



**Pacific Gas and  
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December 1, 2008

Mr. Aaron Yue  
Project Manager  
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Subject: Third Quarter 2008 Performance Monitoring Report  
Interim Measures Performance Monitoring Program  
PG&E Topock Compressor Station, Needles, California

Dear Mr. Yue:

Enclosed is the Quarterly Performance Monitoring Report and Evaluation, August through October 2008 for PG&E's Interim Measures (IM) performance monitoring program for the Topock project. This report presents the Third Quarter (August through October 2008) performance monitoring results for the IM hydraulic containment system and summarizes the operations and performance evaluation for the reporting period. The quarterly performance monitoring report is submitted in conformance with the reporting requirements in DTSC's Interim Measure directive dated February 14, 2005, and includes updates and modifications approved by DTSC in letters dated October 12, 2007, July 14, 2008, and July 17, 2008.

This report also presents water level monitoring data collected from the Arizona monitoring wells MW-54 and MW-55 beginning in Second Quarter 2008.

Please contact me at (805) 546-5243 if you have any questions on the performance monitoring report.

Sincerely,

A handwritten signature in blue ink that reads 'Yvonne Meeks'.

Enclosure  
Interim Measure

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# **Quarterly Performance Monitoring Report and Evaluation, August through October 2008**

**Interim Measures Performance Monitoring Program  
PG&E Topock Compressor Station  
Needles, California**

Prepared for  
**California Department of  
Toxic Substances Control**

on behalf of  
**Pacific Gas and Electric Company**

December 1, 2008

**CH2MHILL**  
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# **Quarterly Performance Monitoring Report and Evaluation, August through October 2008**

## **Interim Measures Performance Monitoring Program PG&E Topock Compressor Station Needles, California**

**Prepared for  
California Department of Toxic Substances Control**

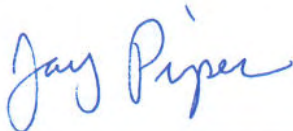
**On behalf of  
Pacific Gas and Electric Company**

**December 1, 2008**

This report was prepared under the supervision of a  
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# Acronyms and Abbreviations

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µg/L	micrograms per liter (essentially the same as parts per billion [ppb])
cfs	cubic feet per second
Cr(VI)	hexavalent chromium
DTSC	California Department of Toxic Substances Control
GMP	Groundwater and Surface Water Monitoring Program
gpm	gallons per minute
IM	Interim Measure
IM No. 3	Interim Measure Number 3
PG&E	Pacific Gas and Electric Company
PMP	Performance Monitoring Program
TDS	total dissolved solids
USBR	United States Bureau of Reclamation

## SECTION 1

# Introduction

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Pacific Gas and Electric Company (PG&E) is implementing an Interim Measure (IM) to address chromium concentrations in groundwater at the Topock Compressor Station near Needles, California. The IM consists of groundwater extraction for hydraulic control of the plume boundaries in the Colorado River floodplain and management of extracted groundwater. The groundwater extraction, treatment, and injection systems are collectively referred to as Interim Measure Number 3 (IM No. 3). Currently, the IM No. 3 facilities include a groundwater extraction system (four extraction wells: TW-2D, TW-3D, TW-2S, and PE-1), conveyance piping, a groundwater treatment plant, and an injection well field for the discharge of the treated groundwater. Figure 1-1 shows the location of the IM No. 3 extraction, conveyance, treatment, and injection facilities. (All figures are located at the end of the report.)

In a letter dated February 14, 2005, the California Department of Toxic Substances Control (DTSC) established the criteria for evaluating the performance of the IM (DTSC, 2005). As defined by DTSC, the performance standard for this IM is to “establish and maintain a net landward hydraulic gradient, both horizontally and vertically, that ensures that hexavalent chromium [Cr(VI)] concentrations at or greater than 20 micrograms per liter [µg/L] in the floodplain are contained for removal and treatment” (DTSC, 2005). A draft *Performance Monitoring Plan for Interim Measures in the Floodplain Area* (CH2M HILL, 2005a) was submitted to DTSC on April 15, 2005 (herein referred to as the Performance Monitoring Plan). The site monitoring, data evaluation, reporting, and response actions required under the February 2005 DTSC directive are collectively referred to as the IM Performance Monitoring Program (PMP) for the floodplain area.

The February 2005 DTSC directive also defined the monitoring and reporting requirements for the IM. The reporting requirements for the PMP were modified by DTSC, via e-mail approval, in August 2007 to discontinue submittals of the monthly performance monitoring reports (the quarterly and annual reporting requirements were unchanged). Additional updates and modifications to the PMP were approved by DTSC in letters dated October 12, 2007, and July 14 and July 17, 2008 (DTSC, 2007a, 2008c, 2008d).

This quarterly report has been prepared in compliance with DTSC’s requirements and documents the monitoring activities and performance evaluation of the IM hydraulic containment system. The third quarter reporting period covers monitoring activities from August 1 through October 31, 2008.

## 1.1 Report Organization

This third quarter 2008 monitoring report presents:

- Description of the wells included in the performance monitoring network (Section 2).
- Evaluation of performance data, including the extraction system, chromium trends in the floodplain monitoring wells, hydraulic gradients, and river levels during the quarterly period, August through October 2008 (Section 3).
- Conclusions (Section 4).

## SECTION 2

# Performance Monitoring Network

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Figure 2-1 shows the locations of wells used for IM extraction, performance monitoring, and hydraulic gradient measurements. With approval from DTSC, the list of wells included in the PMP was modified beginning August 1, 2008. The performance monitoring wells that were in service/active as of October 2008 are defined as:

- **Floodplain Wells** (monitoring wells on the Colorado River floodplain): MW-22, MW-27 cluster (three wells), MW-28 cluster (two wells), MW-30-50, MW-32-35, MW-33 cluster (three wells), MW-34 cluster (three wells), MW-36 cluster (six wells), MW-39 cluster (six wells), MW-42 cluster (two wells), MW-43 cluster (two wells), MW-44 cluster (three wells), MW-45-95, MW-46-175, and MW-49-135. Additionally, three pilot test wells installed on the floodplain (PT-2D, PT-5D, and PT-6D) are used to supplement hydraulic monitoring but are not formally part of the PMP.
- **Intermediate Wells** (monitoring wells located immediately north, west, and southwest of the floodplain): MW-20 cluster (three wells), MW-26, MW-31 cluster (two wells), MW-35 cluster (two wells), MW-47 cluster (two wells), MW-50-95, and MW-51.
- **Interior Wells** (monitoring wells located upgradient of IM pumping): MW-25.

Three extraction wells (TW-2D, TW-3D, and TW-2S) are located on the MW-20 bench, as shown in Figure 1-1. In addition, extraction well PE-1 is located on the floodplain approximately 450 feet east of extraction well TW-3D, as shown in Figure 1-1. Currently, both extraction wells TW-3D and PE-1 are in full-time operation.

The wells screened in the unconsolidated alluvial fan and fluvial deposits, which comprise the Alluvial Aquifer, have been separated into three depth intervals to present groundwater quality and groundwater level data. The depth intervals of the Alluvial Aquifer in the floodplain area – designated upper, middle, and lower – are based on grouping the monitoring wells screened at common elevations. These divisions do not correspond to any lithostratigraphic layers within the aquifer. The floodplain aquifer is considered to be hydraulically undivided. The subdivision of the aquifer into three depth intervals is an appropriate construct for presenting and evaluating groundwater quality data in the floodplain. The three-interval concept is also useful for presenting and evaluating lateral gradients while minimizing effects of vertical gradients and observing the influence of pumping from partially-penetrating wells.

## SECTION 3

# Quarterly Performance Evaluation for August through October 2008

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## 3.1 Extraction System Operations

Pumping data for the IM No. 3 groundwater extraction system for the period of August 1 through October 31, 2008 are presented in Table 3-1. (All tables are presented at the end of the report.) From August 1 through October 31, 2008 (considered third quarter 2008), 17,145,562 gallons of groundwater were extracted and treated by the IM No. 3 system. This resulted in removal of an estimated 82.4 kilograms (or 182 pounds) of chromium from the aquifer during the third quarter reporting period. The average extraction rate for the IM system during the quarter, including system downtime, was 129.4 gallons per minute (gpm). The average monthly pumping rates were 132.6 gpm (August 2008), 124.8 gpm (September 2008), and 130.7 gpm (October 2008) during the quarterly reporting period.

During third quarter 2008, extraction wells TW-3D and PE-1 operated at a combined target pump rate of 135 gpm, excluding periods of planned and unplanned downtime. Extraction well TW-2D only operated for a short period on September 9, 2008 and October 3, 2008. Extraction well TW-2S was not operated during the third quarter 2008. The operational run time percentage for the IM extraction system was 95.3 percent during this reporting period. An operations log for the extraction system during the third quarter of 2008, including planned and unplanned downtime, is included in Appendix A.

The concentrate (i.e., saline water) from the reverse osmosis system was shipped offsite with shipping papers as a Resource Conservation and Recovery Act non-hazardous waste and transported to Liquid Environmental Solutions in Phoenix, Arizona for treatment and disposal. Five containers of solids from the IM No. 3 facility were disposed of at the Kettleman Hills Chemical Waste Management facility during third quarter 2008. Daily inspections included general facility inspections, flow measurements, and site security monitoring. Daily logs with documentation of inspections are maintained onsite.

Table 3-2 summarizes the chromium and total dissolved solids (TDS) analytical results in groundwater samples collected from the IM extraction well system during the third quarter 2008 reporting period and prior months. Chromium concentrations have been gradually decreasing at well PE-1 since February 2008. TDS concentrations have increased slightly at well TW-3D compared to March and April, 2008. Future monitoring of the extraction well(s) water quality will be completed at the frequency required by the Waste Discharge Requirements issued for the IM No. 3 treatment facility.

## 3.2 Cr(VI) Distribution and Trends in the Floodplain Area

During third quarter 2008, groundwater monitoring wells in the floodplain area were sampled for Cr(VI), total chromium, and field water quality parameters under semiannual, quarterly, and monthly schedules, in accordance with the approved groundwater monitoring plan and DTSC directives. Refer to PG&E's *Topock Groundwater and Surface Water Monitoring Report, Fourth Quarter 2007 and Annual Report* (CH2M HILL, 2008a) for description of the 2007 groundwater monitoring activities and sampling frequencies for wells in the performance monitoring area. The sampling frequencies for the site groundwater monitoring wells were updated by DTSC in a letter dated September 28, 2007 (DTSC, 2007c).

The distribution of Cr(VI) in the upper, middle, and lower depth intervals of the Alluvial Aquifer in the performance monitoring area for October 2008 is shown in plan view and cross-section on Figure 3-1. During October 2008, the annual groundwater monitoring event was conducted at the Topock site and the majority of the wells in the PMP area were sampled during this event. The Cr(VI) concentration contours shown for the Alluvial Aquifer have been updated to reflect the October 2008 groundwater sampling data.

Overall, the Cr(VI) concentration contours for October 2008 are similar to the Cr(VI) distribution maps issued in the prior IM performance monitoring reports (CH2M HILL, 2007b-c, 2008b). Figure 3-2 presents the October 2008 Cr(VI) results on a cross-section parallel to the Colorado River (locations of cross-sections shown on Figure 2-1). Cr(VI) contours shown on Figure 3-2 are based on the October 2008 sampling results. Tables B-1 and B-2 in Appendix B present the chromium and field parameter sampling results from October 2007 through October 2008 for the wells in the PMP area.

Figure 3-3 presents Cr(VI) concentration trend graphs for selected deep monitoring wells in the floodplain area through the October 2008 sampling. Sampling results are plotted for wells MW-34-100, MW-36-90, MW-36-100, MW-44-115, MW-44-125, and MW-46-175. The locations of the deep wells selected for performance evaluation are shown in Figure 2-1.

The effects of IM No. 3 pumping are evident in the sampling data from wells MW 36-90 and MW-36-100, as shown in Figure 3-3. Since the initiation of IM pumping, the Cr(VI) concentrations at MW-36-90 have decreased. When PE-1 was placed into service, concentrations decreased further and have remained consistently less than 10 µg/L since August 2006. Concentrations in the deeper well MW-36-100 (well screen at the same level as the PE-1 well screen) decreased under IM No. 3 pumping, initially increased upon initiation of pumping at PE-1, and have decreased since January 2007. The concentration trend for MW-34-100, shown in Figure 3-3, has shown both short-term declines and increases in concentrations since PE-1 pumping commenced. However, since July 2006, concentrations at this well have shown a general downward trend. The Cr(VI) result from May 6, 2008 sampling of MW-34-100 (234 µg/L) is the lowest concentration measured at this well since initial sampling in March 2005, and results since then have shown a flat to slightly upward trend to the most recent sample of 286 µg/L on October 7, 2008.

Monitoring well clusters MW-44 and MW-46 are located within the Cr(VI) plume (approximately 190 feet and 400 feet north of PE-1). The concentration trend for well MW-44-115 has been generally downward since July 2006. Sampling data from well

MW-44-125 show stable concentrations since October 2006. Concentrations in well MW-46-175 generally decreased from March 2006 until May 2007 but have been generally stable since May 2007. The MW-44 and MW-46 well clusters are within the hydraulic capture of IM pumping (see Section 3.4). Stable or decreasing concentrations were observed in the other wells in the floodplain area where Cr(VI) has been detected in prior monitoring (Table B-1).

In addition to the wells presented in Figure 3-3, declining Cr(VI) concentrations have been observed at wells MW-39-70 and MW-39-80, as shown on Figure 3-1 and Appendix B, Table B-1, reflecting the pumping influence from TW-3D. The chromium concentrations observed in the MW-33 cluster wells remained consistent with previous results during the quarterly reporting period.

### 3.3 Hydraulic Gradients and River Levels during Quarterly Period

During third quarter 2008 (considered August through October), water levels were recorded at intervals of 30 minutes with pressure transducers in 54 wells and two river monitoring stations (I-3 and RRB). The data are typically continuous, with only short interruptions for sampling or maintenance. The locations of the wells monitored are shown in Figure 2-1 and are listed in Section 2.0.

Daily average groundwater and river elevations have been calculated from the pressure transducer data for the third quarter 2008 reporting period and are summarized in Appendix C. Due to the variation in groundwater salinity at the site, the water level measurements need to be adjusted (density-corrected) to equivalent freshwater hydraulic heads prior to calculating groundwater elevations and gradients. The methods and procedures used for adjusting the performance monitoring water level data for salinity and temperature differences are described in the PMP. Groundwater elevation hydrographs (for third quarter 2008) for all wells with transducers are included in Appendix C. The Colorado River elevation (I-3 gage station) during the third quarter 2008 is also shown on the hydrographs.

Average quarterly groundwater elevations (August through October 2008 inclusive) for the upper depth interval and mid-depth wells are presented and contoured in plan view in Figure 3-4 and Figure 3-5. To the west of the TW-3D and PE-1 pumping area, the hydraulic gradient in the upper depth interval is easterly and consistent with the regional gradient outside of the floodplain area.

Average quarterly groundwater elevations (August through October 2008 inclusive) for the deep wells are presented and contoured in plan view in Figure 3-6. The average quarterly groundwater elevations are also presented and contoured in floodplain cross-section A, as shown in Figure 3-7. The floodplain cross-section also shows the locations and depths where the current IM pumping in the deep interval of the Alluvial Aquifer is occurring at TW-3D and PE-1. The landward hydraulic gradients for the deep monitoring wells presented in Figure 3-6 and Figure 3-7 are consistent with the strong landward gradients measured and presented in the 2006 and 2007 monitoring reports (CH2M HILL, 2007b-c).

In April 2008, pressure transducers were installed in five of the new wells located on the Arizona side of the Colorado River. For the third quarter 2008 reporting period, a full set of transducer data was recorded in these wells. The quarterly average groundwater elevations for wells MW-55-45, MW-55-120, MW-54-85, MW-54-140, and MW-54-195 are posted on Figures 3-5 and 3-6, and are used for contouring where appropriate.

With the exception of well MW-55-45, all of the wells in the MW-54 and MW-55 clusters are screened in the deep interval of the Alluvial Aquifer. The screened intervals of wells MW-54-140 and MW-55-120 are of the most similar elevation ranges, and therefore best lend themselves to water level contouring. Well MW-55-45 is screened over the boundary between the shallow and middle intervals; because this is the single data point in this depth interval on the Arizona side, this area was not included in contouring of the shallow and middle intervals.

Deep zone water levels shown on Figure 3-6 indicate that potentiometric levels in monitoring wells in Arizona are higher than those in wells across the river on the California floodplain. This means that the hydraulic gradient on the Arizona side of the river is directed to the west and as a result, groundwater flow would also be towards the west in that area. This is consistent with the site conceptual model and with the current numerical groundwater flow model.

Hydraulic gradients were measured during the third quarter period for well pairs selected for performance monitoring with two pumping centers (TW-3D and PE-1). The following well pairs were approved by DTSC on October 12, 2007 (DTSC, 2007a) to define the gradients induced while pumping from two locations:

- MW-31-135 and MW-33-150 (northern gradient pair)
- MW-45-95 and MW-34-100 (central gradient pair)
- MW-45-95 and MW-27-85 (southern gradient pair)

Table 3-3 presents the average monthly hydraulic gradients that were measured between the gradient well pairs in August, September, and October 2008. For the northern (MW-31-135/MW-33-150) well pair, gradients were landward at magnitudes from 1.8 to 2.1 times the target gradient of 0.001 feet per foot. The southern well pair (MW-45-95 / MW-27-85) gradients averaged from 0.0030 to 0.0018 in a landward direction during the reporting period. For the central well pair (MW-45-95/MW-34-100), the average landward gradient ranged from 0.0086 to 0.0039 (8.6 to 3.9 times the target gradient) during the reporting period.

Figure 3-8 presents the measured hydraulic gradients and pumping rates and river levels during the third quarter 2008 reporting period. During August through October 2008, the average daily river levels remained fairly consistent. The monthly average pumping rates for the IM No. 3 system was 132.6 gpm in August 2008, 124.8 gpm in September 2008 and 130.7 gpm in October 2008. For the third quarter 2008 reporting period, consistent average monthly landward gradients above the target gradient were maintained in the gradient control well pairs.

A review of the groundwater elevation contour maps indicates very strong landward hydraulic gradients within the IM capture zone throughout the floodplain. That is, the inferred groundwater flow lines from the floodplain monitoring wells where Cr(VI)

concentrations are greater than 20 µg/L are oriented towards the TW-3D and PE-1 extraction wells within the IM capture zone.

In the time period September 15 through September 17, 2008, the IM No. 3 extraction well system was shut down for monthly maintenance. During this time the water level in seven monitoring wells was collected at five minute intervals and compared to I-3 river data and barometric data. Deconvolution hydraulic monitoring data and interpretation for the system shut down are provided in Appendix E.

### 3.4 Other Water Quality Data for Floodplain Wells

Common water quality parameters (temperature, pH, oxidation-reduction potential, dissolved oxygen, and specific conductance) were measured in the field during well purging and groundwater sampling, as described in the *Sampling, Analysis, and Field Procedures Manual, Revision 1, PG&E Compressor Station* (CH2M HILL, 2005b). The field water quality data measured from July 2005 through October 2008 are presented in Tables B-1 and B-2 of Appendix B.

Table D-1 in Appendix D presents the results of the general chemistry and stable isotope analyses for 14 PMP monitoring wells and two river stations during sampling events from March 2005 through October 2008. Figure 2-1 shows the locations of the monitoring wells sampled for the performance monitoring parameters. In July 2008, DTSC approved modifications to the PMP IM chemical performance monitoring program (DTSC, 2008d). With those modifications, there are now 10 monitoring wells and one river station sampled for IM chemical performance monitoring. Water samples from the selected performance monitoring locations were analyzed for TDS, chloride, sulfate, nitrate, bromide, calcium, potassium, magnesium, sodium, boron, alkalinity, deuterium, and oxygen-18 to monitor the effects of IM pumping on groundwater chemistry. Oxygen-18 and deuterium have an extended laboratory turnaround time. The available stable isotope data are presented in App D-1 and these data are reported in full with subsequent PMR submittals.

During review of the October 2008 monitoring data, the analytical results from MW-27-60 (chromium, and general chemistry cations, anions, and alkalinity) and MW-29 (chromium) were considered anomalous and suspect compared to historical data, so these wells will be re-sampled for the suspect analytes during the fourth quarter GMP event in December 2008. These data were not rejected based on data validation criteria other than the historical comparison. The results from re-sampling these two wells will be reported in the fourth quarter 2008 Ground Water Monitoring Program (GMP) and PMP reports.

### 3.5 Projected River Levels during the Next Quarter

Colorado River stage near the Topock Compressor Station is measured at the I-3 location and is directly influenced by releases from Davis Dam and, to a lesser degree, from Lake Havasu elevations, both of which are controlled by the United States Bureau of Reclamation (USBR). Total releases from Davis Dam follow a predictable annual cycle, with the largest monthly releases typically in spring and early summer and the smallest monthly releases in late fall-winter (November and December). Superimposed on this annual cycle is a diurnal cycle determined primarily by daily fluctuations in electric power demand.

Releases within a given 24-hour period often fluctuate over a wider range of flows than that of monthly average flows over an entire year.

The corresponding river stage at the I-3 station fluctuates in a similar pattern. The monthly average stage at I-3 typically peaks in the early summer and reaches its low point in the winter. Following Davis Dam releases, river stage also fluctuates on a diurnal cycle, though greatly attenuated. The magnitude of the daily river stage fluctuations at I-3 is less than the magnitude of the monthly average river stage fluctuations over a typical year.

Table 3-4 is a summary of the estimated and actual Davis Dam releases and river elevations since January 2006. The actual Davis Dam October 2008 release (10,272 cubic feet per second [cfs]) was almost exactly the same as the USBR-projected release for the July reporting period (10,500 cfs). The projected Colorado River elevation at I-3 (monthly average) is calculated using a multiple regression method that considers both the Davis Dam release and the Lake Havasu level. Current USBR projections show that the average Davis Dam release for November 2008 (10,400 cfs) will be greater than October 2008 (10,272 cfs). Based on the regression method results, using November 12, 2008 USBR projections for both Davis Dam release and Lake Havasu elevation, it is anticipated that the Colorado River level at the I-3 gage location in November 2008 will be slightly lower than the October 2008 river stage.

Figure 3-9 shows river stage measured at I-3 superimposed on the projected I-3 river levels based on actual Davis Dam discharge and Lake Havasu levels. This graph shows that the formula used to calculate I-3 levels provides a good estimate of the actual levels at I-3 over a wide range of river levels. The future projections shown on this graph are based on USBR long-range projections of Davis Dam release and Lake Havasu level. The river stage data and USBR projections indicate the highest river levels of the year typically occur in April, May, and June. Current USBR projections show that the lowest water levels will occur in November through December 2008 and January 2009. Because water demand is based on climatic factors, there is more uncertainty in these projections further into the future.

## 3.6 Status of Operation and Monitoring

Reporting of the IM extraction and monitoring activities will continue as described in the Performance Monitoring Plan and direction from DTSC. On October 12, 2007, the DTSC approved PG&E's request to discontinue monthly performance monitoring reports. As a result, the next performance monitoring report will be the combined fourth quarter 2008 and Annual Performance Evaluation report. The fourth quarter 2008 report will present operations and performance monitoring data from November 1, 2008 through January 31, 2009. The annual report will include the performance monitoring data from February 1, 2008 through January 31, 2009. This report will be submitted by March 15, 2009.

Per DTSC direction, PG&E will continue to operate wells TW-3D and PE-1 at a target combined pumping rate of 135 gpm during the fourth quarter 2008, except for periods when planned and unplanned downtime occurs. Extracted groundwater treated at the IM No. 3 facility will be discharged into the IM No. 3 injection wells in accordance with Waste Discharge Requirements Order No. R7-2006-0060. Saline water and solids generated as byproducts of the treatment process will continue to be transported offsite.

PG&E will balance the pumping rates between wells TW-3D and PE-1 to maintain the target pumping rate and to maintain the DTSC-specified hydraulic gradients across the Alluvial Aquifer. Well TW-2D will serve as a backup to extraction wells TW-3D and PE-1.

## SECTION 4

# Conclusions

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The groundwater elevation and hydraulic gradient data for August, September, and October 2008 performance monitoring indicate that the minimum landward gradient target (0.001 feet/foot) was exceeded throughout the third quarter reporting period. As illustrated in Figure 3-8, the landward gradients measured during August, September, and October 2008 exceeded the required minimum gradient in all compliance well pairs. The current IM pumping was sufficient to meet the minimum gradient target during each month of the third quarter 2008.

A total of 17,145,562 gallons of groundwater was extracted and treated by the IM No. 3 system during the August through October 2008 reporting period. An estimated 82.4 kilograms (or 182 pounds) of chromium were removed and treated by the IM system during this quarter. The average pumping rate for the IM extraction system during third quarter 2008, including system downtime, was 129.4 gpm.

Overall, the Cr(VI) concentrations observed in the floodplain monitoring wells are either stable or decreasing. During third quarter 2008, the groundwater Cr(VI) concentrations at wells MW-36-100, MW-39-70, MW-39-80, MW-39-100, and MW-44-125 declined relative to the previous quarter. Concentrations at wells, MW-44-115, MW-44-175, and MW-46-175 remained stable during the third quarter period. All of these wells are within the IM extraction system capture zone, as shown in Figure 3-6.

Chromium concentrations at well MW-34-100 showed a steady downward trend between July 2006 and May 2008, as shown in Figure 3-3. The concentrations of Cr(VI) have been relatively stable in this well since April 2008.

Based on the hydraulic and chemical performance monitoring data and evaluation presented in this report, the IM performance standard has been met for the third quarter, August through October 2008 reporting period. Performance monitoring and evaluation of the IM hydraulic containment system will continue in accordance with the PMP and as directed by the DTSC.

## SECTION 5

# References

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## Tables

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TABLE 3-1

Pumping Rate and Extracted Volume for IM System August 2008 through October 2008

Interim Measures Performance Monitoring

PG&amp;E Topock Compressor Station

Extraction Well ID	August 2008		September 2008		October 2008		Third Quarter 2008		Project to Date <sup>a</sup>
	Average Pumping Rate <sup>b</sup> (gpm)	Volume Pumped (gal)	Average Pumping Rate <sup>b</sup> (gpm)	Volume Pumped (gal)	Average Pumping Rate <sup>b</sup> (gpm)	Volume Pumped (gal)	Average Pumping Rate <sup>b</sup> (gpm)	Volume Pumped (gal)	Cumulative Volume Pumped (gal)
TW-02S	0.00	0	0.00	0	0.00	0	0.00	0	1,000,779
TW-02D	0.00	0	0.16	6,788	0.46	20,404	0.20	27,192	53,086,909
TW-03D	104.00	4,642,757	98.01	4,234,061	102.30	4,566,617	101.44	13,443,434	147,445,308
PE-01	28.56	1,274,947	26.65	1,151,305	27.97	1,248,684	27.73	3,674,936	46,268,245
<b>TOTAL</b>	<b>132.6</b>	<b>5,917,704</b>	<b>124.8</b>	<b>5,392,153</b>	<b>130.7</b>	<b>5,835,705</b>	<b>129.4</b>	<b>17,145,562</b>	247,801,241
Volume Pumped from the MW-20 Well Cluster									1,527,724
Total Volume Pumped (gal)									249,328,965
Total Volume Pumped (ac-ft)									765.1

**NOTES:**

gpm gallons per minute

gal gallons

ac-ft acre-feet

<sup>a</sup> Interim measure groundwater extraction at the Topock site was initiated in March 2004.<sup>b</sup> The "Average Pumping Rate" is the overall average during the reporting period, including system downtime, based on flow meter readings.

TABLE 3-2

Analytical Results for Extraction Wells, November 2007 through October 2008  
Interim Measures Performance Monitoring  
PG&E Topock Compressor Station

Well ID	Sample Date	Dissolved Total Chromium µg/L	Hexavalent Chromium µg/L	Total Dissolved Solids mg/L
TW-3D	13-Nov-07	1570	1790	4910
TW-3D	12-Dec-07	2040	1800	5660
TW-3D	03-Jan-08	2210	1830	5070
TW-3D	06-Feb-08	1600	1760	5690
TW-3D	05-Mar-08	1740	1810	4730
TW-3D	02-Apr-08	2010	1550	4450
TW-3D	08-May-08	1740	1540	5320
TW-3D	04-Jun-08	1700	1460	5220
TW-3D	02-Jul-08	1780	1460	5660
TW-3D	06-Aug-08	1450	1440	5270
TW-3D	04-Sep-08	1380	1490	5250
TW-3D	01-Oct-08	1300	1460	5640
PE-1	13-Nov-07	51.8	49.6	4150
PE-1	12-Dec-07	54.5	47.3	4530
PE-1	03-Jan-08	56.9	48.4	3790
PE-1	06-Feb-08	44.1	42.8	4360
PE-1	05-Mar-08	40.8	39.5	4080
PE-1	02-Apr-08	37.1	29.0	4180
PE-1	08-May-08	29.3	26.4	4100
PE-1	04-Jun-08	33.4	16.0	3560
PE-1	02-Jul-08	28.7	25.7	4060
PE-1	06-Aug-08	27.4	28.2	4090
PE-1	04-Sep-08	28.0	29.7	3810
PE-1	01-Oct-08	27.5	27.6	3600

**NOTES**

µg/L = concentration in micrograms per liter

mg/L = concentration in milligrams per liter

Analytical results from inactive extraction wells are presented in Table B-2.

Groundwater samples from active extraction wells are taken at sample taps in Valve Vault 1 on the MW-20 Bench.

**TABLE 3-3**

Average Hydraulic Gradients Measured at Well Pairs, August through October 2008

*Interim Measures Performance Monitoring**PG&E Topock Compressor Station*

Well Pair <sup>a</sup>	Reporting Period	Mean Landward Hydraulic Gradient <sup>b</sup> (feet/foot)	Measurement Dates 2008
Northern Gradient Pair	August	0.0021	August 1 through August 31
MW-31-135 / MW-33-150	September	0.0020	September 1 through September 30
	October	0.0018	October 1 through October 30
Central Gradient Pair <sup>c</sup>	August	0.0086	August 1 through August 31
MW-45-95 / MW-34-100	September	0.0053	September 1 through September 30
	October	0.0039	October 1 through October 29
Southern Gradient Pair <sup>d</sup>	August	0.0030	August 1 through August 31
MW-45-95 / MW-27-85	September	0.0018	September 1 through September 30
	October	0.0019	October 1 through October 29

**NOTES:**<sup>a</sup> Refer to Figure 2-1 for location of well pairs<sup>b</sup> For IM pumping, the target landward gradient for the selected well pairs is 0.001 feet/foot<sup>c</sup> With approval of DTSC, this well pair replaced MW-20-130 / MW-34-80.<sup>d</sup> With approval of DTSC, this well pair replaced MW-20-130 / MW-42-65

**TABLE 3-4**

Predicted and Actual Monthly Average Davis Dam Discharge and Colorado River Elevation at I-3

*Interim Measures Performance Monitoring  
PG&E Topock Compressor Station*

	Davis Dam Release			Colorado River Elevation at I-3		
Month	Projected (cfs)	Actual (cfs)	Difference (cfs)	Predicted (ft AMSL)	Actual (ft AMSL)	Difference (feet)
January 2006	8,400	9,166	766	453.2	453.6	0.4
February 2006	11,100	10,790	-310	454.1	454.1	0.1
March 2006	13,000	12,429	-571	454.7	454.8	0.2
April 2006	16,600	18,300	1700	456.0	456.1	0.0
May 2006	15,500	16,818	1318	456.0	456.3	0.3
June 2006	16,100	17,547	1447	456.2	456.4	0.2
July 2006	14,700	15,171	-471	455.7	455.8	0.1
August 2006	12,900	12,871	29	454.9	455.1	0.1
September 2006	12,100	12,409	-309	454.7	454.7	0.0
October 2006	11,400	11,150	250	454.1	454.4	0.3
November 2006	8,300	8,222	78	452.9	453.3	0.4
December 2006	8,100	8,823	-723	453.0	453.4	0.4
January 2007	8,600	8,796	-196	453.2	453.6	0.4
February 2007	9,800	11,680	-1,880	453.6	454.3	0.7
March 2007	14,300	14,554	-254	455.1	455.6	0.5
April 2007	17,300	16,818	482	456.4	456.4	0.0
May 2007	16,800	16,199	601	456.5	456.4	-0.1
June 2007	16,000	16,212	-212	456.4	456.4	0.0
July 2007	14,900	14,897	3	455.8	456.0	0.2
August 2007	12,100	12,776	-676	454.7	455.4	0.7
September 2007	12,700	13,050	-350	454.8	455.4	0.5
October 2007	10,600	10,324	276	454.0	454.3	0.3
November 2007	9,100	8,387	713	453.6	453.6	0.0
December 2007	5,700	6,445	-745	452.3	452.7	0.4
January 2008	9,300	8,900	400	453.5	453.6	0.1
February 2008	10,100	12,463	-2,363	454.5	454.7	0.1
March 2008	15,200	15,837	-637	455.6	455.9	0.3
April 2008	17,600	18,554	-954	456.6	457.0	0.4
May 2008	17,200	16,155	1,045	456.6	456.4	-0.3
June 2008	15,400	15,655	-255	456.2	456.5	0.3
July 2008	14,500	14,574	-74	455.8	456.0	0.2
August 2008	13,100	12,976	124	455.2	455.2	0.0
September 2008	12,300	11,731	569	454.9	455.0	0.1
October 2008	10,500	10,272	228	454.1	454.2	0.1
November 2008	10,400	--		454.1	--	

**NOTES:**

1) cfs = cubic feet per second; ft AMSL = feet above mean sea level

2) Predicted Colorado River elevations (river levels) at I-3 are based upon BOR projections for Davis Dam releases and Lake Havasu elevations from the preceding month, using a multiple regression between historical dam releases and measured river levels at I-3 (updated monthly). This data is reported monthly by the US Department of Interior, at <http://www.usbr.gov/lc/region/g4000/24mo.pdf>

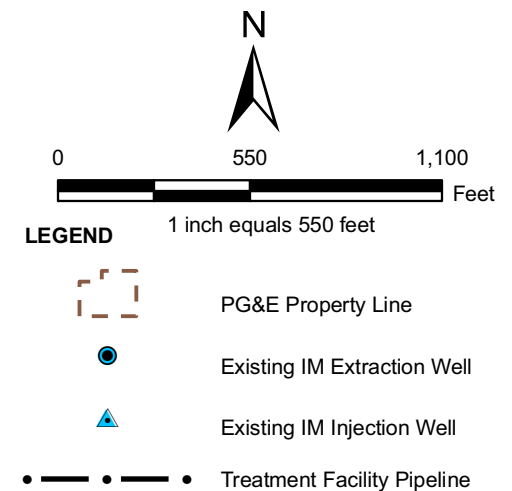
3) The difference in I-3 elevation is the difference between the I-3 elevation predicted, and the actual elevation measured at I-3. The main source of this difference is differences between BOR projections and actual dam releases/Havasu reservoir levels, rather than the multiple regression error.

4) NA = I-3 transducer data unavailable for month of September 2005 due to damage by debris.

5) I-3 elevation for the month of October 2006 limited to average of data from 10/4/2006 through 10/31/2006.

## Figures

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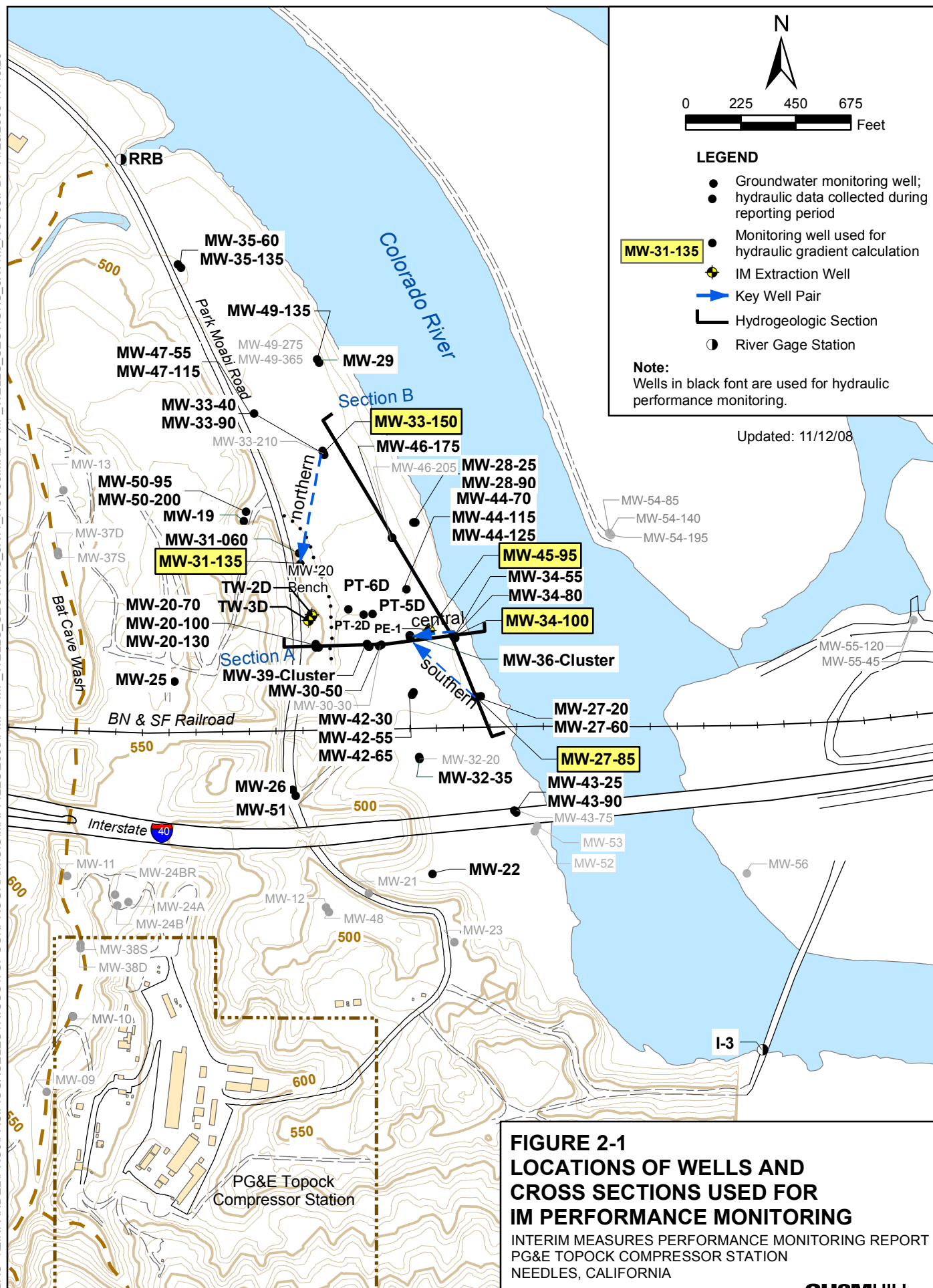


**Notes:** Location map shows Interim Measures No.3 (IM-3) facilities as of January 2006. Aerial photography taken May 2005.

# **FIGURE 1-1** **LOCATIONS OF IM NO. 3** **GROUNDWATER EXTRACTION,** **CONVEYANCE, AND TREATMENT** **FACILITIES**

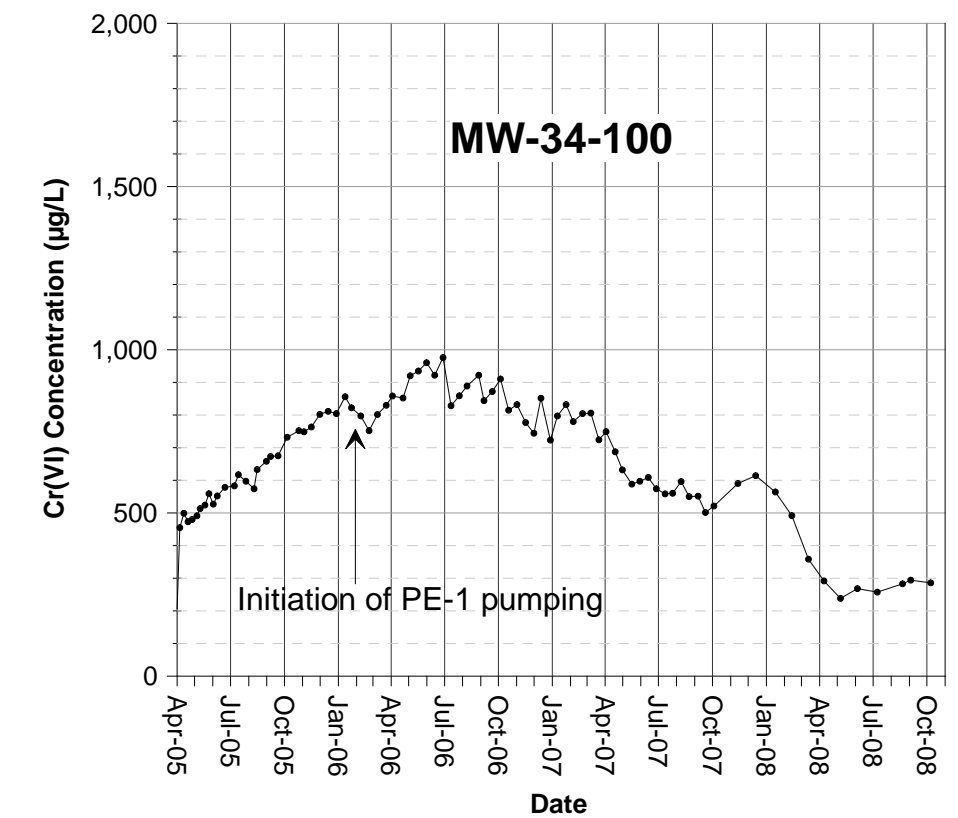
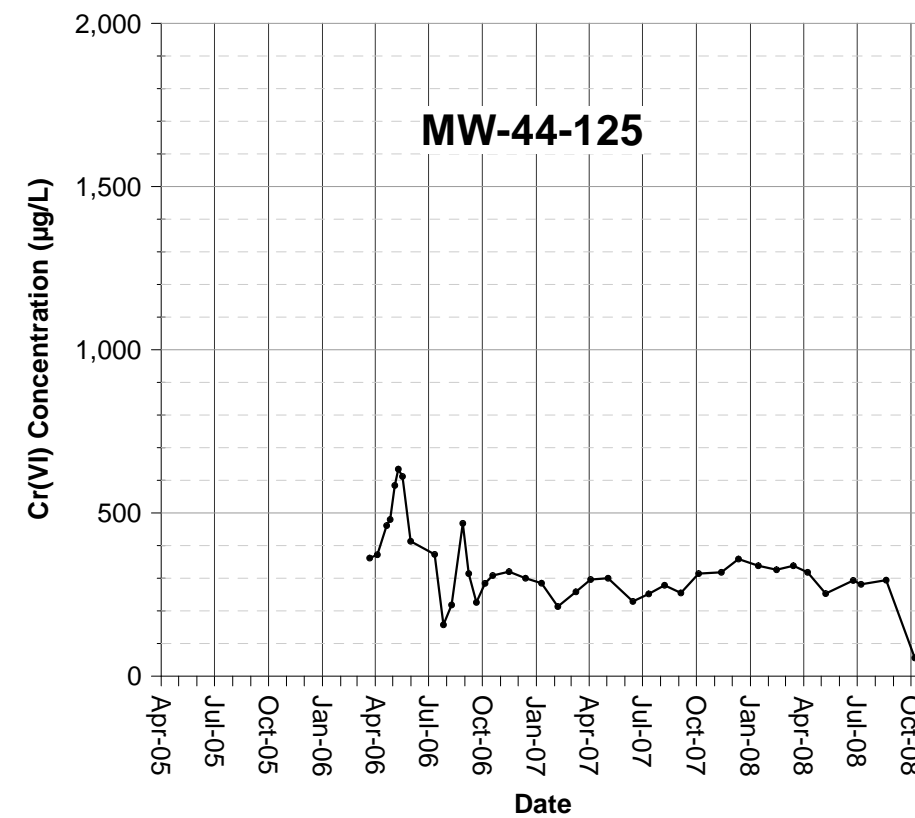
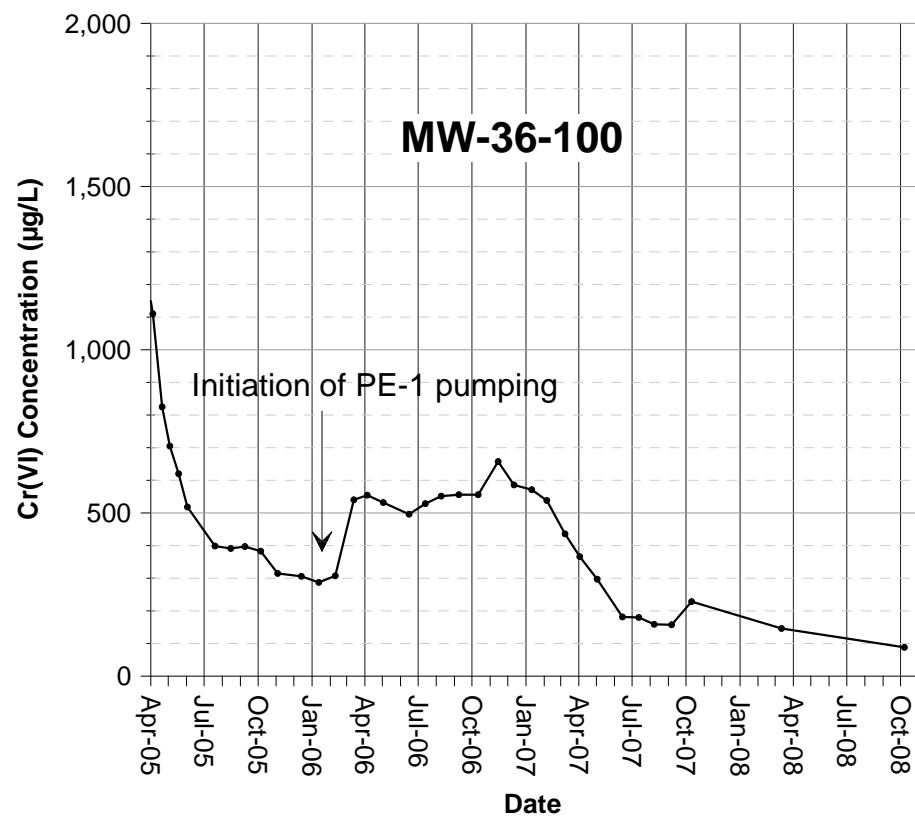
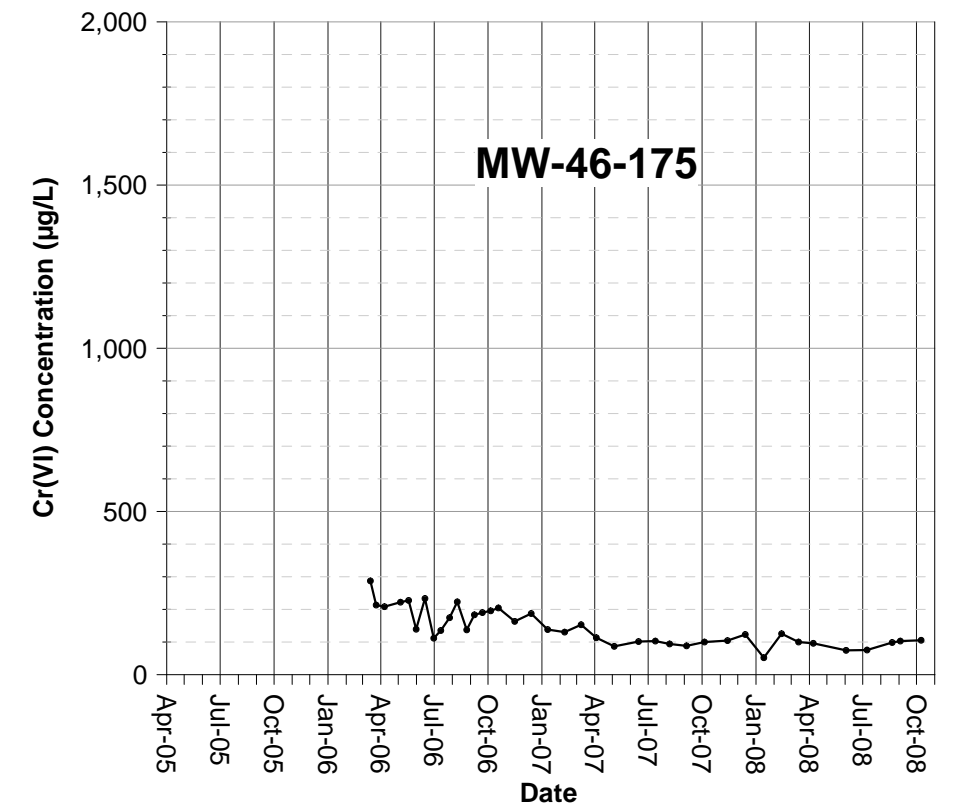
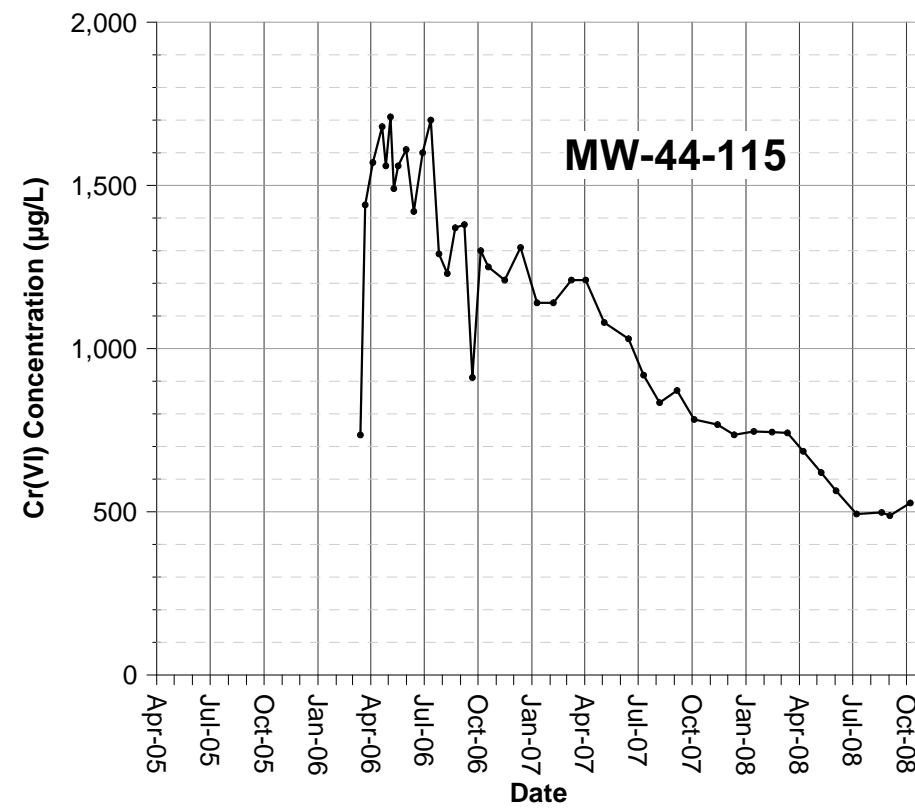
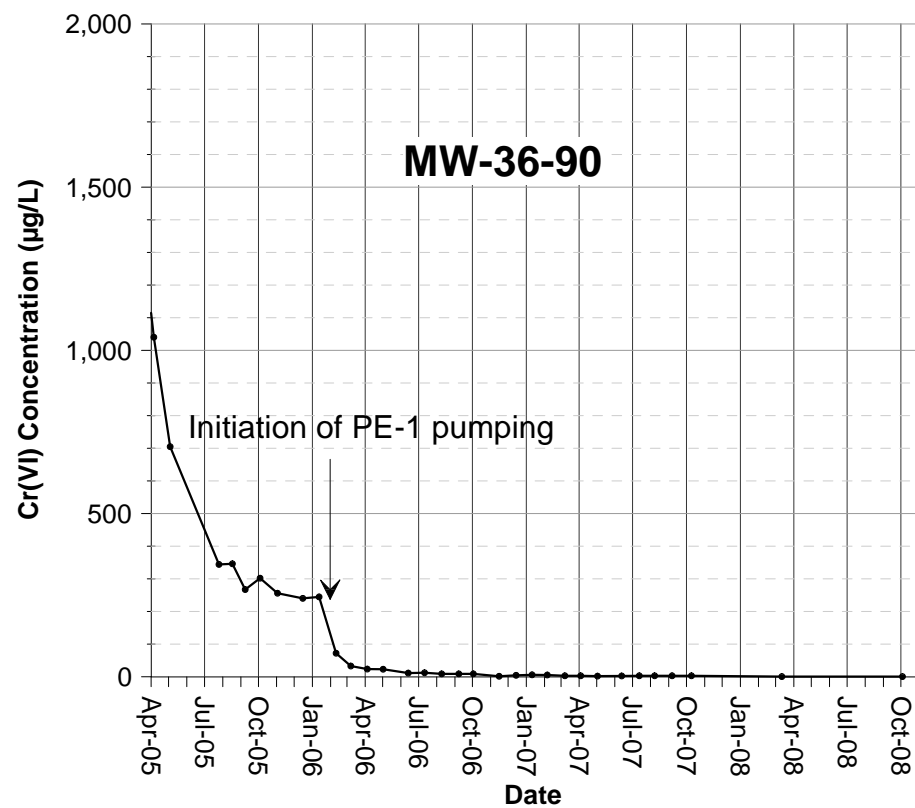
INTERIM MEASURES PERFORMANCE  
 MONITORING REPORT  
 PG&E TOPOCK COMPRESSOR STATION  
 NEEDLES, CALIFORNIA

**CH2MHILL**





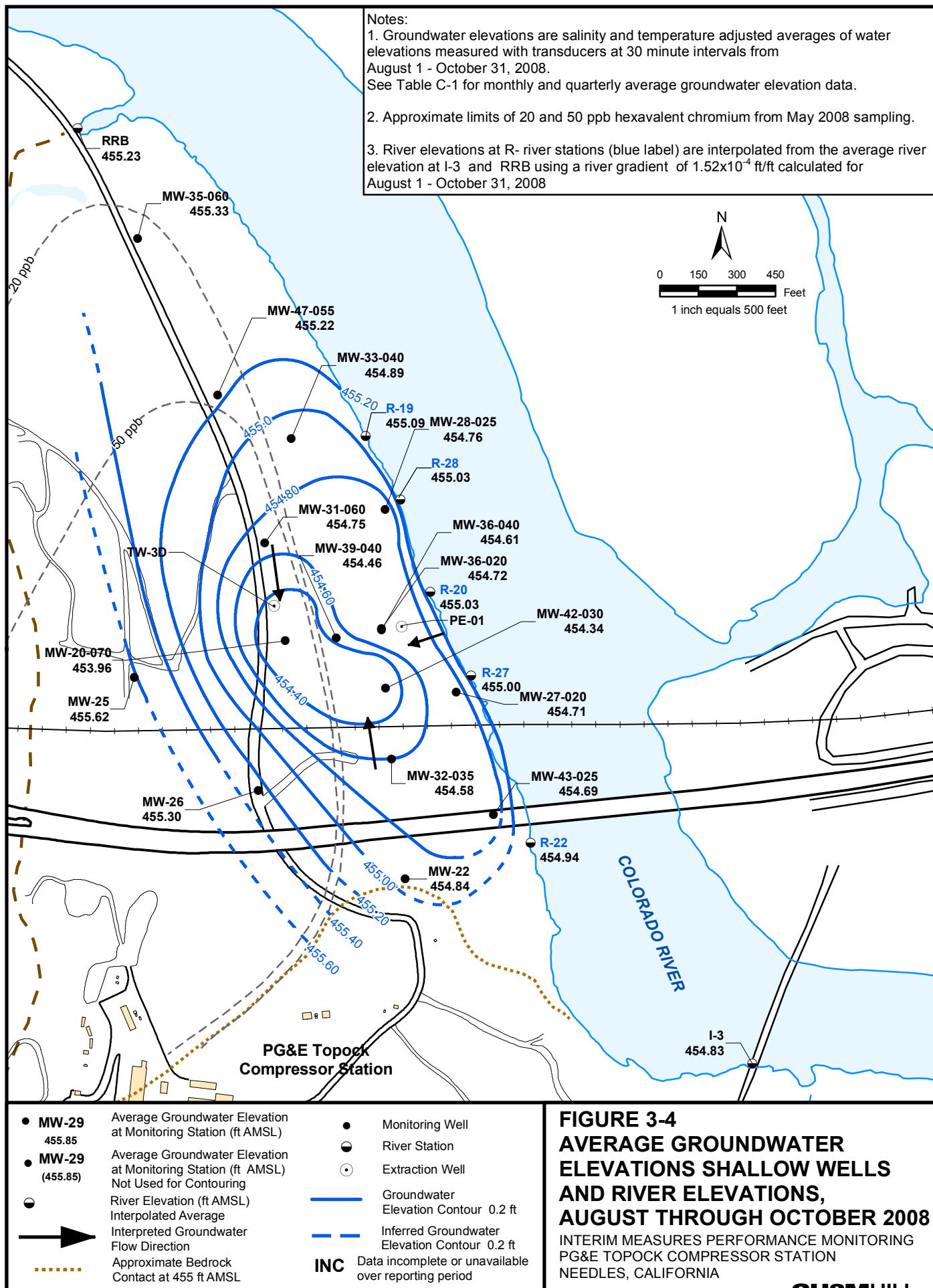


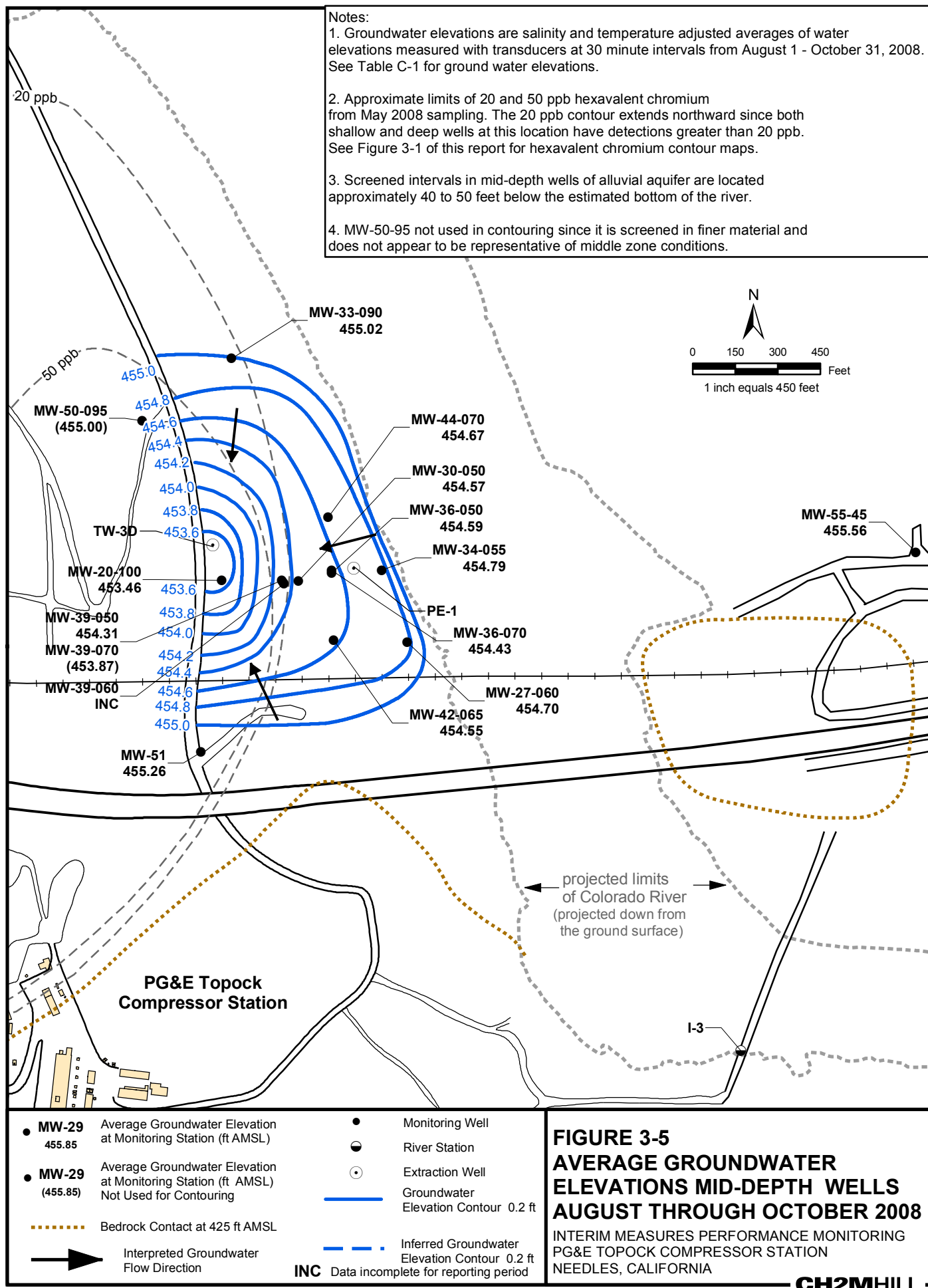


#### Notes

1. Hexavalent chromium [Cr(VI)] results in micrograms per liter (µg/L), approximately equivalent to parts per billion (ppb).
2. Results plotted are maximum concentrations from primary and duplicate samples; see Table B-1 for complete results.
3. MW-36 wells selected to monitor effects of PE-1 pumping on plume west of PE-1. MW-44 wells, MW-46-175, and MW-34-100 selected to monitor concentrations within the plume.

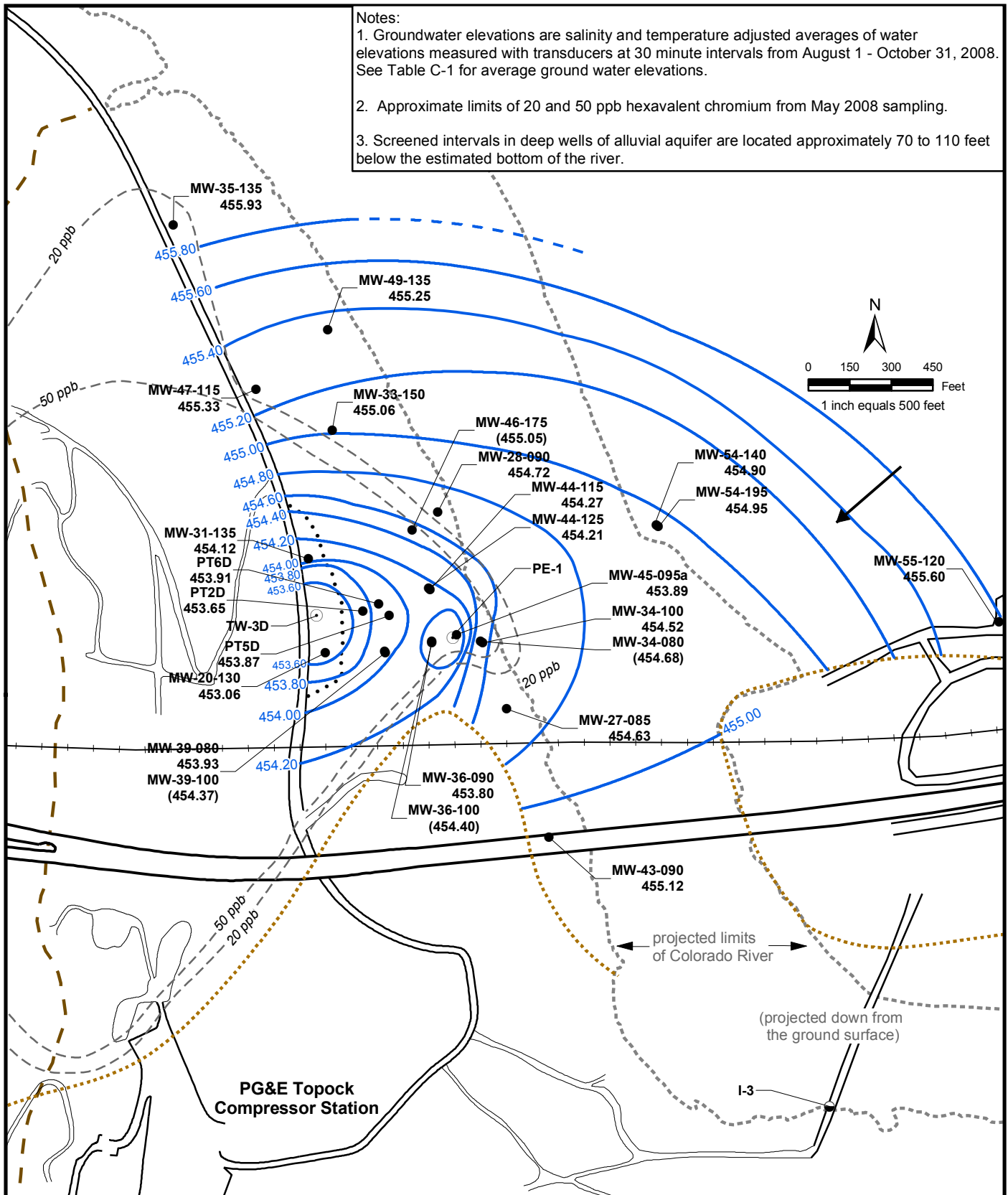
**FIGURE 3-3**  
**Cr(VI) CONCENTRATION TRENDS IN**  
**SELECTED PERFORMANCE MONITORING WELLS**  
**APRIL 2005 THROUGH OCTOBER 2008**  
 INTERIM MEASURES PERFORMANCE MONITORING  
 PG&E TOPOCK COMPRESSOR STATION  
 NEEDLES, CALIFORNIA





**Notes:**

1. Groundwater elevations are salinity and temperature adjusted averages of water elevations measured with transducers at 30 minute intervals from August 1 - October 31, 2008. See Table C-1 for average ground water elevations.
2. Approximate limits of 20 and 50 ppb hexavalent chromium from May 2008 sampling.
3. Screened intervals in deep wells of alluvial aquifer are located approximately 70 to 110 feet below the estimated bottom of the river.



**MW-29**  
● 455.85 Average Groundwater Elevation at Monitoring Station (ft AMSL)

**MW-29**  
● (455.85) Average Groundwater Elevation at Monitoring Station (ft AMSL) Not Used for Contouring



Interpreted Groundwater Flow Direction  
Approximate Bedrock Contact at 395 ft AMSL

● Monitoring Well

○ River Station

○ Extraction Well

— Groundwater Elevation Contour 0.2 ft

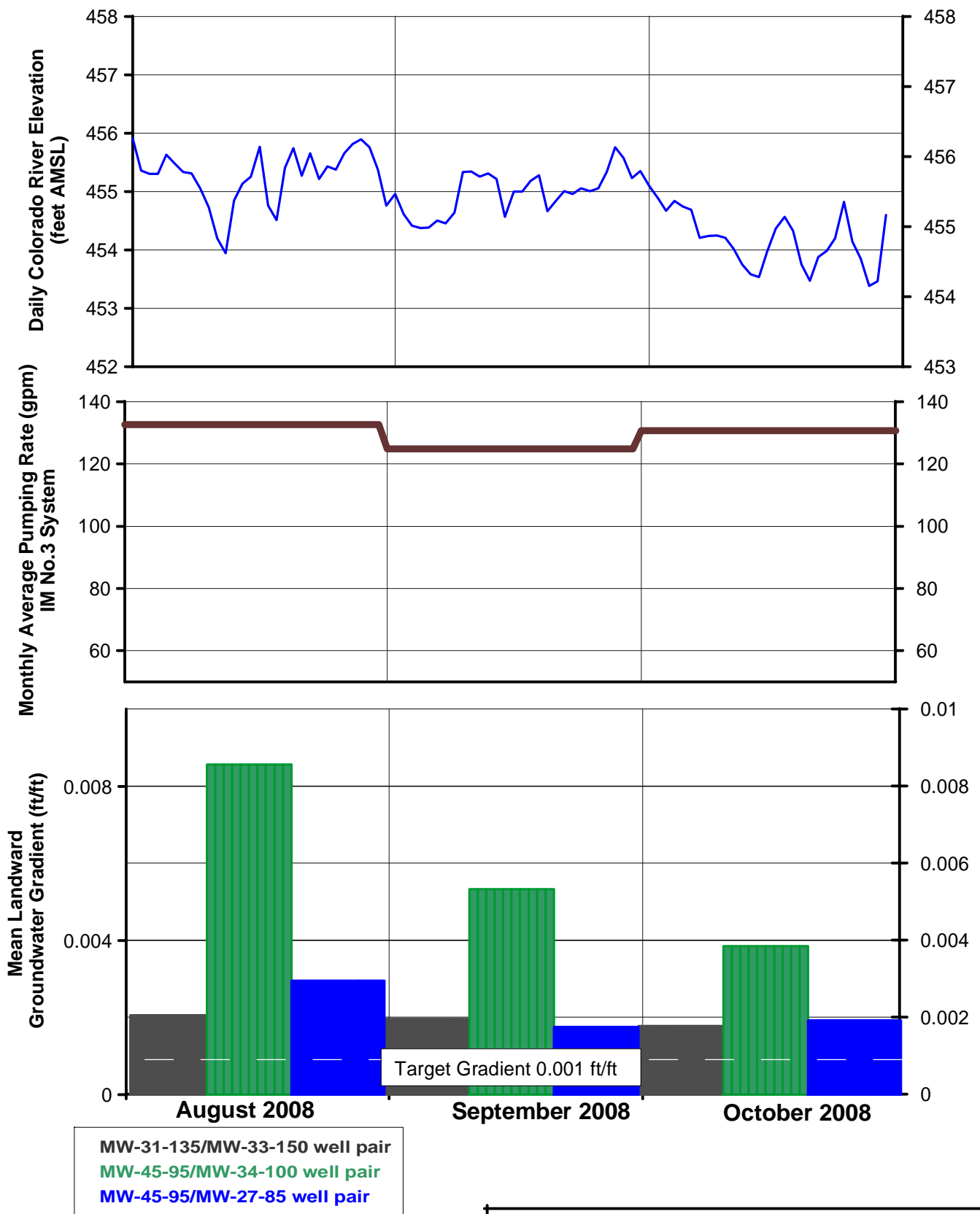
- - - Inferred Groundwater Elevation Contour 0.2 ft

INC Data incomplete for reporting period

**FIGURE 3-6**  
**AVERAGE GROUNDWATER ELEVATIONS DEEP WELLS**  
**AUGUST THROUGH OCTOBER 2008**  
INTERIM MEASURES PERFORMANCE MONITORING  
PG&E TOPOCK COMPRESSOR STATION  
NEEDLES, CALIFORNIA

**CH2MHILL**

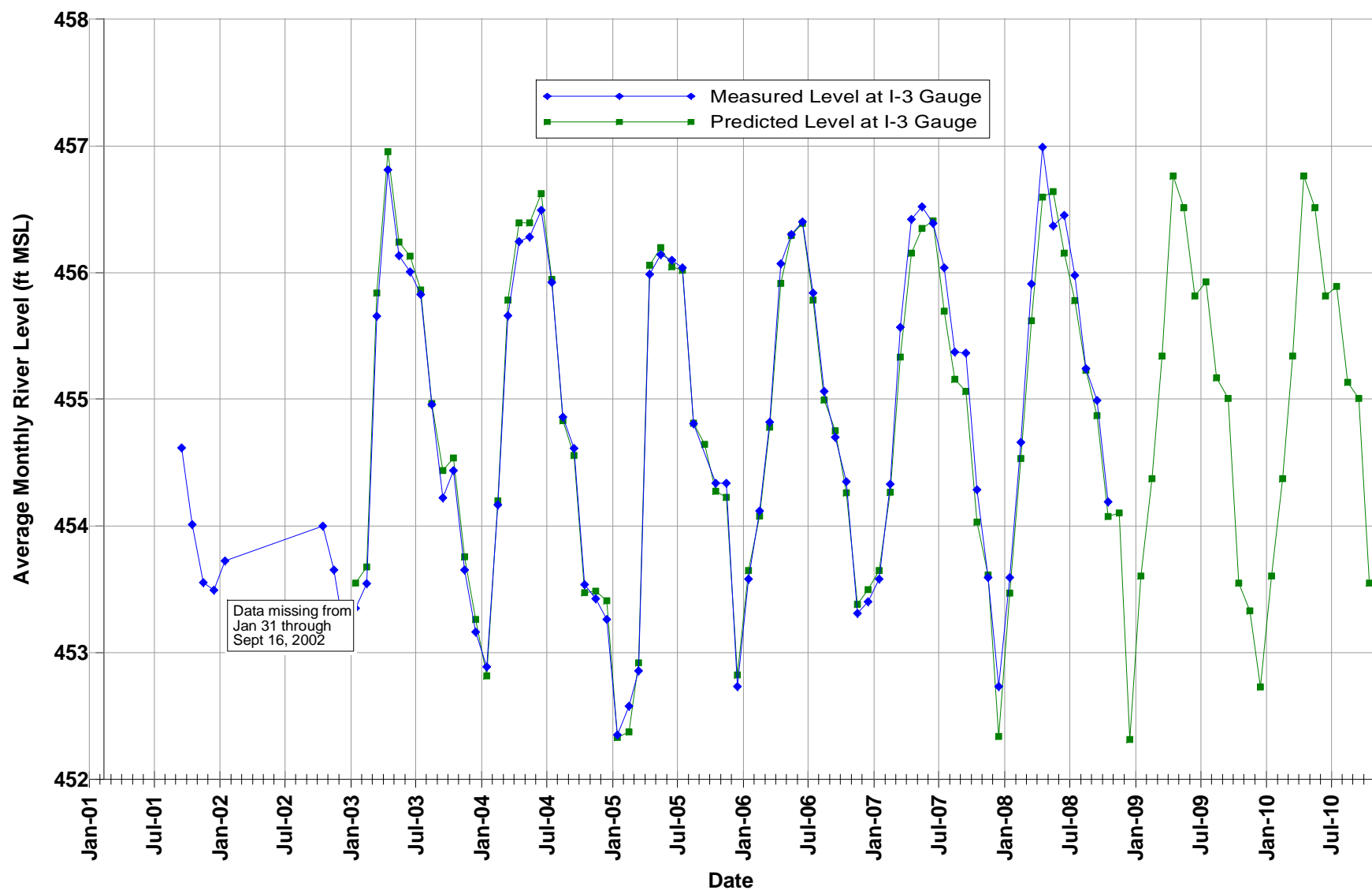




**Notes:**

- 1) For IM pumping, the target landward gradient for well pairs is 0.001 feet/foot.
- 2) Refer to Table 3-1 and Section 3.1 for discussion of pumping data.
- 3) Pumping rate plotted is the combined rate of extraction wells TW-3D and PE-1 in operation each month.
- 4) Refer to Table 3-3 and Section 3.4 for discussion of gradient data.

**FIGURE 3-8**  
**MEASURED HYDRAULIC GRADIENTS,**  
**RIVER ELEVATION AND PUMPING RATE**  
**AUGUST 2008 THROUGH OCTOBER 2008**  
 INTERIM MEASURES PERFORMANCE MONITORING  
 PG&E TOPOCK COMPRESSOR STATION  
 NEEDLES, CALIFORNIA



Note:  
 Projected river level is calculated based on monthly averages of Davis Dam release and stage in Lake Havasu as of November 13, 2008.  
 Measured data through October 31, 2008.  
 I-3 data unavailable from September 18 through October 4, 2006  
 River projections at I-3 are based upon October 2008 USBR projections.

**FIGURE 3-9**  
**PAST AND PREDICTED FUTURE RIVER LEVELS**  
**AT TOPOCK COMPRESSOR STATION**

INTERIM MEASURES PERFORMANCE MONITORING  
 PG&E TOPOCK COMPRESSOR STATION  
 NEEDLES, CALIFORNIA

**Appendix A**  
**Extraction System Operations Log for August**  
**through October 2008**

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## Appendix A

### Extraction System Operations Log for August 2008 through October 2008

#### PG&E Topock Interim Measures Performance Monitoring Program

During the Third Quarter 2008 (August through October), extraction wells TW-3D and PE-1 operated at a target pump rate of at 135 gallons per minute (gpm) excluding periods of planned and unplanned downtime. Extraction well TW-2D ran for a short period on September 9 and October 3 during sampling. Extraction well TW-2S was not operated during Third Quarter 2008. The operational run time for the IM groundwater extraction system (combined or individual pumping) was approximately 95.3 percent during the Third Quarter 2008.

The IM No. 3 facility treated approximately 17,145,562 gallons of extracted groundwater during the Third Quarter 2008. The IM No. 3 facility also treated approximately 8,295 gallons of water generated from the groundwater monitoring program and 45,900 gallons of water from IM No. 3 injection well development. Five containers of solids from the IM No. 3 facility were transported offsite during the Third Quarter 2008.

Periods of planned and unplanned extraction system down time (that together resulted in approximately 4.7 percent of downtime during the Third Quarter 2008) are summarized below. The times shown are in Pacific Standard Time (PST) to be consistent with other data collected (e.g., water level data) at the site.

#### AUGUST 2008

- **August 5, 2008 (unplanned):** The extraction well system was offline from 6:14 p.m. to 6:16 p.m. and from 6:34 p.m. to 6:40 p.m. when the City of Needles power supply imbalance alarmed and shut down the extraction wells. Extraction system downtime was 8 minutes.
- **August 8, 2008 (unplanned):** The extraction well system was offline from 6:40 p.m. to 6:41 p.m., from 7:03 p.m. to 7:13 p.m., from 7:14 p.m. to 7:15 p.m., and from 7:21 p.m. to 10:43 p.m. when the City of Needles power supply imbalance alarmed and shut down the extraction wells. Extraction system downtime was 3 hours and 34 minutes.
- **August 20, 2008 (planned):** The extraction well system was offline from 7:33 a.m. to 4:09 p.m. to perform scheduled monthly maintenance. It was also offline from 5:15 p.m. to 8:33 p.m. when the level in the reverse osmosis feed tank was too high, and it was offline from 9:38 p.m. to 10:03 p.m. and from 10:16 to August 21, 2008 12:04 a.m. when the level in the raw water feed tank was too high. Extraction system downtime was 14 hours and 7 minutes.
- **August 25, 2008 (unplanned):** The extraction well system was offline from 5:01 p.m. to 5:26 p.m. when the City of Needles power supply imbalance alarmed and shut down the extraction wells. Extraction system downtime was 25 minutes.
- **August 26, 2008 (unplanned):** The extraction well system was offline from 7:41 a.m. to 7:44 a.m. when plant power was switched from generator power to City of Needles power. Extraction system downtime was 3 minutes.

## SEPTEMBER 2008

- **September 3, 2008 (planned):** The extraction well system was offline from 12:41 p.m. to 12:57 p.m. for maintenance. Extraction system downtime was 16 minutes.
- **September 6, 2008 (unplanned):** The extraction well system was offline from 1:11 a.m. to 6:33 a.m. when a low flow alarm in the chemical loop triggered, shutting down the extraction system. Extraction system downtime was 5 hours and 22 minutes.
- **September 15 -17, 2008 (planned):** The extraction well system was offline from 8:13 a.m. on September 15 to 9:09 a.m. on September 17 to perform scheduled monthly maintenance. Extraction system downtime was 2 days and 56 minutes.
- **September 17, 2008 (unplanned):** The extraction well system was offline from 1:49 p.m. to 3:12 p.m. when the City of Needles power supply imbalance alarmed and shut down the extraction wells. Extraction system downtime was 1 hour and 23 minutes.
- **September 18, 2008 (planned):** The extraction well system was offline from 6:38 a.m. to 6:47 a.m. when the plant was switched from generator power back to City of Needles power supply. Extraction system downtime was 9 minutes.
- **September 23, 2008 (unplanned):** The extraction well system was offline from 8:33 a.m. to 8:34 a.m., from 8:44 a.m. to 9:11 a.m., from 11:32 a.m. to 11:33 a.m., and from 11:35 a.m. to 11:59 a.m. when the City of Needles power supply imbalance alarmed and shut down the extraction wells. Extraction system downtime was 53 minutes.
- **September 30, 2008 (unplanned):** The extraction well system was offline from 8:56 a.m. to 11:02 a.m. when a leak was detected in the microfilter. The leak was repaired and the plant was brought back online. Extraction system downtime was 2 hours and 6 minutes.

## OCTOBER 2008

- **October 4, 2008 (unplanned):** The extraction well system was offline from 6:19 a.m. to 8:59 a.m. when the high level alarm in T-600 triggered, shutting down the extraction system. Extraction system downtime was 2 hours and 40 minutes.
- **October 12, 2008 (unplanned):** The extraction well system was offline from 9:13 a.m. to 10:19 a.m. when the raw water pump, P-200, shutdown causing the extraction system to shutdown. Extraction system downtime was 1 hour and 6 minutes.
- **October 14, 2008 (unplanned):** The extraction well system was offline from 10:55 a.m. to 12:03 a.m. due to a caustic leak during a fitting inspection. The release was controlled, and 10 mL of caustic spilt onto an absorbent pad within the secondary containment of the chemical area. Extraction system downtime was 1 hour and 8 minutes.
- **October 15, 2008 (planned):** The extraction well system was offline from 7:03 a.m. to 2:57 p.m. and from 4:45 p.m. to 9:27 p.m. to perform scheduled monthly maintenance. Extraction system downtime was 12 hours and 36 minutes.
- **October 29, 2008 (planned):** The extraction well system was offline from 7:22 a.m. to 4:16 p.m. for maintenance. Extraction system downtime was 8 hours and 54 minutes.

**Appendix B**  
**Chromium Sampling Results for Monitoring**  
**Wells in Floodplain Area**

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TABLE B-1

Groundwater Sampling Results for Floodplain Monitoring Wells, October 2007 through October 2008  
Interim Measures Performance Monitoring  
PG&E Topock Compressor Station

Sample Date		Hexavalent Chromium µg/L	Dissolved Total Chromium µg/L	Selected Field Parameters			Groundwater and River Elevations at Sampling Time	
				ORP mV	Dissolved Oxygen mg/L	Specific Conductance µS/cm	Groundwater Elevation salinity-adjusted feet MSL	River Elevation Downstream I-3 Station
Shallow Zone								
MW-27-020	02-Oct-07	ND (0.2)	2.20	-170	0.2	1,133	454.5	453.6
	03-Oct-08	ND (0.2)	ND (1.0)	-66	0.3	1,097	455.1	455.1
MW-28-025	04-Oct-07	ND (1.0)	ND (1.0)	-61	0.5	1,394	454.8	454.5
	08-Oct-08	ND (0.2)	ND (1.0)	14	0.2	1,245	454.7	454.8
MW-29	04-Oct-07	ND (1.0)	ND (1.0)	-112	0.5	3,172	455.3	454.3
	12-Mar-08	ND (1.0)	ND (1.0)	-132	0.4	4,490	455.4	455.0
	30-Sep-08	0.38 J	^	-269	0.3	3,507	455.4	454.5
MW-30-030	08-Oct-07	ND (1.0)	ND (1.0) LF	-97	0.5	42,690	454.6	454.1
MW-32-020	01-Oct-07	ND (2.0)	ND (1.0)	-101	0.5	50,258	455.0	454.2
	10-Mar-08	ND (2.1)	ND (1.0)	-121	0.3	45,930	454.8	454.6
	03-Oct-08	ND (0.2)	ND (1.0)	-7	0.1	55,840	454.1	454.5
MW-32-035	01-Oct-07	ND (1.0)	1.20	-141	0.2	19,607	454.7	454.1
	10-Dec-07	---	ND (2.0)	-145	0.2	19,800	452.7	452.3
	10-Mar-08	---	ND (1.0)	-145	0.1	25,210	455.0	454.5
	06-May-08	---	1.90	-120	0.1	25,580	456.4	457.4
	03-Oct-08	ND (0.2)	ND (1.0)	-52	0.1	22,365	454.5	453.9
MW-33-040	05-Oct-07	ND (0.2)	1.10	109	0.6	8,015	455.2	454.6
	12-Dec-07	0.40	4.10	22	0.2	8,969	453.0	452.5
	12-Mar-08	ND (0.2)	ND (1.0)	-30	0.3	6,112	455.2	454.8
	05-May-08	ND (0.2)	ND (1.0)	59	3.0	5,564	456.1	455.5
	06-Oct-08	ND (1.0)	1.08	-118	0.8	11,782	455.0	454.8
MW-36-020	03-Oct-07	ND (1.0)	ND (1.0)	-216	0.7	25,659	456.7	453.7
MW-36-040	03-Oct-07	ND (1.0)	ND (1.0)	-249	0.3	9,051	454.1	453.6
MW-39-040	08-Oct-07	ND (1.0)	ND (1.0)	-181	0.0	14,900	454.0	453.9
MW-42-030	04-Oct-07	ND (1.0)	ND (1.0)	-130	0.1	21,073	453.8	453.6
MW-43-025	02-Oct-07	ND (1.0)	ND (1.0)	-166	0.3	1,226	454.8	454.3
	10-Dec-07	---	ND (1.0)	-171	0.1	1,333	452.3	452.4
	10-Mar-08	---	ND (1.0)	-161	0.2	1,614	455.1	454.8
	07-May-08	---	ND (1.0)	-165	0.2	1,617	455.8	454.6
	02-Oct-08	ND (0.2)	ND (1.0)	-98	0.2	1,361	455.0	454.7
Middle Zone								
MW-27-060	02-Oct-07	ND (0.2)	ND (1.0)	-109	0.4	7,542	454.5	453.9
	03-Oct-08	0.32	ND (1.0)	-83	0.2	4,430	455.0	454.9
MW-33-090	05-Oct-07	18.2	19.4	206	0.1	9,719	455.1	454.8
	13-Dec-07	21.0	22.7	138	0.1	10,680	453.0	452.6
	13-Dec-07 FD	20.6	21.3	FD	FD	FD	FD	FD
	12-Mar-08	23.7	22.5	-66	0.2	11,390	455.2	454.4
	05-May-08	21.1	20.2	45	0.1	11,160	456.1	455.4
	06-Oct-08	21.1	19.2	-209	0.1	10,635	454.9	454.4
MW-34-055	03-Oct-07	ND (0.2)	ND (1.0)	-207	0.4	1,116	455.0	454.6

Refer to table footnotes for data qualifier explanation.

TABLE B-1

Groundwater Sampling Results for Floodplain Monitoring Wells, October 2007 through October 2008  
Interim Measures Performance Monitoring  
PG&E Topock Compressor Station

Sample Date		Hexavalent Chromium µg/L	Dissolved Total Chromium µg/L	Selected Field Parameters			Groundwater and River Elevations at Sampling Time	
				ORP mV	Dissolved Oxygen mg/L	Specific Conductance µS/cm	Groundwater Elevation salinity-adjusted feet MSL	River Elevation Downstream I-3 Station
Middle Zone								
MW-34-055	07-Oct-08	ND (0.2)	ND (1.0)	-108	0.1	1,107	454.8	454.8
MW-36-050	10-Oct-07	ND (0.2)	2.00	-172	0.0	3,810	454.4	454.1
MW-36-070	09-Oct-07	ND (0.2)	ND (1.0)	-150	0.0	1,800	454.0	453.5
	03-Oct-08	ND (0.2)	ND (1.0)	-29	0.0	1,630	454.5	454.5
MW-39-050	08-Oct-07	ND (0.2)	ND (1.0)	-90	0.0	3,780	453.9	453.5
	01-Oct-08	ND (0.2)	ND (1.0)	-231	0.2	2,702	454.6	454.9
MW-39-060	08-Oct-07	ND (0.2)	ND (1.0)	-83	0.1	5,211	453.6	453.4
	01-Oct-08	ND (0.2)	ND (1.0)	-215	0.2	3,518	454.6	455.2
MW-39-070	08-Oct-07	5.50	6.20	19	0.2	6,159	453.7	453.9
	01-Oct-08	ND (0.2)	ND (1.0)	-279	0.1	5,190	453.9	454.5
MW-42-055	04-Oct-07	ND (1.0)	ND (1.0)	-128	0.1	13,972	454.3	453.8
	11-Dec-07	ND (1.0)	ND (1.0)	-132	0.2	14,960	452.3	452.1
	11-Mar-08	ND (1.0)	ND (1.0)	-126	0.3	15,890	454.9	455.7
	06-May-08	ND (1.0)	ND (1.0)	-100	0.2	15,580	456.4	457.4
	03-Oct-08	ND (0.2)	ND (1.0)	-123	0.2	13,322	454.8	455.4
MW-42-065	03-Oct-07	ND (1.0)	ND (1.0)	-81	0.4	12,290	454.3	453.6
	11-Dec-07	ND (1.0)	ND (1.0)	-59	0.1	16,470	452.5	452.1
	11-Mar-08	ND (1.0)	ND (1.0)	-50	0.2	17,980	455.1	455.5
	06-May-08	ND (1.0)	ND (1.0)	-23	0.1	16,680	456.5	457.6
	03-Oct-08	ND (0.2) J	1.09	-32	0.3	14,084	455.0	455.3
MW-44-070	04-Oct-07	ND (0.2)	ND (1.0)	-404	0.2	4,816	454.5	454.0
	11-Dec-07	ND (0.2)	ND (1.0)	-147	0.1	4,448	452.3	452.1
	11-Mar-08	ND (0.2)	ND (1.0)	-128	0.3	4,663	454.8	454.6
	07-May-08	ND (0.2)	ND (1.0)	-107	0.1	4,321	454.5	457.4
	07-Oct-08	ND (0.2)	ND (1.0)	-159	0.1	3,510	454.1	453.8
MW-52S	11-Oct-07	ND (1.0)	ND (1.0)	-175	0.2	12,740	---	453.7
	17-Dec-07	ND (1.0)	ND (1.0)	-232	0.0	14,800	---	453.3
	13-Mar-08	ND (1.0)	ND (1.0)	-176	0.5	11,390	---	455.0
	07-May-08	ND (1.0)	ND (1.0)	-226	0.0	15,500	---	453.8
	01-Oct-08	ND (1.0)	ND (1.0)	-173	0.5	17,800	---	455.1
Deep Wells								
MW-27-085	02-Oct-07	ND (1.0)	ND (1.0)	-53	0.3	16,793	454.6	453.7
	11-Dec-07	ND (1.0)	ND (1.0)	-44	0.1	18,240	452.5	452.1
	10-Mar-08	ND (1.0)	ND (1.0)	-64	0.2	18,550	454.8	454.5
	06-May-08	ND (1.0)	ND (1.0)	16	0.4	18,720	456.7	457.0
	03-Oct-08	ND (0.2)	1.72	7	0.2	16,341	454.8	454.7
MW-28-090	04-Oct-07	ND (1.0)	ND (1.0)	-123	0.3	8,091	454.9	454.8
	14-Dec-07	ND (0.2)	ND (1.0)	-133	0.2	7,932	452.7	452.9
	13-Mar-08	ND (0.2)	ND (1.0)	-117	0.2	8,048	455.4	455.4
	07-May-08	ND (0.2)	ND (1.0)	-112	0.2	7,956	455.0	454.3

Refer to table footnotes for data qualifier explanation.

TABLE B-1

Groundwater Sampling Results for Floodplain Monitoring Wells, October 2007 through October 2008  
Interim Measures Performance Monitoring  
PG&E Topock Compressor Station

Sample Date		Hexavalent Chromium µg/L	Dissolved Total Chromium µg/L	Selected Field Parameters			Groundwater and River Elevations at Sampling Time	
				ORP mV	Dissolved Oxygen mg/L	Specific Conductance µS/cm	Groundwater Elevation salinity-adjusted feet MSL	River Elevation Downstream I-3 Station
Deep Wells								
MW-28-090	08-Oct-08	ND (0.2)	ND (1.0)	-83	0.1	7,700	454.9	454.9
MW-33-150	09-Oct-07	8.90	8.30	3	0.1	18,600	454.9	453.7
	09-Oct-07 FD	9.40	7.90	FD	FD	FD	FD	FD
	12-Dec-07	8.90	10.0	-67	0.1	17,920	453.4	452.4
	12-Mar-08	7.87	8.06	1	0.6	18,180	455.1	454.2
	06-May-08	8.83	9.21	24	0.1	18,150	456.9	457.7
	06-Oct-08	8.84	9.07	-223	0.1	16,991	454.9	454.0
	06-Oct-08 FD	8.91	7.86	FD	FD	FD	FD	FD
MW-33-210	05-Oct-07	11.9	11.5	-27	0.2	18,138	455.6	455.1
	12-Dec-07	13.3	14.3	-14	0.0	19,800	453.7	452.4
	12-Mar-08	11.7	11.5	-31	0.1	21,180	455.3	454.3
	05-May-08	10.6	9.93	139	0.2	21,150	456.4	455.6
	06-Oct-08	12.4	11.7	-190	0.1	19,726	455.0	454.1
MW-34-080	03-Oct-07	ND (0.2)	ND (1.0)	-63	0.2	8,443	454.9	454.3
	12-Nov-07	ND (1.0)	ND (1.0)	-327	0.1	9,046	453.8	453.0
	13-Dec-07	ND (1.0)	ND (1.0)	-34	0.1	5,648	452.7	452.4
	16-Jan-08	ND (1.0)	ND (1.0)	-26	0.1	9,135	453.9	453.6
	16-Jan-08 FD	ND (1.0)	1.20	FD	FD	FD	FD	FD
	13-Feb-08	ND (0.2)	ND (1.0)	-52	0.2	9,412	455.0	454.7
	12-Mar-08	ND (0.2)	10.9	-62	0.1	9,779	455.5	455.5
	08-Apr-08	ND (1.0)	ND (1.0)	29	0.3	9,061	457.3	457.7
	06-May-08	ND (0.2)	ND (1.0)	-3	0.2	9,911	456.7	457.1
	04-Jun-08	ND (1.0)	ND (1.0)	-114	1.0	9,403	456.1	456.1
	08-Jul-08	ND (1.0)	ND (1.0)	-103	0.2	9,300	455.8	456.2
	20-Aug-08	ND (0.2)	ND (1.0)	-26	0.2	9,337	456.1	455.5
	03-Sep-08	ND (1.0)	ND (1.0)	-286	0.1	8,837	454.5	454.5
	07-Oct-08	ND (0.2)	1.52	-126	0.1	8,610	454.6	454.4
MW-34-100	03-Oct-07	521	609 J	-51	0.2	14,026	454.2	453.8
	03-Oct-07 FD	513	424 J	FD	FD	FD	FD	FD
	13-Nov-07	590	598	-68	0.1	17,040	453.3	453.3
	13-Dec-07	567	591	115	0.1	17,000	452.4	452.5
	13-Dec-07 FD	614	610	FD	FD	FD	FD	FD
	16-Jan-08	564	648	-7	0.1	17,830	453.4	453.5
	13-Feb-08	492	560	-20	0.1	18,310	454.6	454.5
	12-Mar-08	358	338	9	0.2	19,150	455.2	455.3
	08-Apr-08	280	276	20	0.2	17,878	456.8	457.6
	08-Apr-08 FD	292	274	FD	FD	FD	FD	FD
	06-May-08	234	228	52	0.2	19,660	456.5	457.2
	06-May-08 FD	238	228	FD	FD	FD	FD	FD
	04-Jun-08	268	323	70	0.7	18,918	456.0	456.4
	08-Jul-08	250	266	22	0.2	18,910	456.1	456.4
	08-Jul-08 FD	257	268	FD	FD	FD	FD	FD
20-Aug-08	283	287	75	0.2	19,420	456.1	455.8	

Refer to table footnotes for data qualifier explanation.

TABLE B-1

Groundwater Sampling Results for Floodplain Monitoring Wells, October 2007 through October 2008  
Interim Measures Performance Monitoring  
PG&E Topock Compressor Station

			Hexavalent Chromium µg/L	Dissolved Total Chromium µg/L	Selected Field Parameters			Groundwater and River Elevations at Sampling Time	
					ORP mV	Dissolved Oxygen mg/L	Specific Conductance µS/cm	Groundwater Elevation salinity-adjusted feet MSL	River Elevation Downstream I-3 Station
Deep Wells									
MW-34-100	20-Aug-08	FD	250	253	FD	FD	FD	FD	
	03-Sep-08		294	308	-264	0.2	18,510	454.4	454.7
	07-Oct-08		272	245	17	0.1	18,088	454.4	454.7
	07-Oct-08	FD	286 J	242	FD	FD	FD	FD	FD
MW-36-090	09-Oct-07		3.20	2.90	-30	0.1	3,832	453.4	453.5
	11-Mar-08		0.71	1.46	-54	0.2	2,918	454.0	454.9
	11-Mar-08	FD	0.703	1.24	FD	FD	FD	FD	FD
	03-Oct-08		0.61	1.46	-68	0.0	2,240	454.0	454.8
MW-36-100	10-Oct-07		228	196	-27	0.1	14,740	453.9	454.1
	11-Mar-08		146	145	-170	0.2	14,550	454.2	454.8
	07-Oct-08		88.4	89.0	-200	0.1	12,687	453.6	454.2
MW-39-080	08-Oct-07		58.6	48.3	-10	0.1	13,529	453.6	453.5
	14-Mar-08		34.8	28.6	-63	0.4	14,220	454.1	455.2
	01-Oct-08		7.58	8.05	-257	0.1	12,105	454.1	454.7
MW-39-100	10-Oct-07		1660	1840	87	0.2	22,110	454.3	454.5
	14-Mar-08		1150	1290	37	0.6	22,680	454.9	455.5
	01-Oct-08		706	613	-19	0.2	20,895	455.0	455.6
MW-43-075	02-Oct-07		ND (1.0)	ND (1.0)	-147	0.3	13,587	455.1	454.4
	02-Oct-08		ND (0.2)	ND (1.0)	-90	0.1	14,010	454.7	454.2
MW-43-090	02-Oct-07		ND (1.0)	ND (1.0)	-79	0.4	18,809	455.6	454.7
	02-Oct-08		ND (0.2)	ND (1.0)	-85	0.1	19,543	456.0	454.4
MW-44-115	04-Oct-07		763	866	-72	0.1	12,519	454.4	454.3
	04-Oct-07	FD	783	830	FD	FD	FD	FD	FD
	13-Nov-07		766	890	-206	0.1	13,360	453.1	453.2
	13-Nov-07	FD	767	884	FD	FD	FD	FD	FD
	11-Dec-07		736	766	-60	0.1	13,420	453.0	452.1
	14-Jan-08		746	652	-48	0.1	13,550	452.9	453.0
	14-Feb-08		744	668	-48	0.1	14,300	455.1	457.1
	14-Feb-08	FD	735	706	FD	FD	FD	FD	FD
	11-Mar-08		742	596	-70	0.3	14,330	454.4	454.6
	07-Apr-08		685	689	100	0.8	13,480	455.4	455.8
	08-May-08		620	590	-2	0.1	14,330	455.4	455.1
	02-Jun-08		564	542	-142	0.1	13,811	454.9	455.3
	07-Jul-08		493	478	-108	0.2	13,570	455.3	455.7
	19-Aug-08		498 J	555	-66	0.2	13,730	454.2	454.4
	02-Sep-08		488	489	-274	0.1	13,550	454.1	454.3
	07-Oct-08		456	502	-185	0.1	12,917	453.9	454.0
	07-Oct-08	FD	527 J	466	FD	FD	FD	FD	FD
MW-44-125	04-Oct-07		314	347	-15	0.1	12,049	455.0	454.5
	12-Nov-07		318	330	-295	0.1	13,300	453.5	452.6
	11-Dec-07		359	311	-61	0.1	14,030	452.7	452.1
	14-Jan-08		338	344	-55	0.1	13,630	453.6	453.2

Refer to table footnotes for data qualifier explanation.

TABLE B-1

Groundwater Sampling Results for Floodplain Monitoring Wells, October 2007 through October 2008  
Interim Measures Performance Monitoring  
PG&E Topock Compressor Station

Sample Date		Hexavalent Chromium µg/L	Dissolved Total Chromium µg/L	Selected Field Parameters			Groundwater and River Elevations at Sampling Time	
				ORP mV	Dissolved Oxygen mg/L	Specific Conductance µS/cm	Groundwater Elevation salinity-adjusted feet MSL	River Elevation Downstream I-3 Station
Deep Wells								
MW-44-125	14-Feb-08	326	324	-82	0.1	13,760	455.5	457.1
	14-Mar-08	338	291	-112	0.1	13,430	455.5	455.6
	07-Apr-08	318	326	-6	0.3	10,272	455.7	455.5
	08-May-08	253	342	1	0.1	12,400	456.3	455.5
	24-Jun-08	293	339	-77	0.0	17,300	456.7	456.7
	07-Jul-08	281	291	-155	0.2	13,860	455.5	455.2
	19-Aug-08	294	297	-65	0.7	10,910	455.0	454.4
	07-Oct-08	55.9	64.5	-150	0.1	3,249	454.2	453.6
MW-46-175	05-Oct-07	100	86.7	-96	0.1	16,392	455.4	455.2
	13-Nov-07	104	95.0	-292	0.1	17,300	453.7	452.9
	13-Dec-07	123	128	-202	0.0	17,510	453.0	452.3
	14-Jan-08	51.5	133	-159	0.1	17,520	453.6	452.9
	13-Feb-08	125	136	-146	0.1	18,300	454.1	454.5
	13-Mar-08	99.8	92.8	-174	0.1	18,300	455.3	455.6
	07-Apr-08	95.6	100	-52	0.2	17,588	455.7	455.4
	07-May-08	77.9	74.7	-121	0.1	18,470	455.1	453.6
	02-Jun-08	74.2	86.8	-225	0.1	18,176	455.6	455.5
	02-Jun-08 FD	73.6	87.0	FD	FD	FD	FD	FD
	08-Jul-08	75.3	83.4	-192	0.1	17,700	455.8	455.7
	20-Aug-08	98.2	91.4	-103	0.2	18,470	456.0	456.8
	03-Sep-08	100	112	-314	0.1	17,770	454.9	454.9
	03-Sep-08 FD	103	102	FD	FD	FD	FD	FD
	08-Oct-08	105	87.2	-207	0.1	17,622	454.7	454.3
MW-46-205	05-Oct-07	3.70	4.60	2	0.1	20,051	455.7	454.8
	14-Dec-07	3.50	4.20	-12	0.1	21,470	453.6	452.8
	13-Mar-08	5.21	5.20	91	0.1	22,360	455.7	455.8
	07-May-08	4.52	4.25	57	0.1	22,620	455.8	453.8
	08-Oct-08	ND (4.9)	4.32	-127	0.1	21,491	454.8	454.5
MW-49-135	10-Oct-07	ND (1.0)	2.80	-37	1.3	14,690	455.2	453.6
	13-Mar-08	ND (1.0)	1.43	-82	8.4	14,430	455.3	454.7
	06-Oct-08	ND (0.2)	^	-147	0.2	13,684	455.4	455.5
MW-49-275	09-Oct-07	ND (1.0)	ND (1.0)	-178	0.1	26,890	456.3	454.1
	13-Mar-08	ND (1.0)	1.27	-191	0.1	26,350	455.9	454.7
	30-Sep-08	ND (1.0)	ND (1.0)	---	0.1	24,030	455.8	454.6
MW-49-365	09-Oct-07	ND (2.0)	ND (1.0)	-158	0.1	41,790	458.1	454.6
	13-Mar-08	ND (1.0)	ND (1.0)	-207	0.1	40,600	457.5	454.8
	06-Oct-08	ND (1.0)	ND (1.0)	-296	0.1	38,436	457.1	455.0
MW-52D	11-Oct-07	ND (1.0)	ND (1.0)	-201	1.2	25,600	---	453.9
	17-Dec-07	ND (1.0)	ND (1.0)	-280	0.0	24,100	---	453.5
	13-Mar-08	ND (1.0)	ND (1.0)	-142	0.1	22,190	---	455.3
	07-May-08	ND (1.0)	ND (1.0)	-192	0.9	24,050	---	453.7
	01-Oct-08	ND (1.0)	ND (1.0)	-262	0.0	28,600	---	454.8

Refer to table footnotes for data qualifier explanation.

TABLE B-1

Groundwater Sampling Results for Floodplain Monitoring Wells, October 2007 through October 2008

Interim Measures Performance Monitoring

PG&amp;E Topock Compressor Station

Sample Date		Hexavalent Chromium µg/L	Dissolved Total Chromium µg/L	Selected Field Parameters			Groundwater and River Elevations at Sampling Time	
				ORP mV	Dissolved Oxygen mg/L	Specific Conductance µS/cm	Groundwater Elevation salinity-adjusted feet MSL	River Elevation Downstream I-3 Station
Deep Wells								
MW-52M	11-Oct-07	ND (1.0)	ND (1.0)	-164	0.2	18,170	---	454.0
	17-Dec-07	ND (1.0)	ND (1.0)	-240	0.0	21,200	---	453.4
	13-Mar-08	ND (1.0)	ND (1.0)	-220	0.2	17,460	---	455.1
	07-May-08	ND (1.0)	ND (1.0)	-230	0.0	20,800	---	453.7
	01-Oct-08	ND (1.0)	ND (1.0)	-191	0.0	23,400	---	455.2
MW-53D	11-Oct-07	ND (2.0)	2.30 J	-159	0.3	28,930	---	454.4
	11-Oct-07	ND (1.0)	ND (1.0) J	FD	FD	FD	FD	FD
	17-Dec-07	ND (1.0)	ND (1.0)	-283	0.0	30,000	---	453.2
	13-Mar-08	ND (1.0)	ND (1.0)	-241	0.4	27,630	---	454.7
	07-May-08	ND (1.0)	ND (1.0)	-160	0.0	37,300	---	453.6
	01-Oct-08	ND (1.0)	ND (1.0)	-279	0.0	34,000	---	454.3
MW-53M	11-Oct-07	ND (1.0)	ND (1.0)	-160	7.4	21,500	---	454.3
	17-Dec-07	ND (1.0)	ND (1.0)	-176	0.0	22,000	---	453.2
	13-Mar-08	ND (1.0)	ND (1.0)	-140	6.9	18,890	---	454.7
	07-May-08	ND (1.0)	ND (1.0)	-167	1.7	20,940	---	453.6
	01-Oct-08	ND (1.0)	ND (1.0)	-153	1.7	25,900	---	454.0

Refer to table footnotes for data qualifier explanation.

TABLE B-1

Groundwater Sampling Results for Floodplain Monitoring Wells, October 2007 through October 2008  
Interim Measures Performance Monitoring  
PG&E Topock Compressor Station

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**NOTES:**

ND = not detected at listed reporting limit (RL)

FD = field duplicate

MSL = mean sea level

LF = lab filtered

J = concentration or RL estimated by laboratory or data validation

(---) = data not collected, available, rejected, or field instrumentation malfunctioned

µg/L = micrograms per liter

mV = oxidation-reduction potential (ORP)

µS/cm = microSiemens per centimeter

^ = initial results suspect, sample being reanalyzed

Samples taken after February 1, 2008, were field filtered due to the approved change from analysis method 7199 to 218.6 for Cr(VI) analyses (DTSC, 2008b).

Beginning in July 2005, samples analyzed for total chromium by EPA Method 6010B or 6020 were filtered and preserved in the field after sample collection, as per DTSC's June 30, 2005 letter.

The RLs for certain hexavalent chromium results from Method 7199 analyses have been elevated above the standard RL of 0.2 µg/L due to required sample dilution to accommodate matrix interferences.

Groundwater and river elevations in feet above mean sea level (MSL) rounded to 0.1 foot. River elevations from pressure transducer record at I-3.

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Refer to table footnotes for data qualifier explanation.

TABLE B-2

Groundwater Sampling Results for Other Monitoring Wells in PMP Area, October 2007 through October 2008  
Interim Measures Performance Monitoring  
PG&E Topock Compressor Station

Well ID		Sample Date	Hexavalent Chromium µg/L	Dissolved Total Chromium µg/L	Selected Field Parameters		
					ORP mV	Dissolved Oxygen mg/L	Specific Conductance µS/cm
Shallow Zone							
MW-09	04-Oct-07		304	304	48.3	3.81	2980
	06-Oct-08		282	280	137	3.79	3520
MW-12	04-Oct-07		2830	2700	15.6	5.76	5820
	04-Oct-07	FD	2970	2800	FD	FD	FD
	13-Dec-07		2530	2930	-14.1	6.15	5740
	10-Mar-08		2760	2860	-51.3	7.58	5980
	05-May-08		2580	2800	-7.0	6.43	6780
	07-Oct-08		2680	3000	105	5.71	6490
	07-Oct-08	FD	2580	2990	FD	FD	FD
MW-13	02-Oct-07		21.8	23.6	75.0	6.28	1930
	02-Oct-08		23.2	23.0	61.9	4.85	2070
MW-14	02-Oct-07		27.2	31.2	102	---	1390
	03-Oct-08		27.9 J	29.1	125	6.58	1620
MW-19	05-Oct-07		1390	1510	33.9	6.67	2260
	07-Oct-08		682	786	72.4	6.02	2510
MW-20-070	11-Oct-07		2400	2140	147	9.14	3230
	12-Mar-08		2580	2260	86.1	7.91	3210
	07-Oct-08		2010	2070	110	7.31	3190
MW-21	04-Oct-07		ND (5.0)	ND (1.0)	18.0	0.98	15200
	11-Dec-07		ND (1.0)	ND (1.0)	80.7	1.71	14500
	11-Mar-08		ND (1.0)	1.80	-81.9	0.49	14100
	06-May-08		ND (1.0)	3.01	-84.9	0.68	15100
	02-Oct-08		ND (1.0)	ND (1.0)	11.2	0.56	16200
MW-22	10-Oct-07		ND (1.0)	ND (1.0)	-72	0.21	28500
	17-Dec-07		---	1.50	-129	0.00	33500
	11-Mar-08		ND (1.0)	ND (1.0)	-93.5	2.29	30800
	29-Jul-08		---	ND (1.0)	---	---	---
	03-Oct-08		ND (0.2)	ND (1.0)	-151	0.00	36800
MW-24A	12-Dec-07		---	3300	145	1.96	2950
	12-Mar-08		---	2000	-201	0.20	9760
	08-May-08		---	10.0	-367	0.28	11300
	16-Oct-08		---	6.02	-254	0.70	10600
MW-25	02-Oct-07		895	805	33.0	6.67	1320
	02-Oct-07	FD	933	884	FD	FD	FD
	07-Oct-08		544	618	122	6.41	1300
	07-Oct-08	FD	552	572	FD	FD	FD
MW-26	02-Oct-07		3510	3740	25.0	6.90	3790
	11-Dec-07		---	2980	148	4.89	3870
	12-Mar-08		2980	2560	180	3.90	4380
	12-Mar-08	FD	2720	2640	FD	FD	FD
	05-May-08		---	2600	9.10	19.1	4220
	08-Oct-08		2560	2410	97.4	2.40	4120

TABLE B-2

Groundwater Sampling Results for Other Monitoring Wells in PMP Area, October 2007 through October 2008  
Interim Measures Performance Monitoring  
PG&E Topock Compressor Station

Well ID	Sample Date	Hexavalent Chromium µg/L	Dissolved Total Chromium µg/L	Selected Field Parameters		
				ORP mV	Dissolved Oxygen mg/L	Specific Conductance µS/cm
MW-31-060	04-Oct-07	726 J	669	94.4	6.10	3040
	06-Oct-08	534	498	124	4.82	3340
MW-35-060	01-Oct-07	24.8	21.3	52.2	0.80	7430
	01-Oct-07 FD	24.8	20.6	FD	FD	FD
	11-Mar-08	35.8	35.4	-181	0.94	6930
	07-Oct-08	24.3	26.8	185	0.80	7960
	07-Oct-08 FD	26.5	27.7	FD	FD	FD
MW-47-055	04-Oct-07	61.9	59.2	50.6	2.50	3880
	12-Dec-07	152	134	30.3	2.15	4040
	14-Feb-08	37.1	39.0	5.00	2.42	4450
	14-Feb-08 FD	37.2	39.4	FD	FD	FD
	14-Mar-08	53.7	46.1	84.9	2.82	3840
	14-Mar-08 FD	48.4	42.6	FD	FD	FD
	07-May-08	34.8	32.7	-0.1	2.20	4350
	08-Oct-08	ND (49)	50.3	-119	2.54	4270
MW-56D	29-Apr-08	ND (1.0)	ND (5.0)	-181	3.50	24500
	04-Jun-08	ND (1.0)	ND (1.0)	-146	6.52	21900
	09-Jul-08	ND (5.0)	ND (1.0)	-142	3.30	21500
	18-Aug-08	ND (1.0)	ND (1.0)	-154	6.68	22600
	03-Sep-08	ND (1.0)	ND (1.0)	-138	7.00	28000
	02-Oct-08	ND (2.0)	ND (1.0)	-179	6.67	27200
TW-02S	04-Oct-07	1250	1220	9.00	4.80	4830
	03-Oct-08	860	748	134	3.28	5850
<b>Middle Zone</b>						
MW-20-100	10-Oct-07	9000	10700	55.2	4.75	3980
	12-Mar-08	9690	7910	96.2	2.95	3770
	08-Oct-08	6770	8140	89.3	3.27	3710
MW-37S	04-Oct-07	7.70	7.50	70.0	2.60	4720
	04-Oct-07 FD	7.60	7.40	FD	FD	FD
	03-Oct-08	7.59	8.74	91.4	1.81	5430
	03-Oct-08 FD	7.68 J	7.80	FD	FD	FD
MW-50-095	04-Oct-07	217	216	68.0	2.00	5320
	11-Dec-07	173	163	83.5	2.30	5120
	12-Mar-08	150	160	80.4	2.29	5160
	12-Mar-08 FD	148	160	FD	FD	FD
	07-May-08	154	187	-53	2.34	5630
	07-May-08 FD	164	192	FD	FD	FD
	06-Oct-08	ND (89)	87.7	90.9	1.78	5580
MW-51	05-Oct-07	4500	4340	127	2.20	10600
	11-Dec-07	---	4460	89.0	3.78	10900
	11-Mar-08	4940	4590	-70.6	0.97	12300
	08-May-08	---	4600	74.9	1.78	12700
	08-Oct-08	4160	4600	111	1.70	11800

TABLE B-2

Groundwater Sampling Results for Other Monitoring Wells in PMP Area, October 2007 through October 2008  
Interim Measures Performance Monitoring  
PG&E Topock Compressor Station

Well ID	Sample Date	Hexavalent Chromium µg/L	Dissolved Total Chromium µg/L	Selected Field Parameters		
				ORP mV	Dissolved Oxygen mg/L	Specific Conductance µS/cm
MW-55-045	15-Apr-08	ND (0.2)	ND (1.0)	-222	0.13	1580
	03-Jun-08	ND (0.2)	ND (1.0)	-176	0.09	1700
	08-Jul-08	ND (1.0)	ND (1.0)	-179	0.11	1580
	18-Aug-08	ND (0.2)	ND (1.0)	-187	0.15	1630
	03-Sep-08	ND (0.2)	ND (1.0)	-167	0.19	1540
	02-Oct-08	ND (0.2)	ND (1.0)	-130	0.11	1540
<b>Deep Wells</b>						
MW-20-130	05-Oct-07	12200	13000	80.3	1.60	12100
	12-Mar-08	13300	11300	101	1.75	8850
	08-Oct-08	8990	11700	97.9	1.70	13200
MW-31-135	01-Oct-07	33.2	29.4	14.4	0.80	10000
	06-Oct-08	ND (8.6)	20.3	103	0.43	11300
MW-35-135	01-Oct-07	32.4	28.9	37.6	0.60	9470
	07-Oct-08	32.0	32.8	168	0.48	10500
MW-37D	04-Oct-07	834	794	95.0	2.20	19100
	13-Mar-08	695	742	97.8	0.17	15700
	06-Oct-08	451	542	106	0.53	16100
MW-40D	04-Oct-07	112	104	37.0	0.00	17700
	13-Mar-08	115	108	171	0.36	16600
	06-Oct-08	ND (100)	102	180	0.45	17300
MW-41D	03-Oct-07	ND (1.0)	1.30	-168	0.00	20400
	12-Mar-08	2.08	2.98	64.2	0.10	22400
	03-Oct-08	ND (0.2)	ND (1.0)	-110	0.08	23100
MW-47-115	04-Oct-07	11.6	12.2	63.4	0.20	13000
	12-Dec-07	10.3	10.9	52.8	0.10	15000
	12-Dec-07 FD	10.5	11.3	FD	FD	FD
	14-Mar-08	18.0	16.5	57.8	0.23	13500
	07-May-08	18.2	18.3	-37.2	0.24	14200
	08-Oct-08	ND (15)	15.6	-174	0.14	13800
MW-50-200	04-Oct-07	9430	9780	70.0	4.30	24100
	11-Dec-07	8930	9340	123	2.86	21300
	12-Mar-08	10900	11800	101	1.29	21800
	08-May-08	10500	11000	47.9	2.86	23800
	07-Oct-08	7390	8890	101	2.47	21400
MW-54-085	15-Apr-08	ND (0.2)	ND (1.0)	-202	0.20	10100
	03-Jun-08	ND (0.2)	ND (1.0)	-139	0.26	11500
	09-Jul-08	ND (0.2)	ND (1.0)	-178	0.17	10900
	19-Aug-08	ND (0.2)	ND (1.0)	-159	0.16	11400
	04-Sep-08	ND (0.2)	ND (1.0)	-151	0.20	10900
	01-Oct-08	ND (0.2)	ND (1.0)	-144	0.27	10800
MW-54-140	14-Apr-08	ND (0.2)	ND (1.0)	-162	0.16	12400
	03-Jun-08	ND (0.2)	ND (1.0)	-139	0.20	13900
	09-Jul-08	ND (1.0)	ND (1.0)	-164	0.20	13300

TABLE B-2

Groundwater Sampling Results for Other Monitoring Wells in PMP Area, October 2007 through October 2008  
Interim Measures Performance Monitoring  
PG&E Topock Compressor Station

Well ID	Sample Date	Hexavalent Chromium µg/L	Dissolved Total Chromium µg/L	Selected Field Parameters		
				ORP mV	Dissolved Oxygen mg/L	Specific Conductance µS/cm
MW-54-140	19-Aug-08	ND (1.0)	ND (1.0)	-126	0.13	13800
	04-Sep-08	ND (1.0)	ND (1.0)	-154	0.20	13400
	01-Oct-08	ND (1.0)	ND (1.0)	-155	0.14	13300
MW-54-195	14-Apr-08	ND (1.0)	ND (1.0)	-202	0.15	21800
	03-Jun-08	ND (1.0)	ND (1.0)	-199	0.13	21500
	09-Jul-08	ND (1.0)	ND (1.0)	-210	0.11	20300
	19-Aug-08	ND (1.0)	ND (1.0)	-172	0.19	20800
	04-Sep-08	ND (1.0)	ND (1.0)	-184	0.33	19500
	01-Oct-08	ND (1.0) J	ND (1.0)	-208	0.10	19900
MW-55-120	15-Apr-08	ND (0.2)	ND (1.0)	-206	0.17	8940
	03-Jun-08	ND (0.2)	ND (1.0)	-170	0.23	9810
	08-Jul-08	ND (0.2)	ND (1.0)	-169	0.09	8990
	18-Aug-08	ND (0.2)	ND (1.0)	-249	0.20	2430
	03-Sep-08	0.614	ND (1.0)	-81.8	0.18	8500
	02-Oct-08	0.402	1.13	-52.4	0.13	8540
MW-56M	29-Apr-08	ND (0.2)	ND (1.0)	-228	0.30	18700
	04-Jun-08	ND (0.2)	ND (1.0)	-210	0.02	18900
	09-Jul-08	ND (1.0)	ND (1.0)	-173	0.27	20500
	18-Aug-08	ND (1.0)	ND (1.0)	-133	7.01	15100
	03-Sep-08	ND (1.0)	ND (1.0)	-157	7.44	14800
	02-Oct-08	ND (0.2)	ND (1.0)	-167	3.59	20300
MW-56S	29-Apr-08	ND (0.2)	ND (1.0)	-214	0.00	6760
	04-Jun-08	ND (0.2)	ND (1.0)	-173	0.23	7220
	09-Jul-08	ND (0.2)	ND (1.0)	-118	0.33	7110
	18-Aug-08	ND (0.2)	ND (1.0)	-139	0.25	7230
	03-Sep-08	ND (0.2)	ND (1.0)	-127	2.69	6880
	02-Oct-08	ND (0.2)	ND (1.0)	-179	0.00	7400
TW-02D	04-Oct-07	210	228	18.0	1.30	6970
	03-Oct-08	561	644	100	0.00	15500
TW-04	03-Oct-07	33.4	32.2	21.6	0.10	20300
	03-Oct-07 FD	33.6	32.7	FD	FD	FD
	12-Dec-07	26.1	23.2	78.1	0.05	21900
	14-Mar-08	27.4	28.4	16.4	0.13	22000
	08-May-08	22.6	23.2	-107	0.13	22700
	02-Oct-08	19.9	17.5	-94.2	0.10	21300
	02-Oct-08 FD	19.0	20.5	FD	FD	FD
TW-05	04-Oct-07	6.60	7.50	53.0	0.40	16800
	02-Oct-08	9.76	8.89	187	0.56	11700
<b>Bedrock Wells</b>						
PGE-07BR	12-Mar-08	ND (1.0)	1.02	-248	0.16	19100
	08-May-08	ND (1.0)	ND (1.0)	-406	0.08	18200
	07-Oct-08	ND (0.2)	ND (1.0)	-94.7	0.08	20900

**TABLE B-2**

Groundwater Sampling Results for Other Monitoring Wells in PMP Area, October 2007 through October 2008  
Interim Measures Performance Monitoring  
PG&E Topock Compressor Station

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**NOTES:**

Analytical results are validated.

ND = not detected at listed reporting limit (RL)

FD = field duplicate

(---) = data not collected, available, or field instrumentation malfunctioned

µg/L = micrograms per liter

mg/L = milligrams per liter

mV = oxidation-reduction potential (ORP)

µS/cm = microSiemens per centimeter

PMP = Interim Measure Performance Monitoring Program

Samples taken after February 1, 2008, were field filtered due to the approved change from analysis method 7199 to 218.6 for Cr(VI) analyses (DTSC, 2008b).

Samples analyzed for total chromium by EPA Method 6010B or 6020 were filtered and preserved in the field after sample collection, as per DTSC's June 30, 2005 letter.

Monitoring wells MW-24A, MW-24B were excluded from the sampling program during the uplands in-situ pilot study.

**Appendix C**  
**Hydraulic Data for Reporting Period**

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TABLE C-1

Average Monthly and Quarterly Groundwater Elevations, August through October 2008  
Interim Measures Performance Monitoring  
PG&E Topock Compressor Station

Well ID	Aquifer Zone	August 2008	September 2008	October 2008	Quarter Average	Days in Quarter Average
MW-20-070	Shallow Zone	454.33	454.06	453.52	453.97	90
MW-20-100	Middle Zone	453.85	453.52	453.00	453.46	91
MW-20-130	Deep Wells	453.52	453.08	452.61	453.07	90
MW-22	Shallow Zone	455.19	454.88	454.47	454.84	87
MW-25	Shallow Zone	455.96	455.61	455.27	455.62	91
MW-26	Shallow Zone	455.62	455.30	454.96	455.30	91
MW-27-020	Shallow Zone	455.12	454.82	454.16	454.71	90
MW-27-060	Middle Zone	455.12	454.84	454.12	454.70	90
MW-27-085	Deep Wells	455.02	454.74	454.13	454.64	90
MW-28-025	Shallow Zone	455.19	454.89	454.18	454.76	91
MW-28-090	Deep Wells	455.13	454.88	454.17	454.72	88
MW-30-050	Middle Zone	454.94	454.69	454.05	454.57	90
MW-31-060	Shallow Zone	455.12	454.81	454.30	454.74	90
MW-31-135	Deep Wells	454.48	454.22	453.66	454.12	91
MW-32-035	Shallow Zone	454.97	454.67	454.08	454.58	90
MW-33-040	Shallow Zone	455.30	454.98	454.40	454.90	91
MW-33-090	Middle Zone	455.44	455.12	454.49	455.02	91
MW-33-150	Deep Wells	455.46	455.15	454.57	455.07	91
MW-34-055	Middle Zone	455.21	454.93	454.20	454.79	90
MW-34-080	Deep Wells	455.07	454.81	454.12	454.68	90
MW-34-100	Deep Wells	454.93	454.71	453.89	454.52	90
MW-35-060	Shallow Zone	455.77	455.46	454.74	455.33	91
MW-35-135	Deep Wells	456.27	456.04	455.46	455.93	91
MW-36-020	Shallow Zone	455.12	454.82	454.20	454.72	90
MW-36-040	Shallow Zone	455.02	454.73	454.07	454.61	90
MW-36-050	Middle Zone	454.99	454.71	454.04	454.59	90
MW-36-070	Middle Zone	454.85	454.57	453.83	454.43	90
MW-36-090	Deep Wells	454.18	453.94	453.26	453.80	90
MW-36-100	Deep Wells	454.40	INC	INC	INC	26
MW-39-040	Shallow Zone	454.85	454.57	453.94	454.46	90
MW-39-050	Middle Zone	454.70	454.42	453.77	454.31	90
MW-39-060	Middle Zone	458.13	INC	INC	INC	37
MW-39-070	Middle Zone	454.22	453.98	453.38	453.87	90
MW-39-080	Deep Wells	454.31	454.05	453.39	453.93	90
MW-39-100	Deep Wells	454.84	454.60	453.65	454.37	90
MW-42-030	Shallow Zone	454.74	454.43	453.82	454.34	90
MW-42-065	Middle Zone	454.94	454.65	454.02	454.55	90
MW-43-025	Shallow Zone	455.11	454.79	454.14	454.69	90
MW-43-090	Deep Wells	455.47	455.18	454.69	455.12	90
MW-44-070	Middle Zone	455.07	454.82	454.14	454.67	87
MW-44-115	Deep Wells	454.72	454.44	453.66	454.27	87
MW-44-125	Deep Wells	454.17	454.33	454.08	454.21	61
MW-45-095a	Deep Wells	454.05	454.16	453.47	453.90	90
MW-46-175	Deep Wells	455.30	455.27	454.59	455.05	88
MW-47-055	Shallow Zone	455.60	455.28	454.76	455.22	91
MW-47-115	Deep Wells	455.75	455.41	454.80	455.33	91
MW-49-135	Deep Wells	455.67	455.34	454.73	455.25	91
MW-50-095	Middle Zone	455.38	455.05	454.56	455.00	91

TABLE C-1

Average Monthly and Quarterly Groundwater Elevations, August through October 2008

Interim Measures Performance Monitoring

PG&amp;E Topock Compressor Station

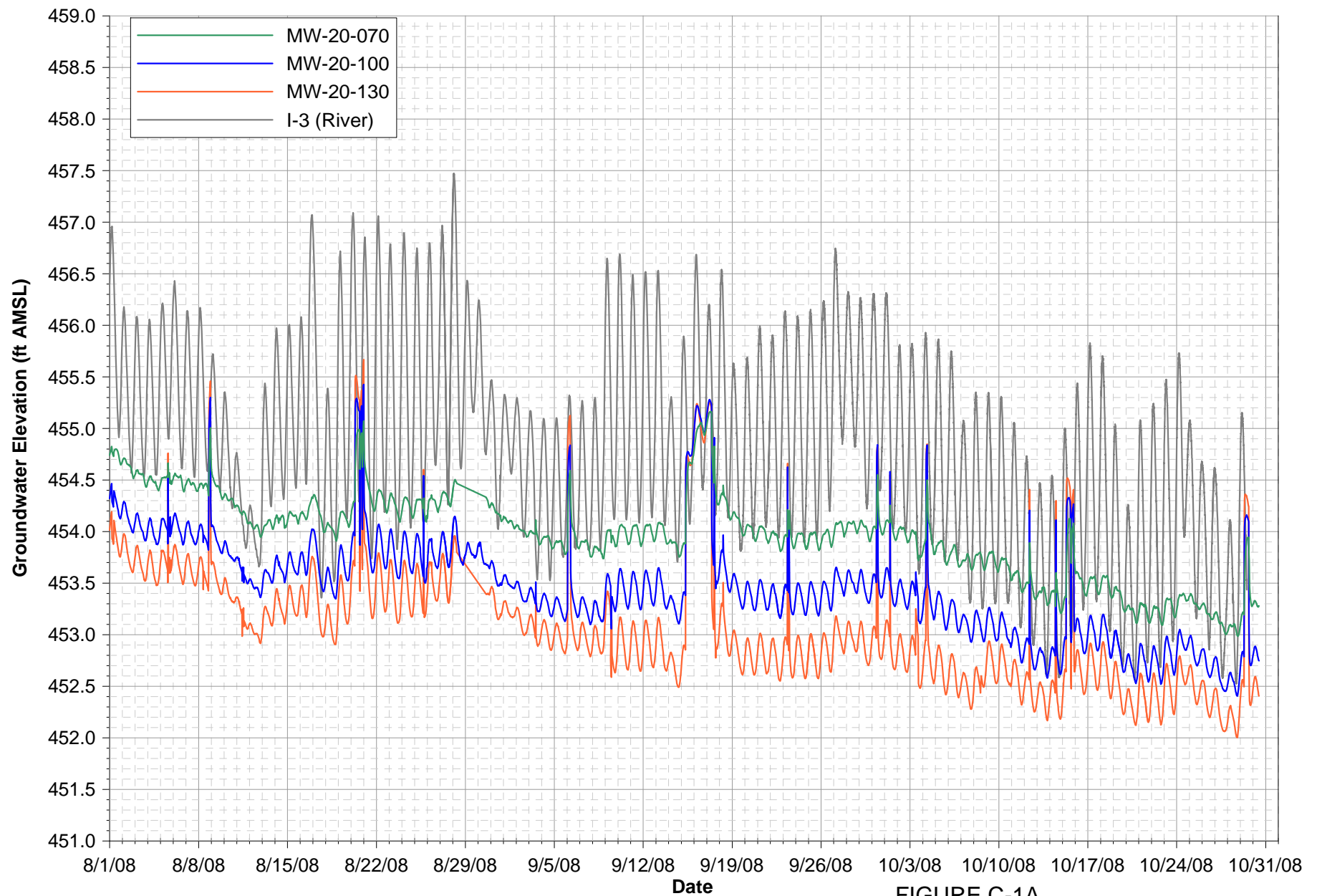
Well ID	Aquifer Zone	August 2008	September 2008	October 2008	Quarter Average	Days in Quarter Average
MW-51	Middle Zone	455.58	455.27	454.91	455.26	91
PT2D	Deep Wells	453.96	453.78	453.18	453.65	90
PT5D	Deep Wells	454.23	453.99	453.36	453.87	90
PT6D	Deep Wells	454.48	454.17	453.55	453.91	64

**NOTES:**

Averages include data collected from August 2008 through October 2008

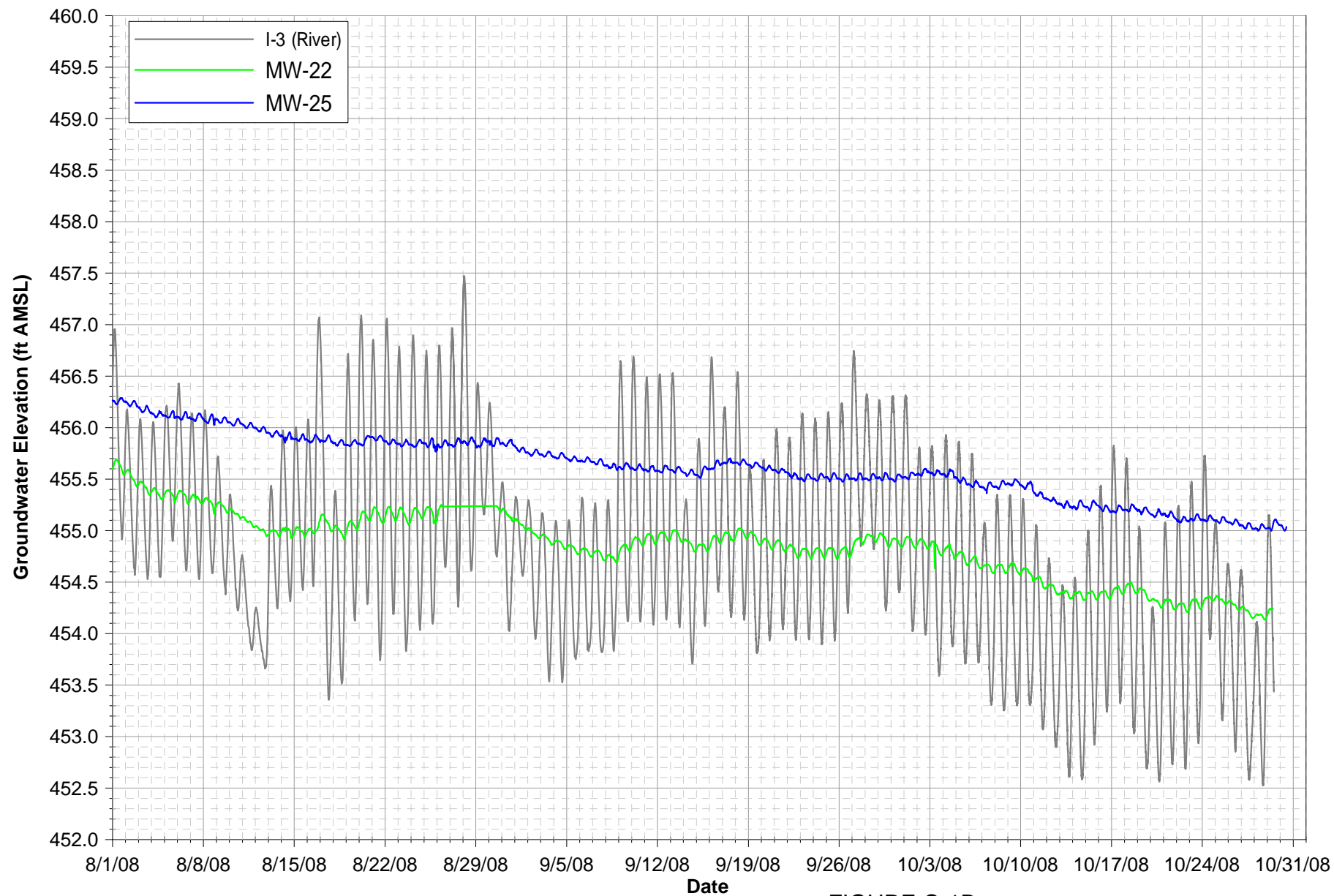
Averages reported in ft AMSL (feet above mean sea level)

INC = data incomplete over reporting period



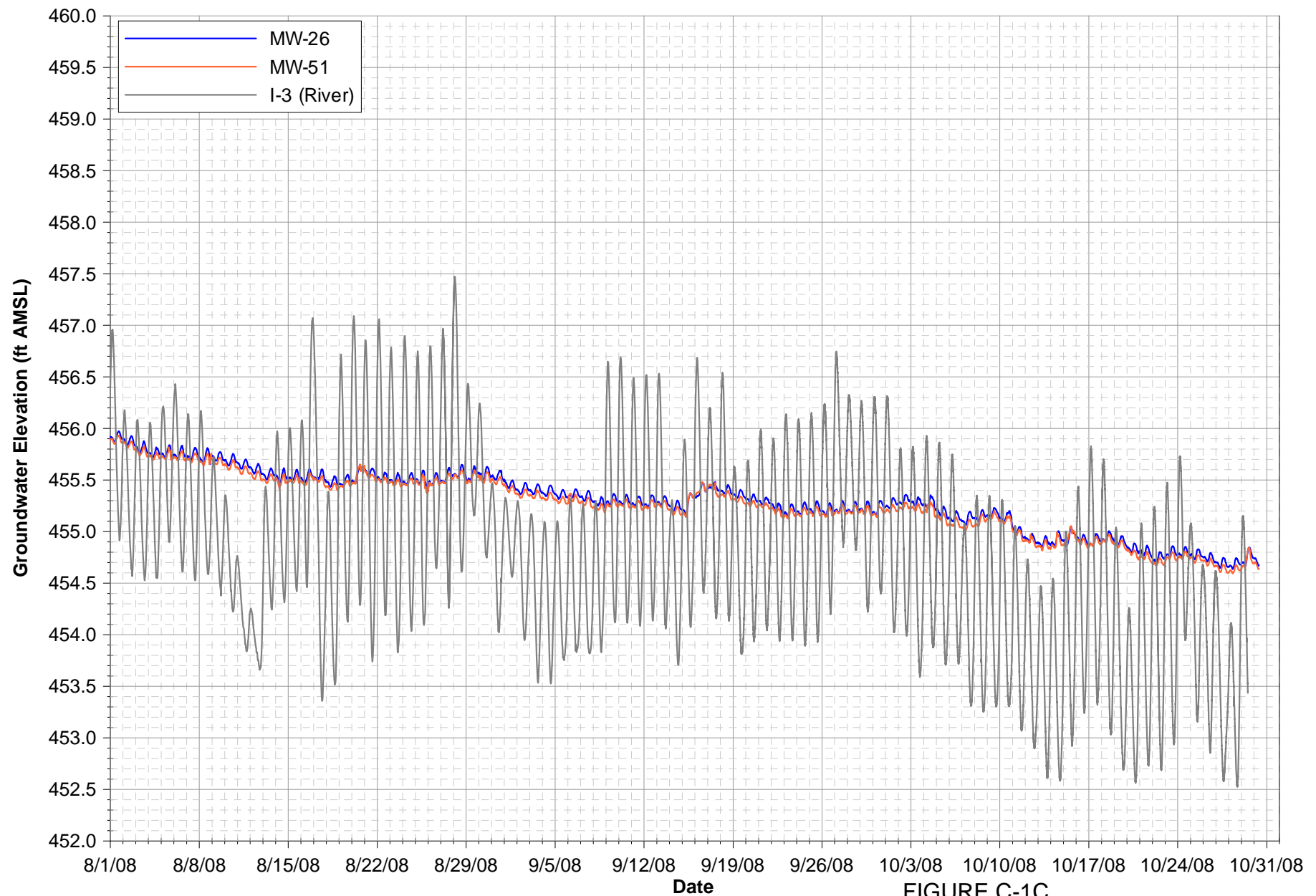
Notes:  
Data subject to review.

**FIGURE C-1A**  
**MW-20 CLUSTER HYDROGRAPHS**  
 INTERIM MEASURES PERFORMANCE MONITORING  
 PG&E TOPOCK COMPRESSOR STATION  
 NEEDLES, CALIFORNIA



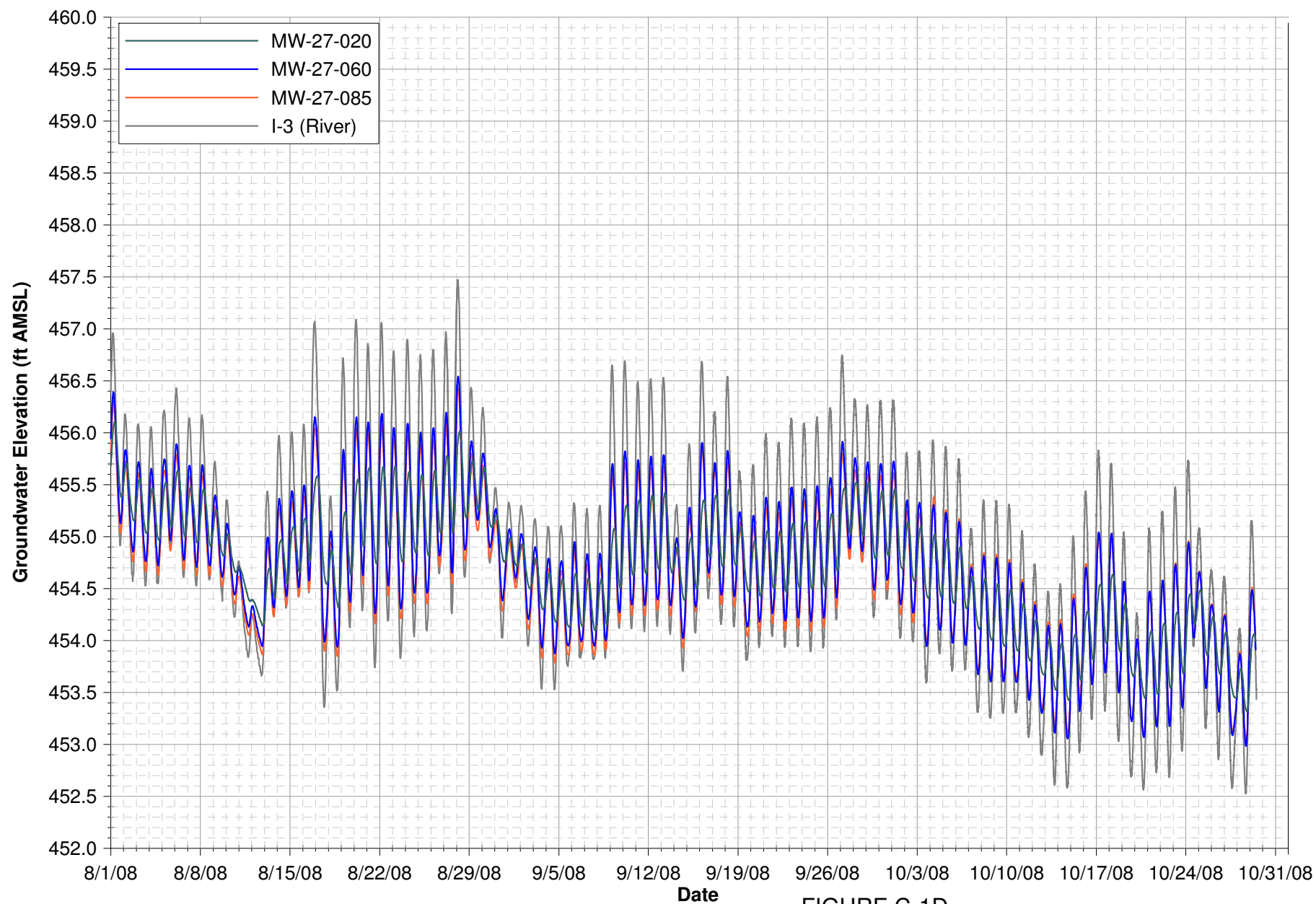
Notes:  
Data subject to review.

**FIGURE C-1B**  
**MW-22 AND MW-25 HYDROGRAPHS**  
 INTERIM MEASURES PERFORMANCE MONITORING  
 PG&E TOPOCK COMPRESSOR STATION  
 NEEDLES, CALIFORNIA



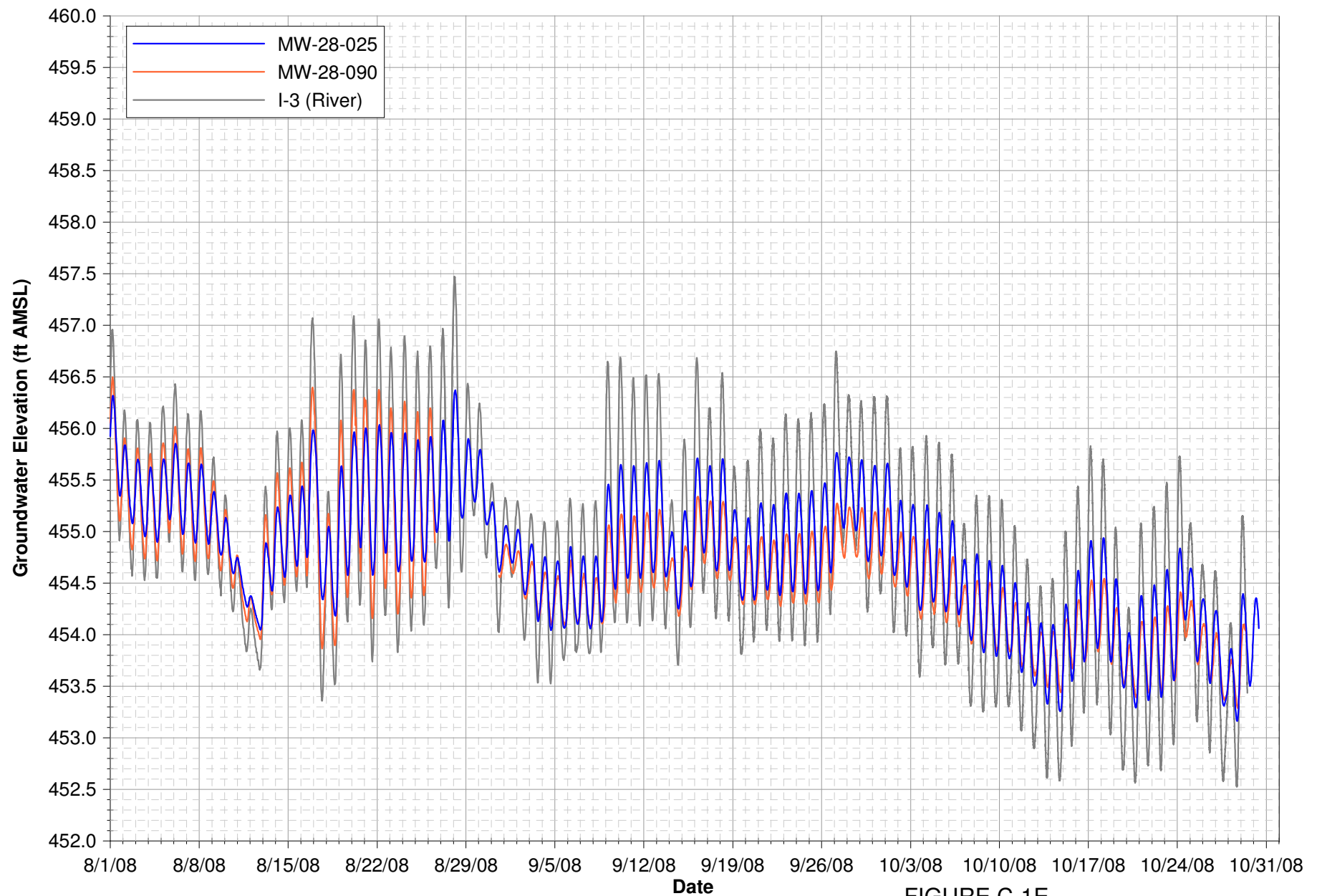
Notes:  
Data subject to review.

**FIGURE C-1C**  
**MW-51 & MW-26 HYDROGRAPHS**  
INTERIM MEASURES PERFORMANCE MONITORING  
PG&E TOPOCK COMPRESSOR STATION  
NEEDLES, CALIFORNIA



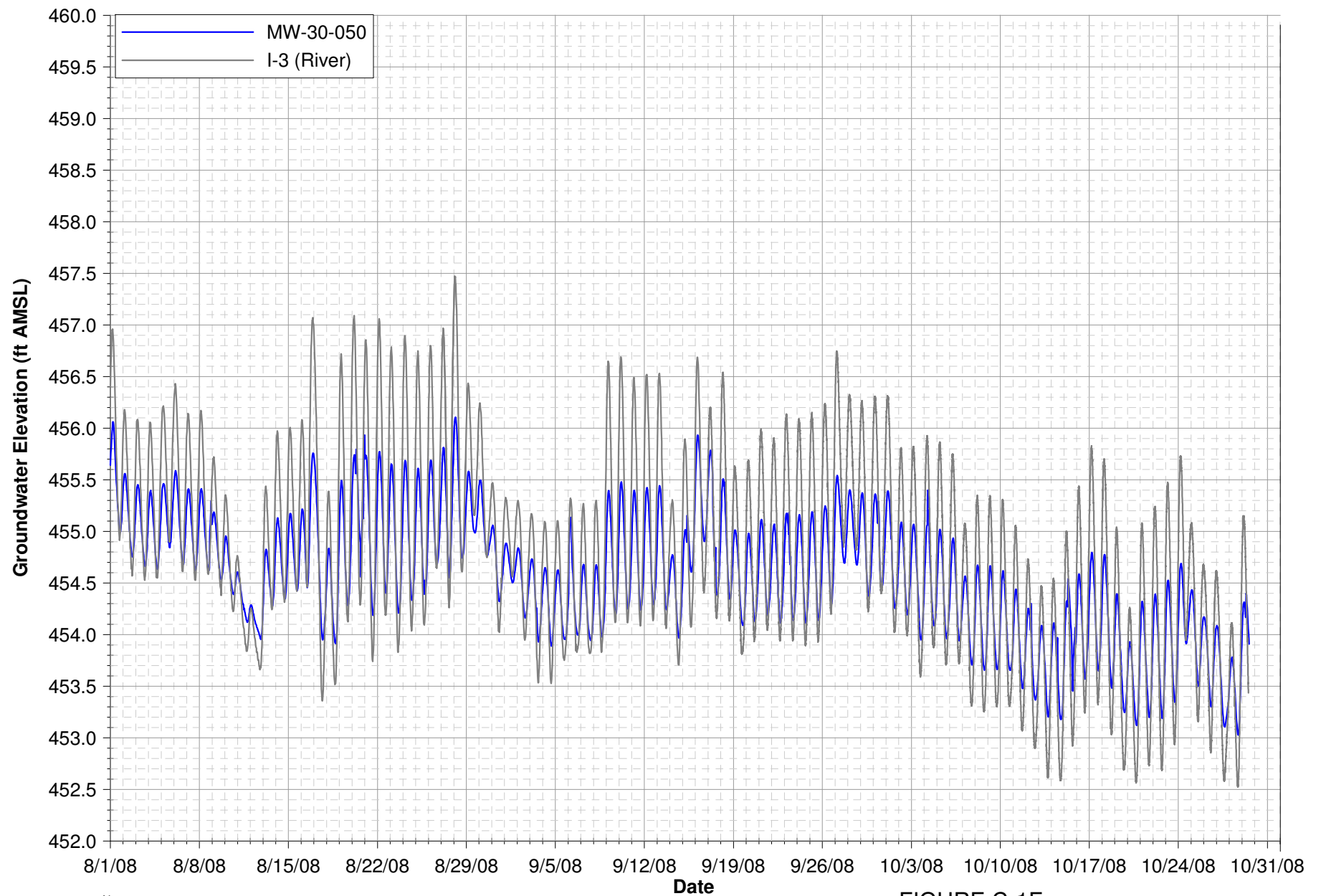
Notes:  
Data subject to review.

**FIGURE C-1D**  
**MW-27 CLUSTER HYDROGRAPHS**  
 INTERIM MEASURES PERFORMANCE MONITORING  
 PG&E TOPOCK COMPRESSOR STATION  
 NEEDLES, CALIFORNIA



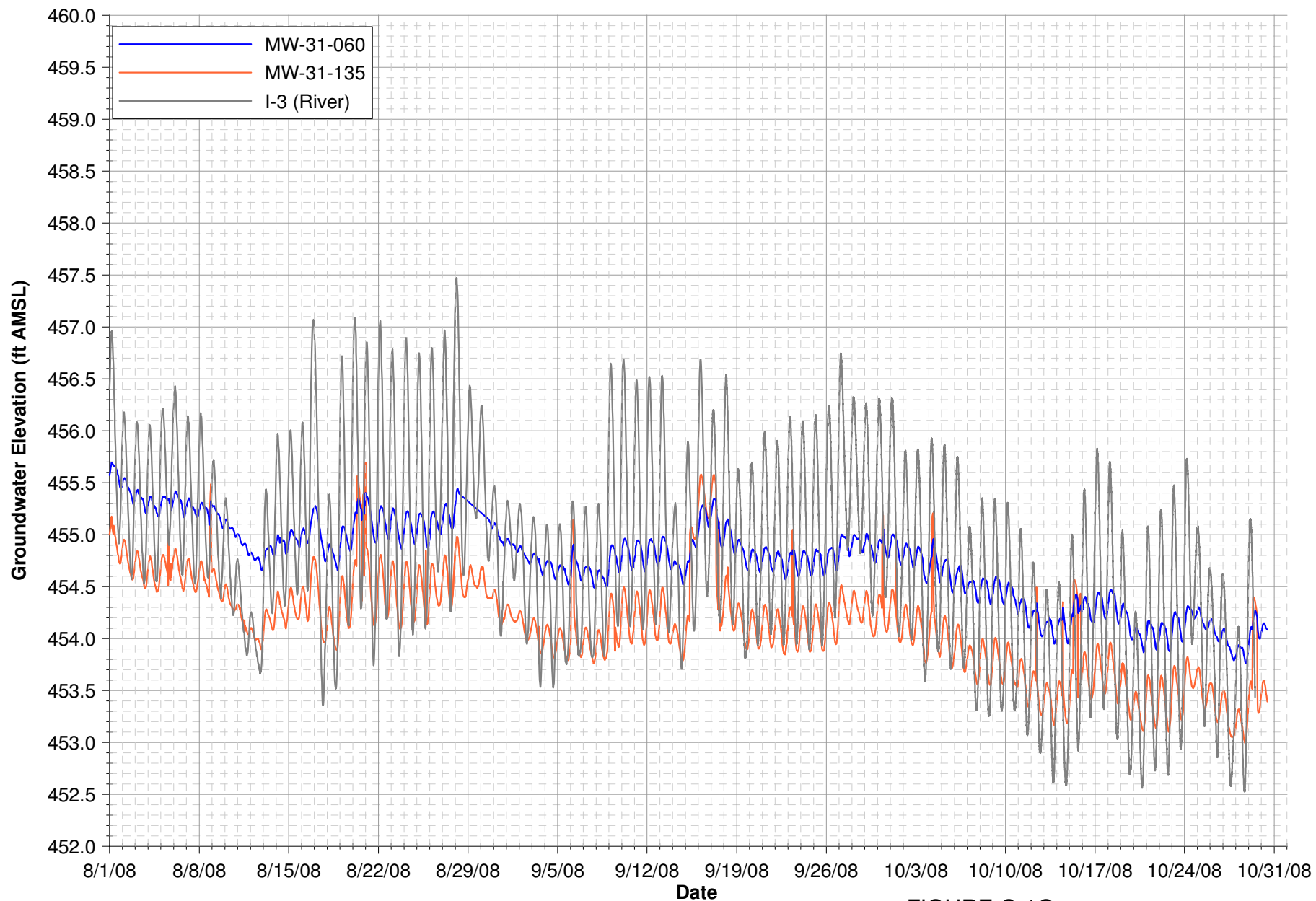
Notes:  
Data subject to review.

**FIGURE C-1E**  
**MW-28 WELL HYDROGRAPHS**  
 INTERIM MEASURES PERFORMANCE MONITORING  
 PG&E TOPOCK COMPRESSOR STATION  
 NEEDLES, CALIFORNIA



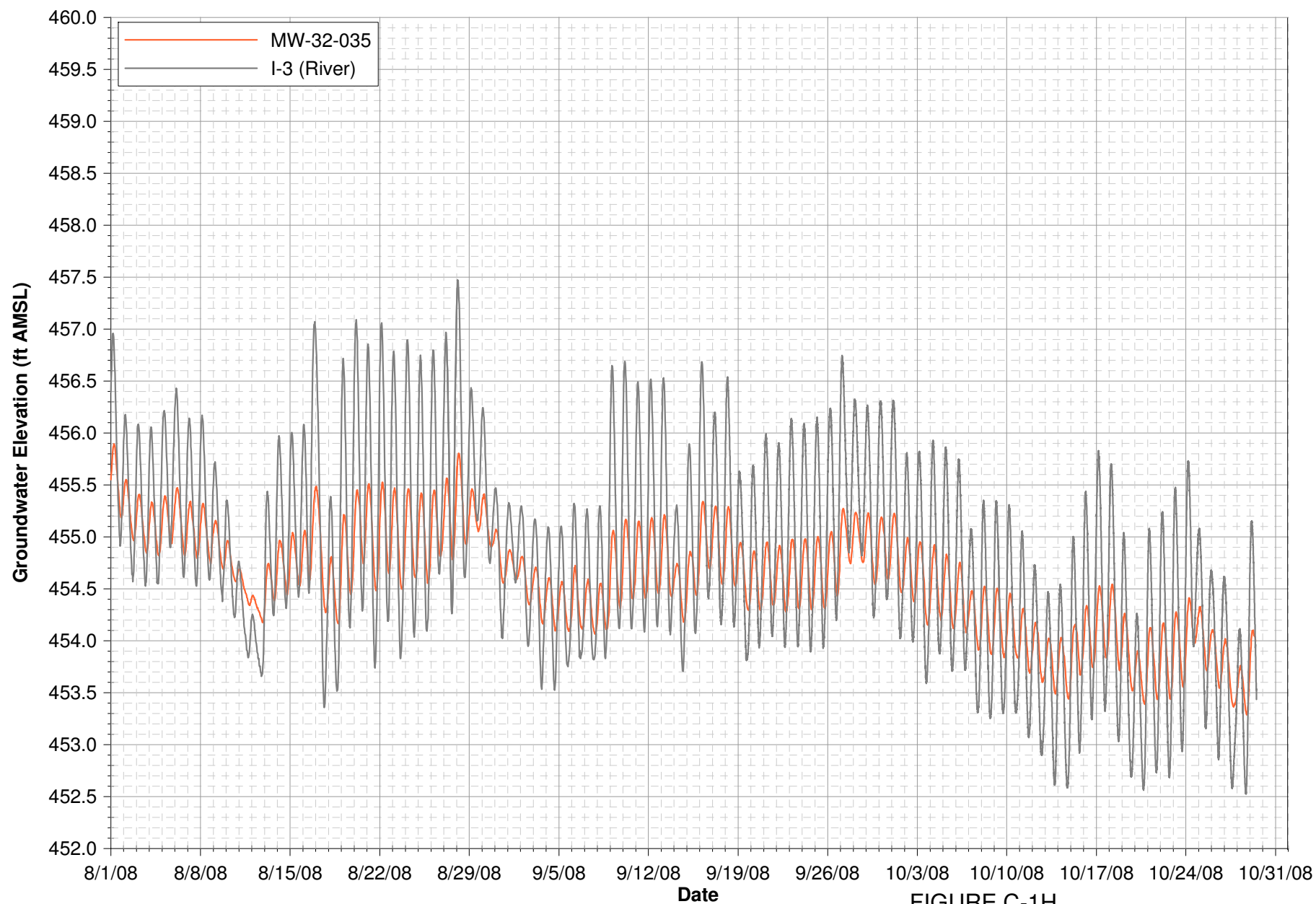
Notes:  
Data subject to review.

**FIGURE C-1F**  
**MW-30-50 WELL HYDROGRAPH**  
INTERIM MEASURES PERFORMANCE MONITORING  
PG&E TOPOCK COMPRESSOR STATION  
NEEDLES, CALIFORNIA



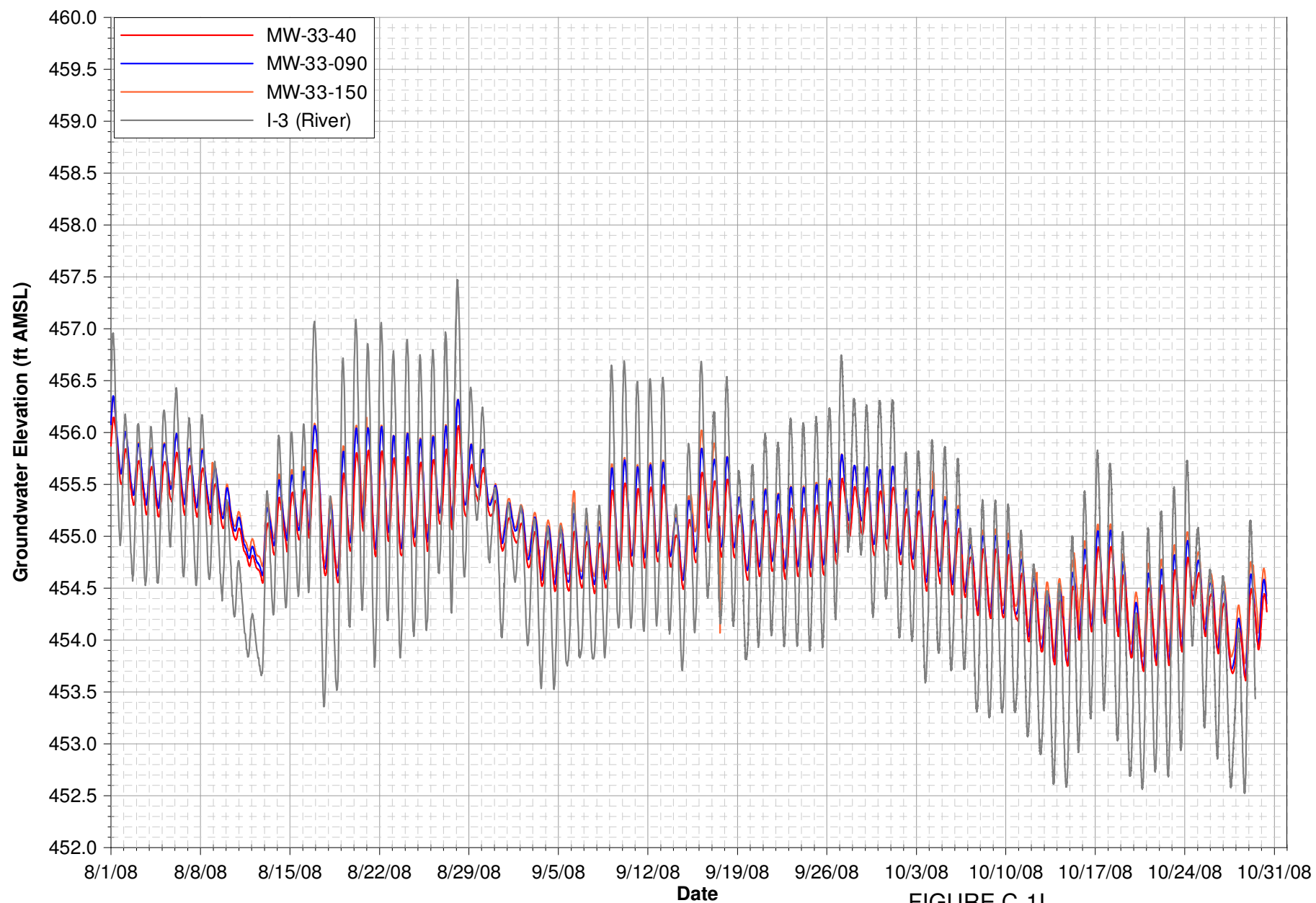
Notes:  
Data subject to review.

**FIGURE C-1G**  
**MW-31 WELL HYDROGRAPHS**  
INTERIM MEASURES PERFORMANCE MONITORING  
PG&E TOPOCK COMPRESSOR STATION  
NEEDLES, CALIFORNIA



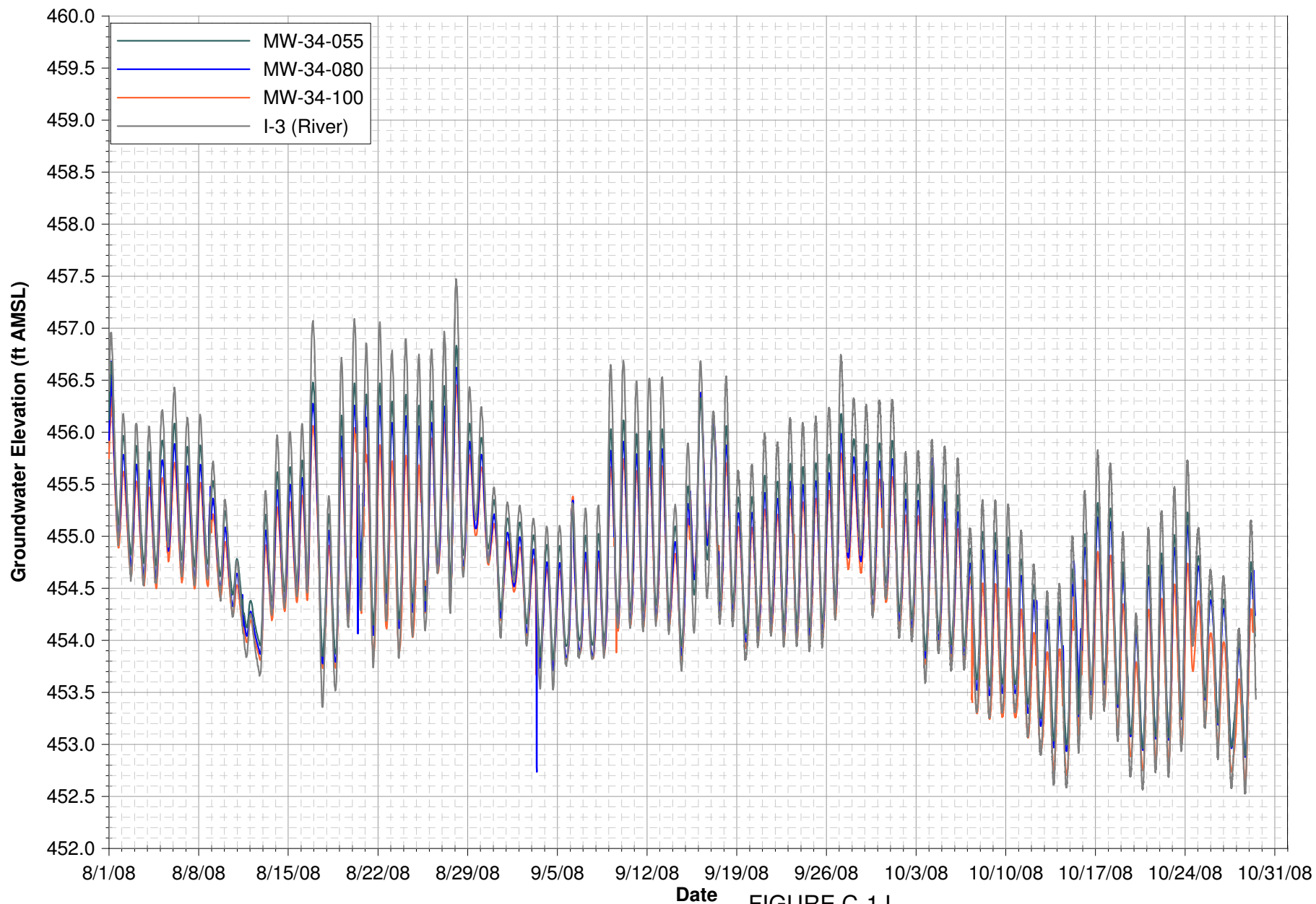
Notes:  
Data subject to review.

**FIGURE C-1H**  
**MW-32 WELL HYDROGRAPHS**  
 INTERIM MEASURES PERFORMANCE MONITORING  
 PG&E TOPOCK COMPRESSOR STATION  
 NEEDLES, CALIFORNIA



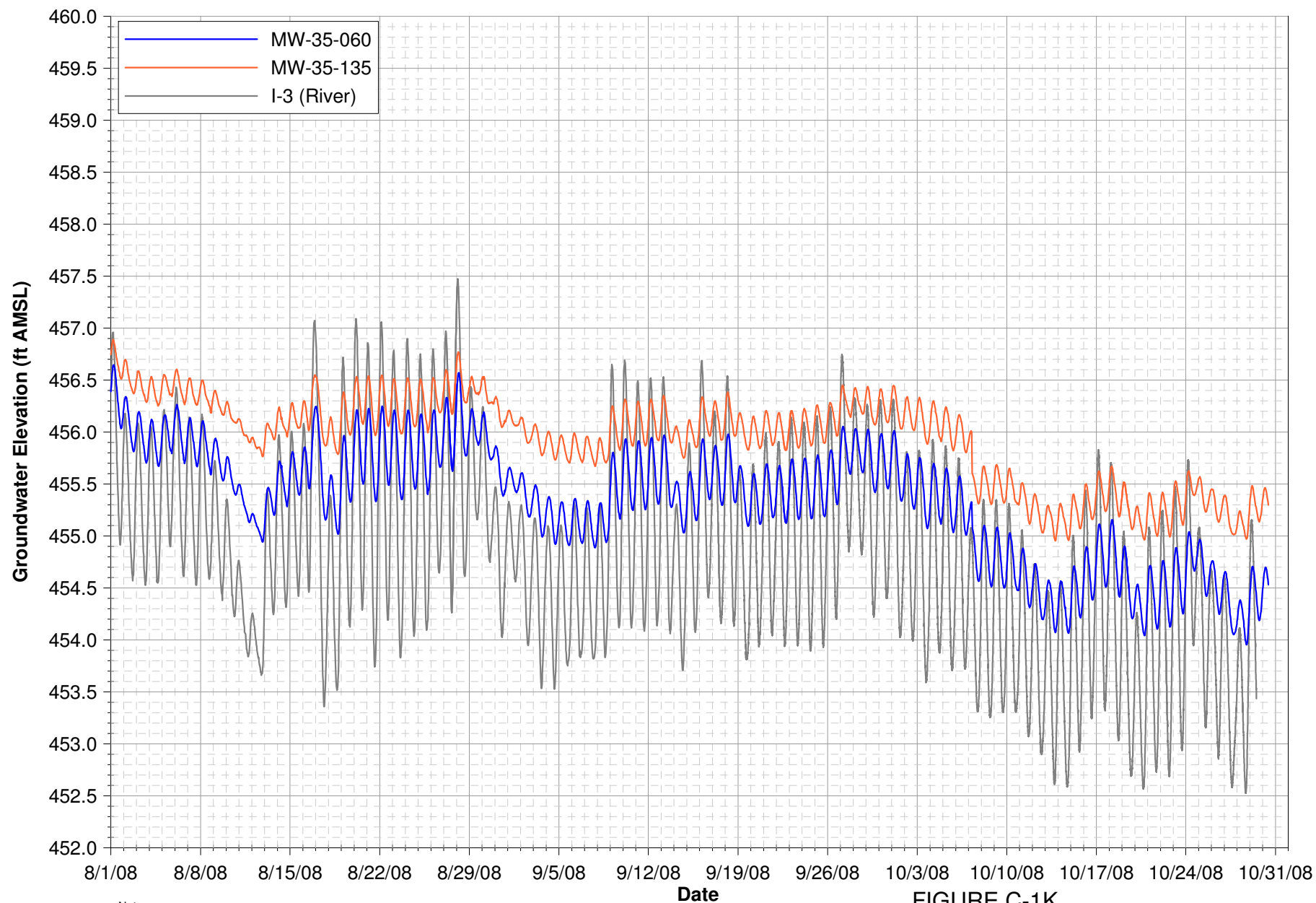
Notes:  
Data subject to review.

**FIGURE C-11**  
**MW-33 CLUSTER HYDROGRAPHS**  
 INTERIM MEASURES PERFORMANCE MONITORING  
 PG&E TOPOCK COMPRESSOR STATION  
 NEEDLES, CALIFORNIA



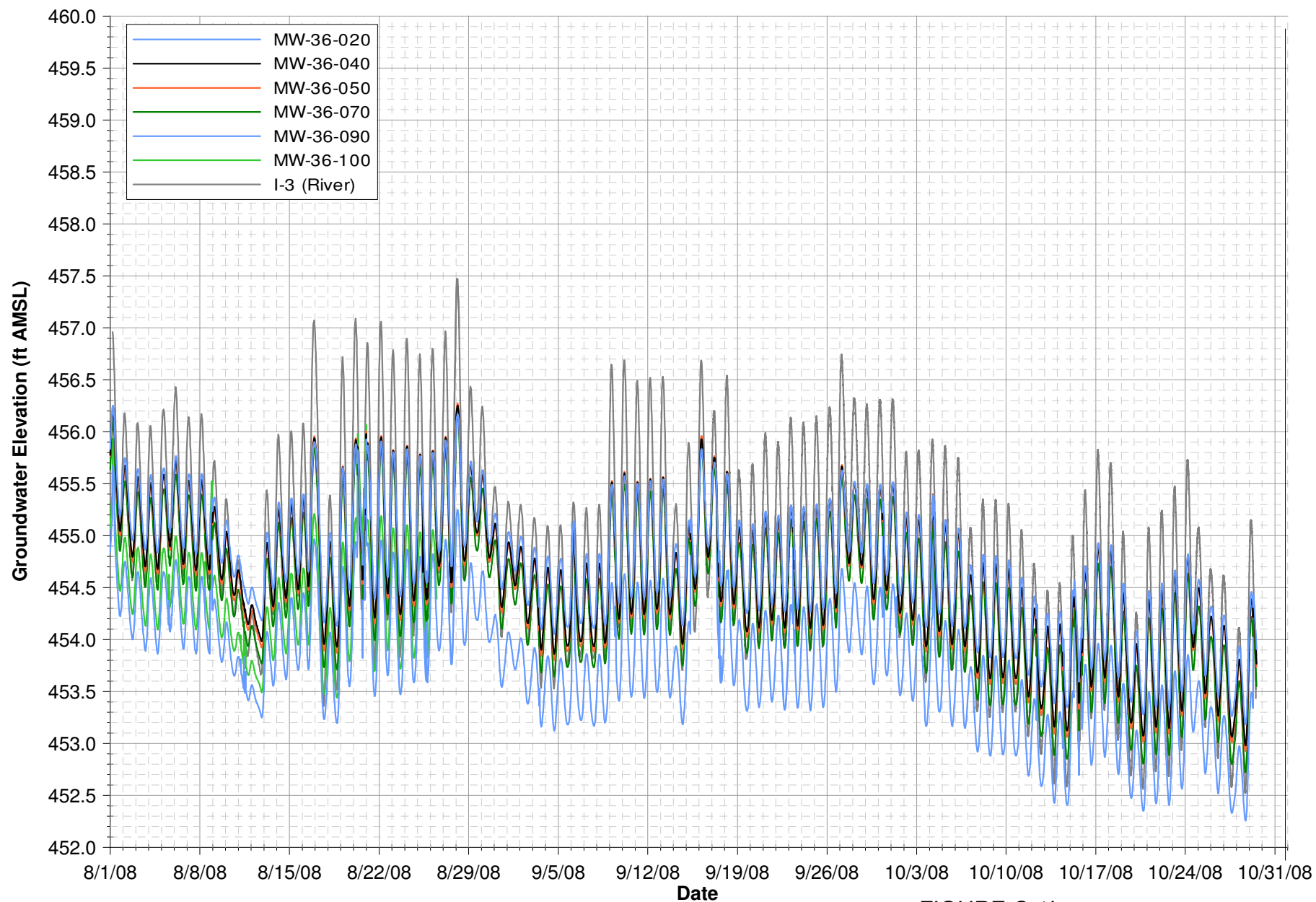
Notes:  
Data subject to review.

**FIGURE C-1J**  
**MW-34 CLUSTER HYDROGRAPHS**  
 INTERIM MEASURES PERFORMANCE MONITORING  
 PG&E TOPOCK COMPRESSOR STATION  
 NEEDLES, CALIFORNIA



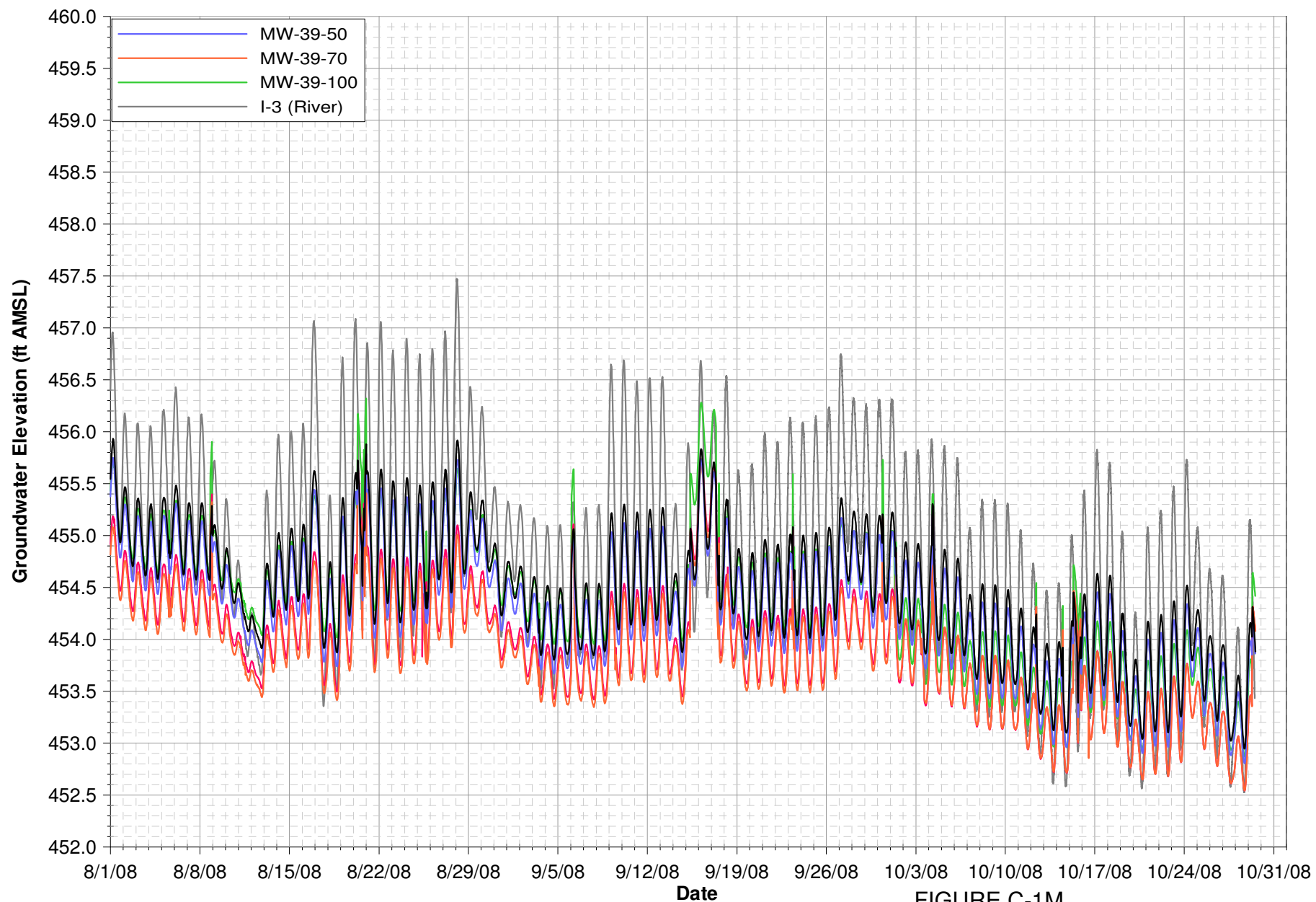
Notes:  
Data subject to review.

**FIGURE C-1K**  
**MW-35 WELL HYDROGRAPHS**  
INTERIM MEASURES PERFORMANCE MONITORING  
PG&E TOPOCK COMPRESSOR STATION  
NEEDLES, CALIFORNIA



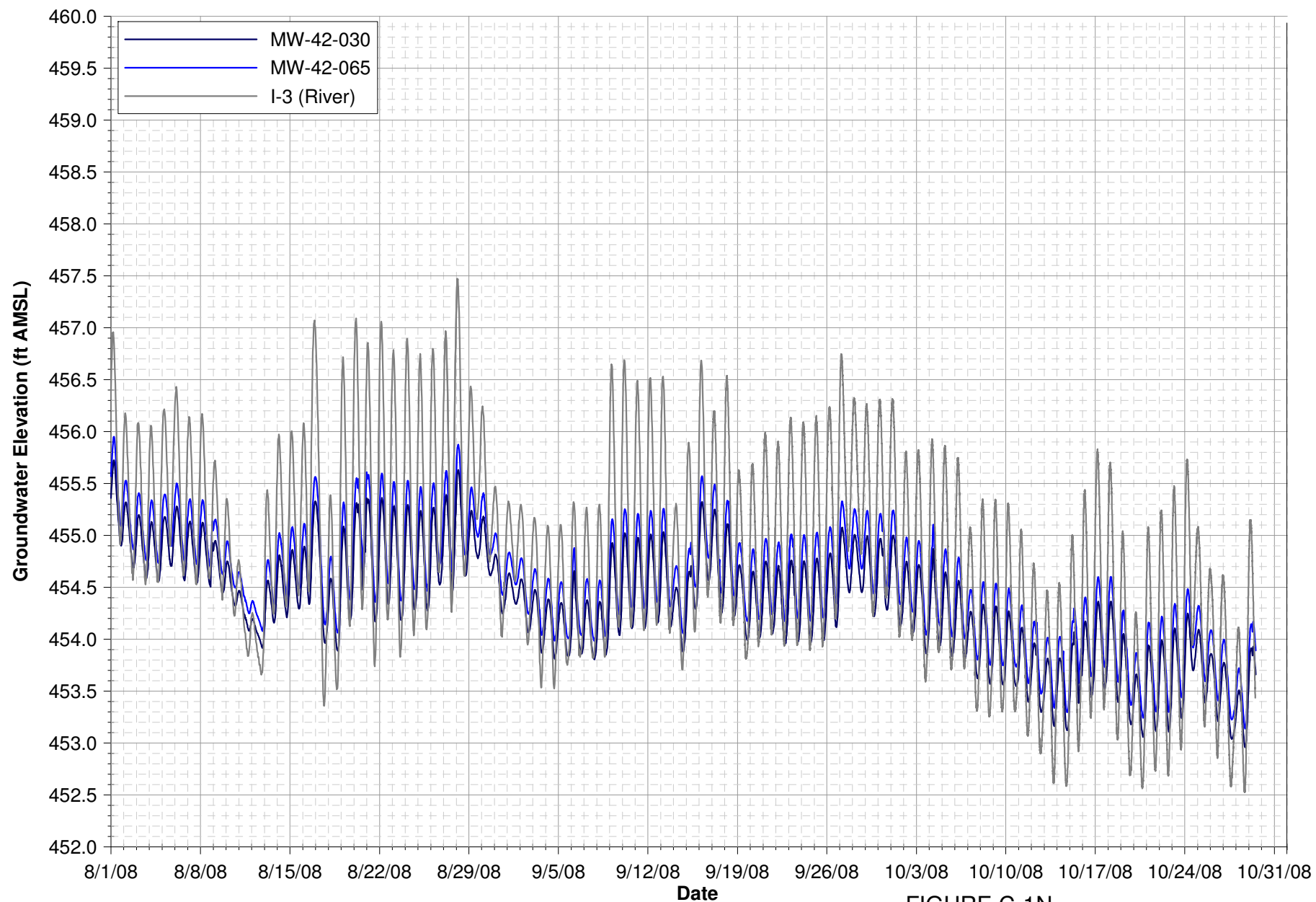
Notes:  
 Data subject to review.  
 MW-36-100 data unavailable from 8/26/08 to present.

**FIGURE C-1L**  
**MW-36 CLUSTER**  
 INTERIM MEASURES PERFORMANCE MONITORING  
 PG&E TOPOCK COMPRESSOR STATION  
 NEEDLES, CALIFORNIA



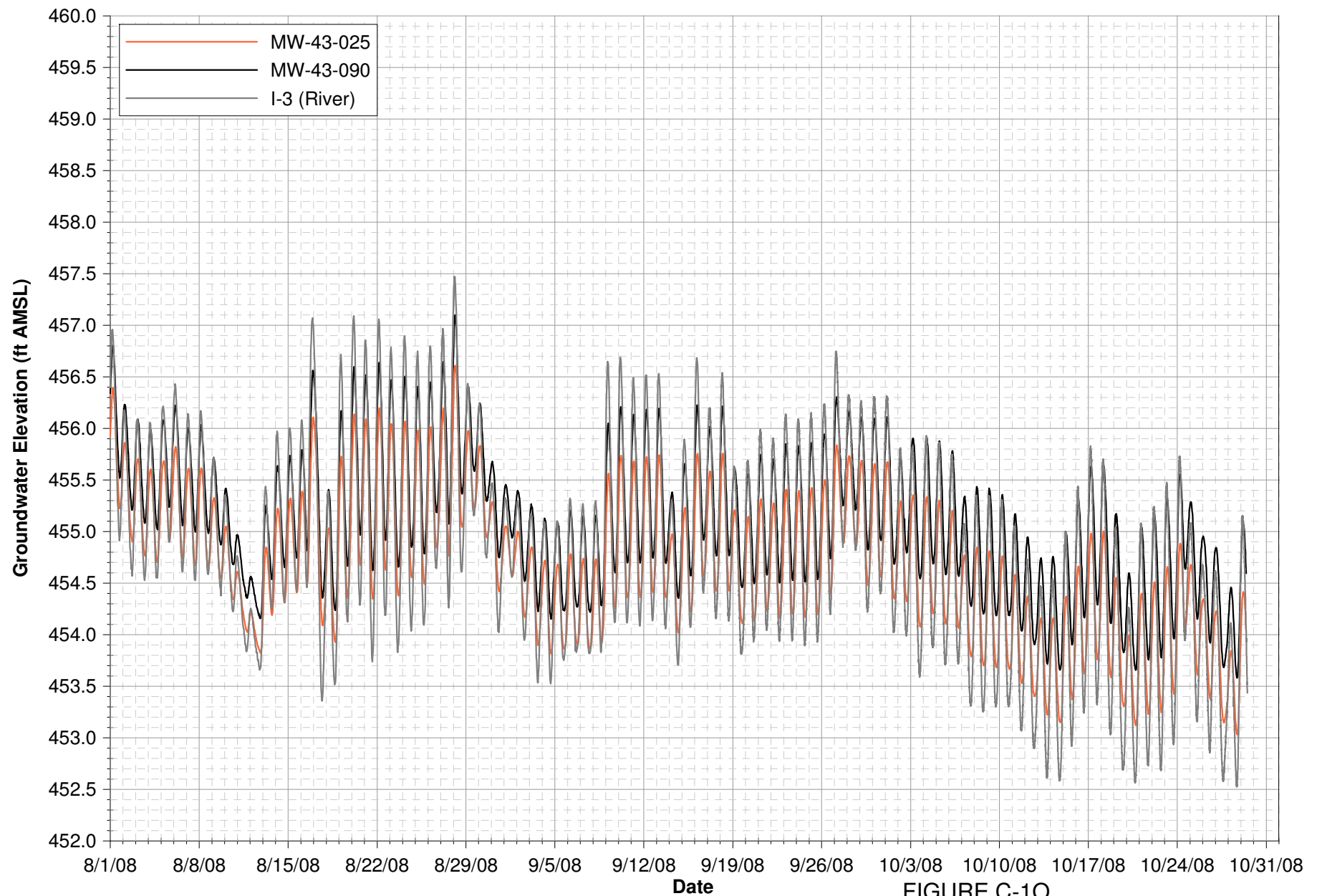
Notes:  
Data subject to review.

**FIGURE C-1M**  
**MW-39 CLUSTER HYDROGRAPHS**  
INTERIM MEASURES PERFORMANCE MONITORING  
PG & E TOPOCK COMPRESSOR STATION  
NEEDLES, CALIFORNIA



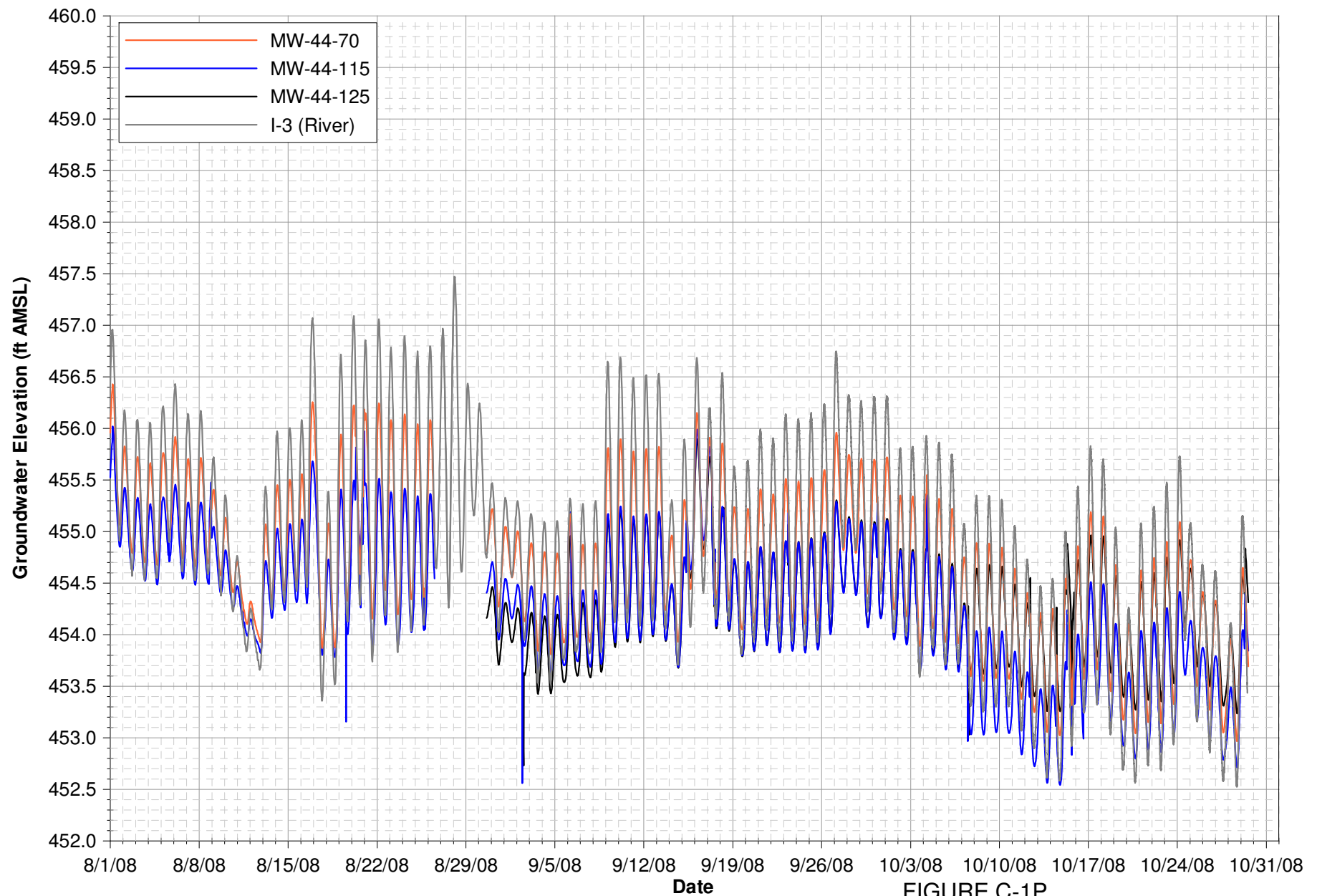
Notes:  
Data subject to review.

**FIGURE C-1N**  
**MW-42 CLUSTER HYDROGRAPHS**  
 INTERIM MEASURES PERFORMANCE MONITORING  
 PG&E TOPOCK COMPRESSOR STATION  
 NEEDLES, CALIFORNIA



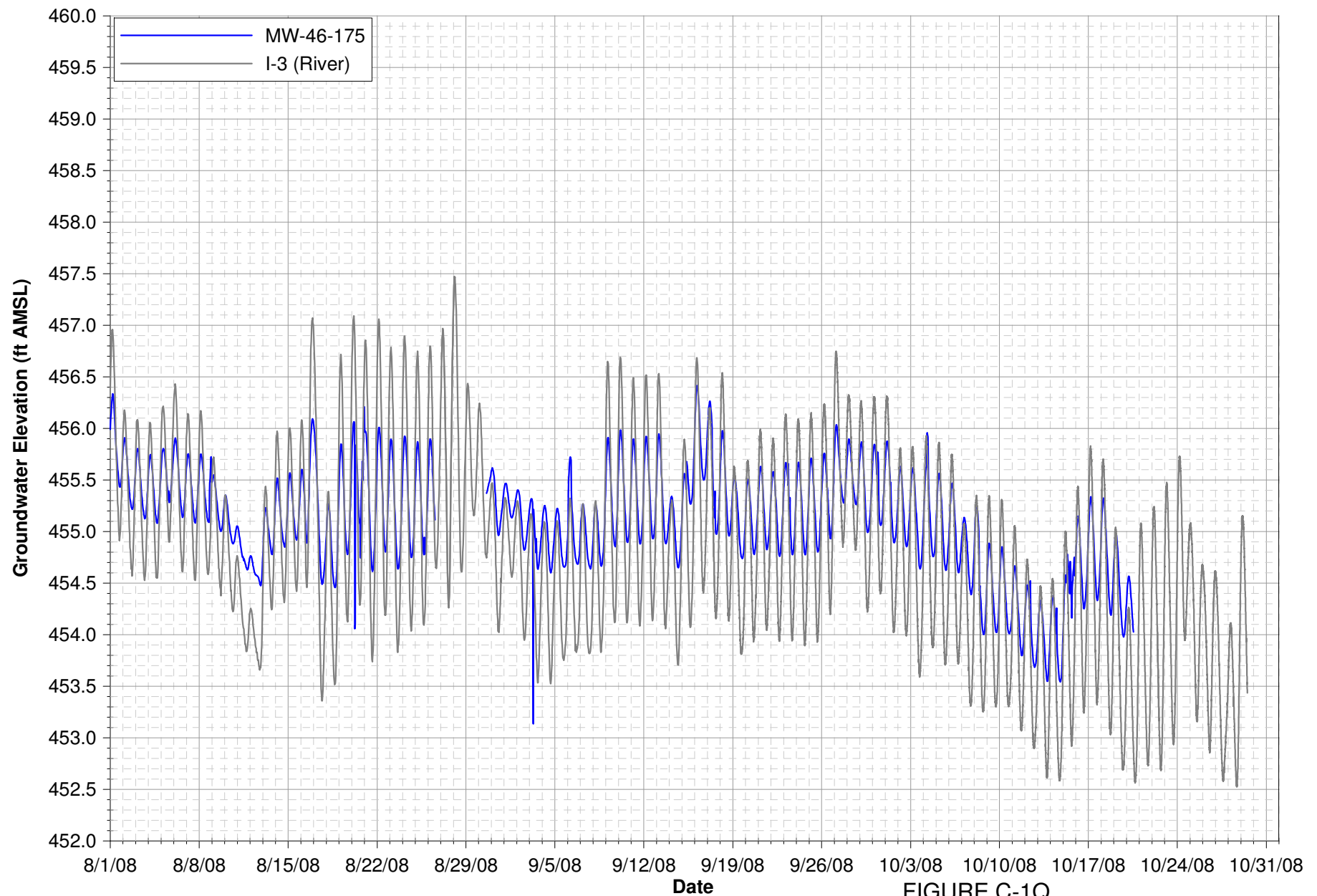
Notes:  
Data subject to review.

**FIGURE C-10**  
**MW-43 CLUSTER HYDROGRAPHS**  
 INTERIM MEASURES PERFORMANCE MONITORING  
 PG&E TOPOCK COMPRESSOR STATION  
 NEEDLES, CALIFORNIA



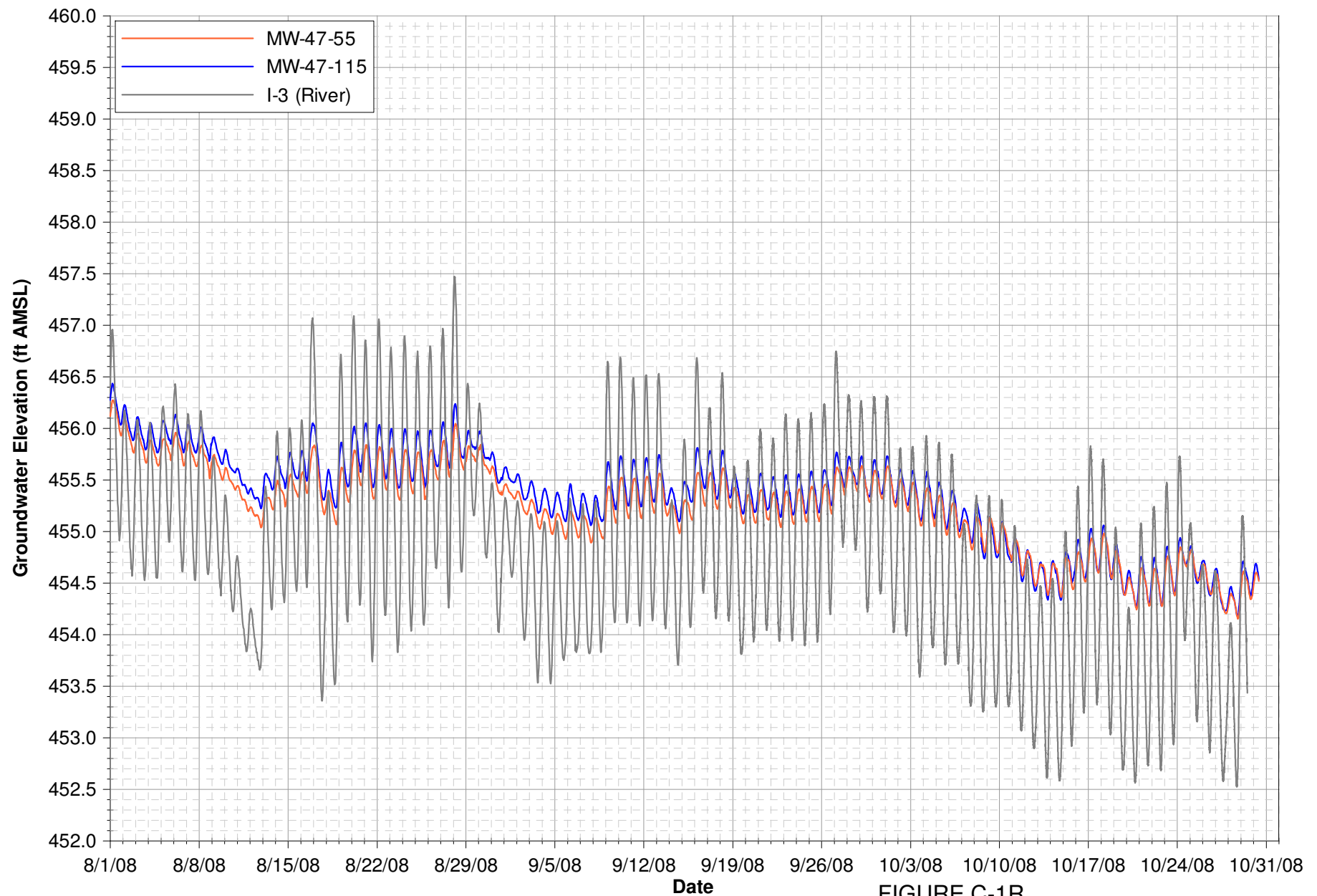
Notes:  
 Data subject to review.  
 MW-44-070 data unavailable from 8/26/2008 to 8/30/2008.  
 MW-44-115 data unavailable from 8/26/2008 to 8/30/2008.  
 MW-44-125 data unavailable from 7/29/2008 to 8/30/2008.

**FIGURE C-1P**  
**MW-44 CLUSTER HYDROGRAPHS**  
 INTERIM MEASURES PERFORMANCE MONITORING  
 PG&E TOPOCK COMPRESSOR STATION  
 NEEDLES, CALIFORNIA



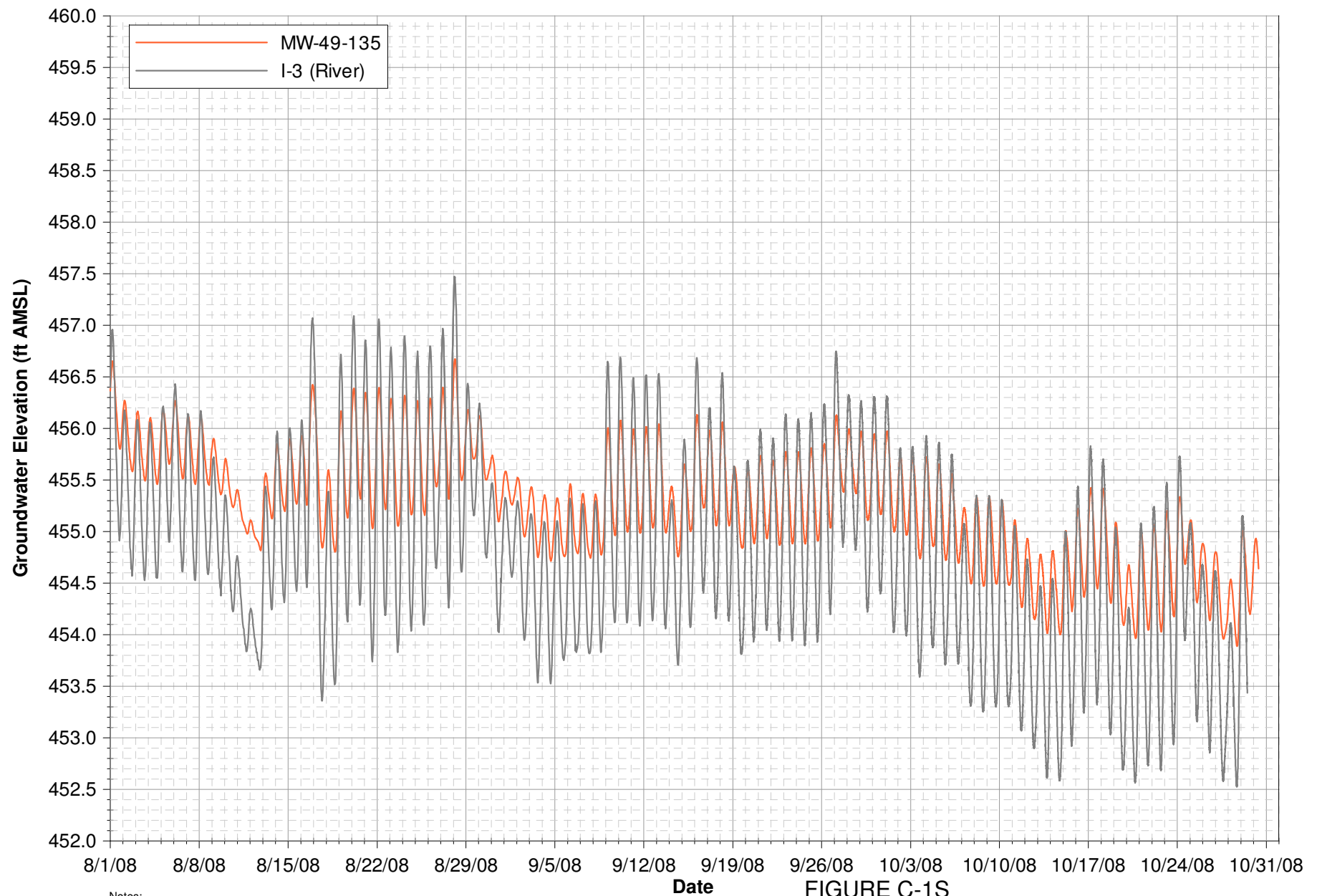
Notes:  
Data subject to review.

**FIGURE C-1Q**  
**MW-46-175 HYDROGRAPH**  
 INTERIM MEASURES PERFORMANCE MONITORING  
 PG&E TOPOCK COMPRESSOR STATION  
 NEEDLES, CALIFORNIA



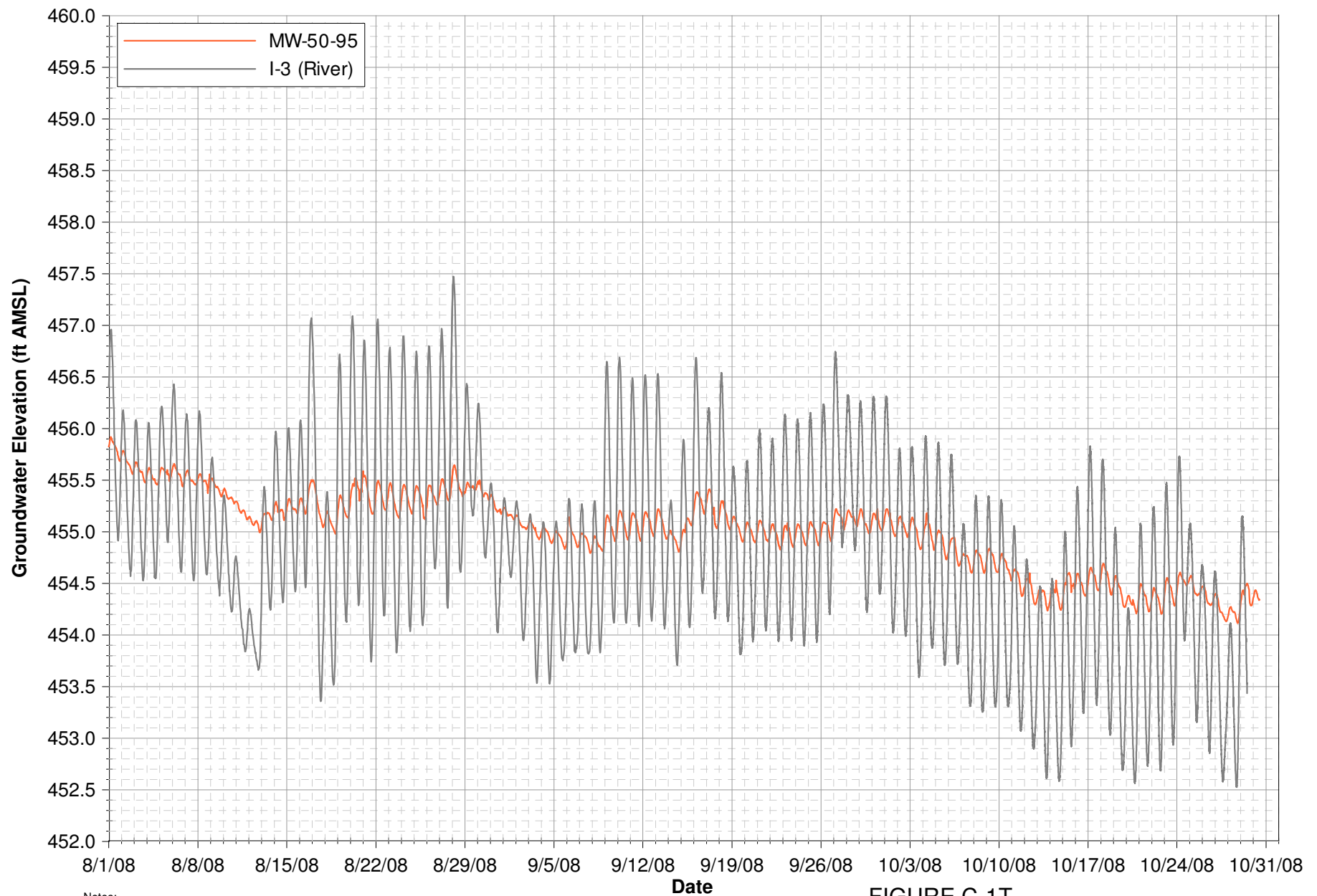
Notes:  
Data subject to review.

**FIGURE C-1R**  
**MW-47 CLUSTER HYDROGRAPHS**  
INTERIM MEASURES PERFORMANCE MONITORING  
PG&E TOPOCK COMPRESSOR STATION  
NEEDLES, CALIFORNIA



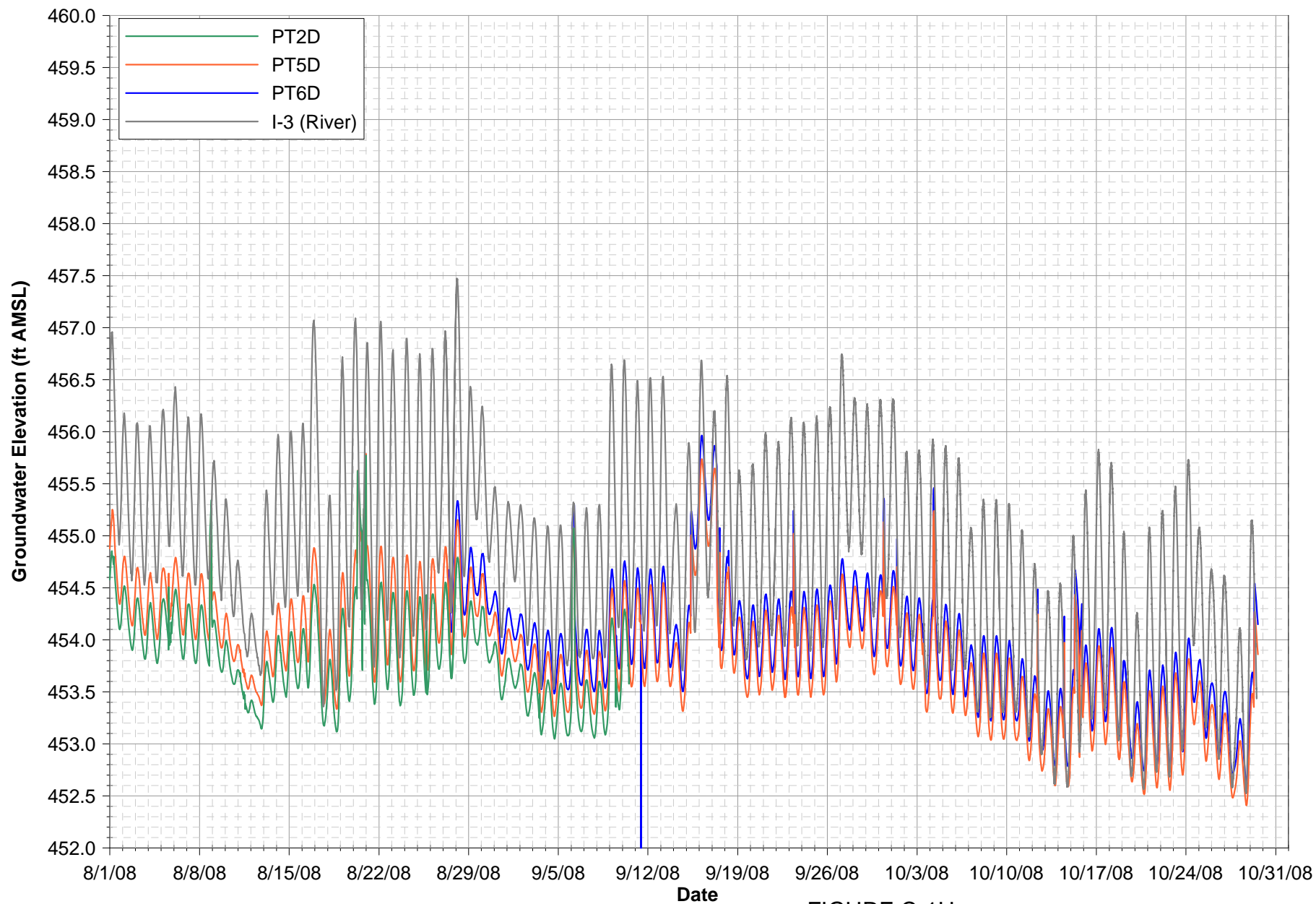
Notes:  
Data subject to review.

**FIGURE C-1S**  
**MW-49-135 HYDROGRAPH**  
INTERIM MEASURES PERFORMANCE MONITORING  
PG&E TOPOCK COMPRESSOR STATION  
NEEDLES, CALIFORNIA



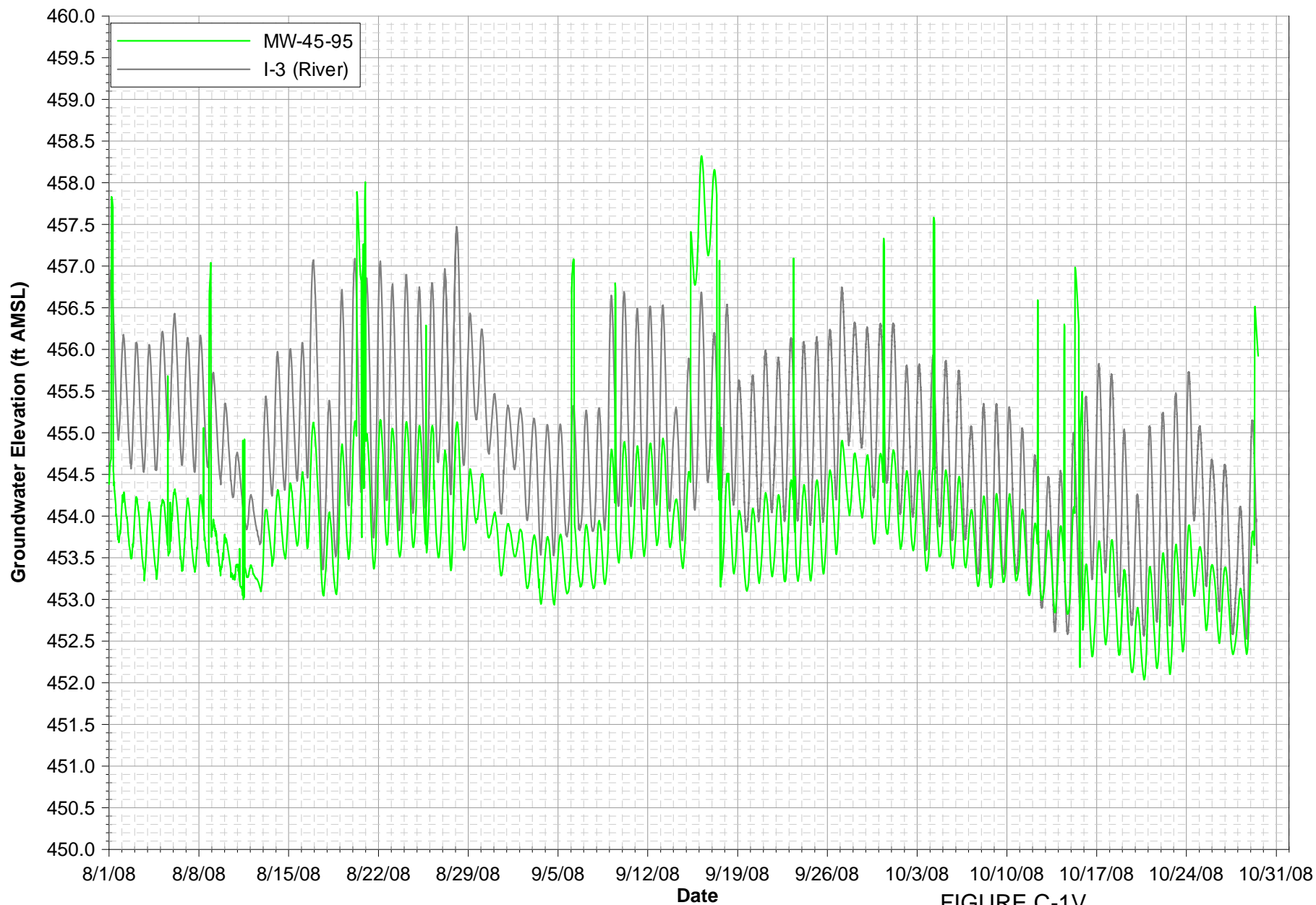
Notes:  
Data subject to review.

**FIGURE C-1T**  
**MW-50-95 HYDROGRAPH**  
INTERIM MEASURES PERFORMANCE MONITORING  
PG&E TOPOCK COMPRESSOR STATION  
NEEDLES, CALIFORNIA



Note:  
Data subject to review.  
PT-6D data unavailable from 7/29/2008 to 8/27/2008.

**FIGURE C-1U**  
**INSITU PILOT STUDY WELL HYDROGRAPHS**  
INTERIM MEASURES PERFORMANCE MONITORING  
PG&E TOPOCK COMPRESSOR STATION  
NEEDLES, CALIFORNIA



Notes:  
Data subject to review.

**FIGURE C-1V**  
**MW-45-95 HYDROGRAPH**  
INTERIM MEASURES PERFORMANCE MONITORING  
PG&E TOPOCK COMPRESSOR STATION  
NEEDLES, CALIFORNIA

**Appendix D**  
**Chemical Performance Monitoring**  
**Analytical Results**

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TABLE D-1

Chemical Performance Monitoring Results, March 2005 through October 2008

Interim Measures Performance Monitoring

PG&amp;E Topock Compressor Station

Location	Sample Date	Total Dissolved Solids	Oxygen 18	Deuterium	Chloride	Sulfate	Nitrate	Bromide	Calcium	Magnesium	Potassium	Sodium	Boron	Alkalinity
<b>Monitoring Wells</b>														
MW-20-70	10-Mar-05	1940	-7.1	-59.0	740	378	9.98	ND (1.0)	198	55.4	9.89	431	0.412	81.7
	15-Jun-05	1980	-7.0	-60.0	749	388	9.79	ND (1.0)	189	55.4	10.5	433	0.414	73.8
	15-Jun-05 FD	2050	-8.3	-57.0	760	392	9.81	ND (1.0)	204	60.7	11.4	468	0.445	71.3
	11-Oct-05	1950	-7.2	-57.0	737	359	9.48	0.641	198	49.9	14.6	323	0.402	69.9
	15-Dec-05	1830	-7.1	-49.0	645	326	9.90	ND (1.0)	138	42.3	14.5	267	0.441	77.8
	10-Mar-06	1940	-7.2	-54.0	679	358	10.5	ND (0.5)	161	48.6	9.22	424	0.427	82.2
	05-May-06	1750	-8.2	-55.9	696	376	9.86	0.574	162	49.2	9.55	461	0.476	74.5
	03-Oct-06	1890	-8.1	-60.4	677	357	13.0	ND (5.0)	158	47.6	9.82	472	0.535	85.0
	03-Oct-06 FD	1840	-8.1	-60.5	669	352	12.9	ND (5.0)	154	45.9	9.51	466	0.515	80.0
	13-Dec-06	1910	-7.6	-61.2	678	352	12.7	0.699	149	44.3	9.09	458	0.459	77.5
	14-Mar-07	1740	-8.5	-64.3	689	358	13.7	0.641	139	42.2	8.83	451	0.503	80.0
	03-May-07	1750	-8.4	-66.7	697	344	25.1	ND (1.0)	139	41.2	8.65	390	0.477	77.5
	11-Oct-07	1820	-8.2	-63.9	699	367	15.6	ND (1.0)	130	39.1	11.0	600	0.54	80.0
	12-Mar-08	1790	-7.6	-65.2	695	360	22.1	ND (1.0)	139	41.2	10.7	403	0.51	77.0
	07-Oct-08	1900	---	---	650	360	15.0	0.61	136	37.9	10.5	400	0.608	83.0
MW-20-100	10-Mar-05	2490	-5.2	-49.0	466	511	9.98	ND (1.0)	133	19.8	8.98	712	0.859	84.2
	15-Jun-05	2500	-4.7	-46.0	921	506	9.02	ND (1.0)	137	21.3	9.06	592	0.713	84.0
	11-Oct-05	2400	-5.3	-48.0	887	484	8.87	0.731	170	23.7	15.2	500	0.718	82.3
	15-Dec-05	2340	-5.4	-40.0	813	404	9.65	ND (1.0)	136	21.4	14.8	406	0.709	82.7
	10-Mar-06	2500	-5.6	-50.3	861	475	9.94	ND (0.5)	171	27.0	7.75	597	0.803	92.5
	05-May-06	2260	-5.1	-46.4	927	522	9.99	ND (1.0)	193	32.0	10.8	577	0.716	82.5
	03-Oct-06	2320	-5.8	-51.5	863	456	13.4	ND (5.0)	202	34.4	10.9 J	568	0.874	90.0
	13-Dec-06	1960	-6.2	-54.4	861	459	12.3	0.83	205	32.2	11.4	579	0.889	97.5
	13-Dec-06 FD	2200	-6.2	-54.5	874	457	12.2	0.851	205	32.2	9.55	575	0.881	92.5
	14-Mar-07	2180	-6.8	-57.8	847	477	14.2	0.785	194	31.7	9.90	521	0.715	87.5
	03-May-07	2300	-7.3	-59.2	879	493	23.2	ND (1.0)	209	36.0	12.0 J	559	0.699	87.5
	03-May-07 FD	2330	-6.7	-59.3	888	484	19.7	ND (1.0)	208	34.6	9.63 J	532	0.686	87.5
	10-Oct-07	2160	-7.2	-57.2	858	468	3.25	ND (1.0)	190	32.0	15.0	560	0.81	92.0
	12-Mar-08	2470	-6.9	-58.3	827	442	19.2	ND (1.0)	218	35.4	11.9	469	0.702	87.0
	08-Oct-08	2200	---	---	760	420	16.0	ND (1.0)	215	36.8	10.3	453	0.669	90.0

TABLE D-1

Chemical Performance Monitoring Results, March 2005 through October 2008

Interim Measures Performance Monitoring

PG&amp;E Topock Compressor Station

Location	Sample Date	Total Dissolved Solids	Oxygen 18	Deuterium	Chloride	Sulfate	Nitrate	Bromide	Calcium	Magnesium	Potassium	Sodium	Boron	Alkalinity
<b>Monitoring Wells</b>														
MW-20-130	09-Mar-05	5520	-5.8	-56.0	3120	1080	10.9	ND (1.0)	219	12.1	24.7	2250	1.90	68.9
	09-Mar-05 FD	6200	-5.4	-51.0	3080	1080	10.9	ND (1.0)	231	12.8	25.4	2390	1.99	68.9
	15-Jun-05	7790	-5.0	-48.0	3410	1230	11.1	ND (1.0)	352	23.2	31.3	2980	2.75	68.7
	07-Oct-05	7330	-5.0	-47.0	3010	1210	10.9	1.04 J	349	13.9	38.4	2070	2.41	72.4
	16-Dec-05	7860	-5.8	-43.0	3260	1000	10.7	ND (2.5)	324	16.3	44.4	1780	1.98	63.2
	10-Mar-06	8610	-5.5	-48.8	3370	1250	10.6	ND (0.5)	312	18.9	27.7	2730	2.03	74.5
	05-May-06	7700	-5.3	-47.2	3900	1280	8.95	ND (1.0)	349	20.3	27.7	2810	2.40	69.2
	18-Oct-06	8450	-6.3	-51.4	3680	1100	11.5	ND (5.0)	358	20.9	28.0	2870	2.28	70.0
	13-Dec-06	7890	-6.0	-54.9	3970	1250	10.6	0.896	335	19.7	27.6	2900	2.31	72.5
	13-Dec-06 FD	8250	-5.9	-54.4	3950	1260	10.5	1.09	328	19.1	27.3	2830	2.24	72.5
	08-Mar-07	8450	-6.5	-57.7	3930	1240	11.3	1.08	353	21.3	27.0	2760	2.24	70.0
	08-Mar-07 FD	8510	-6.6	-57.4	3900	1210	11.3	1.06	351	21.3	26.8	2750	2.19	72.5
	03-May-07	8150	-7.7	-60.0	4020	1310	9.80 J	ND (1.0)	338	22.5	27.8	2550	2.49	75.0
	03-May-07 FD	8100	-6.9	-60.1	3950	1290	20.4 J	ND (1.0)	338	21.9	27.3	2550	2.47	72.5
	05-Oct-07	7980	-7.0	-57.5	3670	1070	11.6	ND (1.0)	310	19.0	31.0	2900	2.40	77.0
	12-Mar-08	8460	-6.2	-58.7	3690	1220	14.3	ND (1.0)	342	23.4	47.0	2260	2.07	75.0
	08-Oct-08	7800	---	---	3500	1200	12.0	ND (2.5)	329	22.0	40.1	1990	2.23	81.0
MW-25	09-Mar-05	877	-8.4	-62.0	247	169	3.64	ND (0.5)	77.6	16.1	6.24	211	0.441	158
	14-Jun-05	942	-8.6	-61.0	289	183	3.89	ND (0.5)	93.5	20.0	8.91	253	0.464	137
	14-Jun-05 FD	980	-7.2	-59.0	294	185	3.94	ND (0.5)	100	20.9	9.06	268	0.475	137
	04-Oct-05	950	-8.2	-68.0	252	171	3.77	ND (0.5)	83.3	14.9	9.93	164	0.362	141
	04-Oct-05 FD	910	-8.3	-60.0	251	171	3.75	ND (0.5)	94.6	15.3	10.2	185	0.371	146
	14-Dec-05	838	-8.4	-55.0	224	158	3.74	ND (0.5)	75.5	14.5	9.80	143	0.396	153
	14-Dec-05 FD	896	-8.4	-50.0	219	155	3.75	ND (0.5)	73.0	14.1	9.71	151	0.382	156
	09-Mar-06	910	-8.4	-64.1	245	164	3.83	ND (0.5)	76.4	15.6	6.97	210	0.39	170
	03-May-06	907	-9.0	-59.4	272	172	3.95	ND (0.5)	78.0	17.3	7.38	222	0.418	150
	03-May-06 FD	924	-9.0	-61.0	274	173	3.94	ND (0.5)	79.7	17.8	7.53	245	0.431	155
	03-Oct-06	892	-8.9	-62.7	222	158	4.09	ND (0.5)	73.3	15.0	7.25	206	0.466	163
	06-Mar-07	843	-9.0	-66.9	221	164	3.95	ND (0.5)	72.9	14.4	6.85	203	0.459	160
	02-Oct-07	796	-9.0	-65.8	189	155	4.58	ND (1.0)	66.0	14.0	7.90	200	0.49	180

TABLE D-1

Chemical Performance Monitoring Results, March 2005 through October 2008

Interim Measures Performance Monitoring

PG&amp;E Topock Compressor Station

Location	Sample Date		Total Dissolved Solids	Oxygen 18	Deuterium	Chloride	Sulfate	Nitrate	Bromide	Calcium	Magnesium	Potassium	Sodium	Boron	Alkalinity
<b>Monitoring Wells</b>															
MW-25	02-Oct-07	FD	758	-9.0	-65.7	195	157	4.40	ND (1.0)	63.0	13.0	7.70	220	0.46	190
	07-Oct-08		740	---	---	170	150	4.30	ND (0.5)	59.2	12.9	9.89	143	0.559	200
	07-Oct-08	FD	730	---	---	170	150	4.40	ND (0.5)	58.4	12.9	10.2	144	0.559	210
MW-26	08-Mar-05		1840	-8.8	-70.0	756	370	4.48	ND (0.5)	166	41.6	10.7	439	0.557	98.7
	08-Mar-05	FD	1800	-8.7	-70.0	708	338	4.45	ND (0.5)	166	40.9	11.4	438	0.559	96.1
	13-Jun-05		2130	-8.2	-65.0	847	371	4.90	ND (0.5)	178	44.6	14.0	511	0.663	103
	04-Oct-05		2120	-7.8	-68.0	779	372	4.88	0.601	166	40.4	19.8	352	0.526	109
	12-Dec-05		2610	-8.5	-55.0	788	372	4.88	0.546	162	39.9	20.3	349	0.613	99.7
	08-Mar-06		2070	-8.6	-60.4	772	324	4.90	ND (0.5)	155	38.1	11.7	434 J	0.621	121
	01-May-06		2130	-8.9	-62.7	927	382	4.87	ND (0.5)	165	42.0	12.8	555	0.723	121
	03-Oct-06		2220	-8.8	-63.0	894	370	6.22	ND (2.5)	170	43.9	12.8	510	0.692	105
	12-Mar-07		2280	-9.0	-67.0	917	387	6.02	0.646	163	41.6	12.9	621	0.622	90.0
	02-Oct-07		2180	-8.6	-66.3	945	391	7.84	ND (1.0)	170	42.0	15.0	620	0.66	100
	12-Mar-08		2500	-8.1	-67.2	908	398	10.7 J	ND (1.0)	176	44.1 J	16.2 J	498	0.589	103
	12-Mar-08	FD	2420	-8.9	-68.2	905	398	7.61 J	ND (1.0)	160	32.8 J	12.7 J	462	0.601	102
	08-Oct-08		2400	---	---	930	440	10.0	ND (1.0)	183	45.8	14.6	555	0.591	110
MW-27-20	08-Mar-05		1250	-12	-102.0	190	432	ND (0.5)	ND (0.5)	137	56.6	4.89	195	ND (0.2)	215
	18-Jul-05		---	-11.9	-98.0	81.9	228	ND (0.5)	ND (0.5)	96.1	30.1	4.27	94.8	ND (0.2)	160
	05-Oct-05		742	-11.8	-102.0	91.1	252	ND (0.5)	ND (0.5)	88.6	31.4	5.48	81.0	ND (0.2)	175
	14-Dec-05		1020	-11.7	-91.0	118	347	ND (0.5)	ND (0.5)	116	41.8	6.96	116	ND (0.2)	216
	06-Mar-06		664	-12.1	-90.9	89.7	231	ND (0.2)	ND (0.2)	89.1	28.8	4.90	103	ND (0.2)	385
	14-Jun-06		730	-12	-89.8	98.3	272	ND (0.5)	ND (0.5)	91.1	28.5	2.79 J	96.9	ND (0.2)	195
	03-Oct-06		600	-13.1	-96.6	90.8	261	ND (0.5)	ND (0.5)	102	34.5	6.45	113	ND (0.2)	160
	02-Oct-07		802	-12.5	-96.3	102	320	ND (1.0)	ND (1.0)	97.0	34.0	5.30	150	0.22	170
	03-Oct-08		---	---	---	94.0	240	ND (0.5)	---	87.9	29.5	---	110	---	---
MW-28-25	10-Mar-05		880	-12.2	-95.0	112	302	ND (0.5)	ND (0.5)	129	36.3	3.50	122	ND (0.2)	204
	15-Jun-05		974	-11.6	-91.0	108	359	ND (0.5)	ND (0.5)	133	38.9	6.54	117	ND (0.2)	221
	06-Oct-05		884	-11.7	-95.0	99.8	300	ND (0.5)	ND (0.5)	123	37.0	6.61	88.7	ND (0.2)	197
	16-Dec-05		1010	-11.4	-90.0	128	348	ND (0.5)	ND (0.5)	134	41.5	6.46	107	ND (0.2)	212
	09-Mar-06		746	-11.5	-93.9	84.4	225	ND (0.5)	ND (0.5)	98.5	27.5	4.15 J	88.5	ND (0.2)	244

TABLE D-1

Chemical Performance Monitoring Results, March 2005 through October 2008

Interim Measures Performance Monitoring

PG&amp;E Topock Compressor Station

Location	Sample Date	Total Dissolved Solids	Oxygen 18	Deuterium	Chloride	Sulfate	Nitrate	Bromide	Calcium	Magnesium	Potassium	Sodium	Boron	Alkalinity
<b>Monitoring Wells</b>														
MW-28-25	05-May-06	741	-11.4	-90.3	110	302	ND (0.5)	ND (0.5)	117	35.7	5.77	118	ND (0.2)	216
	11-Oct-06	1050	-12.2	-95.0	86.3	247	ND (0.5)	ND (0.5)	133	40.8	5.47	132	ND (0.2)	225
	04-Oct-07	812	-12.1	-98.7	110	307	ND (1.0)	ND (1.0)	120	37.0 J	4.80	150	0.26 J	230
	08-Oct-08	---	---	---	100	280	ND (0.5)	---	109	34.7	---	102	---	---
MW-30-30	10-Mar-05	38800	-9.8	-79.0	16000	4270	ND (5.0)	7.91	1590	1600	95.4	13600	4.97	421
	07-Oct-05	36400	-8.5	-75.0	17600	4000	ND (0.5)	ND (10)	1020	842	93.6	7650	5.20	521
	15-Dec-05	35700	-8.7	-59.0	19700	4070	ND (1.0)	3.13	1060	894	110	8540	6.14	504
	13-Mar-06	39700 J	-8.8	-70.5	18600	4530	ND (0.5)	ND (50)	1050	892	77.2	11300	4.62	650
	02-May-06	32400	-10.3	-70.7	15400	3300	ND (0.5)	ND (5.0)	882	828	59.4	10300	3.95	756
	10-Oct-06	29400	-9.4	-68.7	17800	4400	ND (2.5)	ND (2.5)	729	653	55.0	10200	4.32	550
	08-Oct-07	27400	-9.0	-73.9	13700	3370	ND (1.0)	3.88	650	540	56.0	9600	4.50	800
MW-30-50	10-Mar-05	6470 J	-8.3	-68.0	4660	672	ND (0.5)	1.03	335	107	16.5	2040	1.15	324
	07-Oct-05	6860	-9.4	-79.0	3060	857	ND (0.5)	0.899 J	438	101	37.0	1780	1.27	252
	16-Dec-05	5850	-10.5	-65.0	2360	578	ND (0.5)	0.645	265	77.9	32.9	1260	1.19	212
	09-Mar-06	5380	-9.8	-83.5	2420	651	ND (0.5)	ND (0.5)	226	66.2	14.6	1640	1.18	275
	02-May-06	5420	-10.4	-73.6	2380	612	ND (0.5)	3.41	243	70.3	16.4	1750	1.22	261
	11-Oct-06	4170	-10.7	-82.2	1980	468	ND (0.5)	ND (0.5)	171	48.5	14.0	1370	1.11	290
	11-Oct-06 FD	3930	-11	-82.6	1810	462	ND (0.5)	ND (0.5)	163	46.1	14.1	1340	1.08	298
MW-31-60	09-Mar-05	1540	-8.6	-63.0	649	210	4.94	ND (0.5)	108	17.3	5.97	424	0.401	76.6
	13-Jun-05	1660	-8.2	-65.0	745	207	4.12	ND (0.5)	121	18.9	6.57	403	0.388	70.0
	06-Oct-05	1660	-8.6	-65.0	691	206	4.01	ND (0.5)	109	16.5	9.75	308	0.462	77.3
	13-Dec-05	1620	-8.7	-54.0	669	199	4.14	ND (0.5)	87.0	15.4	9.32	275	0.359	73.0
	15-Mar-06	1560 J	-8.6	-65.6	661	191	4.37	ND (0.5)	106	17.5	7.30	403	0.393	89.3
	15-Mar-06 FD	1640 J	-8.6	-64.9	662	192	4.34	ND (0.5)	101	16.8	6.94	391	0.383	81.9
	01-May-06	1630	-9.6	-63.2	691	209	4.58	ND (0.5)	118	20.1	7.78	467	0.449	79.6
	05-Oct-06	1620	-9.4	-66.3	687	205	5.00	ND (0.5)	113	20.6	9.60 J	325	0.464	80.0
	12-Mar-07	1750	-9.3	-69.0	757	222	4.93	ND (0.5)	116	20.3	6.05	454	0.402 J	72.5
	04-Oct-07	1720	-9.4	-69.6	799	208	5.15	ND (1.0)	150	26.0	7.30	580	0.64	80.0
	06-Oct-08	2000	---	---	810	240	4.20	ND (1.0)	150	26.0	9.39	460	0.399	81.0
MW-32-20	09-Mar-05	12500	-7.2	-65.0	6930	1660	ND (0.5)	3.51	838	302	36.9	4000	2.76	123

TABLE D-1

Chemical Performance Monitoring Results, March 2005 through October 2008

Interim Measures Performance Monitoring

PG&amp;E Topock Compressor Station

Location	Sample Date	Total Dissolved Solids	Oxygen 18	Deuterium	Chloride	Sulfate	Nitrate	Bromide	Calcium	Magnesium	Potassium	Sodium	Boron	Alkalinity
<b>Monitoring Wells</b>														
MW-32-20	17-Jun-05	10200	-9.0	-67.0	4810	690	ND (0.5)	ND (2.5)	566	231	23.3	2620	1.75	676
	04-Oct-05	28800	-7.8	-65.0	14200	2420	ND (5.0)	6.19	1380 J	613 J	91.1 J	5400 J	4.75 J	733
	16-Dec-05	24600	-7.8	-61.0	12200	2140	ND (1.0)	3.48	1470	552	90.4	4950	4.16	861
	10-Mar-06	20900	-8.3	-65.5	10600	1970	ND (0.5)	ND (0.5)	1350	530	56.1	6440	3.54	432
	04-May-06	16900	-8.1	-64.9	9430	1380	ND (0.5)	2.35	937	445	46.0	4780	2.87	218
	02-Oct-06	46200 J	-8.6	-67.1	20200	3190	ND (2.5)	7.30	1870	1070	87.0	11300	6.34	660
	11-Dec-06	37900	-8.0	-67.0	17900	3020	ND (5.0)	7.67	1530	785	81.7	8420	4.98	825
	06-Mar-07	27600	-8.7	-72.7	16200	2210	0.925	5.93	1460	635	64.4	7110	3.92	765
	30-Apr-07	17700	-9.6	-78.1	9820	1310	ND (0.2)	3.78	965	484	51.4	5520	3.02	770
	01-Oct-07	37200	-8.3	-70.1	20600	3160	ND (1.0)	6.44	1800	1100	93.0	9900	5.70	700
	10-Mar-08	26000	-9.4	-72.6	15800	2280	ND (1.0)	5.66	1190	710	67.4	11600	2.31	800
	03-Oct-08	---	---	---	21000	3500	ND (5.0)	---	1700	1080	---	9550	---	640
MW-32-35	09-Mar-05	3560	-8.2	-68.0	1770	465	ND (0.5)	0.845	312	85.5	13.0	944	1.07	260
	17-Jun-05	7550	-9.5	-72.0	3520	787	ND (0.5)	ND (2.5)	506	120	14.8	2110	1.18	223
	04-Oct-05	8340	-8.3	-70.0	3840	765	ND (0.5)	ND (5.0)	567	134	29.3	1530	1.26	208
	16-Dec-05	7660	-8.8	-63.0	3510	710	ND (1.0)	1.02	606	128	30.0	1580	1.25	219
	10-Mar-06	9230	-8.6	-74.0	4210	1010	ND (0.5)	ND (0.5)	654	129	19.2	2360	1.13	234
	04-May-06	9840	-9.1	-67.8	4960	1130	ND (0.5)	ND (0.5)	693	148	19.5	2800	1.38	218
	02-Oct-06	11200	-9.4	-71.4	5430	1050	ND (2.5)	ND (2.5)	839	165	23.9	3260	1.48	290
	11-Dec-06	10400	-9.0	-70.4	5090	1000	ND (0.5)	1.90	845	173	22.5	2620	1.43	338
	06-Mar-07	12600	-10.2	-75.4	6070	1200	ND (0.5)	2.65	1080	209	23.5	2910	1.35	360
	30-Apr-07	12100	-9.9	-78.7	6610	1280	ND (0.2)	2.60	1250	273	26.2	3280	1.35	475
	01-Oct-07	13700	-8.9	-72.7	6830	1120	ND (1.0)	2.62	1000	390	29.0	4000	1.70	490
	03-Oct-08	15000	---	---	7600	1300	ND (2.5)	3.10	829	150	^	3490	1.49	550
MW-34-55	10-Mar-05	6230	-10.8	-82.0	2620	739	ND (0.5)	0.654	366	71.3	29.1	1900	1.19	240
	15-Jul-05	---	-10.3	-84.0	2250	607	ND (0.5)	ND (0.5)	247	52.0	16.5	1420	1.02	242
	05-Oct-05	5150	-10.6	-88.0	2170	619	ND (0.5)	ND (0.5)	272	59.1	25.8	1230	1.20	232
	14-Dec-05	5100	-10.8	-74.0	2150	552	ND (0.5)	0.588	217	45.0	27.2	965	0.937	236
	08-Mar-06	4850	-10.8	-86.8	2080	593	ND (0.5)	ND (0.5)	256	54.2	13.5	1640	0.956	272
	03-May-06	4320	-11.5	-84.3	2070	500	ND (0.5)	ND (0.5)	198	44.8	11.1	1360	0.846	302

TABLE D-1

Chemical Performance Monitoring Results, March 2005 through October 2008

Interim Measures Performance Monitoring

PG&amp;E Topock Compressor Station

Location	Sample Date	Total Dissolved Solids	Oxygen 18	Deuterium	Chloride	Sulfate	Nitrate	Bromide	Calcium	Magnesium	Potassium	Sodium	Boron	Alkalinity
<b>Monitoring Wells</b>														
MW-34-55	04-Oct-06	1680 J	-12.2	-94.8	443	230	ND (0.5)	ND (0.5)	37.6	8.08	4.59	536	0.54	368
	03-Oct-07	730	-11.3	-96.6	109	266	ND (1.0)	ND (1.0)	15.0	3.30	3.30	290	0.26	190
	07-Oct-08	700	---	---	100	250	ND (0.5)	---	72.4	16.9	5.26	^	0.248	170
MW-34-80	08-Mar-05	6940	-10.4	-83.0	4180	1040	ND (0.5)	1.01	439	68.1	28.0	2750	1.65	304
	15-Mar-05	8980	---	---	3920	ND (5.0)	ND (1.0)	---	445	65.7	29.7	2990	---	288
	30-Jun-05	7840	-8.4	-82.0	3910	979	ND (0.5)	ND (0.5)	497	76.5	27.7	2670	1.66	302
	05-Oct-05	10200	-10.1	-85.0	3880	1060	ND (0.5)	ND (0.5)	429	72.5	47.4	1660	1.57	302
	14-Dec-05	8800	-10.2	-71.0	3700	880	ND (0.5)	0.854	432	68.3	54.9	1710	1.54	297
	09-Mar-06	7830	-9.9	-86.8	3520	986	ND (0.5)	ND (0.5)	383	65.8	24.0	2420	1.49	313
	03-May-06	7950	-11.7	-77.6	3700	921	ND (0.5)	ND (0.5)	425	70.3	23.9	2480	1.38	297
	04-Oct-06	7080	-11.3	-81.8	3210	786	ND (0.5)	0.737	341	65.4	21.1	2170	1.31	268
	12-Dec-06	6510	-10.5	-80.9	3190	789	ND (0.5)	0.742	298	62.9	18.9	2040	1.26	288
	05-Mar-07	6360 J	-11.5	-85.8	3300	783	ND (0.5)	0.72	315	68.3	19.4	2020	1.29	205
	30-Apr-07	6390	-11.5	-88.9	3320 J	889 J	ND (0.2)	ND (1.0)	282	57.0	18.6	2080	1.33	245
	03-Oct-07	5490	-11.3	-87.8	2630	696	ND (1.0)	ND (1.0)	220	53.0	21.0	2000	1.20	240
	13-Dec-07	5420	-10.9	-88.6	2380	698	ND (1.0)	ND (1.0)	193	49.1	25.4	1450	1.09	264
	12-Mar-08	5500	-11.4	-87.3	2510	739	ND (1.0)	ND (1.0)	237	52.6	19.2	2030	1.14	238
	06-May-08	5820	-11.4	-87.3	2460	753	ND (0.2)	0.525	230	49.0	30.0	1600	1.20	216
	07-Oct-08	5300	---	---	2400	720	ND (2.0)	ND (2.0)	^	^	22.0	1220	0.765	250
<b>Surface Water Stations</b>														
R-27	07-Mar-05	669	-12.3	-102.0	92.7	244	ND (0.5)	ND (0.5)	82.8	31.3	4.72	108	ND (0.2)	136
	14-Jun-05	686	-11.4	-92.0	90.9	266	ND (0.5)	ND (0.5)	81.9	29.8	6.04	98.9	ND (0.2)	127
	05-Oct-05	678	-11.6	-94.0	85.1	255	ND (0.5)	ND (0.5)	101	36.2	6.56	91.2	ND (0.2)	130
	16-Dec-05	718	-11.7	-87.0	87.9	253	ND (0.5)	ND (0.5)	85.5	29.5	5.99	75.6	ND (0.2)	126
	06-Mar-06	656	-11.8	-92.1	90.6	268	ND (0.5)	ND (0.5)	83.5	29.4	5.44 J	101	ND (0.2)	144
	03-May-06	567	-12.8	-93.9	93.1	267	ND (0.5)	ND (0.5)	87.0	31.1	3.12 J	106	ND (0.2)	139
	04-Oct-06	752 J	-12.2	-94.9	91.5	261	ND (0.5)	ND (0.5)	82.9	31.5	6.24 J	98.1	ND (0.2)	128
	20-Dec-06	680	-12.7	-98.1	94.5	266	ND (0.5)	ND (0.5)	83.2	30.9	3.64	106	ND (0.2)	138
	13-Mar-07	750 J	-13	-99.5	96.5	267	0.537	ND (0.5)	86.9	31.3	4.73	106	ND (0.2)	130
	08-May-07	715 J	-12.9	-104.0	92.6	269	ND (0.5)	ND (0.5)	84.3	29.8	5.55	100	ND (0.2)	143

TABLE D-1

Chemical Performance Monitoring Results, March 2005 through October 2008

Interim Measures Performance Monitoring

PG&amp;E Topock Compressor Station

Location	Sample Date	Total Dissolved Solids	Oxygen 18	Deuterium	Chloride	Sulfate	Nitrate	Bromide	Calcium	Magnesium	Potassium	Sodium	Boron	Alkalinity
<b>Surface Water Stations</b>														
R-27	11-Sep-07	650	-12.5	-101.0	89.4	253	0.336	ND (0.2)	74.2	28.9	5.47	86.5	ND (0.2)	132
	05-Dec-07	---	-11.7	-99.0	94.7	256	ND (1.0)	ND (0.2)	89.8	31.7	6.60	93.4	0.157	137
	02-Apr-08	---	---	---	93.0	267	ND (1.0)	ND (1.0)	80.2	30.7	5.50	106	0.432	136
	17-Jun-08	682	---	---	91.6	254	ND (1.0)	ND (1.0)	76.2	31.8	6.69	89.7	ND (0.2)	134
R-28	08-Mar-05	651	-12.5	-102.0	90.4	231	ND (13)	ND (0.5)	83.7	31.4	5.02	107	ND (0.2)	132
	14-Jun-05	680	-11.6	-95.0	91.2	268	ND (0.5)	ND (0.5)	78.5	28.5	5.08	94.5	ND (0.2)	127
	05-Oct-05	672	-11.6	-94.0	85.5	255	ND (0.5)	ND (0.5)	85.7	30.4	6.30	77.0	ND (0.2)	122
	16-Dec-05	710	-11.5	-83.0	88.1	254	ND (0.5)	ND (0.5)	87.2	29.8	6.11	76.8	ND (0.2)	126
	06-Mar-06	675	-12.3	-93.4	91.0	270	ND (0.5)	ND (0.5)	76.6	26.6	5.22 J	91.5	ND (0.2)	146
	03-May-06	586	-13	-92.1	93.4	270	ND (0.5)	ND (0.5)	88.1	31.4	4.04 J	107	ND (0.2)	136
	04-Oct-06	644 J	-12.6	-95.3	90.9	259	ND (0.5)	ND (0.5)	84.2	32.1	6.17 J	96.5	ND (0.2)	133
	20-Dec-06	615	-12.4	-99.6	93.3	262	ND (0.5)	ND (0.5)	85.7	32.0	4.66	108	ND (0.2)	143
	14-Mar-07	710	-12.8	-100.0	96.7	268	0.534	ND (0.5)	87.9	31.0	5.71	105	ND (0.2)	133
	09-May-07	690	-13	-102.0	95.8	271	ND (0.5)	ND (0.5)	86.1	30.5	5.92	103	ND (0.2)	143
	12-Sep-07	682	-12.4	-99.4	106	296	0.372	ND (0.2)	73.8	29.9	6.36	89.2	ND (0.2)	122
	06-Dec-07	---	-11.7	-98.6	96.5	258	0.345	ND (0.2)	75.7	30.4	6.62	79.4	ND (0.2)	139
	02-Apr-08	---	---	---	92.5	309	ND (1.0)	ND (1.0)	84.7	31.4	5.58	108	0.467	137
	18-Jun-08	672	---	---	89.4	248	ND (1.0)	ND (1.0)	43.3	31.1	6.95	93.9	ND (0.2)	132
	17-Sep-08	640	---	---	91.4	256	ND (0.5)	ND (0.5)	83.4	31.2	6.48	78.0	ND (0.2)	132

TABLE D-1

Chemical Performance Monitoring Results, March 2005 through October 2008

Interim Measures Performance Monitoring

PG&E Topock Compressor Station

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NOTES:

FD = field duplicate sample

ND = parameter not detected at the listed reporting limit.

J = concentration or reporting limit estimated by laboratory or data validation

R = result exceeded analytical criteria for precision and accuracy; should not be used for project decision-making

(---) = data not collected or available

^ = initial results suspect, sample being reanalyzed

General chemistry results in milligrams per liter (mg/L), except Oxygen-18 and Deuterium, which are expressed as differences from global standards in parts per thousand.

Alkalinity reported as carbonate (CaCO<sub>3</sub>). Nitrate reported as Nitrogen (N).

**Appendix E**  
**Deconvolution Data from IM No. 3 Shutdown,**  
**September 2008**

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## Deconvolution Data from IM No. 3 Shutdown, September 2008

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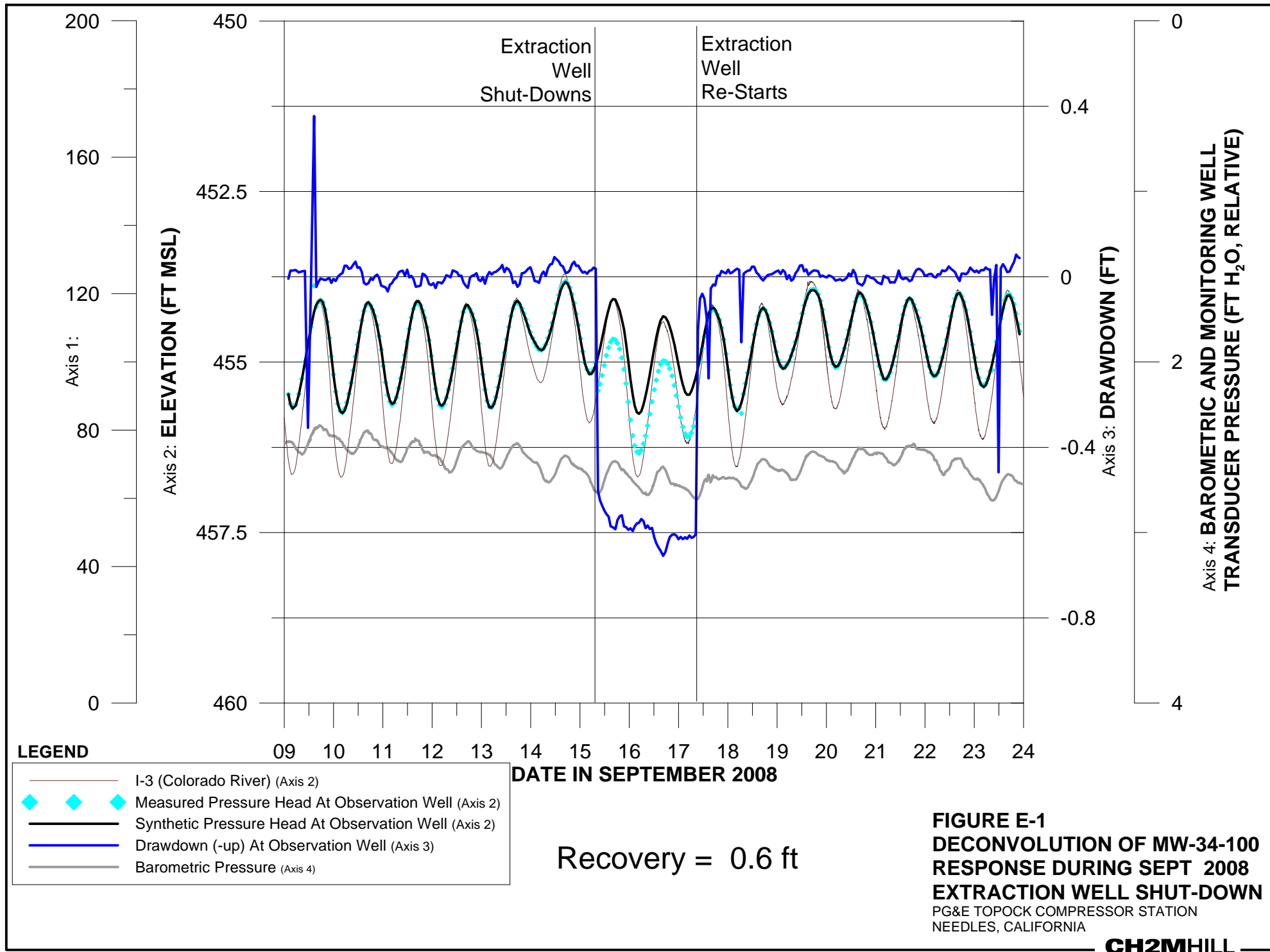
The IM No.3 extraction and treatment system was shut down for routine maintenance for 2 days in mid September. The TW-3D and PE-1 pumping wells were shut down at 8:12 am on 9-15-08, and restarted at 9:09 am on 9-17-08. Water level data collected from pressure transducers with data loggers were analyzed to estimate aquifer response associated with this shutdown. The data were analyzed using the deconvolution method of Halford (USGS, 2006) to screen out the hydraulic effects of fluctuations in river stage, which will obscure aquifer response in wells hydraulically connected to the river. As detailed in the *Summary Report for Hydraulic Testing in Bedrock Wells* (CH2M HILL 2008a), this analytical method has been applied for previous hydraulic evaluations at the site. For this evaluation, the deconvolution fitting period was from 9/9 01:00 through 9/15 08:00, and from 9/19 08:00 through 9/23 22:55, incorporating time both before and after the test.

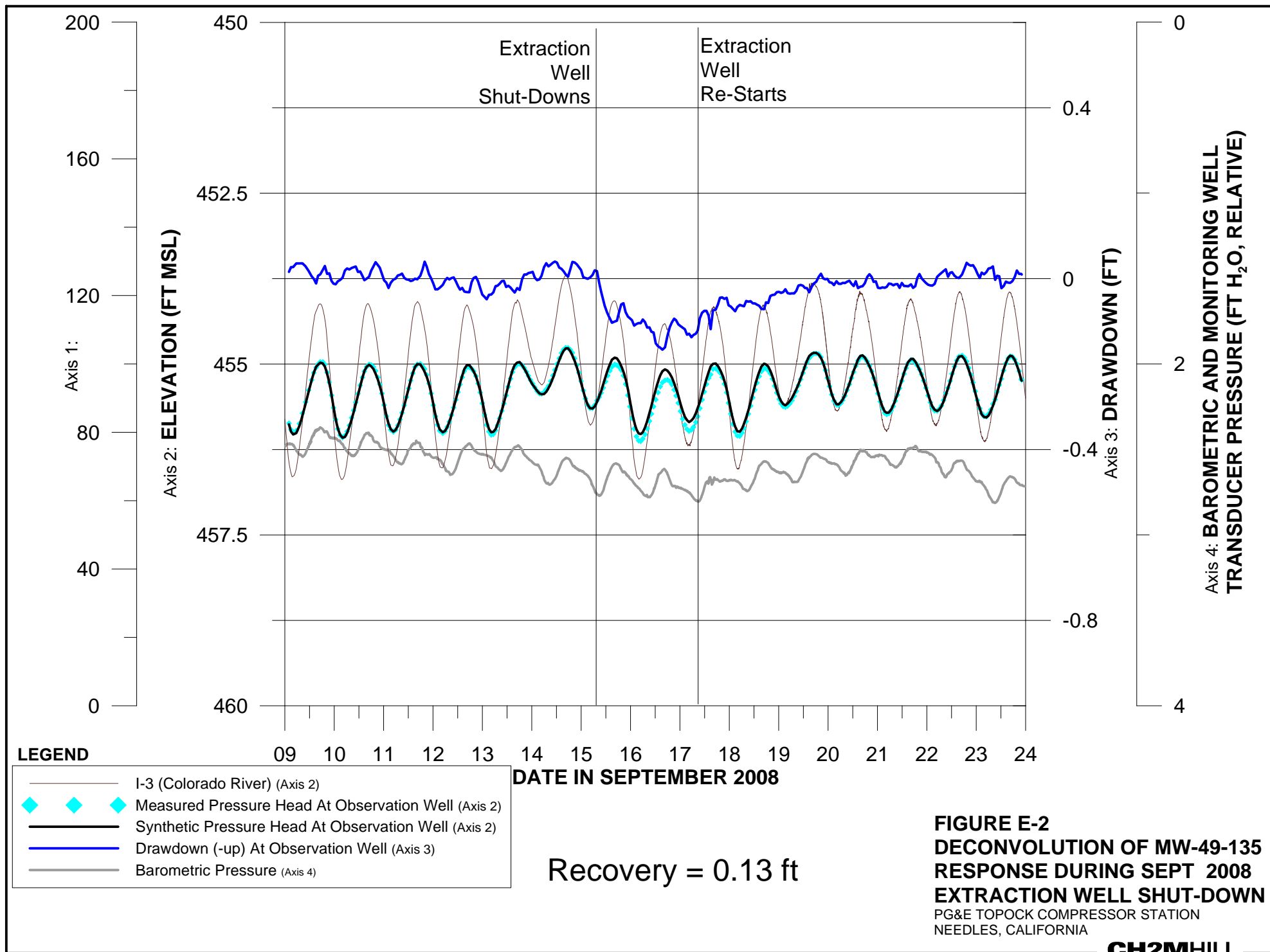
Using the deconvolution analysis, the magnitude of aquifer response (water level recovery/draw down) at 7 observation wells was evaluated. Figures E-1 and E-2 show the deconvolution analysis in two representative wells on California side of the river. Well MW 34-100 is within 100 feet of the pumping well PE-1 and responds most dramatically to the shutdown and restart with a response of about 0.6 feet. Well MW-49-135 is a deep zone well approximately 1,100 feet from TW-3D and 1,300 feet from PE-1. Water level response at MW-49-135 was muted but still observable, at about 0.13 feet. Figures E-3 through E-7 show the deconvolution analyses for the MW-54 and MW-55 wells in Arizona. In general, the detection limit for observable water level fluctuation was estimated to be 0.1 feet, however, the detection limit for water level change in the MW-55 well cluster was estimated to be 0.05 feet due to a less noisy baseline in this well. Measurable water level recovery of 0.1 feet was observed in the deep well at MW-54 (MW-54-195). Water level recovery in the other Arizona wells was below the estimated detection limits.

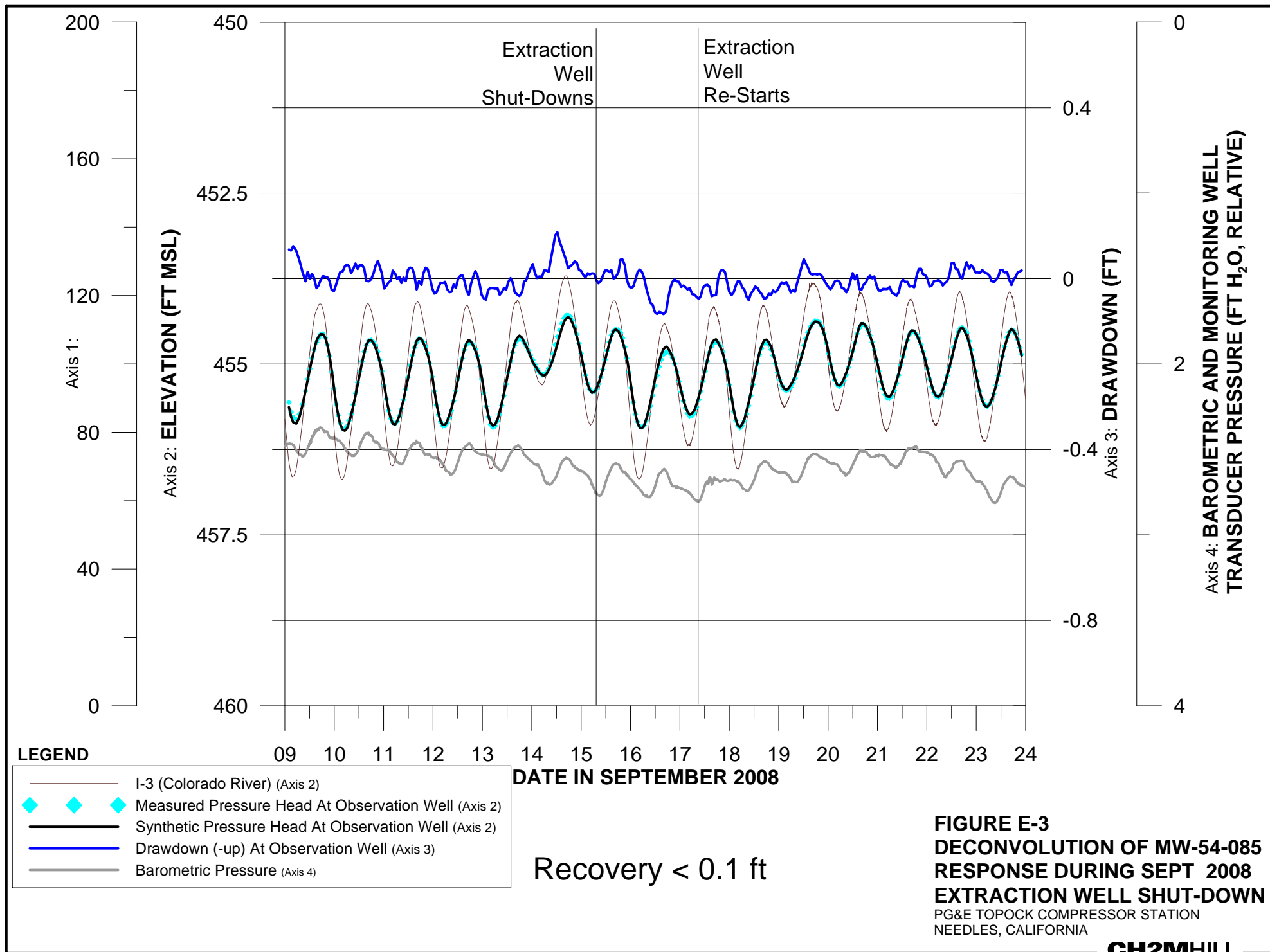
Figure E-8 shows the observed water level recovery in the selected wells that were analyzed for this test. These observations are consistent with the projections of the Topock groundwater model. Water level data are available for most of the other wells in the floodplain during the time of this test. These data will be stored and can be used for future analysis if needed. We have previously obtained and analyzed data from large group of California wells during a similar IM-3 maintenance shutdown in May, 2008. These results were reported in the *Installation Report for Wells on the Arizona Shore of the Colorado River at Topock, Arizona* (CH2M HILL 2008b) During the May shut down, the water level change in Arizona wells was not observable due to larger and more irregular fluctuations in river levels during the May test period. The detection limit in May was estimated to be 0.2 feet.

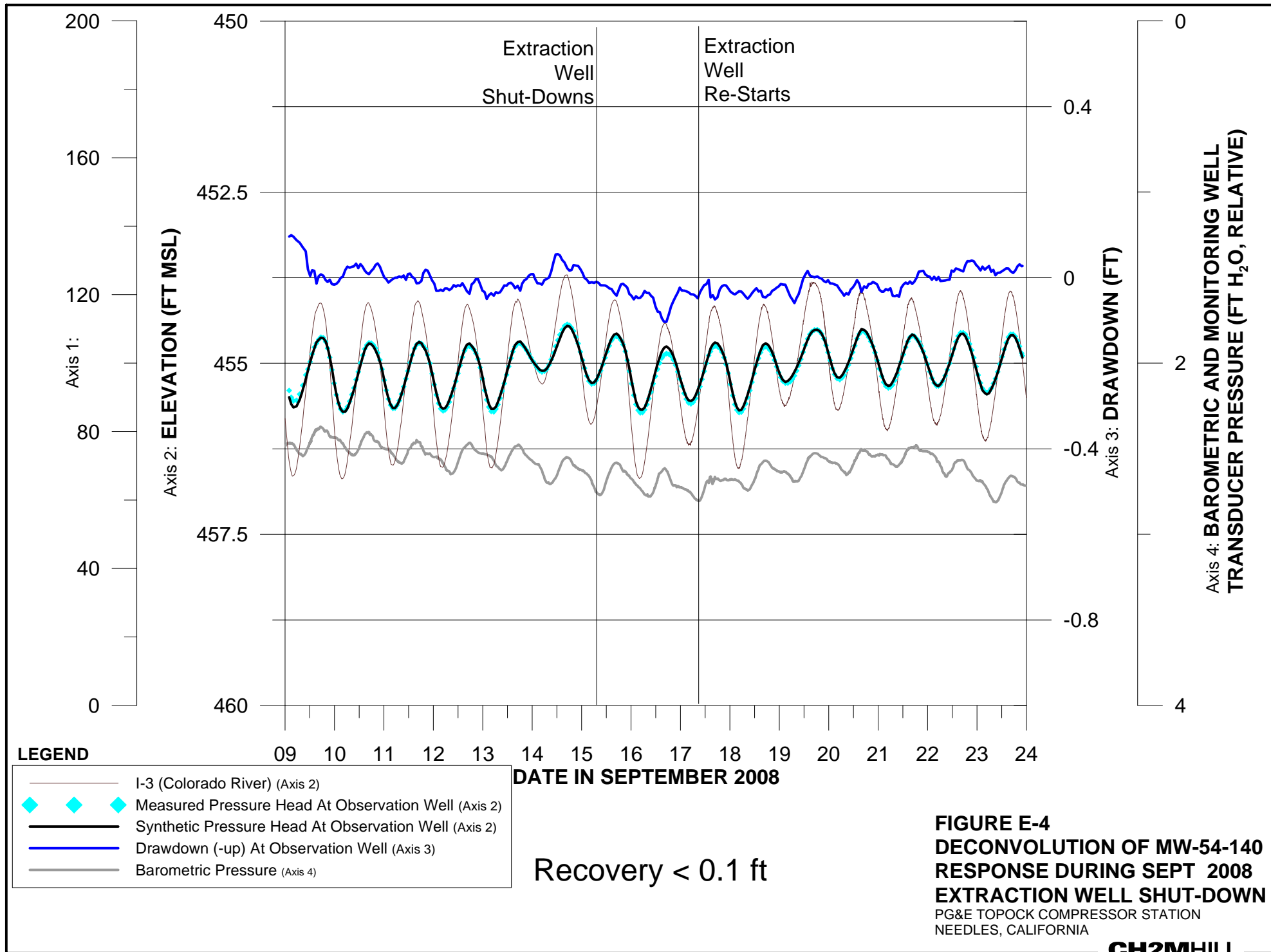
## Works Cited

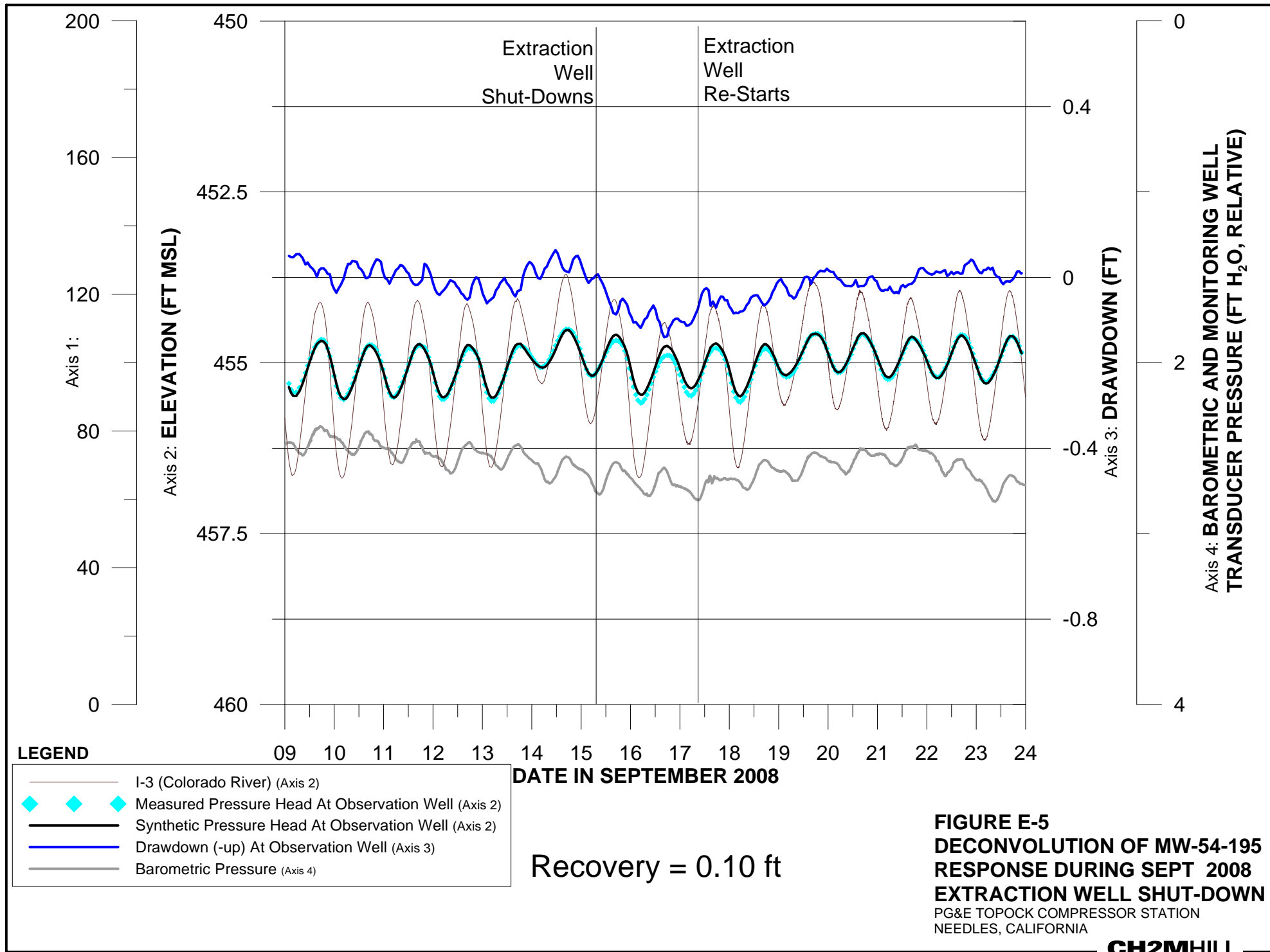
- United States Geological Survey (USGS). 2006. *Documentation of a Spreadsheet for Time-Series Analysis and Drawdown Estimation*. USGS Scientific Investigations Report 2006-5024.
- CH2M HILL 2008a. *Summary Report for Hydraulic Testing in Bedrock Wells*. Topock Compressor Station, Needles, California. January.
- CH2M HILL 2008b. *Installation Report for Wells on the Arizona Shore of the Colorado River at Topock, Arizona*. PG&E Topock Compressor Station Needles, California. August 12.

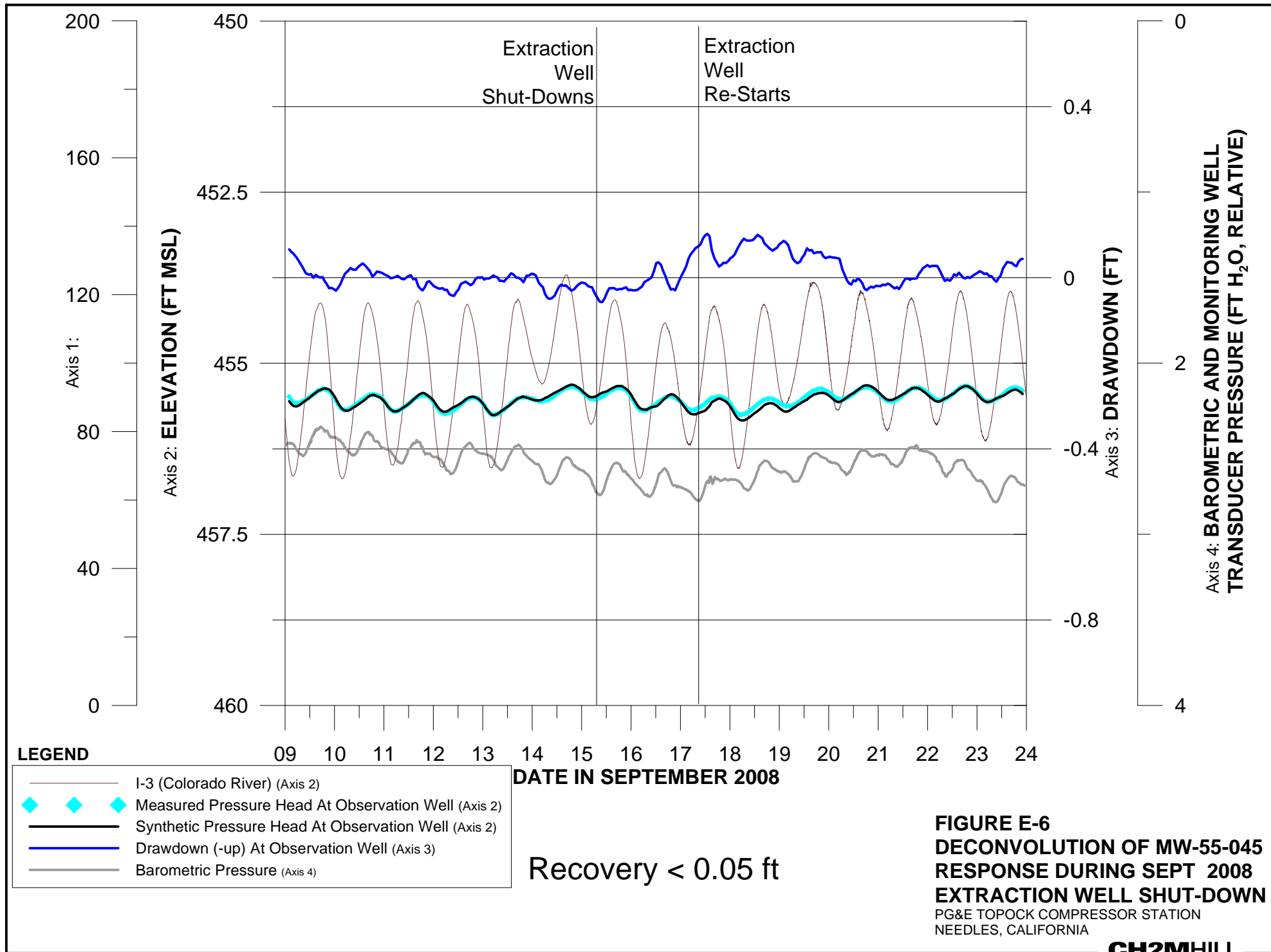


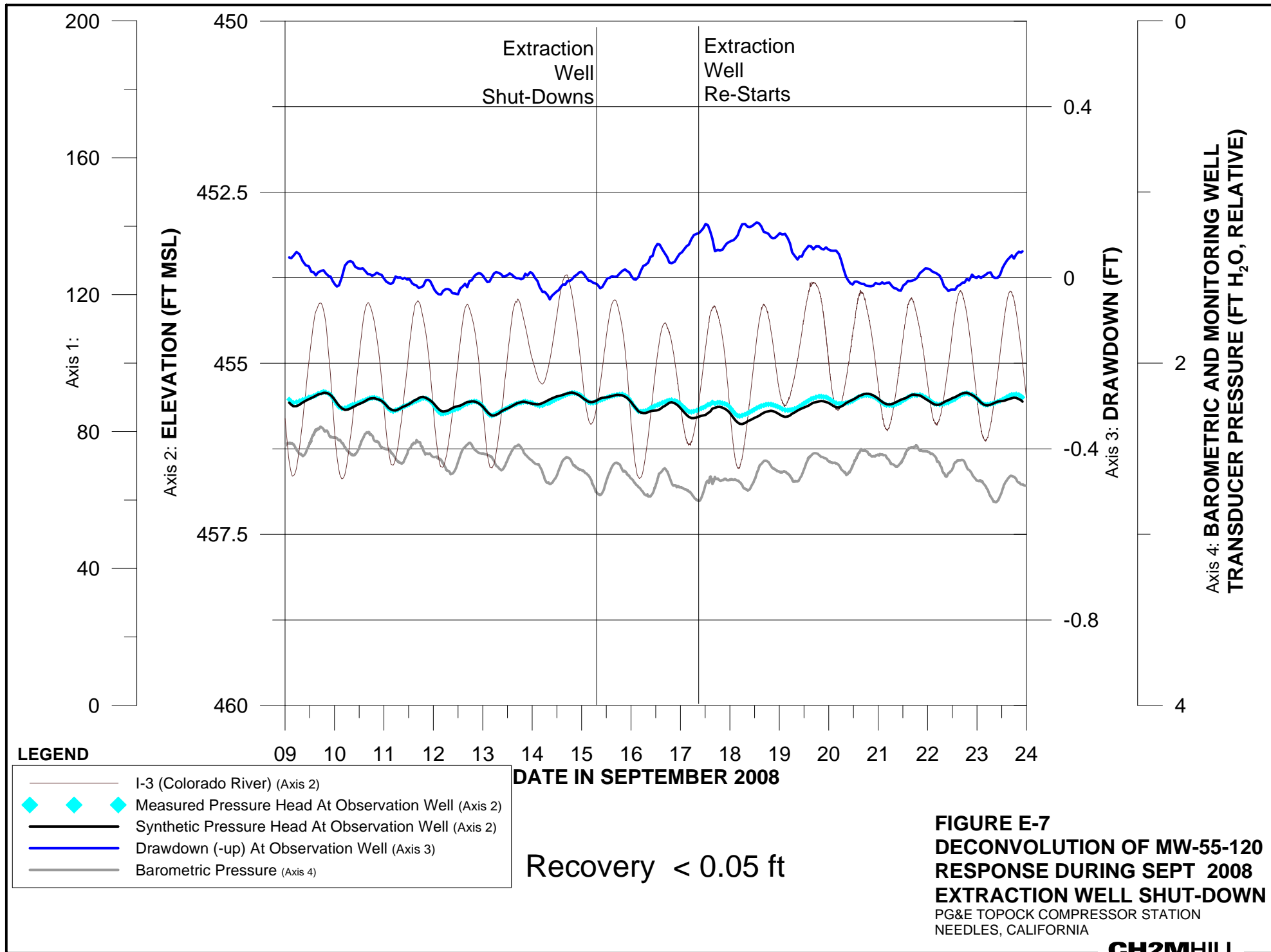














# Topock Project Executive Abstract

Document Title: Quarterly Performance Monitoring Report and Evaluation, August through October 2008

Submitting Agency: DTSC

Final Document? ☒ Yes ☐ No

Date of Document: 12/1/2008

Who Created this Document?: (i.e. PG&E, DTSC, DOI, Other)

PG&E

Priority Status: ☐ **HIGH** ☒ **MED** ☐ **LOW**

Is this time critical? ☐ Yes ☒ No

Type of Document:

☐ Draft ☒ Report ☐ Letter ☐ Memo

☐ Other / Explain:

Action Required:

☒ Information Only ☐ Review & Comment

Return to: \_\_\_\_\_

By Date: \_\_\_\_\_

☐ Other / Explain:

What does this information pertain to?

- ☐ Resource Conservation and Recovery Act (RCRA) Facility Assessment (RFA)/Preliminary Assessment (PA)  
☐ RCRA Facility Investigation (RFI)/Remedial Investigation (RI) (including Risk Assessment)  
☐ Corrective Measures Study (CMS)/Feasibility Study (FS)  
☐ Corrective Measures Implementation (CMI)/Remedial Action  
☐ California Environmental Quality Act (CEQA)/Environmental Impact Report (EIR)  
☒ Interim Measures  
☐ Other / Explain:

Is this a Regulatory Requirement?

☒ Yes

☐ No

If no, why is the document needed?

What is the consequence of NOT doing this item? What is the consequence of DOING this item?

Report is required to be in compliance with DTSC requirements.

Other Justification/s:

☐ Permit

☐ Other / Explain:

Brief Summary of attached document:

This quarterly report documents the monitoring activities and performance evaluation of the Interim Measure (IM) hydraulic containment system. Hydraulic and chemical monitoring data were collected and used to evaluate system performance based on a set of standards approved by DTSC. Key items included in this report are: (1) Measured groundwater elevation and hydraulic gradient data at compliance well pairs, monitoring the direction of groundwater flow away from the Colorado River, and towards the pumping centers on site; (2) Chromium (VI) data for monitoring wells on the floodplain, and (3) Pumping rates and volumes from the IM extraction system.

Based on the data and evaluation presented in this report, the IM performance standard has been met for the second quarter. The average groundwater gradients in the compliance well pairs exceeded the minimum landward gradient target (0.001 ft/ft) for each of the three months in the quarter (August, September, and October 2008). Hexavalent Chromium (Cr(VI)) concentrations observed in the floodplain monitoring wells are either stable or decreasing. The average pumping rate for the IM extraction system was 129.4 gallons per minute and an estimated 82.4 kilograms (or 128 pounds) of chromium were removed during this quarter.

Written by: PG&E

Recommendations:

Performance monitoring and evaluation of the IM hydraulic containment system will continue in accordance with the Performance Monitoring Plan and as directed by the DTSC. This report is for information only.

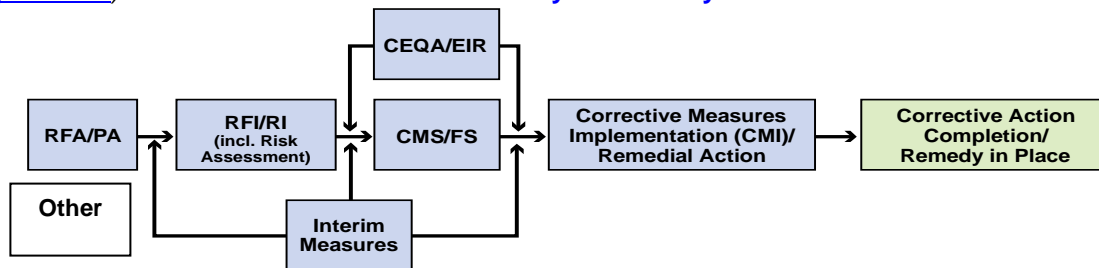
How is this information related to the Final Remedy or Regulatory Requirements:

This report is required by DTSC as part of the Interim Measures Performance Monitoring Program.

Other requirements of this information?

Related Reports and Documents:

Click any boxes in the Regulatory Road Map (below) to be linked to the Documents Library on the DTSC Topock Web Site ([www.dtsc-topock.com](http://www.dtsc-topock.com)). The link to the Documents Library is currently **UNDER CONSTRUCTION**.



**Legend**

RFA/PA – RCRA Facility Assessment/Preliminary Assessment

RFI/RI – RCRA Facility Investigation/CERCLA Remedial Investigation (including Risk Assessment)

CMS/FS – RCRA Corrective Measure Study/CERCLA Feasibility Study

CEQA/EIR – California Environmental Quality Act/Environmental Impact Report