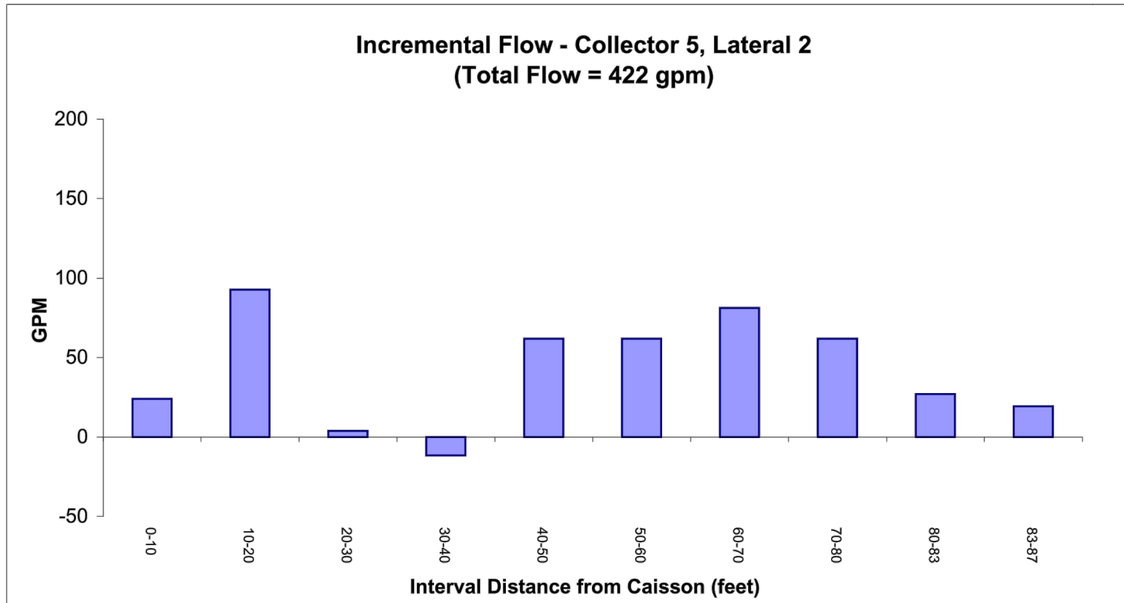
LEGEND

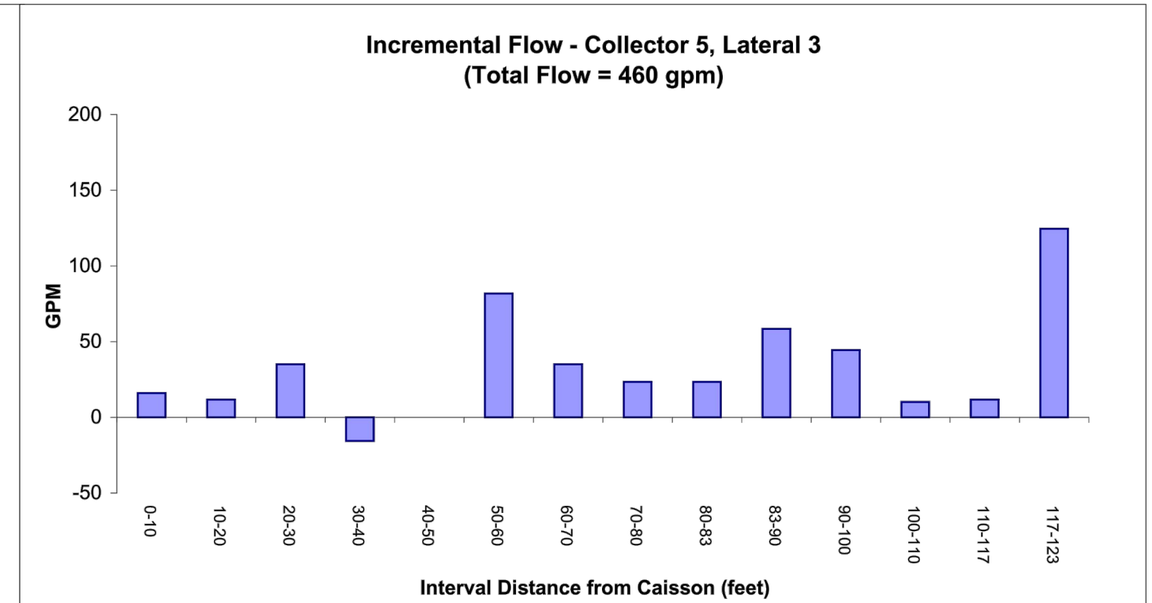
Existing Laterals

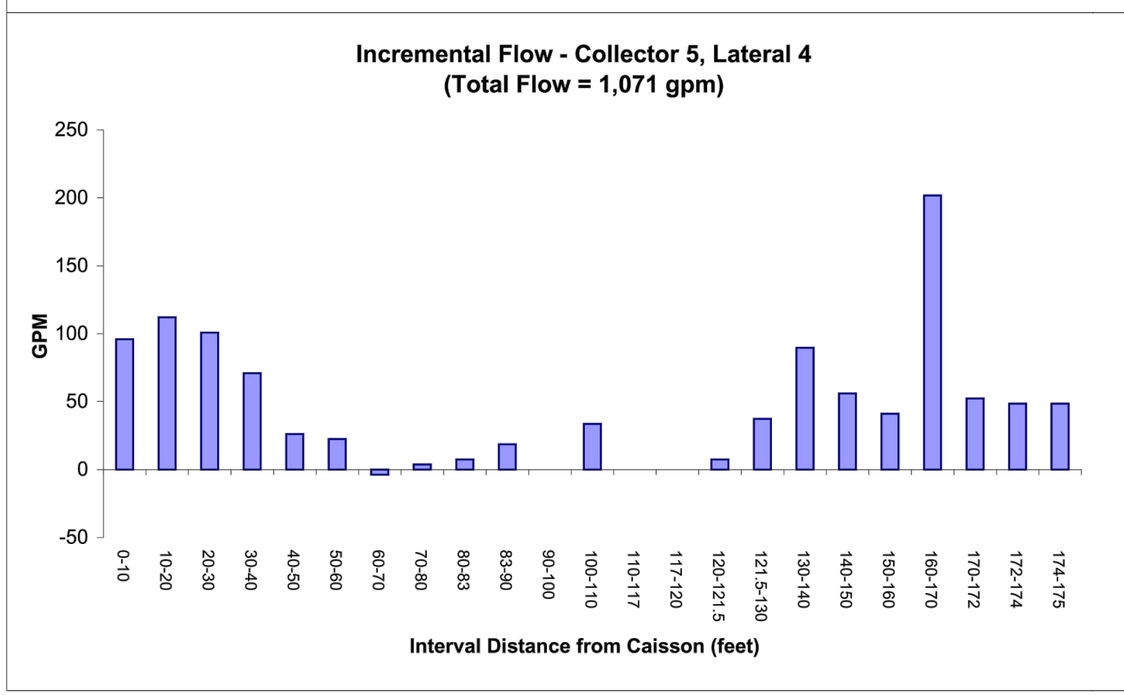
14.4 | 1071 | 6.1
gpm/ft
gpm
%

Figure 28
Relative Lateral Flow Data
Collector #5
Sonoma County Water Agency
Sonoma County, California

ERM 06/11







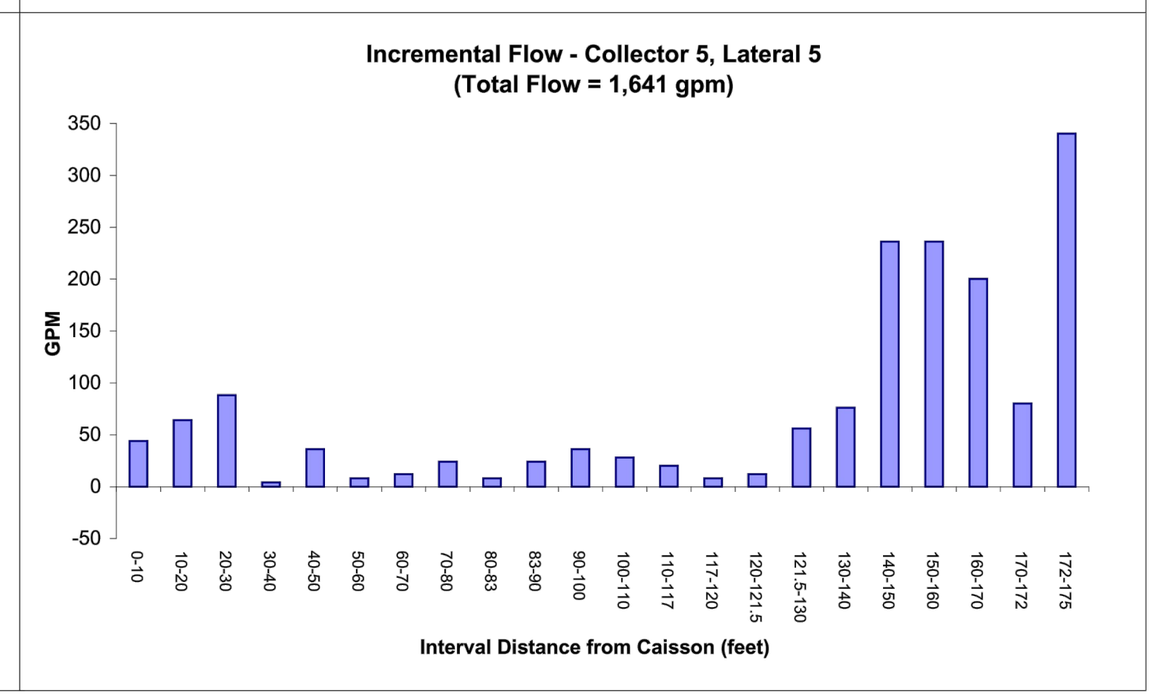
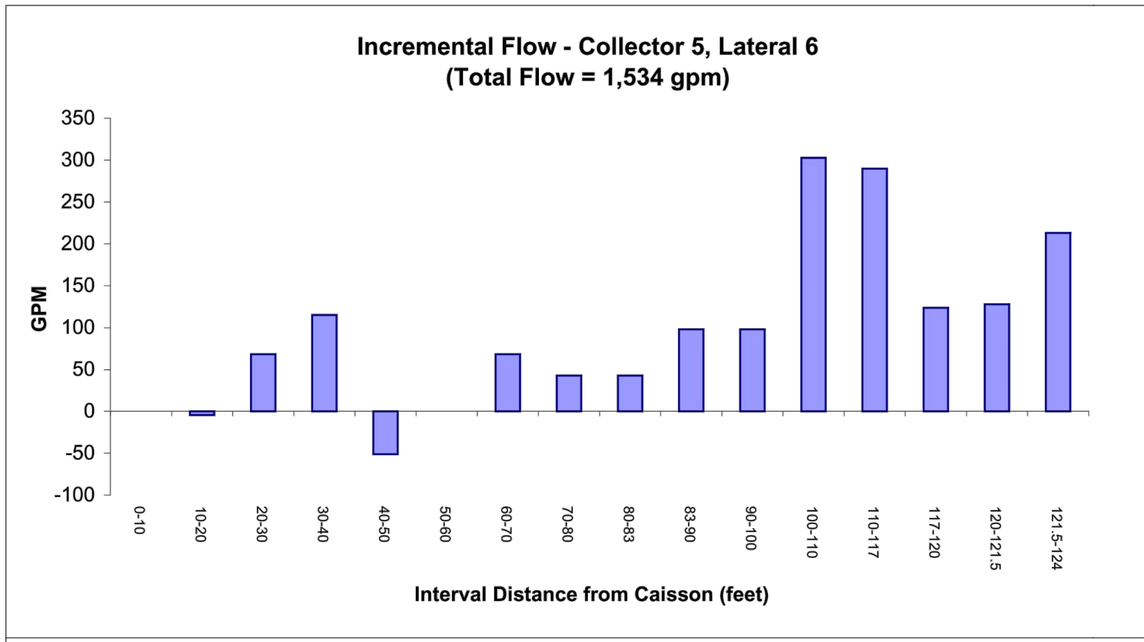


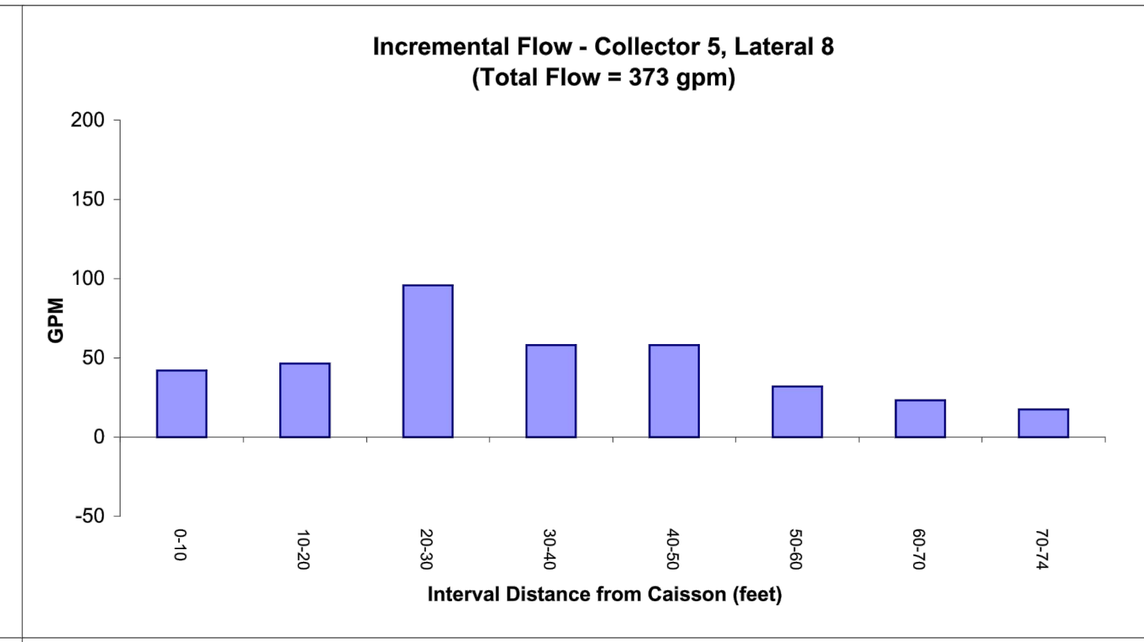
Figure 29a

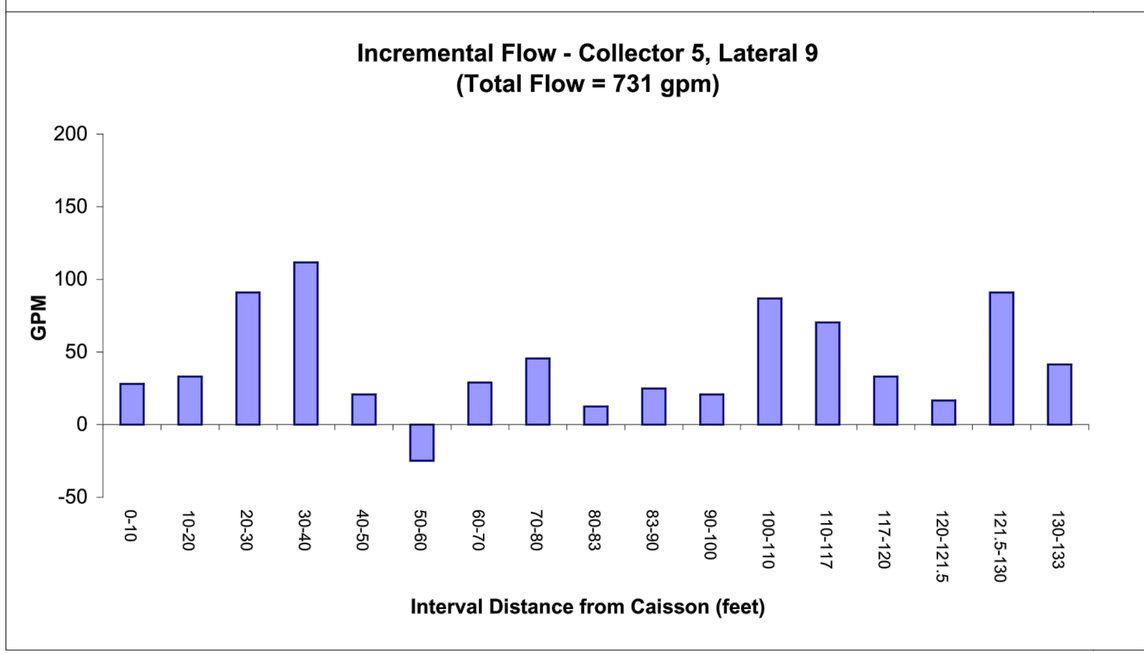
Incremental Flow - Collector 5 Laterals
Sonoma County Water Agency
Sonoma County, California

ERM 06/11

Project No. 0090596.03
Date: 06/30/11
Drawn By: J. Estrada
CAD File: g:\\00090596\03\00905960 3-29.dwg







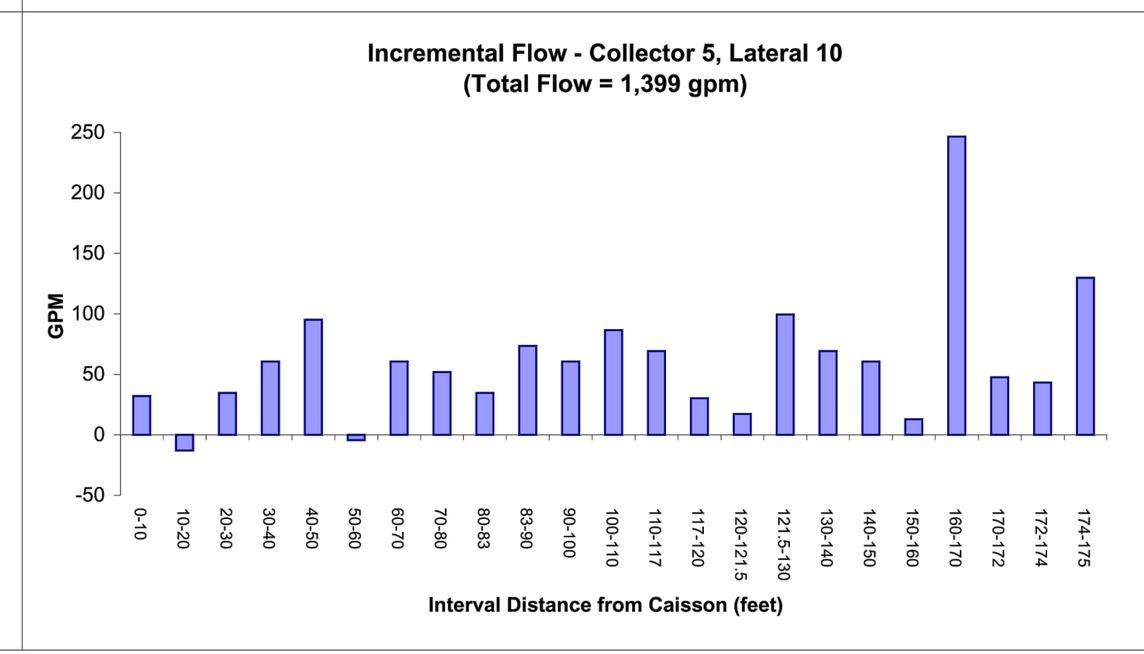


Figure 29b

Incremental Flow - Collector 5 Laterals
Sonoma County Water Agency
Sonoma County, California

ERM 06/11

CAD File: g:\000090596\03\00905960 3-29.dwg
Drawn By: J. Estrada
Date: 06/30/11
Project No. 0090596.03

CAD File:	Drawn By:	Date:	Project No.
g:\\000090596\03\009059603-27.dwg	J. Estrada	06/30/11	0090596.03

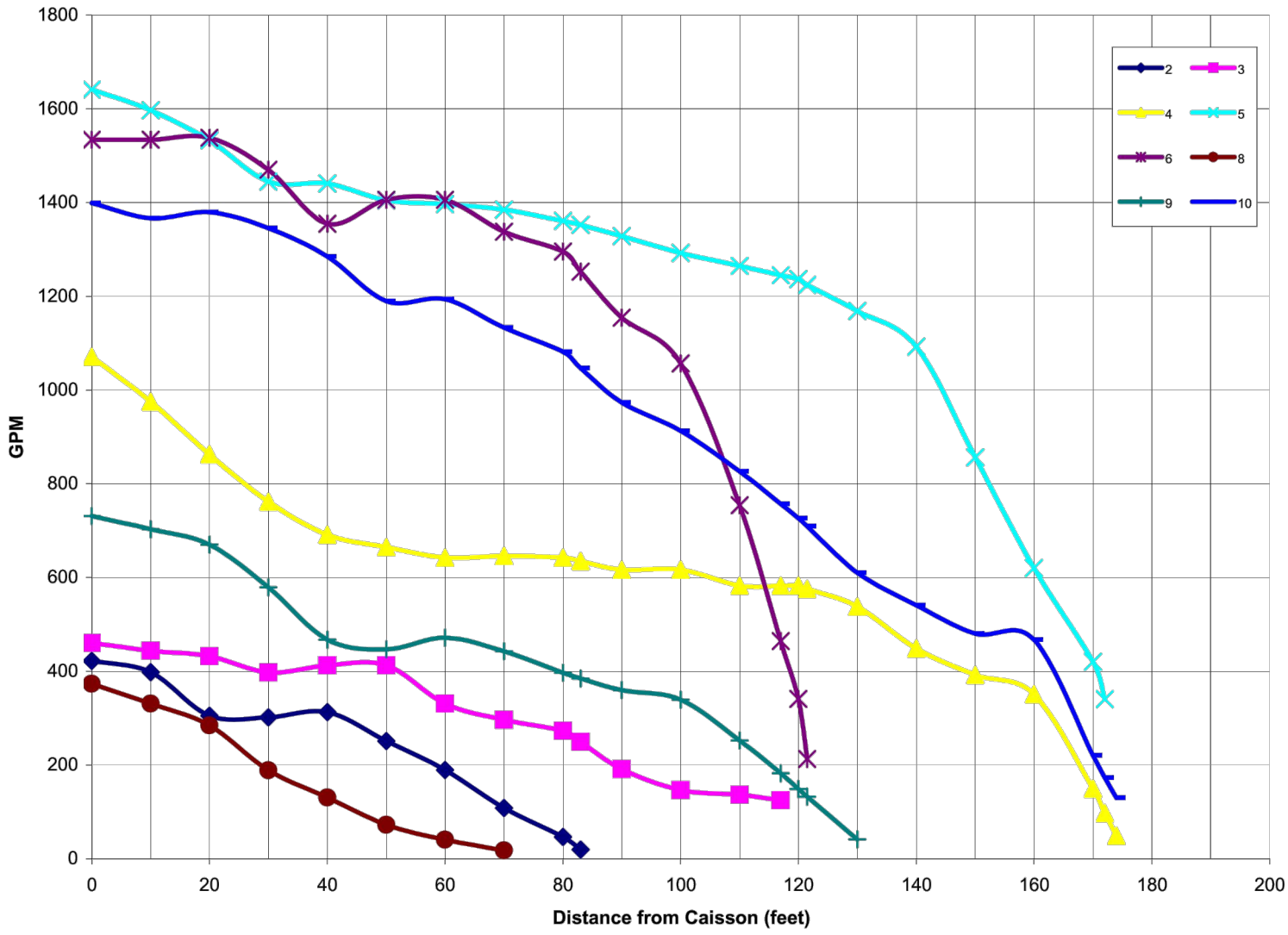


Figure 30

Flow versus Distance from Caisson
Collector 5 Laterals
Sonoma County Water Agency
Sonoma County, California

ERM *06/11*

CAD File:	Drawn By:	Date:	Project No.
g:\\000090596\03\009059603-27.dwg	J. Estrada	06/30/11	0090596.03

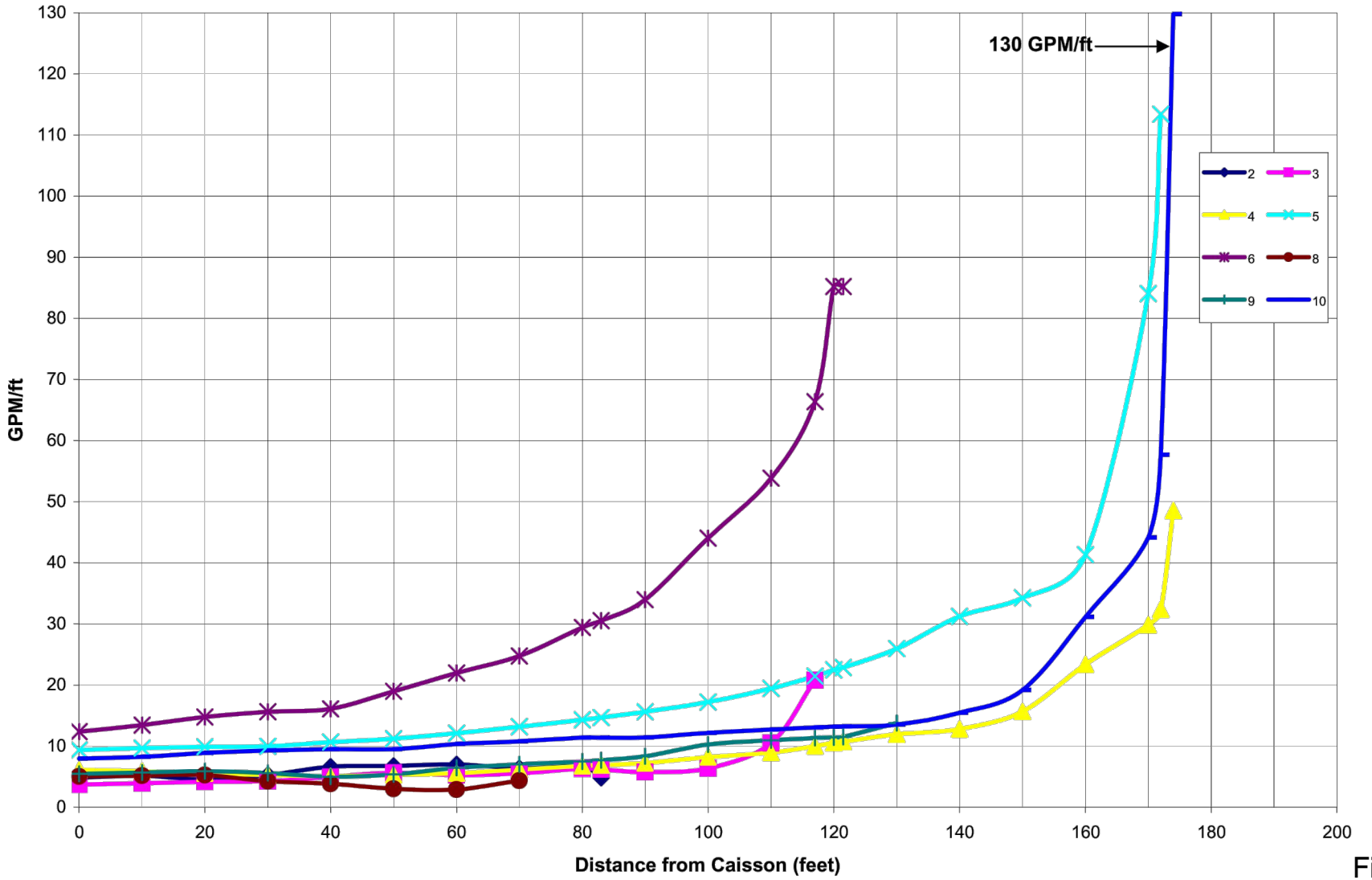


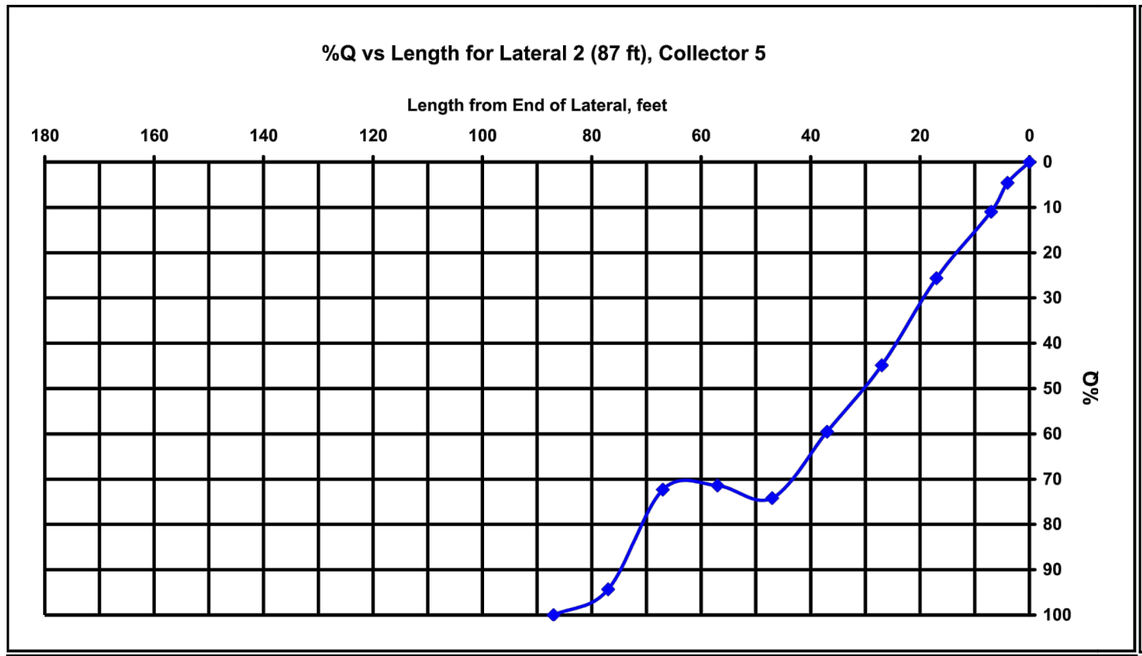
Figure 31

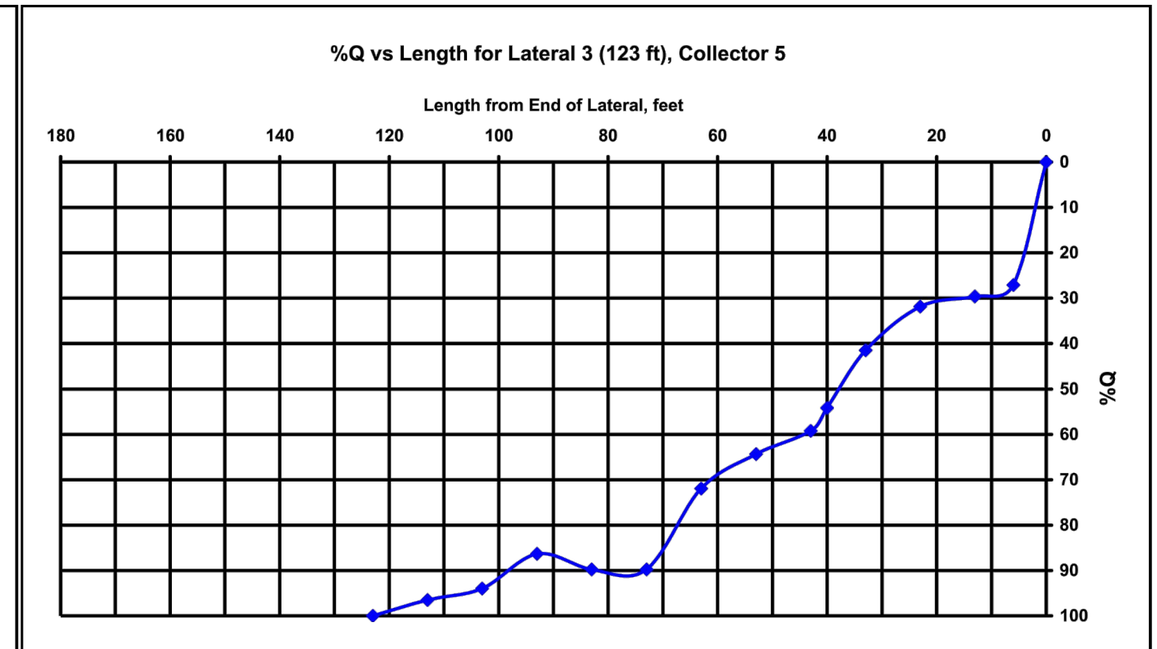
Flow/Screen Length at Distances from Caisson in Collector 5 Laterals

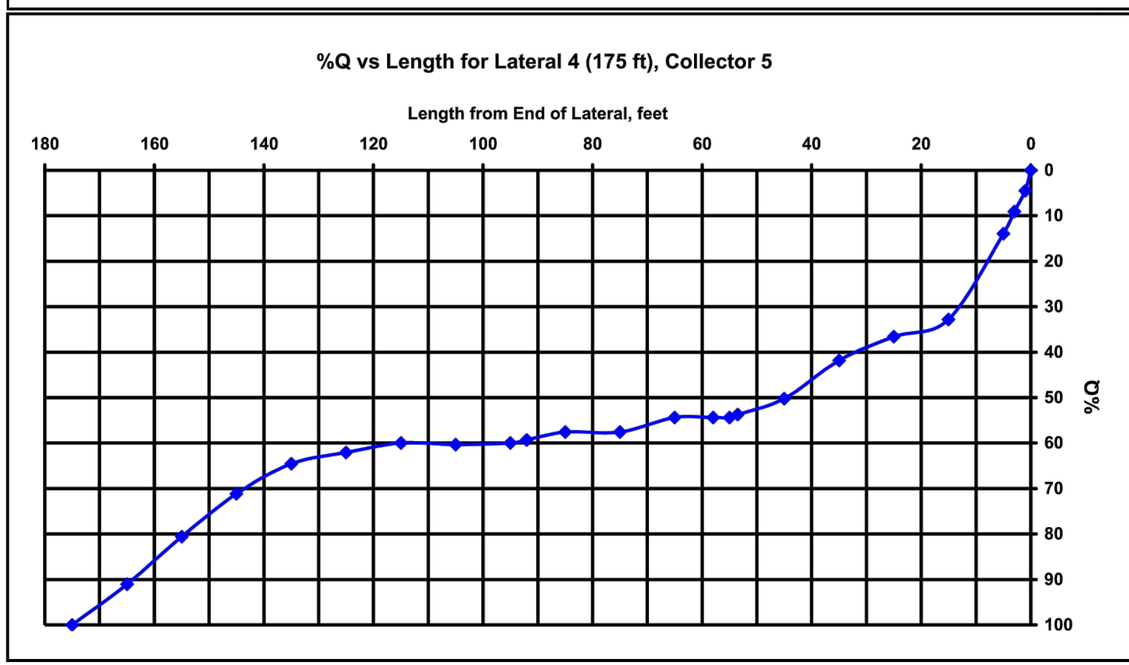
Sonoma County Water Agency

Sonoma County, California

ERM *06/11*







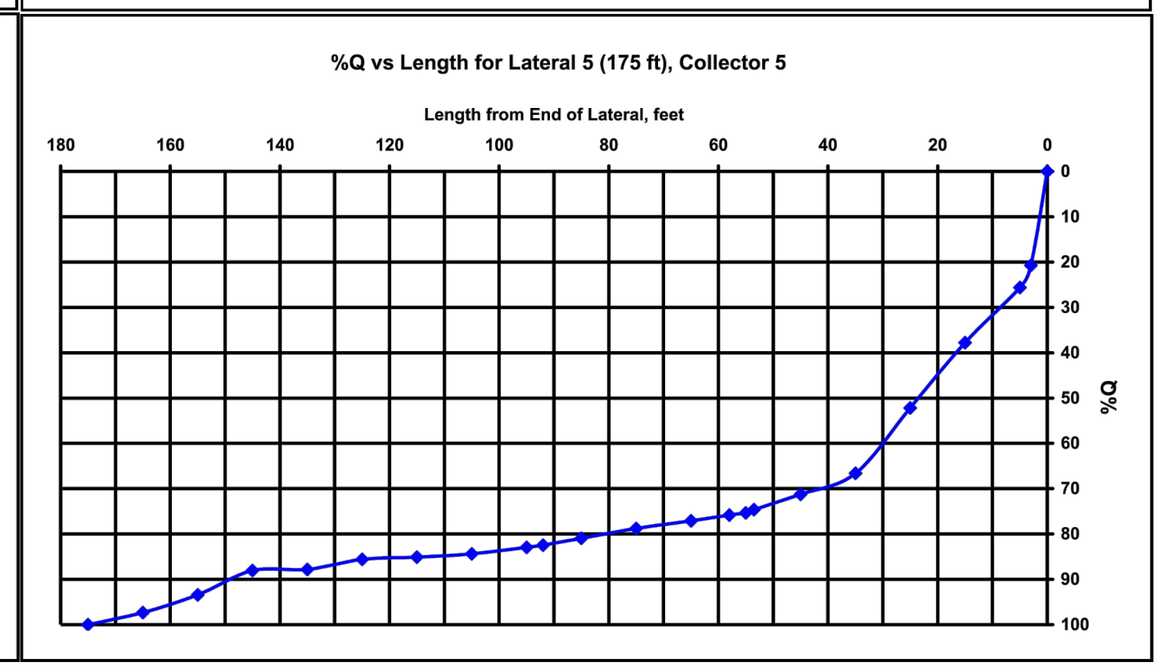
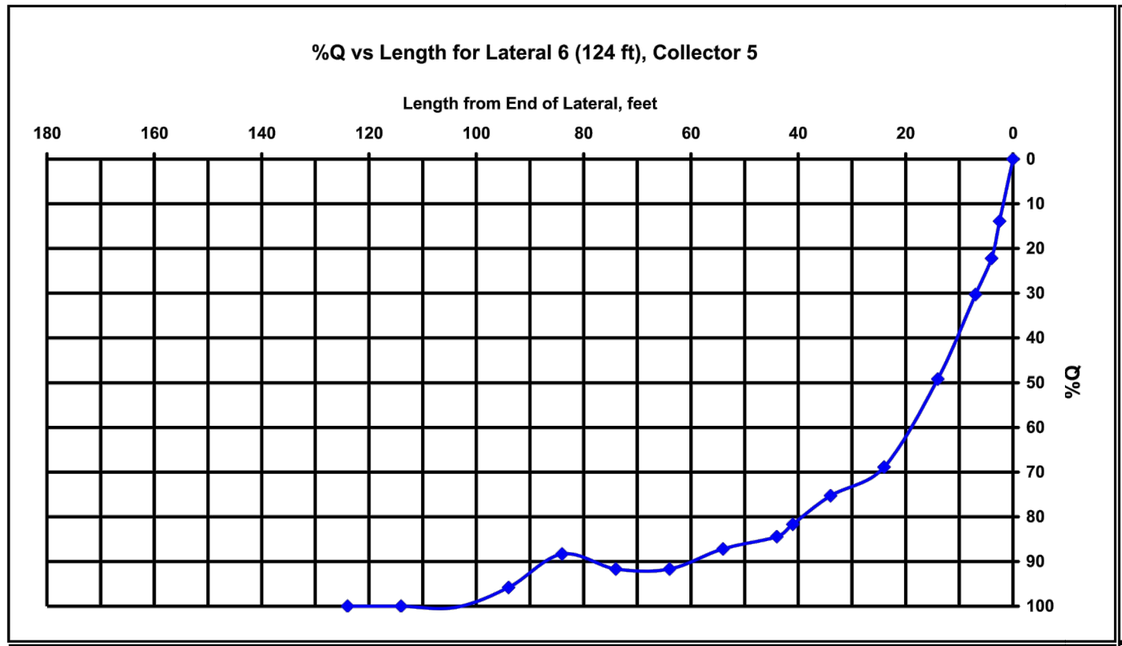


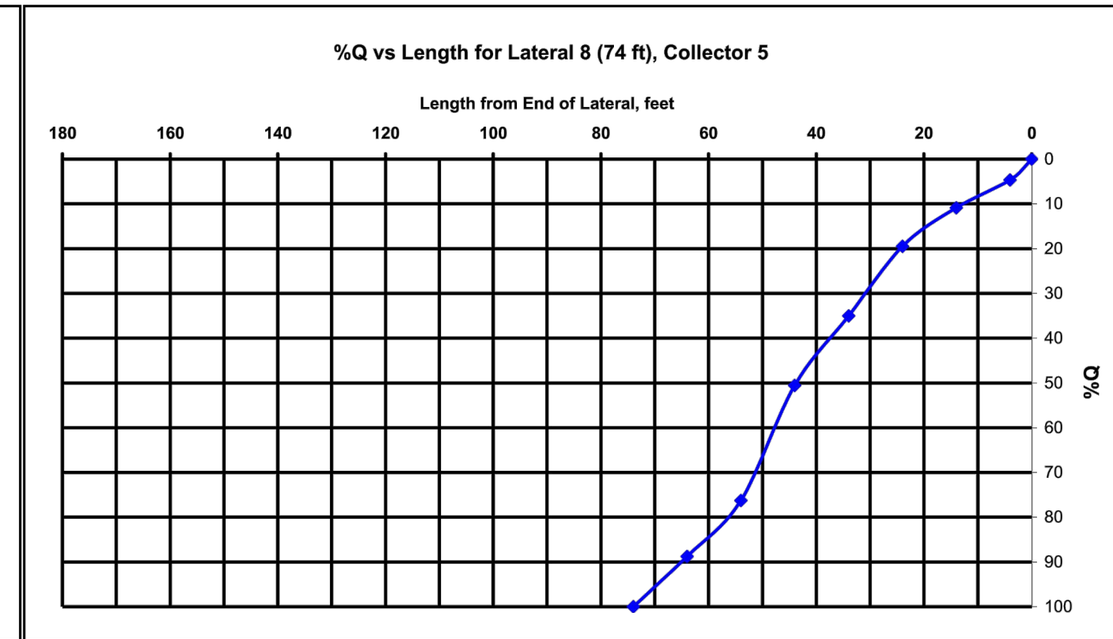
Figure 32a

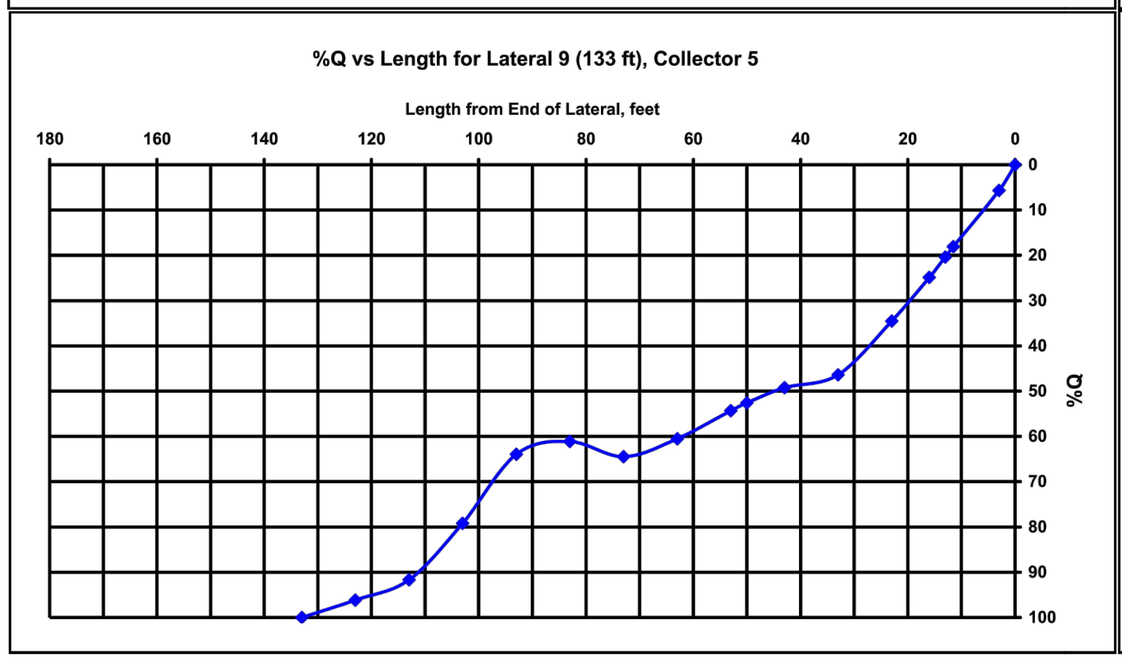
Percent Flow (Q) vs Length - Collector 5 Laterals
Sonoma County Water Agency
Sonoma County, California

ERM 09/11

CAD File: g:\000090596\03\009059603-30.dwg
Drawn By: J. Estrada
Date: 09/02/11
Project No. 0090596.03







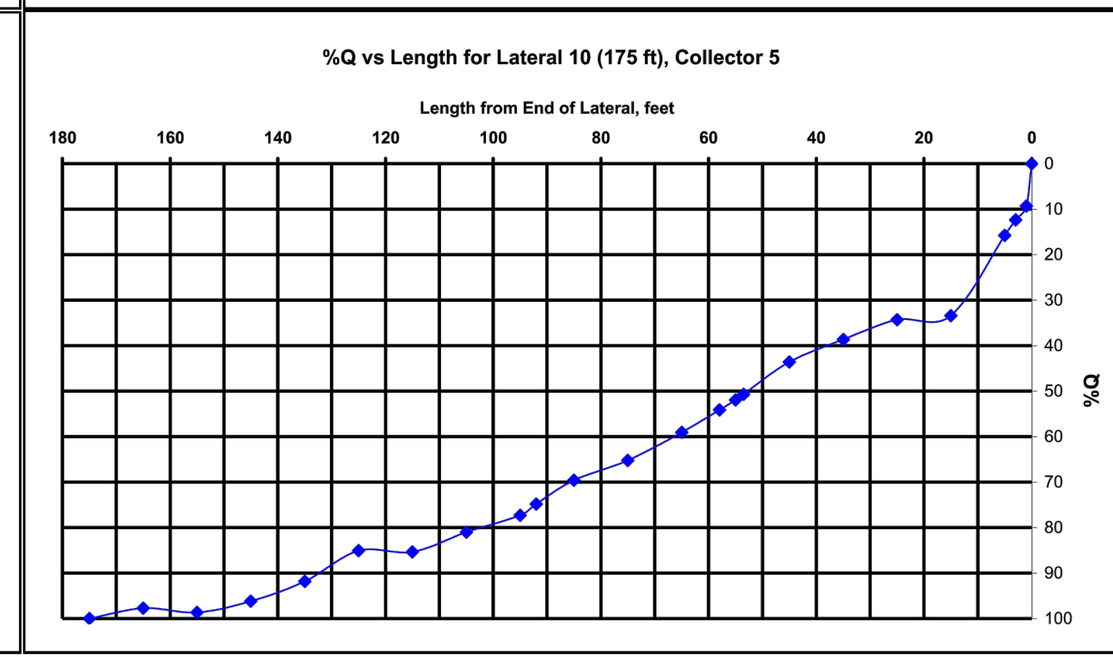


Figure 32b

Percent Flow (Q) vs Length - Collector 5 Laterals
Sonoma County Water Agency
Sonoma County, California

ERM 09/11

Project No. 0090596.03
Date: 09/02/11
Drawn By: J. Estrada
CAD File: g:\\00090596\03\00905960 3-30.dwg

Tables

Table 1
Summary of Construction Parameters, Collectors 3, 4, & 5
Sonoma County Water Agency

Collector Well 3	
Year Constructed	1975
Pump Floor Elevation, ft AMSL	78.05
Bottom Floor Elevation, ft AMSL	-33.05
Total Caisson Length, feet	111.1
Inside Diameter of Caisson, feet	13

Lateral Number	Diameter (in)	Length (ft)	Material	Elevation (msl)	Notes
1	10	172.5	Mild Steel	-29.55	
2	10	173.5	Mild Steel	-29.55	
3	10	173.5	Mild Steel	-29.55	
4	10	173.5	Mild Steel	-29.55	
5	10	173.5	Mild Steel	-29.55	
6	10	134	Mild Steel	-29.55	

Collector Well 4	
Year Constructed	1975
Pump Floor Elevation, ft AMSL	77.95
Bottom Floor Elevation, ft AMSL	-35.75
Total Caisson Length, feet	113.7
Inside Diameter of Caisson, feet	13

Lateral Number	Diameter (in)	Length (ft)	Material	Elevation (msl)	Notes
1	10	124.5	Mild Steel	-33.05	
2	10	172.5	Mild Steel	-33.05	
3	10	172.5	Mild Steel	-33.05	
4	10	152.5	Mild Steel	-33.05	
5	10	110.5	Mild Steel	-33.05	
6					Blank Port
7	10	172.5	Mild Steel	-33.05	
8	10	96.5	Mild Steel	-33.05	

Collector Well 5	
Year Constructed	1982
Pump Floor Elevation, ft AMSL	77.91
Bottom Floor Elevation, ft AMSL	-21.29
Total Caisson Length, feet	99.2
Inside Diameter of Caisson, feet	13

Lateral Number	Diameter (in)	Length (ft)	Material	Elevation (msl)	Notes
1	10	168	Mild Steel	-17.79	
2	10	87	Mild Steel	-17.79	
3	10	123	Mild Steel	-17.79	
4	10	175	Mild Steel	-17.79	
5	10	175	Mild Steel	-17.79	
6	10	124	Mild Steel	-17.79	
7	10	70	Mild Steel	-17.79	
8	10	74	Mild Steel	-17.79	
9	10	133	Mild Steel	-17.79	
10	10	175	Mild Steel	-17.79	

Table 2
Capacity Testing Monitoring Schedule, Collector Wells 3, 4, & 5
Mirabel Wellfield
Sonoma County Water Agency

Location of Test	Observation Points	Background Measurement Frequency	Background Period	Recovery Measurement Frequency	Recovery Period	Test Measurement Frequency	Test Period
	Date	**9/23/2010**		**9/27/2010**		**10/4/2010**	
Collector 3	Collector 3	5 min	9/23-9/27	5 sec	60 min prior to 180 minutes after pump shutdown	5 sec	60 min prior to 180 minutes after pump start
				1 min	Until 10/4	1 min	Until 10/8
	Collector 4	5 min	9/23-9/27	5 sec	60 min prior to 180 minutes after pump shutdown	5 sec	60 min prior to 180 minutes after pump start
				1 min	Until 10/4	1 min	Until 10/8
	Collector 5	5 min	9/23-9/27	5 sec	60 min prior to 180 minutes after pump shutdown	5 sec	60 min prior to 180 minutes after pump start
				1 min	Until 10/4	1 min	Until 10/8
	CP-OW-01 A, B, or C	5 min	9/23-9/27	5 sec	60 min prior to 180 minutes after pump shutdown	5 sec	60 min prior to 180 minutes after pump start
				1 min	Until 10/4	1 min	Until 10/8
	LBNL G-1	5 min	9/23-9/27	5 sec	60 min prior to 180 minutes after pump shutdown	5 sec	60 min prior to 180 minutes after pump start
				1 min	Until 10/4	1 min	Until 10/8
	PZ-97-4	5 min	9/23-9/27	5 sec	60 min prior to 180 minutes after pump shutdown	5 sec	60 min prior to 180 minutes after pump start
				1 min	Until 10/4	1 min	Until 10/8
	SB-OW-2 A or B	1 min	9/23-9/27	1 min	9/27-10/4	1 min	10/4-10/8
	PZ-97-3	1 min	9/23-9/27	1 min	9/27-10/4	1 min	10/4-10/8
	PZ-97-2	1 min	9/23-9/27	1 min	9/27-10/4	1 min	10/4-10/8
	PZ-97-1	1 min	9/23-9/27	1 min	9/27-10/4	1 min	10/4-10/8
	MW-93-2	1 min	9/23-9/27	1 min	9/27-10/4	1 min	10/4-10/8
	River	1 min	9/23-9/27	1 min	9/27-10/4	1 min	10/4-10/8

Table 2
Capacity Testing Monitoring Schedule, Collector Wells 3, 4, & 5
Mirabel Wellfield
Sonoma County Water Agency

Location of Test	Observation Points	Background Measurement Frequency	Background Period	Recovery Measurement Frequency	Recovery Period	Test Measurement Frequency	Test Period
	Date	**10/8/2010**		**10/11/2010**		**10/18/2010**	
Collector 5	Collector 5	5 min	10/8-10/11	5 sec	60 min prior to 180 minutes after pump shutdown	5 sec	60 min prior to 180 minutes after pump start
				1 min	Until 10/18	1 min	Until 10/22
	Collector 4	5 min	10/8-10/11	5 sec	60 min prior to 180 minutes after pump shutdown	5 sec	60 min prior to 180 minutes after pump start
				1 min	Until 10/18	1 min	Until 10/22
	Collector 3	5 min	10/8-10/11	5 sec	60 min prior to 180 minutes after pump shutdown	5 sec	60 min prior to 180 minutes after pump start
				1 min	Until 10/18	1 min	Until 10/22
	CP-OW-01 A, B, or C	5 min	10/8-10/11	5 sec	60 min prior to 180 minutes after pump shutdown	5 sec	60 min prior to 180 minutes after pump start
				1 min	Until 10/18	1 min	Until 10/22
	LBNL G-1	5 min	10/8-10/11	5 sec	60 min prior to 180 minutes after pump shutdown	5 sec	60 min prior to 180 minutes after pump start
				1 min	Until 10/18	1 min	Until 10/22
	PZ-97-4	5 min	10/8-10/11	5 sec	60 min prior to 180 minutes after pump shutdown	5 sec	60 min prior to 180 minutes after pump start
				1 min	Until 10/18	1 min	Until 10/22
	SB-OW-2 A or B	1 min	10/8-10/11	1 min	10/11-10/18	1 min	10/18-10/22
	PZ-97-3	1 min	10/8-10/11	1 min	10/11-10/18	1 min	10/18-10/22
	PZ-97-2	1 min	10/8-10/11	1 min	10/11-10/18	1 min	10/18-10/22
	PZ-97-1	1 min	10/8-10/11	1 min	10/11-10/18	1 min	10/18-10/22
	MW-93-2	1 min	10/8-10/11	1 min	10/11-10/18	1 min	10/18-10/22
	River	1 min	10/8-10/11	1 min	10/11-10/18	1 min	10/18-10/22

Table 2
Capacity Testing Monitoring Schedule, Collector Wells 3, 4, & 5
Mirabel Wellfield
Sonoma County Water Agency

Location of Test	Observation Points	Background Measurement Frequency	Background Period	Recovery Measurement Frequency	Recovery Period	Test Measurement Frequency	Test Period
	Date	**10/22/2010**		**11/1/2010**		**11/8/2010**	
Collector 4	Collector 4	5 min	10/22-11/1	5 sec	60 min prior to 180 minutes after pump shutdown	5 sec	60 min prior to 180 minutes after pump start
				1 min	Until 11/8	1 min	Until 11/12
	Collector 5	5 min	10/22-11/1	5 sec	60 min prior to 180 minutes after pump shutdown	5 sec	60 min prior to 180 minutes after pump start
				1 min	Until 11/8	1 min	Until 11/12
	Collector 3	5 min	10/22-11/1	5 sec	60 min prior to 180 minutes after pump shutdown	5 sec	60 min prior to 180 minutes after pump start
				1 min	Until 11/8	1 min	Until 11/12
	CP-OW-01 A, B, or C	5 min	10/22-11/1	5 sec	60 min prior to 180 minutes after pump shutdown	5 sec	60 min prior to 180 minutes after pump start
				1 min	Until 11/8	1 min	Until 11/12
	LBNL G-1	5 min	10/22-11/1	5 sec	60 min prior to 180 minutes after pump shutdown	5 sec	60 min prior to 180 minutes after pump start
				1 min	Until 11/8	1 min	Until 11/12
	PZ-97-4	5 min	10/22-11/1	5 sec	60 min prior to 180 minutes after pump shutdown	5 sec	60 min prior to 180 minutes after pump start
				1 min	Until 11/8	1 min	Until 11/12
	SB-OW-2 A or B	1 min	10/22-11/1	1 min	11/1-11/8	1 min	11/8-11/12
	PZ-97-3	1 min	10/22-11/1	1 min	11/1-11/8	1 min	11/8-11/12
	PZ-97-2	1 min	10/22-11/1	1 min	11/1-11/8	1 min	11/8-11/12
	PZ-97-1	1 min	10/22-11/1	1 min	11/1-11/8	1 min	11/8-11/12
	MW-93-2	1 min	10/22-11/1	1 min	11/1-11/8	1 min	11/8-11/12
	River	1 min	10/22-11/1	1 min	11/1-11/8	1 min	11/8-11/12

Table 3
Collector Well 3 Lateral Structural Integrity Determination
Sonoma County Water Agency

Lateral	Reported Length (feet)	Accessed Length (feet)	Original Screen Metal Thickness (inches)	Measured Thickness (inches)				Average Thickness (inches)	Change in Thickness (inches)
				12:00 position	3:00 position	6:00 position	9:00 position		
1	172.5	166	0.322	0.195	0.185	0.170	0.172	0.181	-0.14
2	173.5	173.5	0.322	0.355	0.335	0.315	0.315	0.330	0.01
3	173.5	170	0.322	0.160	0.375	0.325	0.345	0.301	-0.02
4	173.5	173.5	0.322	0.375	0.130	0.365	0.320	0.298	-0.02
5	173.5	173.5	0.322	0.120	0.145	0.175	0.355	0.199	-0.12
6	134	123	0.322	0.275	0.180	0.235	0.360	0.263	-0.06
	1,001	*979.5*							

NOTE:
Lateral screen thicknesses measured using Check-Line underwater ultrasonic digital thickness gauge at the 12:00, 3:00, 6:00, and 9:00 positions.
Original screen metal thickness of Laterals 1-6 represents the estimated wall thickness of the carbon steel screen.
NA - Not accessed
NM - Not measured

Table 4
Comparison of Specific Capacities for Collectors 3, 4 and 5
Sonoma County Water Agency
October-December 2010

Duration of Pumping	Collector Well 3			Collector Well 4			Collector Well 5		
	2010 Testing	1998 Inspection	Performance Testing After 1975 Construction	2010 Testing	1998 Inspection	Performance Testing After 1975 Construction	2010 Testing	1998 Inspection	Performance Testing After 1982 Construction
2-3 Hours							658	437* [estimate +/- 568]	540
5 Hours	856			746			655		
24 Hours	725			583			539		478
48 hours	696	297* [estimate +/- 357]	580	492	328* [estimate +/- 356]	597	512		
96 Hours	687			423			470		
168 Hours	671			402			419		

Note: Specific Capacities are presented as gallons per minute per foot of drawdown (GPM/ft)
* denotes specific capacity referenced in 1998 report.
[+/- 357] denotes revision of specific capacity presented in 1998 inspection report, based on consideration of mutual interference between wells.

Table 5
Collector Well 3 Relative Lateral Flow Analysis
Sonoma County Water Agency

	Reported	Accessed	2010 Capacity Testing				1998 Inspection			
	Length	Length	Relative Flow			Temperature	Relative Flow			Temperature
Lateral	(feet)	(feet)	(Percent)	(gpm)	(gpm/lft)	(Degrees C)	(Percent)	(gpm)	(gpm/lft)	(Degrees C)
1	172.5	166	20.6	1985	11.5	20.95	21.9	1946	11.3	NA
2	173.5	173.5	20.6	1985	11.4	20.52	21.7	1928	11.1	NA
3	173.5	170	18.4	1767	10.2	20.34	21.4	1902	10.9	NA
4	173.5	173.5	12.1	1160	6.7	20.84	11.4	1013	5.8	NA
5	173.5	173.5	14.2	1365	7.9	20.63	12.4	1102	6.3	NA
6	134	123	14.1	1356	10.1	20.29	11.2	995	7.4	NA
Total	**1000.5**		**100**	**9,618**			**100**	**8888**		

NOTES:
Data from 1998 test were obtained from 1998 Collector Well International report.
NA - Laterals not tested
gpm - gallons per minute
gpm/ft - gallons per minute per lineal foot
C - Celsius

Table 6
Flow Distribution Along Collector Well 3 Laterals
October 2010
Sonoma County Water Agency

Distance	Lateral No. 1			Lateral No. 2			Lateral No. 3			Lateral No. 4			Lateral No. 5			Lateral No. 6		
	Total Length = 172.5 feet			Total Length = 173.5 feet			Total Length = 173.5 feet			Total Length = 173.5 feet			Total Length = 173.5 feet			Total Length = 134 feet		
	20.6% of Total Flow Rate			20.6% of Total Flow Rate			18.4% of Total Flow Rate			12.1% of Total Flow Rate			14.2% of Total Flow Rate			14.1% of Total Flow Rate		
(feet)	Meter	GPM	GPM/ft	Meter	GPM	GPM/ft	Meter	GPM	GPM/ft	Meter	GPM	GPM/ft	Meter	GPM	GPM/ft	Meter	GPM	GPM/ft
0		1985	11.51		1985	11.44		1767	10.18		1160	6.69		1365	7.87		1356	10.12
10	222.5	1893	11.65	222.5	1893	11.58	198	1710	10.46	130	1121	6.86	153	1365	8.35	152	1316	10.61
20	176	1497	9.82	183.5	1561	10.17	193.5	1671	10.89	127.5	1099	7.16	153	1365	8.89	146.5	1268	11.13
30	163.5	1391	9.76	160	1361	9.49	181.5	1568	10.92	122	1038	7.23	150	1338	9.33	140.5	1216	11.70
40	149	1268	9.57	147	1251	9.37	177.5	1533	11.48	116.5	991	7.42	151.5	1352	10.12	137	1186	12.62
50	153	1302	10.63	130	1106	8.96	166.5	1438	11.64	112.5	957	7.75	152.5	1361	11.02	119.5	1035	12.32
60	140.5	1195	10.63	114.5	974	8.58	164.5	1421	12.52	119	1012	8.92	144.5	1289	11.36	123.5	1069	14.45
70	138	1174	11.45	112	953	9.21	162	1399	13.52	112.5	957	9.25	151.5	1352	13.06	120.5	1043	16.30
80	135	1149	12.42	110.5	940	10.05	161	1390	14.87	111	944	10.10	133.5	1191	12.74	117	1013	18.76
90	132	1123	13.61	94	800	9.58	150.5	1300	15.57	104.5	889	10.65	119.5	1066	12.77	93	805	18.30
100	131.5	1119	15.43	85.5	727	9.90	137.5	1188	16.16	110	936	12.73	103.5	923	12.56	68	589	17.32
110	117	995	15.93	78	664	10.45	124.5	1075	16.93	105	893	14.07	100.5	897	14.12	50	433	18.04
120	106	902	17.18	71.5	608	11.37	114.5	989	18.48	95	808	15.11	101	901	16.84	26.5	229	16.39
123	102	868	17.53	72	613	12.13	114.3	987	19.55	93	791	15.67	101.3	904	17.90	17	147	13.38
130	90.5	770	18.12	73	621	14.28	114	985	22.63	87.5	744	17.11	102	910	20.92	na	na	na
140	83	706	21.73	67	570	17.02	89.5	773	23.07	75	638	19.05	101.5	906	27.03	-	-	-
150	69.5	591	26.28	55	468	19.91	70	605	25.73	56.5	481	20.45	95	848	36.07	-	-	-
160	49.5	421	33.69	51	434	32.14	53.5	462	34.23	26	221	16.39	78	696	51.55	-	-	-
166	42	357	54.97	41	349	46.51	44	380	50.67	18	153	20.42	50	446	59.48	-	-	-
170	na	na	na	34	289	82.65	37	320	91.30	13	111	31.60	32	285	81.57	-	-	-
173	-	-	-	19	162	323	na	na	na	8	68	136	na	na	na	-	-	-

Notes:
GPM = gallons per minute
GPM/ft = gallons per minute per lineal foot
Meter value equals number of flow revolutions per minute
na = not accessed
Flow during test period = 13.85 million of gallons per day (MGD) = 9618 GPM

Table 7
Incremental Flow Along Collector Well 3 Laterals
Sonoma County Water Agency
October 2010 Evaluation

Distance from	Lateral 1		Lateral 2		Lateral 3		Lateral 4		Lateral 5		Lateral 6		Overall		
Caisson, feet	GPM	GPM/lft	GPM	GPM/lft	GPM	GPM/lft	GPM	GPM/lft	GPM	GPM/lft	GPM	GPM/lft	GPM	Percent	GPM/lft
0 - 50	683	13.66	879	17.58	329	6.58	203	4.06	4	0.08	321	6.42	2419	25.2%	8.06
50 - 100	183	3.66	379	7.58	250	5.00	21	0.42	438	8.76	446	8.92	1717	17.9%	5.72
100 - 150	528	10.56	259	5.18	583	11.66	455	9.10	75	1.50	589/34'	17.32	2489	25.9%	9.22
> 150	591/22.5'	26.28	468/23.5'	19.91	605/23.5'	25.73	481/23.5'	20.45	848/23.5'	36.07			2993	31.1%	25.70
													9,618	100.1%	

Performance of Collector Laterals within 60 feet of Caisson

Lateral No.	1	2	3	4	5	6	Overall
GPM	790	1011	346	148	76	287	2658
% Flow	39.8%	50.9%	19.6%	12.8%	5.5%	21.2%	27.6%
GPM/lft	13.17	16.85	5.77	2.47	1.27	4.78	7.38

Percentage Flow Contribution by Relative Segment of Lateral

Lateral No.	1	2	3	4	5	6	Average
Inner Third	38.5%	49.6%	19.4%	17.5%	4.5%	18.1%	24.6%
Middle Third	13.7%	18.6%	22.7%	9.9%	29.6%	21.0%	19.3%
Outer Third	47.8%	31.7%	57.9%	72.6%	65.9%	60.9%	56.1%

LEGEND:
591/22.5' - Used for Laterals that did not span the entire range and corresponds to gpm per feet of lateral within the interval. Example corresponds to 591 gpm for 22.5 feet of lateral.

NOTE:
GPM - Gallons Per Minute
GPM/lft - Gallons Per Minute per lineal foot

Table 8
Flow at Outer Ends of Collector Well 3 Laterals
Sonoma County Water Agency
October 2010 Evaluation

Percentage Flow at Outer End of Laterals

	Within Outer 20 feet		Within Outer 30 feet	
Lateral No.	**GPM**	**% Flow**	**GPM**	**% Flow**
1	549	27.6	677	34.1
2	456	23.0	534	26.9
3	555	31.4	714	40.4
4	390	33.6	583	50.3
5	795	58.2	886	64.9
6	351	25.9	527	38.8

Reduction in Unit Flow Rate at End (Outer Extent) of Laterals
(End Starting Point is Last Accessible Measured Flow Meter Reading)

	Last Measured GPM/ft Near	20 feet From Measured End		30 feet From Measured End	
Lateral No.	**End of Lateral**	**GPM/ft**	**% Reduction**	**GPM/ft**	**% Reduction**
1	54.97	24.46	55.5%	20.29	63.1%
2	323	23.58	92.7%	17.89	94.5%
3	91.30	25.73	71.8%	23.07	74.7%
4	136	19.23	85.9%	19.47	85.7%
5	81.57	36.07	55.8%	27.03	66.9%
6	13.38	17.54	[+31.1%]*	18.01	[+34.6%]*

NOTE:
GPM/ft - Gallons per minute per lineal foot
* - Gain in flow shown with brackets and + sign [+31.1%]

Table 9
Collector 3 Water Quality Field Results
Sonoma County Water Agency

Lateral Number	Elevation (msl)	Date	Time	pH	ORP (mV)	DO (mg/L)	Conductivity (mS/cm)	Salinity (ppt)	TDS (g/L)	Turbidity (NTU)	Temp (Celsius)
1	-29.55	10/4/2010	11:38	6.81	109.6	6.73	0.197	0.1	0.139	0.07	20.95
2	-29.55	10/4/2010	11:42	6.67	110	6.2	0.202	0.1	0.143	0.08	20.52
3	-29.55	10/4/2010	11:47	6.83	125	6.1	0.204	0.11	0.146	0.06	20.34
4	-29.55	10/4/2010	11:51	6.76	100	6.58	0.201	0.1	0.142	0.05	20.84
5	-29.55	10/4/2010	11:56	6.99	89	6.47	0.201	0.1	0.143	0.07	20.63
6	-29.55	10/4/2010	12:01	7.24	80	6.29	0.205	0.11	0.147	0.06	20.29
Total Discharge	**(pump intake)**	**10/4/2010**	**12:05**	**7.16**	**79**	**6.37**	**0.202**	**0.1**	**0.144**	**0.06**	**20.56**

NOTE:
Parameters measured using a YSI Model 6920 downhole probe.
ORP - Oxygen Reduction Potential
DO - Dissolved Oxygen
TDS - Total Dissolved Solids
msl - mean sea level
mV - millivolts
mg/L - milligrams per liter
mS/cm - millisiemens per centimeter
ppt - parts per thousand
g/L - grams per liter
NTU - Nephelometric Turbidity Units

Table 10
Collector Well 4 Lateral Structural Integrity Determination
Sonoma County Water Agency

Lateral	Reported Length (feet)	Accessed Length (feet)	Original Screen Metal Thickness (inches)	Measured Thickness (inches) 12:00 position	3:00 position	6:00 position	9:00 position	Average Thickness (inches)	Change in Thickness (inches)
1	124.5	NA	0.322	0.115	0.235	0.210	0.345	0.226	-0.10
2	172.5	172.5	0.322	0.230	0.255	0.175	0.225	0.221	-0.10
3	172.5	172.5	0.322	0.130	0.225	0.390	0.400	0.286	-0.04
4	152.5	152.5	0.322	0.360	0.375	0.150	0.125	0.253	-0.07
5	110.5	110.5	0.322	0.390	0.220	0.340	0.130	0.270	-0.05
6	Blank								
7	172.5	172.5	0.322	0.125	0.285	0.245	0.285	0.235	-0.09
8	96.5	96.5	0.322	0.225	0.215	0.215	0.265	0.230	-0.09
	1,002	*877*							

NOTE:
Lateral screen thicknesses measured using Check-Line underwater ultrasonic digital thickness gauge at the 12:00, 3:00, 6:00, and 9:00 positions.
Original screen metal thickness of Laterals 1-8 represents the estimated wall thickness of the carbon steel screen.
NA - Not accessed
NM - Not measured

Table 11
Collector Well 4 Relative Lateral Flow Analysis
Sonoma County Water Agency

	Reported	Accessed	2010 Capacity Testing				1998 Inspection			
	Length	Length	Relative Flow			Temperature	Relative Flow			Temperature
Lateral	(feet)	(feet)	(Percent)	(gpm)	(gpm/lft)	(Degrees C)	(Percent)	(gpm)	(gpm/lft)	(Degrees C)
1	124.5	NA	16.9	1658	13.3	17.01	15.4	1567	12.6	NA
2	172.5	172.5	17.3	1696	9.8	16.87	17.1	1745	10.1	NA
3	172.5	172.5	18.0	1764	10.2	16.77	16.2	1654	9.6	NA
4	152.5	152.5	13.3	1303	8.5	17.34	11.4	1164	7.6	NA
5	110.5	110.5	10.2	998	9.0	17.72	9.7	985	8.9	NA
6	Blank									
7	172.5	172.5	14.8	1451	8.4	16.16	20.2	2062	12.0	NA
8	96.5	96.5	9.7	956	9.9	16.93	10.1	1031	10.7	NA
Total	**1001.5**		**100**	**9,826**			**100**	**10,277**		

NOTES:
Data from 1998 test were obtained from 1998 Collector Well International report.
NA - Laterals not tested
gpm - gallons per minute
gpm/ft - gallons per minute per lineal foot
C - Celsius

Table 12
Flow Distribution Along Collector Well 4 Laterals
November-December 2010
Sonoma County Water Agency

Distance	Lateral No. 1			Lateral No. 2			Lateral No. 3			Lateral No. 4			Lateral No. 5			Lateral No. 7			Lateral No. 8		
	Total Length = 124.5 feet			Total Length = 172.5 feet			Total Length = 172.5 feet			Total Length = 152.5 feet			Total Length = 110.5 feet			Total Length = 172.5 feet			Total Length = 96.5 feet		
	16.9% of Total Flow Rate			17.3% of Total Flow Rate			17.95% of Total Flow Rate			13.3% of Total Flow Rate			10.2% of Total Flow Rate			14.8% of Total Flow Rate			9.73% of Total Flow Rate		
(feet)	Meter	GPM	GPM/ft	Meter	GPM	GPM/ft	Meter	GPM	GPM/ft	Meter	GPM	GPM/ft	Meter	GPM	GPM/ft	Meter	GPM	GPM/ft	Meter	GPM	GPM/ft
0		1658	13.32		1696	9.83		1764	10.23		1303	8.54		998	9.03		1451	8.41		956	9.91
10	na	na	na	208	1624	9.99	216.5	1698	10.45	147.5	1224	8.59	107	998	9.93	182	1451	8.93	113	940	10.87
20	na	na	na	194	1515	9.93	194	1522	9.98	132.5	1100	8.30	107	998	11.03	182	1451	9.51	112	932	12.18
30	na	na	na	172.5	1347	9.45	184	1443	10.13	120.5	1000	8.16	104	970	12.05	172	1371	9.62	102.5	853	12.82
40	na	na	na	162	1265	9.55	177	1388	10.48	111.5	925	8.22	102	951	13.49	173.5	1383	10.44	92.5	769	13.62
50	na	na	na	146	1140	9.31	164	1286	10.50	109	905	8.82	98	914	15.11	170	1355	11.06	78.5	653	14.04
60	na	na	na	150	1171	10.41	153	1200	10.67	95	788	8.52	86	802	15.88	170	1355	12.05	74.5	620	16.98
70	na	na	na	156.5	1222	11.92	137.5	1078	10.52	94.5	784	9.51	65	606	14.97	170	1355	13.22	56	466	17.58
80	na	na	na	148	1156	12.49	128	1004	10.85	80.5	668	9.21	53.5	499	16.36	156	1244	13.45	35	291	17.65
90	na	na	na	139	1085	13.15	119	933	11.31	74	614	9.83	41	382	18.65	145	1156	14.01	12	100	15.36
96	na	na	na	134	1046	13.68	114	894	11.69	72.5	602	10.65	31	289	19.94	137.5	1096	14.33	5.5	46	91.50
100	na	na	na	131	1023	14.11	111	871	12.01	71	589	11.22	24.5	229	21.76	132.5	1056	14.57	-	-	-
110	na	na	na	127	992	15.87	103	808	12.93	64	531	12.50	11.5	107	214.5	124	989	15.82	-	-	-
120	na	na	na	119	929	17.70	102	800	15.24	56	465	14.30	-	-	-	114	909	17.31	-	-	-
130	-	-	-	102.5	800	18.83	89	698	16.42	49	407	18.07	-	-	-	93.5	745	17.54	-	-	-
140	-	-	-	86	671	20.66	83	651	20.03	35	290	23.24	-	-	-	78	622	19.13	-	-	-
150	-	-	-	67	523	23.25	68	533	23.70	20	166	66.39	-	-	-	64	510	22.68	-	-	-
152	-	-	-	63	492	23.99	65	510	24.87	14	116	232.4	-	-	-	63	502	24.50	-	-	-
160	-	-	-	47	367	29.36	53	416	33.25	-	-	-	-	-	-	59	470	37.63	-	-	-
170	-	-	-	21	164	65.58	31.5	247	98.82	-	-	-	-	-	-	40	319	127.56	-	-	-
172	-	-	-	6	47	93.69	11	86	172.5	-	-	-	-	-	-	21	167	334.85	-	-	-

Notes:
GPM = gallons per minute
GPM/ft = gallons per minute per lineal foot
Meter value equals number of flow revolutions per minute
na = not accessed
Flow during test period = 14.15 million of gallons per day (MGD) = 9,826 GPM

Table 13
Incremental Flow along Collector Well 4 Laterals
Sonoma County Water Agency
October 2010 Evaluation

Distance from	Lateral 1		Lateral 2		Lateral 3		Lateral 4		Lateral 5		Lateral 7		Lateral 8		Overall		
Caisson, feet	GPM	GPM/lft	GPM	GPM/lft	GPM	GPM/lft	GPM	GPM/lft	GPM	GPM/lft	GPM	GPM/lft	GPM	GPM/lft	GPM*	Percent*	GPM/lft
0 - 50	NA	NA	556	11.12	478	9.56	398	7.96	84	1.68	96	1.92	303	6.06	1915	23.4%	6.38
50 - 100			117	2.34	415	8.30	316	6.32	685	13.70	299	5.98	653/46.5'	14.04	2485	30.4%	8.38
100 - 150			500	10.00	338	6.76	589/52.5'	11.22	229/10.5'	21.76	546	10.92			2202	27.0%	10.34
> 150			523/22.5	23.25	533/22.5'	23.70					510/22.5'	22.68			1566	19.2%	23.20
															8,168*	100%	

Performance of Collector Laterals within 60 feet of Caisson

Lateral No.	1	2	3	4	5	7	8	Overall
GPM	NA	525	564	515	196	96	336	2230 *
% Flow		31.0%	32.0%	40.0%	19.6%	6.6%	35.1%	27.3% *
GPM/lft		8.75	9.40	8.58	3.23	1.60	5.60	6.19

Percentage Flow Contribution by Relative Segment of Lateral

Lateral No.	1	2	3	4	5	7	8	Average
Inner Third	NA	31.4%	30.7%	31.4%	4.1%	6.6%	12.5%	19.4%
Middle Third		11.9%	21.7%	24.3%	39.1%	28.0%	29.1%	25.7%
Outer Third		56.7%	47.6%	44.3%	56.8%	65.4%	58.4%	54.9%

LEGEND:
523/22.5' - Used for Laterals that did not span the entire range and corresponds to gpm per feet of lateral within the interval. For the example shown this correponds to 523 gpm for 22.5 feet of lateral.

NOTE:
GPM - Gallons Per Minute
GPM/lft - Gallons Per Minute per lineal foot
NA - Not Accessible. Lateral No. 1 was blocked by pump and not accessible for meter equipment.
* Overall Discharge Rates and Percentages used in this table do not include consideration of Lateral No. 1, which was inaccessible for profiling of flow versus distance.

Table 14
Flow at Outer Ends of Collector Well 4 Laterals
Sonoma County Water Agency
November-December 2010 Evaluation

Percentage Flow at Outer End of Laterals

	Within Outer 20 feet		Within Outer 30 feet	
Lateral No.	**GPM**	**% Flow**	**GPM**	**% Flow**
2	484	28.5	634	37.4
3	504	28.6	622	35.3
4	378	29.0	451	34.6
5	374	37.5	493	49.4
7	500	34.5	594	40.9
8	352	36.8	520	54.4

Reduction in Unit Flow Rate at End (Outer Extent) of Laterals
(End Starting Point is Last Accessible Measured Flow Meter Reading)

	Last Measured GPM/ft Near	20 feet From Measured End		30 feet From Measured End	
Lateral No.	**End of Lateral**	**GPM/ft**	**% Reduction**	**GPM/ft**	**% Reduction**
2	93.69	23.99	74.4%	21.18	77.4%
3	172.5	24.87	85.6%	20.76	88.0%
4	232.40	19.10	91.8%	15.05	93.5%
5	214.5	18.65	91.3%	16.36	92.4%
7	334.9	24.50	92.7%	19.84	94.1%
8	91.50	17.62	80.7%	17.34	81.0%

NOTE:
GPM/ft - Gallons per minute per lineal foot

Table 15
Collector Well 4 Water Quality Field Results
Sonoma County Water Agency

Lateral Number	Elevation (msl)	Date	Time	pH	ORP (mV)	DO (mg/L)	Conductivity (mS/cm)	Salinity (ppt)	TDS (g/L)	Turbidity (NTU)	Temp (Celsius)
1	-33.05	11/8/2010	11:57:43	6.95	72	7.46	0.176	0.1	0.13	0.21	17.01
2	-33.05	11/8/2010	12:01:56	6.95	73	7.51	0.181	0.1	0.139	0.12	16.87
3	-33.05	11/8/2010	11:33:18	7.05	71	7.5	0.178	0.1	0.137	0.1	16.77
4	-33.05	11/8/2010	11:37:11	7.13	68	7.03	0.183	0.1	0.139	0.1	17.34
5	-33.05	11/8/2010	11:41:03	7.17	67	7.45	0.187	0.1	0.141	0.13	17.72
7	-33.05	11/8/2010	11:45:16	7.28	67	8.97	0.178	0.1	0.139	0.14	16.16
8	-33.05	11/8/2010	11:49:19	7.02	69	7.17	0.175	0.1	0.134	0.24	16.93
Total Discharge	**(pump intake)**	**11/8/2010**	**11:53:40**	**7.2**	**66**	**7.8**	**0.179**	**0.1**	**0.138**	**0.1**	**16.84**

NOTE:
Parameters measured using a YSI Model 6920 downhole probe.
ORP - Oxygen Reduction Potential
DO - Dissolved Oxygen
TDS - Total Dissolved Solids
msl - mean sea level
mV - millivolts
mg/L - milligrams per liter
mS/cm - millisiemens per centimeter
ppt - parts per thousand
g/L - grams per liter
NTU - Nephelometric Turbidity Units

Table 16
Collector Well 5 Lateral Structural Integrity Determination
Sonoma County Water Agency

Lateral	Reported Length (feet)	Accessed Length (feet)	Original Screen Metal Thickness (inches)	Measured Thickness (inches) 12:00 position	3:00 position	6:00 position	9:00 position	Average Thickness (inches)	Change in Thickness (inches)
1	168	20*	0.322	0.385	0.395	0.390	0.455	0.406	0.08
2	87	84	0.322	0.115	0.175	0.385	0.120	0.199	-0.12
3	123	120	0.322	0.130	0.490	0.430	NM	0.350	0.03
4	175	175	0.322	NM	0.270	0.405	NM	0.338	0.02
5	175	175	0.322	NM	0.175	0.340	0.385	0.300	-0.02
6	124	124	0.322	NM	NM	0.400	0.375	0.388	0.07
7	70	NA	0.322	NM	0.145	0.375	NM	0.260	-0.06
8	74	74	0.322	NM	0.310	0.395	0.490	0.398	0.08
9	133	133	0.322	NM	0.205	0.130	0.185	0.173	-0.15
10	175	175	0.322	NM	0.185	0.390	NM	0.288	-0.03
	1,304	*1060*							

NOTE:
Lateral screen thicknesses measured using Check-Line underwater ultrasonic digital thickness gauge at the 12:00, 3:00, 6:00, and 9:00 positions.
Original screen metal thickness of Laterals 1-10 represents the estimated wall thickness of the carbon steel screen.
NA - Not accessed
NM - Not measured

Table 17
Adjusted Collector Well 5 Specific Capacities For Assumed Equivalent Conditions
Sonoma County Water Agency

	Original 1982 Test	Revised 1998 Inspection*	2010 Testing
Observed Conditions			
Static Water Level Elevation	+35.27 ft amsl	+30.0 ft amsl	+36.07 ft amsl
Pumping Water Level Elevation			
2.5 - 3.0 hours	+7.98 ft amsl	+7.75 ft amsl	+21.67 ft amsl
1 day	+5.39 ft amsl		+19.13 ft amsl
2 day			+17.63 ft amsl
Observed Drawdown			
2.5 - 3.0 hours	27.29	16.75	14.40
1 day	29.88		16.94
2 day			18.44
Pre-Pumping Aquifer Thickness	58.27	53.0	59.07
m_{obs}			
2.5 - 3.0 hours	44.63	44.63	51.87
1 day	43.33		50.60
2 day			49.85
Observed Specific Capacity			
2.5 - 3.0 hours	540	568	658
1 day	478		539
2 day			512
Assumed Conditions			
Static Water Level Elevation	+35.0 ft amsl	+35.0 ft amsl	+35.0 ft amsl
Pumping Water Level Elevation	+15.0 ft amsl	+15.0 ft amsl	+15.0 ft amsl
Drawdown	20.0	20.0	20.0
m_{ac}	48.0	48.0	48.0
Adjusted Specific Capacity			
2.5 - 3.0 hours	581	611	609
1 day	530		511
2 day			493

Notes:

* 1998 Inspection results revised for adjusted static water level at +30.0 ft amsl and 5.5 feet of interference from Collector Well 4.

Specific Capacities are in units of gallons per minute per foot of drawdown (GPM/ft)

Table 18
Collector Well 5 Relative Lateral Flow Analysis
Sonoma County Water Agency

Lateral	Reported Length (feet)	Accessed Length (feet)	2010 Capacity Testing Relative Flow (Percent)	2010 Capacity Testing Relative Flow (gpm)	2010 Capacity Testing Relative Flow (gpm/lft)	2010 Capacity Testing Temperature (Degrees C)	1998 Inspection Relative Flow (Percent)	1998 Inspection Relative Flow (gpm)	1998 Inspection Relative Flow (gpm/lft)	1998 Inspection Temperature (Degrees C)
1	168	20*	14.6	1370	8.2	18.67	16.7	1588	9.45	NA
2	87	84	4.5	422	4.9	18.67	5.7	542	6.2	NA
3	123	120	4.9	460	3.7	18.7	5.7	542	4.4	NA
4	175	175	11.4	1071	6.1	18.79	11.4	1085	6.2	NA
5	175	175	17.5	1641	9.4	18.67	15.8	1503	8.6	NA
6	124	124	16.3	1534	12.4	18.72	13.6	1294	10.4	NA
7	70	NA	4.3	402	5.7	19.53	3.1	295	4.2	NA
8	74	74	4.0	373	5.0	19.7	4.0	380	5.1	NA
9	133	133	7.8	731	5.5	19.33	9.5	904	6.8	NA
10	175	175	14.9	1399	8.0	18.74	13.5	1379	7.9	NA
Total	**1304**		**100**	**9,403**			**100**	**9,513**		

NOTES:
Data from 1998 test were obtained from 1998 Collector Well International report.
NA - Laterals not tested
gpm - gallons per minute
gpm/ft - gallons per minute per lineal foot
C - Celsius
* Sandline pipe in Lateral No. 1 blocked further access

Table 19
Flow Distribution Along Collector Well 5 Laterals
October 2010
Sonoma County Water Agency

Distance	Lateral No. 1			Lateral No. 2			Lateral No. 3			Lateral No. 4			Lateral No. 5			Lateral No. 6			Lateral No. 7			Lateral No. 8			Lateral No. 9			Lateral No. 10		
	Total Length = 168 feet			Total Length = 87 feet			Total Length = 123 feet			Total Length = 175 feet			Total Length = 175 feet			Total Length = 124 feet			Total Length = 70 feet			Total Length = 74 feet			Total Length = 133 feet			Total Length = 175 feet		
	14.57% of Total Flow Rate			4.49% of Total Flow Rate			4.89% of Total Flow Rate			11.39% of Total Flow Rate			17.45% of Total Flow Rate			16.31% of Total Flow Rate			4.28% of Total Flow Rate			3.97% of Total Flow Rate			7.77% of Total Flow Rate			14.88% of Total Flow Rate		
(feet)	Meter	GPM	GPM/ft	Meter	GPM	GPM/ft	Meter	GPM	GPM/ft	Meter	GPM	GPM/ft	Meter	GPM	GPM/ft	Meter	GPM	GPM/ft	Meter	GPM	GPM/ft	Meter	GPM	GPM/ft	Meter	GPM	GPM/ft	Meter	GPM	GPM/ft
0		1370	8.16		422	4.85		460	3.74		1071	6.12		1641	9.38		1534	12.37		402	5.74		373	5.04		731	5.50		1399	7.99
10	162	1370	8.67	51.5	398	5.17	57	444	3.93	130.5	975	5.91	199.5	1597	9.68	180	1534	13.46	NA	NA	NA	57	331	5.17	85	703	5.72	158	1367	8.28
20	na	na	na	39.5	305	4.56	55.5	432	4.20	115.5	863	5.57	191.5	1533	9.89	180.5	1538	14.79				49	285	5.27	81	670	5.93	159.5	1380	8.90
30	na	na	na	39	301	5.29	51	397	4.27	102	762	5.26	180.5	1445	9.96	172.5	1470	15.64				32.5	189	4.29	70	579	5.62	155.5	1345	9.28
40	na	na	na	40.5	313	6.66	53	413	4.97	92.5	691	5.12	180	1441	10.67	159	1355	16.13				22.5	131	3.84	56.5	467	5.02	148.5	1285	9.52
50	na	na	na	32.5	251	6.79	53	413	5.66	89	665	5.32	175.5	1405	11.24	165	1406	19.00				12.5	73	3.02	54	447	5.38	137.5	1190	9.52
60	na	na	na	24.5	189	7.01	42.5	331	5.25	86	643	5.59	174.5	1397	12.15	165	1406	21.97				7.0	41	2.90	57	471	6.46	138	1194	10.38
70	na	na	na	14	108	6.36	38	296	5.58	86.5	646	6.15	173	1385	13.19	157	1338	24.78				3	17	4.36	53.5	442	7.02	131	1133	10.79
80	na	na	na	6	46	6.62	35	273	6.34	86	643	6.76	170	1361	14.32	152	1295	29.44							48	397	7.49	125	1081	11.38
83	na	na	na	2.5	19	4.83	32	249	6.23	85	635	6.90	169	1353	14.70	147	1253	30.56							46.5	385	7.69	121	1047	11.38
90	na	na	na				24.5	191	5.78	82.5	616	7.25	166	1329	15.63	135.5	1155	33.96							43.5	360	8.37	112.5	973	11.45
100	na	na	na				18.8	146	6.37	82.5	616	8.22	161.5	1293	17.24	124	1057	44.03							41	339	10.28	105.5	913	12.17
110	na	na	na				17.5	136	10.49	78	583	8.97	158	1265	19.46	88.5	754	53.87							30.5	252	10.97	95.5	826	12.71
117	na	na	na				16	125	20.77	78	583	10.05	155.5	1245	21.46	54.5	464	66.35							22	182	11.37	87.5	757	13.05
120	na	na	na							78	583	10.60	154.5	1237	22.49	40	341	85.22							18	149	11.45	84	727	13.21
121.5	na	na	na							77	575	10.75	153	1225	22.89	25	213	85.22							16	132	11.51	82	709	13.26
130	na	na	na							72	538	11.95	146	1169	25.97										5	41	13.78	70.5	610	13.55
140	na	na	na							60	448	12.81	136.5	1093	31.22													62.5	541	15.45
150	na	na	na							52.5	392	15.69	107	857	34.26													55.5	480	19.21
160	na	na	na							47	351	23.41	77.5	620	41.36													54	467	31.15
170	-	-	-							20	149	29.89	52.5	420	84.05													25.5	221	44.12
172	-	-	-							13	97	32.38	42.5	340	113.40													20	173	57.68
174	-	-	-							6.5	49	48.56																15	130	129.78

Notes:
GPM = gallons per minute
GPM/ft = gallons per minute per lineal foot
Meter value equals number of flow revolutions per minute
na = not accessed
Flow during test period = 13.54 million of gallons per day (MGD) = 9403 GPM
Sandline pipe in Lateral No. 1 blocked further access

Table 20
Incremental Flow along Collector Well 5 Laterals
Sonoma County Water Agency
October 2010 Evaluation

Distance from	Lateral 1		Lateral 2		Lateral 3		Lateral 4		Lateral 5		Lateral 6		Lateral 7		Lateral 8		Lateral 9		Lateral 10		Overall		
Caisson, feet	GPM	GPM/lft	GPM	GPM/lft	GPM	GPM/lft	GPM	GPM/lft	GPM	GPM/lft	GPM	GPM/lft	GPM	GPM/lft	GPM	GPM/lft	GPM	GPM/lft	GPM	GPM/lft	GPM *	Percent*	GPM/lft
0 - 50	NA	NA	171	3.42	47	0.94	406	8.12	236	4.72	128	2.56	NA	NA	300	6.00	284	5.68	209	4.18	1781	23.3%	4.45
50 - 100			251/37'	6.78	267	5.34	49	0.98	112	2.24	349	6.98			73/24'	3.04	108	2.16	277	5.54	1486	19.5%	4.12
100 - 150					146/23'	6.35	224	4.48	436	8.72	1057/24'	44.04					339/33'	10.27	433	8.66	2635	34.5%	11.46
> 150							392/25'	15.68	857/25'	34.28									480/25'	19.20	1729	22.7%	23.05
																					7,631*	100%	

Performance of Collector Laterals within 60 feet of Caisson

Lateral No.	1	2	3	4	5	6	7	8	9	10	Overall
GPM	NA	233	129	428	244	128	NA	332	260	205	1959 *
% Flow		55.2%	28.0%	40.0%	14.9%	8.3%		89.0%	35.6%	14.7%	25.7% *
GPM/lft		3.88	2.15	7.13	4.07	2.13		5.53	4.33	3.42	4.08

Percentage Flow Contribution by Relative Segment of Lateral

Lateral No.	1	2	3	4	5	6	7	8	9	10	Average
Inner Third	NA	28.6%	10.2%	39.6%	14.7%	11.3%	NA	36.4%	37.2%	14.7%	24.1%
Middle Third		23.7%	33.9%	6.0%	9.4%	7.0%		42.4%	13.0%	31.2%	20.8%
Outer Third		47.7%	55.9%	54.4%	75.9%	81.7%		21.2%	49.8%	54.1%	55.1%

LEGEND:
392/25' - Used for Laterals that did not span the entire range and corresponds to gpm per feet of lateral within the interval. For the example shown this correponds to 392 gpm for 25 feet of lateral.

NOTE:
GPM - Gallons Per Minute
GPM/lft - Gallons Per Minute per lineal foot
NA - Not Accessible. Lateral No. 7 was blocked by pump and not accessible for meter equipment. Lateral No. 1 was blocked by a pipe at 20'
* Overall Discharge Rates and Percentages used in this table do not include consideration of Laterals Nos. 1 and 7, which were inaccessible for profiling of flow versus distance.

Table 21
Flow at Outer Ends of Collector Well 5 Laterals
Sonoma County Water Agency
October 2010 Evaluation

Percentage Flow at Outer End of Laterals

	Within Outer 20 feet		Within Outer 30 feet	
Lateral No.	**GPM**	**% Flow**	**GPM**	**% Flow**
2	132	31.4	208	49.2
3	143	31.1	178	38.6
4	372	34.7	420	39.2
5	739	45.0	975	59.4
6	936	61.0	1116	72.7
8	60	16.1	108	28.9
9	222	30.4	313	42.8
10	474	33.8	511	36.5

Reduction in Unit Flow Rate at End (Outer Extent) of Laterals
(End Starting Point is Last Accessible Measured Flow Meter Reading)

	Last Measured				
	GPM/ft Near	20 feet From Measured End		30 feet From Measured End	
Lateral No.	**End of Lateral**	**GPM/ft**	**% Reduction**	**GPM/ft**	**% Reduction**
2	4.83	6.82	[+41.2%]	6.86	[41.9%]*
3	20.77	6.19	70.2%	5.97	71.2%
4	48.56	18.78	61.3%	13.96	71.2%
5	113.4	35.68	68.5%	31.83	71.9%
6	85.22	45.51	46.6%	35.47	58.4%
8	4.36	3.02	30.7%**	3.84	11.9%**
9	13.78	10.97	20.4%	10.28	25.4%
10	129.8	23.99	81.5%	16.95	86.9%

NOTE:
GPM/ft - Gallons per minute per lineal foot
* - Gain in flow shown with brackets and + sign [+31.1%]
** - Although Lateral 8 shows a percentage reduction in unit flow capacity at 20 feet and 30 feet from last accessible measurement, unit flow capacity was actually increasing through this section of the lateral.

Table 22
Collector 5 Water Quality Field Results
Sonoma County Water Agency

Lateral Number	Elevation (msl)	Date	Time	pH	ORP (mV)	DO (mg/L)	Conductivity (mS/cm)	Salinity (ppt)	TDS (g/L)	Turbidity (NTU)	Temp (Celsius)
1	-17.79	10/18/2010	10:44:30	7.1	40	6.89	0.221	0.12	0.163	0.07	18.67
2	-17.79	10/18/2010	10:48:45	7.11	41	6.75	0.22	0.12	0.163	0.09	18.67
3	-17.79	10/18/2010	10:52:36	7.12	38	6.75	0.22	0.12	0.163	0.09	18.7
4	-17.79	10/18/2010	10:56:38	7.23	36	6.87	0.215	0.12	0.159	0.15	18.79
5	-17.79	10/18/2010	11:00:26	7.31	35	6.88	0.212	0.11	0.157	0.12	18.67
6	-17.79	10/18/2010	11:04:42	7.27	34	6.86	0.211	0.11	0.156	0.05	18.72
7	-17.79	10/18/2010	11:08:29	7	37	6.8	0.219	0.12	0.159	0.05	19.53
8	-17.79	10/18/2010	11:12:10	6.94	36	6.8	0.216	0.11	0.156	0.03	19.7
9	-17.79	10/18/2010	11:15:49	6.96	35	6.79	0.215	0.11	0.157	0.05	19.33
10	-17.79	10/18/2010	11:19:33	7.1	35	6.56	0.214	0.12	0.158	0.11	18.74
Total Discharge	**(pump intake)**	**10/18/2010**	**11:23:25**	**7.16**	**33**	**6.7**	**0.212**	**0.11**	**0.156**	**0.09**	**18.87**

NOTE:
Parameters measured using a YSI Model 6920 downhole probe.
ORP - Oxygen Reduction Potential
DO - Dissolved Oxygen
TDS - Total Dissolved Solids
msl - mean sea level
mV - millivolts
mg/L - milligrams per liter
mS/cm - millisiemens per centimeter
ppt - parts per thousand
g/L - grams per liter
NTU - Nephelometric Turbidity Units

Table 23
Summary of Specific Capacities for Collector Wells 3, 4 and 5
Sonoma County Water Agency
October-December 2010

Duration of Pumping	Collector Well 3			Collector Well 4			Collector Well 5		
	2010 Testing	1998 Inspection	Performance Testing After 1975 Construction	2010 Testing	1998 Inspection	Performance Testing After 1975 Construction	2010 Testing	1998 Inspection	Performance Testing After 1982 Construction
2-3 Hours							658	437* [estimate +/- 568]	540
5 Hours	856			746			655		
1 Day	725			583			539		478
2 Days	696	297* [estimate +/- 357]	580	492	328* [estimate +/- 356]	597	512		
4 Days	687			423			470		
7 Days	671			402			419		

Note: Specific Capacities are presented as gallons per minute per foot of drawdown (GPM/ft).
* - denotes specific capacity referenced in 1998 report.
[+/- 357] denotes revision of specific capacity presented in 1998 inspection report, based on consideration of mutual interference between wells.

Appendix A
Capacity Analysis Operations Plan
(on CD)

Appendix B
Water Level Monitoring Data
(on CD)

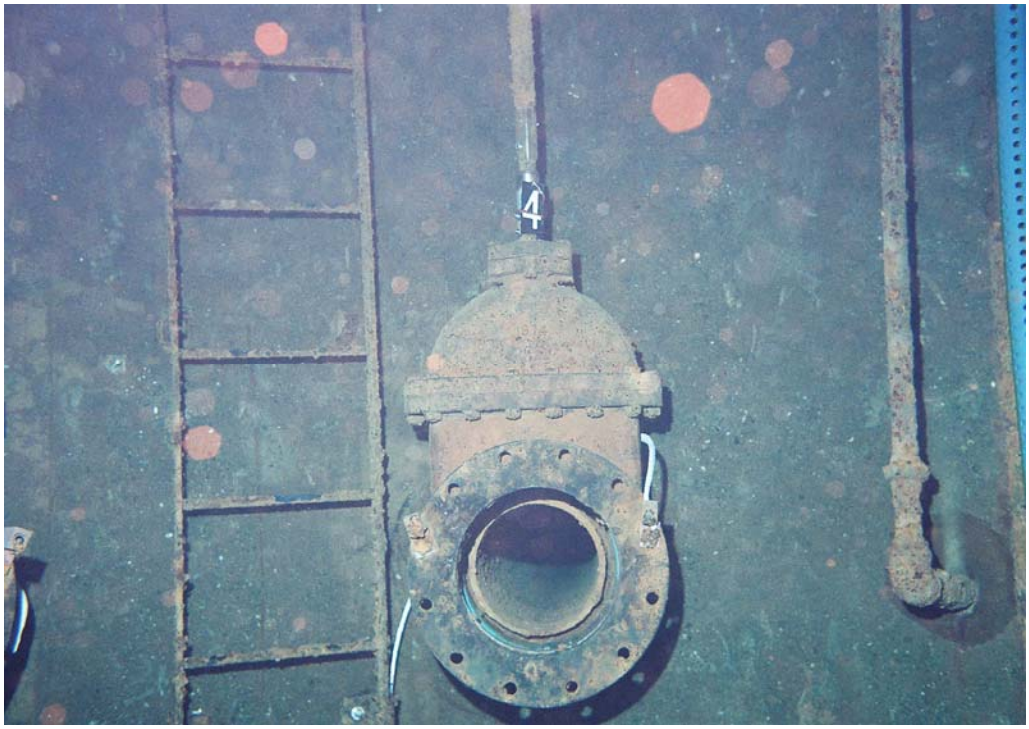
Appendix C
Collector Inspection Photographs

Collector 3 Lateral #1

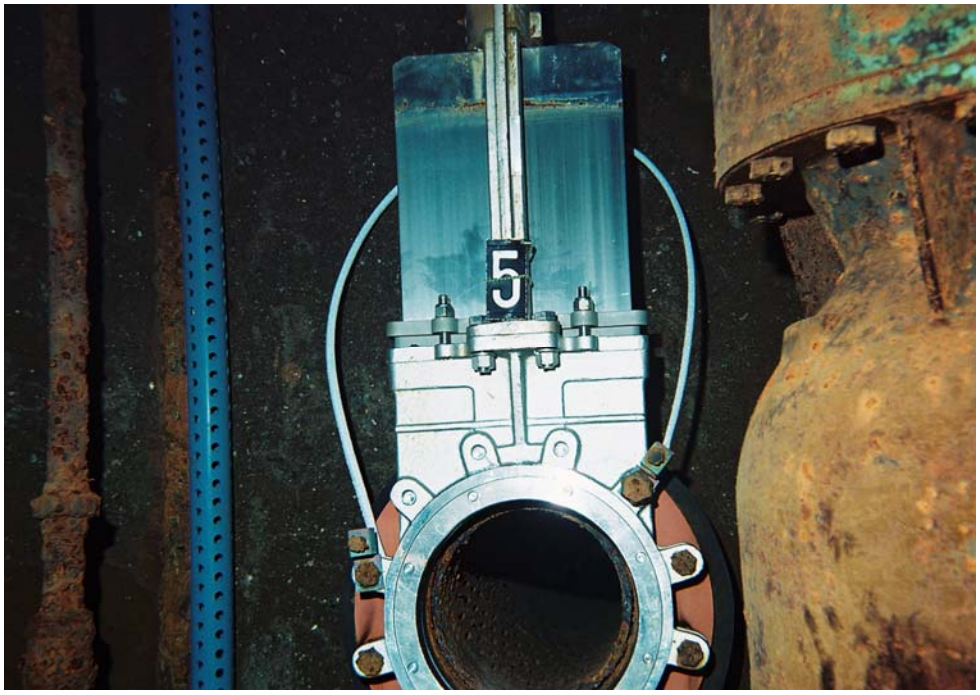
Collector 3 Lateral #2

Collector 3 Lateral #3

Collector 3 Lateral #4

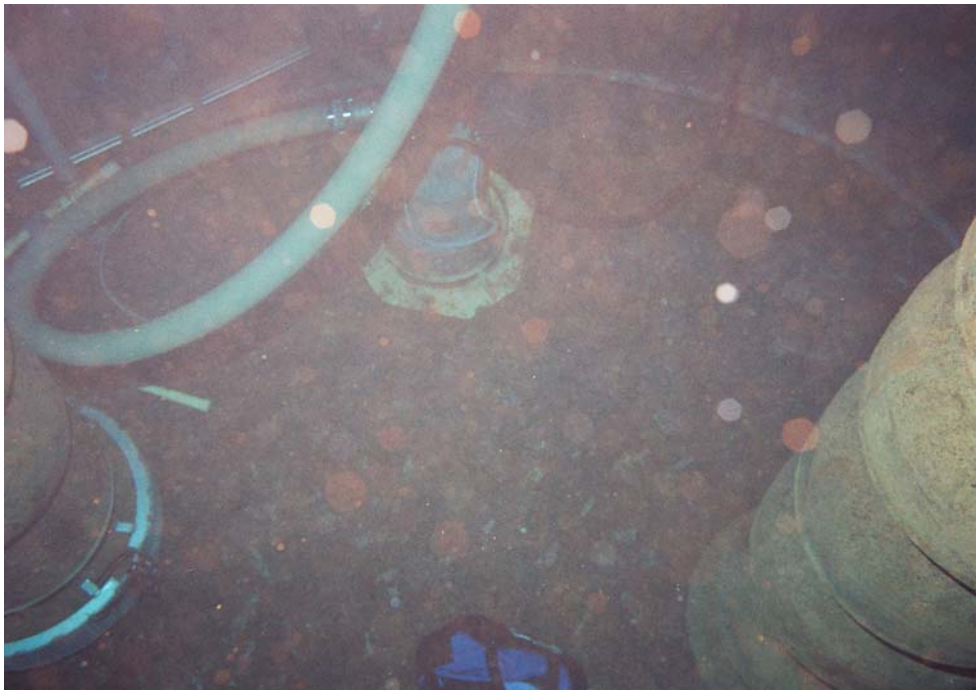


Collector 3 Lateral #5

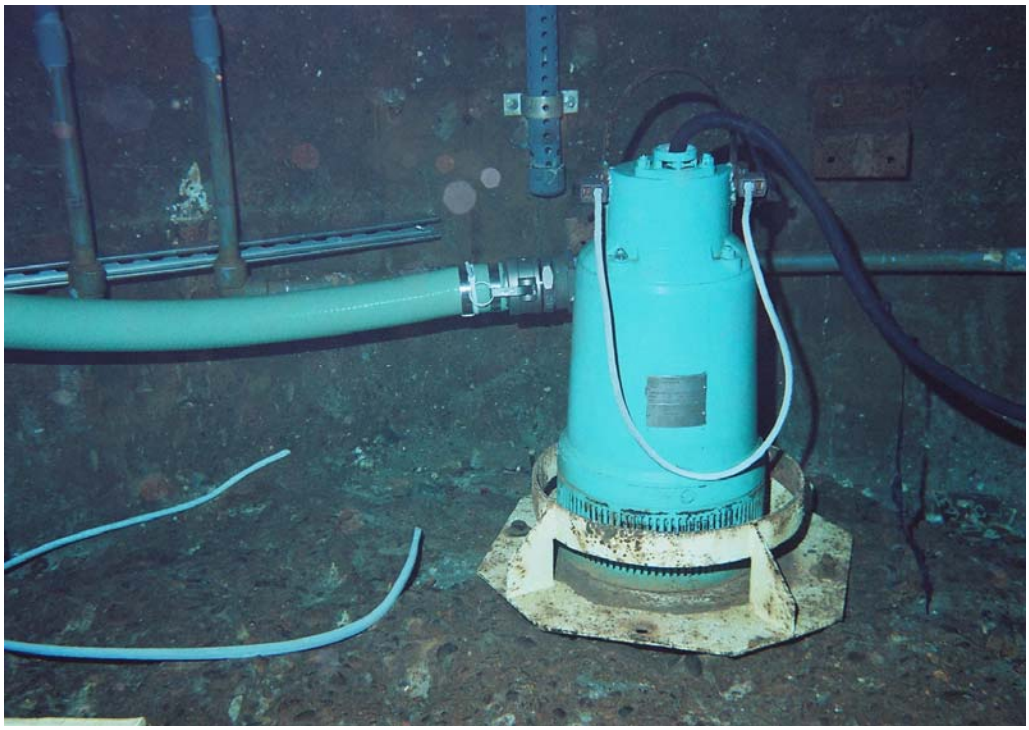


Collector 3 Lateral #6

Collector 3 Sump Pump

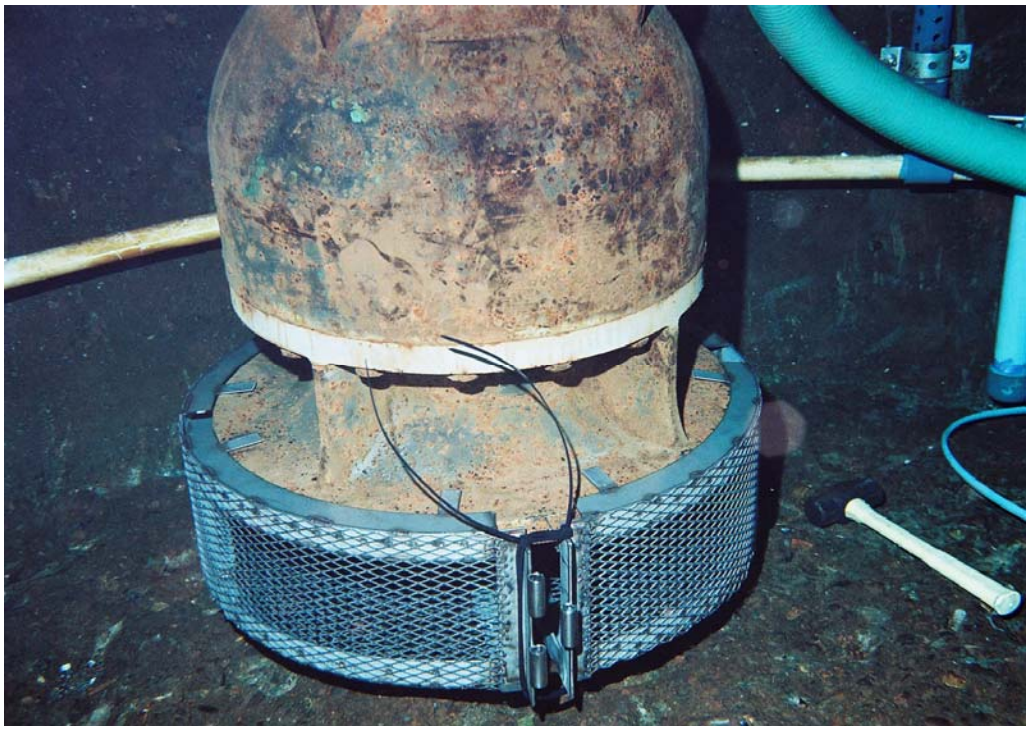


Collector 3 Sump Pump and Caisson Floor



Collector 3 Turbine Pump #6 Column

Collector 3 Turbine Pump #6

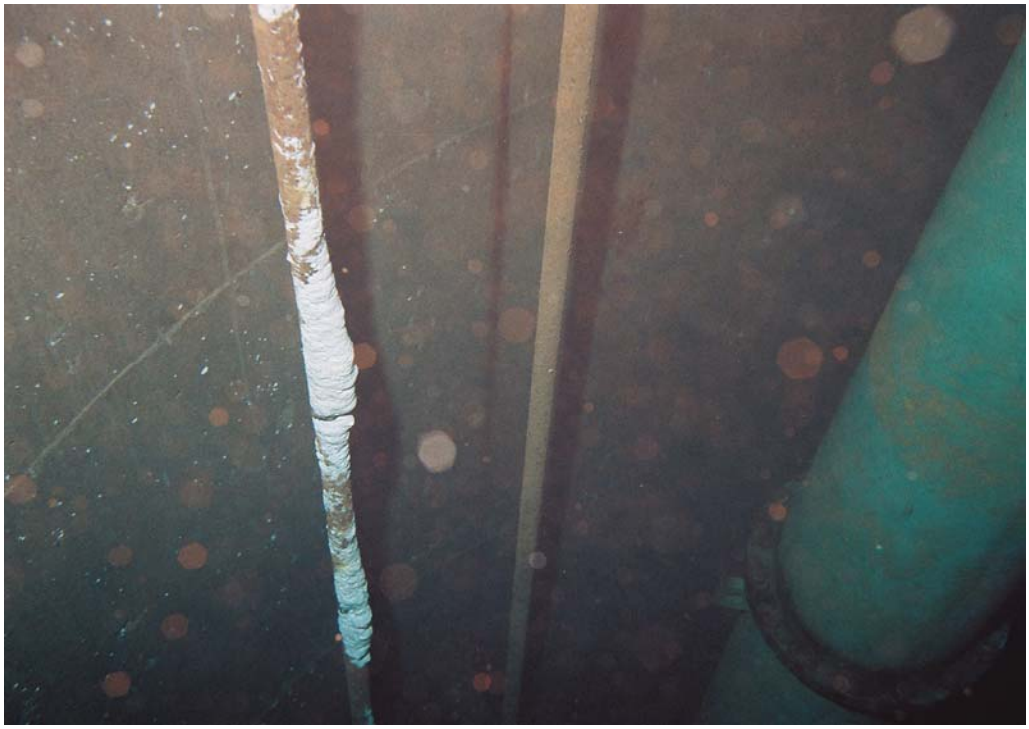


Collector 3 Turbine Pump #5

Collector 3 Turbine Pump #5 Column

Collector 3 Caisson Floor Detail

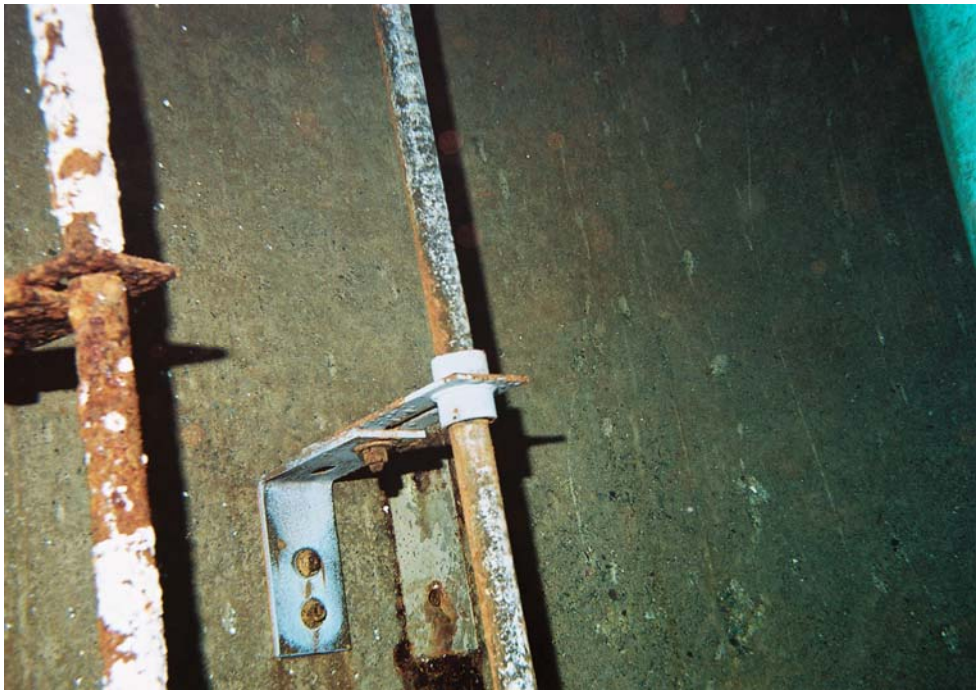
Collector 3 Piping



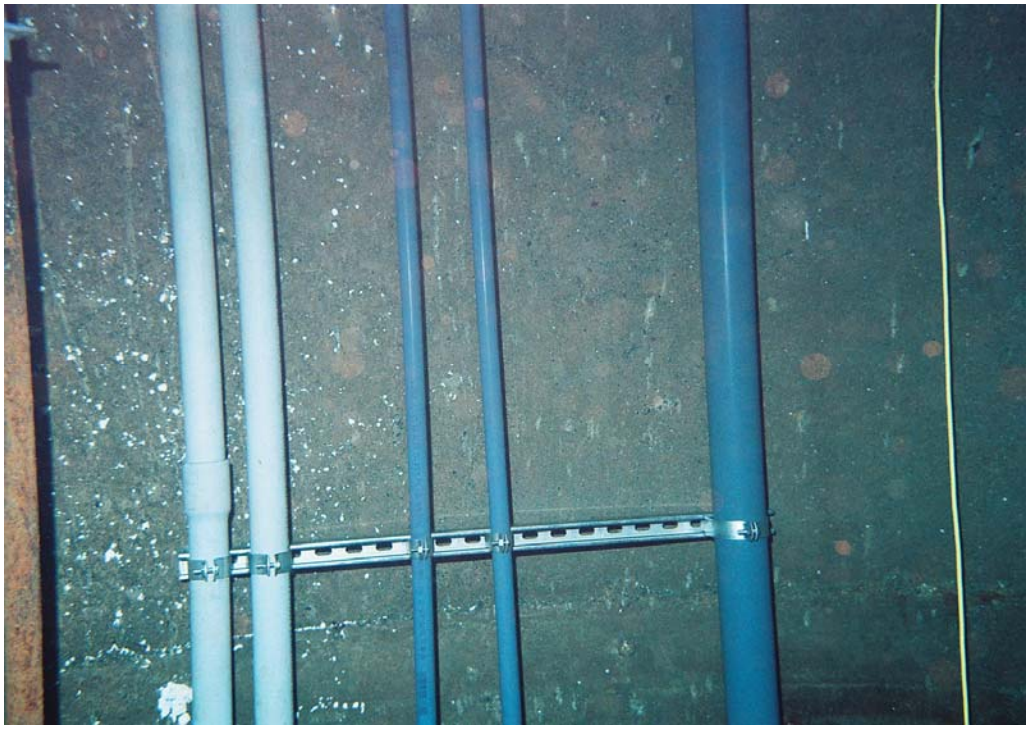
Collector 3 Piping Mount Detail

Collector 3 Piping Mount Detail

Collector 3 Piping Mount Detail



Collector 3 Piping

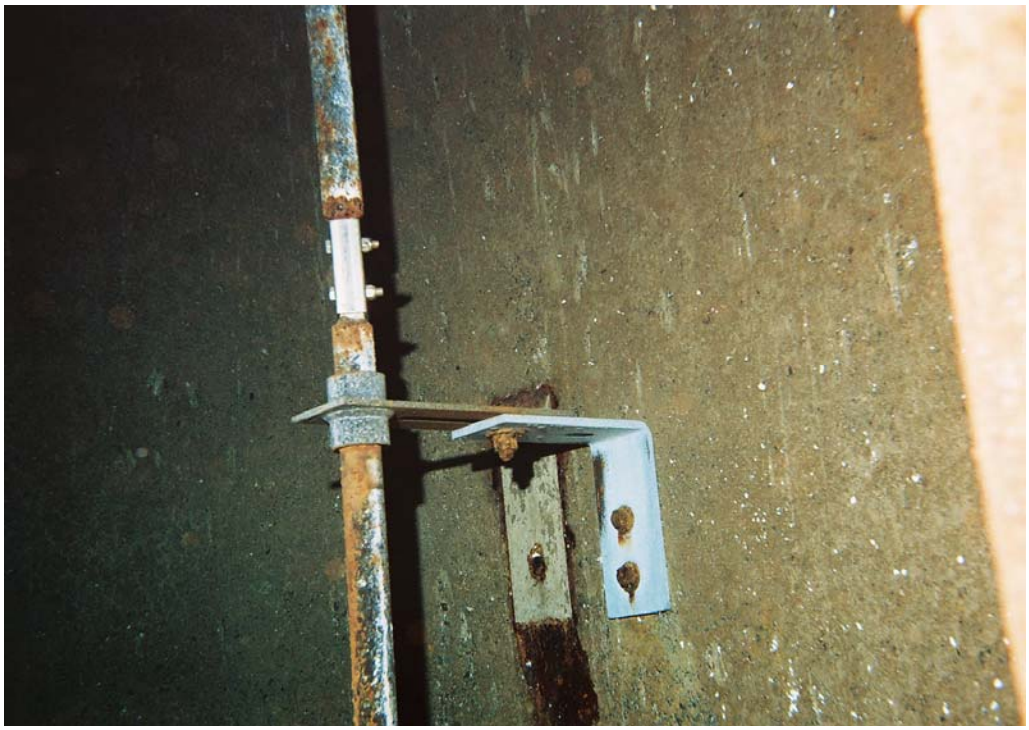


Collector 3 Turbine Pump Column and Piping

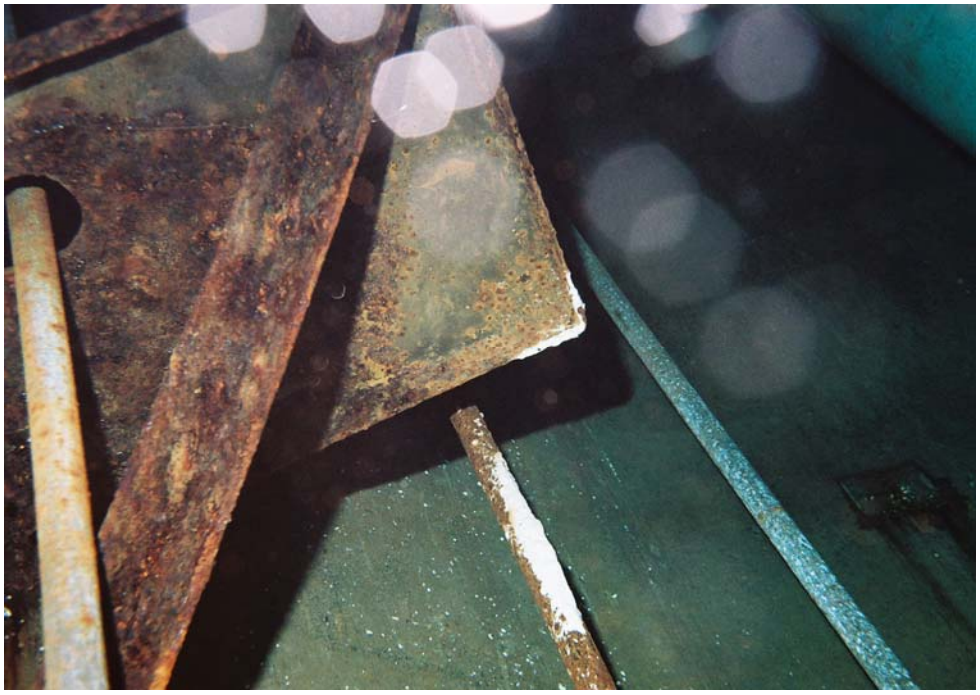
Collector 3 Turbine Pump Column and Piping

Collector 3 Piping Bracket Detail

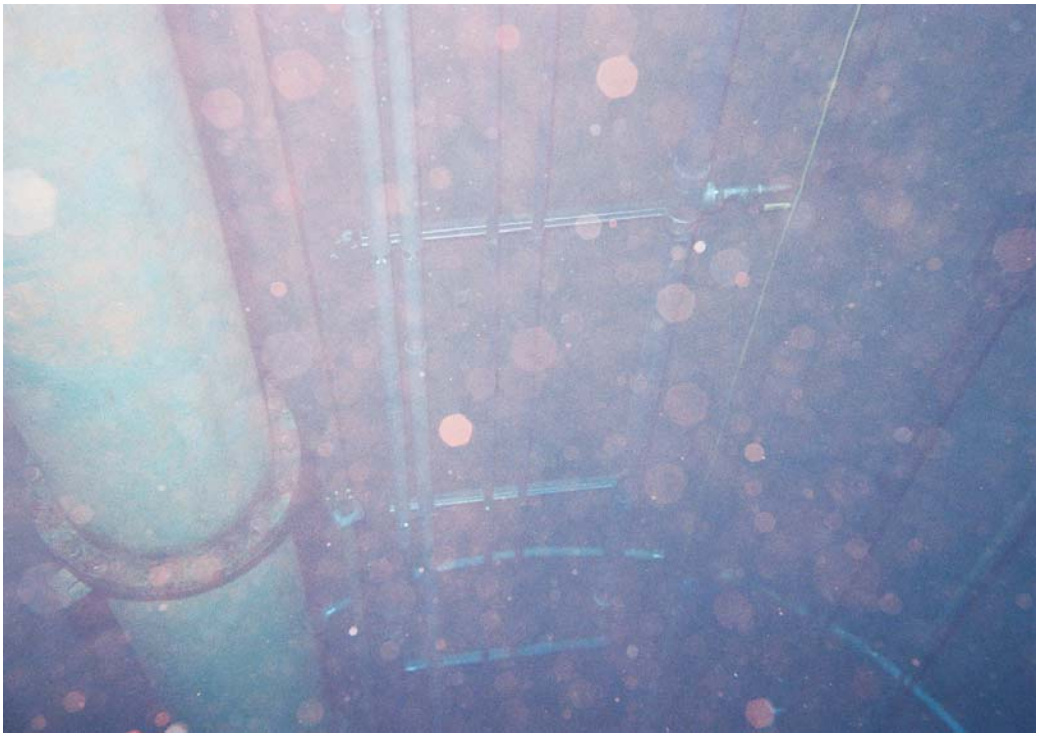
Collector 3 Piping Bracket Detail



Collector 3 Piping and Platform Detail



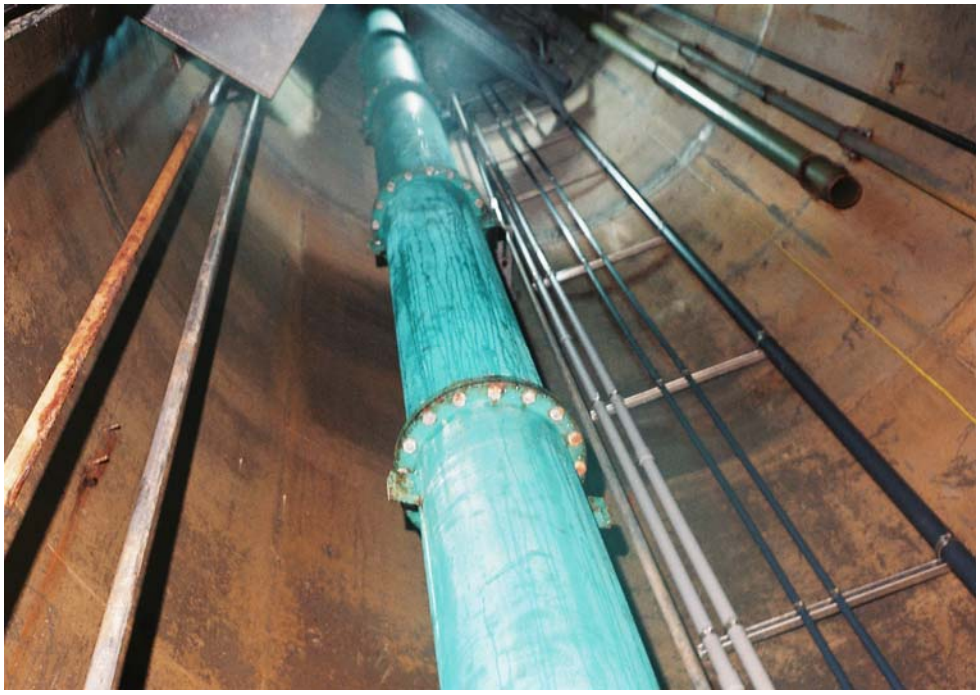
Collector 3 Turbine Pump Column and Piping



Collector 3 Ladder and Piping

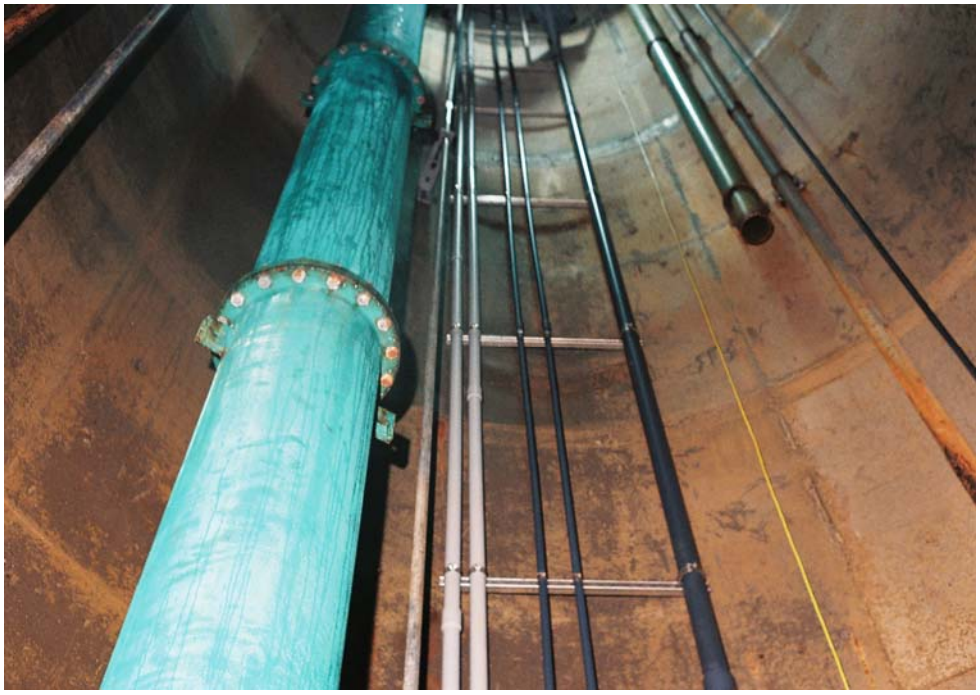
Collector 3 Turbine Pump Column

Collector 3 Upper Turbine Pump Column and Piping



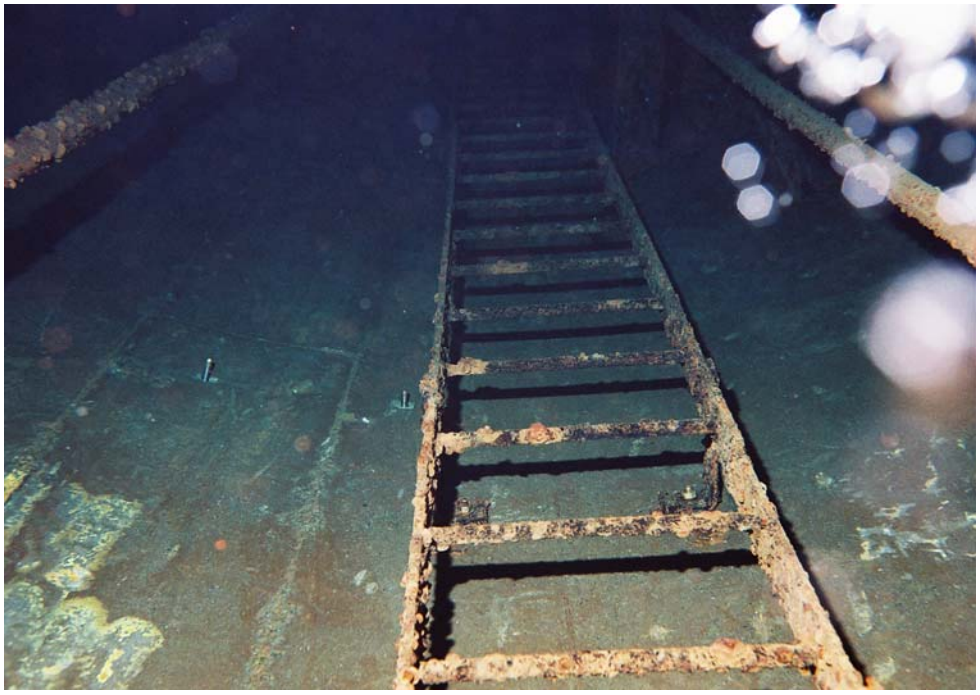
Collector 3 Upper Turbine Pump Column and Piping

Collector 3 Upper Turbine Pump Column and Piping



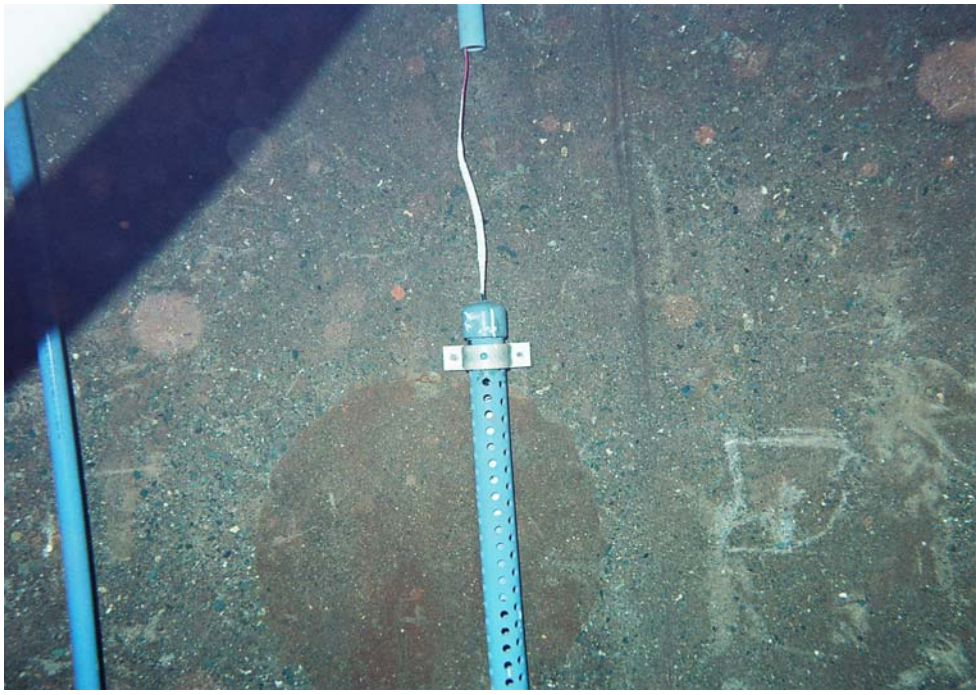
Collector 3 Ladder Detail

Collector 3 Ladder



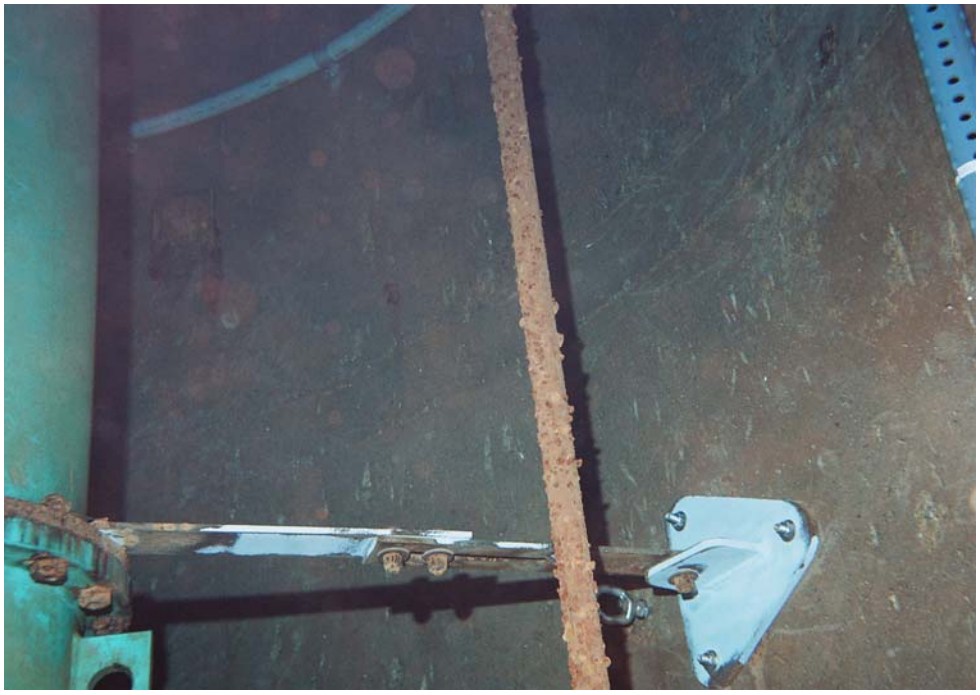
Collector 3 Ladder Detail

Collector 3 Piping Detail



Collector 3 Piping Detail

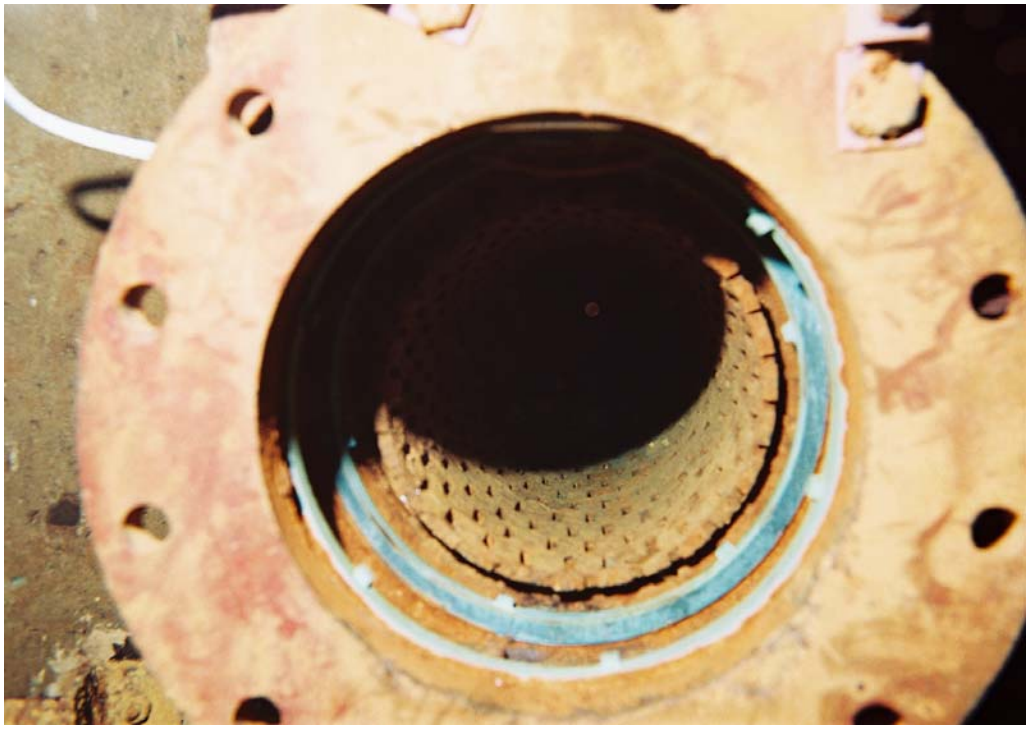
Collector 3 Turbine Pump Column Brace



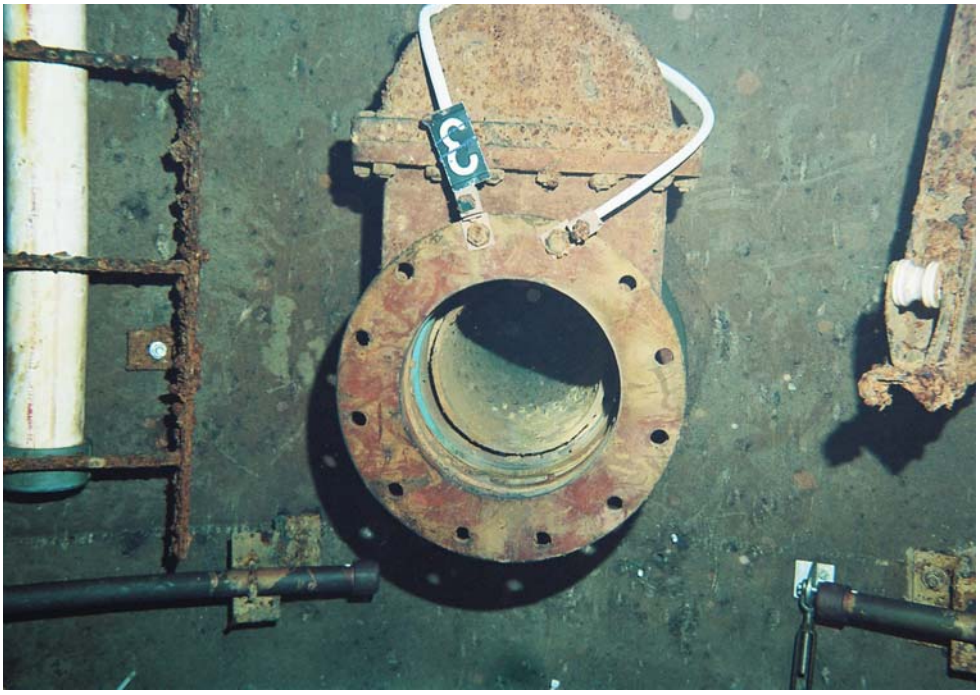
Collector 3 Piping and Platform Detail

Collector 4 Lateral #2

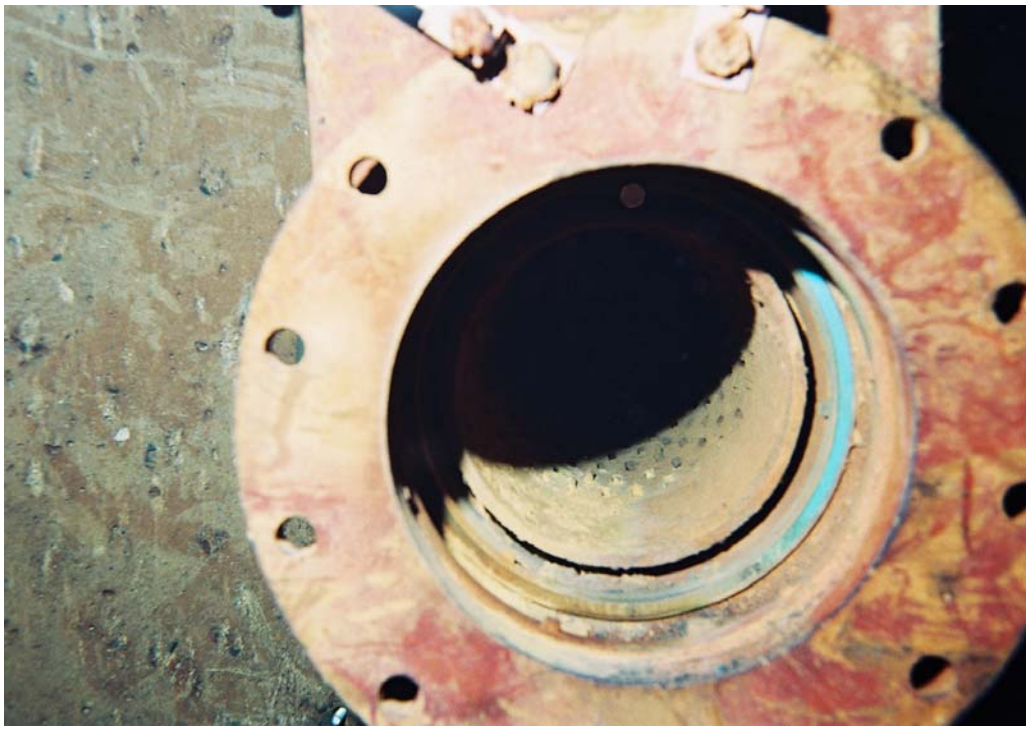
Collector 4 Lateral #2—Old Screen Lined with 6” Stainless Screen



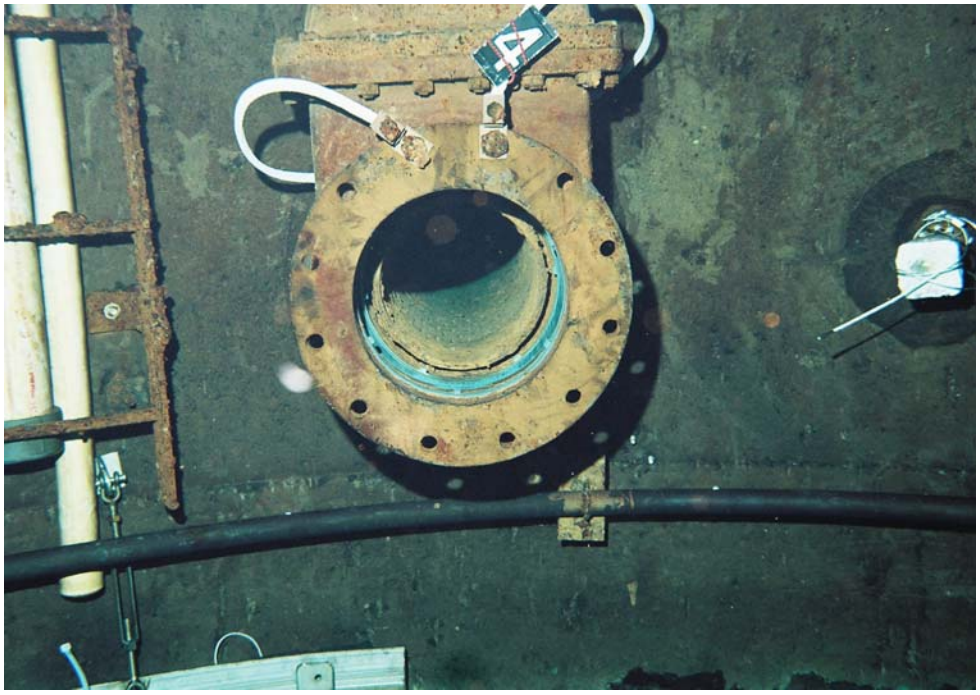
Collector 4 Valve Lateral #3



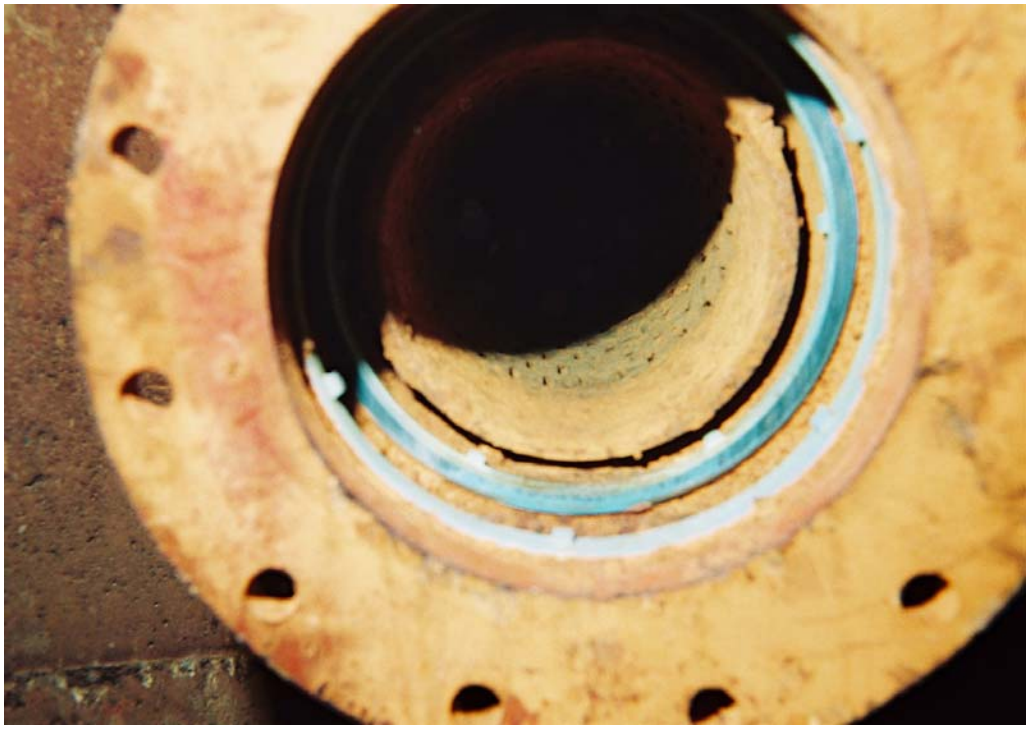
Collector 4 Lateral #3—Old Screen Lined with 6” Stainless Screen



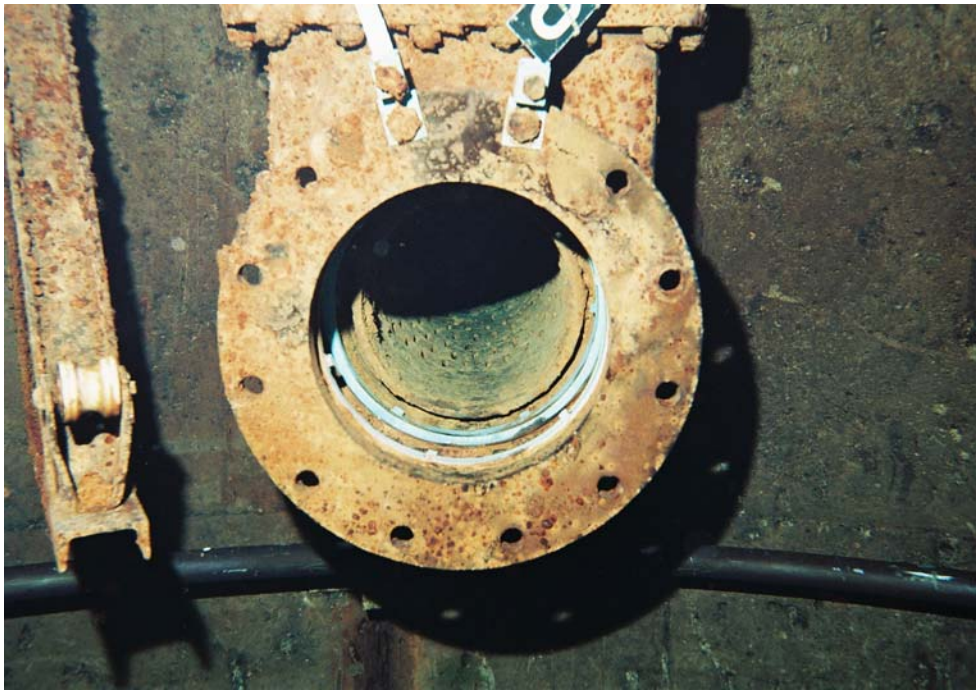
Collector 4 Lateral #4



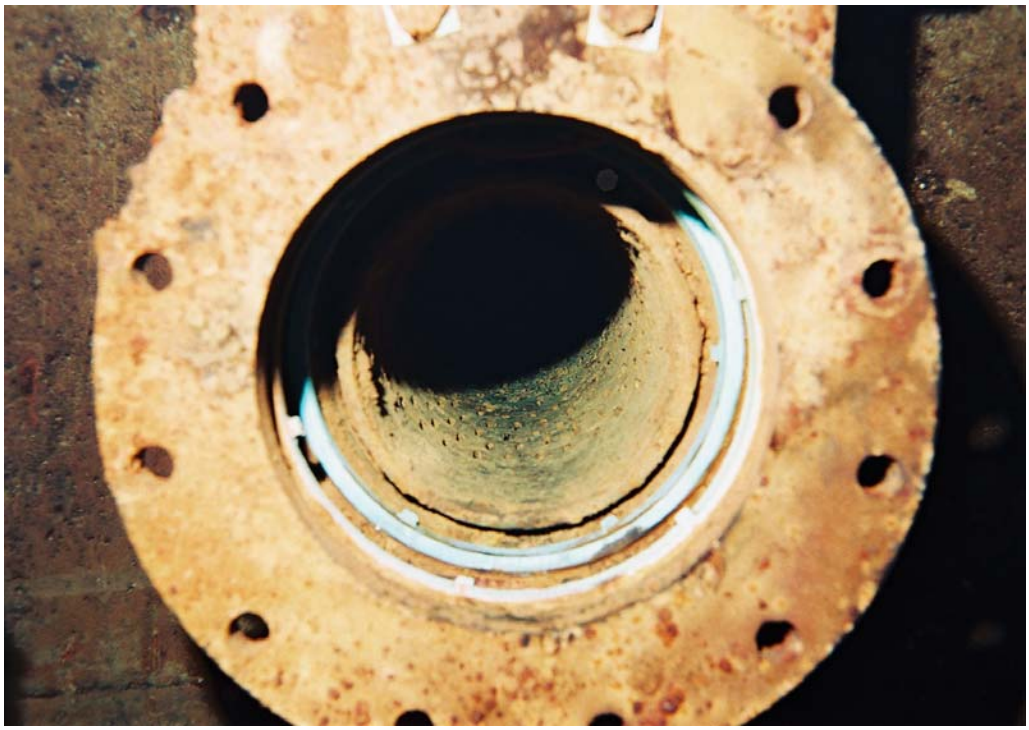
Collector 4 Lateral #4—Old Screen Lined with 6” Stainless Screen



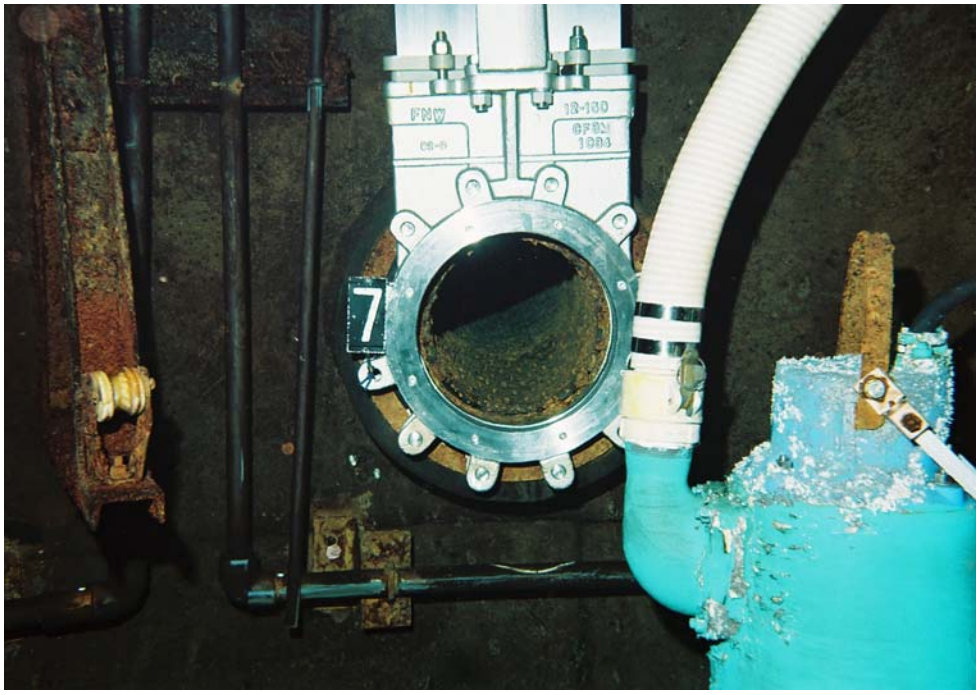
Collector 1 Lateral #5



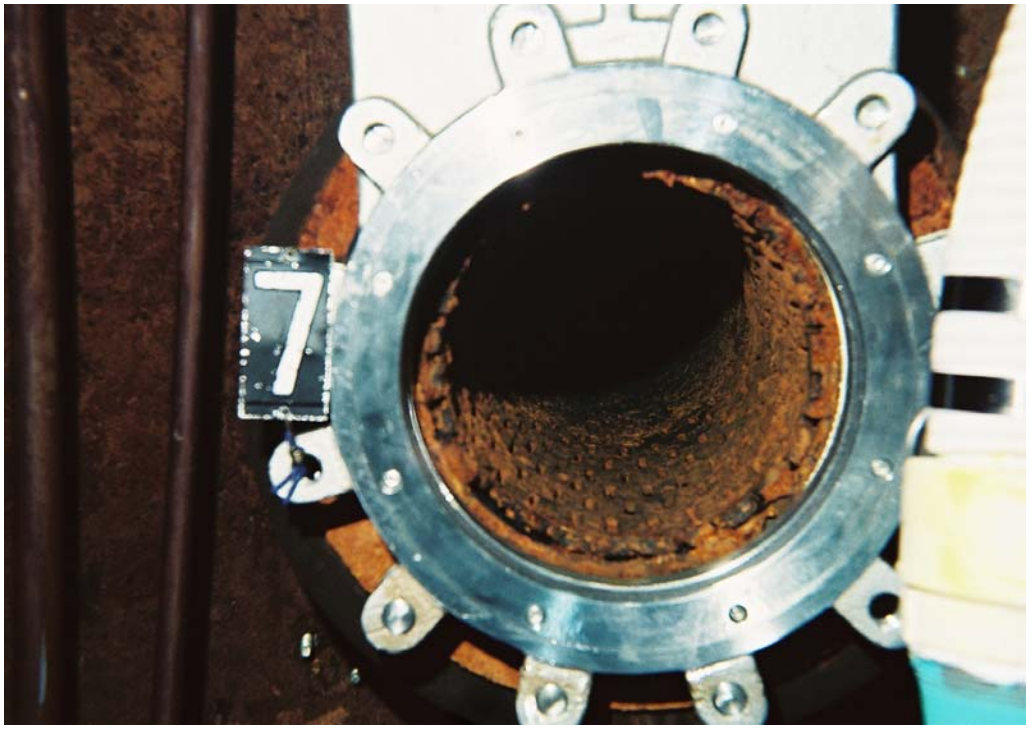
Collector 1 Lateral #5 Old Screen Lined with 6” Stainless



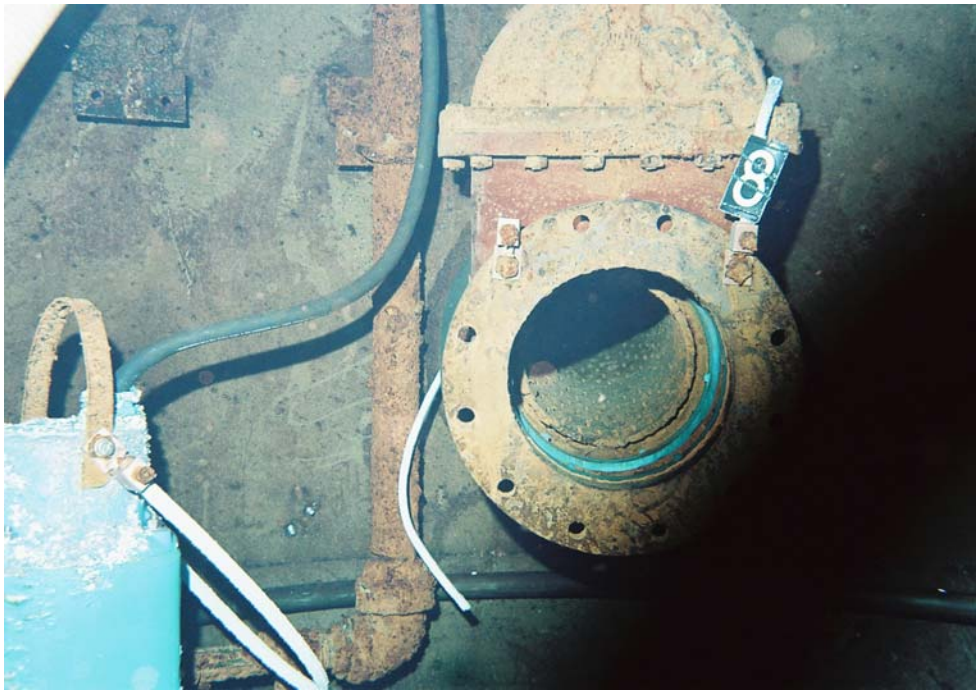
Collector 4 Lateral #7



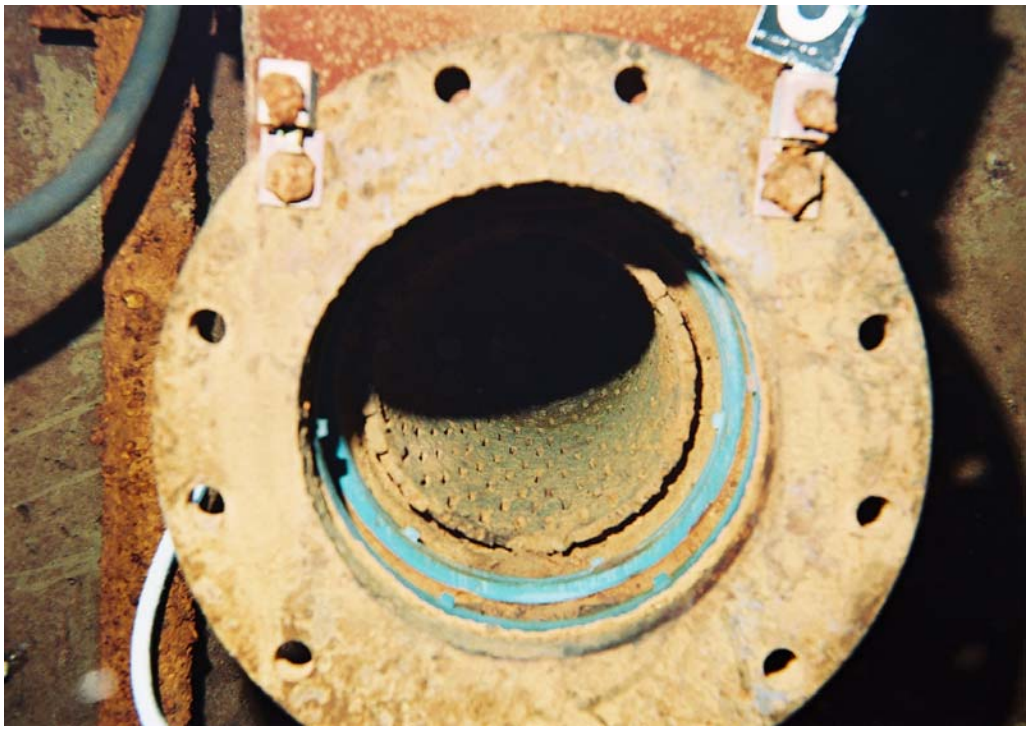
Collector 4 Lateral #7 Old Screen Lined with 6” Stainless Screen



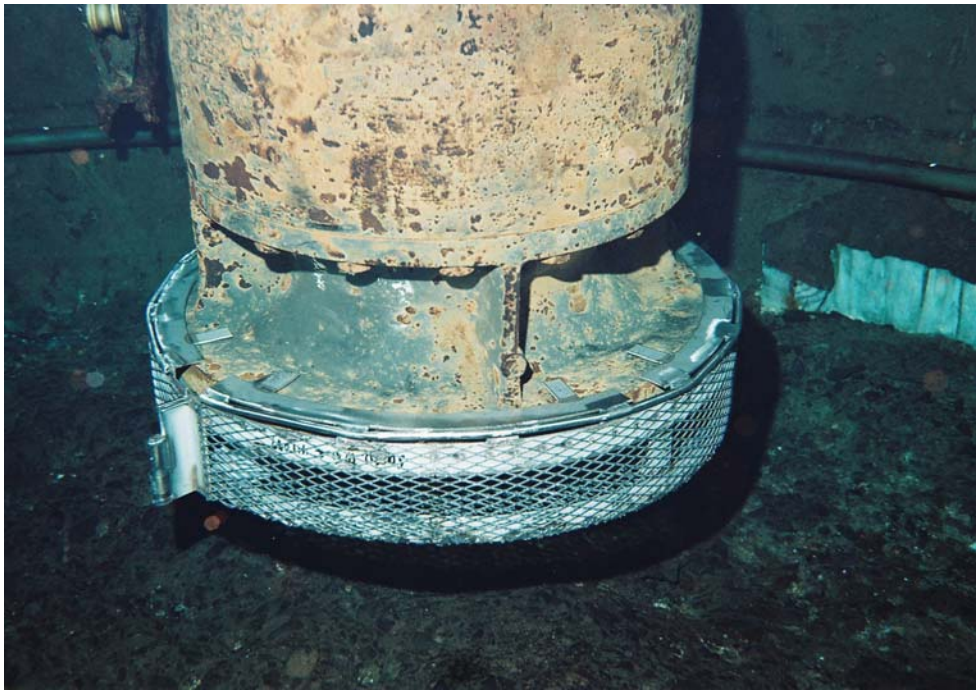
Collector 4 Lateral #8



Collector 4 Lateral #8—Old Screen Lined with 6” Stainless Screen



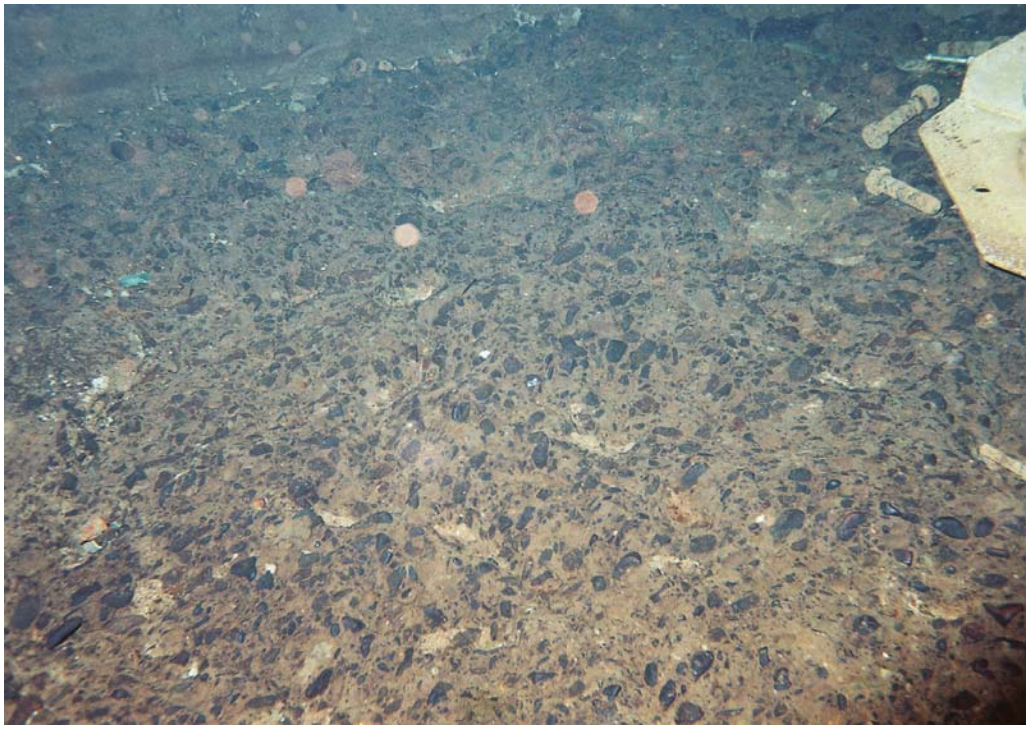
Collector 4 Turbine Pump #7



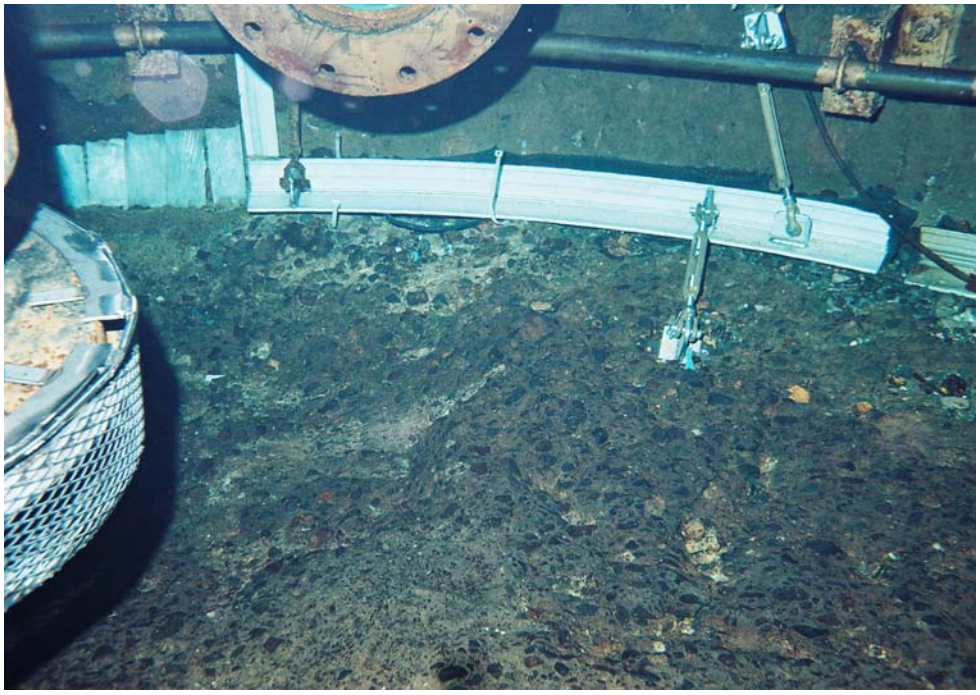
Collector 4 Turbine Pump #8

Collector 4 Ladder and Piping Detail

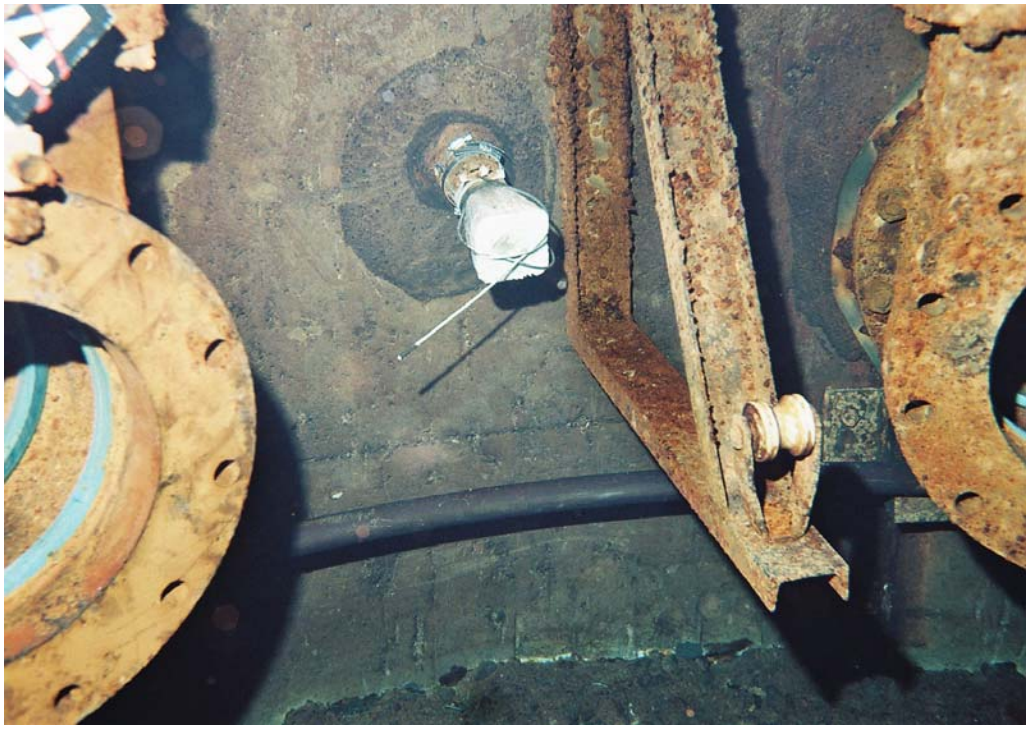
Collector 4 Lateral #9—Caisson Floor Detail



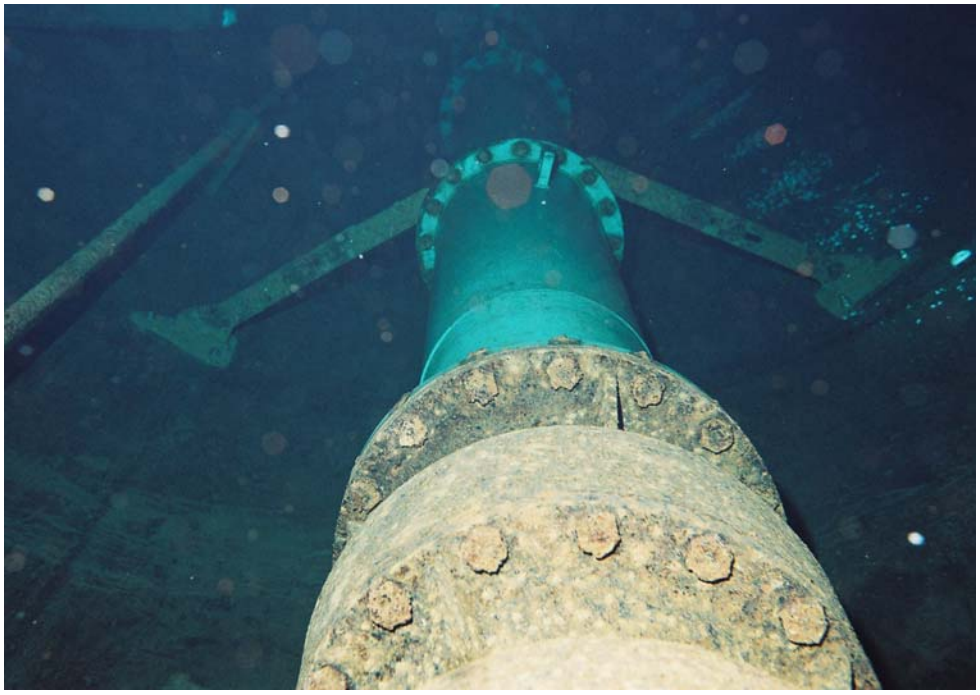
Collector 4 Caisson Floor and Piping



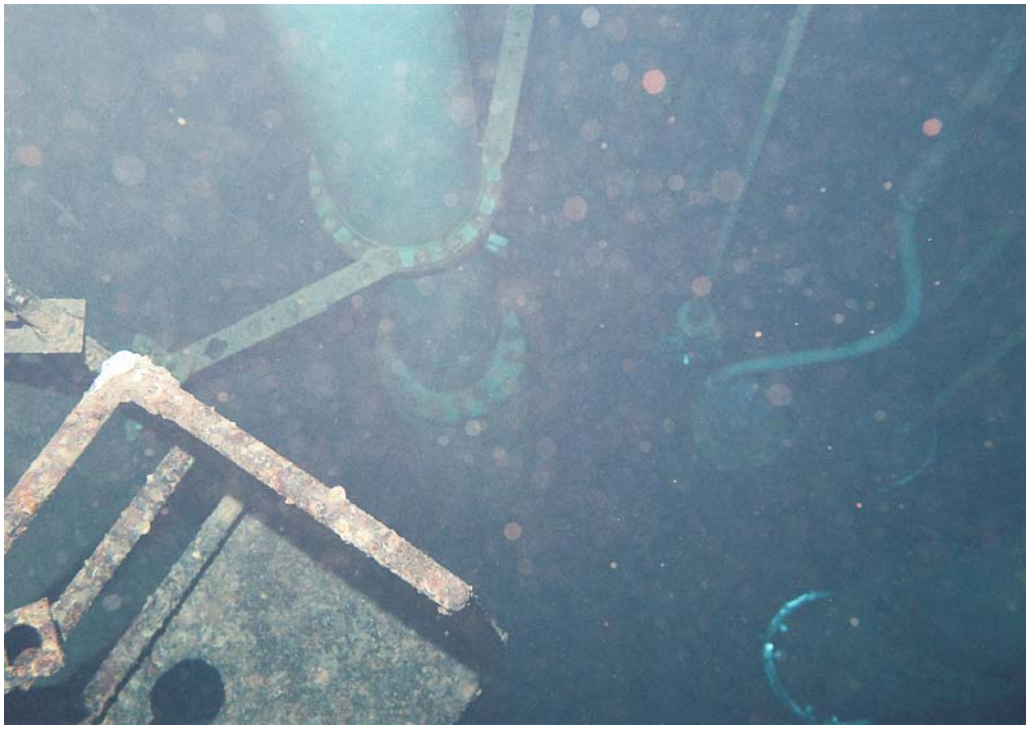
Collector 4 Blanked Valve



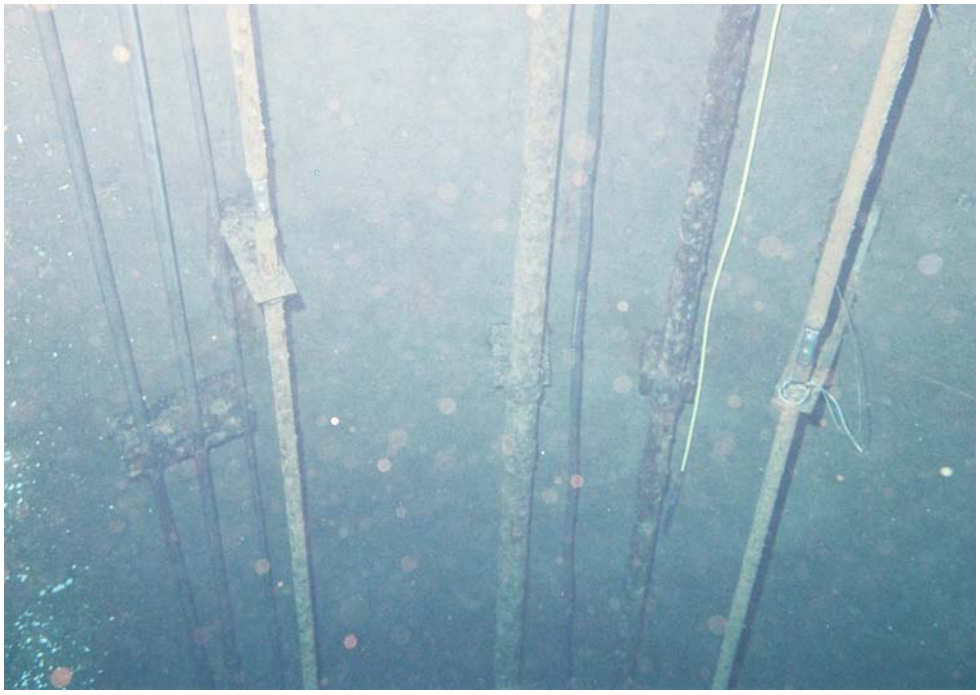
Collector 4 Turbine Pump Column



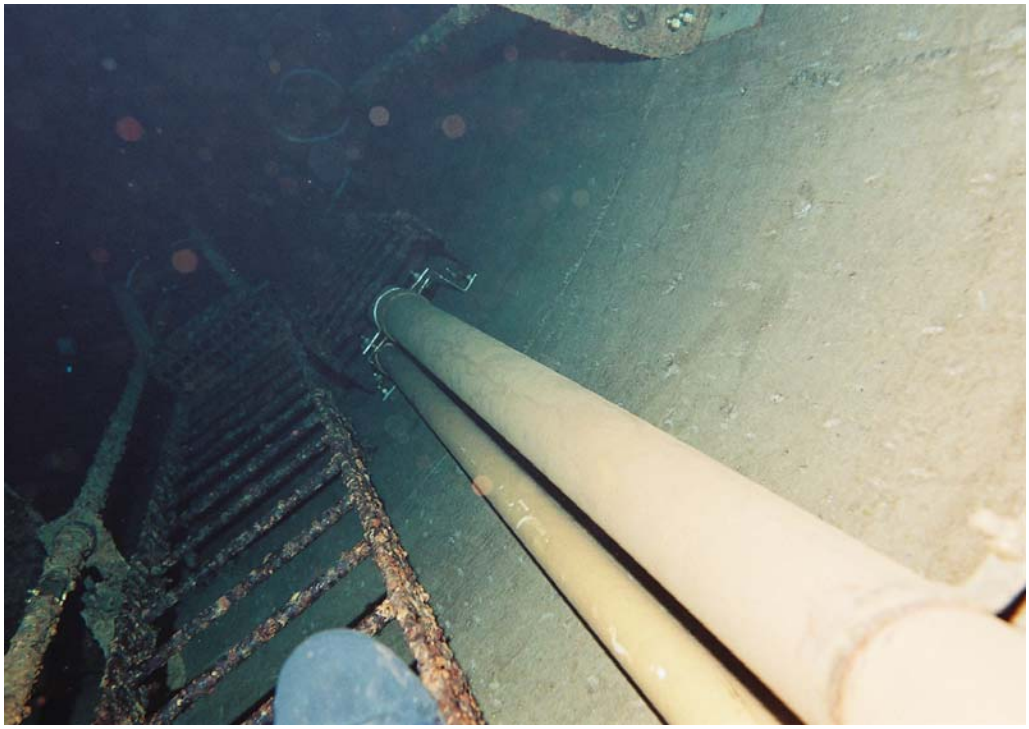
Collector 4 Turbine Pump Column and Platform



Collector 4 Piping



Collector 4 Ladder and Piping

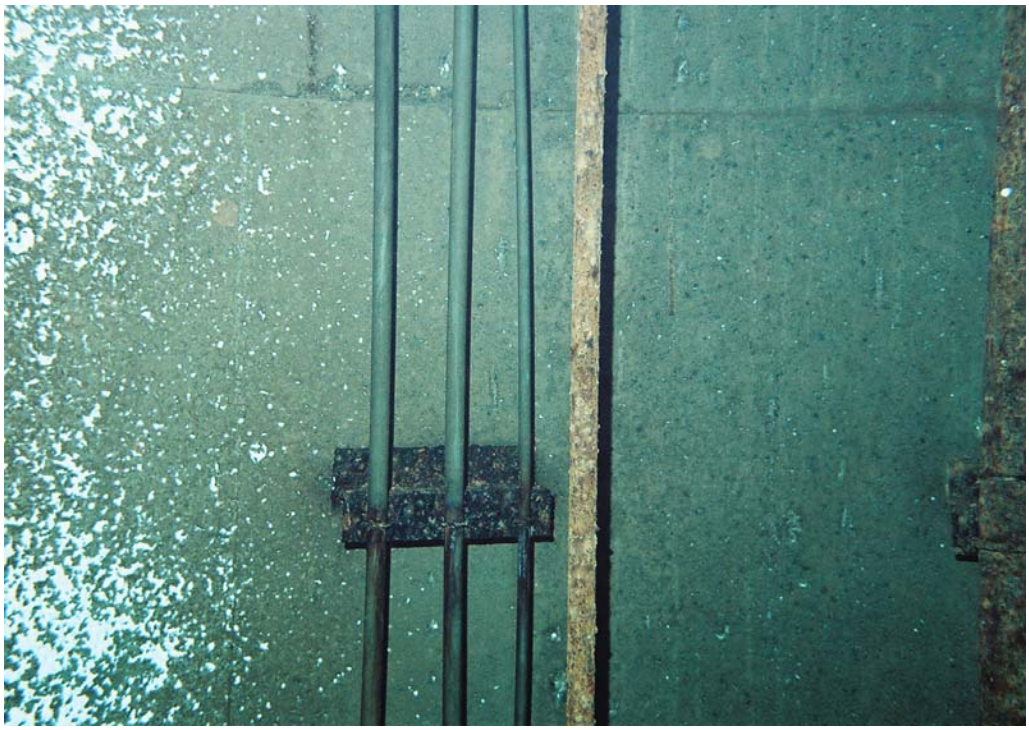


Collector 4 Turbine Pump Column

Collector 4 Turbine Pump Column and Piping

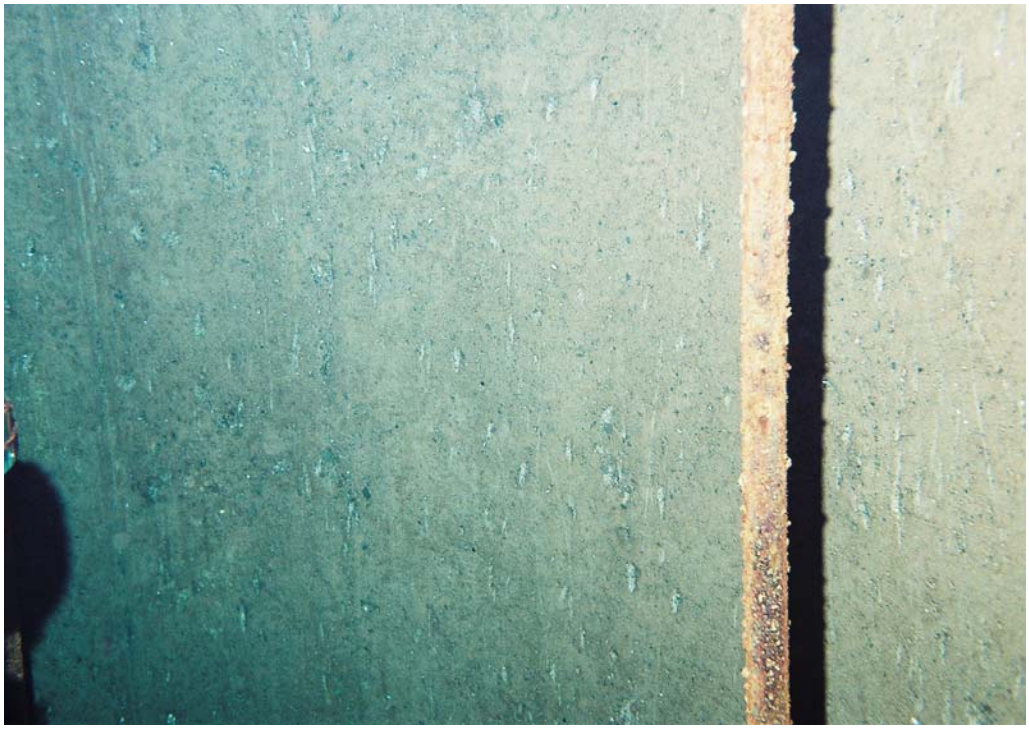
Collector 4 Piping Detail

Collector 4 Piping Detail

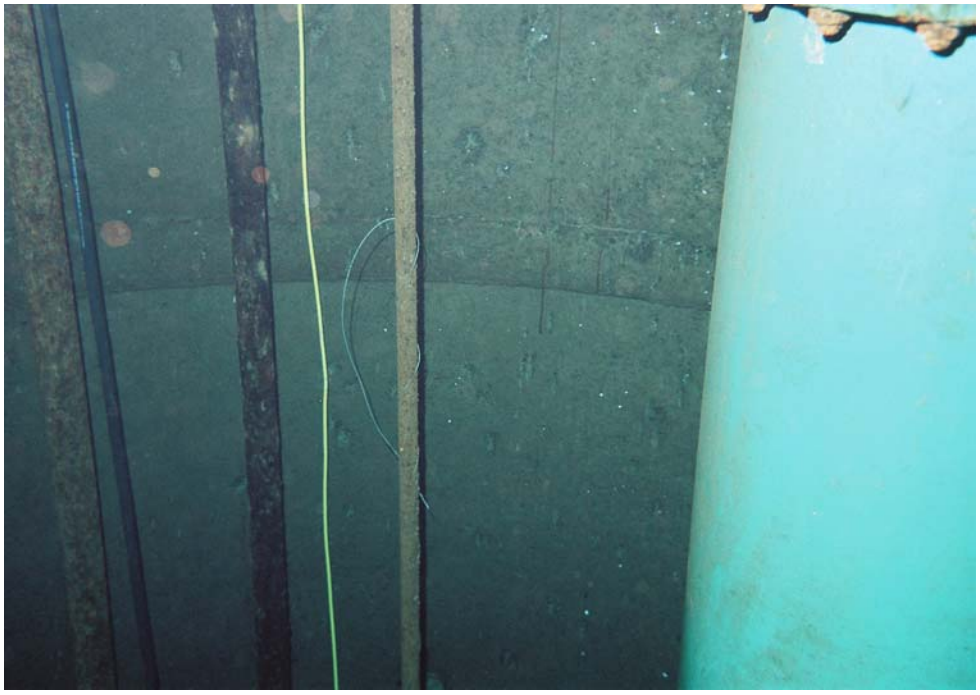


Collector 4 Turbine Pump Column and Piping

Collector 4 Piping Detail



Collector 4 Piping Detail



Collector 4 Piping Detail

Collector 4 Piping

Collector 4 Ladder Detail

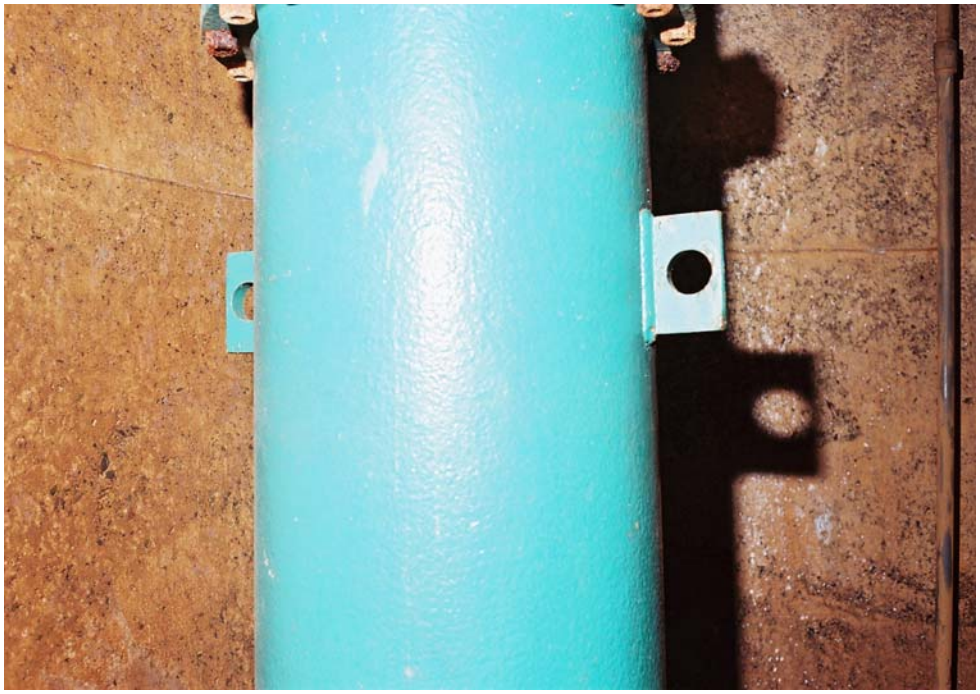
Collector 4 Piping and Turbine Pump Column

Collector 4 Turbine Pump and Brace

Collector 4 Upper Piping and Turbine Pump Columns

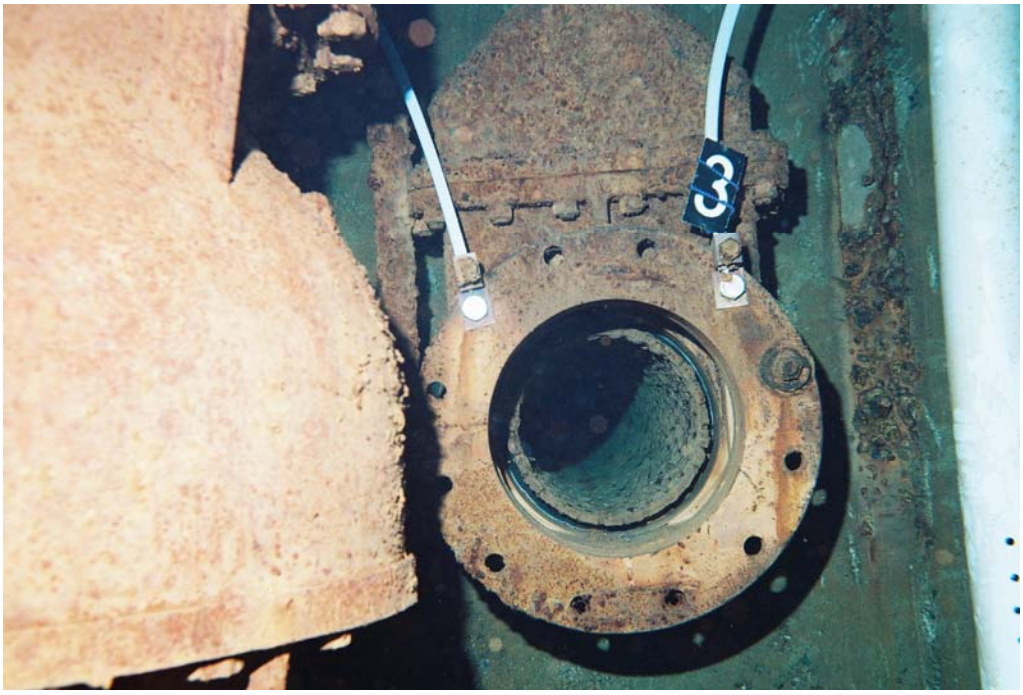
Collector 4 Piping

Collector 4 Turbine Pump Column

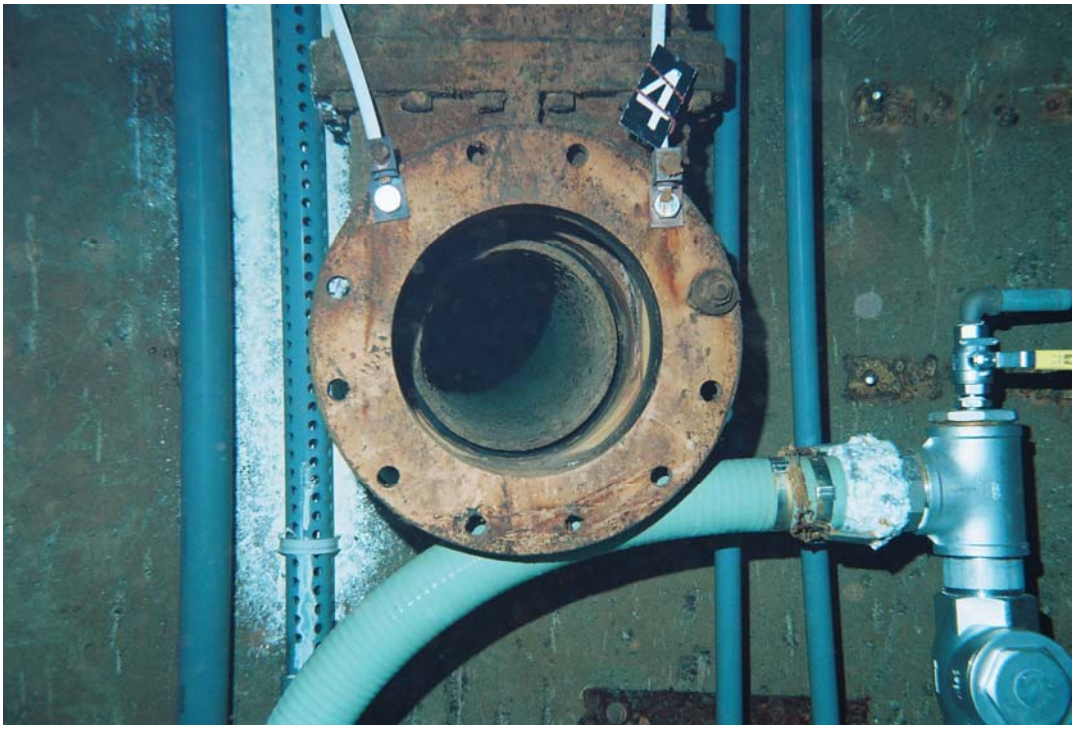


Collector 4 Turbine Pump Column and Piping

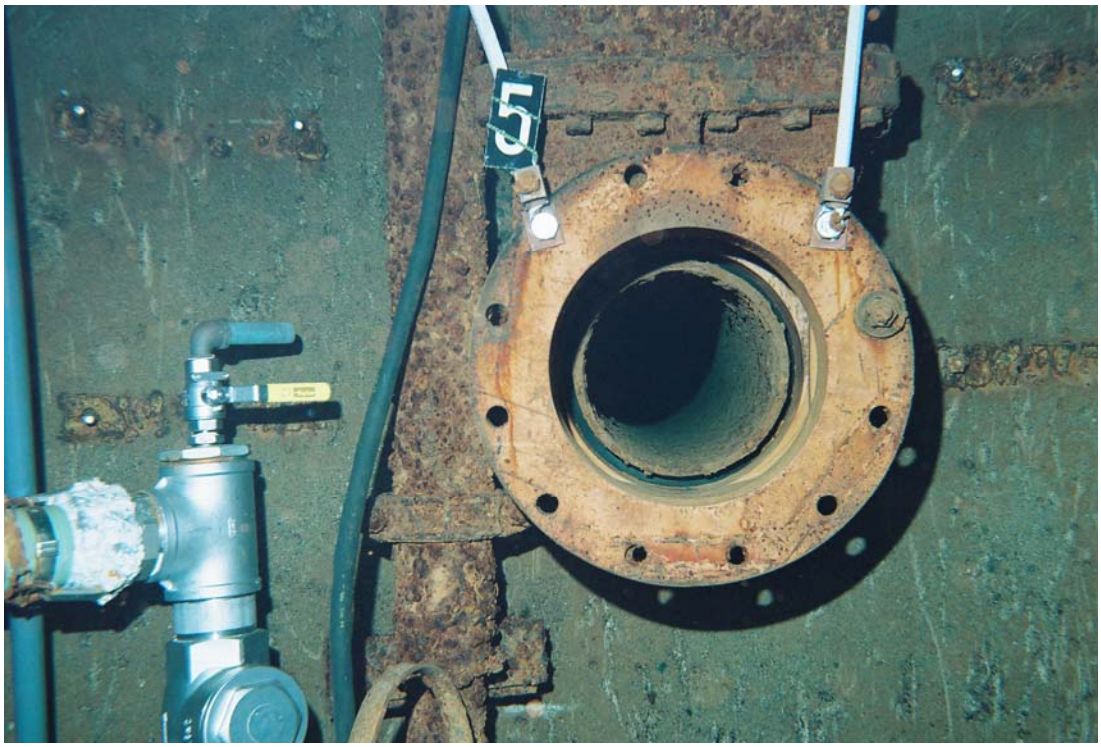
Collector 5 Lateral #3



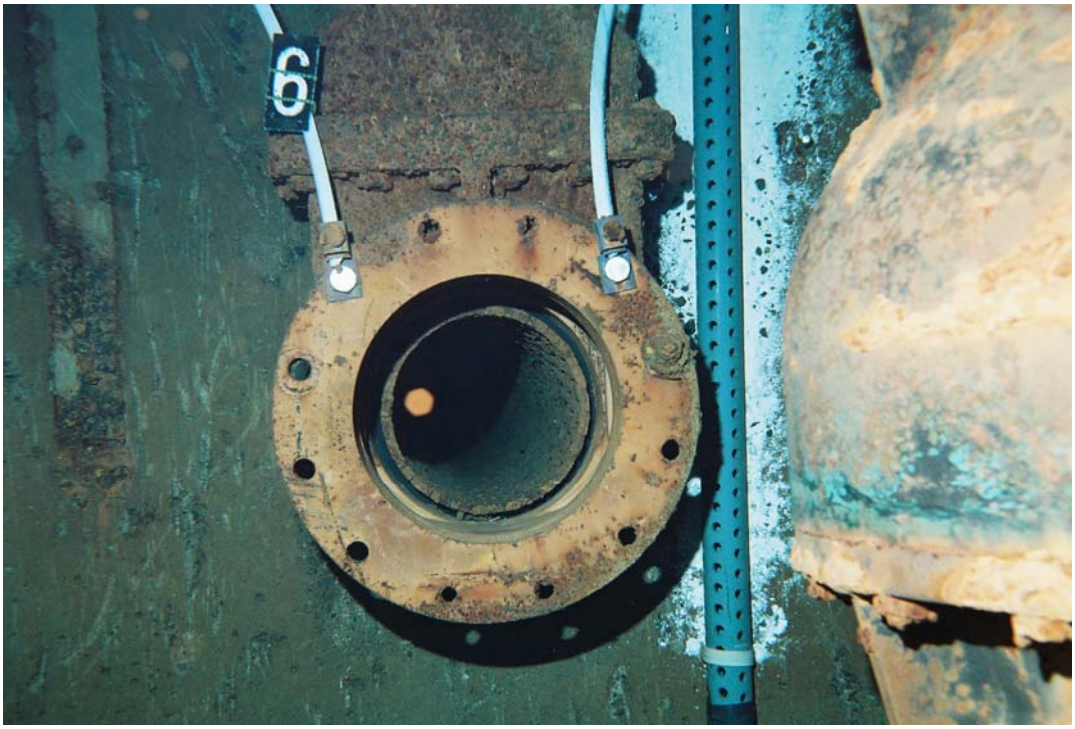
Collector 5 Lateral #4



Collector 5 Valve Lateral #5

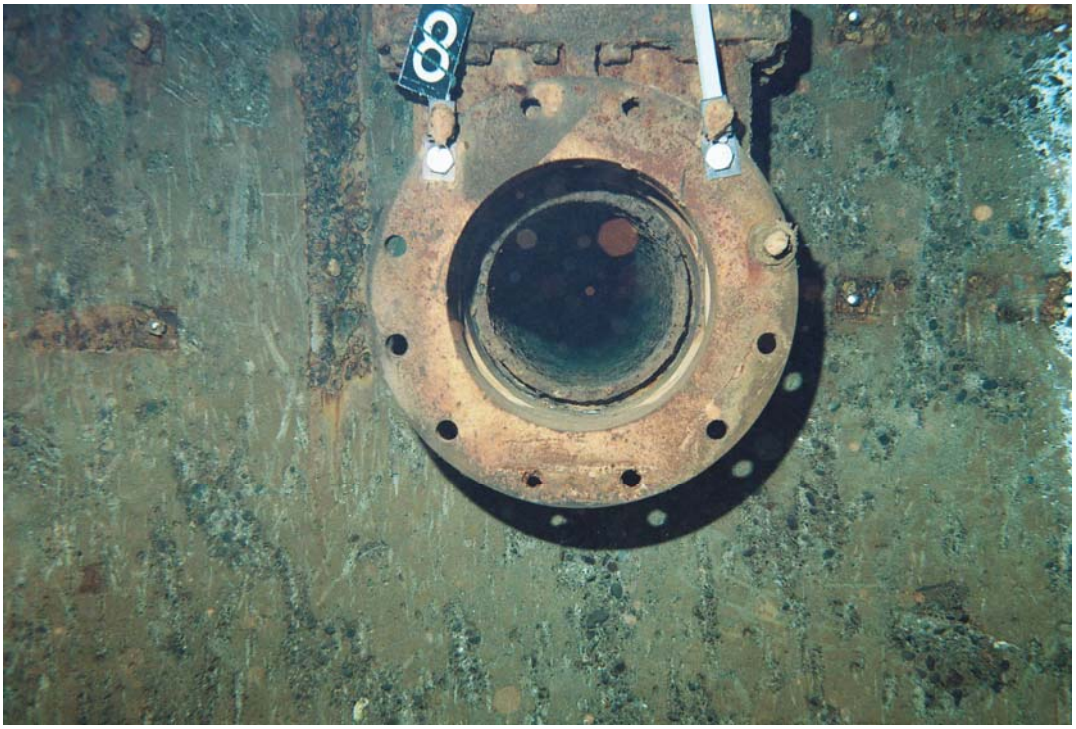


Collector 5 Lateral #6

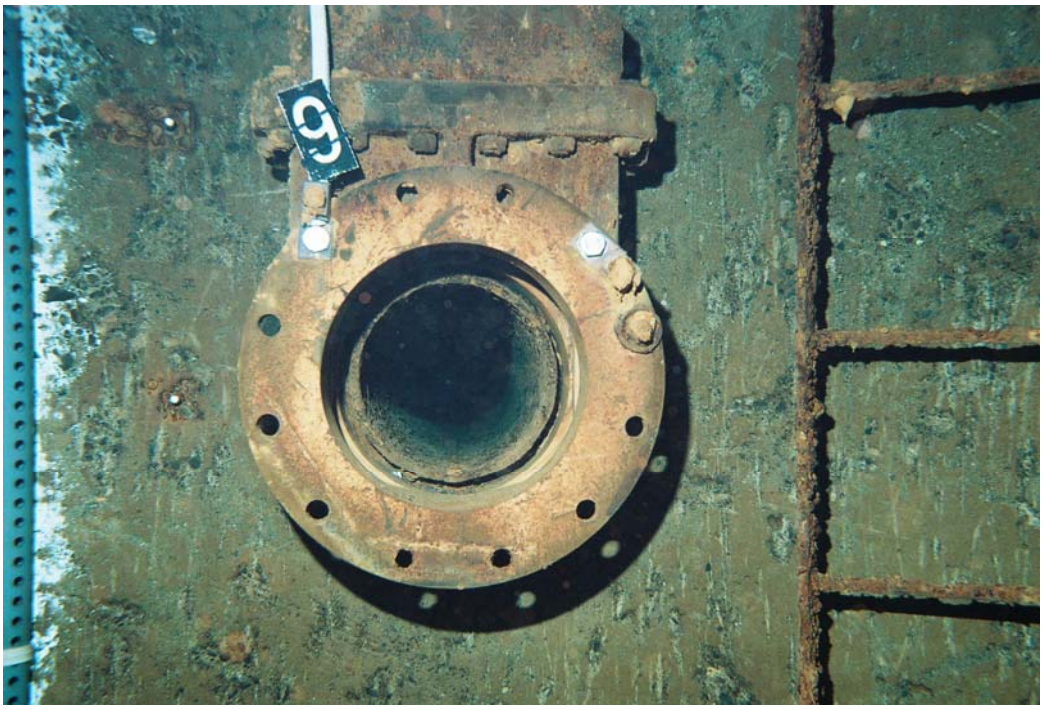


Collector 5 Lateral #7

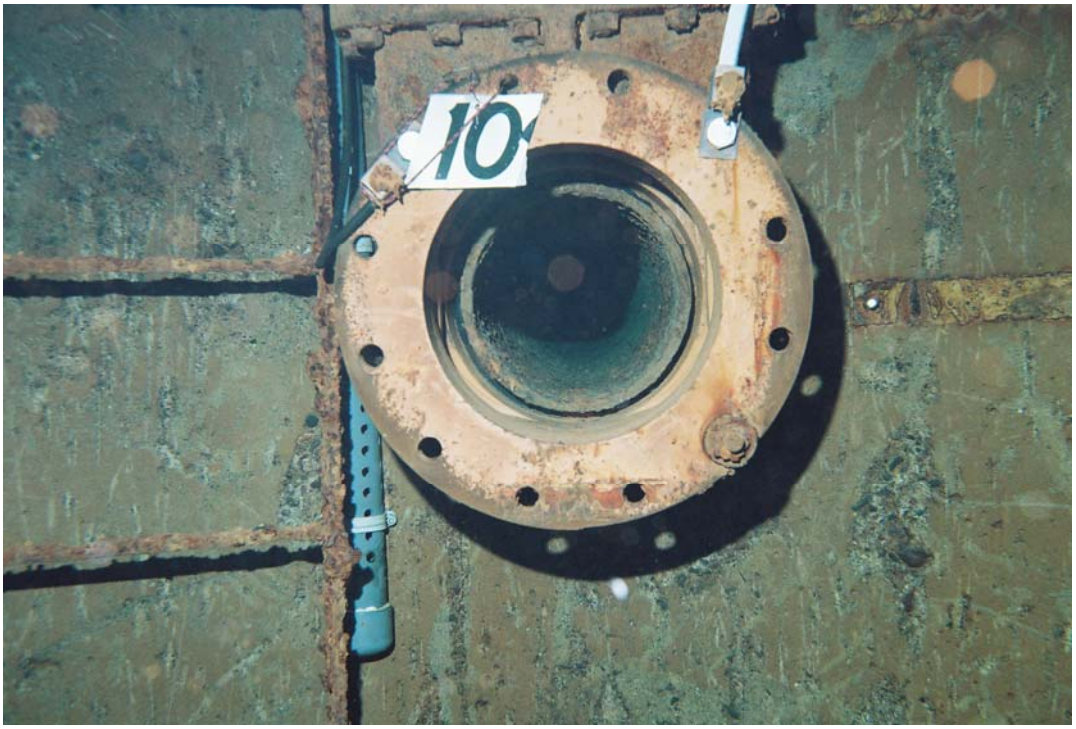
Collector 5 Lateral #8



Collector 5 Lateral #9

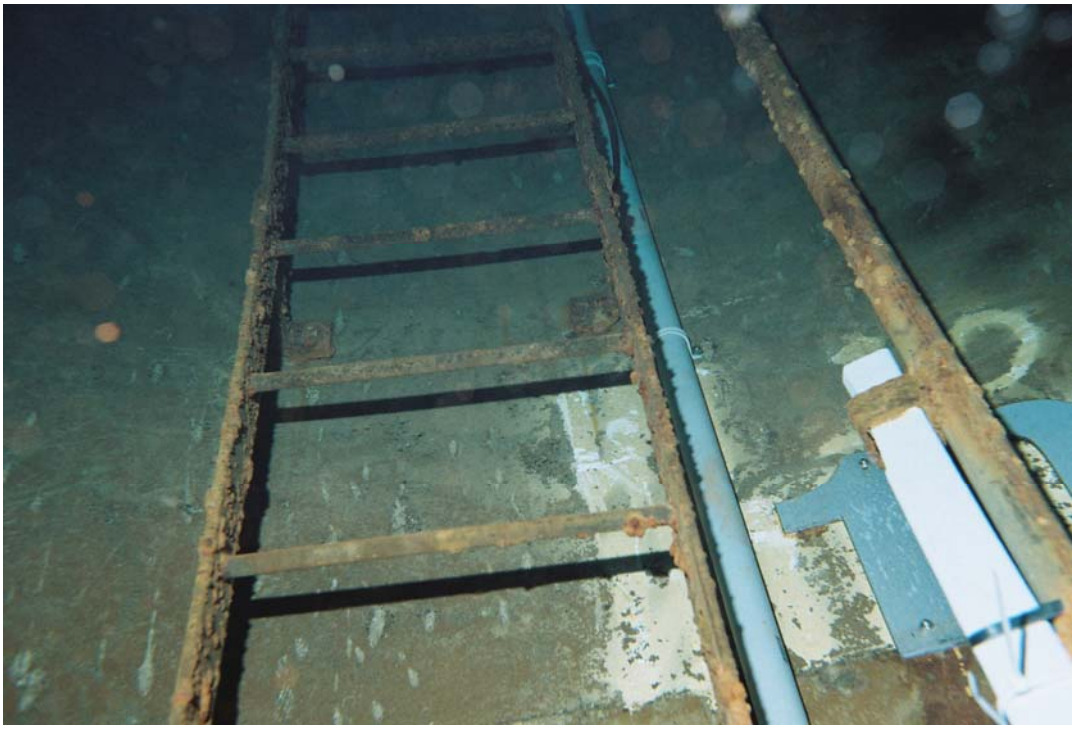


Collector 5 Lateral #10

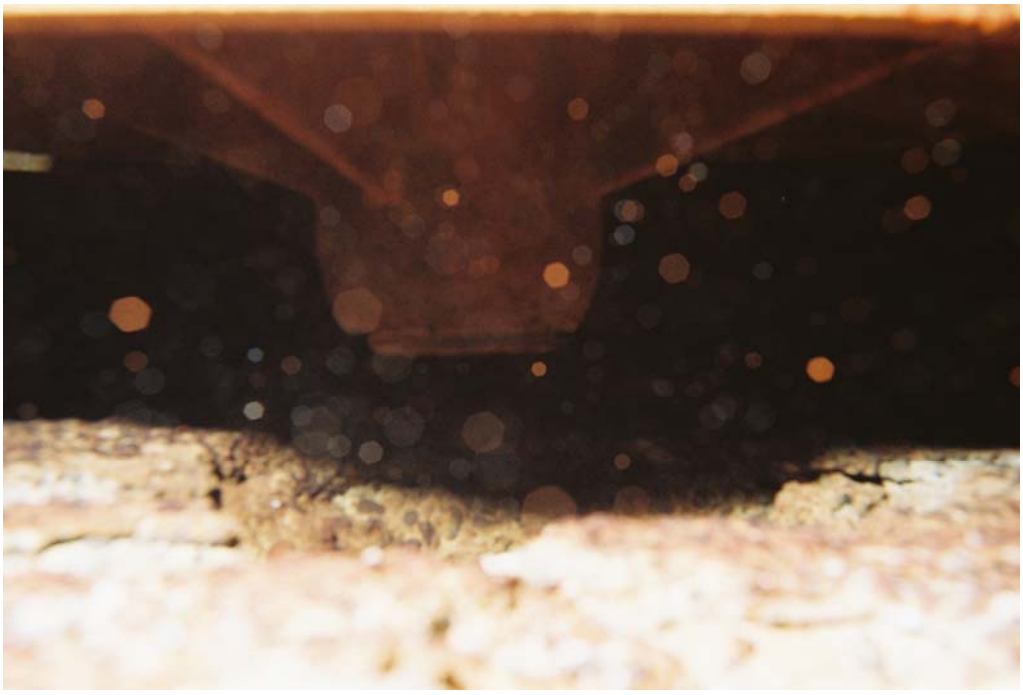


Collector 5 Ladder and Caisson Floor

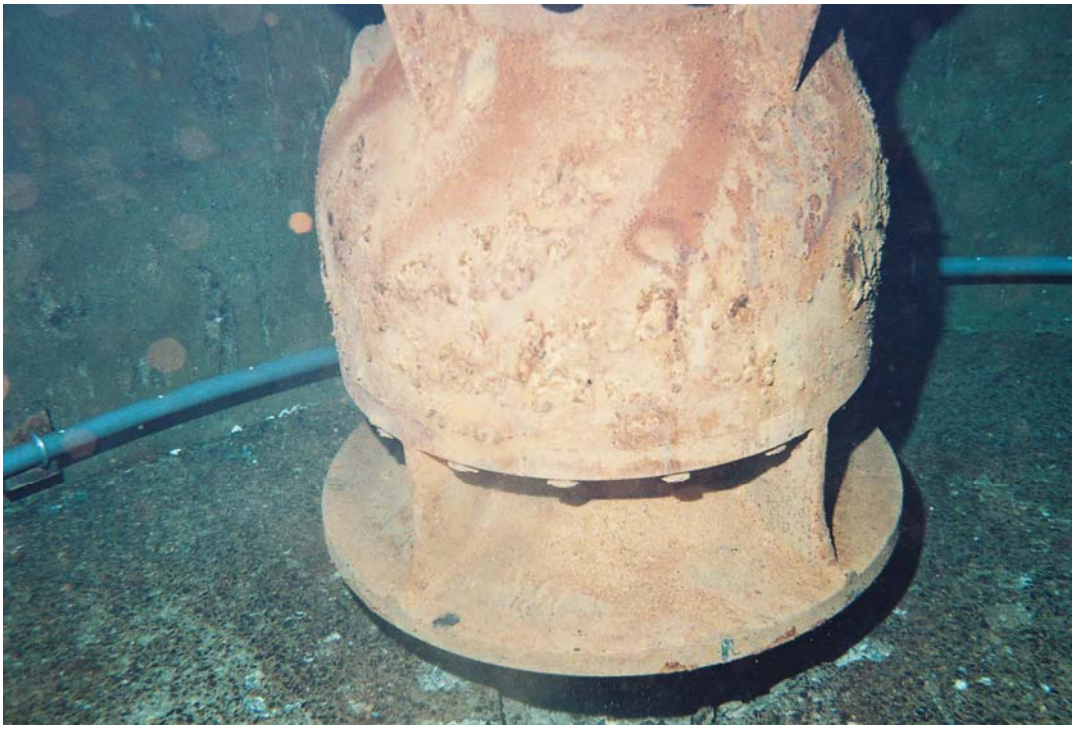
Collector 5 Ladder and Piping



Collector 5 Underside of Turbine Pump

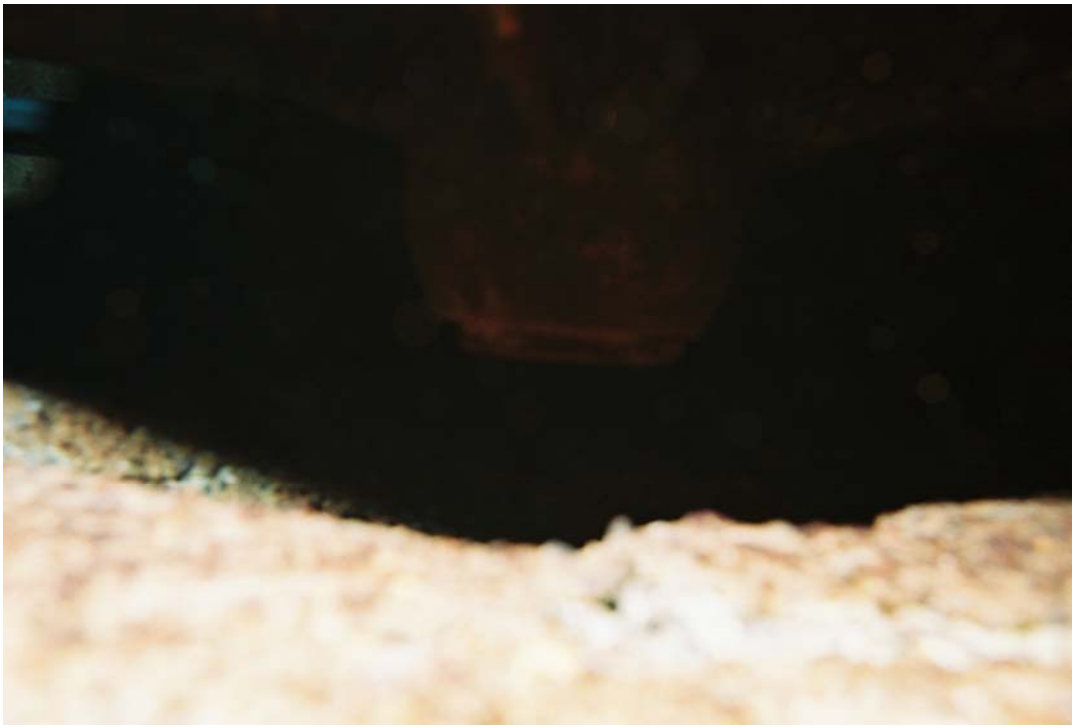


Collector 5 Turbine Pump #9

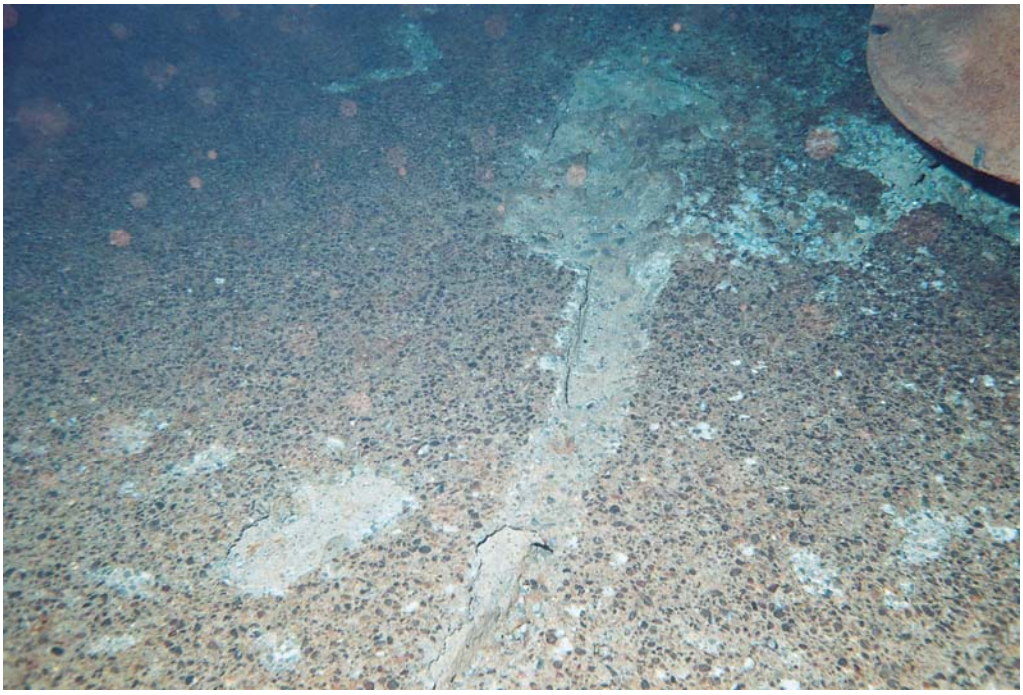


Collector 5 Turbine Pump #10

Collector 5 Underside of Turbine Pump #10



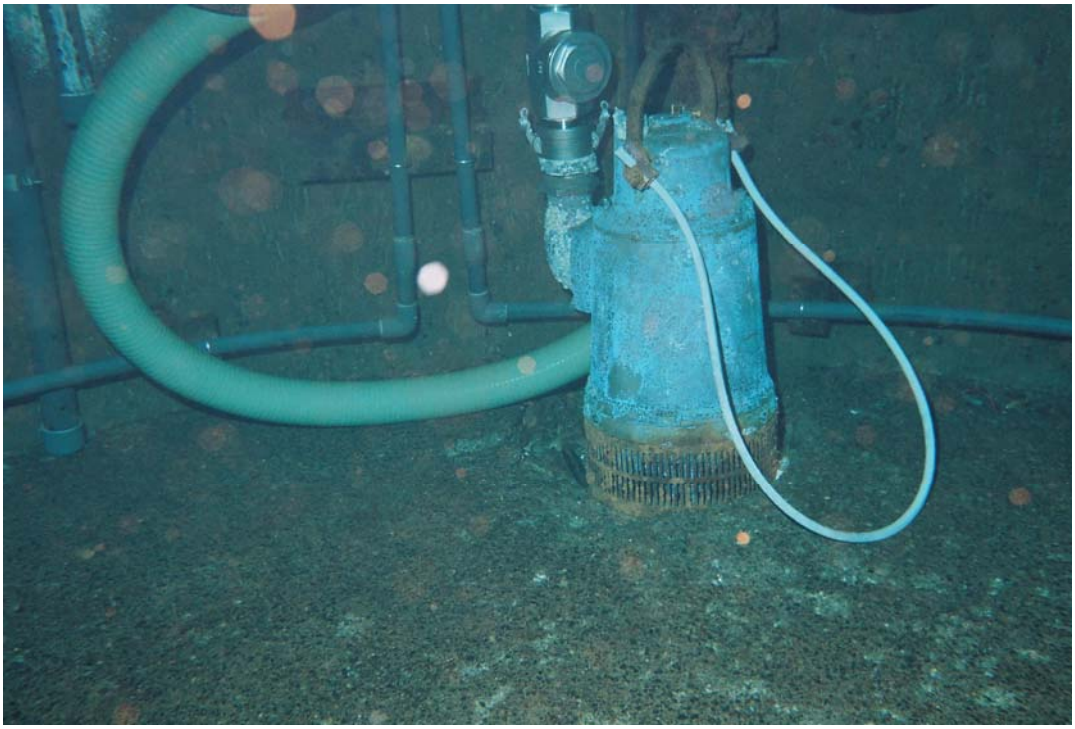
Collector 5 Caisson Floor Detail



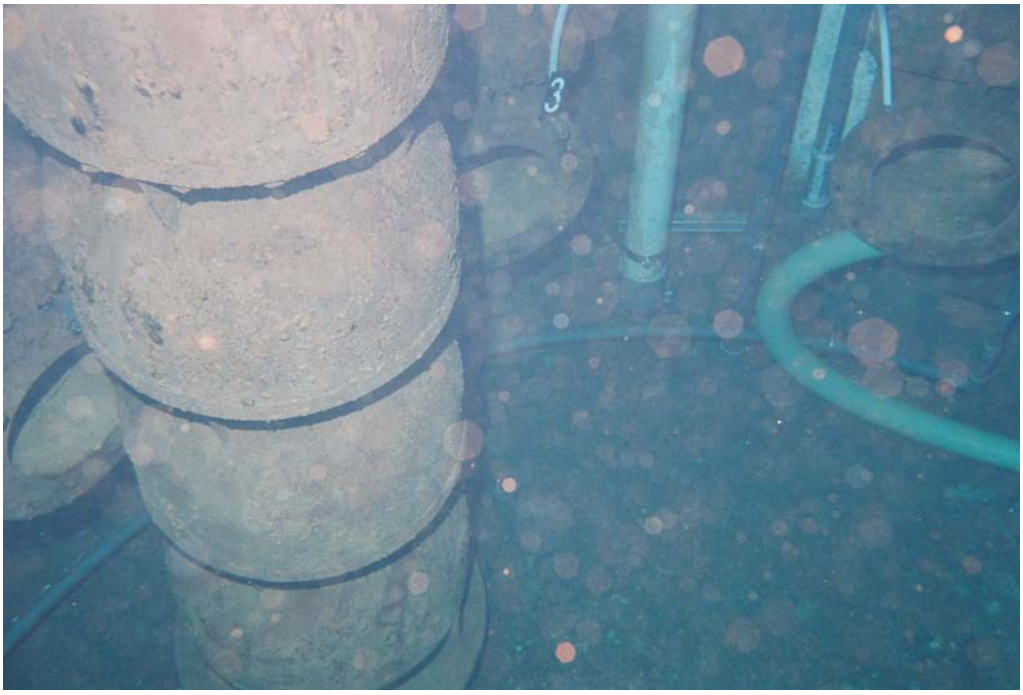
Collector 5 Caisson Floor Detail

Collector 5 Caisson Floor and Piping

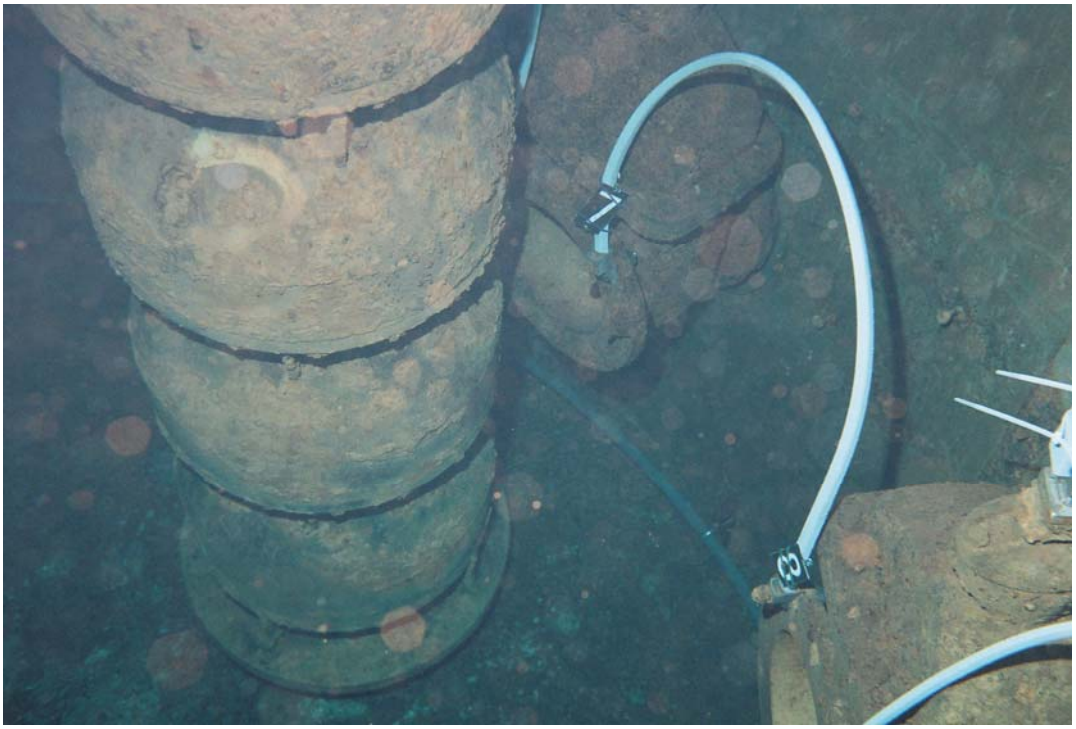
Collector 5 Sump Pump



Collector 5 Turbine Pump Column

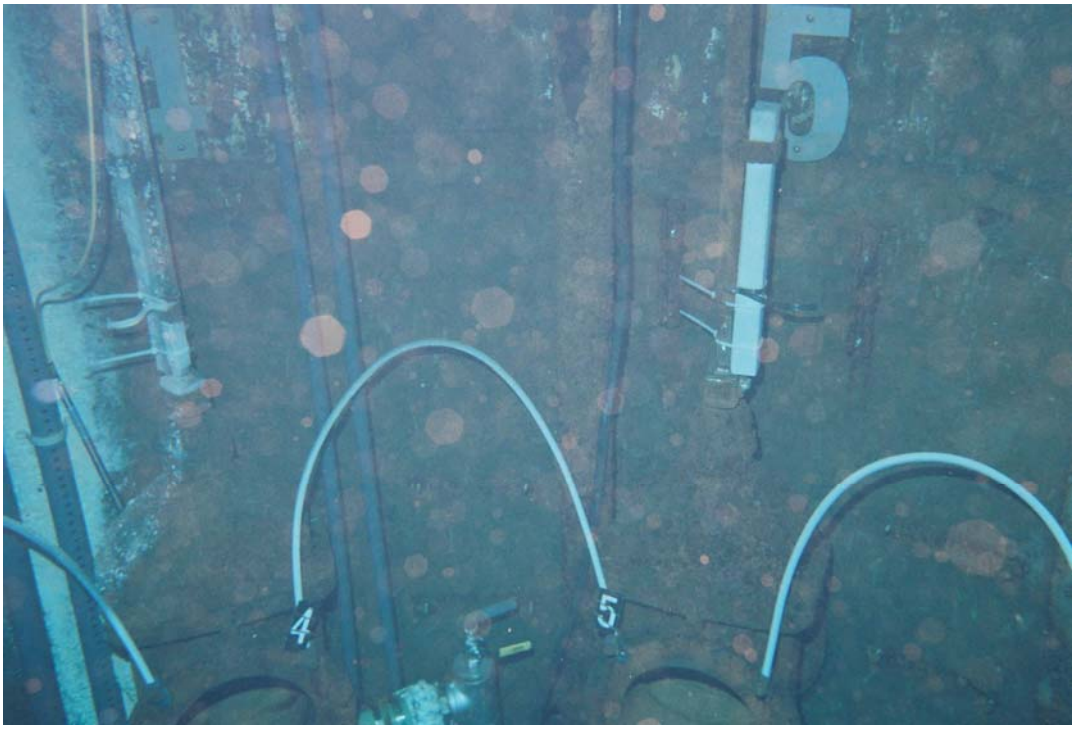


Collector 5 Turbine Pump Column



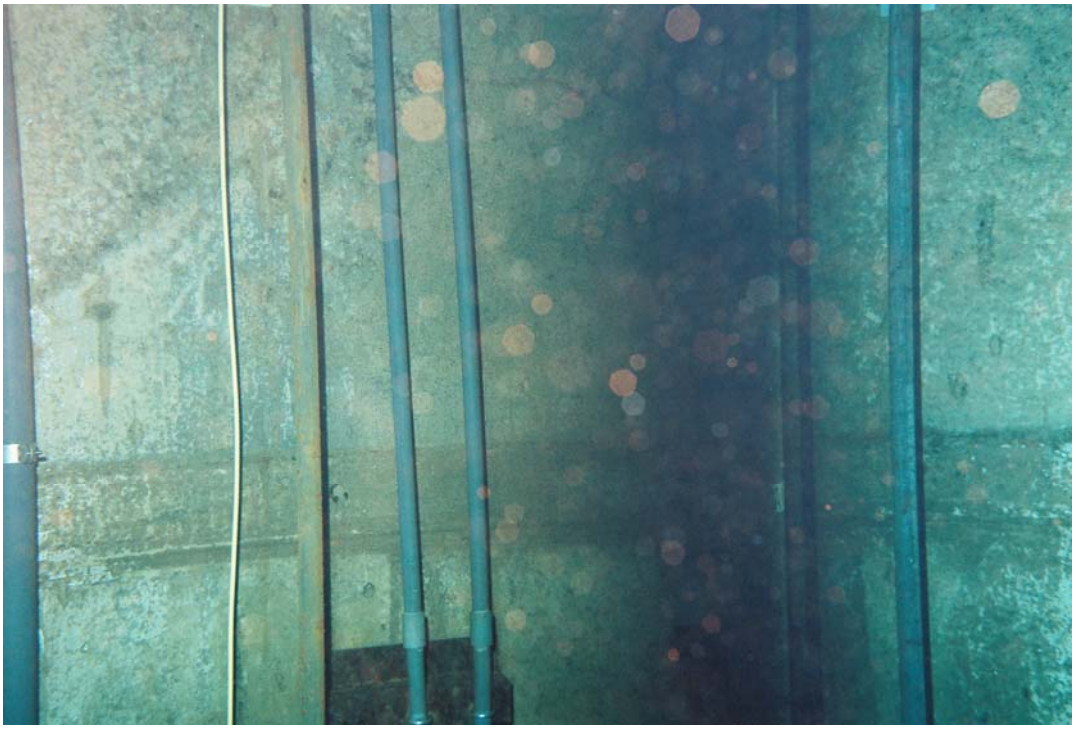
Collector 5 Turbine Pump Column Brace Detail

Collector 5 Piping



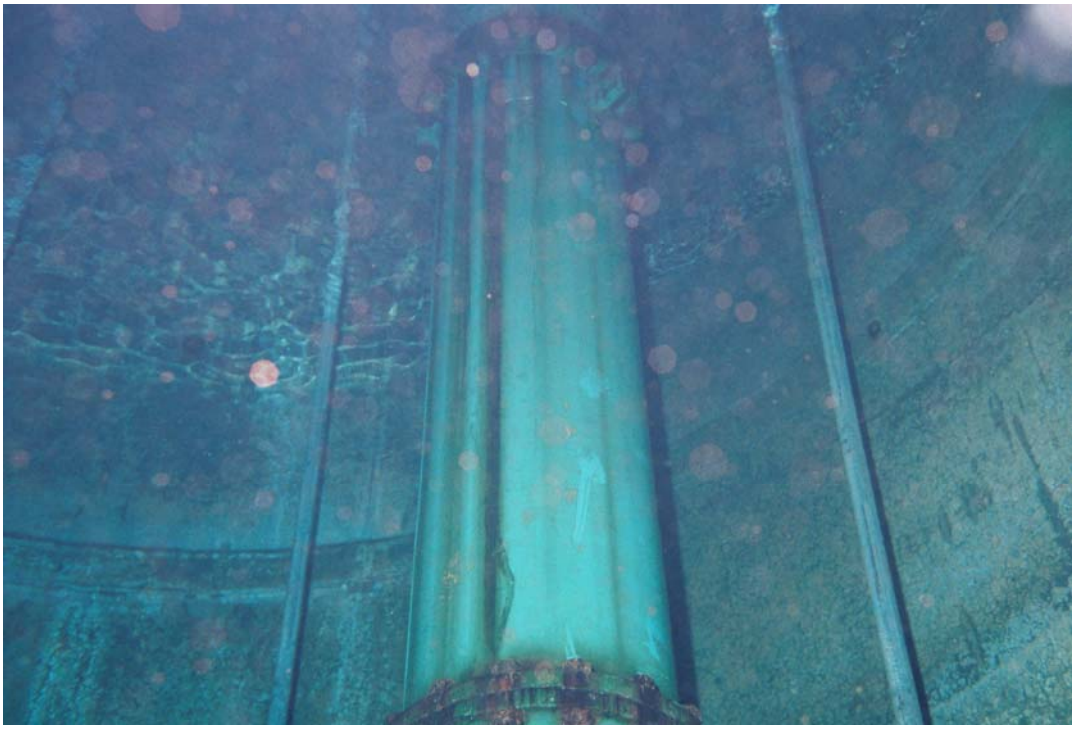
Collector 5 Turbine Pump Column Detail

Collector 5 Piping



Collector 5 Ladder and Piping

Collector 5 Turbine Pump Column



Collector 5 Turbine Pump Column and Piping

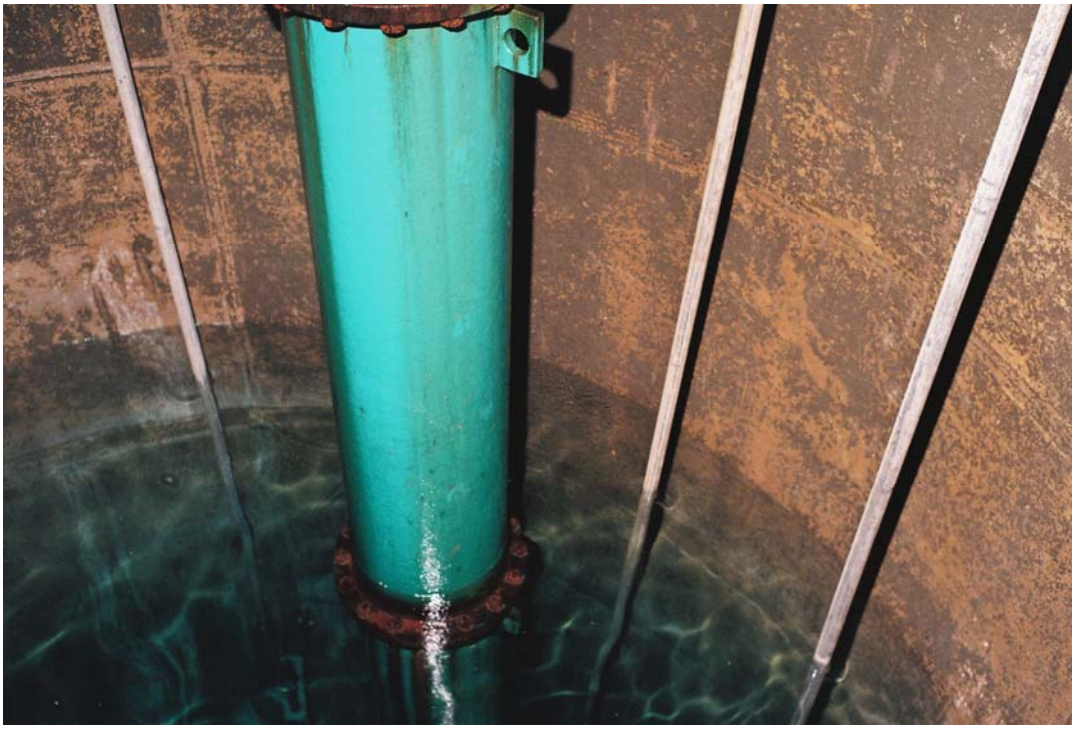
Collector 5 Piping Detail

Collector 5 Piping Detail

Collector 5 Piping Detail

Collector 5 Piping

Collector 5 Turbine Pump Column and Piping Detail



Collector 5 Turbine Pump Column Brace Detail

Collector 5 Turbine Pump and Piping

Collector 5 Upper Piping and Turbine Pump Columns

Collector 5 Upper Piping and Turbine Pump Columns

Collector 5 Upper Piping and Ladder

Collector 5 Bracket and Piping Detail

Appendix D
Collector Inspection Videos

Appendix D
Collector Inspection Videos

by Aqua-Tech, Inc.
(916) 482-3703

10/1/2010	Collector 3	Set-up and Lateral Measurements for SCWA
10/4/2010	Collector 3	SCWA Initial Flow Test
10/5/2010	Collector 3	Laterals 1 & 2 - SCWA
10/6/2010	Collector 3	Lateral 3 - SCWA
10/7/2010	Collector 3	Laterals 4 & 5 - SCWA
10/8/2010	Collector 3	Lateral 6 - SCWA
11/5/2010	Collector 4	SCWA Basket, Readings - Day #1
11/8/2010	Collector 4	SCWA Water Quality Tests
11/9/2010	Collector 4	SCWA Initial Flow Tests / Lateral 8
11/10/2010	Collector 4	SCWA Day 4 / Lateral 5
12/8/2010	Collector 4	SCWA Laterals 4 & 7
12/9/2010	Collector 4	SCWA Laterals 2 & 3
10/15/2010	Collector 5	Thickness Tests & Basket
10/18/2010	Collector 5	Water Quality Initial Flow and Lateral 2
10/19/2010	Collector 5	Laterals 10, 1 & 9 / SCWA Flow Tests
10/20/2010	Collector 5	Laterals 3, 8 & 4 SCWA
10/21/2010	Collector 5	Laterals 5 & 6 SCWA

Appendix E
Capacity Testing Photographs

Photograph #1

Collector 3 pump house.

Mirabel Capacity Analysis – Sonoma County Water Agency

Photograph #2

Collector 3 pump house interior.

Mirabel Capacity Analysis – Sonoma County Water Agency

Photograph #3

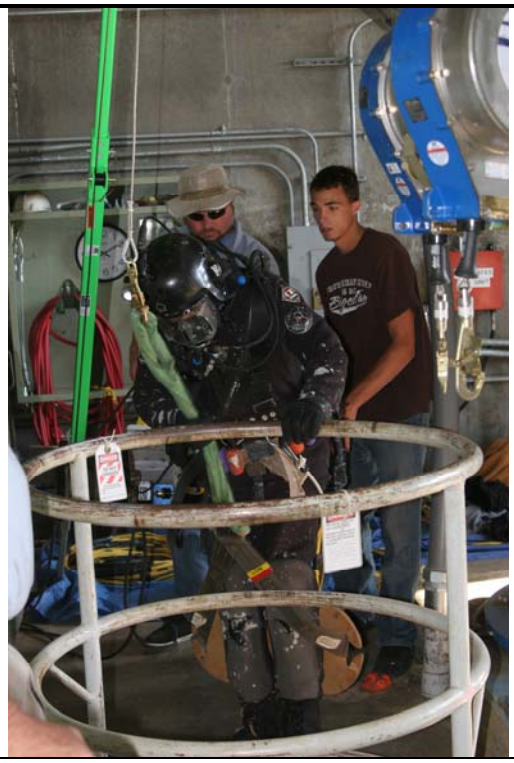
Collector 4 pump house.

Mirabel Capacity Analysis – Sonoma County Water Agency

Photograph #4

Collector 5 pump house interior.

Mirabel Capacity Analysis – Sonoma County Water Agency

Photograph #5

Diver preparing to enter the Collector 3 caisson.
Mirabel Capacity Analysis – Sonoma County Water Agency

Photograph #6
Diver climbing down the Collector 3 caisson ladder.
Mirabel Capacity Analysis – Sonoma County Water Agency

Photograph #7

Lateral videotaping and flow equipment setup at Collector 3.

Mirabel Capacity Analysis – Sonoma County Water Agency

Photograph #8

Gurley Model 1100 digital indicator.

Mirabel Capacity Analysis – Sonoma County Water Agency

Photograph #9

Lateral flow measurement activities in Collector 3.

Mirabel Capacity Analysis – Sonoma County Water Agency

Photograph #10

Gurley Price Type AA flow meter used for relative flow measurements in all wells and lateral flow measurements in all wells.

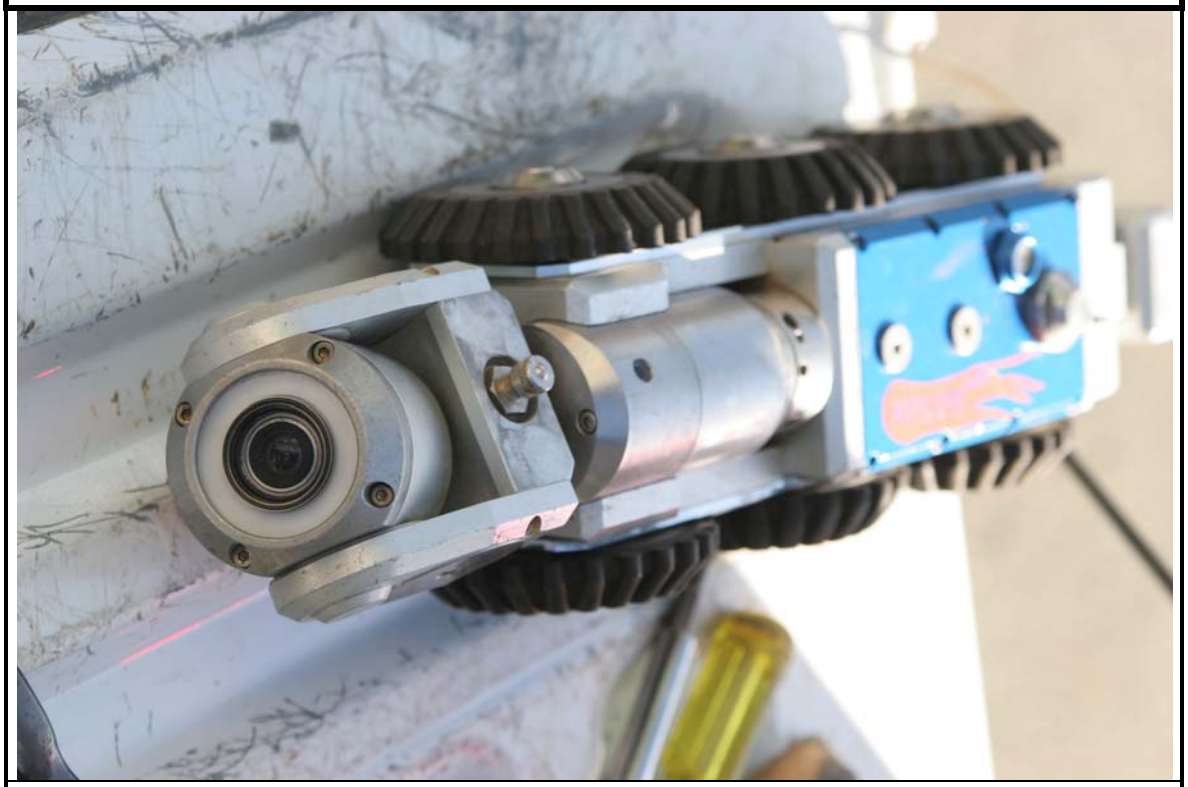
Mirabel Capacity Analysis – Sonoma County Water Agency

Photograph #11

Preparing the flow meter for relative lateral flow measurements.

Mirabel Capacity Analysis – Sonoma County Water Agency

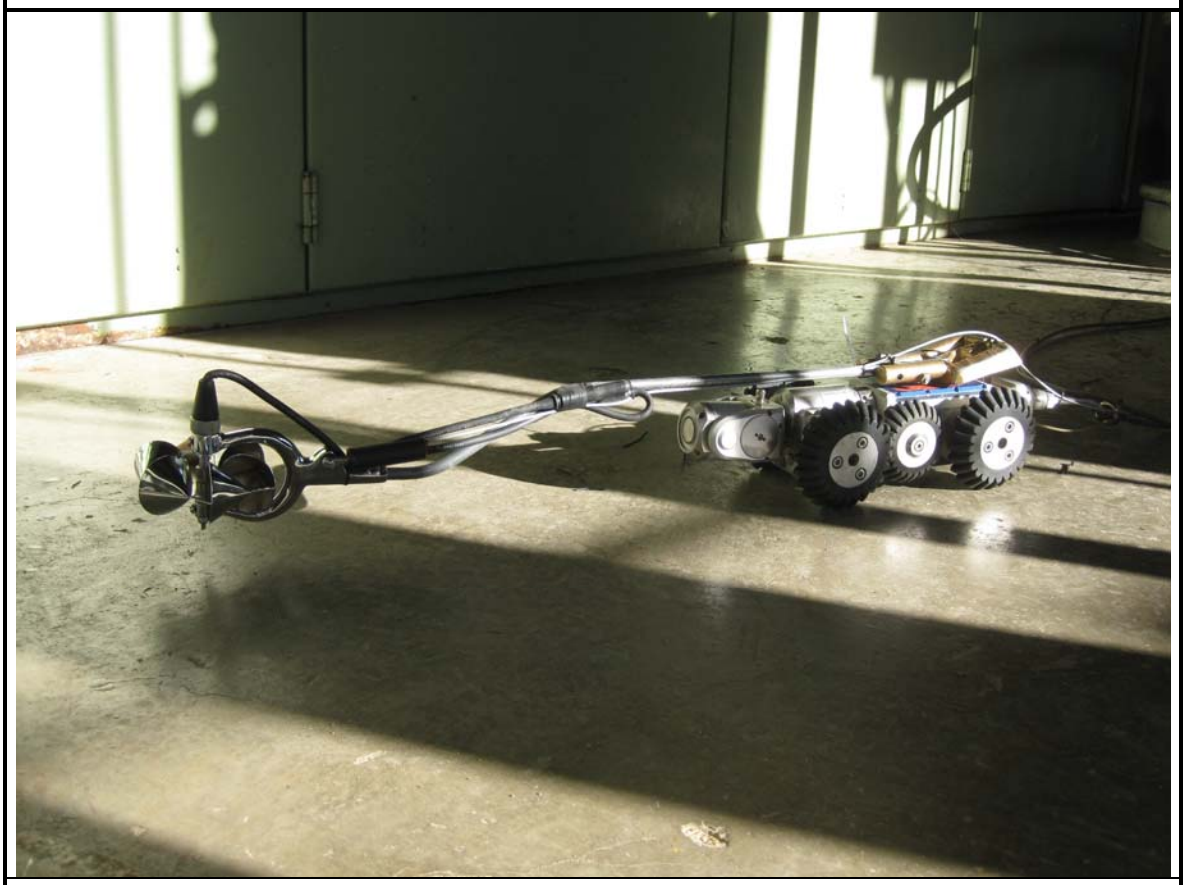
Photograph #12



Remote control video camera vehicle used for lateral evaluations.

Mirabel Capacity Analysis – Sonoma County Water Agency

Photograph #13



Remote control video camera vehicle with attached flow meter apparatus.

Mirabel Capacity Analysis – Sonoma County Water Agency

Photograph #14

Video camera and bull rod apparatus used for initial inspection of laterals.

Mirabel Capacity Analysis – Sonoma County Water Agency

Photograph #15

Mirabel Pond #1 during capacity testing of Collector 3.

Mirabel Capacity Analysis – Sonoma County Water Agency

Photograph #16

Mirabel Pond #2 during capacity testing of Collector 3.

Mirabel Capacity Analysis – Sonoma County Water Agency

Photograph #17

Inflatable dam upriver from the Mirabel collectors.

Mirabel Capacity Analysis – Sonoma County Water Agency

Photograph #18

YSI Model 6920 probe being lowered into Collector 3 caisson.

Mirabel Capacity Analysis – Sonoma County Water Agency

Photograph #19
YSI Model 6920 display for water quality measurements.
Mirabel Capacity Analysis – Sonoma County Water Agency

Photograph #20
HACH 2100P turbidity meter.
Mirabel Capacity Analysis – Sonoma County Water Agency

Appendix F
Lateral Inspection Videos

Appendix F
Lateral Inspection Videos
Sonoma County Water
by PIPEeye

10/5/2010	Collector 3	Lateral 1
10/5/2010	Collector 3	Lateral 2
10/6/2010	Collector 3	Lateral 3
10/7/2010	Collector 3	Lateral 4
10/7/2010	Collector 3	Lateral 5
10/8/2010	Collector 3	Lateral 6
12/9/2010	Collector 4	Laterals 2 & 3
12/9/2010	Collector 4	Lateral 3 - 2nd disc
12/9/2010	Collector 4	Laterals 4 & 7
		First 10' of Lateral 5 / All Lateral 4
12/9/2010	Collector 4	First 10' of Lateral 8
10/18/2010	Collector 5	First 10' & Lateral 2
10/19/2010	Collector 5	Lateral 1
10/19/2010	Collector 5	Lateral 10
10/20/2010	Collector 5	Laterals 3 & 8
10/20/2010	Collector 5	Lateral 4
10/21/2010	Collector 5	Lateral 5
10/21/2010	Collector 5	Lateral 6

Appendix G
Collector Operation and System Data

Caisson 3 Level	Pond 1 Level	Pump5 Flow	Pump6 Flow	Caisson 4 Level	Pond 2 Level	Pump7 Flow	Pump8 Flow	Caisson 5 Level	Pond 3 Level	Pond 4 Level	Pump9 Flow	Pump10 Flow	Mirabel Flow	Mirabel Line Pressure	54inch Intertie Flow	River Level	Pump 1 Status Run	Pump 2 Status Run	Pump 3 Status Run	Date	Interval
57.375	0.06875	0	0	45.9375	1.20625	0	14.5375	33.4635	0	0	-2.50E-16	13.278	28.275	109.5	-5.65E-16	37.8438	0	0	1	9/23/2010	0:00
57.5	0.06875	0	0	45.9375	1.20625	0	14.5375	33.4635	0	0	-2.50E-16	13.278	28.4781	109.5	-5.65E-16	37.8438	0	0	1	9/23/2010	1:00
57.375	0.06875	0	0	45.9375	1.20625	0	14.5375	33.4635	0	0	-2.50E-16	13.278	28.4781	109.5	-5.65E-16	37.8438	0	0	1	9/23/2010	2:00
57.375	0.06875	0	0	45.9375	1.20625	0	14.5375	33.4635	0	0	-2.50E-16	13.278	28.4375	109.5	-5.65E-16	37.8219	0	0	1	9/23/2010	3:00
57.375	0.06875	0	0	45.9375	1.20625	0	14.5375	33.4635	0	0	-2.50E-16	13.278	28.5594	109.5	-5.65E-16	37.8438	0	0	1	9/23/2010	4:00
57.375	0.06875	0	0	45.9375	1.20625	0	14.5375	33.4635	0	0	-2.50E-16	13.278	28.6	109.5	-5.65E-16	37.8438	0	0	1	9/23/2010	5:00
57.5	0.06875	0	0	45.75	1.20625	0	14.5375	33.4635	0	0	-2.50E-16	13.278	28.4781	109.5	-5.65E-16	37.8656	0	0	1	9/23/2010	6:00
57.5	0.06875	0	0	45.75	1.20625	0	14.5375	33.4635	0	0	-2.50E-16	13.278	28.3969	108.375	-5.65E-16	37.8656	0	0	1	9/23/2010	7:00
57.5	0.06875	0	0	45.75	1.20625	0	14.5375	33.4635	0	0	-2.50E-16	13.278	28.5594	108.938	-5.65E-16	37.8656	0	0	1	9/23/2010	8:00
57.375	0.06875	0	0	45.75	1.20625	0	14.5375	33.3628	0	0	-2.50E-16	13.278	28.3156	109.313	-5.65E-16	37.8656	0	0	1	9/23/2010	9:00
57.5	0.06875	0	0	45.75	1.20625	0	14.5375	33.3628	0	0	-2.50E-16	13.278	28.6812	107.063	-5.65E-16	37.8656	0	0	1	9/23/2010	10:00
57.375	0.06875	0	0	45.75	1.20625	0	14.5375	33.3689	0	0	-2.50E-16	13.3848	28.5188	107.063	-5.65E-16	37.8656	0	0	1	9/23/2010	11:00
57.5	0.06875	0	0	45.75	1.20625	0	14.5375	33.3689	0	0	-2.50E-16	13.3848	28.6	107.063	-5.65E-16	37.8875	0	0	1	9/23/2010	12:00
57.5	0.06875	0	0	45.75	1.20625	0	14.5375	33.3689	0.0860622	0	-2.50E-16	13.3848	28.4781	107.063	-5.65E-16	37.8875	0	0	1	9/23/2010	13:00
57.5	0.06875	0	0	45.75	1.20625	0	14.5375	33.3689	0.0848415	0	-2.50E-16	13.3848	28.5188	107.063	-5.65E-16	37.8875	0	0	1	9/23/2010	14:00
57.5	0.06875	0	0	45.9375	1.10625	0	14.5375	33.3689	0.0848415	0	-2.50E-16	13.3848	28.5188	107.063	-5.65E-16	37.8875	0	0	1	9/23/2010	15:00
57.4375	0.06875	0	0	46	1.10625	0	14.5375	33.3689	0.0848415	0	-2.50E-16	13.3848	28.0313	113.25	-5.65E-16	37.8875	0	0	1	9/23/2010	16:00
57.5625	0.06875	0	0	46	1.10625	0	14.425	33.3689	0.0848415	0	-2.50E-16	13.2597	28.3969	109.5	-5.65E-16	37.9094	0	0	1	9/23/2010	17:00
57.5625	0.06875	0	0	46	1.10625	0	14.425	33.3689	0.0848415	0	-2.50E-16	13.2597	28.4375	109.5	-5.65E-16	37.8875	0	0	1	9/23/2010	18:00
57.5625	0.06875	0	0	46	1.10625	0	14.425	33.3689	0.0848415	0	0	13.2597	28.3969	109.5	0	37.9094	0	0	1	9/23/2010	19:00
57.5625	0.06875	0	0	46	1.10625	0	14.425	33.3689	0.00305185	0	0	13.2597	28.3563	109.5	0	37.9094	0	0	1	9/23/2010	20:00
57.5625	0.06875	0	0	46	1.10625	0	14.425	33.3689	0.00305185	0	0	13.2597	28.3969	109.5	0	37.9094	0	0	1	9/23/2010	21:00
57.5625	0.06875	0	0	46	1.10625	0	14.425	33.3689	0.00305185	0	0	13.2597	28.3969	109.5	0	37.9094	0	0	1	9/23/2010	22:00
57.375	0.06875	0	0	46	1.10625	0	14.425	33.3689	0.00305185	0	0	13.2597	28.4375	109.5	0	37.9094	0	0	1	9/23/2010	23:00
57.375	0.06875	0	0	46	1.10625	0	14.525	33.3689	0.00305185	0	0	13.2597	28.3969	109.5	0	37.9094	0	0	1	9/24/2010	0:00
57.375	0.06875	0	0	46	1.10625	0	14.525	33.3689	0.00305185	0	0	13.2597	28.5188	109.5	0	37.9094	0	0	1	9/24/2010	1:00
57.5	0.06875	0	0	46	1.10625	0	14.525	33.3689	0.00305185	0	0	13.2597	28.5594	109.5	0	37.9094	0	0	1	9/24/2010	2:00
57.5	0.06875	0	0	46	1.10625	0	14.525	33.3689	0.00305185	0	0	13.2597	28.3969	109.5	0	37.8875	0	0	1	9/24/2010	3:00
57.5	0.06875	0	0	46	1.10625	0	14.525	33.3689	0.00305185	0	0	13.2597	28.5594	109.5	0	37.9094	0	0	1	9/24/2010	4:00
57.5	0.06875	0	0	46	1.10625	0	14.525	33.3689	0.00305185	0	0	13.2597	28.3563	109.5	0	37.9094	0	0	1	9/24/2010	5:00
57.5	0.06875	0	0	45.75	1.10625	0	14.525	33.3689	0.00305185	0	0	13.2597	28.275	108.375	0	37.9094	0	0	1	9/24/2010	6:00
57.5	0.06875	0	0	45.75	1.10625	0	14.525	33.3689	0.00305185	0	0	13.3641	28.6406	108.375	0	37.9094	0	0	1	9/24/2010	7:00
57.5	0.06875	0	0	45.75	1.10625	0	14.525	33.3689	0.00305185	0	0	13.3641	28.3563	108.375	0	37.9094	0	0	1	9/24/2010	8:00
57.5	0.06875	0	0	45.75	1.10625	0	14.525	33.3689	0.00305185	0	0	13.3641	28.4781	108.375	0	37.8875	0	0	1	9/24/2010	9:00
57.375	0.06875	0	0	45.75	1.10625	0	14.525	33.2469	0.00305185	0	0	13.3641	28.4781	107.063	0	37.8875	0	0	1	9/24/2010	10:00
57.375	0.06875	0	0	45.625	1.10625	0	14.525	33.2469	0.00305185	0	0	13.3641	28.6812	107.063	0	37.8875	0	0	1	9/24/2010	11:00
57.375	0.06875	0	0	45.75	1.10625	0	14.525	33.2469	0.00305185	0	0	13.3641	28.5594	107.063	0	37.9094	0	0	1	9/24/2010	12:00
57.375	0.06875	0	0	45.75	1.10625	0	14.525	33.2469	0.0830103	0	0	13.3641	28.6	107.063	0	37.9094	0	0	1	9/24/2010	13:00
57.375	0.06875	0	0	45.75	1.10625	0	14.525	33.2469	0.0851466	0	0	13.3641	28.5594	107.063	0	37.9094	0	0	1	9/24/2010	14:00
57.375	0.06875	0	0	45.75	1.10625	0	14.525	33.3659	0.0851466	0	0	13.3641	28.5188	107.063	0	37.8875	0	0	1	9/24/2010	15:00
57.5	0.06875	0	0	45.9375	1.10625	0	14.325	33.4727	0.0851466	0	0	13.2359	28.3969	110.25	0	37.9094	0	0	1	9/24/2010	16:00
57.5	0.06875	0	0	46.0625	1.10625	0	14.325	33.4727	0.100101	0	0	13.1199	28.0313	112.313	0	37.8875	0	0	1	9/24/2010	17:00
57.5	0.06875	0	0	46.0625	1.10625	0	14.325	33.4727	0.100101	0	0	13.1199	28.2344	112.313	0	37.8875	0	0	1	9/24/2010	18:00
57.5	0.06875	0	0	46.0625	1.10625	0	14.325	33.5795	0.100101	0	0	13.1199	28.275	112.313	0	37.8875	0	0	1	9/24/2010	19:00
57.375	0.06875	0	0	46.0625	1.10625	0	14.325	33.5795	0.100101	0	0	13.1193	28.1531	111.938	0	37.8875	0	0	1	9/24/2010	20:00
57.5	0.06875	0	0	46.0625	1.10625	0	14.325	33.5795	0	0	0	13.1193	28.1531	113.063	0	37.8875	0	0	1	9/24/2010	21:00
57.375	0.06875	0	0	46.0625	1.10625	0	14.325	33.5795	0	0	0	13.1193	28.0719	113.063	0	37.8875	0	0	1	9/24/2010	22:00
57.5	0.06875	0	0	46.0625	1.10625	0	14.325	33.5795	0	0	0	13.1193	28.1938	113.063	0	37.8875	0	0	1	9/24/2010	23:00
57.5	0.06875	0	0	46.0625	1.10625	0	14.325	33.5795	0	0	0	13.1193	28.1531	113.063	0	37.8656	0	0	1	9/25/2010	0:00
57.5	0.06875	0	0	46.0625	1.10625	0	14.325	33.5795	0	0	0	13.1193	28.0719	113.063	0	37.8656	0	0	1	9/25/2010	1:00
57.5	0.06875	0	0	46.0625	1.10625	0	14.325	33.5795	0	0	0	13.1193	28.1125	113.063	0	37.8438	0	0	1	9/25/2010	2:00
57.3125	0.06875	0	0	45.75	1.10625	0	14.5125	33.3476	0	0	0	13.3012	28.4781	108.75	0	37.8219	0	0	1	9/25/2010	3:00
57.3125	0.06875	0	0	45.75	1.10625	0	14.5125	33.3476	0	0	0	13.3012	28.4375	110.063	0	37.8219	0	0	1	9/25/2010	4:00
57.3125	0.06875	0	0	45.75	1.10625	0	14.5125	33.3476	0	0	0	13.3012	28.6812	108.75	0	37.8438	0	0	1	9/25/2010	5:00
57.3125	0.06875	0	0	45.75	1.10625	0	14.5125	33.3476	0	0	0	13.3012	28.5594	109.875	0	37.8219	0	0	1	9/25/2010	6:00
57.3125	0.06875	0	0	45.75	1.10625	0	14.5125	33.3476	0	0	0	13.3012	28.4781	109.875	0	37.8219	0	0	1	9/25/2010	7:00
57.3125	0.06875	0	0	45.75	1.10625	0	14.5125	33.3476	0	0	0	13.3012	28.4781	108.75	0	37.8219	0	0	1	9/25/2010	8:00
57.3125	0.06875	0	0	45.625	1.10625	0	14.5125	33.1797	0	0	0	13.3012	28.5594	107.063	0	37.8	0	0	1	9/25/2010	9:00

Caisson 3 Level	Pond 1 Level	Pump5 Flow	Pump6 Flow	Caisson 4 Level	Pond 2 Level	Pump7 Flow	Pump8 Flow	Caisson 5 Level	Pond 3 Level	Pond 4 Level	Pump9 Flow	Pump10 Flow	Mirabel Flow	Mirabel Line Pressure	54inch Intertie Flow	River Level	Pump 1 Status Run	Pump 2 Status Run	Pump 3 Status Run	Date	Interval
57.3125	0.06875	0	0	45.625	1.10625	0	14.5125	33.1797	0	0	0	13.3012	28.6	108.188	0	37.8219	0	0	1	9/25/2010	10:00
57.3125	0.06875	0	0	45.625	1.10625	0	14.5125	33.1797	0	0	0	13.3012	28.6	108.188	0	37.8219	0	0	1	9/25/2010	11:00
57.3125	0.06875	0	0	45.625	1.10625	0	14.5125	33.1797	0	0	0	13.3012	28.4375	108.188	0	37.8219	0	0	1	9/25/2010	12:00
57.3125	0.06875	0	0	45.625	1.10625	0	14.5125	33.1797	0.0802637	0	0	13.3012	28.5188	108.188	0	37.8219	0	0	1	9/25/2010	13:00
57.3125	0.06875	0	0	45.75	1.10625	0	14.5125	33.1797	0.0802637	0	0	13.3012	28.3969	108.188	0	37.8	0	0	1	9/25/2010	14:00
57.3125	0.06875	0	0	45.75	1.10625	0	14.4125	33.1797	0.0802637	0	0	13.3012	28.4781	108.188	0	37.8219	0	0	1	9/25/2010	15:00
57.3125	0.06875	0	0	45.75	1.10625	0	14.4125	33.3384	0.0802637	0	0	13.3012	28.5188	111	0	37.8	0	0	1	9/25/2010	16:00
49.375	0.06875	12.7406	0	46.4375	1.10625	0	13.525	33.5551	0.0802637	0	0	12.8629	41.8844	124.875	7.24	37.8	0	0	1	9/25/2010	17:00
48.5	0.06875	12.8625	0	46.0625	1.10625	0	13.6625	34.1594	0.0802637	0	0	12.5278	39.4469	122.625	4.68E-17	37.8	0	0	1	9/25/2010	18:00
48.1875	0.06875	12.8625	0	45.9375	1.10625	0	13.6625	34.1594	0.101321	0	0	12.5278	39.3656	122.625	4.68E-17	37.8	0	0	1	9/25/2010	19:00
47.5625	0.06875	12.8625	0	45.75	1.10625	0	13.6625	34.2692	0.00305185	0	0	12.5278	39.5281	122.625	4.68E-17	37.8	0	0	1	9/25/2010	20:00
47.3125	0.06875	12.7594	0	45.625	1.10625	0	13.6625	34.2692	0.00305185	0	0	12.5278	39.5688	122.625	4.68E-17	37.8	0	0	1	9/25/2010	21:00
47.0625	0.06875	12.7594	0	45.625	1.10625	0	13.6625	34.2692	0.00305185	0	0	12.5278	39.3656	123.75	4.68E-17	37.8219	0	0	1	9/25/2010	22:00
46.375	0.06875	13.2375	0	45	1.10625	0	14.125	33.842	0.00305185	0	0	12.9325	40.5031	115.125	4.68E-17	37.8219	0	0	1	9/25/2010	23:00
46.125	0.06875	13.2375	0	44.875	1.10625	0	14.125	33.842	0.00305185	0	0	12.9325	40.5844	115.125	4.68E-17	37.8	0	0	1	9/26/2010	0:00
45.875	0.06875	13.2375	0	44.6875	1.10625	0	14.125	33.7352	0.00305185	0	0	12.9325	40.9094	115.125	4.68E-17	37.8219	0	0	1	9/26/2010	1:00
45.5625	0.06875	13.2375	0	44.5625	1.10625	0	14.125	33.7352	0.00305185	0	0	12.9325	40.7875	115.125	4.68E-17	37.8	0	0	1	9/26/2010	2:00
45.3125	0.06875	13.2375	0	44.25	1.10625	0	14.125	33.7352	0.00305185	0	0	12.9325	40.7063	115.125	4.68E-17	37.8219	0	0	1	9/26/2010	3:00
45.1875	0.06875	13.2375	0	44.25	1.10625	0	14.125	33.5643	0.00305185	0	0	12.9325	40.8687	115.125	4.68E-17	37.8	0	0	1	9/26/2010	4:00
45	0.06875	13.2375	0	44	1.10625	0	14.125	33.5643	0.00305185	0	0	12.9325	40.8281	114	4.68E-17	37.8	0	0	1	9/26/2010	5:00
44.75	0.06875	13.2375	0	44	1.10625	0	14.125	33.5643	0.00305185	0	0	13.0369	40.9094	114	4.68E-17	37.8219	0	0	1	9/26/2010	6:00
44.625	0.06875	13.2375	0	43.875	1.10625	0	14.125	33.5643	0.00305185	0	0	13.0369	40.7063	114	4.68E-17	37.8219	0	0	1	9/26/2010	7:00
44.375	0.06875	13.3594	0	43.5625	1.10625	0	14.2625	33.3781	0.00305185	0	0	13.0369	41.0719	111.938	4.68E-17	37.8219	0	0	1	9/26/2010	8:00
44.1875	0.06875	13.3594	0	43.4375	1.10625	0	14.2625	33.3781	0.00305185	0	0	13.0369	40.8687	111.938	4.68E-17	37.8	0	0	1	9/26/2010	9:00
44.375	0.06875	13.0031	0	43.75	1.10625	0	13.9125	33.6436	0.00305185	0	0	12.7995	46.1094	118.125	6.755	37.8219	0	0	1	9/26/2010	10:00
45.0625	0.06875	12.1031	0	44.4375	1.20625	0	13.1	34.6782	0.00305185	0	0	11.9633	57.0375	133.5	20.41	37.8219	0	0	1	9/26/2010	11:00
45.1875	0.06875	12.1031	0	44.4375	1.20625	0	13.1	34.8582	0.00305185	0	0	11.9633	56.6719	133.5	20.555	37.8219	0	0	1	9/26/2010	12:00
45.125	0.06875	12	0	44.5625	1.20625	0	13	34.9895	0.00305185	0	0	11.843	56.3469	135.563	20.365	37.8219	0	0	1	9/26/2010	13:00
45.125	0.06875	11.8781	0	44.4375	1.20625	0	12.8875	34.9895	0.0860622	0	0	11.843	56.6719	135.563	20.41	37.8219	0	0	1	9/26/2010	14:00
45	0.06875	11.8781	0	44.5625	1.20625	0	12.8875	35.1726	0.0860622	0	0	11.843	56.5094	135.563	20.455	37.8219	0	0	1	9/26/2010	15:00
45	0.06875	11.8781	0	44.4375	1.20625	0	12.8875	35.2763	0.0860622	0	0	11.843	56.0625	135.563	20.455	37.8219	0	0	1	9/26/2010	16:00
45	0.06875	11.8781	0	44.5625	1.20625	0	12.8875	35.2763	0.0860622	0	0	11.7234	55.9813	136.688	20.015	37.8	0	0	1	9/26/2010	17:00
44.875	0.06875	11.8781	0	44.4375	1.20625	0	12.8875	35.139	0.0860622	0	0	11.7234	54.3563	135.563	18.405	37.8	0	0	1	9/26/2010	18:00
44.875	0.06875	11.9812	0	44.25	1.20625	0	12.8875	35.139	0.097354	0	0	11.8308	54.0313	135.563	17.935	37.8219	0	0	1	9/26/2010	19:00
44.1875	0.06875	12.6281	0	43.75	1.20625	0	13.5125	45.6069	0.097354	0	0	0	47.45	125.25	21.875	37.8	0	0	1	9/26/2010	20:00
44.3125	0.06875	12.2906	0	44	1.20625	0	13.2125	46.8581	0.00305185	0	0	0	43.8344	132	19.295	37.8	0	0	1	9/26/2010	21:00
44.3125	0.06875	12.2906	0	44	1.20625	0	13.2125	47.56	0.00305185	0	0	0	43.5094	132	19.0751	37.8	0	0	1	9/26/2010	22:00
44.3125	0.06875	12.1125	0	44	1.20625	0	13.1	48.1826	0.00305185	0	0	0	42.3313	134.625	18.2401	37.8	0	0	1	9/26/2010	23:00
44	0.06875	12.8344	0	54.125	1.20625	0	0	48.6709	0.00305185	0	0	0	34.8969	123.375	22.8851	37.8	0	0	1	9/27/2010	0:00
44	0.06875	12.8344	0	54.75	1.20625	0	0	48.9883	0.00305185	0	0	0	34.775	122.063	22.6351	37.8	0	0	1	9/27/2010	1:00
44.125	0.06875	12.9656	0	55.25	1.20625	0	0	49.2965	0.00305185	0	0	0	37.2938	120.375	25.4651	37.8	0	0	1	9/27/2010	2:00
44.125	0.06875	13.0781	0	55.75	1.20625	0	0	49.4797	0.00305185	0	0	0	37.0906	118.5	25.1151	37.8	0	0	1	9/27/2010	3:00
44.3125	0.06875	12.9375	0	56.0625	1.20625	0	0	49.7971	0.00305185	0	0	0	38.1063	121.125	25.6101	37.8	0	0	1	9/27/2010	4:00
44.4375	0.06875	12.9375	0	56.5	1.20625	0	0	49.9893	0.00305185	0	0	0	36.9688	119.438	25.0101	37.8	0	0	1	9/27/2010	5:00
44	0.06875	13.5281	0	56.625	1.20625	0	0	50.2121	0.00305185	0	0	0	29.3719	110.438	16.8051	37.8	0	0	1	9/27/2010	6:00
44.125	0.06875	13.5281	0	56.8125	1.20625	0	0	50.3159	0.00305185	0	0	0	29.8188	110.438	17.3051	37.8	0	0	1	9/27/2010	7:00
44.25	0.06875	13.5281	0	57.1875	1.20625	0	0	50.5997	0.00305185	0	0	0	30.1031	111.563	17.4051	37.8	0	0	1	9/27/2010	8:00
44.25	0.06875	13.5281	0	57.1875	1.20625	0	0	50.7645	0.00305185	0	0	0	33.8813	110.063	21.2751	37.8	0	0	1	9/27/2010	9:00
44.6875	0.06875	13.0781	0	57.5	1.20625	0	0	50.8866	0.00305185	0	0	0	41.0719	117.75	29.0701	37.8219	0	0	1	9/27/2010	10:00
44.9375	0.06875	13.0781	0	57.5	1.20625	0	0	50.9934	0.00305185	0	0	0	41.1938	117.938	29.5082	37.8219	0	0	1	9/27/2010	11:00
54.0625	0.06875	0	0	57.875	1.20625	0	0	51.1704	0.00305185	0	0	0	29.0875	110.813	30.5332	37.8656	0	1	0	9/27/2010	12:00
54.75	0.06875	0	0	58.125	1.20625	0	0	51.2803	0.00305185	0	0	0	27.3406	111	28.016	37.8656	0	1	0	9/27/2010	13:00
55.375	0.06875	0	0	58.5625	1.20625	0	0	51.3932	0.00305185	0	0	0	21.8969	105.75	22.096	37.8656	0	1	0	9/27/2010	14:00
55.75	0.06875	0	0	58.6875	1.10625	0	0	51.3932	0.00305185	0	0	0	22.1406	106.5	23.2671	37.8875	0	1	0	9/27/2010	15:00
56.25	0.06875	0	0	58.875	1.10625	0	0	51.3932	0.0860622	0	0	0	22.6688	105.188	22.8121	37.8875	0	1	0	9/27/2010	16:00
56.625	0.06875	0	0	59	1.10625	0	0	51.3932	0.00305185	0	0	0	22.6688	105.188	23.3271	37.8875	0	1	0	9/27/2010	17:00
56.9375	0.06875	0	0	59.25	1.10625	0	0	51.4939	0.000915555	0	0	0	22.5875	105.375	23.0021	37.8875	0	1	0	9/27/2010	18:00
57.1875	0.06875	0	0	59.25	1.10625	0	0	51.3901	0	0	0	0	21.6938	105.563	22.4021	37.8875	0	1	0	9/27/2010	19:00

Caisson 3 Level	Pond 1 Level	Pump5 Flow	Pump6 Flow	Caisson 4 Level	Pond 2 Level	Pump7 Flow	Pump8 Flow	Caisson 5 Level	Pond 3 Level	Pond 4 Level	Pump9 Flow	Pump10 Flow	Mirabel Flow	Mirabel Line Pressure	54inch Intertie Flow	River Level	Pump 1 Status Run	Pump 2 Status Run	Pump 3 Status Run	Date	Interval
57.4375	0.06875	0	0	59.375	0.95625	0	0	51.3901	0	0	0	0	22.1	105.563	22.8571	37.8656	0	1	0	9/27/2010	20:00
57.625	0.06875	0	0	59.5	0.95625	0	0	51.3901	0	0	0	0	22.3844	106.125	22.8571	37.8656	0	1	0	9/27/2010	21:00
57.875	0.06875	0	0	59.5	0.95625	0	0	51.3901	0	0	0	0	22.1	105	22.5621	37.8875	0	1	0	9/27/2010	22:00
58	0.06875	0	0	59.625	0.8125	0	0	51.3901	0	0	0	0	22.1812	105.938	22.4771	37.8656	0	1	0	9/27/2010	23:00
58.125	0.06875	0	0	59.75	0.8125	0	0	51.3901	0	0	0	0	21.775	104.625	22.3571	37.8656	0	1	0	9/28/2010	0:00
58.375	0.06875	0	0	59.75	0.8125	0	0	51.3901	0	0	0	0	22.1	104.813	22.9721	37.8656	0	1	0	9/28/2010	1:00
58.375	0.06875	0	0	59.9375	0.8125	0	0	51.3901	0	0	0	0	22.2219	104.813	22.7521	37.8656	0	1	0	9/28/2010	2:00
58.5	0.06875	0	0	59.9375	0.8125	0	0	51.3901	0	0	0	0	21.8563	103.313	21.8171	37.8656	0	1	0	9/28/2010	3:00
58.75	0.06875	0	0	59.9375	0.8125	0	0	51.3901	0	0	0	0	22.0188	109.688	22.5775	37.8656	0	1	0	9/28/2010	4:00
58.875	0.06875	0	0	60.0625	0.8125	0	0	51.3901	0	0	0	0	22.1406	103.5	22.8275	37.8656	0	1	0	9/28/2010	5:00
58.875	0.06875	0	0	60.0625	0.8125	0	0	51.3901	0	0	0	0	21.775	102.375	22.5225	37.8656	0	1	0	9/28/2010	6:00
58.875	0.06875	0	0	60.0625	0.8125	0	0	51.3901	0	0	0	0	23.5219	100.125	24.1175	37.8656	0	1	0	9/28/2010	7:00
59	0.06875	0	0	60.1875	0.8125	0	0	51.3901	0	0	0	0	24.6594	100.313	25.2175	37.8656	0	1	0	9/28/2010	8:00
59.125	0.06875	0	0	60.1875	0.8125	0	0	51.5091	0	0	0	0	30.9969	105.188	31.4279	37.8656	0	1	0	9/28/2010	9:00
59.25	0.06875	0	0	60.1875	0.70625	0	0	51.5091	0	0	0	0	30.6313	105	30.6829	37.8875	0	1	0	9/28/2010	10:00
59.25	0.06875	0	0	60.3125	0.70625	0	0	51.5091	0	0	0	0	29.6969	105.188	31.5329	37.8875	0	1	0	9/28/2010	11:00
59.375	0.06875	0	0	60.3125	0.70625	0	0	51.5091	0	0	0	0	28.5188	109.313	28.7179	37.8656	0	1	0	9/28/2010	12:00
59.5	0.06875	0	0	60.3125	0.70625	0	0	51.5091	0	0	0	0	28.4781	109.313	28.7779	37.8875	0	1	0	9/28/2010	13:00
59.375	0.06875	0	0	60.4375	0.60625	0	0	51.5091	0	0	0	0	28.0719	108.188	27.6505	37.8656	0	1	0	9/28/2010	14:00
59.5625	0.06875	0	0	60.4375	0.60625	0	0	51.5091	0.0869778	0	0	0	28.3156	109.313	29.6555	37.8219	1	0	0	9/28/2010	15:00
59.5625	0.06875	0	0	60.4375	0.60625	0	0	51.5091	0.0869778	0	0	0	28.0313	109.313	27.8955	37.7781	1	0	0	9/28/2010	16:00
59.5625	0.06875	0	0	60.6875	0.60625	0	0	51.6526	0.0869778	0	0	0	28.2344	109.313	28.8055	37.7781	1	0	0	9/28/2010	17:00
59.6875	0.06875	0	0	60.6875	0.60625	0	0	51.6526	0.0869778	0	0	0	27.7063	110.625	27.7805	37.7781	1	0	0	9/28/2010	18:00
59.6875	0.06875	0	0	60.8125	0.70625	0	0	51.7808	0.09888	0	0	0	27.7063	109.5	28.2905	37.7781	1	0	0	9/28/2010	19:00
59.875	0.06875	0	0	60.8125	0.70625	0	0	51.7808	0.184637	0	0	0	27.5438	109.5	27.6605	37.7562	1	0	0	9/28/2010	20:00
59.875	0.06875	0	0	61.0625	0.70625	0	0	51.8876	0.195013	0	0	0	27.95	110.25	28.2805	37.7562	1	0	0	9/28/2010	21:00
59.875	0.06875	0	0	61.1875	0.70625	0	0	51.9974	0.284433	0	0	0	27.6656	110.25	28.2905	37.7562	1	0	0	9/28/2010	22:00
59.875	0.06875	0	0	61.1875	0.70625	0	0	51.9974	0.284433	0	0	0	27.3406	109.875	28.3355	37.7562	1	0	0	9/28/2010	23:00
60	0.06875	0	0	61.4375	0.70625	0	0	52.1989	0.284433	0	0	0	27.5844	109.875	27.6505	37.7344	1	0	0	9/29/2010	0:00
60.125	0.06875	0	0	61.5625	0.70625	0	0	52.1989	0.386975	0	0	0	27.1375	109.875	27.6505	37.7344	1	0	0	9/29/2010	1:00
60.125	0.06875	0	0	61.5625	0.80625	0	0	52.3667	0.386975	0	0	0	27.3813	109.875	27.8519	37.7344	1	0	0	9/29/2010	2:00
60.125	0.06875	0	0	61.75	0.80625	0	0	52.4979	0.386975	0	0	0	27.4625	109.875	28.4269	37.7344	1	0	0	9/29/2010	3:00
60.25	0.06875	0	0	61.875	0.80625	0	0	52.4979	0.487686	0	0	0	27.4625	109.875	28.1769	37.7344	1	0	0	9/29/2010	4:00
60.375	0.06875	0	0	61.875	0.80625	0	0	52.4979	0.487686	0	0	0	27.5031	107.25	28.7619	37.7344	1	0	0	9/29/2010	5:00
60.375	0.06875	0	0	61.875	0.80625	0	0	52.6811	0.487686	0	0	0	26.6906	108.563	27.0319	37.7344	1	0	0	9/29/2010	6:00
60.375	0.06875	0	0	62.125	0.80625	0	0	52.7818	0.487686	0	0	0	26.7313	107.438	27.2219	37.7344	1	0	0	9/29/2010	7:00
60.375	0.06875	0	0	62.25	0.80625	0	0	52.8947	0.498062	0	0	0	27.2188	108.563	27.5019	37.7344	1	0	0	9/29/2010	8:00
60.5	0.06875	0	0	62.25	0.9125	0	0	52.8947	0.589618	0	0	0	28.0313	109.125	27.5319	37.7344	1	0	0	9/29/2010	9:00
60.5	0.06875	0	0	62.4375	0.9125	0	0	52.9954	0.589618	0	0	0	28.0313	109.125	27.6069	37.7344	1	0	0	9/29/2010	10:00
60.625	0.06875	0	0	62.5625	0.9125	0	0	53.0961	0.589618	0	0	0	27.7469	109.125	27.7519	37.7344	1	0	0	9/29/2010	11:00
60.75	0.06875	0	0	62.5625	0.9125	0	0	53.1999	0.589618	0	0	0	27.7469	109.125	28.3969	37.7125	1	0	0	9/29/2010	12:00
60.75	0.06875	0	0	62.6875	0.9125	0	0	53.1999	0.600604	0	0	0	27.9906	110.25	28.4269	37.7125	1	0	0	9/29/2010	13:00
60.875	0.06875	0	0	62.875	0.9125	0	0	53.386	0.690634	0	0	0	28.1531	110.25	28.541	37.7125	1	0	0	9/29/2010	14:00
60.875	0.06875	0	0	62.875	0.9125	0	0	53.386	0.690634	0	0	0	27.625	109.688	27.781	37.7125	1	0	0	9/29/2010	15:00
61	0.06875	0	0	63	0.9125	0	0	53.386	0.690634	0	0	0	27.95	111.938	29.116	37.7125	1	0	0	9/29/2010	16:00
61	0.06875	0	0	63	1.0125	0	0	53.5722	0.700095	0	0	0	27.4625	111.938	28.266	37.7125	1	0	0	9/29/2010	17:00
61.125	0.06875	0	0	63	1.0125	0	0	53.5722	0.788293	0	0	0	27.5844	111.188	28.486	37.6906	1	0	0	9/29/2010	18:00
61.125	0.06875	0	0	63	1.0125	0	0	53.6729	0.798975	0	0	0	27.6656	111.188	28.456	37.6906	1	0	0	9/29/2010	19:00
61.125	0.06875	0	0	63.25	1.0125	0	0	53.6729	0.798975	0	0	0	27.3406	110.625	27.416	37.6906	1	0	0	9/29/2010	20:00
61.25	0.06875	0	0	63.25	1.0125	0	0	53.7736	0.798975	0	0	0	27.5438	111.938	27.971	37.6906	1	0	0	9/29/2010	21:00
61.25	0.06875	0	0	63.25	1.0125	0	0	53.7736	0.798975	0	0	0	27.5031	111.938	28.101	37.6906	1	0	0	9/29/2010	22:00
61.25	0.06875	0	0	63.375	1.1125	0	0	53.7736	0.798975	0	0	0	27.2594	111.188	27.956	37.6906	1	0	0	9/29/2010	23:00
61.375	0.06875	0	0	63.375	1.1125	0	0	53.8926	0.889615	0	0	0	27.4219	111.188	27.721	37.6688	1	0	0	9/30/2010	0:00
61.375	0.06875	0	0	63.375	1.1125	0	0	53.8926	0.889615	0	0	0	27.0562	111.188	28.306	37.6688	1	0	0	9/30/2010	1:00
61.375	0.06875	0	0	63.5625	1.1125	0	0	53.8926	0.889615	0	0	0	27.4219	111.188	27.7198	37.6688	1	0	0	9/30/2010	2:00
61.375	0.06875	0	0	63.5625	1.1125	0	0	53.9933	0.889615	0	0	0	27.4219	109.875	27.6648	37.6688	1	0	0	9/30/2010	3:00
61.375	0.06875	0	0	63.5625	1.1125	0	0	53.9933	0.899686	0	0	0	27.4625	110.813	28.3348	37.6469	1	0	0	9/30/2010	4:00
61.5	0.06875	0	0	63.5625	1.1125	0	0	53.9933	0.899686	0	0	0	27.7469	110.063	27.6198	37.6688	1	0	0	9/30/2010	5:00

Caisson 3 Level	Pond 1 Level	Pump5 Flow	Pump6 Flow	Caisson 4 Level	Pond 2 Level	Pump7 Flow	Pump8 Flow	Caisson 5 Level	Pond 3 Level	Pond 4 Level	Pump9 Flow	Pump10 Flow	Mirabel Flow	Mirabel Line Pressure	54inch Intertie Flow	River Level	Pump 1 Status Run	Pump 2 Status Run	Pump 3 Status Run	Date	Interval
61.5	0.06875	0	0	63.6875	1.1125	0	0	54.1002	0.992462	0	0	0	26.9344	107.813	28.2948	37.6688	1	0	0	9/30/2010	6:00
61.5	0.06875	0	0	63.6875	1.2125	0	0	54.21	0.992462	0	0	0	27.0156	109.125	27.4748	37.6688	1	0	0	9/30/2010	7:00
61.6875	0.06875	0	0	63.6875	1.2125	0	0	54.21	0.992462	0	0	0	26.8938	109.125	26.8998	37.6688	1	0	0	9/30/2010	8:00
61.6875	0.06875	0	0	63.6875	1.2125	0	0	54.21	0.992462	0	0	0	27.6656	109.313	28.6148	37.6906	1	0	0	9/30/2010	9:00
61.6875	0.06875	0	0	63.6875	1.2125	0	0	54.21	0.992462	0	0	0	27.9094	109.875	28.7748	37.6906	1	0	0	9/30/2010	10:00
61.6875	0.06875	0	0	63.6875	1.2125	0	0	54.21	0.992462	0	0	0	27.9094	109.875	28.7348	37.6906	1	0	0	9/30/2010	11:00
61.6875	0.06875	0	0	63.6875	1.2125	0	0	54.3779	1.00253	0	0	0	28.1938	107.438	28.8348	37.6688	1	0	0	9/30/2010	12:00
61.8125	0.06875	0	0	63.9375	1.2125	0	0	54.3779	1.00192	0	0	0	28.0313	107.438	28.7448	37.6906	1	0	0	9/30/2010	13:00
61.875	0.06875	0	0	63.9375	1.2125	0	0	54.3779	1.09043	0	0	0	27.9906	107.438	28.1598	37.6906	1	0	0	9/30/2010	14:00
61.875	0.06875	0	0	64.0625	1.2125	0	0	54.503	1.09043	0	0	0	27.9906	109.5	28.2914	37.6906	1	0	0	9/30/2010	15:00
61.875	0.06875	0	0	64.0625	1.2125	0	0	54.503	1.09043	0	0	0	28.0313	109.5	28.5264	37.7125	1	0	0	9/30/2010	16:00
62	0.06875	0	0	64.0625	1.2125	0	0	54.503	1.09043	0	0	0	27.9906	109.5	28.1614	37.6906	1	0	0	9/30/2010	17:00
62	0.06875	0	0	64.0625	1.2125	0	0	54.503	1.10172	0	0	0	27.9094	109.5	28.6464	37.6906	1	0	0	9/30/2010	18:00
61.875	0.06875	0	0	64.25	1.31875	0	0	54.503	1.19297	0	0	0	27.5031	109.5	28.1314	37.6906	1	0	0	9/30/2010	19:00
62	0.06875	0	0	64.25	1.31875	0	0	54.619	1.10263	0	0	0	27.7469	109.5	28.5864	37.6906	1	0	0	9/30/2010	20:00
62	0.06875	0	0	64.25	1.31875	0	0	54.619	1.19144	0	0	0	29.8594	102.75	28.1014	37.6906	1	0	0	9/30/2010	21:00
62	0.06875	0	0	64.25	1.31875	0	0	54.619	1.19144	0	0	0	29.4531	105.188	29.3164	37.6906	1	0	0	9/30/2010	22:00
62	0.06875	0	0	64.25	1.31875	0	0	54.619	1.19144	0	0	0	29.0469	105.188	29.4964	37.6906	1	0	0	9/30/2010	23:00
62.125	0.06875	0	0	64.375	1.31875	0	0	54.619	1.19144	0	0	0	29.0063	104.813	29.7164	37.6906	1	0	0	10/1/2010	0:00
62.125	0.06875	0	0	64.375	1.31875	0	0	54.7899	1.19144	0	0	0	29.3313	104.813	29.5814	37.6906	1	0	0	10/1/2010	1:00
62.125	0.06875	0	0	64.375	1.31875	0	0	54.7899	1.19144	0	0	0	28.925	103.688	30.3014	37.6688	1	0	0	10/1/2010	2:00
62.125	0.06875	0	0	64.375	1.31875	0	0	54.7899	1.19144	0	0	0	29.2094	103.688	29.8602	37.6688	1	0	0	10/1/2010	3:00
62.25	0.06875	0	0	64.375	1.31875	0	0	54.9028	1.19144	0	0	0	29.25	103.688	29.8902	37.6688	1	0	0	10/1/2010	4:00
62.25	0.06875	0	0	64.375	1.31875	0	0	54.9028	1.20151	0	0	0	29.575	103.688	30.6352	37.6688	1	0	0	10/1/2010	5:00
62.25	0.06875	0	0	64.375	1.41875	0	0	54.9028	1.20151	0	0	0	29.6563	103.125	30.8852	37.6688	1	0	0	10/1/2010	6:00
62.25	0.06875	0	0	64.375	1.41875	0	0	54.9028	1.20151	0	0	0	26.6906	109.688	27.2402	37.6688	1	0	0	10/1/2010	7:00
62.25	0.06875	0	0	64.375	1.41875	0	0	54.9028	1.20151	0	0	0	27.1781	111	28.2652	37.6688	1	0	0	10/1/2010	8:00
62.25	0.06875	0	0	64.375	1.41875	0	0	54.9028	1.20151	0	0	0	27.9094	109.313	28.1452	37.6688	1	0	0	10/1/2010	9:00
62.375	0.06875	0	0	64.375	1.41875	0	0	55.0066	1.26743	0	0	0	27.8281	109.313	28.5002	37.6688	1	0	0	10/1/2010	10:00
62.375	0.06875	0	0	64.4375	1.41875	0	0	55.0066	1.19755	0	0	0	27.8687	109.313	28.6902	37.7344	0	1	0	10/1/2010	11:00
62.375	0.06875	0	0	64.6875	1.41875	0	0	55.0066	1.19755	0	0	0	27.8281	109.688	28.9502	37.7344	0	1	0	10/1/2010	12:00
62.375	0.06875	0	0	64.6875	1.41875	0	0	55.0066	1.09958	0	0	0	27.8687	109.688	28.3352	37.7562	0	1	0	10/1/2010	13:00
62.5	0.06875	0	0	64.6875	1.41875	0	0	55.0066	1.0007	0	0	0	27.8281	109.688	28.3352	37.7562	0	1	0	10/1/2010	14:00
62.375	0.06875	0	0	64.6875	1.41875	0	0	55.0066	0.901517	0	0	0	28.1531	109.688	28.426	37.7781	0	1	0	10/1/2010	15:00
62.5	0.06875	0	0	64.6875	1.41875	0	0	55.0066	0.800806	0	0	0	27.8687	111	27.956	37.7781	0	1	0	10/1/2010	16:00
62.5	0.06875	0	0	64.6875	1.41875	0	0	55.0066	0.800806	0	0	0	27.95	111	28.806	37.8	0	1	0	10/1/2010	17:00
62.5	0.06875	0	0	64.6875	1.41875	0	0	55.0066	0.702536	0	0	0	27.9906	111	27.766	37.8	0	1	0	10/1/2010	18:00
62.5	0.06875	0	0	64.6875	1.41875	0	0	55.0066	0.60213	0	0	0	27.5438	109.875	28.086	37.8	0	1	0	10/1/2010	19:00
62.5	0.06875	0	0	64.6875	1.41875	0	0	55.0066	0.498978	0	0	0	22.6281	105.563	23.941	37.7781	0	1	0	10/1/2010	20:00
62.625	0.06875	0	0	64.6875	1.41875	0	0	54.8814	0.399792	0	0	0	22.7906	105.563	23.006	37.7781	0	1	0	10/1/2010	21:00
62.5	0.06875	0	0	64.6875	1.41875	0	0	54.8814	0.29725	0	0	0	22.425	105.563	23.531	37.8	0	1	0	10/1/2010	22:00
62.5	0.06875	0	0	64.4375	1.41875	0	0	54.8814	0.200812	0	0	0	22.8313	105.563	22.946	37.7781	0	1	0	10/1/2010	23:00
62.5	0.06875	0	0	64.4375	1.31875	0	0	54.8814	0.200812	0	0	0	22.7094	105.563	23.281	37.7781	0	1	0	10/2/2010	0:00
62.5	0.06875	0	0	64.4375	1.31875	0	0	54.7655	0.101321	0	0	0	22.5063	105.563	23.636	37.7781	0	1	0	10/2/2010	1:00
62.625	0.06875	0	0	64.4375	1.31875	0	0	54.7655	0	0	0	0	22.7094	105.563	23.181	37.7781	0	1	0	10/2/2010	2:00
62.5	0.06875	0	0	64.4375	1.31875	0	0	54.7655	0	0	0	0	22.2219	105.563	22.446	37.7781	0	1	0	10/2/2010	3:00
62.5	0.06875	0	0	64.3125	1.31875	0	0	54.7655	0	0	0	0	21.8563	103.875	22.3874	37.7781	0	1	0	10/2/2010	4:00
62.625	0.06875	0	0	64.3125	1.2125	0	0	54.5824	0	0	0	0	21.6125	103.875	22.2424	37.7781	0	1	0	10/2/2010	5:00
62.5	0.06875	0	0	64.3125	1.2125	0	0	54.4755	0	0	0	0	22.0594	104.25	22.2424	37.7781	0	1	0	10/2/2010	6:00
62.5	0.06875	0	0	64.0625	1.2125	0	0	54.4755	0	0	0	0	22.1406	104.25	22.5624	37.8	0	1	0	10/2/2010	7:00
62.5	0.06875	0	0	64.0625	1.2125	0	0	54.4755	0	0	0	0	22.5063	104.25	22.6374	37.8	0	1	0	10/2/2010	8:00
62.5	0.06875	0	0	63.9375	1.1125	0	0	54.3748	0	0	0	0	22.2625	104.25	23.0324	37.8	0	1	0	10/2/2010	9:00
62.5	0.06875	0	0	63.75	1.1125	0	0	54.2711	0	0	0	0	22.9937	103.5	23.8974	37.8	0	1	0	10/2/2010	10:00
62.375	0.06875	0	0	63.75	1.1125	0	0	54.1673	0	0	0	0	22.9531	103.5	23.2074	37.8	0	1	0	10/2/2010	11:00
62.375	0.06875	0	0	63.75	1.0125	0	0	54.1673	0	0	0	0	22.9531	103.5	23.6024	37.8	0	1	0	10/2/2010	12:00
62.375	0.06875	0	0	63.625	1.0125	0	0	54.0635	0	0	0	0	22.9937	103.5	23.6024	37.8	0	1	0	10/2/2010	13:00
62.375	0.06875	0	0	63.625	1.0125	0	0	54.0635	0	0	0	0	22.9531	103.5	22.8574	37.8	0	1	0	10/2/2010	14:00
62.375	0.06875	0	0	63.5	1.0125	0	0	53.9567	0	0	0	0	23.0344	103.5	23.0174	37.8	0	1	0	10/2/2010	15:00

Caisson 3 Level	Pond 1 Level	Pump5 Flow	Pump6 Flow	Caisson 4 Level	Pond 2 Level	Pump7 Flow	Pump8 Flow	Caisson 5 Level	Pond 3 Level	Pond 4 Level	Pump9 Flow	Pump10 Flow	Mirabel Flow	Mirabel Line Pressure	54inch Intertie Flow	River Level	Pump 1 Status Run	Pump 2 Status Run	Pump 3 Status Run	Date	Interval
62.25	0.06875	0	0	63.5	0.9125	0	0	53.9567	0	0	0	0	23.1156	103.5	23.6643	37.8	0	1	0	10/2/2010	16:00
62.25	0.06875	0	0	63.375	0.9125	0	0	53.9567	0	0	0	0	22.9125	104.25	23.3693	37.8	0	1	0	10/2/2010	17:00
62.25	0.06875	0	0	63.375	0.9125	0	0	53.8499	0.00366222	0	0	0	22.0188	105.75	22.5043	37.7781	0	1	0	10/2/2010	18:00
62.25	0.06875	0	0	63.375	0.8125	0	0	53.8499	0.00366222	0	0	0	21.8969	105.75	22.6543	37.7781	0	1	0	10/2/2010	19:00
62.25	0.06875	0	0	63.375	0.8125	0	0	53.8499	0.00366222	0	0	0	22.0594	105.75	22.5943	37.8	0	1	0	10/2/2010	20:00
62.25	0.06875	0	0	63.25	0.8125	0	0	53.7339	0.00366222	0	0	0	21.9781	105.75	23.0793	37.8	0	1	0	10/2/2010	21:00
62.125	0.06875	0	0	63.25	0.8125	0	0	53.7339	0.00366222	0	0	0	22.3031	105.75	22.8293	37.8	0	1	0	10/2/2010	22:00
62.125	0.06875	0	0	63.25	0.8125	0	0	53.7339	0.00366222	0	0	0	21.6531	104.438	22.1543	37.8	0	1	0	10/2/2010	23:00
62.125	0.06875	0	0	63.0625	0.8125	0	0	53.7339	0.00366222	0	0	0	21.4906	104.438	22.0243	37.8	0	1	0	10/3/2010	0:00
62.125	0.06875	0	0	63.0625	0.8125	0	0	53.5508	0.00366222	0	0	0	21.8156	105.75	21.9043	37.8	0	1	0	10/3/2010	1:00
62	0.06875	0	0	63.0625	0.61875	0	0	53.5508	0.00366222	0	0	0	21.6938	105.75	22.5943	37.8	0	1	0	10/3/2010	2:00
62	0.06875	0	0	63.0625	0.61875	0	0	53.5508	0.00366222	0	0	0	21.6938	105.75	22.2843	37.8	0	1	0	10/3/2010	3:00
62	0.06875	0	0	63.0625	0.61875	0	0	53.5508	0.00366222	0	0	0	21.775	104.625	22.5767	37.8	0	1	0	10/3/2010	4:00
62	0.06875	0	0	62.9375	0.5125	0	0	53.5508	0.00366222	0	0	0	21.7344	104.625	21.8917	37.8	0	1	0	10/3/2010	5:00
62	0.06875	0	0	62.9375	0.5125	0	0	53.5508	0.00366222	0	0	0	21.3687	104.25	21.8017	37.8219	0	1	0	10/3/2010	6:00
62	0.06875	0	0	62.9375	0.5125	0	0	53.5508	0.00366222	0	0	0	21.7344	104.25	22.3717	37.8	0	1	0	10/3/2010	7:00
62	0.06875	0	0	62.9375	0.5125	0	0	53.5508	0.00366222	0	0	0	27.9094	109.5	29.1267	37.8219	0	1	0	10/3/2010	8:00
61.875	0.06875	0	0	62.9375	0.4125	0	0	53.5508	0.00366222	0	0	0	27.625	107.25	27.8217	37.8219	0	1	0	10/3/2010	9:00
61.875	0.06875	0	0	62.8125	0.4125	0	0	53.3982	0.00366222	0	0	0	27.9094	107.25	28.3967	37.8219	0	1	0	10/3/2010	10:00
61.875	0.06875	0	0	62.8125	0.4125	0	0	53.3982	0.00366222	0	0	0	27.95	105.938	28.9367	37.8219	0	1	0	10/3/2010	11:00
61.875	0.06875	0	0	62.8125	0.3125	0	0	53.3982	0.00366222	0	0	0	27.6656	108.75	28.3967	37.7781	1	0	0	10/3/2010	12:00
61.875	0.06875	0	0	62.6875	0.3125	0	0	53.3982	0.00366222	0	0	0	27.6656	108.75	28.1467	37.7781	1	0	0	10/3/2010	13:00
61.875	0.06875	0	0	62.6875	0.3125	0	0	53.3982	0.00366222	0	0	0	27.7469	108.375	27.8667	37.7562	1	0	0	10/3/2010	14:00
61.875	0.06875	0	0	62.875	0.3125	0	0	53.5081	0.0869778	0	0	0	27.5844	109.5	27.6027	37.7562	1	0	0	10/3/2010	15:00
61.875	0.06875	0	0	62.875	0.3125	0	0	53.5081	0.09888	0	0	0	27.6656	109.5	27.8227	37.7562	1	0	0	10/3/2010	16:00
61.875	0.06875	0	0	62.875	0.3125	0	0	53.5081	0.198065	0	0	0	27.1375	111	27.5727	37.7562	1	0	0	10/3/2010	17:00
61.875	0.06875	0	0	62.875	0.3125	0	0	53.6424	0.289621	0	0	0	27.3	111	27.0777	37.7562	1	0	0	10/3/2010	18:00
61.875	0.06875	0	0	63	0.3125	0	0	53.6424	0.390637	0	0	0	27.1781	111	27.7784	37.7344	1	0	0	10/3/2010	19:00
61.875	0.06875	0	0	63	0.3125	0	0	53.6424	0.487381	0	0	0	27.1781	111	27.7384	37.7344	1	0	0	10/3/2010	20:00
61.875	0.06875	0	0	63	0.4125	0	0	53.7645	0.487381	0	0	0	26.975	111	26.9034	37.7344	1	0	0	10/3/2010	21:00
61.875	0.06875	0	0	63	0.4125	0	0	53.7645	0.588397	0	0	0	26.7313	111	27.6034	37.7344	1	0	0	10/3/2010	22:00
61.875	0.06875	0	0	63.25	0.4125	0	0	53.8713	0.588397	0	0	0	27.0562	112.313	27.3284	37.7344	1	0	0	10/3/2010	23:00
61.875	0.06875	0	0	63.25	0.4125	0	0	53.9933	0.689718	0	0	0	26.4875	112.313	26.9134	37.7344	1	0	0	10/4/2010	0:00
61.875	0.06875	0	0	63.25	0.4125	0	0	53.9933	0.689718	0	0	0	26.4875	111.188	27.2384	37.7562	1	0	0	10/4/2010	1:00
61.875	0.06875	0	0	63.375	0.4125	0	0	53.9933	0.793481	0	0	0	26.325	111.188	26.3584	37.7562	1	0	0	10/4/2010	2:00
61.875	0.06875	0	0	63.375	0.60625	0	0	54.1002	0.793481	0	0	0	26.2844	111.188	27.0484	37.7562	1	0	0	10/4/2010	3:00
62	0.06875	0	0	63.5625	0.60625	0	0	54.1002	0.892361	0	0	0	26.3656	111.188	27.1784	37.7562	1	0	0	10/4/2010	4:00
61.875	0.06875	0	0	63.5625	0.60625	0	0	54.2009	0.892361	0	0	0	21.0844	104.25	21.9184	37.7562	1	0	0	10/4/2010	5:00
62	0.06875	0	0	63.5625	0.60625	0	0	54.2009	0.991852	0	0	0	21.2063	105.375	21.7584	37.7562	1	0	0	10/4/2010	6:00
62	0.06875	0	0	63.6875	0.60625	0	0	54.2009	0.991852	0	0	0	20.1906	104.813	20.2939	37.7562	1	0	0	10/4/2010	7:00
62	0.06875	0	0	63.6875	0.60625	0	0	54.2009	0.991852	0	0	0	20.475	102.375	21.3039	37.7562	1	0	0	10/4/2010	8:00
62	0.06875	0	0	63.6875	0.60625	0	0	54.3687	1.09195	0	0	0	21.125	103.875	22.7689	37.7562	1	0	0	10/4/2010	9:00
57.9375	0.06875	0	10.575	63.6875	0.70625	0	0	54.3687	1.09195	0	0	0	27.5031	109.688	19.8389	37.7562	1	0	0	10/4/2010	10:00
52	0.06875	0	13.95	63.375	0.70625	0	0	54.4694	1.09195	0	0	0	33.1906	108	19.3839	37.7562	1	0	0	10/4/2010	11:00
51.6875	0.06875	0	13.95	63.25	0.70625	0	0	54.4694	1.1948	0	0	0	33.4344	108	20.9539	37.7562	1	0	0	10/4/2010	12:00
51.1875	0.06875	0	13.95	63.0625	0.70625	0	0	54.5915	1.1948	0	0	0	33.475	108	19.9289	37.7344	1	0	0	10/4/2010	13:00
50.8125	0.06875	0	13.8469	62.9375	0.70625	0	0	54.5915	1.20212	0	0	0	33.3531	109.5	20.5289	37.7562	1	0	0	10/4/2010	14:00
50.6875	0.06875	0	13.95	62.9375	0.70625	0	0	54.5915	1.29154	0	0	0	33.7594	109.688	20.3539	37.7562	1	0	0	10/4/2010	15:00
50.5	0.06875	0	13.8469	62.8125	0.70625	0	0	54.7014	1.29551	0	0	0	34.0031	109.688	20.2789	37.7562	1	0	0	10/4/2010	16:00
50.375	0.06875	0	13.7344	62.8125	0.70625	0	0	54.7014	1.29551	0	0	0	33.3938	111.938	20.4089	37.7562	1	0	0	10/4/2010	17:00
50.25	0.06875	0	13.7344	62.8125	0.70625	0	0	54.7014	1.39378	0	0	0	33.15	111.75	20.3539	37.7562	1	0	0	10/4/2010	18:00
50.125	0.06875	0	13.7344	62.6875	0.70625	0	0	54.7014	1.39378	0	0	0	33.2313	111.75	20.0735	37.7562	1	0	0	10/4/2010	19:00
49.6875	0.06875	0	13.95	62.6875	0.70625	0	0	54.8021	1.39378	0	0	0	34.9781	108	21.2735	37.7562	1	0	0	10/4/2010	20:00
49.6875	0.06875	0	13.95	62.5625	0.70625	0	0	54.8021	1.39378	0	0	0	35.3844	108	22.0085	37.7562	1	0	0	10/4/2010	21:00
49.6875	0.06875	0	13.8187	62.5625	0.70625	0	0	54.8021	1.4948	0	0	0	36.1969	110.813	23.2235	37.7562	1	0	0	10/4/2010	22:00
49.3125	0.06875	0	13.9406	62.5625	0.70625	0	0	54.8936	1.4948	0	0	0	32.2969	106.875	18.9885	37.7562	1	0	0	10/4/2010	23:00
49.1875	0.06875	0	14.0437	62.4375	0.70625	0	0	54.8936	1.4948	0	0	0	31.6469	105	18.9135	37.7562	1	0	0	10/5/2010	0:00
49.0625	0.06875	0	14.0437	62.4375	0.70625	0	0	54.8936	1.4948	0	0	0	31.8094	105	18.1235	37.7562	1	0	0	10/5/2010	1:00

Caisson 3 Level	Pond 1 Level	Pump5 Flow	Pump6 Flow	Caisson 4 Level	Pond 2 Level	Pump7 Flow	Pump8 Flow	Caisson 5 Level	Pond 3 Level	Pond 4 Level	Pump9 Flow	Pump10 Flow	Mirabel Flow	Mirabel Line Pressure	54inch Intertie Flow	River Level	Pump 1 Status Run	Pump 2 Status Run	Pump 3 Status Run	Date	Interval
48.9375	0.06875	0	14.1844	62.4375	0.70625	0	0	54.8936	1.4948	0	0	0	30.875	105	17.1585	37.7562	1	0	0	10/5/2010	2:00
48.8125	0.06875	0	14.1844	62.4375	0.70625	0	0	54.8936	1.4948	0	0	0	30.3875	102.75	16.6285	37.7562	1	0	0	10/5/2010	3:00
48.8125	0.06875	0	14.1844	62.25	0.70625	0	0	54.8936	1.50273	0	0	0	30.1844	103.125	17.0235	37.7562	1	0	0	10/5/2010	4:00
48.6875	0.06875	0	14.1844	62.25	0.70625	0	0	54.9944	1.59429	0	0	0	29.7375	102	16.5885	37.7781	1	0	0	10/5/2010	5:00
48.625	0.06875	0	14.1844	62.25	0.70625	0	0	54.9944	1.59429	0	0	0	29.9813	102	16.1635	37.7562	1	0	0	10/5/2010	6:00
48.625	0.06875	0	14.0813	62.25	0.70625	0	0	54.9944	1.59429	0	0	0	27.5031	103.5	14.1082	37.7781	1	0	0	10/5/2010	7:00
48.5	0.06875	0	14.0813	62.25	0.70625	0	0	55.1012	1.59429	0	0	0	27.7875	105.563	14.8582	37.7562	1	0	0	10/5/2010	8:00
48.625	0.06875	0	13.9781	62.25	0.70625	0	0	54.9944	1.59429	0	0	0	29.0063	106.688	15.7782	37.7562	1	0	0	10/5/2010	9:00
48.5	0.06875	0	13.9781	62.125	0.70625	0	0	55.1073	1.59429	0	0	0	28.8031	106.688	15.1482	37.7781	1	0	0	10/5/2010	10:00
48.4375	0.06875	0	14.0813	62.125	0.70625	0	0	55.1073	1.59429	0	0	0	29.3719	105.75	15.9832	37.7781	1	0	0	10/5/2010	11:00
48.4375	0.06875	0	14.1937	62.125	0.70625	0	0	55.1073	1.59429	0	0	0	29.0063	105.75	15.1632	37.7781	1	0	0	10/5/2010	12:00
48.4375	0.06875	0	14.0719	62.125	0.70625	0	0	55.1073	1.59429	0	0	0	27.95	106.5	14.7982	37.7562	1	0	0	10/5/2010	13:00
48.4375	0.06875	0	13.9688	62.125	0.70625	0	0	55.1073	1.59825	0	0	0	27.8687	106.5	14.8582	37.7781	1	0	0	10/5/2010	14:00
48.4375	0.06875	0	13.9688	62.125	0.70625	0	0	55.1073	1.69591	0	0	0	28.4375	107.438	14.9432	37.7562	1	0	0	10/5/2010	15:00
48.4375	0.06875	0	13.9688	62.125	0.70625	0	0	55.1073	1.59856	0	0	0	29.0063	108.375	15.5332	37.7562	1	0	0	10/5/2010	16:00
48.4375	0.06875	0	13.8562	62.125	0.70625	0	0	55.1073	1.70415	0	0	0	28.0719	110.25	15.3132	37.7781	1	0	0	10/5/2010	17:00
48.4375	0.06875	0	13.8562	62.125	0.70625	0	0	55.1073	1.69439	0	0	0	28.4375	110.25	15.1232	37.7562	1	0	0	10/5/2010	18:00
48.4375	0.06875	0	13.8562	62.125	0.70625	0	0	55.1073	1.69439	0	0	0	28.0719	109.125	15.2082	37.7781	1	0	0	10/5/2010	19:00
48.4375	0.06875	0	13.8562	62.125	0.70625	0	0	55.1073	1.69439	0	0	0	28.0313	110.25	15.047	37.7562	1	0	0	10/5/2010	20:00
48.4375	0.06875	0	13.8562	62.125	0.70625	0	0	55.1073	1.69439	0	0	0	28.0313	110.25	15.152	37.7562	1	0	0	10/5/2010	21:00
48.3125	0.06875	0	13.8562	62.125	0.70625	0	0	55.2843	1.70507	0	0	0	27.7063	110.813	14.537	37.7562	1	0	0	10/5/2010	22:00
48.3125	0.06875	0	13.8562	62.125	0.70625	0	0	55.2843	1.70507	0	0	0	28.0313	110.813	14.842	37.7562	1	0	0	10/5/2010	23:00
48.3125	0.06875	0	13.7344	62.125	0.70625	0	0	55.2843	1.70507	0	0	0	27.9094	110.813	14.697	37.7562	1	0	0	10/6/2010	0:00
48.3125	0.06875	0	13.7344	62.125	0.70625	0	0	55.2843	1.70507	0	0	0	27.625	110.813	14.507	37.7562	1	0	0	10/6/2010	1:00
48.3125	0.06875	0	13.8375	62.125	0.70625	0	0	55.2843	1.70507	0	0	0	26.5688	110.063	13.452	37.7562	1	0	0	10/6/2010	2:00
48.1875	0.06875	0	13.8375	62.125	0.70625	0	0	55.2843	1.70507	0	0	0	26	108.938	12.777	37.7562	1	0	0	10/6/2010	3:00
48.1875	0.06875	0	13.8375	62.125	0.70625	0	0	55.2843	1.70507	0	0	0	26.3656	107.25	13.072	37.7781	1	0	0	10/6/2010	4:00
47.8125	0.06875	0	14.2312	62.125	0.70625	0	0	55.2843	1.70507	0	0	0	28.4781	102.188	15.412	37.7562	1	0	0	10/6/2010	5:00
47.8125	0.06875	0	14.2312	62.125	0.70625	0	0	55.2843	1.70507	0	0	0	29.0875	102.188	15.812	37.7562	1	0	0	10/6/2010	6:00
47.6875	0.06875	0	14.2312	62.125	0.70625	0	0	55.2843	1.70507	0	0	0	28.8438	101.063	15.282	37.7781	1	0	0	10/6/2010	7:00
47.9375	0.06875	0	14.0531	61.9375	0.70625	0	0	55.2843	1.70507	0	0	0	28.1531	105.75	14.6959	37.7562	1	0	0	10/6/2010	8:00
47.9375	0.06875	0	14.0531	61.9375	0.70625	0	0	55.2843	1.70507	0	0	0	28.5594	105.75	15.0059	37.7562	1	0	0	10/6/2010	9:00
47.6875	0.06875	0	14.0531	61.9375	0.70625	0	0	55.2843	1.60375	0	0	0	28.8031	104.625	15.7509	37.7781	1	0	0	10/6/2010	10:00
48.125	0.06875	0	13.8	61.9375	0.70625	0	0	55.2843	1.6007	0	0	0	34.3687	110.063	21.1009	37.7562	1	0	0	10/6/2010	11:00
48.125	0.06875	0	13.8	61.9375	0.70625	0	0	55.4003	1.6007	0	0	0	34.4094	110.438	21.3609	37.7562	1	0	0	10/6/2010	12:00
48	0.06875	0	13.7719	61.9375	0.70625	0	0	55.2965	1.69744	0	0	0	34.2469	116.25	21.0709	37.7781	1	0	0	10/6/2010	13:00
57.75	0.06875	0	0	62.375	0.70625	0	0	55.3972	1.69469	0	0	0	23.1563	105.75	24.0459	37.7781	1	0	0	10/6/2010	14:00
58.375	0.06875	0	0	62.5625	0.80625	0	0	55.3972	1.69286	0	0	0	23.1563	106.875	23.2395	37.7781	1	0	0	10/6/2010	15:00
49.375	0.06875	0	13.7437	62.5625	0.80625	0	0	55.3972	1.6953	0	0	0	34.3281	111	21.6395	37.7781	1	0	0	10/6/2010	16:00
49.25	0.06875	0	13.7344	62.5625	0.80625	0	0	55.3972	1.695	0	0	0	34.0438	111.563	21.1145	37.7562	1	0	0	10/6/2010	17:00
49	0.06875	0	13.7344	62.4375	0.80625	0	0	55.3972	1.64098	0	-2.50E-16	0	33.9219	112.688	21.0265	37.7781	1	0	0	10/6/2010	18:00
48.875	0.06875	0	13.7344	62.4375	0.80625	0	0	55.3972	1.60375	0	-2.50E-16	0	33.5562	111.563	20.3365	37.7781	1	0	0	10/6/2010	19:00
48.75	0.06875	0	13.7344	62.4375	0.80625	0	0	55.3972	1.60375	0	-2.50E-16	0	33.9625	112.688	20.5415	37.7562	1	0	0	10/6/2010	20:00
48.75	0.06875	0	13.7344	62.4375	0.80625	0	0	55.3972	1.60375	0	-2.50E-16	0	33.8406	112.688	20.7015	37.7562	1	0	0	10/6/2010	21:00
48.625	0.06875	0	13.7344	62.4375	0.80625	0	0	55.3972	1.60375	0	-2.50E-16	0	33.6375	112.5	20.4415	37.7562	1	0	0	10/6/2010	22:00
48.625	0.06875	0	13.7344	62.25	0.80625	0	0	55.3972	1.60375	0	-2.50E-16	0	33.475	112.5	20.2915	37.7562	1	0	0	10/6/2010	23:00
48.625	0.06875	0	13.6219	62.25	0.80625	0	0	55.3972	1.60375	0	-2.50E-16	0	33.6781	112.5	20.7909	37.7562	1	0	0	10/7/2010	0:00
48.5	0.06875	0	13.6219	62.25	0.80625	0	0	55.3972	1.60375	0	-2.50E-16	0	33.9625	112.5	20.8059	37.7562	1	0	0	10/7/2010	1:00
48.5	0.06875	0	13.6219	62.25	0.80625	0	0	55.3972	1.60375	0	-2.50E-16	0	33.9219	112.5	21.0409	37.7562	1	0	0	10/7/2010	2:00
48.5	0.06875	0	13.6219	62.25	0.80625	0	0	55.3972	1.60375	0	-2.50E-16	0	32.9875	112.5	19.9109	37.7562	1	0	0	10/7/2010	3:00
48.375	0.06875	0	13.7344	62.25	0.80625	0	0	55.4064	1.60375	0	-2.50E-16	0	32.7031	111.75	19.5159	37.7562	1	0	0	10/7/2010	4:00
48.375	0.06875	0	13.7344	62.25	0.80625	0	0	55.4064	1.60375	0	-2.50E-16	0	32.2563	110.625	18.5509	37.7562	1	0	0	10/7/2010	5:00
48.375	0.06875	0	13.7344	62.25	0.80625	0	0	55.5071	1.60375	0	-2.50E-16	0	32.0531	110.625	18.6809	37.7562	1	0	0	10/7/2010	6:00
48.25	0.06875	0	13.7344	62.125	0.80625	0	0	55.5071	1.60375	0	-2.50E-16	0	32.5813	110.625	19.6609	37.7562	1	0	0	10/7/2010	7:00
48.25	0.06875	0	13.7344	62.125	0.80625	0	0	55.4033	1.60375	0	-2.50E-16	0	33.5156	110.25	20.6309	37.7781	1	0	0	10/7/2010	8:00
48.1875	0.06875	0	13.7344	62.125	0.80625	0	0	55.4033	1.60375	0	-2.50E-16	0	34.125	111.188	21.1259	37.7781	1	0	0	10/7/2010	9:00
48.1875	0.06875	0	13.7344	62.125	0.80625	0	0	55.5101	1.60375	0	-2.50E-16	0	34.3281	111.188	21.0423	37.7781	1	0	0	10/7/2010	10:00
48.1875	0.06875	0	13.7344	62.125	0.80625	0	0	55.4003	1.60375	0	-2.50E-16	0	33.8813	111.188	20.8523	37.7781	1	0	0	10/7/2010	11:00

Caisson 3 Level	Pond 1 Level	Pump5 Flow	Pump6 Flow	Caisson 4 Level	Pond 2 Level	Pump7 Flow	Pump8 Flow	Caisson 5 Level	Pond 3 Level	Pond 4 Level	Pump9 Flow	Pump10 Flow	Mirabel Flow	Mirabel Line Pressure	54inch Intertie Flow	River Level	Pump 1 Status Run	Pump 2 Status Run	Pump 3 Status Run	Date	Interval
48.1875	0.06875	0	13.7344	62.125	0.80625	0	0	55.4003	1.60375	0	0	0	34.0438	111.188	20.94	37.7781	1	0	0	10/7/2010	12:00
48.1875	0.06875	0	13.7344	62.125	0.80625	0	0	55.4003	1.59612	0	0	0	34.2063	111.188	20.95	37.7781	1	0	0	10/7/2010	13:00
48.1875	0.06875	0	13.7344	62.125	0.80625	0	0	55.504	1.50273	0	0	0	34.3281	111.188	21.845	37.7781	1	0	0	10/7/2010	14:00
48.1875	0.06875	0	13.7344	62.125	0.80625	0	0	55.504	1.5006	0	0	0	34.3687	111.188	21.48	37.7562	1	0	0	10/7/2010	15:00
48.3125	0.06875	0	13.6687	62.125	0.80625	0	0	55.504	1.49846	0	0	0	33.8813	112.5	20.675	37.7781	1	0	0	10/7/2010	16:00
48.3125	0.06875	0	13.6687	62.25	0.80625	0	0	55.504	1.49907	0	0	0	33.9625	113.625	20.91	37.7781	1	0	0	10/7/2010	17:00
48.3125	0.06875	0	13.6687	62.25	0.80625	0	0	55.504	1.59825	0	0	0	33.5156	113.625	20.5421	37.7781	1	0	0	10/7/2010	18:00
48.1875	0.06875	0	13.6687	62.25	0.80625	0	0	55.504	1.49907	0	0	0	33.1094	112.688	19.9721	37.7781	1	0	0	10/7/2010	19:00
48.1875	0.06875	0	13.6687	62.25	0.80625	0	0	55.504	1.49907	0	0	0	33.3531	112.688	20.9821	37.7781	1	0	0	10/7/2010	20:00
48.1875	0.06875	0	13.6687	62.125	0.80625	0	0	55.504	1.49907	0	0	0	33.9219	112.688	20.3671	37.7781	1	0	0	10/7/2010	21:00
48.1875	0.06875	0	13.6687	62.25	0.80625	0	0	55.504	1.49907	0	0	0	33.8	113.813	20.3071	37.7781	1	0	0	10/7/2010	22:00
48.1875	0.06875	0	13.6687	62.25	0.80625	0	0	55.504	1.49907	0	0	0	33.5562	113.25	20.9821	37.7562	1	0	0	10/7/2010	23:00
48.1875	0.06875	0	13.6687	62.125	0.80625	0	0	55.504	1.49907	0	0	0	33.1906	114.375	20.0721	37.7781	1	0	0	10/8/2010	0:00
48.1875	0.06875	0	13.6687	62.125	0.80625	0	0	55.504	1.49907	0	0	0	32.825	111.938	20.3521	37.7781	1	0	0	10/8/2010	1:00
48.1875	0.06875	0	13.6687	62.125	0.80625	0	0	55.504	1.49907	0	0	0	32.825	113.063	19.5621	37.7562	1	0	0	10/8/2010	2:00
48.1875	0.06875	0	13.6687	62.125	0.80625	0	0	55.504	1.49907	0	0	0	32.7031	113.063	19.8071	37.7562	1	0	0	10/8/2010	3:00
48.1875	0.06875	0	13.6687	62.125	0.80625	0	0	55.504	1.49907	0	0	0	32.3375	111.563	18.8121	37.7781	1	0	0	10/8/2010	4:00
48.0625	0.06875	0	13.6687	62.125	0.80625	0	0	55.504	1.49907	0	0	0	32.5	111.938	19.0471	37.7781	1	0	0	10/8/2010	5:00
48	0.06875	0	13.7719	62.125	0.80625	0	0	55.504	1.49907	0	0	0	32.0125	111.938	19.0471	37.7562	1	0	0	10/8/2010	6:00
48.125	0.06875	0	13.7719	62.125	0.80625	0	0	55.504	1.49907	0	0	0	33.2313	112.313	20.5151	37.7562	1	0	0	10/8/2010	7:00
47.9375	0.06875	0	13.9594	62.125	0.80625	0	0	55.504	1.49907	0	0	0	28.5594	108.563	14.6951	37.7562	1	0	0	10/8/2010	8:00
47.8125	0.06875	0	13.9594	62.125	0.80625	0	0	55.388	1.49907	0	0	0	29.4125	107.25	15.9101	37.7562	1	0	0	10/8/2010	9:00
47.8125	0.06875	0	13.9594	61.9375	0.80625	0	0	55.3911	1.49907	0	0	0	29.3719	107.25	16.1901	37.7781	1	0	0	10/8/2010	10:00
47.8125	0.06875	0	13.9594	61.9375	0.80625	0	0	55.3911	1.49602	0	0	0	29.5344	107.25	16.1751	37.7562	1	0	0	10/8/2010	11:00
47.8125	0.06875	0	13.9594	61.9375	0.80625	0	0	55.3972	1.49541	0	0	0	29.4937	107.25	16.3351	37.7781	1	0	0	10/8/2010	12:00
47.8125	0.06875	0	13.9594	61.9375	0.80625	0	0	55.504	1.40202	0	0	0	28.6406	106.313	15.5601	37.7781	1	0	0	10/8/2010	13:00
47.875	0.06875	0	13.9594	61.9375	0.80625	0	0	55.504	1.39988	0	0	0	28.925	107.625	15.5451	37.7781	1	0	0	10/8/2010	14:00
47.875	0.06875	0	13.9594	62.125	0.80625	0	0	55.504	1.49388	0	0	0	29.575	107.625	16.4851	37.7781	1	0	0	10/8/2010	15:00
47.875	0.06875	0	13.8	62.125	0.80625	0	0	55.504	1.40019	0	0	0	29.0875	108.375	15.6351	37.7781	1	0	0	10/8/2010	16:00
47.875	0.06875	0	13.8	62.125	0.80625	0	0	55.504	1.49358	0	0	0	29.3719	108.563	16.6151	37.7562	1	0	0	10/8/2010	17:00
47.875	0.06875	0	13.8	62.125	0.80625	0	0	55.504	1.49388	0	0	0	29.25	108.563	16.4101	37.7781	1	0	0	10/8/2010	18:00
47.875	0.06875	0	13.9031	62.125	0.80625	0	0	55.504	1.4008	0	0	0	29.0875	108.563	15.7651	37.7562	1	0	0	10/8/2010	19:00
47.6875	0.06875	0	14.1	62.125	0.80625	0	0	55.504	1.4008	0	0	0	31.4031	103.5	18.2703	37.7562	1	0	0	10/8/2010	20:00
47.5625	0.06875	0	14.1	62.125	0.80625	0	0	55.504	1.4008	0	0	0	31.2406	103.5	17.0403	37.7562	1	0	0	10/8/2010	21:00
47.5625	0.06875	0	14.1	62.125	0.80625	0	0	55.504	1.4008	0	0	0	30.225	103.5	16.6303	37.7781	1	0	0	10/8/2010	22:00
47.5625	0.06875	0	14.1	62.125	0.80625	0	0	55.504	1.4008	0	0	0	29.9	102	16.4103	37.7562	1	0	0	10/8/2010	23:00
47.5625	0.06875	0	14.1	62	0.80625	0	0	55.504	1.4008	0	0	0	29.9406	103.125	16.9103	37.7562	1	0	0	10/9/2010	0:00
47.375	0.06875	0	14.2031	62	0.80625	0	0	55.504	1.4008	0	0	0	29.25	102	15.1803	37.7562	1	0	0	10/9/2010	1:00
47.5	0.06875	0	14.2031	62	0.80625	0	0	55.504	1.4008	0	0	0	28.925	100.875	15.0203	37.7781	1	0	0	10/9/2010	2:00
47.5	0.06875	0	13.9031	62	0.80625	0	0	55.504	1.4008	0	0	0	26.8125	108.75	13.9353	37.7562	1	0	0	10/9/2010	3:00
47.75	0.06875	0	13.8	62	0.80625	0	0	55.504	1.4008	0	0	0	26.0813	110.063	13.3353	37.7562	1	0	0	10/9/2010	4:00
47.75	0.06875	0	13.8	62	0.80625	0	0	55.504	1.4008	0	0	0	25.6344	109.5	12.6453	37.7562	1	0	0	10/9/2010	5:00
47.75	0.06875	0	13.8	62	0.80625	0	0	55.504	1.4008	0	0	0	26.65	109.5	13.7853	37.7781	1	0	0	10/9/2010	6:00
47.75	0.06875	0	13.8	62	0.80625	0	0	55.385	1.4008	0	0	0	27.1375	109.688	13.9503	37.7562	1	0	0	10/9/2010	7:00
47.75	0.06875	0	13.9219	62	0.80625	0	0	55.385	1.4008	0	0	0	27.1781	108.563	13.7458	37.7781	1	0	0	10/9/2010	8:00
47.75	0.06875	0	13.9219	62	0.80625	0	0	55.385	1.4008	0	0	0	27.4219	108.563	14.4008	37.7781	1	0	0	10/9/2010	9:00
47.75	0.06875	0	13.9219	62	0.80625	0	0	55.504	1.4008	0	0	0	27.2188	108.563	14.1558	37.7781	1	0	0	10/9/2010	10:00
47.75	0.06875	0	13.9219	62	0.80625	0	0	55.504	1.4008	0	0	0	27.4625	108.563	14.3858	37.7781	1	0	0	10/9/2010	11:00
47.75	0.06875	0	13.8187	62	0.80625	0	0	55.504	1.4008	0	0	0	27.95	108.563	15.0458	37.7781	1	0	0	10/9/2010	12:00
47.75	0.06875	0	13.8187	61.875	0.80625	0	0	55.504	1.4008	0	0	0	28.0313	108.563	14.6508	37.8	1	0	0	10/9/2010	13:00
47.75	0.06875	0	13.8	61.875	0.80625	0	0	55.504	1.4008	0	0	0	28.6	109.688	15.1058	37.7781	1	0	0	10/9/2010	14:00
47.75	0.06875	0	13.8	61.875	0.80625	0	0	55.504	1.4008	0	0	0	28.6	109.688	15.6508	37.7781	1	0	0	10/9/2010	15:00
47.875	0.06875	0	13.8	61.875	0.80625	0	0	55.504	1.4008	0	0	0	28.8438	109.688	15.5158	37.8656	0	0	0	10/9/2010	16:00
47.75	0.06875	0	13.8	62	0.80625	0	0	55.504	1.30131	0	0	0	29.1688	109.5	16.1458	37.8	0	0	1	10/9/2010	17:00
47.875	0.06875	0	13.8	62	0.80625	0	0	55.504	1.29093	0	0	0	28.7219	109.313	15.4158	37.8	0	0	1	10/9/2010	18:00
47.75	0.06875	0	13.8	62	0.80625	0	0	55.504	1.19907	0	0	0	29.0875	109.313	16.3208	37.8	0	0	1	10/9/2010	19:00
47.75	0.06875	0	13.8	62	0.80625	0	0	55.504	1.19907	0	0	0	28.925	108.188	15.5458	37.8	0	0	1	10/9/2010	20:00
47.75	0.06875	0	13.8	61.875	0.80625	0	0	55.3911	1.19907	0	0	0	29.4125	109.313	16.4225	37.8	0	0	1	10/9/2010	21:00

Caisson 3 Level	Pond 1 Level	Pump5 Flow	Pump6 Flow	Caisson 4 Level	Pond 2 Level	Pump7 Flow	Pump8 Flow	Caisson 5 Level	Pond 3 Level	Pond 4 Level	Pump9 Flow	Pump10 Flow	Mirabel Flow	Mirabel Line Pressure	54inch Intertie Flow	River Level	Pump 1 Status Run	Pump 2 Status Run	Pump 3 Status Run	Date	Interval
47.75	0.06875	0	13.8	61.875	0.80625	0	0	55.3911	1.19907	0	0	0	29.25	109.313	16.4525	37.7781	0	0	1	10/9/2010	22:00
47.75	0.06875	0	13.8	62	0.80625	0	0	55.3911	1.19907	0	0	0	29.0063	108.938	15.7825	37.7781	0	0	1	10/9/2010	23:00
47.75	0.06875	0	13.8	62	0.80625	0	0	55.3911	1.19907	0	0	0	29.4937	109.125	16.3525	37.7781	0	0	1	10/10/2010	0:00
47.75	0.06875	0	13.8	62	0.80625	0	0	55.3911	1.19907	0	0	0	29.2906	109.125	16.0875	37.7781	0	0	1	10/10/2010	1:00
47.625	0.06875	0	13.9219	62	0.80625	0	0	55.3911	1.19907	0	0	0	27.95	108	14.5625	37.7781	0	0	1	10/10/2010	2:00
47.625	0.06875	0	13.9219	62	0.80625	0	0	55.3911	1.19907	0	0	0	28.6812	107.625	15.0925	37.7781	0	0	1	10/10/2010	3:00
47.625	0.06875	0	13.9219	62	0.80625	0	0	55.3911	1.19907	0	0	0	27.5031	107.625	14.3875	37.7781	0	0	1	10/10/2010	4:00
47.625	0.06875	0	14.025	61.8125	0.80625	0	0	55.3911	1.19907	0	0	0	26.0813	106.5	13.0525	37.7781	0	0	1	10/10/2010	5:00
47.625	0.06875	0	14.025	61.8125	0.80625	0	0	55.3911	1.19907	0	0	0	27.4625	106.5	14.3125	37.7781	0	0	1	10/10/2010	6:00
47.5	0.06875	0	14.025	61.8125	0.80625	0	0	55.3911	1.19907	0	0	0	27.5031	106.5	14.1825	37.8	0	0	1	10/10/2010	7:00
47.625	0.06875	0	14.025	61.8125	0.80625	0	0	55.3911	1.19907	0	0	0	27.7469	106.5	14.5775	37.7781	0	0	1	10/10/2010	8:00
47.5	0.06875	0	14.025	61.8125	0.80625	0	0	55.3911	1.19907	0	0	0	28.7219	106.313	15.4711	37.7781	0	0	1	10/10/2010	9:00
47.5	0.06875	0	14.025	61.8125	0.80625	0	0	55.2965	1.19907	0	0	0	28.1938	106.313	14.8861	37.8	0	0	1	10/10/2010	10:00
47.5	0.06875	0	14.025	61.8125	0.80625	0	0	55.2965	1.19907	0	0	0	28.7219	105.375	15.1961	37.7781	0	0	1	10/10/2010	11:00
47.5	0.06875	0	14.025	61.8125	0.80625	0	0	55.2965	1.19144	0	0	0	29.0469	106.5	15.7211	37.7781	0	0	1	10/10/2010	12:00
47.5	0.06875	0	14.025	61.8125	0.80625	0	0	55.2965	1.19144	0	0	0	29.6156	106.5	16.2911	37.7781	0	0	1	10/10/2010	13:00
47.5	0.06875	0	14.025	61.8125	0.80625	0	0	55.4003	1.19144	0	0	0	29.3719	106.5	15.5311	37.8	0	0	1	10/10/2010	14:00
47.5	0.06875	0	14.025	61.8125	0.80625	0	0	55.4003	1.19144	0	0	0	29.3719	106.5	16.0461	37.8	0	0	1	10/10/2010	15:00
47.625	0.06875	0	13.8562	61.8125	0.80625	0	0	55.4003	1.19144	0	0	0	29.0875	107.625	16.2211	37.8	0	0	1	10/10/2010	16:00
47.625	0.06875	0	13.8562	61.8125	0.80625	0	0	55.4003	1.19144	0	0	0	29.3719	108	16.1011	37.8	0	0	1	10/10/2010	17:00
47.625	0.06875	0	13.8562	61.8125	0.80625	0	0	55.4003	1.19144	0	0	0	27.6656	108.563	14.4461	37.8	0	0	1	10/10/2010	18:00
47.625	0.06875	0	13.8562	61.8125	0.80625	0	0	55.4003	1.19144	0	0	0	27.5031	108.563	14.417	37.8	0	0	1	10/10/2010	19:00
47.625	0.06875	0	13.8562	61.8125	0.80625	0	0	55.2629	1.20182	0	0	0	27.95	109.125	15.002	37.7781	0	0	1	10/10/2010	20:00
47.625	0.06875	0	13.8562	61.8125	0.80625	0	0	55.2446	1.20182	0	0	0	27.7469	110.25	14.842	37.8	0	0	1	10/10/2010	21:00
47.625	0.06875	0	13.8562	61.8125	0.80625	0	0	55.2446	1.20182	0	0	0	28.0313	110.063	14.842	37.8	0	0	1	10/10/2010	22:00
47.625	0.06875	0	13.7437	61.8125	0.80625	0	0	55.3545	1.20182	0	0	0	27.95	110.063	14.962	37.8219	0	0	1	10/10/2010	23:00
47.75	0.06875	0	13.7156	61.8125	0.80625	0	0	55.2477	1.20182	0	0	0	32.9469	111.563	19.662	37.8	0	0	1	10/11/2010	0:00
47.75	0.06875	0	13.7156	61.8125	0.80625	0	0	55.2477	1.20182	0	0	0	33.1094	111.563	19.632	37.8219	0	0	1	10/11/2010	1:00
47.75	0.06875	0	13.7156	61.8125	0.80625	0	0	55.2477	1.20182	0	0	0	33.5156	112.688	20.442	37.8219	0	0	1	10/11/2010	2:00
47.75	0.06875	0	13.7156	61.8125	0.80625	0	0	55.2477	1.19236	0	0	0	33.2719	111.938	20.762	37.8219	0	0	1	10/11/2010	3:00
47.75	0.06875	0	13.7156	61.8125	0.80625	0	0	55.2477	1.1008	0	0	0	33.8	112.5	21.422	37.8219	0	0	1	10/11/2010	4:00
47.75	0.06875	0	13.7156	61.8125	0.80625	0	0	55.2477	1.1008	0	0	0	32.7437	111.375	19.897	37.8438	0	0	1	10/11/2010	5:00
47.75	0.06875	0	13.7156	61.8125	0.80625	0	0	55.2477	1.1008	0	0	0	32.3375	111.375	19.2244	37.8438	0	0	1	10/11/2010	6:00
47.625	0.06875	0	13.8187	61.8125	0.80625	0	0	55.2477	1.1008	0	0	0	31.9312	109.875	18.8594	37.8438	0	0	1	10/11/2010	7:00
47.4375	0.06875	0	13.9125	61.8125	0.80625	0	0	55.2477	1.1008	0	0	0	34.6125	106.875	21.8044	37.8438	0	0	1	10/11/2010	8:00
47.4375	0.06875	0	13.9125	61.8125	0.80625	0	0	55.2477	1.1008	0	0	0	35.9937	106.688	22.6244	37.8656	0	0	1	10/11/2010	9:00
47.5625	0.06875	0	13.6781	61.8125	0.70625	0	0	55.2477	1.1008	0	0	0	36.4	106.688	23.1794	37.8438	0	0	1	10/11/2010	10:00
57.375	0.06875	0	0	62.125	0.70625	0	0	55.2477	1.09073	0	0	0	30.4281	106.313	29.7744	37.8656	0	0	1	10/11/2010	11:00
58.0625	0.06875	0	0	62.25	0.70625	0	0	55.2477	1.09073	0	0	0	27.9906	108.75	28.6444	37.8656	0	0	1	10/11/2010	12:00
58.5625	0.06875	0	0	62.4375	0.80625	0	0	55.2477	1.09073	0	0	0	28.1531	109.125	27.8544	37.8656	0	0	1	10/11/2010	13:00
58.8125	0.06875	0	0	62.6875	0.80625	0	0	55.2477	1.10233	0	0	0	27.9906	109.125	28.5279	37.8656	0	0	1	10/11/2010	14:00
59.125	0.06875	0	0	62.6875	0.80625	0	0	55.3514	1.19144	0	0	0	27.3406	109.125	27.2967	37.8875	0	0	1	10/11/2010	15:00
59.4375	0.06875	0	0	62.875	0.80625	0	0	55.3514	1.19144	0	0	0	27.5031	111.563	27.3567	37.8875	0	0	1	10/11/2010	16:00
59.6875	0.06875	0	0	63	0.80625	0	0	55.3514	1.19144	0	0	0	22.4656	111.188	23.4117	37.8875	0	0	1	10/11/2010	17:00
59.8125	0.06875	0	0	63	0.80625	0	0	55.3514	1.19144	0	0	0	24.4563	108.375	26.0243	37.8875	0	0	1	10/11/2010	18:00
60.0625	0.06875	0	0	63.25	0.80625	0	0	55.3514	1.19144	0	0	0	24.5375	108.375	24.3949	37.8875	0	0	1	10/11/2010	19:00
60.1875	0.06875	0	0	63.375	0.80625	0	0	55.3514	1.20151	0	0	0	24.6594	108.375	25.0699	37.8656	0	0	1	10/11/2010	20:00
60.3125	0.06875	0	0	63.375	0.80625	0	0	55.3514	1.20151	0	0	0	24.4969	108.375	25.3749	37.8656	0	0	1	10/11/2010	21:00
60.4375	0.06875	0	0	63.5625	0.80625	0	0	55.3514	1.20151	0	0	0	24.6594	108.375	25.3749	37.8875	0	0	1	10/11/2010	22:00
60.5625	0.06875	0	0	63.5625	0.80625	0	0	55.3514	1.20151	0	0	0	24.8219	109.5	25.0399	37.8656	0	0	1	10/11/2010	23:00
60.6875	0.06875	0	0	63.6875	0.80625	0	0	55.3514	1.20151	0	0	0	24.4563	109.125	25.2449	37.8875	0	0	1	10/12/2010	0:00
60.8125	0.06875	0	0	63.6875	0.80625	0	0	55.3514	1.20151	0	0	0	24.0094	108	24.2949	37.9094	0	0	1	10/12/2010	1:00
60.8125	0.06875	0	0	63.6875	0.80625	0	0	55.3514	1.20151	0	0	0	24.1719	108	24.6899	37.8875	0	0	1	10/12/2010	2:00
60.9375	0.06875	0	0	63.6875	0.80625	0	0	55.3514	1.20151	0	0	0	23.9688	106.125	24.4416	37.8875	0	0	1	10/12/2010	3:00
61.0625	0.06875	0	0	63.6875	0.80625	0	0	55.3514	1.20151	0	0	0	24.0094	105.75	24.5566	37.9094	0	0	1	10/12/2010	4:00
61.0625	0.06875	0	0	63.9375	0.80625	0	0	55.3514	1.20151	0	0	0	23.8875	104.625	24.2516	37.9094	0	0	1	10/12/2010	5:00
61.1875	0.06875	0	0	63.9375	0.9125	0	0	55.3514	1.20151	0	0	0	23.9281	104.625	24.3816	37.9094	0	0	1	10/12/2010	6:00
61.1875	0.06875	0	0	63.9375	0.9125	0	0	55.3514	1.20151	0	0	0	24.2531	106.313	24.9966	37.9312	0	0	1	10/12/2010	7:00

Caisson 3 Level	Pond 1 Level	Pump5 Flow	Pump6 Flow	Caisson 4 Level	Pond 2 Level	Pump7 Flow	Pump8 Flow	Caisson 5 Level	Pond 3 Level	Pond 4 Level	Pump9 Flow	Pump10 Flow	Mirabel Flow	Mirabel Line Pressure	54inch Intertie Flow	River Level	Pump 1 Status Run	Pump 2 Status Run	Pump 3 Status Run	Date	Interval
61.375	0.06875	0	0	63.9375	0.9125	0	0	55.4796	1.20151	0	0	0	24.9438	105.375	24.9966	37.9312	0	0	1	10/12/2010	8:00
61.375	0.06875	0	0	64.0625	0.9125	0	0	55.4796	1.28849	0	0	0	24.9031	105.563	25.7566	37.9312	0	0	1	10/12/2010	9:00
61.375	0.06875	0	0	64.0625	0.9125	0	0	55.4735	1.28849	0	0	0	25.025	105.563	25.2916	37.9312	0	0	1	10/12/2010	10:00
61.5	0.06875	0	0	64.0625	0.9125	0	0	55.4735	1.28849	0	0	0	24.7813	106.125	25.2916	37.9531	0	0	1	10/12/2010	11:00
61.5	0.06875	0	0	64.0625	0.9125	0	0	55.4735	1.28849	0	0	0	24.8219	106.125	25.4666	37.9531	0	0	1	10/12/2010	12:00
61.625	0.06875	0	0	64.1875	0.9125	0	0	55.4735	1.28849	0	0	0	24.9844	107.438	25.5116	37.9531	0	0	1	10/12/2010	13:00
61.625	0.06875	0	0	64.1875	1.0125	0	0	55.4735	1.28849	0	0	0	24.9438	107.438	25.4816	37.9531	0	0	1	10/12/2010	14:00
61.75	0.06875	0	0	64.1875	1.0125	0	0	55.5803	1.28849	0	0	0	24.7	108.375	24.8051	37.975	0	0	1	10/12/2010	15:00
61.75	0.06875	0	0	64.3125	1.0125	0	0	55.5803	1.30009	0	0	0	24.7813	108.375	25.3651	37.9531	0	0	1	10/12/2010	16:00
61.875	0.06875	0	0	64.3125	1.0125	0	0	55.5803	1.3947	0	0	0	24.7406	108.375	24.6001	37.9531	0	0	1	10/12/2010	17:00
61.875	0.06875	0	0	64.3125	1.0125	0	0	55.5803	1.3947	0	0	0	24.5781	107.063	24.9101	37.975	0	0	1	10/12/2010	18:00
61.875	0.06875	0	0	64.3125	1.0125	0	0	55.5803	1.3947	0	0	0	24.6187	107.25	25.5251	37.975	0	0	1	10/12/2010	19:00
62	0.06875	0	0	64.4375	1.0125	0	0	55.5803	1.3947	0	0	0	24.7	108.375	24.8501	37.975	0	0	1	10/12/2010	20:00
62	0.06875	0	0	64.4375	1.0125	0	0	55.5803	1.3947	0	0	0	24.7406	108.188	25.3751	37.975	0	0	1	10/12/2010	21:00
62	0.06875	0	0	64.4375	1.0125	0	0	55.5803	1.3947	0	0	0	24.7406	108.188	26.1401	37.9969	0	0	1	10/12/2010	22:00
62	0.06875	0	0	64.4375	1.0125	0	0	55.6017	1.3947	0	0	0	24.375	107.063	25.0701	37.9969	0	0	1	10/12/2010	23:00
62	0.06875	0	0	64.4375	1.1125	0	0	55.6017	1.3947	0	0	0	24.0094	107.063	23.9401	37.9969	0	0	1	10/13/2010	0:00
62	0.06875	0	0	64.6875	1.1125	0	0	55.7024	1.3947	0	0	0	23.8469	105.75	25.3201	38.0187	0	0	1	10/13/2010	1:00
62.1875	0.06875	0	0	64.6875	1.1125	0	0	55.7024	1.3947	0	0	0	24.05	105.75	24.7601	38.0187	0	0	1	10/13/2010	2:00
62.1875	0.06875	0	0	64.6875	1.1125	0	0	55.7024	1.49541	0	0	0	23.9688	105.75	25.2001	38.0187	0	0	1	10/13/2010	3:00
62.1875	0.06875	0	0	64.6875	1.1125	0	0	55.7024	1.49541	0	0	0	24.0906	105.938	25.1723	38.0406	0	0	1	10/13/2010	4:00
62.1875	0.06875	0	0	64.6875	1.1125	0	0	55.7024	1.49541	0	0	0	24.375	106.125	24.2473	38.0625	0	0	1	10/13/2010	5:00
62.1875	0.06875	0	0	64.6875	1.1125	0	0	55.7024	1.49541	0	0	0	23.8469	104.625	24.3073	38.0625	0	0	1	10/13/2010	6:00
62.1875	0.06875	0	0	64.6875	1.1125	0	0	55.7024	1.49541	0	0	0	24.2531	103.313	23.7823	38.0844	0	0	1	10/13/2010	7:00
62.3125	0.06875	0	0	64.6875	1.1125	0	0	55.7024	1.49541	0	0	0	24.4969	102.75	25.3623	38.1063	0	0	1	10/13/2010	8:00
62.3125	0.06875	0	0	64.6875	1.1125	0	0	55.7024	1.49541	0	0	0	26.975	103.875	26.8273	38.1063	0	0	1	10/13/2010	9:00
62.3125	0.06875	0	0	64.6875	1.2125	0	0	55.7024	1.49541	0	0	0	26.2031	103.875	27.0623	38.1281	0	0	1	10/13/2010	10:00
62.3125	0.06875	0	0	64.6875	1.2125	0	0	55.7024	1.49541	0	0	0	26.975	103.875	27.7673	38.15	0	0	1	10/13/2010	11:00
62.4375	0.06875	0	0	64.8125	1.2125	0	0	55.7024	1.49541	0	0	0	27.1781	105.188	27.1523	38.15	0	0	1	10/13/2010	12:00
62.4375	0.06875	0	0	64.8125	1.2125	0	0	55.8031	1.59307	0	0	0	27.2188	105.188	27.7973	38.1719	0	0	1	10/13/2010	13:00
62.4375	0.06875	0	0	64.8125	1.2125	0	0	55.8031	1.59307	0	0	0	26.975	105.188	27.2223	38.1937	0	0	1	10/13/2010	14:00
62.5625	0.06875	0	0	64.8125	1.2125	0	0	55.8031	1.59307	0	0	0	27.2594	105.188	27.2527	38.2156	0	0	1	10/13/2010	15:00
62.5625	0.06875	0	0	64.8125	1.2125	0	0	55.8031	1.59307	0	0	0	27.0562	107.438	27.4577	38.2594	0	0	1	10/13/2010	16:00
62.5625	0.06875	0	0	64.8125	1.2125	0	0	55.8031	1.59307	0	0	0	26.8938	107.438	27.2077	38.2813	0	0	1	10/13/2010	17:00
62.5625	0.06875	0	0	64.8125	1.2125	0	0	55.8031	1.69469	0	0	0	26.8938	107.438	27.0627	38.325	0	0	1	10/13/2010	18:00
62.5625	0.06875	0	0	64.8125	1.2125	0	0	55.8031	1.69469	0	0	0	26.8938	107.438	27.7524	38.3687	0	0	1	10/13/2010	19:00
62.6875	0.06875	0	0	65	1.2125	0	0	55.8031	1.69469	0	0	0	26.6906	106.313	27.3574	38.4344	0	0	1	10/13/2010	20:00
62.6875	0.06875	0	0	65	1.31875	0	0	55.8031	1.69469	0	0	0	26.8531	106.313	26.6824	38.4562	0	0	1	10/13/2010	21:00
62.6875	0.06875	0	0	65	1.31875	0	0	55.9069	1.69469	0	0	0	26.8938	106.313	27.1224	38.5219	0	0	1	10/13/2010	22:00
62.6875	0.06875	0	0	65	1.31875	0	0	55.9069	1.69469	0	0	0	27.0969	108	27.1374	38.5656	0	0	1	10/13/2010	23:00
62.8125	0.06875	0	0	65	1.31875	0	0	55.9069	1.69469	0	0	0	26.6094	106.125	27.2374	38.5875	0	0	1	10/14/2010	0:00
62.8125	0.06875	0	0	65.125	1.31875	0	0	55.9069	1.69469	0	0	0	26.2437	106.125	26.6674	38.6312	0	0	1	10/14/2010	1:00
62.8125	0.06875	0	0	65.125	1.31875	0	0	55.9069	1.69469	0	0	0	26.1625	106.125	26.7674	38.675	0	0	1	10/14/2010	2:00
62.9375	0.06875	0	0	65.125	1.31875	0	0	55.9069	1.69469	0	0	0	26.0406	106.125	26.0524	38.7188	0	0	1	10/14/2010	3:00
62.9375	0.06875	0	0	65.125	1.31875	0	0	56.0076	1.79846	0	0	0	25.5938	106.125	26.4474	38.7406	0	0	1	10/14/2010	4:00
62.9375	0.06875	0	0	65.125	1.31875	0	0	56.0076	1.79846	0	0	0	25.6344	106.125	26.1543	38.7625	0	0	1	10/14/2010	5:00
63.0625	0.06875	0	0	65.375	1.31875	0	0	56.0076	1.79846	0	0	0	25.9188	106.125	26.2843	38.7844	0	0	1	10/14/2010	6:00
63.0625	0.06875	0	0	65.375	1.31875	0	0	56.1083	1.79846	0	0	0	26.7313	106.125	27.2843	38.8062	0	0	1	10/14/2010	7:00
63.0625	0.06875	0	0	65.375	1.31875	0	0	56.1083	1.79846	0	0	0	26.0813	106.125	27.0043	38.8281	0	0	1	10/14/2010	8:00
63.1875	0.06875	0	0	65.375	1.31875	0	0	56.1083	1.79846	0	0	0	26.6906	104.438	26.7843	38.8281	0	0	1	10/14/2010	9:00
63.1875	0.06875	0	0	65.375	1.31875	0	0	56.1083	1.79846	0	0	0	26.8531	104.438	27.3393	38.85	0	0	1	10/14/2010	10:00
63.1875	0.06875	0	0	65.375	1.31875	0	0	56.1083	1.79846	0	0	0	26.5281	105.563	27.3093	38.8281	0	0	1	10/14/2010	11:00
63.3125	0.06875	0	0	65.375	1.31875	0	0	56.1083	1.89795	0	0	0	27.1781	105.563	27.2843	38.8719	0	0	1	10/14/2010	12:00
63.3125	0.06875	0	0	65.375	1.31875	0	0	56.1083	1.89795	0	0	0	26.3656	105.563	26.5493	38.8719	0	0	1	10/14/2010	13:00
63.3125	0.06875	0	0	65.375	1.50625	0	0	56.1846	1.89795	0	0	0	26.2844	105.563	27.1043	38.8719	0	0	1	10/14/2010	14:00
63.3125	0.06875	0	0	65.375	1.50625	0	0	56.1846	1.89795	0	0	0	26.6094	105.938	26.9893	38.8719	0	0	1	10/14/2010	15:00
63.3125	0.06875	0	0	65.375	1.50625	0	0	56.2914	1.89917	0	0	0	25.8375	108.75	26.652	38.8719	0	0	1	10/14/2010	16:00
63.4375	0.06875	0	0	65.375	1.50625	0	0	56.2914	1.99835	0	0	0	26.4469	107.063	26.507	38.8719	0	0	1	10/14/2010	17:00

Caisson 3 Level	Pond 1 Level	Pump5 Flow	Pump6 Flow	Caisson 4 Level	Pond 2 Level	Pump7 Flow	Pump8 Flow	Caisson 5 Level	Pond 3 Level	Pond 4 Level	Pump9 Flow	Pump10 Flow	Mirabel Flow	Mirabel Line Pressure	54inch Intertie Flow	River Level	Pump 1 Status Run	Pump 2 Status Run	Pump 3 Status Run	Date	Interval
63.4375	0.06875	0	0	65.5	1.50625	0	0	56.2914	1.99835	0	0	0	25.9594	107.063	25.467	38.8719	0	0	1	10/14/2010	18:00
63.4375	0.06875	0	0	65.5	1.50625	0	0	56.2914	1.99835	0	0	0	25.7969	107.063	25.612	38.8719	0	0	1	10/14/2010	19:00
63.4375	0.06875	0	0	65.5	1.50625	0	0	56.3921	1.99835	0	0	0	26.2844	107.063	26.357	38.8719	0	0	1	10/14/2010	20:00
63.4375	0.06875	0	0	65.5	1.50625	0	0	56.3921	1.99835	0	0	0	26.2031	107.063	26.492	38.8719	0	0	1	10/14/2010	21:00
63.5	0.06875	0	0	65.5	1.6125	0	0	56.3921	1.99835	0	0	0	26.2437	107.063	26.547	38.85	0	0	1	10/14/2010	22:00
63.5	0.06875	0	0	65.5	1.6125	0	0	56.3921	2.09784	0	0	0	26.325	107.063	26.562	38.85	0	0	1	10/14/2010	23:00
63.5	0.06875	0	0	65.5	1.6125	0	0	56.3921	2.09784	0	0	0	24.9031	106.875	25.877	38.85	0	0	1	10/15/2010	0:00
63.5	0.06875	0	0	65.75	1.6125	0	0	56.3921	2.09784	0	0	0	25.0656	106.875	24.862	38.85	0	0	1	10/15/2010	1:00
63.5	0.06875	0	0	65.75	1.6125	0	0	56.3921	2.09784	0	0	0	25.2688	106.875	25.847	38.85	0	0	1	10/15/2010	2:00
63.5	0.06875	0	0	65.75	1.6125	0	0	56.4959	2.09784	0	0	0	25.2688	106.875	25.127	38.85	0	0	1	10/15/2010	3:00
63.5	0.06875	0	0	65.75	1.6125	0	0	56.4959	2.09784	0	0	0	24.7406	105.563	24.997	38.85	0	0	1	10/15/2010	4:00
63.625	0.06875	0	0	65.75	1.6125	0	0	56.4959	2.19672	0	0	0	24.8625	105.563	25.7302	38.85	0	0	1	10/15/2010	5:00
63.625	0.06875	0	0	65.75	1.6125	0	0	56.4959	2.19672	0	0	0	25.5125	105.563	25.1002	38.85	0	0	1	10/15/2010	6:00
63.625	0.06875	0	0	65.75	1.7125	0	0	56.4959	2.19672	0	0	0	25.1875	105.563	25.6252	38.85	0	0	1	10/15/2010	7:00
63.625	0.06875	0	0	65.75	1.7125	0	0	56.4959	2.19672	0	0	0	25.5938	105.563	26.2102	38.85	0	0	1	10/15/2010	8:00
63.625	0.06875	0	0	65.75	1.7125	0	0	56.4959	2.19672	0	0	0	26.2031	104.25	26.0352	38.8281	0	0	1	10/15/2010	9:00
63.625	0.06875	0	0	65.75	1.7125	0	0	56.4959	2.19672	0	0	0	26.325	105.375	26.6502	38.85	0	0	1	10/15/2010	10:00
63.75	0.06875	0	0	65.75	1.7125	0	0	56.6027	2.19672	0	0	0	21.45	102.938	21.6552	38.8281	0	0	1	10/15/2010	11:00
63.75	0.06875	0	0	65.75	1.7125	0	0	56.6027	2.29652	0	0	0	25.025	106.688	26.1116	38.8281	0	0	1	10/15/2010	12:00
63.75	0.06875	0	0	65.75	1.7125	0	0	56.6027	2.29652	0	0	0	24.9438	106.688	25.6566	38.8281	0	0	1	10/15/2010	13:00
63.75	0.06875	0	0	65.875	1.7125	0	0	56.6027	2.29652	0	0	0	24.9031	106.688	25.0716	38.8062	0	0	1	10/15/2010	14:00
63.75	0.06875	0	0	65.875	1.7125	0	0	56.6027	2.29652	0	0	0	25.35	107.813	25.5516	38.8062	0	0	1	10/15/2010	15:00
63.75	0.06875	0	0	65.875	1.7125	0	0	56.6027	2.39784	0	0	0	25.1063	106.875	25.4516	38.8062	0	0	1	10/15/2010	16:00
63.75	0.06875	0	0	65.875	1.7125	0	0	56.6027	2.3011	0	0	0	25.1469	108.938	26.0216	38.8062	0	0	1	10/15/2010	17:00
63.75	0.06875	0	0	65.875	1.81875	0	0	56.6027	2.39784	0	0	0	24.7813	108.938	25.2873	38.7844	0	0	1	10/15/2010	18:00
63.75	0.06875	0	0	65.875	1.81875	0	0	56.6027	2.39784	0	0	0	25.1469	108.938	25.7123	38.7844	0	0	1	10/15/2010	19:00
63.875	0.06875	0	0	65.875	1.81875	0	0	56.7125	2.39784	0	0	0	25.1063	108.938	26.1673	38.7844	0	0	1	10/15/2010	20:00
63.875	0.06875	0	0	65.875	1.81875	0	0	56.7125	2.39784	0	0	0	25.025	108.75	25.6873	38.7844	0	0	1	10/15/2010	21:00
63.875	0.06875	0	0	66.0625	1.81875	0	0	56.7125	2.39784	0	0	0	25.1469	108.75	25.5673	38.7844	0	0	1	10/15/2010	22:00
63.875	0.06875	0	0	65.875	1.81875	0	0	56.7125	2.39784	0	0	0	24.7	108.75	24.9523	38.7844	0	0	1	10/15/2010	23:00
63.875	0.06875	0	0	66.0625	1.81875	0	0	56.7125	2.39784	0	0	0	23.8875	107.625	24.5723	38.7625	0	0	1	10/16/2010	0:00
63.875	0.06875	0	0	66.0625	1.81875	0	0	56.7125	2.49794	0	0	0	23.5219	107.625	24.2623	38.7844	0	0	1	10/16/2010	1:00
63.875	0.06875	0	0	66.0625	1.81875	0	0	56.7125	2.49794	0	0	0	23.8062	107.625	24.1773	38.7625	0	0	1	10/16/2010	2:00
63.875	0.06875	0	0	66.0625	1.81875	0	0	56.7125	2.49794	0	0	0	23.6844	107.625	24.1773	38.7625	0	0	1	10/16/2010	3:00
63.875	0.06875	0	0	66.0625	1.81875	0	0	56.7125	2.49794	0	0	0	23.2781	107.063	24.0423	38.7625	0	0	1	10/16/2010	4:00
63.875	0.06875	0	0	66.0625	1.81875	0	0	56.7125	2.49794	0	0	0	24.1313	106.688	24.4823	38.7625	0	0	1	10/16/2010	5:00
63.875	0.06875	0	0	66.0625	1.81875	0	0	56.7125	2.49794	0	0	0	23.8875	106.688	23.5306	38.7625	0	0	1	10/16/2010	6:00
63.875	0.06875	0	0	66.0625	1.81875	0	0	56.7125	2.49794	0	0	0	24.9031	103.688	25.3206	38.7406	0	0	1	10/16/2010	7:00
63.875	0.06875	0	0	66.0625	1.81875	0	0	56.7125	2.49794	0	0	0	24.6594	103.688	25.2756	38.7406	0	0	1	10/16/2010	8:00
63.875	0.06875	0	0	66.0625	1.81875	0	0	56.7125	2.59529	0	0	0	25.4719	104.25	26.5056	38.7406	0	0	1	10/16/2010	9:00
63.875	0.06875	0	0	66.0625	1.81875	0	0	56.7125	2.59529	0	0	0	25.9594	105.188	26.5506	38.7406	0	0	1	10/16/2010	10:00
64	0.06875	0	0	66.0625	1.9625	0	0	56.7125	2.59529	0	0	0	26.5688	103.875	27.1806	38.7406	0	0	1	10/16/2010	11:00
64	0.06875	0	0	66.0625	1.9625	0	0	56.7125	2.59529	0	0	0	26.4469	103.875	26.0956	38.7406	0	0	1	10/16/2010	12:00
64	0.06875	0	0	66.0625	1.9625	0	0	56.8163	2.59529	0	0	0	27.4625	99.375	28.0456	38.7188	0	0	1	10/16/2010	13:00
64	0.06875	0	0	66.0625	1.9625	0	0	56.8163	2.59529	0	0	0	27.7875	100.5	28.6006	38.7188	0	0	1	10/16/2010	14:00
64	0.06875	0	0	66.0625	1.9625	0	0	56.8163	2.59529	0	0	0	26.2437	103.875	26.7106	38.7188	0	0	1	10/16/2010	15:00
64	0.06875	0	0	66.0625	1.9625	0	0	56.8163	2.59804	0	0	0	26.2437	103.875	27.6506	38.7188	0	0	1	10/16/2010	16:00
64	0.06875	0	0	66.0625	1.9625	0	0	56.8163	2.6017	0	0	0	26.6094	105	26.5506	38.7188	0	0	1	10/16/2010	17:00
64	0.06875	0	0	66.0625	1.9625	0	0	56.8163	2.69845	0	0	0	26.2031	105.75	26.8849	38.7188	0	0	1	10/16/2010	18:00
64	0.06875	0	0	66.0625	1.9625	0	0	56.8163	2.69845	0	0	0	25.6344	108.375	26.3899	38.7188	0	0	1	10/16/2010	19:00
64	0.06875	0	0	66.1875	1.9625	0	0	56.8163	2.69845	0	0	0	25.5938	108.375	26.6949	38.7188	0	0	1	10/16/2010	20:00
64	0.06875	0	0	66.1875	1.9625	0	0	56.8163	2.69845	0	0	0	25.7156	108.375	25.9649	38.6969	0	0	1	10/16/2010	21:00
64	0.06875	0	0	66.1875	1.9625	0	0	56.8163	2.69845	0	0	0	25.7156	108.375	25.7299	38.6969	0	0	1	10/16/2010	22:00
64.0625	0.06875	0	0	66.1875	1.9625	0	0	56.8163	2.69845	0	0	0	25.6344	108.375	25.8749	38.6969	0	0	1	10/16/2010	23:00
64.0625	0.06875	0	0	66.1875	2.1125	0	0	56.8163	2.69845	0	0	0	25.9594	108.563	26.3449	38.6969	0	0	1	10/17/2010	0:00
64.0625	0.06875	0	0	66.1875	2.1125	0	0	56.917	2.69845	0	0	0	25.8375	108.563	25.9799	38.675	0	0	1	10/17/2010	1:00
64.0625	0.06875	0	0	66.1875	2.1125	0	0	56.917	2.79824	0	0	0	25.0656	107.438	25.1449	38.675	0	0	1	10/17/2010	2:00
64.0625	0.06875	0	0	66.1875	2.1125	0	0	56.917	2.79977	0	0	0	24.6594	107.438	25.8149	38.675	0	0	1	10/17/2010	3:00

Caisson 3 Level	Pond 1 Level	Pump5 Flow	Pump6 Flow	Caisson 4 Level	Pond 2 Level	Pump7 Flow	Pump8 Flow	Caisson 5 Level	Pond 3 Level	Pond 4 Level	Pump9 Flow	Pump10 Flow	Mirabel Flow	Mirabel Line Pressure	54inch Intertie Flow	River Level	Pump 1 Status Run	Pump 2 Status Run	Pump 3 Status Run	Date	Interval
64.0625	0.06875	0	0	66.1875	2.1125	0	0	56.917	2.79977	0	0	0	24.5375	107.438	24.8199	38.675	0	0	1	10/17/2010	4:00
64.0625	0.06875	0	0	66.1875	2.1125	0	0	56.917	2.79977	0	0	0	24.2125	106.313	24.4099	38.675	0	0	1	10/17/2010	5:00
64.0625	0.06875	0	0	66.1875	2.1125	0	0	56.917	2.79977	0	0	0	24.7	107.625	24.8959	38.675	0	0	1	10/17/2010	6:00
64.0625	0.06875	0	0	66.1875	2.1125	0	0	56.917	2.79977	0	0	0	24.8625	107.625	25.4959	38.675	0	0	1	10/17/2010	7:00
64.0625	0.06875	0	0	66.1875	2.1125	0	0	56.917	2.79977	0	0	0	24.3344	106.5	24.9659	38.675	0	0	1	10/17/2010	8:00
64.0625	0.06875	0	0	66.1875	2.1125	0	0	56.917	2.79977	0	0	0	24.9438	107.625	25.5659	38.675	0	0	1	10/17/2010	9:00
64.0625	0.06875	0	0	66.1875	2.1125	0	0	56.917	2.79977	0	0	0	25.2281	107.625	25.6559	38.675	0	0	1	10/17/2010	10:00
64.0625	0.06875	0	0	66.1875	2.1125	0	0	56.917	2.90048	0	0	0	25.675	109.313	25.4509	38.6531	0	0	1	10/17/2010	11:00
64.0625	0.06875	0	0	66.1875	2.1125	0	0	56.917	2.90048	0	0	0	25.6344	108.188	26.3159	38.6531	0	0	1	10/17/2010	12:00
64.0625	0.06875	0	0	66.1875	2.1125	0	0	56.917	2.90048	0	0	0	25.5125	108.188	26.3886	38.6531	0	0	1	10/17/2010	13:00
64.0625	0.06875	0	0	66.1875	2.2125	0	0	56.917	2.90048	0	0	0	25.7156	108.188	26.2136	38.6312	0	0	1	10/17/2010	14:00
64.0625	0.06875	0	0	66.1875	2.2125	0	0	56.917	2.90048	0	0	0	20.9625	103.875	21.5686	38.6312	0	0	1	10/17/2010	15:00
64.0625	0.06875	0	0	66.1875	2.2125	0	0	56.917	2.90048	0	0	0	20.8406	103.875	21.5836	38.6531	0	0	1	10/17/2010	16:00
64.0625	0.06875	0	0	66.1875	2.2125	0	0	56.917	2.90048	0	0	0	21.2063	103.125	21.7736	38.6312	0	0	1	10/17/2010	17:00
64.0625	0.06875	0	0	66.1875	2.2125	0	0	56.917	2.90048	0	0	0	21.0438	103.313	21.9636	38.6312	0	0	1	10/17/2010	18:00
64.125	0.06875	0	0	66.1875	2.2125	0	0	56.917	2.90048	0	0	0	21.2469	103.313	21.7436	38.6312	0	0	1	10/17/2010	19:00
64	0.06875	0	0	66.1875	2.2125	0	0	56.917	2.90048	0	0	0	21.0844	103.313	21.7586	38.6312	0	0	1	10/17/2010	20:00
64.125	0.06875	0	0	66.1875	2.2125	0	0	56.917	2.99783	0	0	0	20.8406	103.313	20.9986	38.6312	0	0	1	10/17/2010	21:00
64.125	0.06875	0	0	66.1875	2.2125	0	0	56.917	2.99783	0	0	0	20.9625	103.313	21.3336	38.6094	0	0	1	10/17/2010	22:00
64.125	0.06875	0	0	66.1875	2.2125	0	0	56.917	2.99783	0	0	0	20.3938	104.625	20.4236	38.6312	0	0	1	10/17/2010	23:00
64.125	0.06875	0	0	66.1875	2.2125	0	0	56.917	2.99783	0	0	0	20.1906	104.625	20.5136	38.6312	0	0	1	10/18/2010	0:00
64.125	0.06875	0	0	66.1875	2.2125	0	0	56.917	2.99783	0	0	0	20.7188	104.625	20.7927	38.6094	0	0	1	10/18/2010	1:00
64.125	0.06875	0	0	66.1875	2.2125	0	0	56.917	2.99783	0	0	0	20.7188	104.625	21.2727	38.6094	0	0	1	10/18/2010	2:00
64.125	0.06875	0	0	66.1875	2.2125	0	0	57.0177	2.99783	0	0	0	20.475	104.625	20.9977	38.6094	0	0	1	10/18/2010	3:00
64.125	0.06875	0	0	66.1875	2.2125	0	0	57.0177	2.99783	0	0	0	20.0281	103.125	20.3377	38.6094	0	0	1	10/18/2010	4:00
64.125	0.06875	0	0	66.1875	2.2125	0	0	57.0177	2.99783	0	0	0	19.7031	103.125	20.2177	38.6094	0	0	1	10/18/2010	5:00
64.125	0.06875	0	0	66.1875	2.2125	0	0	57.0177	2.99783	0	0	0	19.4188	102.75	19.9577	38.5875	0	0	1	10/18/2010	6:00
64.125	0.06875	0	0	66.1875	2.2125	0	0	57.0177	2.99783	0	0	0	19.5813	100.688	20.1027	38.6094	0	0	1	10/18/2010	7:00
64.125	0.06875	0	0	66.1875	2.31875	0	0	57.0177	2.99783	0	0	0	19.825	100.688	20.0427	38.6094	0	0	1	10/18/2010	8:00
64.125	0.06875	0	0	66.1875	2.31875	0	0	57.0086	2.99783	0	0	0	20.2719	100.688	20.5577	38.6094	0	0	1	10/18/2010	9:00
64.125	0.06875	0	0	66.1875	2.31875	0	0	56.914	3.09977	0	0	0	20.6375	103.688	21.2327	38.5875	0	0	1	10/18/2010	10:00
64.125	0.06875	0	0	66.1875	2.31875	0	0	44.3831	3.09977	0	0	13.4336	32.1344	108.563	19.0177	38.5875	0	0	1	10/18/2010	11:00
64.125	0.06875	0	0	66.1875	2.31875	0	0	43.2905	3.00089	0	0	13.6509	34.45	102.938	20.8227	38.5875	0	0	1	10/18/2010	12:00
64.125	0.06875	0	0	66.1875	2.31875	0	0	42.7686	3.00272	0	0	13.6509	34.3687	103.688	20.8771	38.5875	0	0	1	10/18/2010	13:00
64.125	0.06875	0	0	66.1875	2.31875	0	0	42.1827	3.00272	0	0	13.7742	34.6125	103.5	21.4671	38.5656	0	0	1	10/18/2010	14:00
64.125	0.06875	0	0	66.1875	2.31875	0	0	41.8806	3.00272	0	0	13.585	34.8563	103.5	20.4121	38.5875	0	0	1	10/18/2010	15:00
64.125	0.06875	0	0	66.1875	2.31875	0	0	41.4747	3.00272	0	0	13.585	34.45	103.5	20.8481	38.5875	0	0	1	10/18/2010	16:00
64.125	0.06875	0	0	66.1875	2.31875	0	0	41.261	3.00272	0	0	13.585	35.0594	104.063	21.7131	38.5875	0	0	1	10/18/2010	17:00
64.125	0.06875	0	0	66.1875	2.31875	0	0	41.0443	2.90017	0	0	13.585	35.0188	101.813	21.6581	38.5875	0	0	1	10/18/2010	18:00
64.125	0.06875	0	0	66.1875	2.31875	0	0	40.7636	2.90139	0	0	13.585	35.1406	101.813	21.7581	38.5656	0	0	1	10/18/2010	19:00
64.125	0.06875	0	0	66.0625	2.31875	0	0	40.5499	2.90139	0	0	13.7669	34.8563	102.938	21.1431	38.5875	0	0	1	10/18/2010	20:00
64.125	0.06875	0	0	66.0625	2.31875	0	0	40.5499	2.80099	0	0	13.6564	35.1812	102.75	20.9231	38.5656	0	0	1	10/18/2010	21:00
64	0.06875	0	0	66.0625	2.31875	0	0	40.3729	2.80099	0	0	13.6564	35.5063	102.75	21.9931	38.5656	0	0	1	10/18/2010	22:00
64	0.06875	0	0	66.0625	2.31875	0	0	40.2631	2.80099	0	0	13.6564	35.5875	102.75	22.1081	38.5656	0	0	1	10/18/2010	23:00
64	0.06875	0	0	66.0625	2.31875	0	0	40.2631	2.70302	0	0	13.6564	35.5063	104.063	22.7531	38.5656	0	0	1	10/19/2010	0:00
64	0.06875	0	0	66.0625	2.31875	0	0	40.2631	2.70302	0	0	13.5466	35.5875	104.063	22.4931	38.5656	0	0	1	10/19/2010	1:00
64	0.06875	0	0	66.0625	2.31875	0	0	40.1624	2.70302	0	0	13.5466	35.6281	103.875	21.9781	38.5656	0	0	1	10/19/2010	2:00
64	0.06875	0	0	66.0625	2.31875	0	0	40.022	2.60018	0	0	13.6503	34.6531	102.75	20.5131	38.5656	0	0	1	10/19/2010	3:00
64	0.06875	0	0	65.875	2.31875	0	0	39.8877	2.60018	0	0	13.6503	33.9219	101.625	20.9799	38.5656	0	0	1	10/19/2010	4:00
64	0.06875	0	0	65.875	2.31875	0	0	39.7809	2.60018	0	0	13.6503	34.0438	101.813	21.0549	38.5438	0	0	1	10/19/2010	5:00
64	0.06875	0	0	65.875	2.31875	0	0	39.6649	2.50343	0	0	13.6503	33.9625	101.813	20.4099	38.5656	0	0	1	10/19/2010	6:00
64	0.06875	0	0	65.875	2.31875	0	0	39.6649	2.50343	0	0	13.6503	34.45	101.813	20.6899	38.5438	0	0	1	10/19/2010	7:00
64	0.06875	0	0	65.875	2.31875	0	0	40.0708	2.50343	0	0	13.2591	32.1344	112.5	19.6349	38.5656	0	0	1	10/19/2010	8:00
64	0.06875	0	0	65.875	2.2125	0	0	40.1715	2.50343	0	0	13.1516	32.8656	112.313	20.7899	38.5656	0	0	1	10/19/2010	9:00
64	0.06875	0	0	65.875	2.2125	0	0	40.1715	2.40242	0	0	13.1516	32.5406	112.313	19.4599	38.5438	0	0	1	10/19/2010	10:00
64	0.06875	0	0	65.75	2.2125	0	0	40.0708	2.40242	0	0	13.1516	32.8656	112.313	20.6449	38.5438	0	0	1	10/19/2010	11:00
64	0.06875	0	0	65.75	2.2125	0	0	40.0708	2.40242	0	0	13.1516	32.5	112.313	19.2099	38.5219	0	0	1	10/19/2010	12:00
63.875	0.06875	0	0	65.75	2.2125	0	0	40.08	2.40242	0	0	13.1516	32.9469	112.313	19.4999	38.5219	0	0	1	10/19/2010	13:00

Caisson 3 Level	Pond 1 Level	Pump5 Flow	Pump6 Flow	Caisson 4 Level	Pond 2 Level	Pump7 Flow	Pump8 Flow	Caisson 5 Level	Pond 3 Level	Pond 4 Level	Pump9 Flow	Pump10 Flow	Mirabel Flow	Mirabel Line Pressure	54inch Intertie Flow	River Level	Pump 1 Status Run	Pump 2 Status Run	Pump 3 Status Run	Date	Interval
63.875	0.06875	0	0	65.75	2.2125	0	0	39.9762	2.30049	0	0	13.1516	32.8656	112.313	19.8249	38.5438	0	0	1	10/19/2010	14:00
63.875	0.06875	0	0	65.75	2.2125	0	0	39.9762	2.30049	0	0	13.1516	32.5406	112.125	19.3249	38.5219	0	0	1	10/19/2010	15:00
64	0.06875	0	0	65.75	2.2125	0	0	39.8083	2.30049	0	0	13.1852	30.225	110.625	16.5399	38.5219	0	0	1	10/19/2010	16:00
64	0.06875	0	0	65.75	2.2125	0	0	39.6863	2.30049	0	0	13.1852	30.1844	109.5	16.4984	38.5219	0	0	1	10/19/2010	17:00
64	0.06875	0	0	65.75	2.2125	0	0	39.3506	2.30049	0	0	13.6021	22.5469	103.875	8.43842	38.5438	0	0	1	10/19/2010	18:00
64	0.06875	0	0	65.5625	2.2125	0	0	39.3506	2.19977	0	0	13.4904	22.6688	104.625	9.20342	38.5219	0	0	1	10/19/2010	19:00
64	0.06875	0	0	65.5625	2.2125	0	0	39.1949	2.19977	0	0	13.4904	22.5063	104.063	8.84842	38.5219	0	0	1	10/19/2010	20:00
64	0.06875	0	0	65.5625	2.2125	0	0	39.1949	2.19977	0	0	13.4904	22.75	104.063	8.32342	38.5438	0	0	1	10/19/2010	21:00
63.875	0.06875	0	0	65.5625	2.2125	0	0	39.0606	2.19977	0	0	13.4904	22.5469	104.063	9.28842	38.5438	0	0	1	10/19/2010	22:00
63.875	0.06875	0	0	65.5625	2.2125	0	0	39.0606	2.10242	0	0	13.6216	22.8313	102.75	9.53842	38.5438	0	0	1	10/19/2010	23:00
63.875	0.06875	0	0	65.5625	2.2125	0	0	39.2102	2.10242	0	0	13.3915	29.8188	106.5	16.0734	38.5438	0	0	1	10/20/2010	0:00
63.875	0.06875	0	0	65.5625	2.2125	0	0	39.2102	2.10242	0	0	13.3915	29.9406	107.625	16.4834	38.5219	0	0	1	10/20/2010	1:00
63.875	0.06875	0	0	65.5625	2.2125	0	0	39.0728	2.10242	0	0	13.3915	28.6406	106.5	15.5734	38.5219	0	0	1	10/20/2010	2:00
63.875	0.06875	0	0	65.5625	2.2125	0	0	39.0728	2.10242	0	0	13.3915	28.5594	106.5	14.7234	38.5438	0	0	1	10/20/2010	3:00
63.875	0.06875	0	0	65.4375	2.2125	0	0	39.0728	2.00507	0	0	13.3915	27.7063	107.625	14.2584	38.5438	0	0	1	10/20/2010	4:00
63.875	0.06875	0	0	65.4375	2.1125	0	0	39.0728	2.00507	0	0	13.3915	27.7875	107.625	14.6222	38.5438	0	0	1	10/20/2010	5:00
63.875	0.06875	0	0	65.4375	2.1125	0	0	39.0728	2.00507	0	0	13.3915	27.5031	107.25	13.7722	38.5438	0	0	1	10/20/2010	6:00
63.875	0.06875	0	0	65.4375	2.1125	0	0	38.9691	2.00507	0	0	13.3915	27.5438	107.25	14.4622	38.5219	0	0	1	10/20/2010	7:00
63.875	0.06875	0	0	65.4375	2.1125	0	0	38.9691	2.00507	0	0	13.3915	29.2906	107.813	16.1322	38.5219	0	0	1	10/20/2010	8:00
63.875	0.06875	0	0	65.4375	2.1125	0	0	38.6456	1.90039	0	0	13.5911	21.9781	103.313	8.35223	38.5219	0	0	1	10/20/2010	9:00
63.75	0.06875	0	0	65.4375	2.1125	0	0	38.6456	1.90039	0	0	13.5911	22.1812	103.313	8.67223	38.5219	0	0	1	10/20/2010	10:00
63.75	0.06875	0	0	65.4375	2.1125	0	0	38.6456	1.90039	0	0	13.5911	22.5875	103.313	8.46723	38.5219	0	0	1	10/20/2010	11:00
63.75	0.06875	0	0	65.4375	2.1125	0	0	38.496	1.90039	0	0	13.5911	22.1406	103.313	8.45223	38.5219	0	0	1	10/20/2010	12:00
63.75	0.06875	0	0	65.4375	2.1125	0	0	38.496	1.90039	0	0	13.5911	22.5469	103.313	9.02723	38.5219	0	0	1	10/20/2010	13:00
63.75	0.06875	0	0	65.3125	2.1125	0	0	38.496	1.80181	0	0	13.5911	22.5469	103.313	9.05723	38.5219	0	0	1	10/20/2010	14:00
63.75	0.06875	0	0	65.3125	2.1125	0	0	38.496	1.80273	0	0	13.5911	22.2625	103.313	8.54223	38.5219	0	0	1	10/20/2010	15:00
63.75	0.06875	0	0	65.3125	2.1125	0	0	38.2031	1.80273	0	0	13.7718	24.1313	99.375	10.4022	38.5	0	0	1	10/20/2010	16:00
63.75	0.06875	0	0	65.3125	2.1125	0	0	38.2031	1.8012	0	0	13.7718	24.1719	99.375	10.1672	38.5219	0	0	1	10/20/2010	17:00
63.75	0.06875	0	0	65.3125	2.1125	0	0	38.0993	1.8012	0	0	13.7718	23.7656	98.25	10.2579	38.5219	0	0	1	10/20/2010	18:00
63.75	0.06875	0	0	65.3125	2.1125	0	0	38.3679	1.8012	0	0	13.5405	31.0781	103.5	17.5379	38.5	0	0	1	10/20/2010	19:00
63.75	0.06875	0	0	65.3125	2.1125	0	0	38.3679	1.8012	0	0	13.5405	30.7125	103.5	17.3329	38.5	0	0	1	10/20/2010	20:00
63.75	0.06875	0	0	65.3125	2.1125	0	0	38.2611	1.8012	0	0	13.5405	30.8344	103.5	17.4629	38.5	0	0	1	10/20/2010	21:00
63.625	0.06875	0	0	65.3125	2.1125	0	0	38.2611	1.69927	0	0	13.6442	31.2406	103.5	17.1279	38.5	0	0	1	10/20/2010	22:00
63.625	0.06875	0	0	65.3125	2.1125	0	0	38.1603	1.69927	0	0	13.6442	31.3219	103.5	17.5529	38.4781	0	0	1	10/20/2010	23:00
63.625	0.06875	0	0	65.1875	2.1125	0	0	38.5815	1.69927	0	0	13.1706	28.9656	111.563	15.3679	38.4781	0	0	1	10/21/2010	0:00
63.625	0.06875	0	0	65.1875	2.1125	0	0	38.5815	1.69927	0	0	13.3055	28.7625	108.75	15.1779	38.4781	0	0	1	10/21/2010	1:00
63.625	0.06875	0	0	65.1875	2.1125	0	0	38.4655	1.69927	0	0	13.3055	29.0063	108.75	15.5879	38.4562	0	0	1	10/21/2010	2:00
63.625	0.06875	0	0	65.1875	2.1125	0	0	38.4655	1.69927	0	0	13.3055	28.7625	107.625	15.0779	38.4562	0	0	1	10/21/2010	3:00
63.625	0.06875	0	0	65.1875	1.975	0	0	38.4655	1.69927	0	0	13.3055	27.9094	108	14.7979	38.4562	0	0	1	10/21/2010	4:00
63.625	0.06875	0	0	65.1875	1.975	0	0	38.4655	1.63091	0	0	13.3055	27.8281	108.375	14.4629	38.4344	0	0	1	10/21/2010	5:00
63.625	0.06875	0	0	65.1875	1.975	0	0	38.4655	1.60161	0	0	13.3055	27.5031	109.5	14.0659	38.4344	0	0	1	10/21/2010	6:00
63.625	0.06875	0	0	65.1875	1.975	0	0	38.4655	1.60161	0	0	13.3055	26.8125	108.563	13.4659	38.4344	0	0	1	10/21/2010	7:00
63.5	0.06875	0	0	65.1875	1.975	0	0	38.4655	1.60161	0	0	13.3055	27.5438	108.563	14.0509	38.4125	0	0	1	10/21/2010	8:00
63.5	0.06875	0	0	65.0625	1.975	0	0	38.0779	1.60161	0	0	13.5368	23.1563	104.438	9.51093	38.4125	0	0	1	10/21/2010	9:00
63.5	0.06875	0	0	65.0625	1.975	0	0	37.9742	1.60161	0	0	13.5563	21.9781	103.5	8.27593	38.4125	0	0	1	10/21/2010	10:00
63.5	0.06875	0	0	65.0625	1.975	0	0	37.9742	1.60161	0	0	13.5563	22.3031	103.5	8.77593	38.3906	0	0	1	10/21/2010	11:00
63.5	0.06875	0	0	65.0625	1.975	0	0	37.9742	1.60161	0	0	13.5563	21.8969	103.5	8.44093	38.4125	0	0	1	10/21/2010	12:00
63.5	0.06875	0	0	65.0625	1.975	0	0	37.9742	1.59673	0	0	13.5563	22.0594	103.5	8.01593	38.3906	0	0	1	10/21/2010	13:00
63.5	0.06875	0	0	65.0625	1.975	0	0	37.9742	1.53722	0	0	13.5563	21.9781	103.875	8.70093	38.3906	0	0	1	10/21/2010	14:00
63.5	0.06875	0	0	65.0625	1.975	0	0	37.9742	1.50151	0	0	13.5563	22.9531	105	9.32051	38.4344	0	1	0	10/21/2010	15:00
63.5	0.06875	0	0	65.0625	1.825	0	0	37.5805	1.40019	0	0	13.845	14.4219	103.875	0.000512821	38.4125	0	1	0	10/21/2010	16:00
63.5	0.06875	0	0	64.875	1.825	0	0	37.4371	1.39409	0	0	13.845	14.4625	103.875	0.000512821	38.4125	0	1	0	10/21/2010	17:00
63.5	0.06875	0	0	64.875	1.825	0	0	37.4371	1.2009	0	0	13.845	14.3813	103.875	0.000512821	38.4125	0	1	0	10/21/2010	18:00
63.5	0.06875	0	0	64.875	1.825	0	0	37.4371	1.10172	0	0	13.845	14.4625	103.875	0.000512821	38.4125	0	1	0	10/21/2010	19:00
63.5	0.06875	0	0	64.875	1.71875	0	0	37.4371	1.0004	0	0	13.845	14.4219	103.875	0.000512821	38.4125	0	1	0	10/21/2010	20:00
63.5	0.06875	0	0	64.875	1.71875	0	0	37.3211	0.898465	0	0	13.845	14.3406	105	0.000512821	38.4125	0	1	0	10/21/2010	21:00
63.5	0.06875	0	0	64.875	1.71875	0	0	37.3211	0.803247	0	0	13.845	14.3406	105	0.000512821	38.4125	0	1	0	10/21/2010	22:00
63.5	0.06875	0	0	64.75	1.71875	0	0	37.1807	0.702536	0	0	13.845	14.3813	104.438	0.000512821	38.4125	0	1	0	10/21/2010	23:00

Caisson 3 Level	Pond 1 Level	Pump5 Flow	Pump6 Flow	Caisson 4 Level	Pond 2 Level	Pump7 Flow	Pump8 Flow	Caisson 5 Level	Pond 3 Level	Pond 4 Level	Pump9 Flow	Pump10 Flow	Mirabel Flow	Mirabel Line Pressure	54inch Intertie Flow	River Level	Pump 1 Status Run	Pump 2 Status Run	Pump 3 Status Run	Date	Interval
63.375	0.06875	0	0	64.75	1.6125	0	0	37.1807	0.598163	0	0	13.845	14.5031	104.438	0.000512821	38.3906	0	1	0	10/22/2010	0:00
63.375	0.06875	0	0	64.75	1.6125	0	0	37.0647	0.500504	0	0	13.845	14.3813	103.313	0.000512821	38.4125	0	1	0	10/22/2010	1:00
63.375	0.06875	0	0	64.625	1.6125	0	0	36.9549	0.399792	0	0	13.845	14.4219	103.125	0.000512821	38.4125	0	1	0	10/22/2010	2:00
63.375	0.06875	0	0	64.625	1.6125	0	0	36.9549	0.399792	0	0	13.845	14.3813	103.125	0.000512821	38.3906	0	1	0	10/22/2010	3:00
63.375	0.06875	0	0	64.625	1.6125	0	0	36.9549	0.299692	0	0	13.845	14.4625	103.125	0.000512821	38.3906	0	1	0	10/22/2010	4:00
63.25	0.06875	0	0	64.4375	1.6125	0	0	36.668	0.200507	0	0	13.845	14.4625	102	0.000512821	38.3906	0	1	0	10/22/2010	5:00
63.25	0.06875	0	0	64.4375	1.6125	0	0	36.668	0.0970489	0	0	13.845	14.5437	102	0.000512821	38.4125	0	1	0	10/22/2010	6:00
63.25	0.06875	0	0	64.4375	1.6125	0	0	36.5581	0.00427259	0	0	13.9482	14.5031	100.875	0.000512821	38.3906	0	1	0	10/22/2010	7:00
63.25	0.06875	0	0	64.4375	1.4125	0	0	36.4544	0.00427259	0	0	13.9482	14.4219	102	0.000512821	38.3906	0	1	0	10/22/2010	8:00
63.25	0.06875	0	0	64.3125	1.4125	0	0	36.4544	0.00427259	0	0	13.9482	14.5437	102	0.000512821	38.3906	0	1	0	10/22/2010	9:00
63.125	0.06875	0	0	64.3125	1.4125	0	0	36.3536	0.00427259	0	0	13.8444	14.4219	102.75	0.000512821	38.3906	0	1	0	10/22/2010	10:00
63.125	0.06875	0	0	64.3125	1.4125	0	0	36.2529	0.00427259	0	0	13.8444	14.4625	102.75	0.000512821	38.3687	0	1	0	10/22/2010	11:00
63.125	0.06875	0	0	64.0625	1.3125	0	0	36.2529	0.00427259	0	0	13.8444	14.3813	103.875	0.000512821	38.3906	0	1	0	10/22/2010	12:00
63	0.06875	0	0	63.9375	1.3125	0	0	36.0729	0.00427259	0	0	13.8444	14.3813	103.875	0.000512821	38.3906	0	1	0	10/22/2010	13:00
63	0.06875	0	0	63.75	1.3125	0	0	35.9722	0.00427259	0	0	13.7388	14.3406	105.563	0.000512821	38.3687	0	1	0	10/22/2010	14:00
63	0.06875	0	0	63.75	1.3125	0	0	35.8501	0.00427259	0	0	13.7388	14.3813	103.313	0.000512821	38.3906	0	1	0	10/22/2010	15:00
63	0.06875	0	0	63.625	1.3125	0	0	35.6548	0.00427259	0	0	13.8456	14.5031	103.313	0.000512821	38.3906	0	1	0	10/22/2010	16:00
63	0.06875	0	0	63.625	1.3125	0	0	35.548	0.00427259	0	0	13.8456	14.3813	103.313	0.000512821	38.3906	0	1	0	10/22/2010	17:00
62.875	0.06875	0	0	63.375	1.11875	0	0	35.548	0.00427259	0	0	13.7291	14.2594	104.625	0.000512821	38.3906	0	1	0	10/22/2010	18:00
62.875	0.06875	0	0	63.375	1.11875	0	0	35.432	0.00427259	0	0	13.7291	14.3	104.625	0.000512821	38.3687	0	1	0	10/22/2010	19:00
62.875	0.06875	0	0	63.25	1.11875	0	0	35.258	0.00427259	0	0	13.7291	14.3813	104.625	0.000512821	38.3687	0	1	0	10/22/2010	20:00
62.75	0.06875	0	0	63.25	1.0125	0	0	35.258	0.00427259	0	0	13.7291	14.3813	104.625	0.000512821	38.3687	0	1	0	10/22/2010	21:00
62.75	0.06875	0	0	63.0625	1.0125	0	0	35.1329	0.00427259	0	0	13.7291	14.3	104.625	0.000512821	38.3687	0	1	0	10/22/2010	22:00
62.625	0.06875	0	0	63.0625	1.0125	0	0	35.1329	0.00427259	0	0	13.7291	14.3406	104.625	0.000512821	38.3906	0	1	0	10/22/2010	23:00
62.625	0.06875	0	0	62.9375	0.9125	0	0	34.9834	0.00427259	0	0	13.7291	14.3813	104.625	0.000512821	38.3687	0	1	0	10/23/2010	0:00
62.5	0.06875	0	0	62.9375	0.9125	0	0	35.258	0.00427259	0	0	13.4214	24.1719	111.938	11.5305	38.3687	0	1	0	10/23/2010	1:00
62.5	0.06875	0	0	62.9375	0.9125	0	0	35.258	0.00427259	0	0	13.3171	24.6187	111.938	11.3865	38.3687	0	1	0	10/23/2010	2:00
62.625	0.06875	0	0	62.9375	0.8125	0	0	34.8888	0.00427259	0	0	13.6399	17.9156	105.188	4.11956	38.3687	0	1	0	10/23/2010	3:00
62.4375	0.06875	0	0	62.6875	0.8125	0	0	34.7606	0.00427259	0	0	13.6399	16.7375	105.375	3.01826	38.3687	0	1	0	10/23/2010	4:00
62.4375	0.06875	0	0	62.6875	0.8125	0	0	34.6477	0.00427259	0	0	13.7419	16.0063	103.5	2.68326	38.3687	0	1	0	10/23/2010	5:00
62.4375	0.06875	0	0	62.6875	0.8125	0	0	34.6477	0.00427259	0	0	13.7419	15.7219	103.688	1.99326	38.3687	0	1	0	10/23/2010	6:00
62.3125	0.06875	0	0	62.5625	0.8125	0	0	34.4554	0.00427259	0	0	13.7419	15.8031	103.688	2.02326	38.3687	0	1	0	10/23/2010	7:00
62.3125	0.06875	0	0	62.5625	0.8125	0	0	34.4554	0.00427259	0	0	13.7419	15.1531	103.688	1.31826	38.3906	0	1	0	10/23/2010	8:00
62.1875	0.06875	0	0	62.5625	0.8125	0	0	34.3547	0.00427259	0	0	13.7419	15.9656	104.438	2.29828	38.3906	0	1	0	10/23/2010	9:00
62.1875	0.06875	0	0	62.4375	0.70625	0	0	34.3547	0.00427259	0	0	13.7419	16.4125	103.875	2.09328	38.3906	0	1	0	10/23/2010	10:00
62.1875	0.06875	0	0	62.4375	0.70625	0	0	34.254	0.00427259	0	0	13.7419	16.3719	102.75	2.57828	38.3906	0	1	0	10/23/2010	11:00
62.1875	0.06875	0	0	62.4375	0.70625	0	0	34.254	0.00427259	0	0	13.7419	16.4937	102.75	2.66828	38.4125	0	1	0	10/23/2010	12:00
62.1875	0.06875	0	0	62.4375	0.70625	0	0	34.254	0.00427259	0	0	13.7419	16.5344	102.75	2.81328	38.4125	0	1	0	10/23/2010	13:00
62.1875	0.06875	0	0	62.25	0.70625	0	0	34.0709	0.00427259	0	0	13.7419	17.3875	104.063	3.60328	38.4344	0	1	0	10/23/2010	14:00
62.1875	0.06875	0	0	62.25	0.70625	0	0	34.0709	0.00427259	0	0	13.7419	17.3469	104.063	3.75328	38.4562	0	1	0	10/23/2010	15:00
62.1875	0.06875	0	0	62.25	0.70625	0	0	34.0709	0.00427259	0	0	13.7419	17.3875	104.063	3.61828	38.5	0	1	0	10/23/2010	16:00
62.1875	0.06875	0	0	62.25	0.70625	0	0	34.0709	0.00427259	0	0	13.7419	16.6156	104.438	2.87328	38.5438	0	1	0	10/23/2010	17:00
62.1875	0.06875	0	0	62.25	0.70625	0	0	34.0709	0.0845363	0	0	13.7419	16.3313	104.438	2.75679	38.5656	0	1	0	10/23/2010	18:00
62.1875	0.06875	0	0	62.25	0.70625	0	0	34.0709	0.0845363	0	0	13.7419	16.2906	104.438	2.68179	38.5875	0	1	0	10/23/2010	19:00
62.1875	0.06875	0	0	62.25	0.70625	0	0	34.0709	0.0845363	0	0	13.7419	16.2906	104.438	2.59179	38.5875	0	1	0	10/23/2010	20:00
62.1875	0.06875	0	0	62.25	0.70625	0	0	34.0709	0.0845363	0	0	13.7419	16.1281	104.438	2.59179	38.5875	0	1	0	10/23/2010	21:00
62.1875	0.06875	0	0	62.25	0.70625	0	0	34.0709	0.0845363	0	0	13.7419	16.2094	104.438	2.74179	38.5875	0	1	0	10/23/2010	22:00
62.1875	0.06875	0	0	62.25	0.70625	0	0	34.0709	0.0845363	0	0	13.7419	16.25	104.438	2.59179	38.5875	0	1	0	10/23/2010	23:00
62.1875	0.06875	0	0	62.25	0.70625	0	0	34.0709	0.0845363	0	0	13.7419	18.2406	103.875	4.49679	38.5875	0	1	0	10/24/2010	0:00
62.3125	0.06875	0	0	62.4375	0.70625	0	0	34.1899	0.0845363	0	0	13.7419	18.4844	103.875	4.74679	38.5875	0	1	0	10/24/2010	1:00
62.3125	0.06875	0	0	62.4375	0.70625	0	0	34.1899	0.0845363	0	0	13.7419	18.4031	103.875	4.82179	38.5875	0	1	0	10/24/2010	2:00
62.3125	0.06875	0	0	62.4375	0.70625	0	0	34.1899	0.0845363	0	0	13.7419	18.5656	103.875	4.77679	38.5875	0	1	0	10/24/2010	3:00
62.3125	0.06875	0	0	62.4375	0.70625	0	0	34.1899	0.0845363	0	0	13.7419	17.225	103.125	3.39679	38.6094	0	1	0	10/24/2010	4:00
62.3125	0.06875	0	0	62.4375	0.70625	0	0	34.1899	0.0845363	0	0	13.7419	17.3875	103.125	3.64679	38.5875	0	1	0	10/24/2010	5:00
62.4375	0.06875	0	0	62.4375	0.70625	0	0	34.1899	0.0848415	0	0	13.7419	14.5844	102.938	0.00179487	38.5875	0	1	0	10/24/2010	6:00
62.4375	0.06875	0	0	62.4375	0.70625	0	0	34.1899	0.0848415	0	0	13.7419	14.4625	102.938	0.00179487	38.6094	0	1	0	10/24/2010	7:00
62.4375	0.06875	0	0	62.4375	0.70625	0	0	34.1899	0.0848415	0	0	13.7419	14.3	102.938	0.00179487	38.6531	0	1	0	10/24/2010	8:00
62.5625	0.06875	0	0	62.5625	0.70625	0	0	34.1899	0.0997955	0	0	13.7419	14.3813	102.938	0.00179487	38.7406	0	1	0	10/24/2010	9:00

Caisson 3 Level	Pond 1 Level	Pump5 Flow	Pump6 Flow	Caisson 4 Level	Pond 2 Level	Pump7 Flow	Pump8 Flow	Caisson 5 Level	Pond 3 Level	Pond 4 Level	Pump9 Flow	Pump10 Flow	Mirabel Flow	Mirabel Line Pressure	54inch Intertie Flow	River Level	Pump 1 Status Run	Pump 2 Status Run	Pump 3 Status Run	Date	Interval
62.5625	0.06875	0	0	62.5625	0.80625	0	0	34.1899	0.187384	0	0	13.7419	14.4219	102.938	0.00179487	38.8719	0	1	0	10/24/2010	10:00
62.75	0.06875	0	0	62.5625	0.80625	0	0	34.1899	0.187384	0	0	13.7419	14.3813	102.938	0.00179487	39.0469	0	0	0	10/24/2010	11:00
62.875	0.06875	0	0	62.6875	0.80625	0	0	34.3242	0.187384	0	0	13.8444	14.4219	102.938	0.00179487	39.1781	0	0	0	10/24/2010	12:00
62.875	0.06875	0	0	62.875	0.80625	0	0	34.4371	0.0970489	0	0	13.8444	14.4625	102.938	0.00179487	39.2219	0	0	0	10/24/2010	13:00
63.0625	0.06875	0	0	62.875	0.80625	0	0	34.5408	0.00152593	0	0	13.8444	14.3813	102.938	0.00179487	39.2437	0	0	0	10/24/2010	14:00
63.0625	0.06875	0	0	63	0.70625	0	0	34.666	0.00152593	0	0	13.8444	14.4625	102.938	0.00179487	39.1563	0	0	0	10/24/2010	15:00
63.25	0.06875	0	0	63	0.70625	0	0	34.666	0.00152593	0	0	13.8444	14.3813	102.938	0.00179487	39.0906	0	0	0	10/24/2010	16:00
63.25	0.06875	0	0	63	0.5125	0	0	34.7667	0.00152593	0	0	13.8444	14.4219	102.938	0.00179487	39.025	0	0	0	10/24/2010	17:00
63.375	0.06875	0	0	63	0.5125	0	0	34.7667	0.00152593	0	0	13.8444	14.4219	102.938	0.00179487	39.0469	0	0	0	10/24/2010	18:00
63.375	0.06875	0	0	63	0.4125	0	0	34.7667	0.00152593	0	0	13.8444	14.4625	102.938	0.00179487	39.2437	0	0	0	10/24/2010	19:00
63.375	0.06875	0	0	63	0.4125	0	0	35.3374	0.00152593	0	0	13.2969	24.6187	111.938	11.5918	39.5281	0	0	0	10/24/2010	20:00
63.5	0.06875	0	0	63	0.3125	0	0	35.3374	0.00152593	0	0	13.2969	25.1063	111.938	11.8675	39.6812	0	0	0	10/24/2010	21:00
63.5	0.06875	0	0	63	0.3125	0	0	35.3374	0.00152593	0	0	13.2969	25.1469	111.938	12.1475	39.725	0	0	0	10/24/2010	22:00
63.5	0.06875	0	0	62.9375	0.1125	0	0	35.3374	0.00152593	0	0	13.2969	25.2281	111.938	12.0725	39.725	0	0	0	10/24/2010	23:00
63.5	0.06875	0	0	62.9375	0.0125	0	0	35.3374	0.00152593	0	0	13.2969	26.2844	114.375	12.7625	39.725	0	0	0	10/25/2010	0:00
63.625	0.06875	0	0	62.9375	0.0125	0	0	35.3374	0.00152593	0	0	13.2969	26.7313	114.375	13.6425	39.6812	0	0	0	10/25/2010	1:00
63.625	0.06875	0	0	62.9375	0.0125	0	0	35.3374	0.00152593	0	0	13.2969	26.6906	114.375	13.5975	39.6156	0	0	0	10/25/2010	2:00
63.625	0.06875	0	0	62.9375	0.0125	0	0	35.3374	0.00152593	0	0	13.1712	26.1625	113.25	12.9975	39.55	0	0	0	10/25/2010	3:00
63.625	0.06875	0	0	62.9375	0.0125	0	0	35.3374	0.00152593	0	0	13.3537	24.9031	112.125	11.9975	39.5281	0	0	0	10/25/2010	4:00
63.5	0.06875	0	0	62.6875	0.0125	0	0	35.1817	0.00152593	0	0	13.3537	24.7813	113.25	11.7788	39.5281	0	0	0	10/25/2010	5:00
63.5	0.06875	0	0	62.6875	0.0125	0	0	34.959	0.00152593	0	0	13.3537	25.1469	110.625	11.9988	39.55	0	0	0	10/25/2010	6:00
63.5	0.06875	0	0	62.5625	0.0125	0	0	34.959	0.00152593	0	0	13.3366	25.35	110.625	12.2788	39.5719	0	0	0	10/25/2010	7:00
63.5	0.06875	0	0	62.5625	0.0125	0	0	34.7453	0.00152593	0	0	13.4751	26.4875	110.813	13.4188	39.5719	0	0	0	10/25/2010	8:00
63.5	0.06875	0	0	62.5625	0.0125	0	0	34.7453	0.00152593	0	0	13.4751	26.6094	110.813	13.4638	39.5938	0	0	0	10/25/2010	9:00
63.5	0.06875	0	0	62.4375	0.0125	0	0	34.7453	0.00152593	0	0	13.4751	26.8938	111.188	13.8038	39.5938	0	0	0	10/25/2010	10:00
63.5	0.06875	0	0	62.4375	0.0125	0	0	34.5897	0.00152593	0	0	13.4751	26.3656	110.813	13.2138	39.6375	0	0	0	10/25/2010	11:00
63.4375	0.06875	0	0	62.25	0.0125	0	0	34.5897	0.00152593	0	0	13.3726	26.8938	110.438	13.5388	39.725	0	0	0	10/25/2010	12:00
63.4375	0.06875	0	0	62.25	0.0125	0	0	34.5897	0.00152593	0	0	13.3726	26.2844	111.563	13.0688	39.8344	0	0	0	10/25/2010	13:00
63.4375	0.06875	0	0	62.25	0.0125	0	0	34.4829	0.00152593	0	0	13.2676	26.6094	111.563	13.4188	39.9875	0	0	0	10/25/2010	14:00
63.4375	0.06875	0	0	62.25	0.0125	0	0	33.8542	0.00152593	0	0	13.9091	14.4625	100.875	-0.00117216	40.1187	0	0	0	10/25/2010	15:00
63.4375	0.06875	0	0	62.25	0.1125	0	0	33.8542	0.00152593	0	0	13.9091	14.4219	100.875	-0.00117216	40.25	0	0	0	10/25/2010	16:00
63.4375	0.06875	0	0	62.25	0.1125	0	0	33.7504	0.00152593	0	0	13.9091	14.5437	100.875	-0.00117216	40.2938	0	0	0	10/25/2010	17:00
63.5625	0.06875	0	0	62.25	0.1125	0	0	33.7504	0.00152593	0	0	13.9091	14.4625	99.75	-0.00117216	40.3156	0	0	0	10/25/2010	18:00
63.5625	0.06875	0	0	62.25	0.1125	0	0	33.6467	0.00152593	0	0	13.9091	14.5844	99.75	-0.00117216	40.2719	0	0	0	10/25/2010	19:00
63.5625	0.06875	0	0	62.25	0.1125	0	0	33.7748	0.00152593	0	0	13.8206	14.3	102.75	-0.00117216	40.25	0	0	0	10/25/2010	20:00
63.5625	0.06875	0	0	62.25	0.1125	0	0	33.6375	0.00152593	0	0	13.8206	14.4625	102.75	-0.00117216	40.1625	0	0	0	10/25/2010	21:00
63.5625	0.06875	0	0	62.25	0.1125	0	0	33.6375	0.00152593	0	0	13.8206	14.4625	102.75	-0.00117216	40.0969	0	0	0	10/25/2010	22:00
63.4375	0.06875	0	0	62.125	0.1125	0	0	33.6375	0.00152593	0	0	13.8206	14.5437	102.75	-0.00117216	40.0094	0	0	0	10/25/2010	23:00
63.4375	0.06875	0	0	62.125	0.1125	0	0	33.6375	0.00152593	0	0	13.8206	14.4219	102.75	-0.00117216	39.9219	0	0	0	10/26/2010	0:00
63.4375	0.06875	0	0	62.125	0.1125	0	0	33.6375	0.00152593	0	0	13.8206	14.3406	102.75	-0.00117216	39.8344	0	0	0	10/26/2010	1:00
63	0.06875	0	0	50.8125	0.1125	0	14.475	34.2509	0.00152593	0	0	13.1425	28.1938	116.438	-0.00117216	39.7687	0	0	0	10/26/2010	2:00
62.8125	0.06875	0	0	50.125	0.1125	0	14.475	34.2509	0.00152593	0	0	13.1425	28.1125	116.438	-0.00117216	39.6812	0	0	0	10/26/2010	3:00
62.625	0.06875	0	0	49.375	0.1125	0	14.675	34.0037	0.00152593	0	0	13.4098	28.6406	111	-0.00117216	39.6156	0	0	0	10/26/2010	4:00
61.9375	0.06875	0	0	48.9375	0.1125	0	14.675	33.8908	0.00152593	0	0	13.4098	28.6406	118.875	-0.00117216	39.55	0	0	0	10/26/2010	5:00
52.6875	0.06875	0	13.6594	48.75	0.1125	0	14.1875	34.2418	0.00152593	0	0	12.8446	40.95	119.438	-0.00117216	39.4844	0	0	0	10/26/2010	6:00
51.25	0.06875	0	14.2688	47.5625	0.1125	0	14.8375	46.26	0.00152593	0	0	0	29.1688	107.063	-0.00117216	39.4406	0	0	0	10/26/2010	7:00
50.75	0.06875	0	14.2688	47.125	0.1125	0	14.8375	47.5082	0.00152593	0	0	0	29.0875	107.063	-0.00117216	39.3969	0	0	0	10/26/2010	8:00
50.1875	0.06875	0	14.2688	46.625	0.1125	0	14.8375	48.2864	0.00152593	0	0	0	29.0063	107.063	-0.00117216	39.3531	0	0	0	10/26/2010	9:00
49.6875	0.06875	0	14.2688	46.25	0.1125	0	14.8375	48.8083	0.00152593	0	0	0	29.0469	107.063	-0.00117216	39.2875	0	0	0	10/26/2010	10:00
49.375	0.06875	0	14.2688	46.0625	0.1125	0	14.8375	49.1165	0.00152593	0	0	0	28.9656	107.063	-0.00117216	39.2656	0	0	0	10/26/2010	11:00
48.8125	0.06875	0	14.2688	45.625	0.1125	0	14.8375	49.3149	0.00152593	0	0	0	28.925	107.063	-0.00117216	39.2219	0	0	0	10/26/2010	12:00
48.5625	0.06875	0	14.2688	45.25	0.1125	0	14.7375	49.5834	0.00152593	0	0	0	29.0469	107.063	-0.00117216	39.2	0	0	0	10/26/2010	13:00
48.1875	0.06875	0	14.1656	45	0.1125	0	14.7375	49.7116	0.00152593	0	0	0	28.8844	107.063	-0.00117216	39.1344	0	0	0	10/26/2010	14:00
47.8125	0.06875	0	14.1656	44.6875	0.1125	0	14.7375	49.8886	0.00152593	0	0	0	28.925	107.063	-0.00117216	39.1344	0	0	0	10/26/2010	15:00
47.5625	0.06875	0	14.1656	44.5625	0.1125	0	14.7375	49.9893	0.00152593	0	0	0	28.8844	107.063	-0.00117216	39.0906	0	0	0	10/26/2010	16:00
47.1875	0.06875	0	14.2688	44.25	0.1125	0	14.7375	49.9893	0.00152593	0	0	0	26.975	105.938	1.77441	39.0687	0	0	0	10/26/2010	17:00
47.0625	0.06875	0	14.1844	44.25	0.1125	0	14.6	49.9893	0.00152593	0	0	0	29.0063	108.188	-0.000586081	39.0469	0	0	0	10/26/2010	18:00
46.6875	0.06875	0	14.1844	43.875	0.1125	0	14.725	50.09	0.00152593	0	0	0	28.8031	108.188	-0.000586081	39.025	0	0	0	10/26/2010	19:00

Caisson 3 Level	Pond 1 Level	Pump5 Flow	Pump6 Flow	Caisson 4 Level	Pond 2 Level	Pump7 Flow	Pump8 Flow	Caisson 5 Level	Pond 3 Level	Pond 4 Level	Pump9 Flow	Pump10 Flow	Mirabel Flow	Mirabel Line Pressure	54inch Intertie Flow	River Level	Pump 1 Status Run	Pump 2 Status Run	Pump 3 Status Run	Date	Interval
46.5	0.06875	0	14.1844	43.5625	0.1125	0	14.725	50.1999	0.00152593	0	0	0	28.6812	108.188	-0.000586081	39.0031	0	0	0	10/26/2010	20:00
46.125	0.06875	0	14.1844	43.4375	0.1125	0	14.725	50.1785	0.00152593	0	0	0	28.8844	108.188	-0.000586081	38.9813	0	0	0	10/26/2010	21:00
46	0.06875	0	14.0719	43.4375	0.1125	0	14.625	50.1785	0.00152593	0	0	0	28.4781	110.813	-0.000586081	38.9594	0	0	0	10/26/2010	22:00
46.0625	0.06875	0	13.0781	43.0625	0.1125	0	14.875	50.0656	0.00152593	0	0	0	25.1469	104.063	-0.000586081	38.9375	0	0	0	10/26/2010	23:00
55.625	0.06875	0	0	43.0625	0.1125	0	15.0375	50.0656	0.00152593	0	0	0	15.0719	103.313	-0.000586081	38.9156	0	0	0	10/27/2010	0:00
56.125	0.06875	0	0	43.0625	0.1125	0	15.0375	50.0656	0.00152593	0	0	0	15.0719	103.313	-0.000586081	38.9156	0	0	0	10/27/2010	1:00
56.375	0.06875	0	0	43.0625	0.1125	0	15.0375	50.0656	0.00152593	0	0	0	15.1125	103.313	-0.000586081	38.8937	0	0	0	10/27/2010	2:00
56.5625	0.06875	0	0	43.0625	0.1125	0	15.0375	50.0656	0.00152593	0	0	0	15.1938	103.313	-0.000586081	38.8937	0	0	0	10/27/2010	3:00
56.75	0.06875	0	0	43.0625	0.1125	0	15.0375	49.9649	0.00152593	0	0	0	15.1125	102	-0.000586081	38.8719	0	0	0	10/27/2010	4:00
56.8125	0.06875	0	0	43.0625	0.1125	0	15.0375	49.9649	0.00152593	0	0	0	15.1938	101.063	-0.000586081	38.85	0	0	0	10/27/2010	5:00
56.9375	0.06875	0	0	43.0625	0.1125	0	15.0375	49.9649	0.00152593	0	0	0	15.1125	102.375	-0.000586081	38.85	0	0	0	10/27/2010	6:00
57.0625	0.06875	0	0	42.875	0.1125	0	15.0375	49.9649	0.00152593	0	0	0	15.1938	101.25	-0.000586081	38.8281	0	0	0	10/27/2010	7:00
57.0625	0.06875	0	0	42.875	0.1125	0	15.1375	49.9649	0.00152593	0	0	0	15.275	101.25	-0.000586081	38.8062	0	0	0	10/27/2010	8:00
57.0625	0.06875	0	0	42.875	0.1125	0	15.0375	49.8306	0.00152593	0	0	0	15.1531	101.25	-0.000586081	38.7844	0	0	0	10/27/2010	9:00
57.0625	0.06875	0	0	42.875	0.1125	0	15.0375	49.8306	0.00152593	0	0	0	15.0719	101.25	-0.000586081	38.7188	0	0	0	10/27/2010	10:00
57.1875	0.06875	0	0	42.875	0.1125	0	15.0375	49.8306	0.00152593	0	0	0	15.3563	101.25	-0.000586081	38.4562	0	0	0	10/27/2010	11:00
57.1875	0.06875	0	0	42.875	0.1125	0	15.0375	49.8306	0.00152593	0	0	0	15.1938	102.375	-0.000586081	38.15	0	0	0	10/27/2010	12:00
57.1875	0.06875	0	0	42.875	0.1125	0	15.0375	49.8306	0.00152593	0	0	0	15.275	102.375	-0.000586081	37.8219	0	0	0	10/27/2010	13:00
57.1875	0.06875	0	0	42.875	0.1125	0	15.0375	49.8306	0.0848415	0	0	0	15.1938	102.375	-0.000586081	37.5375	0	0	0	10/27/2010	14:00
57.1875	0.06875	0	0	42.875	0.1125	0	15.0375	49.8306	0.0848415	0	0	0	15.1938	102.375	-0.000586081	37.2094	0	0	0	10/27/2010	15:00
57.1875	0.06875	0	0	42.875	0.1125	0	14.9125	49.8306	0.185858	0	0	0	15.275	102.375	-0.000586081	36.925	0	0	0	10/27/2010	16:00
57.1875	0.06875	0	0	42.875	0.1125	0	14.9125	49.6994	0.185858	0	0	0	15.0719	102.375	-0.000586081	36.6844	0	0	0	10/27/2010	17:00
57.1875	0.06875	0	0	42.875	0.1125	0	15.0125	49.6994	0.285348	0	0	0	15.275	102.375	-0.000586081	36.4656	0	0	0	10/27/2010	18:00
57.1875	0.06875	0	0	43.0625	0.1125	0	14.9125	49.6994	0.285348	0	0	0	15.1938	103.5	-0.000586081	36.3125	0	0	0	10/27/2010	19:00
57.1875	0.06875	0	0	43.0625	0.1125	0	14.9125	49.8001	0.385754	0	0	0	15.1938	103.5	-0.000586081	36.1812	0	0	0	10/27/2010	20:00
57.1875	0.06875	0	0	42.875	0.1125	0	15.1125	49.8001	0.385754	0	0	0	15.3156	99.375	-0.000586081	36.0281	0	0	0	10/27/2010	21:00
57.0625	0.06875	0	0	42.875	0.1125	0	15.1125	49.8001	0.48677	0	0	0	15.275	99.375	-0.000586081	35.8969	0	0	0	10/27/2010	22:00
57.0625	0.06875	0	0	42.875	0.1125	0	15.1125	49.8032	0.48677	0	0	0	15.3563	99.375	-0.000586081	35.7437	0	0	0	10/27/2010	23:00
57.0625	0.06875	0	0	42.875	0.1125	0	15.1125	49.8032	0.48677	0	0	0	15.4375	99.375	-0.000586081	35.6125	0	0	0	10/28/2010	0:00
57.0625	0.06875	0	0	42.875	0.1125	0	15.1125	49.8032	0.590228	0	0	0	15.4375	99.375	-0.000586081	35.4813	0	0	0	10/28/2010	1:00
57.0625	0.06875	0	0	42.875	0.1125	0	15.1125	49.9863	0.590228	0	0	0	15.3563	99.375	-0.000586081	35.3719	0	0	0	10/28/2010	2:00
57.0625	0.06875	0	0	43.0625	0.1125	0	15.1125	49.9863	0.590228	0	0	0	15.3563	99.375	-0.000586081	35.2406	0	0	0	10/28/2010	3:00
56.9375	0.06875	0	0	42.875	0.1125	0	15.1125	49.9863	0.590228	0	0	0	15.5188	98.25	-0.000586081	35.1094	0	0	0	10/28/2010	4:00
56.9375	0.06875	0	0	43.0625	0.1125	0	15.2125	50.1175	0.690939	0	0	0	15.3156	98.25	-0.000586081	34.9781	0	0	0	10/28/2010	5:00
56.9375	0.06875	0	0	43.0625	0.1125	0	15.2125	50.1175	0.690939	0	0	0	15.4375	97.125	-0.000586081	34.7375	0	0	0	10/28/2010	6:00
56.9375	0.06875	0	0	43.0625	0.1125	0	15.2125	50.1175	0.690939	0	0	0	15.4375	96	-0.000586081	34.4531	0	0	0	10/28/2010	7:00
56.9375	0.06875	0	0	42.875	0.1125	0	15.325	50.1175	0.601215	0	0	0	15.5188	95.8125	-0.000586081	34.1688	0	0	0	10/28/2010	8:00
56.9375	0.06875	0	0	43.125	0.1125	0	15.1625	50.2853	0.500504	0	0	0	15.3156	98.8125	-0.000586081	33.775	0	0	0	10/28/2010	9:00
56.9375	0.06875	0	0	43.125	0.1125	0	15.1625	50.2853	0.500504	0	0	0	15.3969	98.8125	-0.000586081	33.3813	0	0	0	10/28/2010	10:00
56.9375	0.06875	0	0	43.125	0.1125	0	15.1625	50.2853	0.400708	0	0	0	15.3156	98.8125	-0.000586081	32.9875	0	0	0	10/28/2010	11:00
56.9375	0.06875	0	0	43.125	0.1125	0	15.1625	50.2853	0.299692	0	0	0	15.4781	98.8125	-0.000586081	32.8781	0	0	0	10/28/2010	12:00
56.8125	0.06875	0	0	43.125	0.1125	0	15.1625	50.3922	0.299692	0	0	0	15.275	98.8125	-0.000586081	32.55	0	0	0	10/28/2010	13:00
56.8125	0.06875	0	0	43.125	0.1125	0	15.1625	50.3922	0.289621	0	0	0	15.4375	97.6875	-0.000586081	32.2219	0	0	0	10/28/2010	14:00
56.8125	0.06875	0	0	43.125	0.1125	0	15.1625	50.4013	0.19776	0	0	0	15.275	97.6875	-0.000586081	31.9156	0	0	0	10/28/2010	15:00
56.8125	0.06875	0	0	43.125	0.1125	0	15.1625	50.4013	0.0991852	0	0	0	15.3969	97.6875	-0.000586081	31.5875	0	0	0	10/28/2010	16:00
56.8125	0.06875	0	0	43.125	0.1125	0	15.1625	50.2945	0.0723289	0	0	0	15.3563	98.4375	-0.000586081	31.1062	0	0	0	10/28/2010	17:00
56.8125	0.06875	0	0	43.125	0.1125	0	15.1625	50.2945	0.00061037	0	0	0	15.3563	98.4375	-0.000586081	30.4063	0	0	0	10/28/2010	18:00
56.8125	0.06875	0	0	43	0.1125	0	15.1625	50.2945	0.00061037	0	0	0	15.3563	98.4375	-0.000586081	30.3406	0	0	0	10/28/2010	19:00
56.8125	0.06875	0	0	43	0.1125	0	15.1625	50.2945	0.00061037	0	0	0	15.3156	98.4375	-0.000586081	30.2969	0	0	0	10/28/2010	20:00
56.6875	0.06875	0	0	43.125	0.1125	0	15.1625	50.1938	0.00061037	0	0	0	15.3563	98.4375	-0.000586081	30.3188	0	0	0	10/28/2010	21:00
56.6875	0.06875	0	0	42.875	0.1125	0	15.1625	50.1938	0.00061037	0	0	0	15.3563	98.4375	-0.000586081	30.2969	0	0	0	10/28/2010	22:00
56.6875	0.06875	0	0	42.875	0.1125	0	15.1625	50.0778	0.00061037	0	0	0	15.3563	98.4375	-0.000586081	30.2969	0	0	0	10/28/2010	23:00
56.6875	0.06875	0	0	42.875	0.1125	0	15.1625	50.0778	0.00061037	0	0	0	15.3563	98.4375	-0.000586081	30.2969	0	0	0	10/29/2010	0:00
56.6875	0.06875	0	0	42.75	0.1125	0	15.1625	49.971	0.00061037	0	0	0	15.3969	98.4375	-0.000586081	30.2969	0	0	0	10/29/2010	1:00
56.6875	0.06875	0	0	42.75	0.1125	0	15.1625	49.971	0.00061037	0	0	0	15.1938	98.4375	-0.000586081	30.2969	0	0	0	10/29/2010	2:00
56.6875	0.06875	0	0	42.625	0.1125	0	15.1625	49.8367	0.00061037	0	0	0	15.2344	99.5625	-0.000586081	30.3188	0	0	0	10/29/2010	3:00
56.6875	0.06875	0	0	42.625	0.1125	0	15.1625	49.8367	0.00061037	0	0	0	15.1938	99.5625	-0.000586081	30.3188	0	0	0	10/29/2010	4:00
56.5625	0.06875	0	0	42.625	0.1125	0	15.1625	49.7116	0.00061037	0	0	0	15.1938	99.5625	-0.000586081	30.3188	0	0	0	10/29/2010	5:00

Caisson 3 Level	Pond 1 Level	Pump5 Flow	Pump6 Flow	Caisson 4 Level	Pond 2 Level	Pump7 Flow	Pump8 Flow	Caisson 5 Level	Pond 3 Level	Pond 4 Level	Pump9 Flow	Pump10 Flow	Mirabel Flow	Mirabel Line Pressure	54inch Intertie Flow	River Level	Pump 1 Status Run	Pump 2 Status Run	Pump 3 Status Run	Date	Interval
56.5625	0.06875	0	0	42.5	0.1125	0	15.1625	49.7116	0.00061037	0	0	0	15.275	99.5625	-0.000586081	30.3625	0	0	0	10/29/2010	6:00
56.5625	0.06875	0	0	42.5	0.1125	0	15.1625	49.5926	0.0845363	0	0	0	15.4781	99.5625	-0.000586081	30.3625	0	0	0	10/29/2010	7:00
56.5625	0.06875	0	0	42.375	0.1125	0	15.1625	49.5926	0.0845363	0	0	0	15.3563	99.5625	-0.000586081	30.4281	0	0	0	10/29/2010	8:00
56.5625	0.06875	0	0	42.375	0.1125	0	15.1625	49.4797	0.188299	0	0	0	15.3563	99.5625	-0.000586081	30.4937	0	0	0	10/29/2010	9:00
56.4375	0.06875	0	0	42.375	0.1125	0	15.1625	49.4797	0.188299	0	0	0	15.2344	99.5625	-0.000586081	30.5812	0	0	0	10/29/2010	10:00
56.4375	0.06875	0	0	42.375	0.1125	0	15.1625	49.4797	0.0970489	0	0	0	15.2344	99.5625	-0.000586081	30.7125	0	0	0	10/29/2010	11:00
56.4375	0.06875	0	0	42.1875	0.1125	0	15.1625	49.5987	0.0985748	0	0	0	15.275	99.5625	-0.000586081	30.8875	0	0	0	10/29/2010	12:00
56.4375	0.06875	0	0	42.375	0.1125	0	15.1625	49.5987	0.0851466	0	0	0	15.3563	99.5625	-0.000586081	31.1281	0	0	0	10/29/2010	13:00
56.5625	0.06875	0	0	42.375	0.1125	0	15.1625	49.5987	0.00152593	0	0	0	15.3156	99.5625	-0.000586081	31.3469	0	0	0	10/29/2010	14:00
56.5625	0.06875	0	0	42.375	0.1125	0	15.1625	49.7116	0.00152593	0	0	0	15.4375	99.5625	-0.000586081	31.5	0	0	0	10/29/2010	15:00
56.5625	0.06875	0	0	42.375	0.1125	0	15.1625	49.7116	0.00152593	0	0	0	15.1938	99.5625	-0.000586081	31.6313	0	0	0	10/29/2010	16:00
56.5625	0.06875	0	0	42.5	0.1125	0	15.1625	49.7116	0.00152593	0	0	0	15.3563	98.4375	-0.000586081	31.7188	0	0	0	10/29/2010	17:00
56.5625	0.06875	0	0	42.5	0.1125	0	15.1625	49.7116	0.00152593	0	0	0	15.3563	98.4375	-0.000586081	31.7625	0	0	0	10/29/2010	18:00
56.6875	0.06875	0	0	42.5	0.1125	0	15.1625	49.8825	0.00152593	0	0	0	15.3563	98.4375	-0.000586081	31.8281	0	0	0	10/29/2010	19:00
56.6875	0.06875	0	0	42.5	0.1125	0	15.1625	49.8825	0.00152593	0	0	0	15.275	98.4375	-0.000586081	31.8719	0	0	0	10/29/2010	20:00
56.6875	0.06875	0	0	42.5	0.1125	0	15.1625	49.8825	0.00152593	0	0	0	15.3156	97.875	-0.000586081	31.9812	0	0	0	10/29/2010	21:00
56.6875	0.06875	0	0	42.5	0.1125	0	15.1625	49.8825	0.00152593	0	0	0	15.3156	97.875	-0.000586081	32.0688	0	0	0	10/29/2010	22:00
56.875	0.06875	0	0	42.5	0.1125	0	15.1625	49.8825	0.00152593	0	0	0	15.4781	97.875	-0.000586081	32.2	0	0	0	10/29/2010	23:00
56.875	0.06875	0	0	42.5	0.1125	0	15.1625	49.8825	0.00152593	0	0	0	15.3156	97.875	-0.000586081	32.3094	0	0	0	10/30/2010	0:00
56.875	0.06875	0	0	42.5	0.1125	0	15.1625	49.8825	0.00152593	0	0	0	15.3563	97.875	-0.000586081	32.4406	0	0	0	10/30/2010	1:00
56.875	0.06875	0	0	42.5	0.1125	0	15.1625	49.8825	0.00152593	0	0	0	15.275	97.875	-0.000586081	32.5719	0	0	0	10/30/2010	2:00
56.875	0.06875	0	0	42.5	0.1125	0	15.1625	49.9832	0.00152593	0	0	0	15.275	97.875	-0.000586081	32.6812	0	0	0	10/30/2010	3:00
56.875	0.06875	0	0	42.6875	0.1125	0	15.1625	49.9832	0.00152593	0	0	0	15.2344	99.75	-0.000586081	32.7469	0	0	0	10/30/2010	4:00
56.875	0.06875	0	0	42.6875	0.1125	0	15.1625	49.9832	0.00152593	0	0	0	15.3156	99.75	-0.000586081	32.8125	0	0	0	10/30/2010	5:00
57	0.06875	0	0	42.6875	0.1125	0	15.1625	49.9832	0.00152593	0	0	0	15.2344	99.75	-0.000586081	32.8563	0	0	0	10/30/2010	6:00
57	0.06875	0	0	42.6875	0.1125	0	15.1625	49.9832	0.00152593	0	0	0	15.275	99.75	-0.000586081	32.9	0	0	0	10/30/2010	7:00
57	0.06875	0	0	42.6875	0.1125	0	15.1625	49.9832	0.00152593	0	0	0	15.275	99.75	-0.000586081	32.9	0	0	0	10/30/2010	8:00
57	0.06875	0	0	42.6875	0.1125	0	15.1625	49.9832	0.00152593	0	0	0	15.2344	99.75	-0.000586081	32.8781	0	0	0	10/30/2010	9:00
57	0.06875	0	0	42.6875	0.1125	0	15.0625	49.9832	0.00152593	0	0	0	15.3156	99.75	-0.000586081	32.8563	0	0	0	10/30/2010	10:00
57	0.06875	0	0	42.6875	0.1125	0	15.0625	49.9832	0.00152593	0	0	0	15.1938	99.75	-0.000586081	32.8125	0	0	0	10/30/2010	11:00
57.125	0.06875	0	0	42.6875	0.1125	0	15.0625	49.9832	0.00152593	0	0	0	15.275	99.75	-0.000586081	32.7469	0	0	0	10/30/2010	12:00
57.125	0.06875	0	0	42.6875	0.1125	0	15.0625	49.9832	0.00152593	0	0	0	15.3563	99.75	-0.000586081	32.6812	0	0	0	10/30/2010	13:00
57.125	0.06875	0	0	42.6875	0.1125	0	15.0625	49.9832	0.00152593	0	0	0	15.1938	99.75	-0.000586081	32.6156	0	0	0	10/30/2010	14:00
57.125	0.06875	0	0	42.8125	0.1125	0	15.0625	49.9832	0.00152593	0	0	0	15.2344	99.75	-0.000586081	32.55	0	0	0	10/30/2010	15:00
57.125	0.06875	0	0	42.625	0.1125	0	15.0625	49.9832	0.00152593	0	0	0	15.1938	99.75	-0.000586081	32.4844	0	0	0	10/30/2010	16:00
57.125	0.06875	0	0	42.75	0.1125	0	15.0625	49.9832	0.00152593	0	0	0	15.2344	99.75	-0.000586081	32.3969	0	0	0	10/30/2010	17:00
57.125	0.06875	0	0	42.625	0.1125	0	15.0625	49.9832	0.00152593	0	0	0	15.2344	99.75	-0.000586081	32.3094	0	0	0	10/30/2010	18:00
57.125	0.06875	0	0	42.625	0.1125	0	15.0625	49.9832	0.00152593	0	0	0	15.2344	99.75	-0.000586081	32.2219	0	0	0	10/30/2010	19:00
57.125	0.06875	0	0	42.625	0.1125	0	15.0625	49.9832	0.00152593	0	0	0	15.2344	99.75	-0.000586081	32.1563	0	0	0	10/30/2010	20:00
57	0.06875	0	0	42.625	0.1125	0	15.0625	49.9832	0.00152593	0	0	0	15.3563	99.75	-0.000586081	32.0688	0	0	0	10/30/2010	21:00
57	0.06875	0	0	42.5	0.1125	0	15.0625	49.9832	0.00152593	0	0	0	15.275	99.75	-0.000586081	32.0031	0	0	0	10/30/2010	22:00
57	0.06875	0	0	42.5	0.1125	0	15.0625	49.8215	0.00152593	0	0	0	15.2344	99.75	-0.000586081	31.9156	0	0	0	10/30/2010	23:00
57	0.06875	0	0	42.5	0.1125	0	15.175	49.8215	0.00152593	0	0	0	15.3156	99.75	-0.000586081	31.85	0	0	0	10/31/2010	0:00
57	0.06875	0	0	42.5	0.1125	0	15.175	49.8215	0.00152593	0	0	0	15.3156	99.75	-0.000586081	31.7844	0	0	0	10/31/2010	1:00
57	0.06875	0	0	42.5	0.1125	0	15.175	49.7208	0.00152593	0	0	0	15.2344	99.75	-0.000586081	31.7188	0	0	0	10/31/2010	2:00
57	0.06875	0	0	42.375	0.1125	0	15.175	49.7208	0.00152593	0	0	0	15.275	99.75	-0.000586081	31.6531	0	0	0	10/31/2010	3:00
57	0.06875	0	0	42.375	0.1125	0	15.175	49.7208	0.00152593	0	0	0	15.3563	99.75	-0.000586081	31.5875	0	0	0	10/31/2010	4:00
56.8125	0.06875	0	0	42.375	0.1125	0	15.175	49.7208	0.00152593	0	0	0	15.2344	99.75	-0.000586081	31.5437	0	0	0	10/31/2010	5:00
56.8125	0.06875	0	0	42.375	0.1125	0	15.175	49.62	0.00152593	0	0	0	15.3969	98.625	-0.000586081	31.4781	0	0	0	10/31/2010	6:00
56.8125	0.06875	0	0	42.1875	0.1125	0	15.175	49.62	0.00152593	0	0	0	15.275	98.625	-0.000586081	31.4562	0	0	0	10/31/2010	7:00
56.8125	0.06875	0	0	42.1875	0.1125	0	15.175	49.62	0.00152593	0	0	0	15.3969	98.625	-0.000586081	31.4125	0	0	0	10/31/2010	8:00
56.8125	0.06875	0	0	42.1875	0.1125	0	15.175	49.5102	0.00152593	0	0	0	15.3563	98.625	-0.000586081	31.3469	0	0	0	10/31/2010	9:00
56.6875	0.06875	0	0	42.1875	0.1125	0	15.175	49.5102	0.00152593	0	0	0	15.2344	98.625	-0.000586081	31.325	0	0	0	10/31/2010	10:00
56.8125	0.06875	0	0	42.0625	0.1125	0	15.175	49.5102	0.00152593	0	0	0	15.4375	98.625	-0.000586081	31.2813	0	0	0	10/31/2010	11:00
56.6875	0.06875	0	0	42.0625	0.1125	0	15.175	49.3851	0.00152593	0	0	0	15.275	97.3125	-0.000586081	31.2594	0	0	0	10/31/2010	12:00
56.6875	0.06875	0	0	41.9375	0.1125	0	15.175	49.3851	0.00152593	0	0	0	15.3969	97.3125	-0.000586081	31.2156	0	0	0	10/31/2010	13:00
56.6875	0.06875	0	0	41.9375	0.1125	0	15.175	49.3851	0.00152593	0	0	0	15.3156	97.3125	-0.000586081	31.1938	0	0	0	10/31/2010	14:00
56.5	0.06875	0	0	41.9375	0.1125	0	15.175	49.3851	0.00152593	0	0	0	15.3969	97.3125	-0.000586081	31.15	0	0	0	10/31/2010	15:00

Caisson 3 Level	Pond 1 Level	Pump5 Flow	Pump6 Flow	Caisson 4 Level	Pond 2 Level	Pump7 Flow	Pump8 Flow	Caisson 5 Level	Pond 3 Level	Pond 4 Level	Pump9 Flow	Pump10 Flow	Mirabel Flow	Mirabel Line Pressure	54inch Intertie Flow	River Level	Pump 1 Status Run	Pump 2 Status Run	Pump 3 Status Run	Date	Interval
56.5	0.06875	0	0	41.9375	0.1125	0	15.175	49.263	0.00152593	0	0	0	15.3969	97.3125	-0.000586081	31.1281	0	0	0	10/31/2010	16:00
56.5	0.06875	0	0	41.8125	0.1125	0	15.175	49.263	0.00152593	0	0	0	15.3969	97.3125	-0.000586081	31.0844	0	0	0	10/31/2010	17:00
56.5	0.06875	0	0	41.8125	0.1125	0	15.175	49.263	0.00152593	0	0	0	15.3969	97.3125	-0.000586081	31.0625	0	0	0	10/31/2010	18:00
56.5	0.06875	0	0	41.8125	0.1125	0	15.175	49.1562	0.00152593	0	0	0	15.3563	97.3125	-0.000586081	31.0406	0	0	0	10/31/2010	19:00
56.5	0.06875	0	0	41.8125	0.1125	0	15.175	49.1562	0.00152593	0	0	0	15.3563	97.3125	-0.000586081	31.0187	0	0	0	10/31/2010	20:00
56.5	0.06875	0	0	41.8125	0.1125	0	15.175	49.1562	0.00152593	0	0	0	15.3156	97.3125	-0.000586081	30.9969	0	0	0	10/31/2010	21:00
56.375	0.06875	0	0	41.8125	0.1125	0	15.175	49.1562	0.00152593	0	0	0	15.3156	98.625	-0.000586081	30.9531	0	0	0	10/31/2010	22:00
56.375	0.06875	0	0	41.8125	0.1125	0	15.175	49.1562	0.00152593	0	0	0	15.275	98.625	-0.000586081	30.9531	0	0	0	10/31/2010	23:00
56.375	0.06875	0	0	41.6875	0.1125	0	15.0625	49.0097	0.00152593	0	0	0	15.1531	99.75	-0.000586081	30.9094	0	0	0	11/1/2010	0:00
56.25	0.06875	0	0	41.625	0.1125	0	15.0625	49.0097	0.00152593	0	0	0	15.2344	99.75	-0.000586081	30.8875	0	0	0	11/1/2010	1:00
56.25	0.06875	0	0	41.625	0.1125	0	15.0625	49.0097	0.00152593	0	0	0	15.2344	99.75	-0.000586081	30.8656	0	0	0	11/1/2010	2:00
56.25	0.06875	0	0	41.625	0.1125	0	15.0625	49.0097	0.00152593	0	0	0	15.1938	100.875	-0.000586081	30.8438	0	0	0	11/1/2010	3:00
56.25	0.06875	0	0	41.625	0.1125	0	15.0625	48.8662	0.00152593	0	0	0	15.3156	100.875	-0.000586081	30.8219	0	0	0	11/1/2010	4:00
56.125	0.06875	0	0	41.625	0.1125	0	15.0625	48.8662	0.00152593	0	0	0	15.1531	100.875	-0.000586081	30.8	0	0	0	11/1/2010	5:00
56.125	0.06875	0	0	41.625	0.1125	0	15.0625	48.8662	0.00152593	0	0	0	15.1938	100.875	-0.000586081	30.8	0	0	0	11/1/2010	6:00
56.375	0.06875	0	0	53.5625	0.1125	0	0	48.8662	0.00152593	0	0	0	0.4875	95.4375	-0.000586081	30.7781	0	0	0	11/1/2010	7:00
56.625	0.06875	0	0	54.3125	0.1125	0	0	48.8662	0.00152593	0	0	0	5.97188	98.625	6.59258	30.7563	0	0	0	11/1/2010	8:00
56.75	0.06875	0	0	55	0.1125	0	0	48.8662	0.00152593	0	0	0	10.9281	98.8125	11.3709	30.7344	0	0	0	11/1/2010	9:00
56.875	0.06875	0	0	55.375	0.1125	0	0	48.8662	0.00152593	0	0	0	10.9688	97.6875	11.5147	30.7125	0	0	0	11/1/2010	10:00
57.0625	0.06875	0	0	55.6875	0.1125	0	0	49.0036	0.00152593	0	0	0	10.9688	97.6875	11.1047	28.5031	0	0	0	11/1/2010	11:00
57.1875	0.06875	0	0	55.9375	0.1125	0	0	49.0036	0.00152593	0	0	0	11.0906	97.6875	11.0747	30.6687	0	0	0	11/1/2010	12:00
57.4375	0.06875	0	0	56.1875	0.1125	0	0	49.0036	0.00152593	0	0	0	11.7406	97.875	11.9847	30.6687	0	0	0	11/1/2010	13:00
57.625	0.06875	0	0	56.5	0.1125	0	0	49.0036	0.00152593	0	0	0	11.5375	97.875	12.1447	30.6906	0	0	0	11/1/2010	14:00
57.75	0.06875	0	0	56.625	0.1125	0	0	49.0036	0.00152593	0	0	0	11.8625	97.875	12.0747	31.15	0	0	0	11/1/2010	15:00
57.75	0.06875	0	0	56.75	0.1125	0	0	49.0036	0.00152593	0	0	0	11.8625	97.875	12.1447	31.5875	0	0	0	11/1/2010	16:00
57.875	0.06875	0	0	57.0625	0.1125	0	0	49.1501	0.0021363	0	0	0	12.3094	97.875	13.1263	31.7406	0	0	0	11/1/2010	17:00
58.125	0.06875	0	0	57.1875	0.1125	0	0	49.1501	0.0021363	0	0	0	11.6594	99.375	12.1313	31.8719	0	0	0	11/1/2010	18:00
58.125	0.06875	0	0	57.3125	0.1125	0	0	49.1501	0.0021363	0	0	0	11.7406	99.375	12.3963	32.025	0	0	0	11/1/2010	19:00
58.25	0.06875	0	0	57.4375	0.1125	0	0	49.1501	0.0021363	0	0	0	11.5781	99.375	12.0713	32.1563	0	0	0	11/1/2010	20:00
58.25	0.06875	0	0	57.5625	0.1125	0	0	49.2538	0.0021363	0	0	0	11.7406	99.375	12.1163	32.3094	0	0	0	11/1/2010	21:00
58.375	0.06875	0	0	57.75	0.1125	0	0	49.2538	0.0021363	0	0	0	11.8219	99.375	12.1763	32.4406	0	0	0	11/1/2010	22:00
58.375	0.06875	0	0	57.75	0.1125	0	0	49.2538	0.0021363	0	0	0	11.9438	99.375	12.6313	32.5938	0	0	0	11/1/2010	23:00
58.5	0.06875	0	0	57.875	0.1125	0	0	49.4003	0.0021363	0	0	0	11.9438	99.375	11.9113	32.725	0	0	0	11/2/2010	0:00
58.625	0.06875	0	0	57.875	0.1125	0	0	49.4003	0.0021363	0	0	0	11.9031	99.375	12.2363	32.8781	0	0	0	11/2/2010	1:00
58.625	0.06875	0	0	57.875	0.1125	0	0	49.4003	0.0021363	0	0	0	11.9844	97.3125	12.6463	33.0094	0	0	0	11/2/2010	2:00
58.75	0.06875	0	0	58.125	0.1125	0	0	49.4003	0.0021363	0	0	0	11.0906	98.4375	11.5763	33.1406	0	0	0	11/2/2010	3:00
58.75	0.06875	0	0	58.125	0.1125	0	0	49.4003	0.0021363	0	0	0	11.4156	97.3125	12.2613	33.3156	0	0	0	11/2/2010	4:00
58.875	0.06875	0	0	58.25	0.1125	0	0	49.4003	0.0021363	0	0	0	11.5375	95.25	12.0313	33.6437	0	0	0	11/2/2010	5:00
58.875	0.06875	0	0	58.25	0.1125	0	0	49.4003	0.0021363	0	0	0	11.4156	96.375	12.0123	33.9719	0	0	0	11/2/2010	6:00
58.875	0.06875	0	0	58.25	0.1125	0	0	49.4003	0.0021363	0	0	0	11.6188	95.625	11.7223	34.3219	0	0	0	11/2/2010	7:00
58.875	0.06875	0	0	58.25	0.1125	0	0	49.4003	0.0021363	0	0	0	17.55	100.5	18.0523	34.4969	0	0	1	11/2/2010	8:00
58.875	0.06875	0	0	58.375	0.1125	0	0	49.4003	0.0021363	0	0	0	17.0219	99.75	17.478	34.8469	0	0	1	11/2/2010	9:00
59	0.06875	0	0	58.375	0.1125	0	0	49.4003	0.0021363	0	0	0	17.1031	99.75	17.583	35.2625	0	0	1	11/2/2010	10:00
59	0.06875	0	0	58.375	0.1125	0	0	49.501	0.0021363	0	0	0	16.9813	99.9375	17.743	35.6344	0	0	1	11/2/2010	11:00
59	0.06875	0	0	58.375	0.1125	0	0	49.501	0.0836207	0	0	0	17.0625	99.9375	17.218	36.0281	0	0	1	11/2/2010	12:00
59	0.06875	0	0	58.5625	0.1125	0	0	49.501	0.100711	0	0	0	17.4688	96.75	17.713	36.4875	0	0	1	11/2/2010	13:00
59	0.06875	0	0	58.5625	0.4	0	0	49.501	0.185247	0	0	0	17.3062	97.6875	17.918	36.9469	0	0	1	11/2/2010	14:00
59	0.06875	0	0	58.5625	0.50625	0	0	49.501	0.285348	0	0	0	17.3469	97.6875	17.658	37.4937	0	0	1	11/2/2010	15:00
59	0.06875	0	0	58.5625	0.70625	0	0	49.501	0.38667	0	0	0	17.1438	96	18.023	37.9969	0	0	1	11/2/2010	16:00
59	0.06875	0	0	58.5625	0.70625	0	0	49.501	0.48677	0	0	0	17.0625	96	17.598	38.1937	0	0	1	11/2/2010	17:00
59.125	0.06875	0	0	58.6875	0.80625	0	0	49.501	0.587176	0	0	0	17.3062	94.875	17.508	38.2813	0	0	1	11/2/2010	18:00
59.125	0.06875	0	0	58.6875	0.80625	0	0	49.6017	0.689108	0	0	0	17.2656	96	17.7436	38.3031	0	0	1	11/2/2010	19:00
59.25	0.06875	0	0	58.875	1.00625	0	0	49.7116	0.789819	0	0	0	17.3469	96	17.5836	38.325	0	0	1	11/2/2010	20:00
59.25	0.06875	0	0	59	1.1125	0	0	49.7116	0.894192	0	0	0	17.2656	96	17.2036	38.325	0	0	1	11/2/2010	21:00
59.25	0.06875	0	0	59	1.1125	0	0	49.8917	0.99002	0	0	0	17.3875	96	18.2836	38.3031	0	0	1	11/2/2010	22:00
59.375	0.06875	0	0	59.25	1.2125	0	0	49.9985	1.09195	0	0	0	17.3875	97.125	17.7736	38.3031	0	0	1	11/2/2010	23:00
59.375	0.06875	0	0	59.25	1.2125	0	0	49.9985	1.09195	0	0	0	17.3062	97.125	18.1236	38.325	0	0	1	11/3/2010	0:00
59.375	0.06875	0	0	59.375	1.2125	0	0	50.2853	1.19449	0	0	0	17.4688	97.125	17.9036	38.3031	0	0	1	11/3/2010	1:00

Caisson 3 Level	Pond 1 Level	Pump5 Flow	Pump6 Flow	Caisson 4 Level	Pond 2 Level	Pump7 Flow	Pump8 Flow	Caisson 5 Level	Pond 3 Level	Pond 4 Level	Pump9 Flow	Pump10 Flow	Mirabel Flow	Mirabel Line Pressure	54inch Intertie Flow	River Level	Pump 1 Status Run	Pump 2 Status Run	Pump 3 Status Run	Date	Interval
59.375	0.06875	0	0	59.5	1.3375	0	0	50.2853	1.29215	0	0	0	17.3469	96.75	17.6386	38.3031	0	0	1	11/3/2010	2:00
59.5625	0.06875	0	0	59.6875	1.5125	0	0	50.4837	1.29215	0	0	0	16.9	95.4375	16.8636	38.2813	0	0	1	11/3/2010	3:00
59.5625	0.06875	0	0	59.6875	1.5125	0	0	50.5844	1.39409	0	0	0	16.8188	95.4375	16.8636	38.2813	0	0	1	11/3/2010	4:00
59.6875	0.06875	0	0	59.9375	1.5125	0	0	50.6912	1.39409	0	0	0	16.8188	95.4375	17.3036	38.3031	0	0	1	11/3/2010	5:00
59.6875	0.06875	0	0	60.0625	1.5125	0	0	50.8103	1.49327	0	0	0	16.3719	93.75	16.7036	38.3031	0	0	1	11/3/2010	6:00
59.6875	0.06875	0	0	60.1875	1.7125	0	0	50.9812	1.49327	0	0	0	16.7375	94.125	17.5236	38.2594	0	0	1	11/3/2010	7:00
59.875	0.06875	0	0	60.375	1.7125	0	0	51.1002	1.49327	0	0	0	16.8188	94.5	17.5514	38.3031	0	0	1	11/3/2010	8:00
59.875	0.06875	0	0	60.6875	1.81875	0	0	51.2009	1.59825	0	0	0	17.5094	95.0625	17.8464	38.3031	0	0	1	11/3/2010	9:00
60.0625	0.06875	0	0	60.6875	1.81875	0	0	51.3016	1.59825	0	0	0	17.4688	95.0625	17.8464	38.325	0	0	1	11/3/2010	10:00
60.0625	0.06875	0	0	60.8125	1.81875	0	0	51.4603	1.59825	0	0	0	17.1031	97.3125	17.8164	38.3031	0	0	1	11/3/2010	11:00
60.1875	0.06875	0	0	61.0625	1.81875	0	0	51.5824	1.69347	0	0	0	17.1844	97.3125	17.4814	38.3031	0	0	1	11/3/2010	12:00
60.1875	0.06875	0	0	61.1875	1.95625	0	0	51.6831	1.69347	0	0	0	17.4688	97.3125	18.1114	38.3031	0	0	1	11/3/2010	13:00
60.3125	0.06875	0	0	61.1875	1.95625	0	0	51.7991	1.74413	0	0	0	17.4281	97.3125	17.7864	38.3031	0	0	1	11/3/2010	14:00
60.4375	0.06875	0	0	61.4375	2.1125	0	0	51.9791	1.79418	0	0	0	17.4688	97.3125	17.8314	38.3031	0	0	1	11/3/2010	15:00
60.4375	0.06875	0	0	61.5625	2.1125	0	0	51.9791	1.79418	0	0	0	17.5094	97.3125	18.0964	38.3031	0	0	1	11/3/2010	16:00
60.5625	0.06875	0	0	61.75	2.1125	0	0	52.0798	1.80059	0	0	0	17.4281	97.3125	17.8314	38.2813	0	0	1	11/3/2010	17:00
60.6875	0.06875	0	0	61.75	2.2125	0	0	52.1836	1.8952	0	0	0	17.3469	98.4375	17.6114	38.3031	0	0	1	11/3/2010	18:00
60.6875	0.06875	0	0	61.875	2.2125	0	0	52.2904	1.8952	0	0	0	17.1438	98.4375	17.7314	38.2813	0	0	1	11/3/2010	19:00
60.6875	0.06875	0	0	61.875	2.2125	0	0	52.4003	1.8952	0	0	0	17.3469	98.4375	17.4964	38.2813	0	0	1	11/3/2010	20:00
60.8125	0.06875	0	0	61.875	2.2125	0	0	52.501	1.8952	0	0	0	17.5094	98.4375	18.3162	38.2813	0	0	1	11/3/2010	21:00
60.8125	0.06875	0	0	62.125	2.31875	0	0	52.501	1.99591	0	0	0	17.55	98.4375	18.2412	38.2813	0	0	1	11/3/2010	22:00
60.9375	0.06875	0	0	62.25	2.31875	0	0	52.6658	1.99591	0	0	0	17.0625	98.4375	17.5812	38.2813	0	0	1	11/3/2010	23:00
61.0625	0.06875	0	0	62.4375	2.31875	0	0	52.6658	1.99591	0	0	0	16.3719	98.25	17.0412	38.2813	0	0	1	11/4/2010	0:00
61.0625	0.06875	0	0	62.4375	2.31875	0	0	52.7879	1.99591	0	0	0	16.575	98.25	17.1012	38.2594	0	0	1	11/4/2010	1:00
61.1875	0.06875	0	0	62.5625	2.5125	0	0	52.913	1.99591	0	0	0	16.6156	99.9375	16.5712	38.2594	0	0	1	11/4/2010	2:00
61.1875	0.06875	0	0	62.6875	2.5125	0	0	52.913	1.99591	0	0	0	17.225	100.5	17.7712	38.2594	0	0	1	11/4/2010	3:00
61.1875	0.06875	0	0	62.875	2.5125	0	0	52.913	2.09815	0	0	0	17.225	100.5	17.5512	38.2594	0	0	1	11/4/2010	4:00
61.3125	0.06875	0	0	62.875	2.5125	0	0	53.0931	2.09815	0	0	0	17.1844	99.375	17.4662	38.2594	0	0	1	11/4/2010	5:00
61.4375	0.06875	0	0	63	2.6125	0	0	53.1999	2.09815	0	0	0	16.6969	98.625	17.1012	38.2594	0	0	1	11/4/2010	6:00
61.4375	0.06875	0	0	63	2.6125	0	0	53.1999	2.09815	0	0	0	16.9406	98.0625	17.0712	38.2594	0	0	1	11/4/2010	7:00
61.5625	0.06875	0	0	63.125	2.6125	0	0	53.3067	2.09815	0	0	0	17.4688	98.25	17.9912	38.2375	0	0	1	11/4/2010	8:00
61.5625	0.06875	0	0	63.25	2.6125	0	0	53.3067	2.09815	0	0	0	17.4688	98.25	17.3484	38.2594	0	0	1	11/4/2010	9:00
61.6875	0.06875	0	0	63.25	2.71875	0	0	53.4959	2.09815	0	0	0	17.5906	98.25	18.0084	38.2375	0	0	1	11/4/2010	10:00
61.75	0.075	0	0	63.375	2.71875	0	0	53.5997	2.09815	0	0	0	17.8344	97.875	17.7434	38.2375	0	0	1	11/4/2010	11:00
61.75	0.075	0	0	63.375	2.71875	0	0	53.5997	2.09815	0	0	0	17.5906	97.875	17.7734	38.2156	0	0	1	11/4/2010	12:00
61.875	0.075	0	0	63.5625	2.71875	0	0	53.5997	2.14698	0	0	0	17.4688	97.875	18.4784	38.2156	0	0	1	11/4/2010	13:00
61.875	0.075	0	0	63.5625	2.81875	0	0	53.7034	2.10089	0	0	0	17.6719	97.875	17.9334	38.2156	0	0	1	11/4/2010	14:00
62	0.075	0	0	63.6875	2.81875	0	0	53.7034	2.19642	0	0	0	17.6719	97.875	18.2834	38.2156	0	0	1	11/4/2010	15:00
62	0.075	0	0	63.6875	2.81875	0	0	53.8652	2.19642	0	0	0	17.6719	97.875	18.0384	38.2156	0	0	1	11/4/2010	16:00
62	0.075	0	0	63.6875	2.81875	0	0	53.8652	2.19642	0	0	0	17.7125	97.875	18.5784	38.2156	0	0	1	11/4/2010	17:00
62	0.075	0	0	63.6875	2.81875	0	0	53.9811	2.19642	0	0	0	17.4688	97.875	18.0684	38.2156	0	0	1	11/4/2010	18:00
62.125	0.075	0	0	63.6875	2.81875	0	0	53.9811	2.19642	0	0	0	17.55	97.875	18.5184	38.1937	0	0	1	11/4/2010	19:00
62.125	0.075	0	0	63.9375	2.81875	0	0	54.0849	2.19642	0	0	0	17.6313	97.875	18.096	38.1937	0	0	1	11/4/2010	20:00
62.25	0.075	0	0	63.9375	2.81875	0	0	54.0849	2.19642	0	0	0	17.8344	97.875	18.271	38.2156	0	0	1	11/4/2010	21:00
62.25	0.075	0	0	64.0625	3.01875	0	0	54.2009	2.20283	0	0	0	17.7938	97.875	18.681	38.2156	0	0	1	11/4/2010	22:00
62.25	0.075	0	0	64.0625	3.01875	0	0	54.2009	2.29896	0	0	0	12.9187	95.0625	13.201	38.1937	0	0	1	11/4/2010	23:00
62.375	0.075	0	0	64.0625	3.01875	0	0	54.2009	2.29896	0	0	0	12.2688	95.8125	12.441	38.1937	0	0	1	11/5/2010	0:00
62.375	0.075	0	0	64.25	3.01875	0	0	54.2009	2.29896	0	0	0	12.4313	95.8125	13.026	38.1937	0	0	1	11/5/2010	1:00
62.5	0.075	0	0	64.25	3.01875	0	0	54.2009	2.29896	0	0	0	12.4719	95.8125	13.026	38.1937	0	0	1	11/5/2010	2:00
62.375	0.075	0	0	64.375	3.01875	0	0	54.4084	2.29896	0	0	0	12.1062	95.0625	12.221	38.1937	0	0	1	11/5/2010	3:00
62.5	0.075	0	0	64.375	3.01875	0	0	54.4084	2.29896	0	0	0	11.9438	95.0625	12.821	38.1937	0	0	1	11/5/2010	4:00
62.625	0.075	0	0	64.375	3.125	0	0	54.4084	2.29896	0	0	0	11.4969	95.0625	12.071	38.1937	0	0	1	11/5/2010	5:00
62.625	0.075	0	0	64.375	3.125	0	0	54.5122	2.29896	0	0	0	11.6188	93.9375	12.016	38.1937	0	0	1	11/5/2010	6:00
62.625	0.075	0	0	64.375	3.125	0	0	54.5122	2.29896	0	0	0	11.9438	95.0625	12.4966	38.1937	0	0	1	11/5/2010	7:00
62.625	0.075	0	0	64.375	3.125	0	0	54.5122	2.29896	0	0	0	12.5125	95.25	12.7916	38.1937	0	0	1	11/5/2010	8:00
62.75	0.075	0	0	64.625	3.225	0	0	54.5122	2.29896	0	0	0	12.4719	93.9375	12.8916	38.1719	0	0	1	11/5/2010	9:00
62.75	0.075	0	0	64.625	3.225	0	0	54.6495	2.39814	0	0	0	12.5938	95.0625	12.9366	38.1719	0	0	1	11/5/2010	10:00
62.75	0.075	0	0	64.75	3.225	0	0	54.6495	2.39692	0	0	0	13.2031	100.688	13.1116	38.1937	0	0	1	11/5/2010	11:00

Caisson 3 Level	Pond 1 Level	Pump5 Flow	Pump6 Flow	Caisson 4 Level	Pond 2 Level	Pump7 Flow	Pump8 Flow	Caisson 5 Level	Pond 3 Level	Pond 4 Level	Pump9 Flow	Pump10 Flow	Mirabel Flow	Mirabel Line Pressure	54inch Intertie Flow	River Level	Pump 1 Status Run	Pump 2 Status Run	Pump 3 Status Run	Date	Interval
62.875	0.075	0	0	64.75	3.225	0	0	54.7777	2.39692	0	0	0	17.5906	96.9375	18.1116	38.2156	0	0	1	11/5/2010	12:00
62.875	0.075	0	0	64.75	3.225	0	0	54.7777	2.39692	0	0	0	17.7125	96.9375	18.5216	38.2375	0	0	1	11/5/2010	13:00
63	0.075	0	0	64.75	3.225	0	0	54.7777	2.39692	0	0	0	17.7125	96.9375	17.8016	38.2594	0	0	1	11/5/2010	14:00
63	0.075	0	0	64.875	3.225	0	0	54.9089	2.39692	0	0	0	17.1844	96.9375	18.1116	38.3031	0	0	1	11/5/2010	15:00
63	0.075	0	0	64.875	3.225	0	0	54.9089	2.39692	0	0	0	17.5094	98.0625	18.5766	38.3469	0	0	1	11/5/2010	16:00
63	0.075	0	0	64.875	3.225	0	0	54.9089	2.39692	0	0	0	17.6313	96.75	17.9916	38.3469	0	0	1	11/5/2010	17:00
63.125	0.075	0	0	65.0625	3.225	0	0	54.9089	2.39692	0	0	0	17.7125	96.75	17.9761	38.3906	0	0	1	11/5/2010	18:00
63.125	0.075	0	0	65.0625	3.225	0	0	54.9089	2.49886	0	0	0	17.9156	96.75	17.7561	38.3906	0	0	1	11/5/2010	19:00
63.125	0.075	0	0	65.0625	3.225	0	0	54.9089	2.49886	0	0	0	17.7125	96.75	18.7711	38.3687	0	0	1	11/5/2010	20:00
63.25	0.075	0	0	65.0625	3.40625	0	0	55.0829	2.49886	0	0	0	17.8344	96.75	18.3761	38.3687	0	0	1	11/5/2010	21:00
63.25	0.075	0	0	65.1875	3.40625	0	0	55.0829	2.49886	0	0	0	18.1594	96.75	18.1261	38.3469	0	0	1	11/5/2010	22:00
63.25	0.075	0	0	65.1875	3.40625	0	0	55.0829	2.49886	0	0	0	18.1594	96.75	18.6961	38.3469	0	0	1	11/5/2010	23:00
63.25	0.075	0	0	65.1875	3.40625	0	0	55.2049	2.49886	0	0	0	16.8594	97.3125	17.3461	38.325	0	0	1	11/6/2010	0:00
63.375	0.075	0	0	65.375	3.40625	0	0	55.2049	2.49886	0	0	0	16.9	97.3125	17.6711	38.3031	0	0	1	11/6/2010	1:00
63.375	0.075	0	0	65.375	3.40625	0	0	55.2049	2.49886	0	0	0	17.1031	97.3125	16.9061	38.3031	0	0	1	11/6/2010	2:00
63.375	0.075	0	0	65.375	3.40625	0	0	55.2049	2.49886	0	0	0	17.55	97.3125	18.1661	38.2813	0	0	1	11/6/2010	3:00
63.5	0.075	0	0	65.375	3.40625	0	0	55.3117	2.49886	0	0	0	17.875	97.3125	17.7711	38.2594	0	0	1	11/6/2010	4:00
63.5	0.075	0	0	65.5	3.50625	0	0	55.3117	2.49886	0	0	0	17.9156	97.3125	18.5061	38.2813	0	0	1	11/6/2010	5:00
63.5	0.075	0	0	65.5	3.50625	0	0	55.3117	2.49886	0	0	0	17.875	97.3125	17.9327	38.2375	0	0	1	11/6/2010	6:00
63.5	0.075	0	0	65.5	3.50625	0	0	55.3117	2.60109	0	0	0	17.8344	97.3125	18.0677	38.2594	0	0	1	11/6/2010	7:00
63.5	0.075	0	0	65.5	3.50625	0	0	55.3117	2.60109	0	0	0	17.7531	97.3125	18.0527	38.2375	0	0	1	11/6/2010	8:00
63.5	0.075	0	0	65.5	3.50625	0	0	55.4125	2.60109	0	0	0	17.4688	97.3125	18.2727	38.2375	0	0	1	11/6/2010	9:00
63.625	0.075	0	0	65.5	3.50625	0	0	55.4125	2.60109	0	0	0	17.7938	97.3125	17.7277	38.2156	0	0	1	11/6/2010	10:00
63.625	0.075	0	0	65.5	3.50625	0	0	55.4125	2.60109	0	0	0	17.7531	97.3125	17.9777	38.2375	0	0	1	11/6/2010	11:00
63.625	0.075	0	0	65.5	3.50625	0	0	55.4125	2.60109	0	0	0	17.9563	97.3125	18.3877	38.2156	0	0	1	11/6/2010	12:00
63.625	0.075	0	0	65.5	3.50625	0	0	55.4125	2.60109	0	0	0	17.6719	97.3125	18.0977	38.1937	0	0	1	11/6/2010	13:00
63.625	0.075	0	0	65.5	3.50625	0	0	55.4125	2.60109	0	0	0	17.7125	97.3125	18.4927	38.1937	0	0	1	11/6/2010	14:00
63.75	0.075	0	0	65.75	3.50625	0	0	55.4125	2.60109	0	0	0	17.875	97.3125	18.4618	38.1937	0	0	1	11/6/2010	15:00
63.75	0.075	0	0	65.75	3.50625	0	0	55.4125	2.60109	0	0	0	17.8344	96.375	17.8618	38.1937	0	0	1	11/6/2010	16:00
63.75	0.075	0	0	65.75	3.61875	0	0	55.5681	2.59774	0	0	0	17.8344	97.5	18.5068	38.1719	0	0	1	11/6/2010	17:00
63.75	0.075	0	0	65.75	3.61875	0	0	55.5681	2.59774	0	0	0	17.875	97.5	18.0518	38.1719	0	0	1	11/6/2010	18:00
63.75	0.075	0	0	65.75	3.61875	0	0	55.5681	2.59774	0	0	0	17.9563	97.5	18.4468	38.15	0	0	1	11/6/2010	19:00
63.75	0.075	0	0	65.75	3.61875	0	0	55.5681	2.69875	0	0	0	18.1187	96.375	18.9468	38.1281	0	0	1	11/6/2010	20:00
63.75	0.075	0	0	65.75	3.61875	0	0	55.5681	2.69875	0	0	0	18.1594	96.375	18.7118	38.15	0	0	1	11/6/2010	21:00
63.875	0.075	0	0	65.75	3.61875	0	0	55.5681	2.69875	0	0	0	18.0781	96.375	18.6518	38.1281	0	0	1	11/6/2010	22:00
63.875	0.075	0	0	65.75	3.61875	0	0	55.5681	2.69875	0	0	0	17.5906	96.375	18.9168	38.1063	0	0	1	11/6/2010	23:00
63.875	0.075	0	0	65.875	3.61875	0	0	55.678	2.69875	0	0	0	17.7938	96.375	18.1118	38.1281	0	0	1	11/7/2010	0:00
63.875	0.075	0	0	65.875	3.61875	0	0	55.678	2.69875	0	0	0	17.7125	96.375	18.5068	38.1063	0	0	1	11/7/2010	1:00
63.875	0.075	0	0	65.875	3.61875	0	0	55.678	2.69875	0	0	0	17.55	96.375	18.5368	38.1281	0	0	1	11/7/2010	2:00
63.875	0.075	0	0	65.875	3.61875	0	0	55.678	2.69875	0	0	0	17.5094	96.375	18.345	38.1281	0	0	1	11/7/2010	3:00
63.875	0.075	0	0	65.875	3.61875	0	0	55.678	2.69875	0	0	0	17.3875	96.375	18.285	38.15	0	0	1	11/7/2010	4:00
64	0.075	0	0	65.875	3.61875	0	0	55.678	2.79946	0	0	0	17.4281	97.125	17.745	38.1719	0	0	1	11/7/2010	5:00
64	0.075	0	0	66.0625	3.61875	0	0	55.8	2.79946	0	0	0	17.4688	97.125	18.095	38.1937	0	0	1	11/7/2010	6:00
64	0.075	0	0	66.0625	3.61875	0	0	55.8	2.79946	0	0	0	17.9156	97.875	18.8	38.2594	0	0	1	11/7/2010	7:00
64	0.075	0	0	66.0625	3.61875	0	0	55.8	2.79946	0	0	0	17.7938	97.875	17.95	38.3906	0	0	1	11/7/2010	8:00
64	0.075	0	0	66.0625	3.61875	0	0	55.8	2.79946	0	0	0	17.5094	97.6875	18.285	38.5	0	0	1	11/7/2010	9:00
64.125	0.075	0	0	66.0625	3.7875	0	0	55.9099	2.79946	0	0	0	17.5906	97.125	18.83	38.5219	0	0	1	11/7/2010	10:00
64.125	0.075	0	0	66.0625	3.7875	0	0	56.0106	2.79946	0	0	0	17.7125	97.125	18.39	38.5438	0	0	1	11/7/2010	11:00
64.25	0.075	0	0	66.1875	3.7875	0	0	56.0106	2.80068	0	0	0	17.9156	96.5625	18.345	38.5	0	0	1	11/7/2010	12:00
64.375	0.075	0	0	66.1875	3.7875	0	0	56.0106	2.80068	0	0	0	17.6313	96.5625	18.005	38.4781	0	0	1	11/7/2010	13:00
64.375	0.075	0	0	66.1875	3.7875	0	0	56.0106	2.80068	0	0	0	17.6313	96.9375	18.61	38.4562	0	0	1	11/7/2010	14:00
64.375	0.075	0	0	66.4375	3.7875	0	0	56.0106	2.80068	0	0	0	17.7531	96.9375	18.27	38.4781	0	0	0	11/7/2010	15:00
64.5	0.075	0	0	66.4375	3.7875	0	0	56.1541	2.80068	0	0	0	17.6719	96.9375	18.1662	38.5	0	0	0	11/7/2010	16:00
64.5	0.075	0	0	66.4375	3.7875	0	0	56.1541	2.7015	0	0	0	18.0375	96.9375	18.1262	38.5875	0	0	0	11/7/2010	17:00
64.5	0.075	0	0	66.4375	3.61875	0	0	56.1541	2.49855	0	0	0	17.7938	96.9375	18.5362	38.6531	0	0	0	11/7/2010	18:00
64.5	0.075	0	0	66.4375	3.61875	0	0	56.1541	2.40089	0	0	0	17.7125	97.875	18.1662	38.7188	0	0	0	11/7/2010	19:00
64.5	0.075	0	0	66.4375	3.4875	0	0	56.1541	2.30079	0	0	0	17.7531	96.75	18.0662	38.7625	0	0	0	11/7/2010	20:00
64.625	0.075	0	0	66.4375	3.31875	0	0	56.1541	2.20283	0	0	0	17.3875	96.75	18.0812	38.7844	0	0	0	11/7/2010	21:00

Caisson 3 Level	Pond 1 Level	Pump5 Flow	Pump6 Flow	Caisson 4 Level	Pond 2 Level	Pump7 Flow	Pump8 Flow	Caisson 5 Level	Pond 3 Level	Pond 4 Level	Pump9 Flow	Pump10 Flow	Mirabel Flow	Mirabel Line Pressure	54inch Intertie Flow	River Level	Pump 1 Status Run	Pump 2 Status Run	Pump 3 Status Run	Date	Interval
64.625	0.075	0	0	66.25	3.31875	0	0	56.1541	2.0011	0	0	0	17.55	96.75	18.0662	38.7844	0	0	0	11/7/2010	22:00
64.625	0.075	0	0	66.25	3.21875	0	0	56.1541	1.90405	0	0	0	13.3656	95.0625	14.1812	38.7844	0	0	0	11/7/2010	23:00
64.625	0.075	0	0	66.25	3.21875	0	0	56.1541	1.8012	0	0	0	12.7563	95.0625	13.3462	38.7844	0	0	0	11/8/2010	0:00
64.625	0.075	0	0	66.25	3.01875	0	0	56.1541	1.60192	0	0	0	12.8375	95.0625	13.3612	38.8062	0	0	0	11/8/2010	1:00
64.625	0.075	0	0	66.25	2.91875	0	0	55.9984	1.49846	0	0	0	12.7563	95.0625	13.2012	38.8281	0	0	0	11/8/2010	2:00
64.625	0.075	0	0	66.125	2.91875	0	0	55.9984	1.40141	0	0	0	12.1062	93.9375	12.3512	38.85	0	0	0	11/8/2010	3:00
64.625	0.075	0	0	66.125	2.8125	0	0	55.9984	1.30253	0	0	0	12.5125	93.9375	13.5832	38.8937	0	0	0	11/8/2010	4:00
64.625	0.075	0	0	66.125	2.8125	0	0	55.8947	1.20151	0	0	0	12.6344	93.9375	13.3782	38.8937	0	0	0	11/8/2010	5:00
64.625	0.075	0	0	66.125	2.61875	0	0	55.8947	1.10263	0	0	0	12.7563	93.9375	13.2432	38.9156	0	0	0	11/8/2010	6:00
64.625	0.075	0	0	66.125	2.61875	0	0	55.8947	1.00009	0	0	0	12.675	94.3125	13.2032	38.9156	0	0	0	11/8/2010	7:00
64.625	0.075	0	0	66.125	2.61875	0	0	55.8947	0.800806	0	0	0	13.0406	94.3125	13.3632	38.9156	0	0	0	11/8/2010	8:00
64.625	0.075	0	0	66.125	2.41875	0	0	55.7848	0.698874	0	0	0	13	94.3125	13.4782	38.9594	0	0	0	11/8/2010	9:00
64.625	0.075	0	0	66	2.3125	0	0	55.7848	0.597858	0	0	0	13.0406	94.3125	13.5532	39.0031	0	0	0	11/8/2010	10:00
64.125	0.075	0	0	54.5625	2.3125	14	0	55.7848	0.501419	0	0	0	25.2281	99.5625	11.4732	39.0469	0	0	0	11/8/2010	11:00
63.9375	0.075	0	0	53.9375	2.3125	13.9	0	55.678	0.401013	0	0	0	25.1875	99.5625	11.5482	39.0906	0	0	0	11/8/2010	12:00
63.8125	0.075	0	0	53.6875	2.11875	14.05	0	55.5681	0.298166	0	0	0	25.1469	99.5625	11.6632	39.1125	0	0	0	11/8/2010	13:00
63.625	0.075	0	0	53.5625	2.0125	13.8625	0	55.5681	0.201422	0	0	0	25.2281	100.688	11.2982	39.1125	0	0	0	11/8/2010	14:00
63.625	0.075	0	0	53.25	2.0125	13.85	0	55.4796	0.0982696	0	0	0	24.9031	100.313	11.1632	39.1125	0	0	0	11/8/2010	15:00
63.3125	0.075	0	0	52.875	2.0125	13.9125	0	55.3697	0.0021363	0	0	0	19.2563	96.75	5.44821	39.1125	0	0	0	11/8/2010	16:00
63.3125	0.075	0	0	52.5625	1.81875	14.0375	0	55.3697	0.0021363	0	0	0	19.4188	96.75	5.67194	39.0906	0	0	0	11/8/2010	17:00
63.1875	0.075	0	0	52.4375	1.7125	14.075	0	55.266	0.0021363	0	0	0	19.3375	96.75	5.42194	39.0687	0	0	0	11/8/2010	18:00
63	0.075	0	0	52.0625	1.6125	14.175	0	55.1622	0.0021363	0	0	0	20.7594	93.1875	6.72694	39.0469	0	0	0	11/8/2010	19:00
63	0.075	0	0	51.75	1.6125	14.2125	0	54.9944	0.0021363	0	0	0	21.0844	92.25	7.16694	39.025	0	0	0	11/8/2010	20:00
62.8125	0.075	0	0	51.5	1.41875	14.2125	0	54.8936	0.0021363	0	0	0	21.0031	92.25	6.81194	39.0031	0	0	0	11/8/2010	21:00
62.6875	0.075	0	0	51.1875	1.41875	14.15	0	54.7655	0.0021363	0	0	0	21.1656	91.125	6.88694	38.9813	0	0	0	11/8/2010	22:00
62.5625	0.075	0	0	51.0625	1.3125	14.25	0	54.5763	0.0021363	0	0	0	21.45	91.125	6.94694	38.9594	0	0	0	11/8/2010	23:00
62.4375	0.075	0	0	51.0625	1.3125	14	0	54.4115	0.0021363	0	0	0	18.7688	96.9375	5.09694	38.9375	0	0	0	11/9/2010	0:00
62.3125	0.075	0	0	50.75	1.15	14.025	0	54.2863	0.0021363	0	0	0	18.2813	95.8125	4.45194	38.9156	0	0	0	11/9/2010	1:00
62.1875	0.075	0	0	50.75	1.01875	13.9625	0	54.1551	0.0021363	0	0	0	18.2813	95.8125	4.54194	38.8937	0	0	0	11/9/2010	2:00
62	0.075	0	0	50.375	1.01875	14.0125	0	53.9995	0.0021363	0	0	0	18.1594	95.8125	4.54194	38.8719	0	0	0	11/9/2010	3:00
62	0.075	0	0	50.375	0.9125	13.9875	0	53.8865	0.0021363	0	0	0	17.225	95.8125	3.35694	38.85	0	0	0	11/9/2010	4:00
61.8125	0.075	0	0	50.125	0.8125	14.1	0	53.7797	0.0021363	0	0	0	17.9563	95.625	4.17791	38.85	0	0	0	11/9/2010	5:00
61.8125	0.075	0	0	49.8125	0.8125	13.9375	0	53.5997	0.0021363	0	0	0	17.4688	95.625	3.45791	38.8281	0	0	0	11/9/2010	6:00
61.625	0.075	0	0	49.5625	0.8125	14.025	0	53.4959	0.0021363	0	0	0	17.6313	94.5	3.56291	38.8062	0	0	0	11/9/2010	7:00
61.5	0.075	0	0	49.375	0.6125	14.05	0	53.3921	0.0021363	0	0	0	18.2	95.8125	4.30791	38.7844	0	0	0	11/9/2010	8:00
61.3125	0.075	0	0	49.25	0.6125	14.05	0	53.2792	0.0021363	0	0	0	18.525	94.6875	4.33791	38.7844	0	0	0	11/9/2010	9:00
61.1875	0.075	0	0	49.125	0.5125	14.025	0	53.1755	0.0021363	0	0	0	16.2906	92.625	1.84791	38.7625	0	0	0	11/9/2010	10:00
61.125	0.075	0	0	48.8125	0.5125	14.225	0	53.0717	0.0021363	0	0	0	22.8719	91.5	8.51291	38.7406	0	0	0	11/9/2010	11:00
61	0.075	0	0	48.5625	0.4125	14.2125	0	52.9038	0.0021363	0	0	0	23.2781	91.5	9.15791	38.7406	0	0	0	11/9/2010	12:00
60.875	0.075	0	0	48.4375	0.4125	14.2	0	52.9038	0.0021363	0	0	0	23.4	91.5	9.42291	38.7188	0	0	0	11/9/2010	13:00
60.875	0.075	0	0	48.25	0.3125	14.4	0	52.7787	0.0021363	0	0	0	23.4	90.9375	9.46291	38.6969	0	0	0	11/9/2010	14:00
60.75	0.075	0	0	48.5	0.3125	13.7875	0	52.6719	0.0021363	0	0	0	19.0531	96.375	5.20291	38.6969	0	0	0	11/9/2010	15:00
60.625	0.075	0	0	48.3125	0.3125	14	0	52.5681	0.0021363	0	0	0	18.6063	96.375	4.74791	38.675	0	0	0	11/9/2010	16:00
60.5	0.075	0	0	48.1875	0.20625	14	0	52.4613	0.0021363	0	0	0	18.3219	95.25	4.42291	38.675	0	0	0	11/9/2010	17:00
60.5	0.075	0	0	48.0625	0.20625	13.875	0	52.4613	0.0021363	0	0	0	18.6063	95.25	4.70364	38.6531	0	0	0	11/9/2010	18:00
60.375	0.075	0	0	47.8125	0.20625	14.0875	0	52.2752	0.0021363	0	0	0	19.3781	93.75	5.42364	38.675	0	0	0	11/9/2010	19:00
60.25	0.075	0	0	47.5625	0.1	14.0375	0	52.1714	0.0021363	0	0	0	19.5406	93.9375	5.47864	38.6531	0	0	0	11/9/2010	20:00
60.25	0.075	0	0	47.5625	0.1	14.0125	0	52.0646	0.0021363	0	0	0	19.5	93.9375	5.50864	38.6312	0	0	0	11/9/2010	21:00
60.125	0.075	0	0	47.4375	0.1	14.0625	0	52.0646	0.0021363	0	0	0	19.2156	93.9375	5.22864	38.6312	0	0	0	11/9/2010	22:00
60	0.075	0	0	47.1875	0.1	14.0125	0	52.0646	0.0021363	0	0	0	18.525	93.75	4.43864	38.6312	0	0	0	11/9/2010	23:00
59.875	0.075	0	0	47.1875	0.1	14.1	0	51.8967	0.0021363	0	0	0	18.3625	93.75	4.43864	38.6094	0	0	0	11/10/2010	0:00
59.875	0.075	0	0	47.0625	0.1	13.9	0	51.7747	0.0021363	0	0	0	18.1187	93.75	4.27864	38.6094	0	0	0	11/10/2010	1:00
59.6875	0.075	0	0	46.9375	0.1	13.9625	0	51.6739	0.0021363	0	0	0	17.8344	95.25	3.85364	38.6094	0	0	0	11/10/2010	2:00
59.6875	0.075	0	0	46.8125	0.1	13.8625	0	51.6739	0.0021363	0	0	0	18.4031	94.875	4.64364	38.5875	0	0	0	11/10/2010	3:00
59.5625	0.075	0	0	46.6875	0.1	14.0375	0	51.5732	0.0021363	0	0	0	18.2406	94.875	4.32234	38.5875	0	0	0	11/10/2010	4:00
59.4375	0.075	0	0	46.6875	0.1	13.95	0	51.5732	0.0021363	0	0	0	18.0375	94.875	4.27734	38.5656	0	0	0	11/10/2010	5:00
59.3125	0.075	0	0	46.5	0.1	13.925	0	51.4145	0.0021363	0	0	0	17.5094	94.875	3.75234	38.5875	0	0	0	11/10/2010	6:00
59.3125	0.075	0	0	46.375	0.1	13.7875	0	51.4145	0.0021363	0	0	0	18.1187	94.875	4.27734	38.5656	0	0	0	11/10/2010	7:00

Caisson 3 Level	Pond 1 Level	Pump5 Flow	Pump6 Flow	Caisson 4 Level	Pond 2 Level	Pump7 Flow	Pump8 Flow	Caisson 5 Level	Pond 3 Level	Pond 4 Level	Pump9 Flow	Pump10 Flow	Mirabel Flow	Mirabel Line Pressure	54inch Intertie Flow	River Level	Pump 1 Status Run	Pump 2 Status Run	Pump 3 Status Run	Date	Interval
59.125	0.075	0	0	46.375	0.1	13.8	0	51.2833	0.0021363	0	0	0	17.8344	94.875	4.10234	38.5656	0	0	0	11/10/2010	8:00
59.125	0.075	0	0	46.25	0.1	14.0125	0	51.2833	0.0021363	0	0	0	17.4688	96	3.26734	38.5656	0	0	0	11/10/2010	9:00
59	0.075	0	0	46.0625	0.1	13.8125	0	51.1734	0.0021363	0	0	0	17.55	95.0625	3.80734	38.5438	0	0	0	11/10/2010	10:00
59	0.075	0	0	46.0625	0.1	14	0	51.1734	0.0021363	0	0	0	17.5094	95.0625	3.61734	38.5656	0	0	0	11/10/2010	11:00
58.875	0.075	0	0	46.3125	0.1	13.6875	0	51.0666	0.0021363	0	0	0	25.35	112.313	10.2423	38.5438	0	0	0	11/10/2010	12:00
58.875	0.075	0	0	46.0625	0.1	13.5125	0	50.9629	0.0021363	0	0	0	24.0094	102.375	10.2273	38.5219	0	0	0	11/10/2010	13:00
58.75	0.075	0	0	46.0625	0.1	13.55	0	50.9629	0.0021363	0	0	0	23.8062	102.375	10.3573	38.5219	0	0	0	11/10/2010	14:00
58.75	0.075	0	0	46.0625	0.1	13.475	0	50.9629	0.0021363	0	0	0	23.8062	103.5	10.3723	38.5219	0	0	0	11/10/2010	15:00
58.75	0.075	0	0	46.0625	0.1	13.6375	0	50.8591	0.0021363	0	0	0	23.5219	104.063	10.4615	38.5219	0	0	0	11/10/2010	16:00
58.625	0.075	0	0	45.9375	0.1	13.5125	0	50.8591	0.0021363	0	0	0	23.4813	104.063	9.97654	38.5	0	0	0	11/10/2010	17:00
58.5	0.075	0	0	45.75	0.1	13.5375	0	50.8591	0.0021363	0	0	0	24.5781	102.188	11.1065	38.5219	0	0	0	11/10/2010	18:00
58.5	0.075	0	0	45.75	0.1	13.5625	0	50.6851	0.0021363	0	0	0	24.5375	102.188	10.9865	38.5	0	0	0	11/10/2010	19:00
58.5	0.075	0	0	45.625	0.1	13.6875	0	50.6851	0.0021363	0	0	0	24.6594	102	11.0915	38.5	0	0	0	11/10/2010	20:00
58.3125	0.075	0	0	45.625	0.1	13.7125	0	50.5814	0.0021363	0	0	0	24.8219	102	11.1665	38.5	0	0	0	11/10/2010	21:00
58.3125	0.075	0	0	45.625	0.1	13.4625	0	50.5814	0.0021363	0	0	0	24.7813	102	11.4265	38.5	0	0	0	11/10/2010	22:00
58.1875	0.075	0	0	45.625	0.1	13.5125	0	50.4746	0.0021363	0	0	0	24.8625	103.125	11.3865	38.5	0	0	0	11/10/2010	23:00
58.1875	0.075	0	0	45.5	0.1	13.5875	0	50.4746	0.0021363	0	0	0	24.5375	103.125	11.3265	38.4781	0	0	0	11/11/2010	0:00
58.1875	0.075	0	0	45.375	0.1	13.35	0	50.4746	0.0021363	0	0	0	24.9844	103.125	11.5615	38.4781	0	0	0	11/11/2010	1:00
58.1875	0.075	0	0	45.25	0.1	13.7625	0	50.4746	0.0021363	0	0	0	24.7	99.9375	11.2365	38.4781	0	0	0	11/11/2010	2:00
58	0.075	0	0	45.125	0.1	13.6625	0	50.4746	0.0021363	0	0	0	24.7	99.9375	11.3115	38.4781	0	0	0	11/11/2010	3:00
58	0.075	0	0	45.125	0.1	13.7	0	50.2945	0.0021363	0	0	0	23.6438	99.1875	10.1404	38.4562	0	0	0	11/11/2010	4:00
58	0.075	0	0	44.9375	0.1	13.675	0	50.2945	0.0021363	0	0	0	23.2375	100.313	9.8304	38.4781	0	0	0	11/11/2010	5:00
58	0.075	0	0	44.9375	0.1	13.85	0	50.2945	0.0021363	0	0	0	23.4813	100.313	10.7104	38.4562	0	0	0	11/11/2010	6:00
57.875	0.075	0	0	44.9375	0.1	13.75	0	50.1633	0.0021363	0	0	0	24.4969	98.0625	10.8154	38.4781	0	0	0	11/11/2010	7:00
57.875	0.075	0	0	44.6875	0.1	13.7625	0	50.1633	0.0021363	0	0	0	24.8625	97.875	11.4554	38.4781	0	0	0	11/11/2010	8:00
57.6875	0.075	0	0	44.6875	0.1	13.875	0	50.1633	0.0021363	0	0	0	25.1875	97.875	11.2504	38.4781	0	0	0	11/11/2010	9:00
57.8125	0.075	0	0	44.5625	0.1	13.775	0	50.0626	0.0021363	0	0	0	24.8219	97.875	11.5454	38.4562	0	0	0	11/11/2010	10:00
57.6875	0.075	0	0	44.5625	0.1	13.7125	0	50.0626	0.0021363	0	0	0	24.4969	97.875	10.9438	38.4562	0	0	0	11/11/2010	11:00
57.6875	0.075	0	0	44.4375	0.1	13.925	0	50.0626	0.0021363	0	0	0	18.6063	95.4375	4.62877	38.4562	0	0	0	11/11/2010	12:00
57.5	0.075	0	0	44.25	0.1	14.05	0	50.0626	0.0021363	0	0	0	18.5656	94.3125	4.73377	38.4562	0	0	0	11/11/2010	13:00
57.5	0.075	0	0	44.25	0.1	14.05	0	49.9283	0.0021363	0	0	0	18.1594	94.5	4.61734	38.4562	0	0	0	11/11/2010	14:00
57.5	0.075	0	0	44.25	0.1	13.8875	0	49.9283	0.0021363	0	0	0	18.3219	94.6875	4.65734	38.4562	0	0	0	11/11/2010	15:00
57.375	0.075	0	0	44.25	0.1	14.0125	0	49.9283	0.0021363	0	0	0	18.4438	94.3125	4.54234	38.4344	0	0	0	11/11/2010	16:00
57.375	0.075	0	0	44.25	0.1	13.9125	0	49.7696	0.0021363	0	0	0	18.6469	94.3125	4.76234	38.4562	0	0	0	11/11/2010	17:00
57.375	0.075	0	0	44.1875	0.1	13.675	0	49.7696	0.0021363	0	0	0	16.2094	99.1875	2.76734	38.4344	0	0	0	11/11/2010	18:00
57.375	0.075	0	0	44.1875	0.1	13.8625	0	49.7696	0.0021363	0	0	0	16.9406	98.625	3.42734	38.4344	0	0	0	11/11/2010	19:00
57.25	0.075	0	0	44.1875	0.1	13.8625	0	49.7696	0.0021363	0	0	0	17.1031	98.625	3.38234	38.4562	0	0	0	11/11/2010	20:00
57.25	0.075	0	0	44	0.1	13.7875	0	49.7696	0.0021363	0	0	0	17.0219	98.625	3.25234	38.4562	0	0	0	11/11/2010	21:00
57.25	0.075	0	0	44	0.1	13.675	0	49.7696	0.0021363	0	0	0	17.0219	98.625	3.38234	38.4562	0	0	0	11/11/2010	22:00
57.125	0.075	0	0	44	0.1	13.7875	0	49.5926	0.0021363	0	0	0	17.0625	97.5	3.67734	38.4344	0	0	0	11/11/2010	23:00
57.125	0.075	0	0	44	0.1	13.875	0	49.5926	0.0021363	0	0	0	16.6563	97.5	2.81234	38.4344	0	0	0	11/12/2010	0:00
57.125	0.075	0	0	43.875	0.1	13.8125	0	49.5926	0.0021363	0	0	0	16.7375	97.5	2.91734	38.4344	0	0	0	11/12/2010	1:00
57	0.075	0	0	43.875	0.1	13.8125	0	49.5926	0.0021363	0	0	0	16.7781	97.5	3.04734	38.4125	0	0	0	11/12/2010	2:00
57	0.075	0	0	43.75	0.1	13.8625	0	49.5926	0.0021363	0	0	0	16.7375	97.5	3.21053	38.4344	0	0	0	11/12/2010	3:00
57	0.075	0	0	43.75	0.1	13.8375	0	49.4644	0.0021363	0	0	0	15.8031	97.3125	2.24053	38.4125	0	0	0	11/12/2010	4:00
57	0.075	0	0	43.75	0.1	13.8	0	49.4644	0.0021363	0	0	0	16.1281	97.3125	2.59553	38.4125	0	0	0	11/12/2010	5:00
56.875	0.075	0	0	43.5625	0.1	13.8875	0	49.4644	0.0021363	0	0	0	16.1688	97.3125	2.69553	38.4344	0	0	0	11/12/2010	6:00
56.875	0.075	0	0	43.5625	0.1	13.775	0	49.4644	0.0021363	0	0	0	16.1688	97.3125	2.56553	38.4125	0	0	0	11/12/2010	7:00
56.875	0.075	0	0	43.5625	0.1	13.825	0	49.4644	0.0021363	0	0	0	16.575	97.5	3.15053	38.4125	0	0	0	11/12/2010	8:00
56.875	0.075	0	0	43.875	0.1	13.575	0	49.3332	0.0021363	0	0	0	22.9531	103.875	9.68553	38.4125	0	0	0	11/12/2010	9:00
56.75	0.075	0	0	43.875	0.1	13.6375	0	49.3332	0.0021363	0	0	0	22.9937	103.688	9.74553	38.4125	0	0	0	11/12/2010	10:00
56.75	0.075	0	0	43.875	0.1	13.6875	0	49.3332	0.0021363	0	0	0	22.9125	103.688	9.74553	38.3906	0	0	0	11/12/2010	11:00
56.75	0.075	0	0	43.875	0.1	13.425	0	49.3332	0.0021363	0	0	0	23.0344	103.688	9.59553	38.3906	0	0	0	11/12/2010	12:00
56.75	0.075	0	0	43.75	0.1	13.5	0	49.1958	0.0021363	0	0	0	22.9937	102.75	9.59553	38.3906	0	0	0	11/12/2010	13:00
56.625	0.075	0	0	43.5625	0.1	13.65	0	49.1958	0.0021363	0	0	0	27.4219	99.9375	14.4905	38.3906	0	0	0	11/12/2010	14:00
56.625	0.075	0	0	43.5625	0.1	13.65	0	49.1958	0.0021363	0	0	0	27.5844	99.9375	14.0086	38.3906	0	0	0	11/12/2010	15:00
56.625	0.075	0	0	43.3125	0.1	13.9	0	49.1958	0.0021363	0	0	0	20.5969	96.375	6.92863	38.3906	0	0	0	11/12/2010	16:00
56.625	0.075	0	0	43.3125	0.1	14.0375	0	49.1958	0.0021363	0	0	0	20.3531	96.375	6.78363	38.3906	0	0	0	11/12/2010	17:00

Caisson 3 Level	Pond 1 Level	Pump5 Flow	Pump6 Flow	Caisson 4 Level	Pond 2 Level	Pump7 Flow	Pump8 Flow	Caisson 5 Level	Pond 3 Level	Pond 4 Level	Pump9 Flow	Pump10 Flow	Mirabel Flow	Mirabel Line Pressure	54inch Intertie Flow	River Level	Pump 1 Status Run	Pump 2 Status Run	Pump 3 Status Run	Date	Interval
56.5	0.075	0	0	43.1875	0.1	13.8125	0	49.0707	0.0021363	0	0	0	20.6781	96.375	6.84363	38.3687	0	0	0	11/12/2010	18:00
56.5	0.075	0	0	43.1875	0.1	13.95	0	49.0707	0.0021363	0	0	0	20.5969	96.375	7.20863	38.3906	0	0	0	11/12/2010	19:00
56.5	0.075	0	0	43.1875	0.1	13.975	0	49.0707	0.0021363	0	0	0	19.1344	95.0625	5.62863	38.3687	0	0	0	11/12/2010	20:00
56.375	0.075	0	0	43.0625	0.1	13.9125	0	49.0707	0.0021363	0	0	0	19.3781	96.5625	5.87363	38.3687	0	0	0	11/12/2010	21:00
56.4375	0.075	0	0	43.0625	0.1	13.85	0	49.0707	0.0021363	0	0	0	20.3125	96.5625	6.97363	38.3906	0	0	0	11/12/2010	22:00
56.4375	0.075	0	0	43.0625	0.1	13.8125	0	48.9669	0.0021363	0	0	0	20.6375	96.5625	7.10863	38.3687	0	0	0	11/12/2010	23:00
56.4375	0.075	0	0	43.0625	0.1	13.9	0	48.9669	0.0021363	0	0	0	20.2719	96	7.10863	38.3687	0	0	0	11/13/2010	0:00
56.3125	0.075	0	0	42.875	0.1	13.925	0	48.9669	0.0021363	0	0	0	20.2313	94.875	6.60863	38.3687	0	0	0	11/13/2010	1:00
56.3125	0.075	0	0	42.875	0.1	13.9125	0	48.9669	0.0021363	0	0	0	20.475	94.875	6.72363	38.3687	0	0	0	11/13/2010	2:00
56.3125	0.075	0	0	42.875	0.1	14.025	0	48.9669	0.0021363	0	0	0	20.475	94.875	6.72363	38.3687	0	0	0	11/13/2010	3:00
56.3125	0.075	0	0	42.875	0.1	13.875	0	48.9669	0.0021363	0	0	0	20.3125	94.875	6.5935	38.3687	0	0	0	11/13/2010	4:00
56.3125	0.075	0	0	42.75	0.1	13.875	0	48.9669	0.0021363	0	0	0	20.2313	94.875	6.3735	38.3469	0	0	0	11/13/2010	5:00
56.1875	0.075	0	0	42.75	0.1	13.8625	0	48.9669	0.0021363	0	0	0	20.8406	94.875	6.9035	38.3469	0	0	0	11/13/2010	6:00
56.1875	0.075	0	0	42.75	0.1	13.8375	0	48.9669	0.0021363	0	0	0	21.8969	95.4375	8.2035	38.3469	0	0	0	11/13/2010	7:00
56.1875	0.075	0	0	42.75	0.1	14.0625	0	48.8205	0.0021363	0	0	0	21.2875	95.4375	7.5735	38.3469	0	0	0	11/13/2010	8:00
56.375	0.075	0	0	53.4375	0.1	0	0	48.8205	0.0021363	0	0	0	9.62813	89.625	10.4476	38.3469	0	0	0	11/13/2010	9:00
56.1875	0.075	0	0	43.0625	0.1	13.8875	0	48.8205	0.0021363	0	0	0	21.5719	94.6875	8.05756	38.3469	0	0	0	11/13/2010	10:00
56.1875	0.075	0	0	42.875	0.1	13.9	0	48.8205	0.0021363	0	0	0	18.6469	96	4.74756	38.3469	0	0	0	11/13/2010	11:00
56.1875	0.075	0	0	42.875	0.1	13.9375	0	48.8205	0.0021363	0	0	0	18.85	96	4.82256	38.3469	0	0	0	11/13/2010	12:00
56.1875	0.075	0	0	42.75	0.1	13.9125	0	48.8205	0.0021363	0	0	0	18.5656	94.875	4.82256	38.3469	0	0	0	11/13/2010	13:00
56.1875	0.075	0	0	42.75	0.1	13.925	0	48.8205	0.0021363	0	0	0	18.7281	94.875	4.98256	38.325	0	0	0	11/13/2010	14:00
56.1875	0.075	0	0	42.75	0.1	13.8375	0	48.6923	0.0021363	0	0	0	18.6875	94.875	5.04256	38.325	0	0	0	11/13/2010	15:00
56	0.075	0	0	42.625	0.1	13.9625	0	48.6923	0.0021363	0	0	0	18.6875	94.875	5.09756	38.325	0	0	0	11/13/2010	16:00
56	0.075	0	0	42.625	0.1	13.85	0	48.6923	0.0021363	0	0	0	18.8094	94.875	4.99756	38.325	0	0	0	11/13/2010	17:00
56	0.075	0	0	42.625	0.1	13.8375	0	48.6923	0.0021363	0	0	0	19.0125	94.875	5.46756	38.325	0	0	0	11/13/2010	18:00
56	0.075	0	0	42.625	0.1	13.9625	0	48.6923	0.0021363	0	0	0	18.8906	94.875	5.37756	38.325	0	0	0	11/13/2010	19:00
56	0.075	0	0	42.4375	0.1	14.0375	0	48.6923	0.0021363	0	0	0	18.9719	94.875	5.28938	38.325	0	0	0	11/13/2010	20:00
56	0.075	0	0	42.4375	0.1	13.9375	0	48.6923	0.0021363	0	0	0	19.175	94.875	5.34938	38.325	0	0	0	11/13/2010	21:00
55.875	0.075	0	0	42.4375	0.1	13.7625	0	48.5916	0.0021363	0	0	0	19.0531	94.875	5.41938	38.325	0	0	0	11/13/2010	22:00
56	0.075	0	0	42.4375	0.1	13.8875	0	48.5916	0.0021363	0	0	0	19.1344	96	5.40438	38.325	0	0	0	11/13/2010	23:00
55.875	0.075	0	0	42.4375	0.1	13.8875	0	48.5916	0.0021363	0	0	0	18.6063	96	5.06938	38.325	0	0	0	11/14/2010	0:00
55.875	0.075	0	0	42.4375	0.1	14.0125	0	48.5916	0.0021363	0	0	0	18.5656	96	4.81938	38.325	0	0	0	11/14/2010	1:00
55.875	0.075	0	0	42.4375	0.1	13.825	0	48.5916	0.0021363	0	0	0	18.5656	96	4.86438	38.3031	0	0	0	11/14/2010	2:00
55.875	0.075	0	0	42.4375	0.1	13.8125	0	48.4878	0.0021363	0	0	0	18.4844	96	4.68938	38.3031	0	0	0	11/14/2010	3:00
55.875	0.075	0	0	42.4375	0.1	13.775	0	48.4909	0.0021363	0	0	0	17.8344	95.8125	4.04438	38.325	0	0	0	11/14/2010	4:00
55.75	0.075	0	0	42.4375	0.1	13.9125	0	48.4909	0.0021363	0	0	0	18.2813	95.8125	4.80438	38.3031	0	0	0	11/14/2010	5:00
55.75	0.075	0	0	42.4375	0.1	13.9125	0	48.4909	0.0021363	0	0	0	17.9156	95.8125	4.33938	38.325	0	0	0	11/14/2010	6:00
55.75	0.075	0	0	42.4375	0.1	13.825	0	48.4909	0.0021363	0	0	0	18.0781	95.8125	4.42438	38.3031	0	0	0	11/14/2010	7:00
55.75	0.075	0	0	42.4375	0.1	13.9	0	48.4909	0.0021363	0	0	0	18.4438	96.9375	4.86438	38.3031	0	0	0	11/14/2010	8:00
55.75	0.075	0	0	42.1875	0.1	13.775	0	48.4909	0.0021363	0	0	0	18.7281	96.1875	4.93529	38.3031	0	0	0	11/14/2010	9:00
55.75	0.075	0	0	42.1875	0.1	13.975	0	48.4695	0.0021363	0	0	0	18.525	96.1875	4.76029	38.3031	0	0	0	11/14/2010	10:00
55.625	0.075	0	0	42.1875	0.1	13.9125	0	48.3657	0.0021363	0	0	0	18.6469	96.1875	4.89529	38.3031	0	0	0	11/14/2010	11:00
55.625	0.075	0	0	42.1875	0.1	13.875	0	48.3657	0.0021363	0	0	0	18.525	95.0625	4.76029	38.2813	0	0	0	11/14/2010	12:00
55.625	0.075	0	0	42.1875	0.2	13.8875	0	48.3657	0.0021363	0	0	0	18.5656	95.0625	4.95029	38.3031	0	0	0	11/14/2010	13:00
55.625	0.075	0	0	42.1875	0.2	13.75	0	48.3657	0.0021363	0	0	0	18.85	95.0625	5.17029	38.3031	0	0	0	11/14/2010	14:00
55.625	0.075	0	0	42.1875	0.2	13.8125	0	48.3657	0.00305185	0	0	0	18.9312	95.0625	5.61029	38.2813	0	0	0	11/14/2010	15:00
55.625	0.075	0	0	42.1875	0.2	13.9125	0	48.3657	0.0833155	0	0	0	18.6875	96.1875	5.01029	38.3031	0	0	0	11/14/2010	16:00
55.625	0.075	0	0	42.0625	0.2	13.8125	0	48.3657	0	0	0	0	18.5656	96.1875	4.82029	38.2813	0	0	0	11/14/2010	17:00
55.5	0.075	0	0	42.0625	0.2	13.85	0	48.3657	0	0	0	0	18.7688	96.1875	4.85029	38.2813	0	0	0	11/14/2010	18:00
55.5	0.075	0	0	42.0625	0.2	13.75	0	48.3657	0	0	0	0	18.6875	96.1875	4.89529	38.3031	0	0	0	11/14/2010	19:00
55.5	0.075	0	0	42.0625	0.2	13.8125	0	48.3657	0	0	0	0	20.8813	93	7.78029	38.2813	0	0	0	11/14/2010	20:00
55.5	0.075	0	0	41.9375	0.2	13.975	0	48.265	0	0	0	0	20.9625	93	7.22529	38.2813	0	0	0	11/14/2010	21:00
55.5	0.075	0	0	41.9375	0.2	13.85	0	48.265	0	0	0	0	21.125	93	7.40066	38.2813	0	0	0	11/14/2010	22:00
55.5	0.075	0	0	41.9375	0.2	13.9625	0	48.265	0	0	0	0	21.4906	93	8.01566	38.3031	0	0	0	11/14/2010	23:00
55.375	0.075	0	0	41.8125	0.2	13.9	0	48.265	0	0	0	0	21.0438	91.6875	7.78066	38.2813	0	0	0	11/15/2010	0:00
55.375	0.075	0	0	41.8125	0.2	13.975	0	48.265	0	0	0	0	21.2063	91.6875	7.26566	38.2813	0	0	0	11/15/2010	1:00
55.375	0.075	0	0	41.8125	0.2	14.0625	0	48.265	0	0	0	0	21.5719	91.6875	7.78066	38.2813	0	0	0	11/15/2010	2:00
55.375	0.075	0	0	41.8125	0.2	14.15	0	48.265	0	0	0	0	21.7344	91.6875	7.97066	38.2813	0	0	0	11/15/2010	3:00

Caisson 3 Level	Pond 1 Level	Pump5 Flow	Pump6 Flow	Caisson 4 Level	Pond 2 Level	Pump7 Flow	Pump8 Flow	Caisson 5 Level	Pond 3 Level	Pond 4 Level	Pump9 Flow	Pump10 Flow	Mirabel Flow	Mirabel Line Pressure	54inch Intertie Flow	River Level	Pump 1 Status Run	Pump 2 Status Run	Pump 3 Status Run	Date	Interval
55.5	0.075	0	0	41.625	0.2	13.9875	0	48.1552	0	0	0	0	21.0031	91.5	7.16566	38.2813	0	0	0	11/15/2010	4:00
55.4375	0.075	0	0	41.625	0.2	13.9875	0	48.1552	0	0	0	0	22.7094	91.875	9.01066	38.2813	0	0	0	11/15/2010	5:00
55.3125	0.075	0	0	41.6875	0.2	14.125	0	48.1552	0	0	0	0	22.5469	91.875	9.07066	38.2813	0	0	0	11/15/2010	6:00
55.3125	0.075	0	0	41.6875	0.2	13.975	0	48.1552	0	0	0	0	22.0188	91.875	8.19066	38.2813	0	0	0	11/15/2010	7:00
55.3125	0.075	0	0	41.6875	0.2	14	0	48.1552	0	0	0	0	22.75	90.9375	8.79066	38.2813	0	0	0	11/15/2010	8:00
55.3125	0.075	0	0	41.6875	0.2	13.95	0	48.1552	0	0	0	0	23.3188	92.4375	9.43566	38.2813	0	0	0	11/15/2010	9:00
55.1875	0.075	0	0	41.5625	0.1	14.1	0	48.1552	0	0	0	0	23.3594	91.3125	9.14066	38.2813	0	0	0	11/15/2010	10:00
55.1875	0.075	0	0	41.5625	0.1	14.05	0	48.1552	0	0	0	0	23.4	91.875	9.62473	38.2813	0	0	0	11/15/2010	11:00
55.1875	0.075	0	0	41.5625	0.1	14.025	0	48.1552	0	0	0	0	23.4813	91.875	9.85973	38.2594	0	0	0	11/15/2010	12:00
55.1875	0.075	0	0	41.5625	0.2	13.875	0	48.1552	0	0	0	0	23.5625	91.875	9.71473	38.2594	0	0	0	11/15/2010	13:00
45.75	0.075	13.9125	0	41.6875	0.2	13.5875	0	48.1552	0	0	0	0	33.8	100.5	6.41973	38.2594	0	0	0	11/15/2010	14:00
45.0625	0.075	13.8844	0	41.8125	0.2	13.55	0	48.0514	0	0	0	0	33.9219	102.375	7.00473	38.2594	0	0	0	11/15/2010	15:00
44.25	0.075	14.1281	0	41.3125	0.2	13.825	0	48.0514	0	0	0	0	28.1125	97.3125	-0.000274725	38.2813	0	0	0	11/15/2010	16:00
43.6875	0.075	14.1281	0	40.9375	0.2	13.775	0	48.0514	0	0	0	0	28.1125	96.9375	-0.000274725	38.2594	0	0	0	11/15/2010	17:00
43.3125	0.075	14.1469	0	40.9375	0.2	13.9125	0	48.0514	0	0	0	0	28.2344	96.9375	-0.000274725	38.2594	0	0	0	11/15/2010	18:00
43	0.075	14.1469	0	40.5625	0.2	13.8125	0	48.0514	0	0	0	0	28.1938	96	-0.000274725	38.2594	0	0	0	11/15/2010	19:00
42.6875	0.075	14.2875	0	40.4375	0.2	13.6375	0	48.0514	0	0	0	0	28.275	96	-0.000274725	38.2594	0	0	0	11/15/2010	20:00
42.375	0.075	14.2875	0	40.25	0.2	13.75	0	48.0514	0	0	0	0	28.1938	96	-0.000274725	38.2594	0	0	0	11/15/2010	21:00
42.125	0.075	14.2875	0	40	0.2	13.9375	0	48.0514	0	0	0	0	28.3969	96	-0.000274725	38.2594	0	0	0	11/15/2010	22:00
41.875	0.075	14.2875	0	39.875	0.2	13.8	0	48.0514	0	0	0	0	28.275	96	-0.000274725	38.2594	0	0	0	11/15/2010	23:00
41.625	0.075	14.2875	0	39.5625	0.2	13.9	0	48.0514	0	0	0	0	28.3563	96	-0.000274725	38.2594	0	0	0	11/16/2010	0:00
41.375	0.075	14.2875	0	39.4375	0.2	13.8	0	47.9415	0	0	0	0	27.4219	102.75	-0.000274725	38.2594	0	0	0	11/16/2010	1:00
41.5625	0.075	13.8938	0	39.8125	0.2	13.6125	0	47.9415	0	0	0	0	27.625	101.813	-0.000274725	38.2594	0	0	0	11/16/2010	2:00
41.4375	0.075	13.8938	0	39.5625	0.2	13.6	0	47.9415	0	0	0	0	27.625	102.938	-0.000274725	38.2594	0	0	0	11/16/2010	3:00
41.3125	0.075	13.8938	0	39.4375	0.2	13.5	0	47.9415	0	0	0	0	27.4219	102.938	-0.000274725	38.2375	0	0	0	11/16/2010	4:00
41.1875	0.075	13.7906	0	39.25	0.2	13.3875	0	47.8347	0	0	0	0	27.3813	102.938	-0.000274725	38.2594	0	0	0	11/16/2010	5:00
40.9375	0.075	13.7906	0	39.125	0.2	13.4375	0	47.8347	0	0	0	0	27.5031	102.938	-0.000274725	38.2375	0	0	0	11/16/2010	6:00
40.8125	0.075	13.9125	0	39.125	0.2	13.575	0	47.8347	0	0	0	0	27.4219	102.938	-0.000274725	38.2375	0	0	0	11/16/2010	7:00
40.6875	0.075	13.9125	0	38.875	0.2	13.575	0	47.8347	0	0	0	0	27.5031	101.625	-0.000274725	38.2594	0	0	0	11/16/2010	8:00
49.9375	0.075	0	0	39.0625	0.2	13.5875	0	35.8989	0	0	12	0	27.5438	102.188	-0.000274725	38.2375	0	0	0	11/16/2010	9:00
50.75	0.075	0	0	39.1875	0.1	13.5375	0	34.669	0	0	12	0	27.3813	103.313	-0.000274725	38.2594	0	0	0	11/16/2010	10:00
51.25	0.075	0	0	39.1875	0.1	13.575	0	33.7687	0	0	12	0	27.2594	103.313	-0.000274725	38.2375	0	0	0	11/16/2010	11:00
51.625	0.075	0	0	39.1875	0.1	13.5625	0	33.1187	0	0	12	0	27.2594	103.5	-0.000274725	38.2375	0	0	0	11/16/2010	12:00
52	0.075	0	0	39.4375	0.1	13.4125	0	32.5175	0	0	12	0	27.2188	103.5	-0.000274725	38.2375	0	0	0	11/16/2010	13:00
52.125	0.075	0	0	39.4375	0.2	13.4125	0	32.1574	0	0	12	0	27.3	104.625	-0.000274725	38.2375	0	0	0	11/16/2010	14:00
52.375	0.075	0	0	39.5625	0.2	13.2875	0	31.6599	0	0	12	0	27.1375	104.625	-0.000274725	38.2375	0	0	0	11/16/2010	15:00
52.5	0.075	0	0	39.5625	0.2	13.45	0	31.4402	0	0	12	0	27.1375	104.625	-0.000274725	38.2156	0	0	0	11/16/2010	16:00
52.625	0.075	0	0	39.8125	0.2	13.4375	0	30.9763	0.0021363	0	12	0	27.1375	105	-0.000274725	38.2375	0	0	0	11/16/2010	17:00
52.75	0.075	0	0	39.8125	0.2	13.4375	0	30.7413	0.0021363	0	12	0	27.2594	105	-0.000274725	38.2375	0	0	0	11/16/2010	18:00
52.875	0.075	0	0	39.8125	0.2	13.4375	0	30.488	0.0021363	0	12	0	27.1375	105	-0.000274725	38.2375	0	0	0	11/16/2010	19:00
52.875	0.075	0	0	39.8125	0.2	13.4375	0	30.2591	0.0021363	0	12	0	27.1781	105	-0.000274725	38.2375	0	0	0	11/16/2010	20:00
53	0.075	0	0	39.8125	0.2	13.3875	0	30.0394	0.0021363	0	12	0	27.0156	105	-0.000274725	38.2375	0	0	0	11/16/2010	21:00
53.125	0.075	0	0	39.8125	0.2	13.4875	0	29.7647	0.0021363	0	12	0	27.0969	106.125	-0.000274725	38.2375	0	0	0	11/16/2010	22:00
53.125	0.075	0	0	39.8125	0.2	13.4875	0	29.5511	0.0021363	0	12	0	26.975	106.125	-0.000274725	38.2375	0	0	0	11/16/2010	23:00
53.25	0.075	0	0	39.8125	0.2	13.35	0	29.3985	0.0021363	0	12	0	27.0562	106.125	-0.000274725	38.2375	0	0	0	11/17/2010	0:00
53.25	0.075	0	0	39.8125	0.2	13.3375	0	29.2489	0.0021363	0	12	0	27.0156	106.125	-0.000274725	38.2375	0	0	0	11/17/2010	1:00
53.375	0.075	0	0	39.9375	0.2	13.375	0	29.1055	0.00122074	0	12	0	26.975	107.25	-0.000274725	38.2156	0	0	0	11/17/2010	2:00
53.375	0.075	0	0	39.9375	0.2	13.375	0	28.9987	0.00122074	0	12	0	26.8938	107.25	-0.000274725	38.2375	0	0	0	11/17/2010	3:00
53.375	0.075	0	0	39.9375	0.2	13.3375	0	28.8797	0.00122074	0	12	0	26.975	107.25	-0.000274725	38.2375	0	0	0	11/17/2010	4:00
53.375	0.075	0	0	39.8125	0.2	13.3625	0	28.7454	0.00122074	0	12	0	26.9344	107.25	-0.000274725	38.2375	0	0	0	11/17/2010	5:00
53.375	0.075	0	0	39.8125	0.2	13.1875	0	28.5714	0.00122074	0	12	0	26.7719	107.25	-0.000274725	38.2375	0	0	0	11/17/2010	6:00
53.5	0.075	0	0	39.8125	0.2	13.325	0	28.4707	0.00122074	0	12	0	26.7313	107.25	-0.000274725	38.2156	0	0	0	11/17/2010	7:00
53.375	0.075	0	0	39.8125	0.2	13.2375	0	28.3456	0.00122074	0	12	0	26.8531	107.25	-0.000274725	38.2375	0	0	0	11/17/2010	8:00
NULL	NULL	0	0	39.8125	0.2	13.375	0	28.2418	0.00122074	0	12	0	26.7719	107.25	-0.000274725	38.2156	0	0	0	11/17/2010	9:00
NULL	NULL	0	0	39.1875	0.1	13.9125	0	28.4585	0.00122074	0	-2.50E-16	0	14.3	100.5	-0.000274725	38.2375	0	0	0	11/17/2010	10:00
NULL	NULL	0	0	39.1875	0.1	13.775	0	41.0718	0.00122074	0	-2.50E-16	0	14.3813	97.5	-0.000274725	38.2156	0	0	0	11/17/2010	11:00
NULL	NULL	0	0	39.1875	0.1	13.8125	0	42.3902	0.00122074	0	-2.50E-16	0	14.3	97.5	-0.000274725	38.2156	0	0	0	11/17/2010	12:00
NULL	NULL	0	0	39.1875	0.1	13.6875	0	43.0738	0.00122074	0	-2.50E-16	0	14.4625	97.5	-0.000274725	38.2156	0	0	0	11/17/2010	13:00

Caisson 3 Level	Pond 1 Level	Pump5 Flow	Pump6 Flow	Caisson 4 Level	Pond 2 Level	Pump7 Flow	Pump8 Flow	Caisson 5 Level	Pond 3 Level	Pond 4 Level	Pump9 Flow	Pump10 Flow	Mirabel Flow	Mirabel Line Pressure	54inch Intertie Flow	River Level	Pump 1 Status Run	Pump 2 Status Run	Pump 3 Status Run	Date	Interval
NULL	NULL	0	0	39.1875	0.1	13.625	0	43.6567	0.00122074	0	-2.50E-16	0	14.3813	96.9375	-0.000274725	38.2156	0	0	0	11/17/2010	14:00
NULL	NULL	0	0	39.1875	0.1	13.85	0	44.1969	0.00122074	0	-2.50E-16	0	14.3813	98.25	-0.000274725	38.2156	0	0	0	11/17/2010	15:00
NULL	NULL	0	0	39.1875	0.1	13.8625	0	44.4746	0.00122074	0	-2.50E-16	0	14.4219	97.125	-0.000274725	38.1937	0	0	0	11/17/2010	16:00
NULL	NULL	0	0	39.1875	0.1	13.8625	0	44.8836	0.0021363	0	-2.50E-16	0	14.2188	97.125	-0.000274725	38.2156	0	0	0	11/17/2010	17:00
NULL	NULL	0	0	39.1875	0.1	13.875	0	45.0972	0.0021363	0	-2.50E-16	0	14.1781	97.125	-0.000274725	38.2156	0	0	0	11/17/2010	18:00
NULL	NULL	0	0	39.3125	0.1	13.8	0	45.2071	0.0021363	0	-2.50E-16	0	14.3	97.125	-0.000274725	38.1937	0	0	0	11/17/2010	19:00
NULL	NULL	0	0	39.3125	0.1	13.9	0	45.3749	0.0021363	0	-2.50E-16	0	14.3813	97.125	-0.000274725	38.1937	0	0	0	11/17/2010	20:00
NULL	NULL	0	0	39.3125	0.1	13.8	0	45.5	0.0021363	0	-2.50E-16	0	14.3	97.125	-0.000274725	38.1937	0	0	0	11/17/2010	21:00
NULL	NULL	0	0	39.3125	0.1	13.7625	0	45.6862	0.0021363	0	-2.50E-16	0	14.2188	97.125	-0.000274725	38.1937	0	0	0	11/17/2010	22:00
NULL	NULL	0	0	39.4375	0.1	13.7875	0	45.793	0.0021363	0	-2.50E-16	0	14.4219	97.125	-0.000274725	38.1937	0	0	0	11/17/2010	23:00
NULL	NULL	0	0	39.4375	0.1	13.7375	0	45.793	0.0021363	0	-2.50E-16	0	14.3406	97.125	-0.000274725	38.1719	0	0	0	11/18/2010	0:00
NULL	NULL	0	0	39.4375	0.1	13.8125	0	45.912	0.0021363	0	-2.50E-16	0	14.4219	97.125	-0.000274725	38.1719	0	0	0	11/18/2010	1:00
NULL	NULL	0	0	39.4375	0.1	13.8125	0	46.0646	0.0021363	0	-2.50E-16	0	14.4219	96	-0.000274725	38.1719	0	0	0	11/18/2010	2:00
NULL	NULL	0	0	39.4375	0.1	14	0	46.0646	0.0021363	0	-2.50E-16	0	14.4625	96	-0.000274725	38.1719	0	0	0	11/18/2010	3:00
NULL	NULL	0	0	39.4375	0.1	13.95	0	46.1715	0.0021363	0	-2.50E-16	0	14.3406	96	-0.000274725	38.15	0	0	0	11/18/2010	4:00
NULL	NULL	0	0	39.4375	0.1	13.975	0	46.1715	0.0021363	0	-2.50E-16	0	14.3406	96	-0.000274725	38.15	0	0	0	11/18/2010	5:00
NULL	NULL	0	0	39.4375	0.1	13.85	0	46.3088	0.0021363	0	-2.50E-16	0	14.5031	96	-0.000274725	38.15	0	0	0	11/18/2010	6:00
NULL	NULL	0	0	39.4375	0.1	13.7625	0	46.3088	0.0021363	0	-2.50E-16	0	14.3813	94.875	-0.000274725	38.15	0	0	0	11/18/2010	7:00
NULL	NULL	0	0	39.4375	0.1	14.0125	0	46.3088	0.0021363	0	-2.50E-16	0	14.3813	95.25	-0.000274725	38.15	0	0	0	11/18/2010	8:00
53.5625	0.08125	0	0	39.4375	0.1	14.0125	0	46.3088	0.0021363	0	-2.50E-16	0	14.4625	95.25	-0.000274725	38.15	0	0	0	11/18/2010	9:00
53.5625	0.08125	0	0	39.4375	0.1	13.9125	0	46.4614	0.0021363	0	-2.50E-16	0	14.3406	95.25	-0.000274725	38.15	0	0	0	11/18/2010	10:00
53.5625	0.08125	0	0	39.4375	0.1	13.8625	0	46.4614	0.0021363	0	-2.50E-16	0	14.3813	95.25	-0.000274725	38.1281	0	0	0	11/18/2010	11:00
53.5625	0.08125	0	0	39.5625	0.1	14.025	0	46.4614	0.0021363	0	-2.50E-16	0	14.2594	95.25	-0.000274725	38.1281	0	0	0	11/18/2010	12:00
43.875	0.08125	13.8375	0	39.5	0.1	13.4875	0	46.5835	0.0021363	0	-2.50E-16	0	27.3406	102.375	-0.000274725	38.1281	0	0	0	11/18/2010	13:00
43.0625	0.08125	13.8375	0	39.5	0.1	13.55	0	46.5835	0.0021363	0	-2.50E-16	0	27.4625	102.375	-0.000274725	38.1281	0	0	0	11/18/2010	14:00
42.5	0.08125	13.7531	0	39.25	0.1	13.425	0	46.5835	0.0021363	0	-2.50E-16	0	27.1375	104.625	-0.000274725	38.1063	0	0	0	11/18/2010	15:00
42.1875	0.08125	13.7531	0	39.125	0.1	13.4875	0	46.5835	0.0021363	0	-2.50E-16	0	27.0562	104.625	-0.000274725	38.1063	0	0	0	11/18/2010	16:00
41.8125	0.08125	13.6406	0	39.125	0.1	13.375	0	46.5835	0.0021363	0	-2.50E-16	0	27.1781	104.625	-0.000274725	38.1063	0	0	0	11/18/2010	17:00
41.5625	0.08125	13.6406	0	38.875	0.1	13.375	0	46.5835	0.0021363	0	-2.50E-16	0	27.3813	104.625	-0.000274725	38.1281	0	0	0	11/18/2010	18:00
41.1875	0.08125	13.6406	0	38.75	0.1	13.2625	0	46.7025	0.0021363	0	-2.50E-16	0	27.1781	104.625	-0.000274725	38.1063	0	0	0	11/18/2010	19:00
40.875	0.08125	13.6406	0	38.5	0.1	13.3625	0	46.7025	0.0021363	0	-2.50E-16	0	27.0969	105.75	-0.000274725	38.1063	0	0	0	11/18/2010	20:00
40.75	0.08125	13.6406	0	38.5	0.1	13.3625	0	46.7025	0.0021363	0	-2.50E-16	0	27.2188	105.75	-0.000274725	38.1063	0	0	0	11/18/2010	21:00
40.5	0.08125	13.6406	0	38.375	0.1	13.4	0	46.7025	0.0021363	0	-2.50E-16	0	27.0562	105.75	-0.000274725	38.1063	0	0	0	11/18/2010	22:00
40.375	0.08125	13.6406	0	38.1875	0.1	13.275	0	46.7025	0.0021363	0	-2.50E-16	0	27.0969	105.75	-0.000274725	38.1063	0	0	0	11/18/2010	23:00
40	0.08125	13.8094	0	37.8125	0.1	13.4375	0	46.7025	0.0021363	0	-2.50E-16	0	27.625	100.875	-0.000274725	38.1063	0	0	0	11/19/2010	0:00
39.75	0.08125	13.9125	0	37.6875	0.1	13.5	0	46.7025	0.0021363	0	-2.50E-16	0	27.625	100.875	-0.000274725	38.1063	0	0	0	11/19/2010	1:00
39.625	0.08125	13.8094	0	37.6875	0.1	13.6	0	46.7025	0.0021363	0	-2.50E-16	0	27.5844	100.875	-0.000274725	38.1063	0	0	0	11/19/2010	2:00
39.375	0.08125	13.8094	0	37.5	0.1	13.6	0	46.7025	0.0021363	0	-2.50E-16	0	27.5844	100.875	-0.000274725	38.1063	0	0	0	11/19/2010	3:00
39.1875	0.08125	13.8094	0	37.375	0.1	13.575	0	46.5957	0.0021363	0	-2.50E-16	0	27.3813	100.875	-0.000274725	38.1063	0	0	0	11/19/2010	4:00
39.125	0.08125	14.2594	0	48.1875	0.1	0	0	46.5957	0.00396741	0	-2.50E-16	0	14.2594	94.3125	-0.000274725	38.1063	0	0	0	11/19/2010	5:00
39.125	0.08125	14.2594	0	48.875	0.1	0	0	46.5957	0.00396741	0	-2.50E-16	0	14.1781	94.3125	-0.000274725	38.1063	0	0	0	11/19/2010	6:00
39.125	0.08125	14.3625	0	49.375	0.1	0	0	46.5957	0.00396741	0	-2.50E-16	0	14.2594	93.1875	-0.000274725	38.1063	0	0	0	11/19/2010	7:00
39.125	0.08125	14.3625	0	49.6875	0.1	0	0	46.8001	0.00396741	0	-2.50E-16	0	14.2594	93.1875	-0.000274725	38.0844	0	0	0	11/19/2010	8:00
39.25	0.08125	14.3625	0	49.9375	0.1	0	0	46.8001	0.00396741	0	-2.50E-16	0	14.2594	92.0625	-0.000274725	38.0844	0	0	0	11/19/2010	9:00
39.25	0.08125	14.4844	0	50.25	0.1	0	0	46.8001	0.00396741	0	-2.50E-16	0	14.3	92.0625	-0.000274725	38.1063	0	0	0	11/19/2010	10:00
39.375	0.08125	14.4844	0	50.5625	0.1	0	0	46.8001	0.00396741	0	-2.50E-16	0	14.3813	90.9375	-0.000274725	38.0844	0	0	0	11/19/2010	11:00
39.375	0.08125	14.4844	0	50.6875	0.1	0	0	46.8001	0.00396741	0	-2.50E-16	0	14.4625	90.9375	-0.000274725	38.0844	0	0	0	11/19/2010	12:00
39.375	0.08125	14.4844	0	50.8125	0.1	0	0	46.8001	0.00396741	0	-2.50E-16	0	14.3	89.8125	-0.000274725	38.0844	0	0	0	11/19/2010	13:00
39.5	0.08125	14.4844	0	50.9375	0.1	0	0	46.9649	0.00396741	0	-2.50E-16	0	14.4625	89.8125	-0.000274725	38.0844	0	0	0	11/19/2010	14:00
39.5	0.08125	14.5875	0	51.0625	0.1	0	0	46.9649	0.00396741	0	-2.50E-16	0	14.4625	89.8125	-0.000274725	38.0844	0	0	0	11/19/2010	15:00
39.6875	0.08125	14.325	0	51.1875	0.1	0	0	46.9649	0.00396741	0	-2.50E-16	0	14.3406	91.5	-0.000274725	38.0844	0	0	0	11/19/2010	16:00
39.6875	0.08125	14.325	0	51.375	0.1	0	0	47.1053	0.0881985	0	-2.50E-16	0	14.3813	92.625	-0.000274725	38.0844	0	0	0	11/19/2010	17:00
39.8125	0.08125	14.4375	0	51.375	0.1	0	0	47.1053	0.00579852	0	-2.50E-16	0	14.3406	92.625	-0.000274725	38.0844	0	0	0	11/19/2010	18:00
39.8125	0.08125	14.4375	0	51.5	0.1	0	0	47.1053	0.00579852	0	-2.50E-16	0	14.2594	92.625	-0.000274725	38.0844	0	0	0	11/19/2010	19:00
39.8125	0.08125	14.4375	0	51.6875	0.1	0	0	47.1053	0.00579852	0	-2.50E-16	0	14.2594	92.625	-0.000274725	38.0844	0	0	0	11/19/2010	20:00
39.9375	0.08125	14.4375	0	51.6875	0.1	0	0	47.1053	0.00579852	0	-2.50E-16	0	14.3406	92.625	-0.000274725	38.0844	0	0	0	11/19/2010	21:00
39.9375	0.08125	14.4375	0	51.6875	0.1	0	0	47.206	0.00579852	0	-2.50E-16	0	14.3813	92.625	-0.000274725	38.0625	0	0	0	11/19/2010	22:00
39.9375	0.08125	14.4375	0	51.8125	0.1	0	0	47.3159	0.00579852	0	-2.50E-16	0	14.1781	92.625	-0.000274725	38.0625	0	0	0	11/19/2010	23:00

Appendix H
Collector 3 Capacity Evaluation
Field Data

WATER QUALITY MONITORING
SONOMA COUNTY WATER AGENCY
RADIAL COLLECTOR WELLS
ERM-WEST 0090596

Date: 10-4-10
Set up time: 1030
Weather: 67° Sunny
Samplers: cy / kw

COLLECTOR WELL 3

Datalogging every 5 sec.

Date	Time	Lateral Number	Diameter (in)	Length (ft)	Elev. of Lateral (ft amsl)	pH	ORP (mV)	Dissolved Oxygen (mg/L)	Conductivity (uS/cm)	Salinity (ppt)	Total Dissolved Solids (g/L)	Turbidity (NTU) YSI	Turbidity (NTU) Hach	Temperature (C)	Comments
10-4-10	1131	1	10	172.5	-29.55	6.89	136.3	6.63	204	0.10	0.142	-1.2	-	20.94	Start
	1132			Turb = 10/5	0.07 NTU	6.69	127.1	6.81	198	0.10	0.139	-1.2	-	20.93	1.5 min
	1134					6.76	114.3	6.70	112.8	0.10	0.139	-1.6	1.31	20.94	3 min - end
	1135	2	10	173.5		6.95	102.4	6.56	219	0.10	0.142	-1.7	-	20.55	Start
	1136			Turb = 10/5	0.08 NTU	6.74	110.2	6.19	201	0.10	0.143	-1.5	-	20.52	1.5 min
	1138					6.66	110.8	6.19	201	0.10	0.143	-1.5	0.74	20.53	3 min - end
	1141	3	10	173.5		6.18	112.6	6.14	204	0.11	0.146	-1.6	-	20.34	Start
	1142			Turb = 10/5	0.06 NTU	6.83	121.8	6.09	204	0.11	0.145	-1.6	-	20.35	1.5 min
	1144					6.82	125.3	6.09	204	0.11	0.146	-1.6	1.73	20.34	3 min - end
	1145	4	10	173.5		6.79	102.0	6.56	201	0.10	0.142	-1.6	-	20.83	Start
	1146			Turb = 10/5	0.05 NTU	6.78	100.7	6.58	201	0.10	0.142	-1.6	-	20.84	1.5 min
	1148					6.77	99.5	6.58	201	0.10	0.142	-1.6	1.37	20.84	3 min - end
	1150	5	10	173.5		7.00	90.1	6.47	201	0.10	0.143	-1.5	-	20.62	Start.
	1151			Turb = 10/5	0.07 NTU	6.98	91.0	6.46	201	0.10	0.143	-1.7	-	20.63	1.5 min
	1153					6.98	90.3	6.47	201	0.10	0.143	-1.6	1.48	20.62	3 min - end
	1155	6	10	134		7.14	84.3	6.35	205	0.11	0.147	-1.5	-	20.28	Start
	1156			Turb = 10/5	0.06 NTU	7.25	79.9	6.30	205	0.11	0.147	-1.6	-	20.27	1.5 min
	1158					7.23	79.6	6.24	205	0.11	0.147	-1.6	0.54	20.29	3 min - end
	1200	Total Discharge		Turb = 10/5	0.06 NTU	7.19	78.3	6.37	202	0.10	0.144	-1.6	-	20.56	Start
	1201	(center of Caisson				7.17	78.8	6.37	202	0.10	0.144	-1.6	-	20.57	1.5 min
	1203	near pump intake)				7.17	79.2	6.38	202	0.10	0.144	-1.7	0.74	20.56	3 min - end

0.80
0.75
0.54

SCWA COLLECTOR No 3
10-4-10

0800 On Site
Visual inspection of well access.

0815 WL meter in caisson shows 61.7' of water
(what level/elev. is probe)

Top Slab Elev 78.05'
℄ -29.55 Flow -33.05

0926 47.85' SWL from access port for transducer
47.85' below top slab
(top of access port ≈ 0.05' above slab)

1250 Hp motors (each one)

No3 on @ 10:00 10-4 (Pump #6)

SWL	47.85 @10:00	8	56.76	26	57.37
15	48.35	8.5	56.81	30	57.47 Meter =52.2'
40	48.32	9	56.94	~~35~~	
1-15	48.60	9.5	56.98		13.95 MGD
1-50	49.47	10	57.04		
2-20	50.60	10.5	57.08	50	57.66 meter 52.0
2-45	51.40	11	57.10	60	57.81 meter 51.8
3	51.80	12	57.14	90	58.03 (1130) meter 51.6
3-30	52.81	13	57.16	13.95 MGD	
4	53.54	14	57.20	120	58.27 (1200) meter 51.3
4-35	54.41	15	57.23	150	58.44 (1230)
5	54.94	16	57.25	180	58.61 (1300) meter 51.0
5.5	55.48	17	57.25	212	58.76 (1337) meter 50.8
6	55.83	18	57.27	290	59.10 (1450) meter 50.5
6.5	56.22	20	57.29	312	59.17 (1512) meter 50.5
7-10	56.47	22	57.35		
7.5	56.63	24	57.33		

FLOW DISTRIBUTION FROM
ALL LATERALS : WELL #3

10-5-10

Q = 13.85 MGD (9618 GPM)

LAT		RPM 1st	2nd	3rd	Use
1	(1355)	232	228	216	227
2	(1400)	256	✓247	✓238	242.5
3	(1404)	198	192	234*	205
			222	218	
4	(1408)	170	✓154	140 ✓146	150
5	(1413)	176	✓170	154 ✓165	167.5
6	(1430)	194	197	189 185	190
				188	
				Σ	1182

for 9618 GPM

NOTE: Meter readings for some laterals with meter in mouth of lateral vary more than desired. Diver inconsistent in hold meter steady — too much flow. Need to use meter readings with meter inserted farther into pipe, eg. at 10', etc.

TUES. 10-5-10 SCWA No. 3

0758 on site

No 3 PWL 61.20' @ 0827

wl meter 48.4

19.745 °C

PWL 61.24 @ 0927

wl meter 48.3

PWL 61.34' @ 1145

wl meter 48.2'

PWL 61.35 @ 1315

Q = 14.11 mgd

wl meter = 48.2'

PWL 61.40 @ 1537

Q = 14.07 mgd

wl meter 48.2'

Q = 13.85 MGD = 9618 GPM

LAT	RPM	%	GPM	GPM/ft	L'
1	227	19.2%	1847	10.71	172.5
2	242.5	20.5%	1973	11.37	173.5
3	205	17.3%	1668	9.61	173.5
4	150	12.7%	1221	7.03	173.5
5	167.5	14.2%	1363	7.86	173.5
6	190	16.1%	1546	11.54	134
	1182		9618		

REVISE (10')

	1998	2010
1	21.9%	19.2%
2	21.7	20.5
3	21.4	17.3
4	11.4	12.7
5	12.1	14.2
6	11.2	16.1

FLOW DISTRIB LAT #1

10-5-10 @ 1020

Q = 14.0 MGD 14.14 MGD

14.17 mgd @ end of test

X	Meter Out		Ave	Back					
0	279/min	266/min	— ignore						
10'	222/min	223	222.5						
20'	176/min	176	176						
30'	157/min	154/59sec	155.5	163/min	164/min				
40'	148/min	149/min	148.5	149					
50'	154/min	152/min	153						
60'	140/min	141/min	140.5						

	Meter Out		Ave	Back
70'	138/min	138/min	138	
80' (1055)	135/min	135/min	135	
90'	132/min	132/min	132	
100'	132/min	131/min	131.5	
110'	117/min	117/min	117	
120'	109/min	103/min	106	
130'	91/min	90/min	90.5	
140	83/min	83/min	83	
150	69/min	70/min	69.5	

	METER OUT		AVE	BACK
160'	50/min	49/min	49.5	
166'	42/min	42/min	42	

debris in bottom of lateral prevents further

18.8% of flow coming from outer 6.5'

18.8% x 1847 gpm = 348 gpm

= 53.51 gpm/ft

10-5-10

1030 Diver back in the well

- collecting water samples

FLOW DISTRIBUTION LAT #2

SCWA WELL NO 3

10-5-10 1415

Q = 14.11 MGD @ 1315

14.08 MGD @ 1415

14.07 MGD @ 1535

X'	Meter Out		Ave	Back
0 (243)	197/min	199/min	198/min	
10'	223/min	222/min	222.5/min	
20' (1428)	183/min	184/min	183.5/min	
30'	157/59sec	160/min	160/min	
40'	147/min	147/min	147/min	
56'	134/min	133/min	133.5/min	127/min 126/min

	Meter Out		Ave	Back
60'	114/min	115/min	114.5/min	
70'	112/min	112/min	112/min	
80'	110/min	111/min	110.5/min	
90'	94/min	94/min	94/min	
100' (1452)	86/min	85/min	85.5/min	
110'	78/min	78/min	78/min	
120'	72/min	71/min	71.5/min	
130'	73/min	73/min	73/min	
140'	67/min	67/min	67/min	

	Meter Out	Ave	Back
150'	55/min	55/min	55/min
160'	51/min	51/min	51/min
170'	34/min	34/min	34/min
173' (1525)	19/min	19/min	19/min

PWL 61.40' @ 1537
wl meter 48.2'

15.3% of Lat #2 flow coming from outer 3.5"
14.07 mgd = 9771 gpm
20.5% of 9771 = 2003 gpm
15.3% of 2003 = 306 gpm in 3.5
87.45 gpm/ft

10-6-10 SCWA No. 3

0755 on site

sunny, 55°

PWL 61.89' @ 0802

WL meter 47.7'

14.18 mgd ± .02

- walkdown to look at Russian River

a) 70' W × 6'-9" × 2.5-3 fps

88 - 157 cfs

b.) 50' W × 1.5' × 1 fps

75 cfs

estimate 80-110 cfs

PWL 61.88' @ 0927

WL meter 47.7'

Q = 14.17 mgd

FLOW DISTRIB. LAT #3

10-6-10

Q = 14.17 MGD } 9840 gpm 0925

PWL = 61.88'

Q = 13.94 MGD @ 1055

9681 gpm

X'	METER IN		AVE	BACK
0 (0940)	195/min	196/min	195.5/min	
10'	198/min	198/min	198/min	
20' (0952)	193/min	194/min	193.5/min	
30' (0957)	182/min	181/min	181.5/min	
40' (1000)	178/mn	177/min	177.5/min	
50'	167/min	166/min	166.5/min	

	IN		AVE	BACK
60' (1006)	165/min	164/min	164.5/min	
70'	171/min	170/min	170.5/min	* 162/min 162/min
80' (1014)	162/min	160/min	161/min	
90'	151/min	150/min	150.5/min	
100' (1020)	137/min	138/min	137.5/min	
110'	124/min	125/min	124.5/min	
120' (1026)	114/min	115/min	114.5/min	
130'	115/min	113/min	114/min	115/min 116/min
140' (1032)	89/min	90/min	89.5/min	

Lat #3 Flow Dist. (SCWA No 3

150'	70/min	70/min	70/min
160' (1038)	54/min	53/min	53.5/min
170' (1042)	37/min	37/min	37/min

Debris, Sand prevents beyond 170'

Finish & back out @ 1055

13.94 MGD @ 1055

18.7% flow from 8

$(17.3\% \times 9681\text{ gpm}) \times 18.7\% = 313.2$ gpm

1675 gpm

$\frac{313.2}{3.5} = 89.5$ gpm/ft

FLOW DISTRIBUTION LAT #4

SCWA Well 3 10-6-10

Q = 13.94 MGD @ 1242

9681 gpm

X'	METER IN		AVE	BACK
0' (1240)	113/min	113/min	113/min	
10'	135/min	135/min	135/min	
20' (1247)	133/min	134/min	133.5/min	

Cable for TV camera is sucked up into pump impellors - cable got past basket on pump suction bell

1307 Pump off

1310 WL meter 56.7

1505 WL meter 58.3

Brought basket to surface SCWA personnel try to fix basket. Diver back in water @ 1455 to reinstall basket on Pump No 6

Restarting Pump #6

No.3 51.21 @ 1527 10-6-10 WL meter 49.2

On @ 1530.5 (EBW) 7.5 59.76 13.92 MGD

15s	51.81	8	59.88		
40s	51.73	9	60.00	41	60.36
1	51.79	10	60.13	13.82 MGD	
1.5	52.23	13.92 MGD			
2	53.10	11	60.17	50	60.41
2.5	54.31	12	60.21	13.84 MGD	
3	55.21	13	60.23		
3.5	56.20	14	60.23	60	60.47
4	56.97	16	60.26	13.87 MGD	
4.5	57.63	18	60.28	WL meter 49.2	
5	58.21	20	60.29		
5.5	58.68	13.92 MGD			
6	59.07	Meter 49.3'			
6.5	59.41	25	60.31		
7	59.59	1600.5 30	60.35		
		156 psi			

10-7-10 No. 3 testing cont

WL meter 48.1
PWL 61.55 @0806
Q = 13.91 MGD

PWL 61.51 0927
WL meter 48.2
Q = 13.82 mgd

PWL 61.61 @1300
WL meter 48.0
Q = 13.87 MGD

1325 Diver enters caisson for afternoon testing of flow in Lat #5

PWL 61.60 @1504
WL meter 48.0 / 48.1

SCWA No. 3 UBH 10-7-10

FLOW DISTRIBUTION LATERAL #4

1010 Start Q = 13.90 MGD

PWL = 61.51 @ 0930

13.90 MGD @ 1030

X	METER IN		AVE	BACK
0' (1012)	113/min	112/min	112.5/min	
10'	130/min	130/min	130/min	
20' (1025)	127/min	128/min	127.5/min	
30'	122/min	122/min	122/min	
40'	117/min	116/min	116.5/min	
50' (1030)	113/min	112/min	112.5/min	
60'	121/min	120/min	120.5/min	119/min 119/min

	METER IN		AVE	BACK
70'	113/min	112/min	112.5/min	
80' (1043)	111/min	111/min	111/min	
90'	105/min	104/min	104.5/min	100/min 102/min
100' (1049)	111/min	109/min	110/min	
110'	105/min	105/min	105/min	
120' (1059)	95/min	95/min	95/min	
130'	87/min	88/min	87.5/min	
140' (1105)	75/min	75/min	75/min	
150'	57/min	56/min	56.5/min	

Well 3 LAT #4 continued

	METER IN	AVE	BACK
160' (1113)	26/min	26/min	26/min
170'	13/min	13/min	13/min

± 5' beyond 170, hit end of line.

13.93 MGD @ 1115

173' (six inches back from end)

8 rev/min 8 rev/min

13.89 MGD @ 1131

FLOW DISTRIBUTION LAT #5

in WELL No 3 10-7-10

Q = 13.87 MGD @ 13.00 & 1330

PWL 61.61 WL meter 48.0

13.85 MGD @ 1402

13.83 MGD @ 1502

X'	METER IN		AVE	BACK
0 (1332)	164/min	166/min	165/min	
10'	153/min	153/min	153/min	
20' (1343)	153/min	154/min	153/min	
30'	151/min	149/min	150/min	
40'	151/min	152/min	151.5/min	
50' (1354)	152/min	153	152.5/min	

LATERAL #5 CONTINUED

X'	METER IN		AVE	BACK
60'	144/min	145	144.5/min	144 min
70' (1400)	152/min	151/min	151.5/min	
80'	134/min	133/min	133.5/min	
90' (1409)	120/min	119/min	119.5/min	
100'	103/min	104/min	103.5/min	
110'	99/min	99/min	99/min	101/min 100/min
120' (1420)	101/min	101/min	101/min	101/min
130'	106/min	106/min	106/min	102/min 106/min
140' (1426)	101/min	102/min	101.5/min	

WELL No. 3 Lateral #5

	METER IN		AVE	BACK
150'	95/min	95/min	95/min	
160'	78/min	78/min	78/min	
170' (1438)	33/min	31/min	32/min	

13.83 MGD @ 1502

10-8-10 SCWA Well No.3

Q = 14.08 MGD @ 0823
PWL 61.93 @ 0825
WL meter 47.7'

Q = 14.11 MGD @ 0941
PWL 61.96 @ 0942
WL meter 47.6

PWL 61.98 @ 1139
Q = 14.08 MGD @ 1140
WL meter = 47.6'

FLOW DISTRIBUTION FOR
LATERAL #6 SCWA Well No3
10-8-10 Q = 14.11 MGD @0941
Q = 14.09 MGD @1012
14.10 MGD @ 1055 (end)

X'	METER IN		AVE	BACK
0' (0945)	168/min	170/min	169/min	
10'	152/min	152/min	152/min	
20' (0953)	146/min	147/min	146.5/min	
30'	141/min	140/min	140.5/min	
40' (1000)	139/min	138/min	138.5/min	137/min
50'	120/min	122/min	121/min	~~119/min~~ 120/min
60' (1007)	124/min	123/min	123.5/min	

FLOW DISTRIB. LAT #6 SCOA No 3

X'	METER IN		AVE	BACK
70' (1012)	121/min	120/min	120.5/min	
80'	117/min	117/min	117/min	
90'	93/min	93/min	93/min	
100' (1023)	68/min	68/min	68/min	
110'	50/min	50/min	50/min	
120' (1032)	33/min	27/min 26/min	26.5/min	
123' (1037)	17/min	17/min	17/min	

Debris in lateral #6 blocks further movement of meter & camera past 123'

Appendix I
Collector 4 Capacity Evaluation
Field Data

WATER QUALITY MONITORING
SONOMA COUNTY WATER AGENCY
RADIAL COLLECTOR WELLS
ERM-WEST 0090596

Date: 11/8/10
Set up time: 1100
Weather: cool, sunny
Samplers: KW

COLLECTOR WELL 4

Date	Time	Lateral Number	Diameter (in)	Length (ft)	Elev. of Lateral (ft amsl)	pH	ORP (mV)	Dissolved Oxygen (mg/L)	Conductivity (uS/cm)	Salinity (ppt)	Total Dissolved Solids (g/L)	Turbidity (NTU) YSI	Turbidity (NTU) HACH	Temperature (C)	Comments
	1155	1	10	124.5	-33.05	6.93	73.2	7.51	176	0.10	0.135	2.7	[redacted]	17.00	start
	1156					6.95	71.8	7.45	176	0.10	0.135	2.7	0.21	17.01	1.5 min
	1158					6.95	72.2	7.46	176	0.10	0.135	2.7		17.01	3 min - end
	1159	2	10	172.5		6.94	74.6	7.60	181	0.10	0.139	2.7	[redacted]	16.88	start
	1200					6.92	74.4	7.52	181	0.10	0.139	2.7	0.12	16.87	1.5 min
	1202					6.93	74.6	7.51	181	0.10	0.139	2.7		16.87	3 min - end
	1130	3	10	172.5		7.06	72.9	7.48	178	0.10	0.138	2.7	[redacted]	16.73	start
	1131					7.06	70.7	7.47	178	0.10	0.137	2.7	0.10	16.77	1.5 min
	1133					7.06	70.1	7.50	178	0.10	0.137	2.7		16.77	3 min - end
	1135	4	10	152.5		7.12	70.6	7.12	183	0.10	0.139	2.7	0.10	17.33	Start
	1136					7.11	69.0	7.03	183	0.10	0.139	2.7		17.32	1.5 min
	1138					7.13	68.5	7.04	183	0.10	0.139	2.7		17.34	3 min - end
	1139	5	10	110.5		7.14	69.0	7.38	187	0.10	0.141	2.7	0.13	17.71	start
	1140					7.16	67.8	7.44	218	0.10	0.141	2.7		17.71	1.5 min
	1142					7.18	67.1	7.44	187	0.10	0.141	2.7		17.72	3 min - end
		6	Blank Port			CEMENTED OVER									
	1143	7	10	172.5		7.21	69.5	8.78	178	0.10	0.139	2.7	0.14	16.20	Start
	1144					7.28	67.2	8.40	178	0.10	0.139	2.6		16.19	1.5 min
	1146					7.27	67.2	8.98	178	0.10	0.139	2.7		16.16	3 min - end
	1147	8	10	96.5		7.01	70.8	7.43	175	0.10	0.134	2.7	0.24	16.92	start
	1148					7.04	68.5	7.16	175	0.10	0.134	2.7		16.92	1.5 min
	1150					7.03	68.7	7.17	175	0.10	0.134	2.7		16.93	3 min - end
	1151	Total Discharge				7.14	69.0	7.74	179	0.10	0.138	2.7	0.10	16.82	start
	1152					7.16	67.3	7.79	179	0.10	0.138	2.7		16.84	1.5 min
	1154					7.18	64.7	7.78	179	0.10	0.138	2.7		16.84	3 min - end

SCWA WELL No: 4 11-8-10

0800 On site - move equipment from WELL No 5 to WELL No 4

WELL 4 Caisson 42.81' @ 0827 below rim of floor hatch

WL meter 66.0'

#8 Pump against caisson wall
- couldn't get screen around suction bell.
- will use #7 Pump - although this pump blocks access to Lateral Wall

Ponds 2 & 3 are wet.

No. 4

Pump On 10:02 11-8-10

SWL	42.81	
1	43.39	(1003)
1.5	43.75	
2	44.82	
2.5	—	
3	46.88	(1005)
3.5	48.03	
4	49.28	
4.75	50.37	
5	51.02	(1007)
6	52.17	(1008)
7	52.90	
8	53.41	(1010)
9	53.59	
10	53.76	(1012)
11	53.89	
12	53.96	
13	53.90	(1015)
14	54.00	(1016)
15	53.99	(1017)
16	54.04	
17	54.06	
18	54.09	(1020)
19	54.05	
20	54.10	(1022) 13.94 MGD
22	54.10	(1024)
25	54.25	(1027)
27	54.35	(1029)
28	54.36	(1030)
30	54.23	(1032)

WL meter 54.6'

ST 54.25 1042

ST 54.28' @ 1044

ET 54.26 "

13.90 MGD @ 1050

11-8-10 SCWA No. 4

13.80 - 13.90 MGD @ 1235

Caisson 54.98 @ 1248

Q 13.80 MGD

WL meter 53.8'

Caisson 55.60 @ 1520

Q = 13.76 MGD ± .03

WL meter 53.1'

130 psi

No. 4 Well

- Top Slab 77.95
- ℄ -33.05
- Plug -35.75

77.95
-42.81
+35.14 SWL

Russian River est. +29' msl

WL meter 53.4

Caisson 55.39 @ 1425

Q = 13.7 MGD ± 0.05

11/8 #1 198/192

#2 223/227

WELL No. 4 - FLOW DISTRIBUTION AMONG ALL LATERALS 1045 11/9/10

Q =

	L'	AT VALVE	AT 10' 1st	2nd	AVE.
#1	124.5	194/206	—	—	(196) est.
#2	172.5	207/202	200	201	200.5
#3	172.5	212/212	202/208/209		208.5
#4	152.5	131-149 143-162/159	154	154	154
#5	110.5	121/119	119/116/118		118
#6	BLANK				
#7	172.5	150-148 160-156	172	171	171.5
#8	96.5	111/109	113	113	113

Q = 14.15 MGD ± 0.1 @ 1040

14.15 MGD ± 0.1 @ 1130

@14.15 MGD

LATERAL	L'	RPM	%	GPM	GPM/FT
#1	124.5	196	16.87	1658	13.32
#2	172.5	200.5	17.26	1696	9.83
#3	172.5	208.5	17.95	1764	10.23
#4	152.5	154	13.26	1303	8.54
#5	110.5	118	10.16	998	9.03
#7	172.5	171.5	14.77	1451	8.41
#8	96.5	113	9.73	956	9.91
TOTALS	1001.5	1161.5	100.0	9826	

10'/valve

		LATERAL	% Q	% L	RATIO % Q/% L
#1					
#2	.98	#1 R	16.87	12.43	1.36
#3	.983	#2 R	17.26	17.22	1.002
#4	.96	#3 P	17.95	17.22	1.042
#5	.983	#4 L	13.26	15.23	0.871
#7	1.035	#5 L	10.16	11.03	0.921
#8	1.071	#7 P	14.77	17.22	0.858
		#8 R	9.73	9.63	1.01

SCWA WELL No 4 11/9/10

Sunny 60 / 50°

Caisson 59.36' @ 0802

Q = 13.95 MGD ± .05

WL meter 49.3'

124 psi

Caisson 60.10' @ 1016

Q = 14.25 MGD ± .05

WL meter 48.8

Caisson 60.45 @ 1335

Q = 14.2 MGD ± 0.1

118 psi

WL meter 48.2'

FLOW PROFILE LATERAL #8 WELL 4

11/9/10

	IN 1st	IN 2nd	Q = AVE	BACK	
10' (1150)	113	113	113	116	116
20' (1155)	112	112	112		
30' (1159)	103	102	102.5		
	← break to switch divers				
redo 30' (1405)	103	102	✓OK		
40' (1410)	93	92	92.5		
50'	78	79	78.5		
60' (1416)	74	75	74.5		
70'	56	56	56		

FLOW PROFILE LATERAL #8 WELL 4 11/9/10

	IN 1st	IN 2nd	AVE	BACK
80' (1421)	35	35	35	
89'	14	15	14.5	
96' (1435)	4/1min	✓11/2min	5.5	
96.5-97?	4	8/2 min	4	

Q = 13.93 MGD @ 1322

Caisson 60.41 @ 1504

124 psi

WL meter 48.4

SCWA Well No 4 11/10/10

Q = 13.85 MGD ± 0.05
Caisson 62.66 @ 0940
123 psi
WL meter 46.0'

@ 1255
Q = 13.6 MGD ± 0.05
WL meter 46.2'

Q = 13.55 ± 0.1 MGD @ 1355

Caisson 62.79 @ 1538
131 psi
Q = 13.55 MGD ± 0.1
WL meter 45.9'

FLOW PROFILE LATERAL #5

Well 4 11/10/10 1350

Q = 13.55 MGD ± 0.1

	IN 1st	2nd	3rd	Ave	BACK
10' (1350)	106	107		106.5	
20'	108	107		107.5	
30' (1357)	104	104		104	
40'	102	102		102	
50' (1403)	98	98		98	
60'	86	86		86	
70 (1410)	65	65		65	
80	54	53		53.5	

FLOW PROFILE LATERAL #5 WELL 4

11/10/10 Q = 13.55 ± 0.1 MGD 1441

	IN 1st	2nd	3rd	Ave	BACK
90 (1415)	41	41		41	
100	24	25		24.5	
110 (1420)	11	23/2min		11.5	
112	11/2min			5.5	

→ see digging head

Lateral has significant encrustation – brown/yel-brn hard scale – slots obscured near end & mostly in outer half – some slots (not all) visible in inner half length

SCWA WELL No 4 11/12/10

Caisson 65.01 − .02 = 64.99'
@ 10:10
WL meter 43.8' 13.5 psi
Q = 13.50 MGD ± 0.1
13.39 − 13.58
Metal Platform (ground level)
3.48' above top slab
(pump floor)

ponds North & NE of
Well 4 are now dry

Caisson 65.02 − .02 = 65.00 @1210
Q = 13.42 MGD 13.36 − 13.52
WL meter 43.8 13.5 psi

12-8-10 on site Well No. 4 @ 0800

Pump #8 on @ 14.7 mgd
(was 13.4 - 13.6 mgd on 11/12/10)
PWL 70.21' @ 0806 (64.99)
WL meter head 38.6' (43.8)

±0830 Pump #8 turned off,
Pump #7 turned on
Coll. No. 3 on but is
being turned off

Pump #7 13.85 - 14.0 mgd
@0839
13.95 - 14.05

PWL 69.59 @ 0842
meter 39.2' head
39.2' @ 0970

12-8-10 Well No 4

Caisson 69.35 @ 1022
Meter 39.4'
Q = 13.86 - 14.02 mgd

Caisson 69.25 @ 1105
120.5 psi
Q = 13.81 - 14.05 mgd
meter 39.5' head

Q = 13.83 - 14.11 mgd
@ 1130
meter 39.5' head

Water retention / recharge ponds are all empty

Lateral No. 5 @ 10'
@ 1135 1st 108
2nd 107
Ave 107.5

Lateral No. 4 has sand & debris in bottom of screen starts about ± 145'
- camera held up about 1' short of back of digging head.

Q = 13.87 - 14.06 mgd
@ ± 13.92 @ 1240

FLOW PROFILE LATERAL #4 WELL 4

12-8-10 Q = ± 13.9 mgd @ 1105

Q = 14.15 mgd @ 1225

	IN RPM 1st	2nd	Ave	BACK	
10' (1140)	147	148	147.5		
20' (1143)	133	132	132.5		
30'	120	121	120.5		
40' (1147)	112	111	111.5		
50'	109	109	109	108	109
60' (1153)	95	95	95		
70' (1156)	95	94	94.5	97 (1227)	98

LATERAL #4 WELL 4

	1st	2nd	Ave	BACK	
80'	81	80	80.5		
90' (1203)	74	74	74	76	76
100' (1205)	71	71	71		
110'	64	64	64		
120' (1210)	66/90 sec = 56.6	55	55.5 55.8	58	58
130' (1214)	49	49	49		
140'	35	35	35		
150' (1220)	20	20	20		
153.5	14	14	14	close to digging head	

12-8-10

Lateral No. 8 @ 10' @ 1244

1st 119
2nd 119 } Ave 119

Caisson 68.97' @ 1327

Q = 13.87 - 14.07 mgd

13.86 14.18

± 13.97 mgd

meter 39.8' head

Lateral #8 118 @ 1350 } 1185
119 Ave 118.5

(no real change from 1244)

Q = 13.84 - 14.03 mgd

± 13.93 - 13.96 @ 1530

FLOW PROFILE LATERAL #7 WELL 4

Q = 13.95 - 14.13 @ 1355 12/8/10

	IN RAM 1st	2nd	AVE	BACK	
10' (1406)	182	181	181.5		
20'	182	182	182		
				(1515)	
30' (1412)	171	172	171.5	171	173
	199/70 sec = 170.6		171.3	~~174~~	173
40'	173	174	173.5		
				(1510)	
50' (1419)	168	169	168.5	169	170
				170	
60'	169	170	169.5		
	197/70 = 168.8				
70' (1424)	170	170	170		
80' (1427)	156	156	156		

FLOW PROFILE LATERAL #7 WELL 4

	1st	2nd	AVE	BACK
90'	145	145	145	
100' (1433)	133	132	132.5	
110'	124	124	124	
120' (1438)	114	114	114	115 (1505')
130'	94	93	93.5	
140' (1444)	78	78	78	
150'	64	64	64	
160' (1451)	59	59	59	

Lateral #7 Well 4

	1st	2nd	AVE
170' (1453)	41	39	40
		40	
172 (1500)	23	19	
		21	

Can see slots in screen @ first 30' → 70' still see some

- still have partial slots beyond 70' but slightly less distinct.
- slots look a little more encrusted beyond 110'
- tubercles extend down @ 160'
- hit back of head at ± 173'

Q = 13.93 - 13.96 mgd @ 1530

meter 40.1 head

Well No. 4 12-8-10
Caisson 68.59 @1555
meter 40.2' head
Q = 13.94 - 14.12
13.92
± 14.03 mgd ± .05

12-9-10 (Thurs)
SCWA Well No 4
Q = 13.57 - 13.72 mgd
@ 0800 13.60 ± 0.03

Caisson 69.48 @ 0803
meter 39.2' head

Well No 3 was turned on
≈ 16 hrs ago ie. ≈ 1600 hrs
yesterday afternoon. Will
be turned off again this
morning about ± 0950?

Caisson 69.49' @ 1030
meter 39.2' head
Q = 13.69 - 13.85 mgd
± 13.75 ± 0.04

FLOW PROFILE LATERAL #2 WELL 4

12-9-10 Q = 13.75 mgd @ 1030

	IN RPM 1st	2nd	AVE	BACK	
10' (1053)	209	207	208		
20'	193	195	194		
30' (1100)	173	172	172.5		
40'	162	162	162		
50' (1106)	146	146	146	144 (1157)	145
68'	150	150	150	153	152
70' (1111)	156	157	156.5		

13.85 mgd

LATERAL #2 WELL 4

	IN 1st	2nd	AVE	BACK
80' (1114)	148	148	148	
90'	139	139	139	
100' (1120)	131	131	131	131
110'	127	127	127	
120' (1126)	119	119	119	
130'	102	103	102.5	
140' (1131)	86	86	86	
150'	68	66	67	

152.5

13.74 mgd ± .0

LATERAL #2 WELL 4

	1st	2nd	Ave
160' (1138)	48	46	47
170' (1148)	21	21	21
172.5 (1' from digging head)	6	6	6

End 173.5' (?)

0-60 slots look open, pipe relatively clear

@ 60' some scale showing on pipe surface but slots still relatively visible

@ 90' slots not very visible

@ 150' debris, gul in bottom of pipe

video footage is 10' short

FLOW PROFILE LATERAL #3 WELL 4

12-9-10 Q = 13.66 - 13.92

	IN RPM 1st	2nd	AVE	BACK	
10' (1205)	216	217	216.5		
20' (1217)	194	194	194		
30'	184	184	184		
40'	178	176	177		
50' (1226)	159	160	159.5	164	164
60'	153	153	153	152 (1317)	
70' (1232)	137	138	137.5		

FLOW PROFILE CATERAC #3 WELL 4

12/9/10	1st	2nd	AVE	BACK			1st	2nd	AVE	
80' (1234)	128	128	128			170'	31	32	31.5	
90'	119	119	119			1' from dig. head (1305)	18	19	18.5	@ hole
							11	11	11	
100' (1240)	111	111	111							
110'	100	100	100	103	104 103.5					
120' (1246)	102	102	102	104 (1311)	104 13.85 mgd					
130'	89	89 104/70	89							
140' (1252)	83	83	83							
150'	68	68	68							
160' (1257)	53	53	53							

@ 90' some scale on bottom of pipe - otherwise slots seem clean

@ 120' bottom encrustation broader ± 140°

@ 140' start seeing debris & gvl in bottom of screen

12-9-10 well 4

Q = 13.61 – 13.97 mgd
13.85 ± 0.05 @ 1350

Caisson 68.99 @ 1352
- meter 39.8' head
(well 3 must now be off)

meter 39.9' head @ 1442

River 100' w × 5-6' Deep
@ 3-4 fps
elev ± 34 ?
(surveyed +33.85')

Caisson 68.72 @ 1532
121 psi meter 40.1'
Q = 13.77 – 13.92
13.84 mgd ± .02

Pump #7 off @ 1546

meter 51.0' @ 1550
(? 51.4) @ 1606
51.6 @ 1607
51.7 @ 1615

Appendix J
Collector 5 Capacity Evaluation
Field Data

WATER QUALITY MONITORING
SONOMA COUNTY WATER AGENCY
RADIAL COLLECTOR WELLS
ERM-WEST 00090596

Date: 10-18-10
Set up time: 0955
Weather: 60° overcast
Samplers: CY / KW

COLLECTOR WELL 5

Datalogging every 5 sec.

Date	Time	Lateral Number	Diameter (in)	Length (ft)	Elev. of Lateral (ft amsl)	pH	ORP (mV)	Dissolved Oxygen (mg/L)	Conductivity (uS/cm)	Salinity (ppt)	Total Dissolved Solids (g/L)	Turbidity (NTU) YSI	Turbidity (NTU) Hach	Temperature (C)	Comments
10-18-10	1040	1	10	168	-17.79	7.04	32.4	7.24	223	0.12	0.163	-0.3	~~0.09~~	18.67	Start
	1041					7.06	35.8	7.01	222	0.12	0.163	-0.3	0.07	18.67	1.5 min
	1043					7.08	39.9	6.90	220	0.12	0.163	-0.3		18.67	3 min -end
	1044	2	10	87		7.11	41.8	6.83	221	0.12	0.163	-0.5	~~0.13~~	18.66	Start
	1045					7.11	41.4	6.78	221	0.12	0.163	-0.4	~~0.10~~	18.66	1.5 min
	1047					7.11	40.9	6.75	221	0.12	0.163	-0.4	0.09	18.67	3 min - end
	1048	3	10	123		7.15	39.9	6.78	220	0.12	0.163	-0.4	0.09	18.69	Start
	1049					7.12	39.1	6.77	220	0.12	0.163	-0.5		18.70	1.5 min
	1051					7.12	38.4	6.76	220	0.12	0.163	-0.5		18.70	3 min -end
	1052	4	10	175		7.19	37.0	6.82	217	0.12	0.160	-0.3	0.15	18.78	Start
	1053					7.20	36.5	6.89	216	0.12	0.159	-0.3		18.79	1.5 min
	1055					7.23	35.6	6.87	215	0.12	0.158	-0.4		18.79	3 min -end
	1056	5	10	175		7.23	38.1	6.89	214	0.12	0.158	-0.4	0.12	18.69	Start
	1057					7.26	36.7	6.90	213	0.12	0.157	-0.4		18.67	1.5 min
	1059					7.30	35.7	6.89	212	0.11	0.157	-0.4		18.67	3 min - end
	1100	6	10	124		7.20	37.4	6.85	212	0.11	0.156	-0.5	0.05	18.72	Start
	1101					7.22	34.6	6.88	211	0.11	0.156	-0.5		18.72	1.5 min
	1103					7.26	33.6	6.86	211	0.11	0.156	-0.5		18.72	3 min - end
	1104	7	10	70		7.13	37.8	6.79	218	0.12	0.158	-0.3	0.05	19.44	Start
	1105					7.03	37.0	6.81	219	0.12	0.159	-0.3		19.54	1.5 min
	1107					7.00	37.1	6.80	219	0.12	0.159	-0.4		19.53	3 min -end
	1108	8	10	74		7.01	37.3	6.79	217	0.11	0.157	-0.5	0.03	19.66	Start
	1109					6.95	36.6	6.81	215	0.11	0.156	-0.5		19.69	1.5 min
	1111					6.95	36.2	6.80	216	0.11	0.156	-0.6		19.69	3 min -end
	1111	9	10	133		6.95	37.1	6.80	216	0.11	0.157	-0.5	0.05	19.36	Start
	1112					6.94	36.3	6.80	215	0.11	0.157	-0.6		19.34	1.5 min
	1114					6.96	35.4	6.79	215	0.11	0.157	-0.5		19.33	3 min-end

WATER QUALITY MONITORING
SONOMA COUNTY WATER AGENCY
RADIAL COLLECTOR WELLS
ERM-WEST 0090596

Date:
Set up time:
Weather:
Samplers:

COLLECTOR WELL 5

Date	Time	Lateral Number	Diameter (in)	Length (ft)	Elev. of Lateral (ft amsl)	pH	ORP (mV)	Dissolved Oxygen (mg/L)	Conductivity (uS/cm)	Salinity (ppt)	Total Dissolved Solids (g/L)	Turbidity (NTU) YSI	Turbidity (NTU) Hach	Temperature (C)	Comments
10-18-10	1115	10	10	175		7.05	34.5	6.76	215	0.12	0.158	-0.5	0.11	18.79	Start
	1117					7.10	34.6	6.56	214	0.12	0.158	-0.6		18.73	1.5 min
	1118					7.11	34.5	6.56	214	0.12	0.158	-0.6		18.74	3 min-end
	1119	Total Discharge				7.10	34.4	6.63	212	0.11	0.156	-0.5	0.09	18.85	Start
	1120	(center of				7.15	33.0	6.71	212	0.11	0.156	-0.5		18.87	1.5 min
	1122	caisson near				7.15	32.9	6.70	212	0.11	0.156	-0.5		18.88	3 min -end
		pump intake)													

10/18/10 COLLECTOR # 5 SCWA

onsite 0800

measure air from hatch

Caisson 41.83 @ 0910 (scw)

air meter 56.85

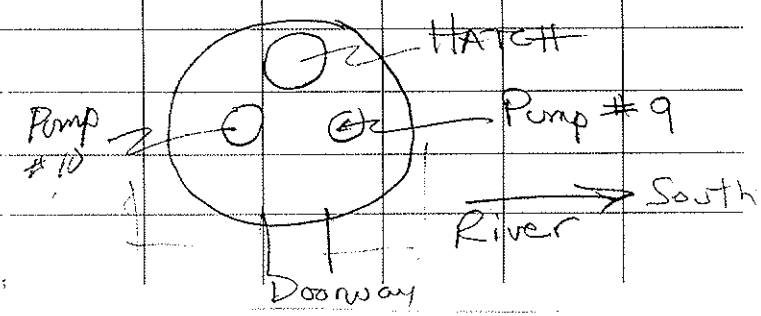
Caisson 41.85 @ 0951 scw

Caisson 41.83 @ 1011

Caisson 41.84 @ 10:28

Ladder between Lateral #9

and Lateral #10



CRT Well #5 SCWA 10/18/10

ON @	1031.59	51.207	4:45		54.25	14:00 min				
42:46	10	51.6[illegible]	5:00		54.32	16:00 min				
42:52	20 sec	51.94	5:25		54:37	18:00				
42:58	35 sec	52:25	6:00		54:40	20:00 min	WL meter 44.3'			
42:62	45 sec	52.49	25		(EBW	1052.40 sec	= 20 min)			
42:73	1:15 min	52.70	6:45		∴ Q =	13.40 MGD				
42:87	1:30 min	52.95	7:00							
43:46	1:55	53.16	7:30		54.54	25 min				
44.10	2:05	53:37	7:50		54.62	30 min				
45,00	2:25	53.51	8:15		54.68	35				
45:80	2:45	53.65	8:40		54.74	40				
46:61	3:00	53.73	8:55		54.83	45				
47.62	3:20	53.86	9:25		54.87	50				
48:37	3:40	53.94	9:55		54.89	55				
49.26	3:55	54.02	10:25		54.96	60	@ 1132.40	EBW		
49:97	4:15	54.06	10:45		WL meter 43.8'					
50.43	4:30	54.15	11:55		13.38 MGD					

CRT Well #5 Cont. 10/18/10

55.07 70 min (13:23')

55.24 80

55.61 100 meter 43.2'

Q = 13.56 MGD

56.24 @ 13:12:40 (±160 min?)

meter 42.6 Q = 13.55 MGD

130 psi

56.32 @ 1325 (172.5 min?)

57.28 @ 1550

meter 41.6' Q = 13.53 MGD

FLOW DISTRIBUTION 10/18/10

FROM ALL LATERALS WELL #5

- held meter @ 10' Start 1345

	L'	1st	2nd	Ave
#1	168'	167/min	167/min	167/min
#2	87'	51/min	52/min	51.5/min
#3	123'	55/min	57/min	56/min
#4	175'	130/min	131/min	130.5/min
#5	175'	199/min	201/min	200/min
#6	124'	187/min	187/min	187/min
#7	70'	—		
#8	74'	46/min	45/min	45.5/min
#9	133'	89/min	89/min	89/min
#10	175'	170/min	171/min	170.5/min

13.54 MGD @ 1355

13.50 MGD @ 1557 meter 41.7'

FLOW PROFILE LATERAL #2 WELL No.5

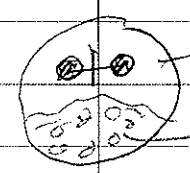
10/18/10

	IN 1st	IN 2nd	IN AVE	BACK
10' 1417	51/min	52/m	51.5/min	
20' (1420)	40/min	39/min	39.5/min	
30'	39/min	39/min	39/min	
40'	40/min	41/min	40.5/min	
50'	32/min	33/min	32.5/min	
60'	23/min	26/min	24.5/min	
70	14/min	14/min	14/min	
80'	6/min	6/min	6/min	
84'	14/min	14/min	14/min	pile & gvl @ hi Veloc.

#9 @ mouth 47/min 44/min
AVE 45.5 x 1.08 = 49

Redo #8 @ mouth
41/min 43/min = 42
∴ 42 vs 45.5 @ 10' (1.08x)

Redo #6 @ mouth
141/min 141/min = 141
141 vs 187 @ 10' (1.326 x)



water moisture higher velocity in reduced area of flow

→ @83' 3/min 2/min 2.5/min

Tues 10/19/10 SCWA WELL No 5

Note: ERM transducer set in pipe access thru top slab.
Top of access pipe ≈ 0.27' above floor slab

Caisson 58.75' @ 0803 below hatch
Q = 13.12 MGD
WL meter 40.1'

0930 Diver in well
Q = 13.10 MGD @ 0930
meter 40.1' water
Q = 13.08 MGD @ 1010
135 psi

Q = 13.10 MGD @ 1135
Caisson 58.78 @ 1137
WL meter 40.1'

1220 Diver in well
Caisson 58.82 @ 1403
WL meter 40.0

FLOW PROFILE LAT #10 WELL #5

IN Q = 13.10 MGD @ 0930

X'	1st	2nd	Ave	BACK	
10' (0935)	157/min	158/min	157.5/min	159/min	158/min
20'	160/min	159/min	159.5/min		
30' (0941)	155/min	156/min	155.5/min		
40'	148/min	149/min	148.5/min		
50' (0947)	138/min	137/min	137.5/min		
60'	138/min	136/59s	138/min		
70' (0951)	131/min	131/min	131/min		
80' (0956)	125/min	125/min	125/min	122/min	122/min

Lateral #10 looks relatively clean in 1st 30' - 150'?

IN

X'	1st	2nd	Ave	BACK
90	113/min	112/min	112.5/min	
100' (1001)	105/min	106/min	105.5/min	
110'	95/min	96/min	95.5/min	
120' (1007)	84/min	84/min	84/min	
130'	70/min	71/min	70.5/min	
140' (1012)	62/min	63/min	62.5/min	
150'	55/min	56/min	55.5/min	
160' (1020)	53/min	55/min	54/min	

FLOW PROFILE LAT #10 Well #5 SCWA WELL No. 5 10/18/10 1345-1415

(cont.)

Q = 13.54 MGD (9403 GPM)

X	IN 1st	IN 2nd	AVE
170' (1022)	25/min	26/min	25.5/min
174' (1025)	15/min	15/min	15/min

LATERAL	L'	AVE RPM	%	GPM	GPM/FT
#1	168'	167	14.6%	1370	8.16
#2	89'	51.5	4.5%	422.6	4.86
#3	128'	56	4.9%	459.5	3.74
#4	175'	130.5	11.4%	1070.8	6.12
#5	175'	200	17.4%	1641.0	9.38
#6	124'	187	16.3%	1534.3	12.37
#7	70'	est 49	4.28%	402.0	5.74
#8	74'	45.5	3.97%	373.3	5.05
#9	133'	89	7.77%	730.3	5.49
#10	175'	170.5	14.88%	1399	7.99
TOTALS	1304'	1146	100.0	9402.8	Ave 7.21

9402.5 w/ round off Q's

Use 460 gpm w/ #3

Meter went to 175' to end of digging head. Velocity through sandline hole at digging head increased flow - pulled back one foot to 174' to do flow meter measurement

PUMP BLOCKING #7 LATERAL
- CAN'T INSERT CAMERA/FLOWMETER

FLOW PROFILE LATERAL #1 WELL #5

10/19/10 1227

Q = 13.10 MGD @ 1135 13.09 @ 1225

SCWA WELL No. 5

Q = 13.54 MGD (9403 GPM)

1304' TOTAL

	IN			
X'	1st	2nd	AVE	BACK
10' (1227)	162/min	162/min	162/min	
~~20'~~	~~177/min~~	~~170/min~~		
18'	173/min	174/min		

SANDLINE PIPE in lateral at 20' - can't get past.

Mag influence higher velocity at end 18' - 20'

LAT	L'	% L	% Q	RATIO Q/L
#1 R	168'	12.9%	14.6%	1.13
#2 R	87'	6.7%	4.5%	0.67
#3 P/R	123'	9.4%	4.9%	0.52
#4 P/R	175'	13.4%	11.4%	0.85
#5 L/P	175'	13.4%	17.4%	1.30
#6 L	124'	9.5%	16.3%	1.72
#7 L	70'	5.4%	4.3%	0.80
#8 L	74'	5.7%	3.97%	0.70
#9 P/L	133'	10.2%	7.77%	0.76
10 R	175'	13.4%	14.9%	1.11
	1304'			

FLOW PROFILE LATERAL #9 Well No 5

10/19/10 1240 Q = 13.09 MGD @1225

Q = 13.05 MGD @1352

X'	IN 1st	IN 2nd	IN Ave	Back		
10' (1242)	85/min	85/min	85/min			
20'	81/min	81/min	81/min			
30' (1246)	70/min	70/min	70/min			
40'	57/min	56/min	56.5/min			
50' (1251)	53/min	54/min	53.5/min	55/min	54/min	
60'	56/59.5	57/min	57/min	59/min	55/min	53/min
70'	54/min	53/min	53.5/min			

	IN 1st	IN 2nd	IN Ave	Back
80' (1258)	47/min	49/min	48/min	
90'	44/min	49/min	43.5/min	43/min
100' (1305)	41/min	44/min	41/min	41/min
110'	31/min	34/min	30.5/min	30/min
120' (1313)	18/min	22/min	18/min	18/min
130'	5/min	5/min	5/min	
132.5	6/min	6/min	6/min	?

- Lateral relatively clean 10' – 100'
- See hole in digging head at 133'

WED 10/20/10 SCWA Well 5

Caisson 59.85 @ 0808
Q = 13.26 MGD
WL meter 39.0'

0856 WL meter 38.7
Q = 13.57 MGD ± 0.03

0855 diver in well

Caisson 60.28' @ 1210
Q = 13.53 MGD , 125 psi
WL meter 38.5'

Caisson 60.32 @ 1358
WL meter 38.5'
Q = 13.46 - 13.52 MGD

FLOW PROFILE LAT #3 WELL #5

10/20/10 .0904

Q = 13.57 MGD @ 0856

IN

X'	1st	2nd	AVE	BACK
10' (0909)	57/min	58/min	57/min	55/min 56/min (1005)
20'	55/min	56/min	55.5/min	
30' (0917)	52/min	50/min	51/min	61/min 60/min (0957)
40'	51/min 56/min	54/min 52/min	53/min	56/min 59/min
50' (0922)	53/min 53/min	47/min	53/min	
60'	42/min	43/min	42.5/min	
70'	39/min	37/min	38/min	

IN

X'	1st	2nd	AVE	BACK
80' (0932)	38/min 32/min	35/min 36/min	35/min	32/min 34/min (0955)
90' (0937)	24/min	25/min	24.5/min	
100' (0940)	18/min	19/min	18.5/min	
110' (0944)	18/min 17/min	15/min	17.5/min ?	
119'	20/min	18/min	← higher Velocity because reduced pipe open area.	
117'	16/min	16/min		

hit debris in screen @ 120
– blocked water cones

Lateral 3 more encrusted on inside of screen

FLOW PROFILE LAT #8 WELL #5

10/20/10 1008

Q = 13.49 - 13.59 MGD @ 1010

IN

X'	1st	2nd	AVE	BACK
10' (1010)	55/min	58/min	56.5/min	(1041) 57/min
20' (1012)	48/min 49/min	43/min	48.5/min	(1039) 50/min 49/min
30' (1016)	33/min	32/min	32.5/min	
40' (1019)	23/min	22/min	22.5/min	
50'	12/min	13/min	12.5/min	
60' (1025)	6/min	8/min	7/min	
69 (1027)	3/min	6/2min	3/min	

73.5' 14/2min = 7/min * ↓
8/min Higher Velocity because debris reduces open area of flow

· some debris in bottom of screen from 70' - 73.5'

FLOW PROFILE LATERAL #4 WELL #5

10/20/10 1235

Q = 13.53 MGD @ 1210

Q = 13.68 – 13.70 MGD @ 1304

IN

X'	1st	2nd	AVE	BACK
10' (1237)	131/min	130/min	130.5/min	
20' (1239)	116/min	115/min	115.5/min	
30' (1243)	102/min	102/min	102/min	
40' (1245)	92/min	93/min	92.5/min	
50' (1248)	89/min	89/min	89/min	
60' (1250)	86/min	86/min	86/min	
70' (1252)	87/min	86/min	86.5/min	

IN

X'	1st	2nd	AVE	BACK
80' (1255)	89/min	90/min	89.5/min	(1332) 87/min 85/min
90'	83/min	82/min	82.5/min	
100' (1300)	83/min	82/min	82.5/min	
110' (1304)	78/min	78/min	78/min	
120' (1306)	78/min	78/min	78/min	
130' (1309)	72/min	72/min	72/min	
140' (1313)	60/min	60/min	60/min	
150' (1314)	52/min	53/min	52.5/min	
160' (1317)	46/min	49/min 47/min	47/min	

FLOW PROFILE LAT # 4 CONT.

IN

X'	1st	2nd	AVE	BACK
170' (1322)	20/min	16/min 20/min	20/min	
174'	7/min	6/min	6.5/min	

- Lateral 4 light-moderately encrusted
- 13.55 MGD @ 1306

10/21/10 SCWA Well No 5

Caisson 60.46 @ 0755
Q = 13.27 MGD
WL meter 38.3

Q = 13.50 MGD @ 0830 130 psi
WL meter 38.1

Caisson 60.82 @ 1125
Q = 13.52 MGD
WL meter 38.0

WL meter 37.9 @ 1310
Caisson 60.90 @ 1318
Q = 13.46 MGD – 13.51 MGD
WL meter 37.9

FLOW PROFILE LATERAL #5 WELL 5

10/21/10 0905

Q = 13.50 MGD (0830)

Q = 14.01 @ 0946

IN

X'	1st	2nd	AVE	BACK
10' (0905)	200/min	199/min	199.5/min	
20'	193/min	190/min	191.5/min	
30' (0911)	180/min	181/min	180.5/min	
40'	180/min	180/min	180/min	
50'	176/min	175/min	175.5/min	
60'	175/min	174/min	174.5/min	
70' (0921)	173/min	173/min	173/min	

LAT #5 WELL 5

IN

X'	1st	2nd	AVE	BACK
80'	170/min	170/min	170/min	(1004) 166/min 166/min
90' (0928)	166/min	166/min	166/min	
100' (0931)	161/min	162/min	161.5/min	
110'	158/min	158/min	158/min	
120' (0936	155/min	154/min	154.5/min	
130' (0941)	145/min	147/min	146/min	
140'	136/min	137/min	136.5/min	
150' (0945)	108/min	106/min	107/min	
160'	78/min	77/min	77.5/min	

- LATERAL #5 WELL 5 SCWA

10/21/10 IN

X'	1st	2nd	AVE	BACK
170' (0957)	53/min 50/min	48/min	52.5/min	

DIAGIND HEAD @ 175'

172.5' (0958)	48/min 43/min	42/min	42.5/min	

- Inside of Lat #5 relatively clean
  - slots open & visible
- Small collection of debris @168'

FLOW PROFILE LATERAL #6 WELL #5

10/21 /10 1148 Q = 13.5 MGD

13.48 mgd @ 1202

IN

X'	1st	2nd	AVE	BACK	
10' (1148)	181/min	179/min	180/min		
20'	181/min	180/min	180.5/min		
30' (1153)	173/min	172/min	172.5/min		
40'	158/min	160/min	159/min	(1243) ?	152/min 156/min 157/min 156
50' (1200)	165/min	165/min	165/min		
60'	165/min	165/min	165/min		
70' (1206)	155/min	155/min	155/min	(1239) (157)	156/min 158/min

IN LATERAL #6 WELL No 5

X'	1st	2nd	AVE	BACK	
80' (1210)	155/min	155/min	155/min	(1236) (152)	152/min 152/min
90'	135/min	136/min	135.5/min		
100' (1214)	126/min	122/min 124/min	124/min		
110'	89/min	88/min	88.5/min		
120' (1222)	38/min	42/min 40/min	40/min		
127.5' (1230)	25/min	25/min	25/min		

- digging head clean - no debris
- relatively clean; no scale entire length
- lots of velocity thru hole in digging head but erratic spin at 122'