



**Pacific Gas and
Electric Company®**

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October 15, 2004

Norman Shopay
Project Manager
California Department of Toxic Substances Control
Geology and Corrective Action Branch
700 Heinz Avenue
Berkeley, California 94710

Subject: Performance Monitoring Report No. 10
Interim Measure No. 2
PG&E Topock Compressor Station, Needles, California

Dear Mr. Shopay:

Enclosed is the tenth performance monitoring report for Interim Measure No. 2 for the Topock project. This report was prepared in conformance with Final Interim Measures Work Plan No. 2 and DTSC's Requirement for Future Monitoring Reports (letter dated July 21, 2004). This report describes the activities performed and monitoring data collected during the period September 1 through 30, 2004.

Please contact me at (805) 546-5243 if you have any questions or if you need additional information.

Sincerely,

Teri Heron
for Yvonne Meeks

Enclosure

cc: CWG Members

**Performance Monitoring Report No. 10,
PG&E Topock Compressor Station,
Interim Measures No. 2,
September 1 through 30, 2004**

Prepared for
Pacific Gas and Electric Company

October 15, 2004

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**Performance Monitoring Report No. 10
PG&E Topock Compressor Station, Interim Measures No. 2
September 1 through 30, 2004**

Prepared for
Pacific Gas and Electric Company

This monitoring report was prepared under supervision of a
California Registered Geologist,



Brian Schroth, Registered Geologist No. 7423
Senior Hydrogeologist

Performance Monitoring Report No. 10, PG&E Topock Compressor Station, Interim Measures No. 2 September 1 through 30, 2004

Pacific Gas and Electric Company (PG&E) is implementing Interim Measure (IM) No. 2 at the Topock Compressor Station near Needles, California, as described in the *Final Interim Measures Work Plan No. 2* prepared by CH2M HILL on March 2, 2004 and *Addenda to Interim Measures Work Plan No. 2*, prepared by CH2M HILL on March 1, 2004. This performance monitoring report describes operational and monitoring information for IM No. 2 for the period between September 1 and September 30, 2004.

This performance monitoring report has been prepared in compliance with the *Final Interim Measures Work Plan No. 2*, which requires reporting of system operations and performance monitoring data. Future reports will be submitted monthly on the 15th of each month, and each report will cover activities of the entire preceding month. The next report will be submitted on November 15th.

System Operations

Batch Plant Description

On May 21, 2004, the United States Bureau of Land Management approved the PG&E work plan to modify the existing operations to batch treat the water onsite. The modifications were started on June 9, 2004 and completed on July 15, 2004. Start-up and testing of the batch plant began on July 19, 2004.

Treatment is completed in three steps: (1) chromium reduction by reaction with ferrous chloride to reduce the hexavalent chromium to the less soluble trivalent form, (2) iron oxidation to precipitate out excess iron and reduced chromium, and (3) clarification to remove the precipitated solids from the water. Treated water from the clarifier is transferred to holding tanks for off-site disposal. Precipitated solids are periodically pumped from the clarifier into a container (phase separator) for off-site disposal.

The following sections summarize the IM No. 2 operations and activities during this reporting period. Pumping volumes, analytical test results and hydraulic evaluations are also included.

System Operations

Table 1 summarizes the pumping data for the reporting period. The pumping rate from TW-2D was increased from 30 to 40 gallons per minute (gpm) on September 7, 2004, upon DTSC approval of a request by PG&E to increase the pumping rate in order maintain the objective

of IM No. 2. The pumping rate from TW-2D was increased from 40 to 50 gpm on September 20, 2004, upon DTSC notification. A total of 1,625,700 gallons of groundwater were extracted and batch treated during this reporting period. The batch treated water was transported to United States Filter Corporation in Los Angeles, California for treatment and disposal. The treated water was manifested as a RCRA non-hazardous waste during this reporting period.

Water will continue to be transported to United States Filter Corporation for treatment and disposal in the interim until other disposal options are approved by regulatory agencies and implemented by PG&E. Solids accumulated in the clarifier were characterized as a RCRA hazardous waste. The first bin of solids was disposed at the Waste Management, Kettleman Hills Facility in September 2004.

TABLE 1

Pump Data from TW-2S and TW-2D (September 1 through September 30, 2004)
Performance Monitoring Report No. 10, Topock Compressor Station, Interim Measure No. 2

Extraction Well	Reporting Period		Project To Date
	Average Pumping Rate ² (gpm)	Volume Pumped (gal)	Cumulative Volume Pumped (gal)
TW-2S ¹	0	0	486,358
TW-2D	37.4	1,625,700	4,818,909
Total	37.4	1,625,700	5,305,267
Volume Pumped from MW-20 Cluster:			1,224,325
Total Volume Pumped (gal)			6,529,592
Total Volume Pumped (ac-ft)			20.04

gpm: gallons per minute.

Gal: gallons.

ac-ft: acre-feet.

¹Pumping from TW-2S was temporarily terminated on June 11, 2004.

²The "Average Pumping Rate" is the overall average during the reporting period (30.2 days), including system downtime. Actual pump rates from TW-2D were increased from 30 gpm to 50 gpm during the reporting period.

Daily inspections include tank inspections, flow measurements, site security, and desert tortoise sitings. Daily logs with documentation of inspections are maintained on site. No precipitation events occurred in September. The system was temporarily off-line on September 7, 2004 to repair the generator and on September 28, 2004 to install a temporary backup generator onsite.

Extracted Water Analytical Results

Weekly grab samples were collected from TW-2D during this reporting period. Table 2 summarizes analytical results from TW-2S and TW-2D since May 19, 2004.

Batch Plant Modifications

Small operational changes have been implemented within the batch plant to increase treatment rates. Recent changes include increased clarifier throughput rates, increased chemical addition rates, shorter treatment tank residence times, and decreased pipe diameters on pump influent lines at the treatment tanks.

A potable water supply system for polymer make-up water and laboratory use (4 - 200 gallon tanks) was also installed at the site during this reporting period.

Hydraulic Monitoring

Hydraulic Data

Water levels were recorded at intervals of 30 minutes with pressure transducers in multiple wells and two river monitoring stations (I-3 and RRB). The data are typically continuous with only short interruptions for sampling or maintenance. The wells monitored were:

- **Floodplain Wells:** MW-27, MW-28 cluster (2), MW-29, MW-30 cluster (2), MW-32 cluster (2), MW-33 cluster (2), MW-34 cluster (2), MW-36 cluster (6), and MW-39 cluster (6).
- **Intermediate Wells:** MW-19, MW-20 cluster (3), MW-26, MW-31 cluster (2), MW-35 cluster (2), TW-2S, TW-2D.
- **Basin Wells:** MW-10, MW-25.

Hydrographs for all wells with transducers are provided as Attachment 1; the Colorado River elevation at I-3 is shown on all hydrographs. Reported groundwater elevations (or hydraulic heads) are adjusted for temperature and for salinity differences between wells (i.e., adjusted to a common freshwater equivalent).

The average and the minimum and maximum daily average groundwater/river elevations have been calculated from the transducer data for the September reporting period (September 1 to 30, 2004). These values are shown on Figures 1, 2, and 3.

Evaluation of Groundwater Gradients From the Reporting Period

Hydraulic data are summarized and groundwater elevations contoured by zone of unconsolidated aquifer (UA) on the following figures:

Figure 1 – Upper Unconsolidated Aquifer Zone (Upper UA)

Figure 2 – Middle Unconsolidated Aquifer Zone (Middle UA)

Figure 3 – Lower Unconsolidated Aquifer Zone (Lower UA)

The groundwater elevations for all zones indicate landward hydraulic gradients along the floodplain. Further west from the floodplain, the gradient in the Upper UA is eastward, consistent with regional hydraulic gradients outside of the river area.

Figure 4 shows the location of a hydrogeologic section B1 that runs east-west through monitoring points between TW-2 and the river. It is used to present the vertical as well as

lateral groundwater gradients in a key area of the site. The average elevations, plotted on Figure 5 and contoured on Figure 6, indicate average upward hydraulic gradients across most of the profile and converging hydraulic gradients near the pumping wells. The water level inside the pumping well has not been posted or contoured on these figures because drawdown in actively pumping wells can be exaggerated due to well inefficiency.

The correlation between Colorado River levels and United States Bureau of Reclamation (USBR) records for Davis Dam discharge has been used to estimate future river levels from of USBR discharge projections. The predicted river levels are input to the groundwater model to help estimate future pumping requirements. Measured Davis Dam discharges do not always agree with USBR projections.

The estimated and actual dam discharges and river elevations since April 2004 are summarized in Table 3. The actual Davis Dam September 2004 discharge (monthly average) was less (221 cubic feet per second [cfs]) than the USBR projected discharge for the September reporting period. The actual Colorado River elevation at I-3 (monthly average) was greater (0.4 feet) than the predicted elevation for the September reporting period. Ongoing evaluation of the batch treatment system during late September suggested that the system was operationally capable of treating additional extracted groundwater to concentrations acceptable to the offsite disposal facility. Therefore, at the end of September PG&E requested approval from the DTSC and BLM for another increase to the pumping rate from extraction well TW-2D from 50 gpm to 70 gpm. PG&E will continue to monitor the operational capacity of the system and will request additional increases to the extraction rate until the maximum capacity of the system is reached.

Future Activities

Reporting of Interim Measures No. 2 activities will continue as described in the *Final Interim Measures Work Plan No. 2*. The next status report will be submitted on November 15, 2004 and will cover activities from October 1 to October 31, 2004.

Full-time pumping from TW-2D will continue in October 2004. The USBR projects that Davis Dam releases in October 2004 will be reduced relative to September rates. Calculations based on this projected dam release reduction indicate a corresponding drop in river level on the order of one foot. PG&E will request DTSC approval for a pump rate increase to approximately 70 gpm in early-October 2004. Based on recent operational changes noted above, the batch plant is capable of treating the hexavalent chromium in groundwater to non-hazardous levels at the increased pump rate. PG&E will also request BLM approval to install additional holding tanks to temporarily store treated, non-hazardous water on the MW-20 bench as a result of higher pumping rates. Future increases in pump rate are dependent on groundwater gradients, system treatment performance at 70 gpm, potential system modifications, and approval to take treated water to other disposal facilities.

Tables

Table 2
Analytical Results - TW-2 Extraction Wells
Topock Interim Measures No. 2

Sample Time Relative to TW-2 Pumping Start	TW-2S				TW-2D				TW-2 Combined			
	Sample Date	Total Dissolved Chromium mg/L	Hexavalent Chromium mg/L	Total Dissolved Solids mg/L	Sample Date	Total Dissolved Chromium mg/L	Hexavalent Chromium mg/L	Total Dissolved Solids mg/L	Sample Date	Total Dissolved Chromium mg/L	Hexavalent Chromium mg/L	Total Dissolved Solids mg/L
6 days	19-May-04	6.61	7.36	2,620	19-May-04	7.06	7.77	7,740	19-May-04	6.68	7.58	5,230
13 days	26-May-04	6.68	7.00	2,700	26-May-04	7.15	7.47	7,620	26-May-04	7.29	7.19	5,520
20 days	02-Jun-04	7.93	7.19	2,690	02-Jun-04	7.02	7.33	7,540	02-Jun-04	6.93	7.33	5,350
27 days	09-Jun-04	6.82	7.19	2,740	09-Jun-04	6.98	7.41	7,540	09-Jun-04	6.81	7.50	5,300
34 days	NS				16-Jun-04	7.55	7.11	7,400	NS			
41 days	NS				23-Jun-04	7.11	6.75	7,200	NS			
48 days	NS				30-Jun-04	6.37	6.64	7,060	NS			
56 days	NS				08-Jul-04	7.29	6.29	7,150	NS			
62 days	NS				14-Jul-04	5.92	6.15	7,020	NS			
69 days	NS				21-Jul-04	5.74	6.20	6,830	NS			
76 days	NS				28-Jul-04	5.66	6.01	6,760	NS			
83 days	NS				04-Aug-04	5.95	6.06	7,140	NS			
98 days	NS				19-Aug-04	7.61	6.20	6,700	NS			
105 days	NS				26-Aug-04	5.31	6.03	6,620	NS			
111 days	NS				01-Sep-04	6.26	6.03	6,730	NS			
118 days	NS				08-Sep-04	6.20	6.33	6,960	NS			
119 days	NS				09-Sep-04	6.47	6.17	6,520	NS			
125 days	NS				15-Sep-04	6.31	6.30	6,430	NS			
132 days	NS				22-Sep-04	6.37	6.39	6,650	NS			

Notes:

1. NS = Not Sampled
2. Sampling of TW-2S and TW-2 combined were halted when pumping from TW-2S was temporarily terminated on June 11, 2004 per DTSC direction.

Table 3
Predicted and Actual Monthly Average Davis Dam Discharge and Colorado River Elevation at I-3
PG&E Topock

Month	Davis Dam Release (cfs)			Colorado River Elevation at I-3 (ft AMSL or ft)		
	Projected	Actual	Difference	Predicted	Actual	Difference
April 2004	17,400	17,354	-46	456.4	456.2	-0.2
May 2004	17,100	16,788	-312	456.3	456.3	-0.1
June 2004	15,800	16,869	1,069	455.8	456.6	0.7
July 2004	14,000	14,951	951	455.2	455.9	0.7
August 2004	12,100	12,000	-100	454.5	454.9	0.4
September 2004	11,200	10,979	-221	454.2	454.6	0.4

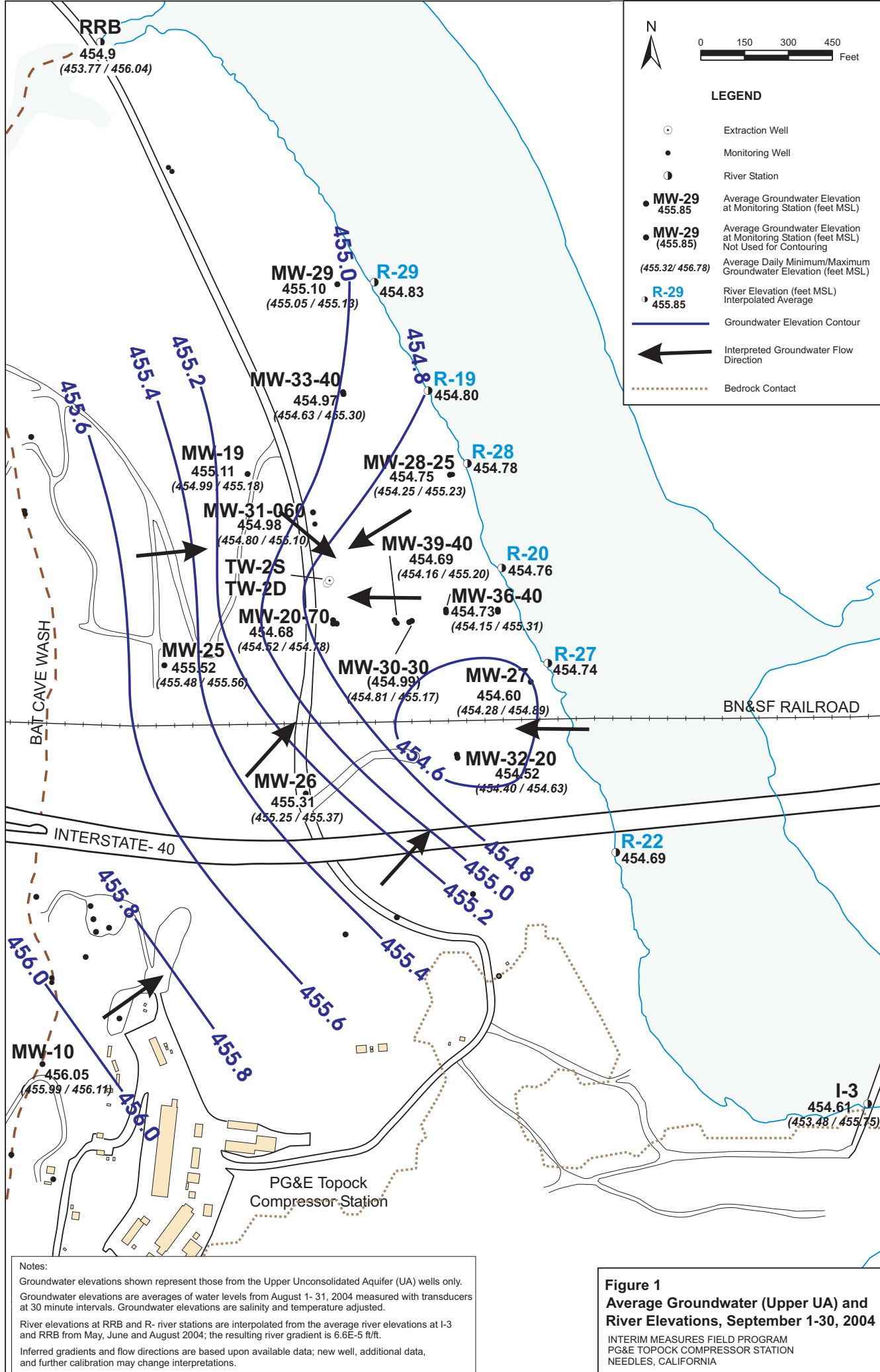
Notes:

Projected Davis Dam Releases, updated monthly, are reported by the US Department of Interior, Bureau of Reclamation at <http://www.usbr.gov/lc/region/g4000/24mo.pdf>; listed projections for April through July 2004 are from April 2004 data, and August and September 2004 projections were obtained at the beginning of each month.

Colorado River levels at I-3 are predicted from a linear regression between historical dam releases and measured river levels at I-3.

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

Figures



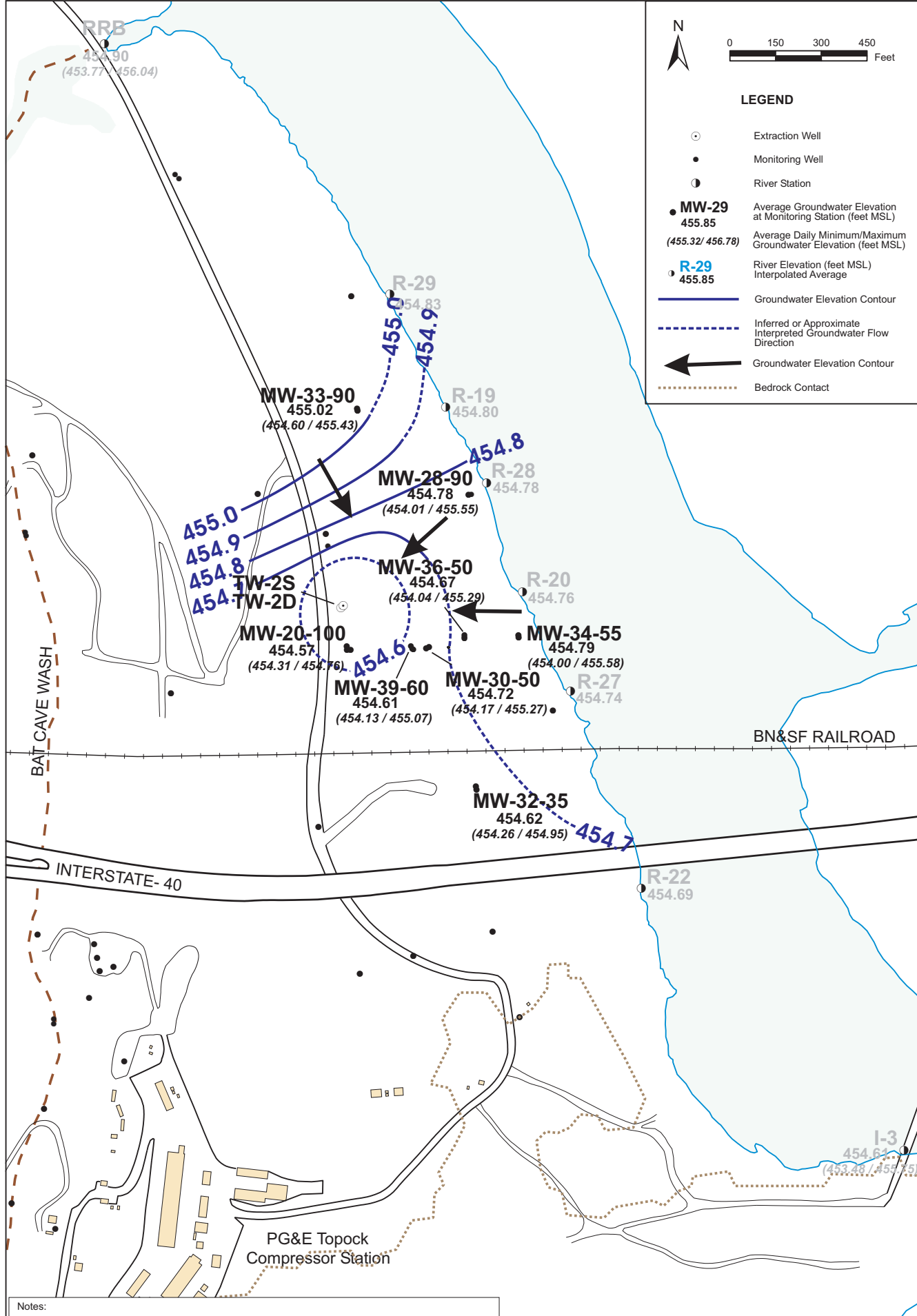
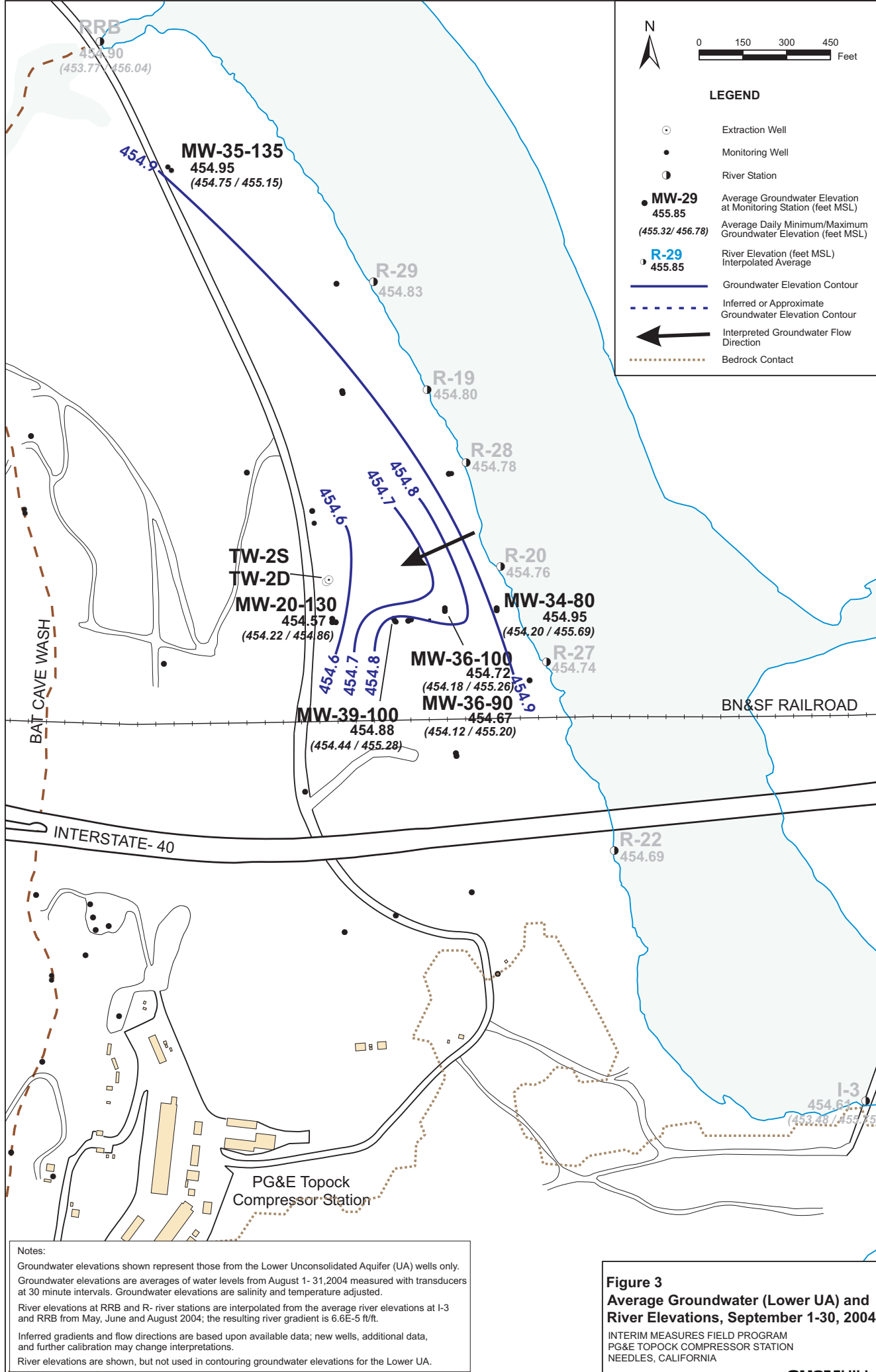


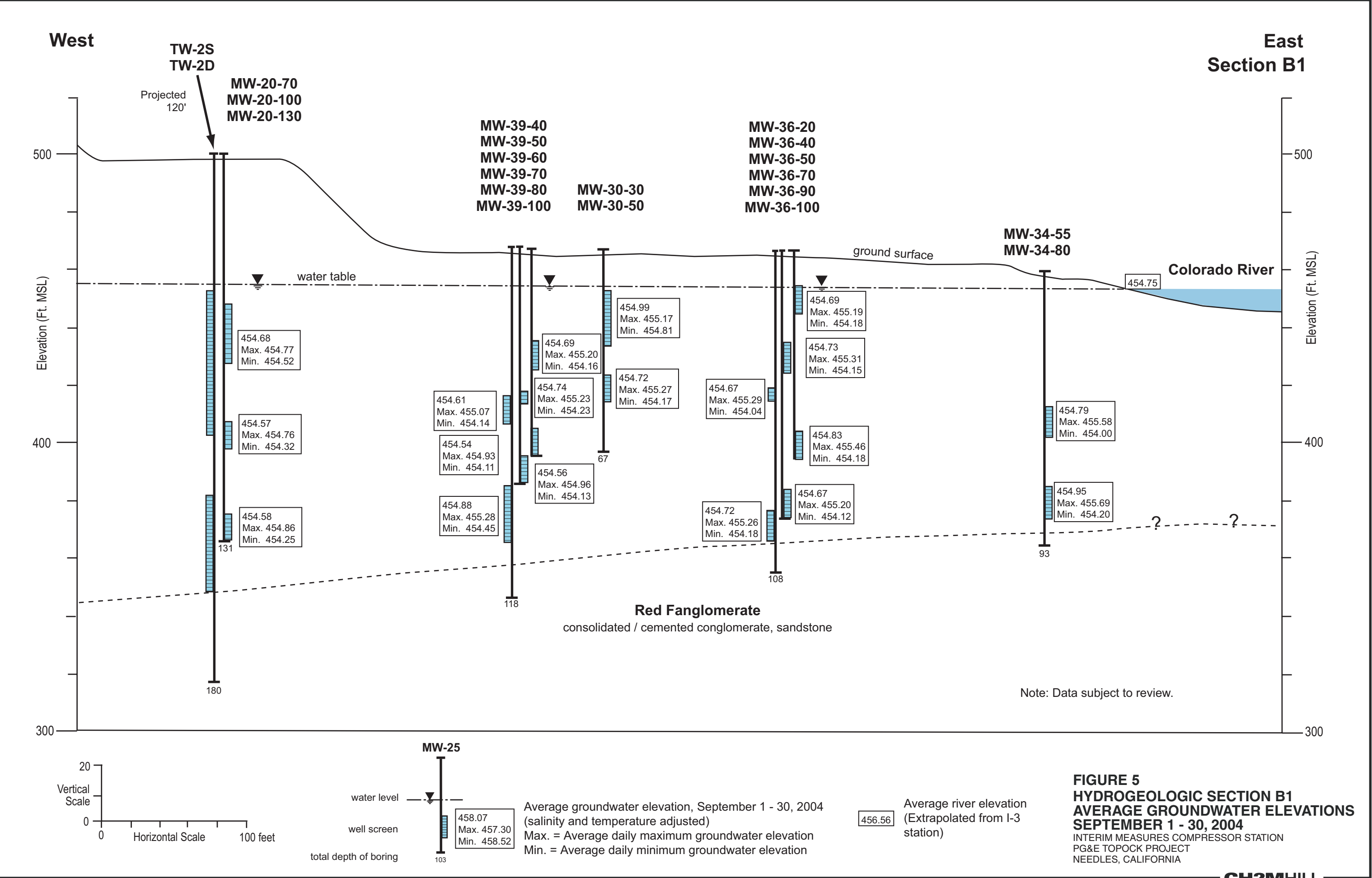
Figure 2
Average Groundwater (Middle UA) and River Elevations, September 1-30, 2004

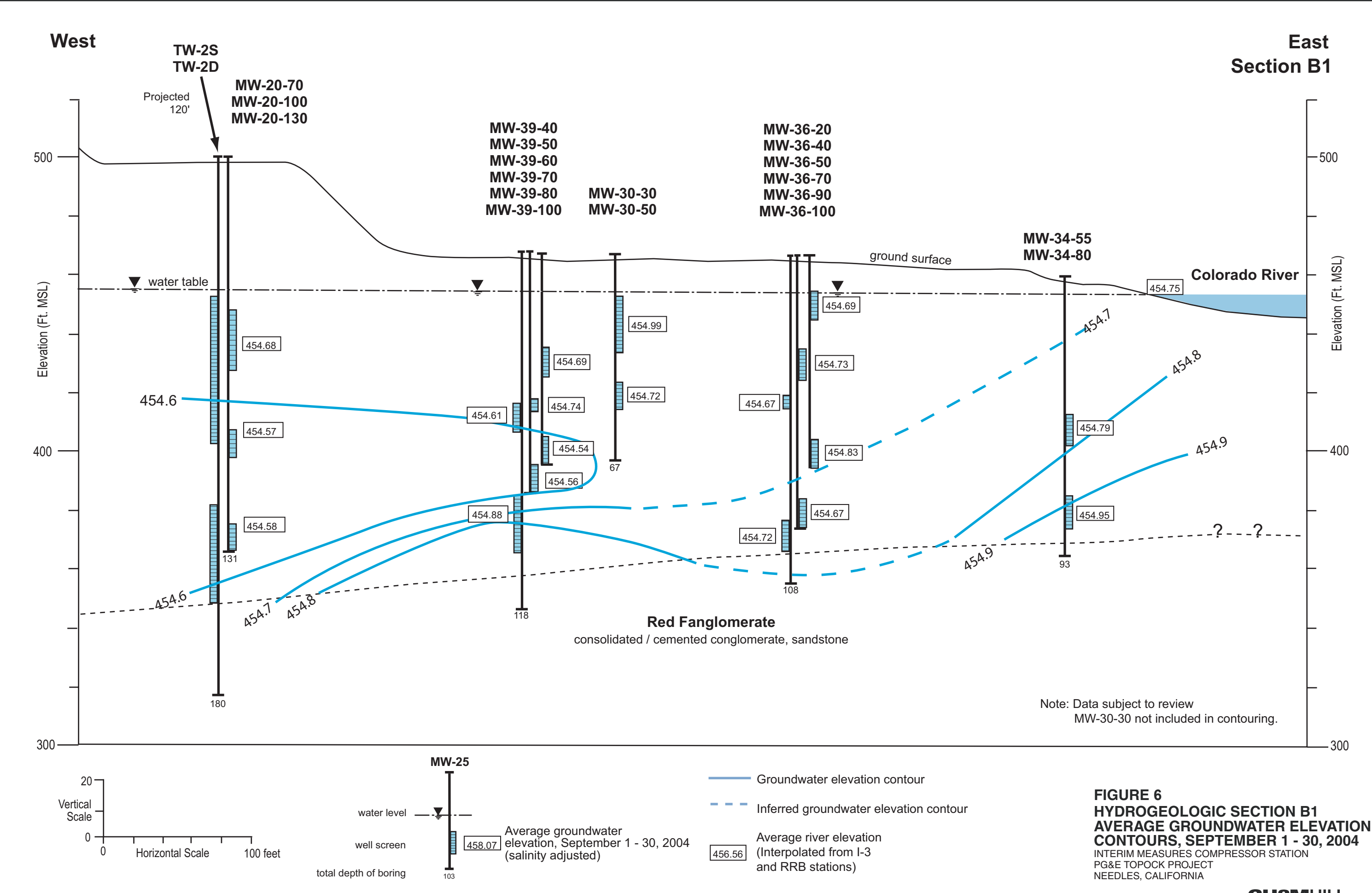
INTERIM MEASURES FIELD PROGRAM
PG&E TOPOCK COMPRESSOR STATION
NEEDLES, CALIFORNIA

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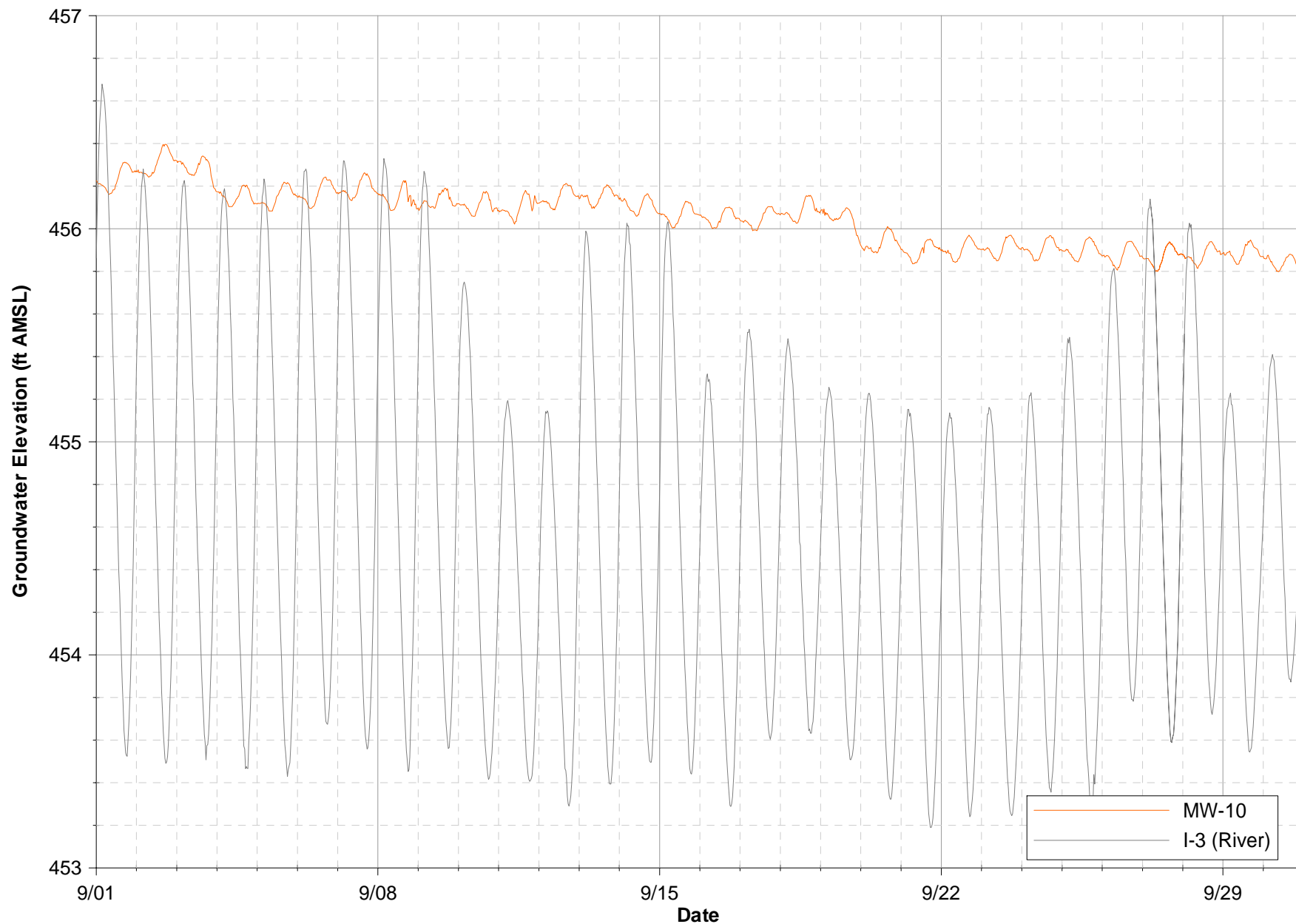






Attachment 1

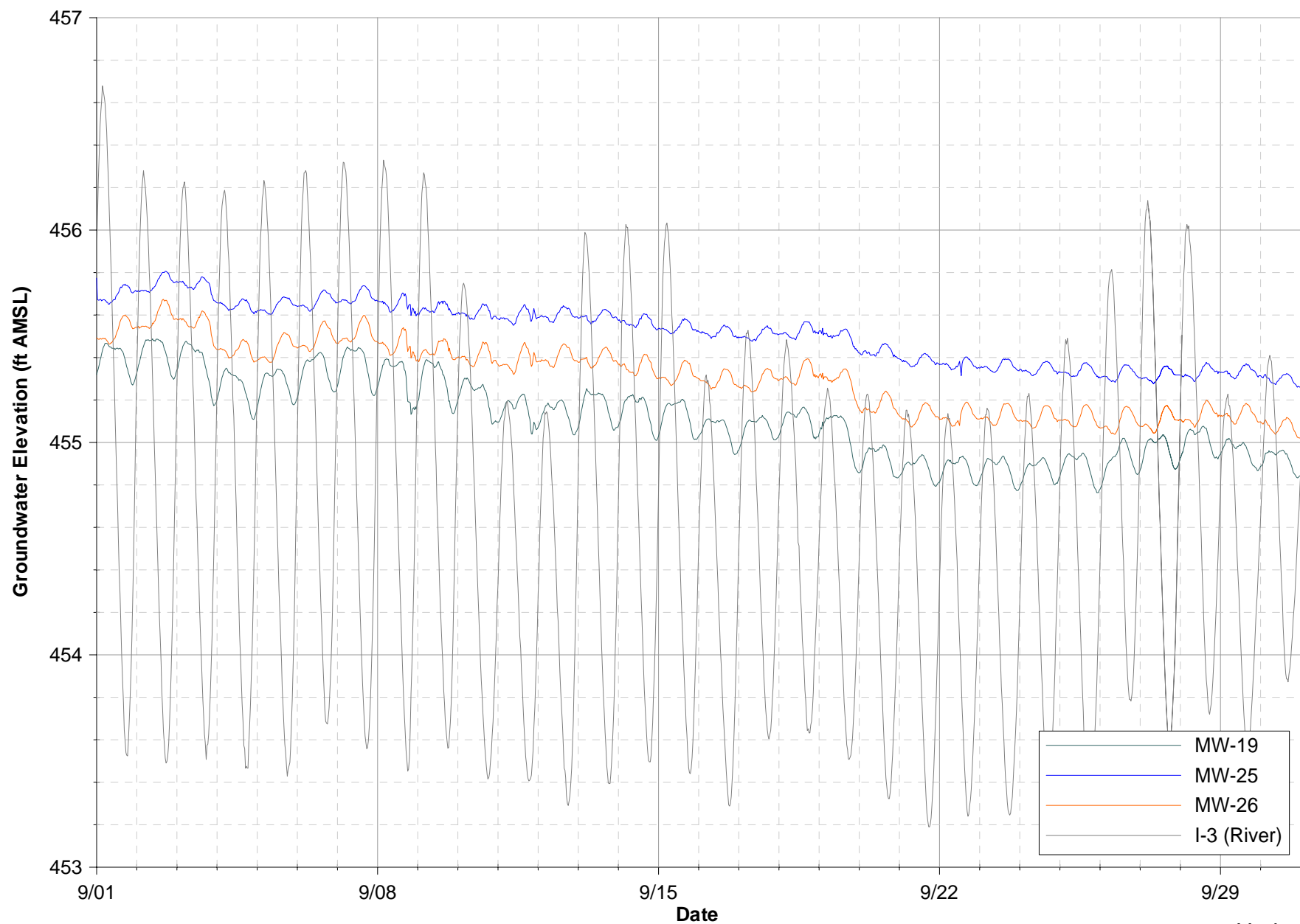
Hydrographs



Note: Data subject to review.

Hydrograph
PG&E TOPOCK COMPRESSOR STATION
NEEDLES, CALIFORNIA

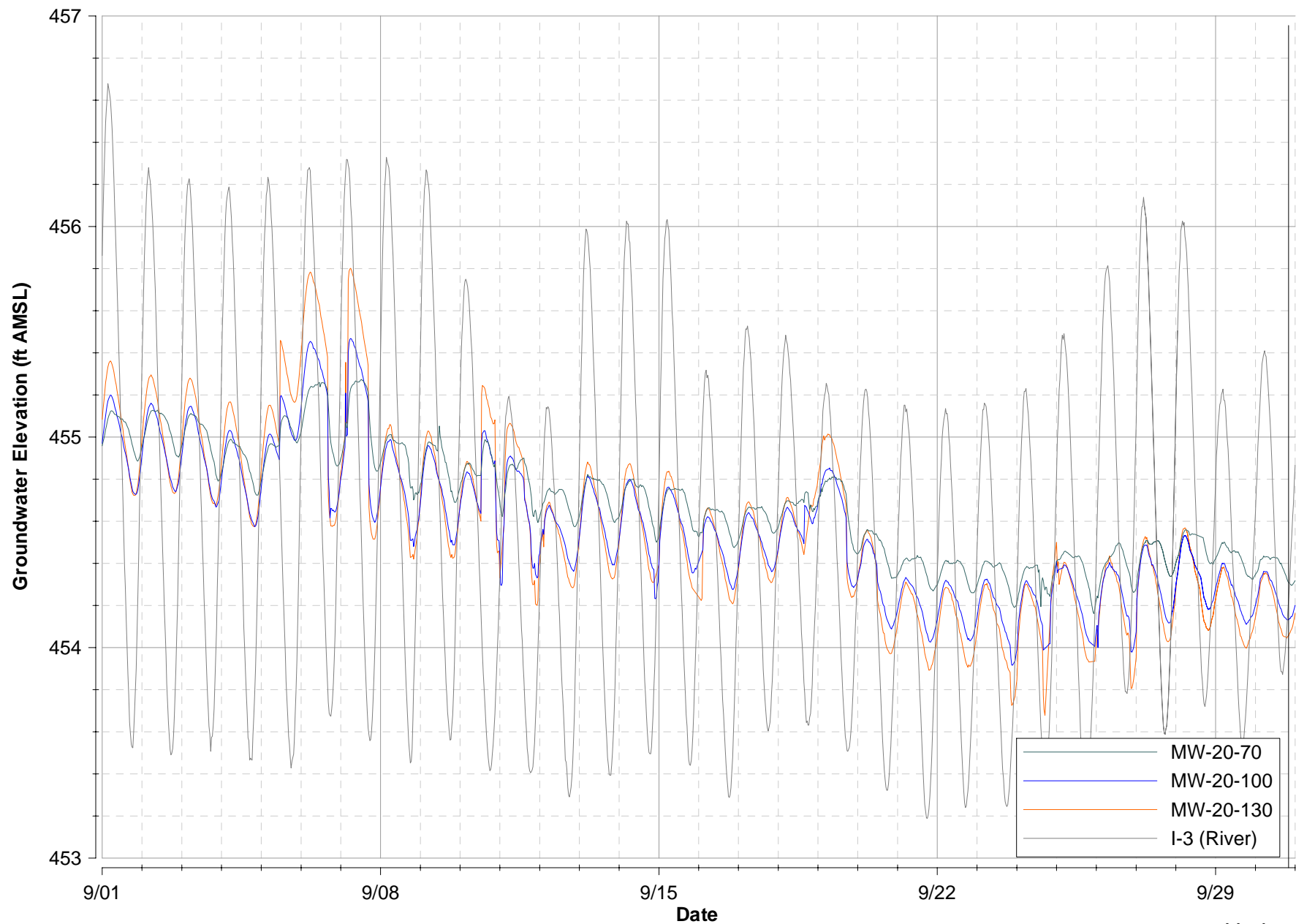
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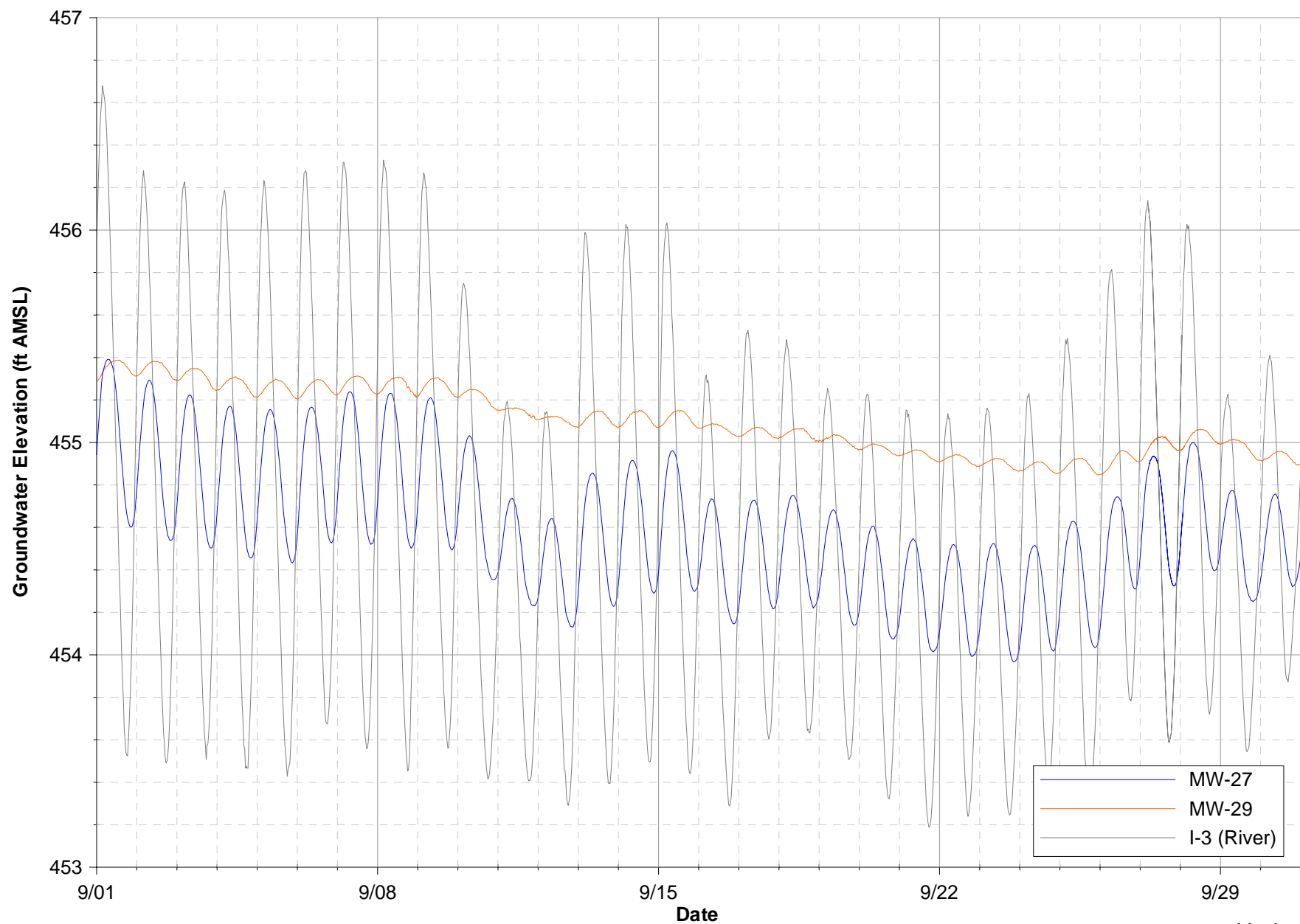
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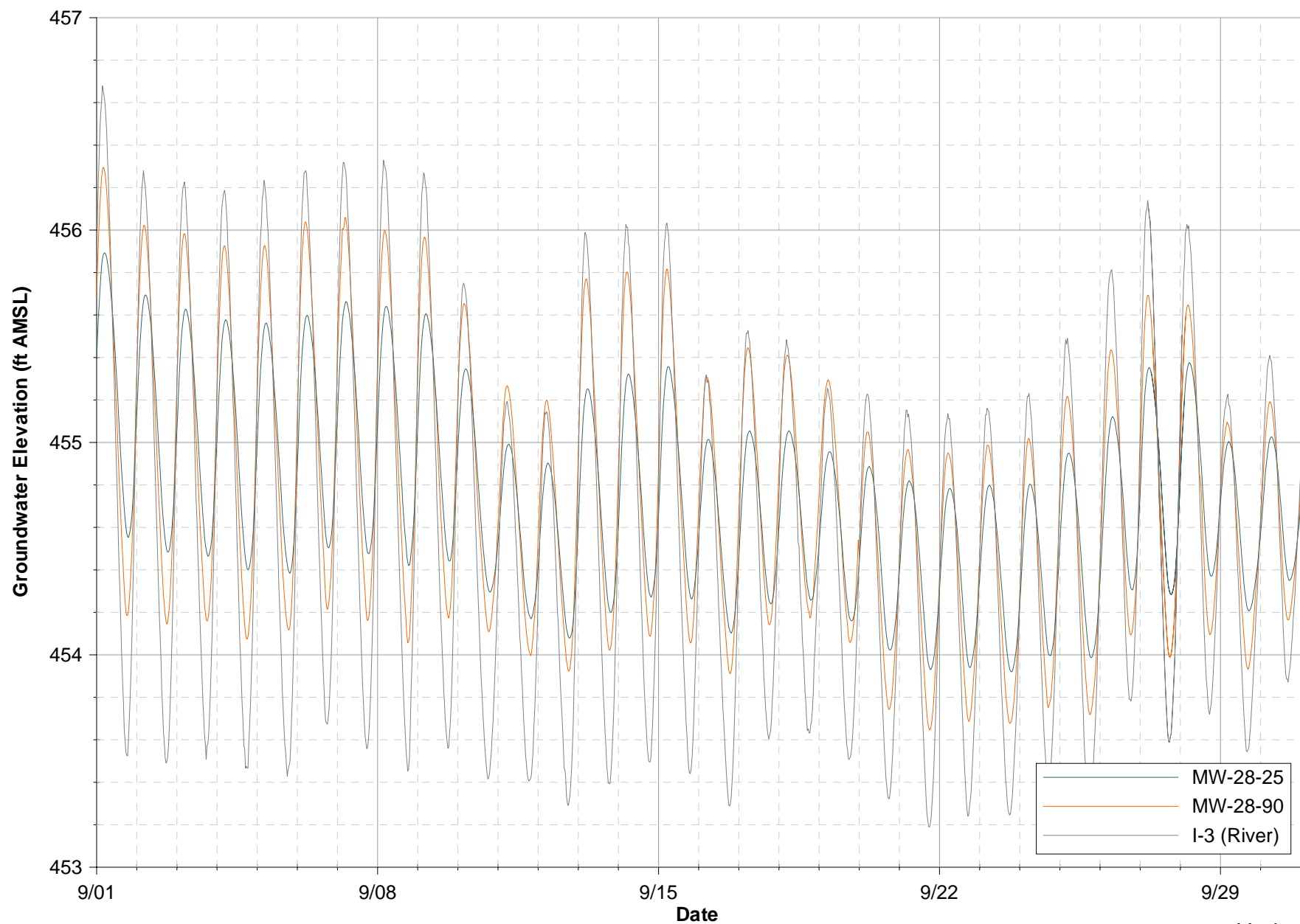
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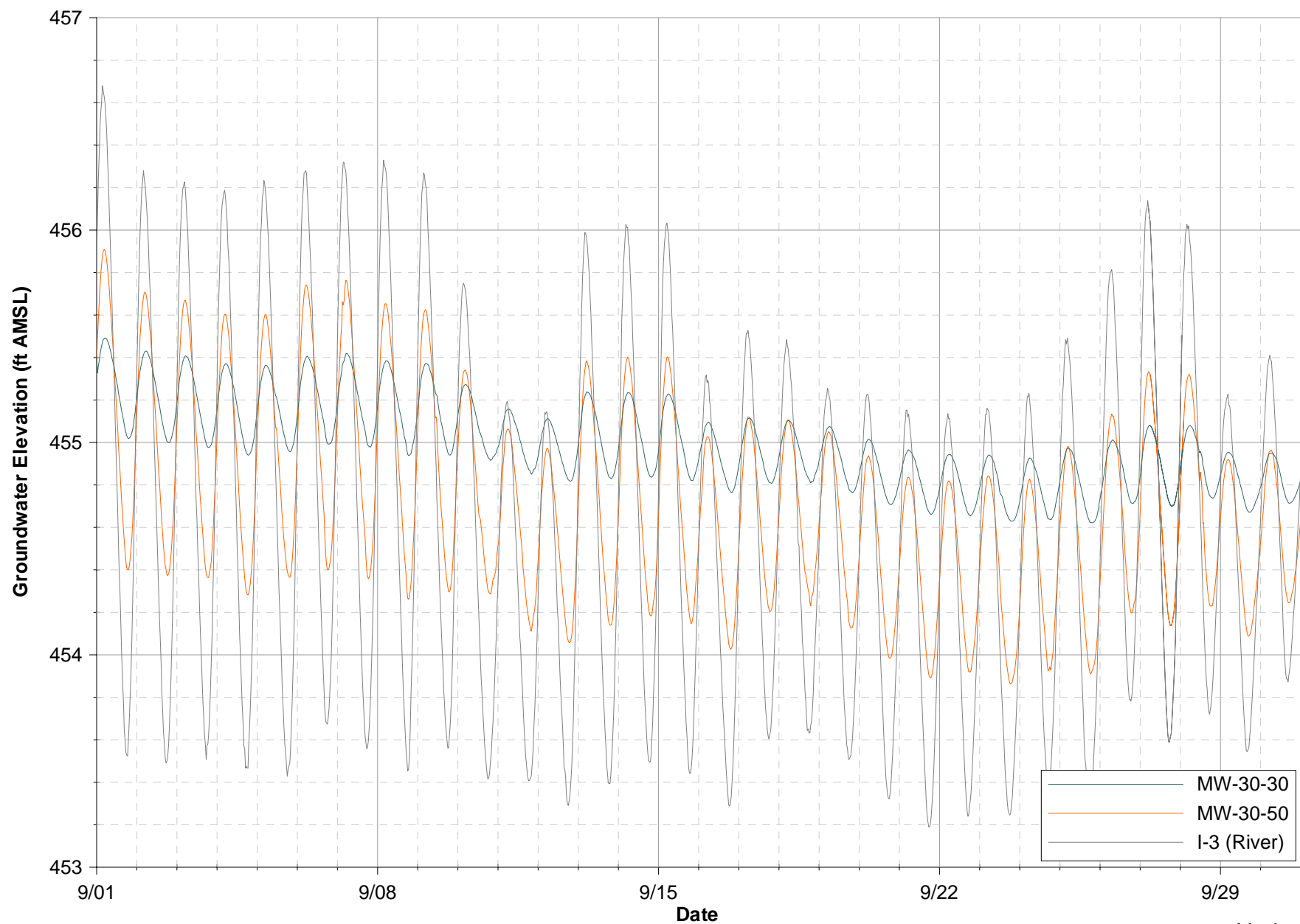
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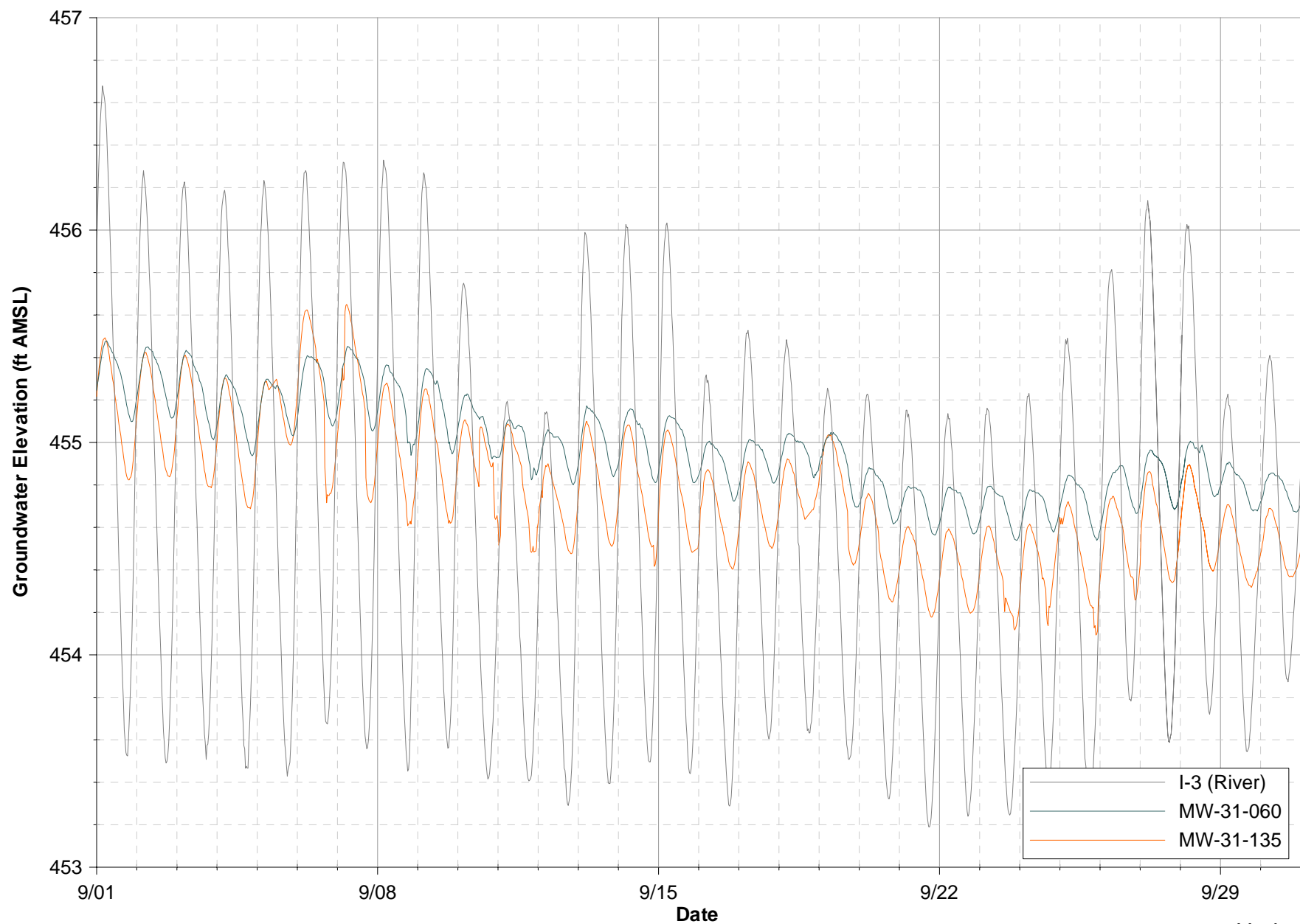
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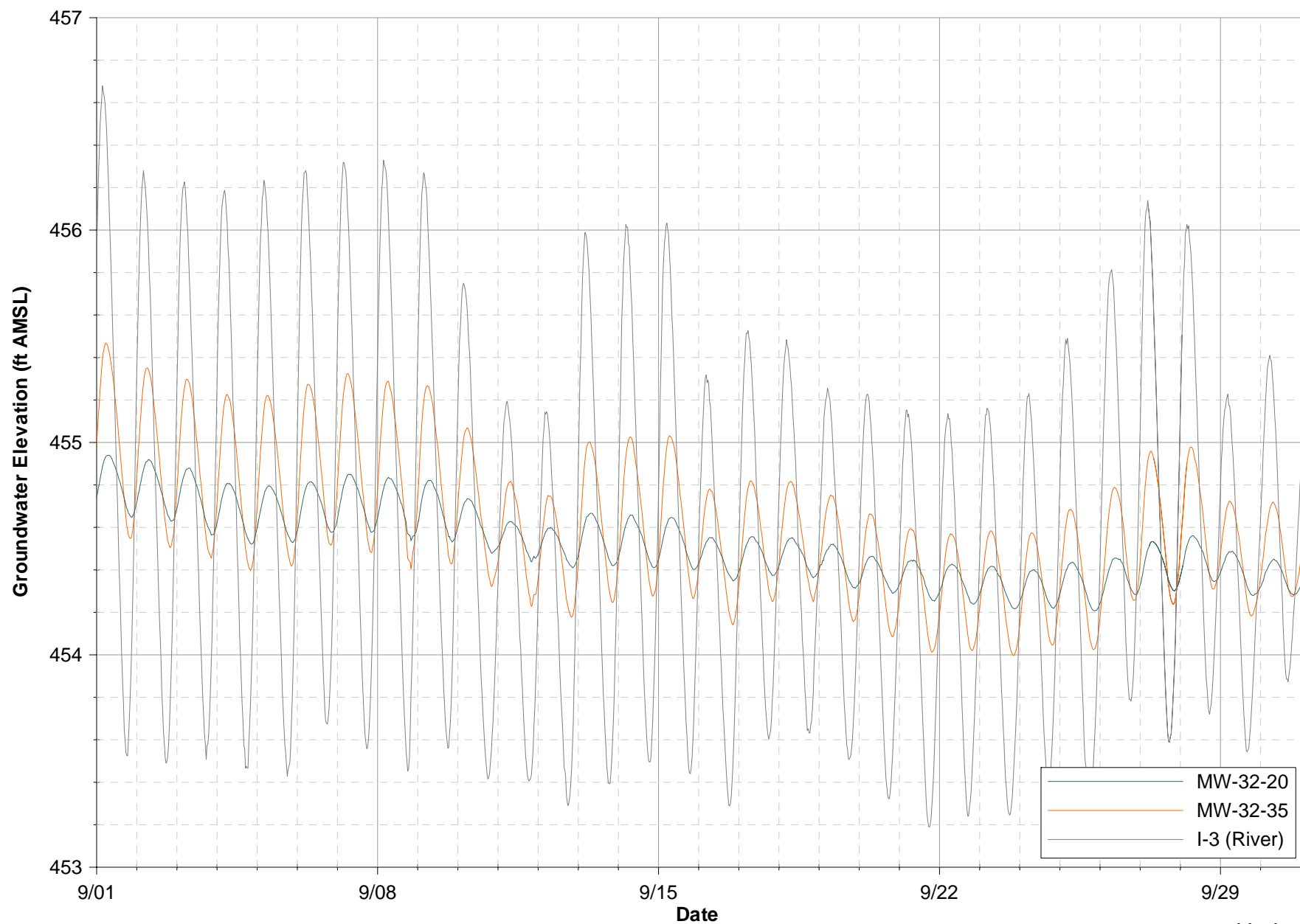
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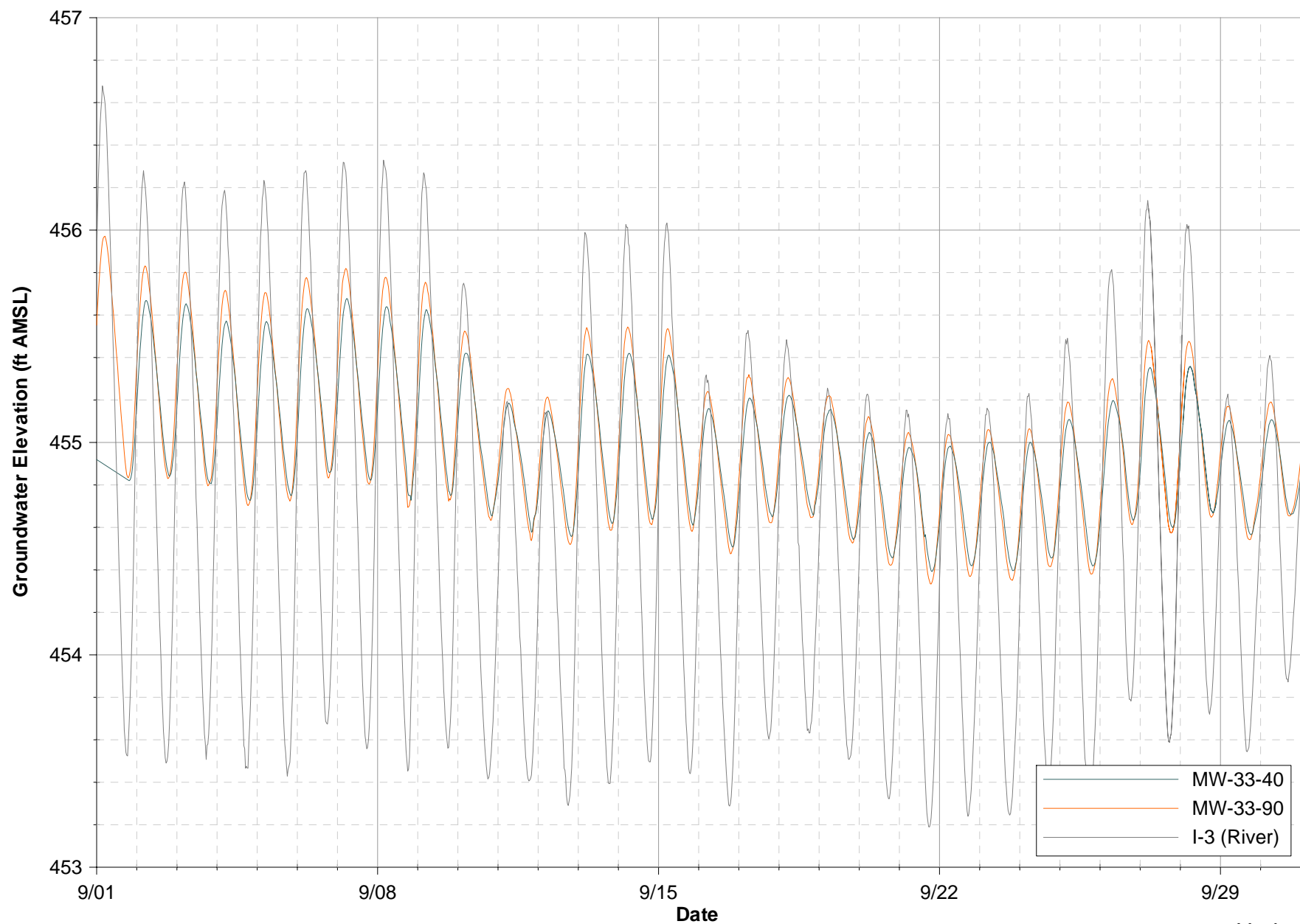
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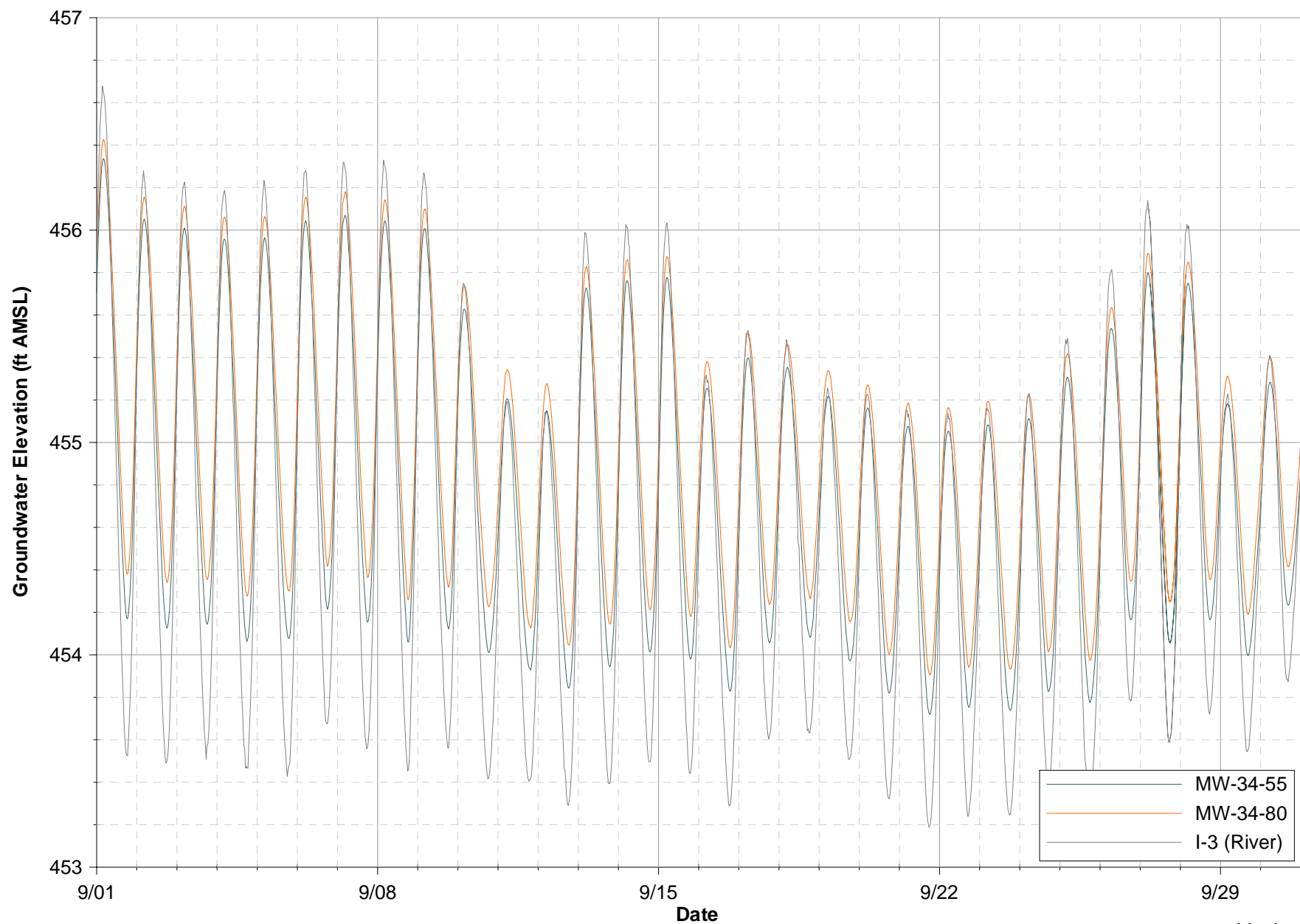
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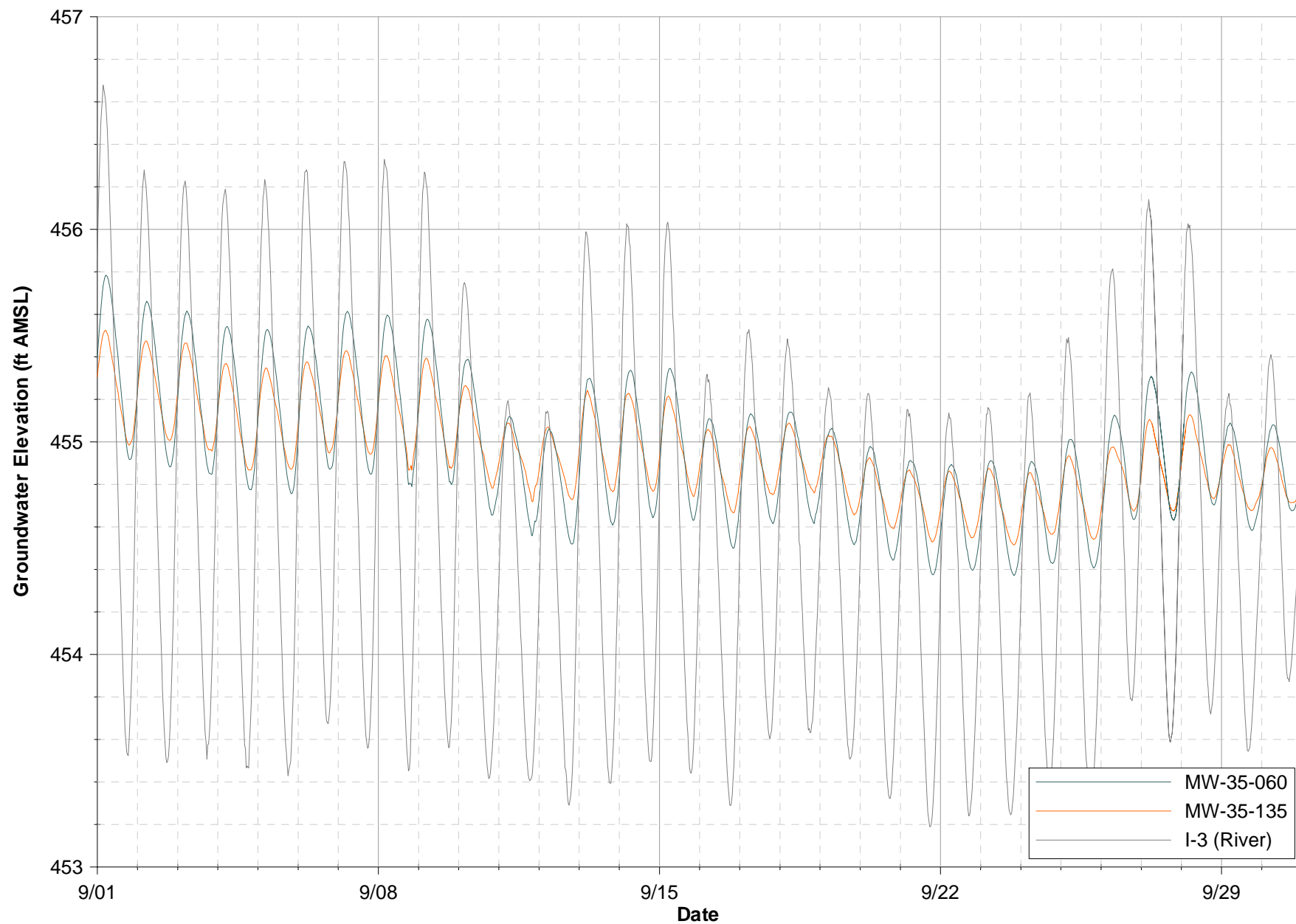
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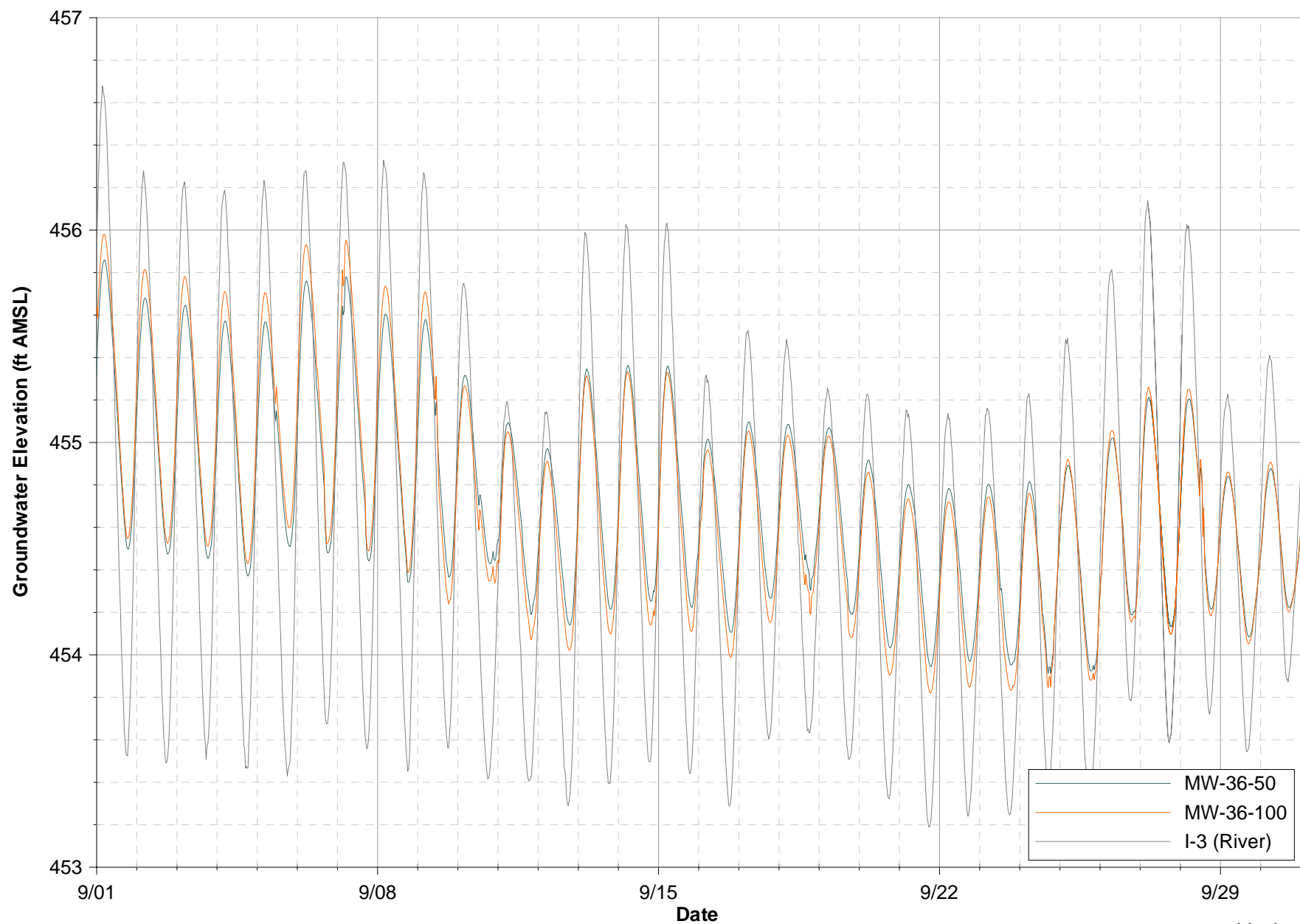
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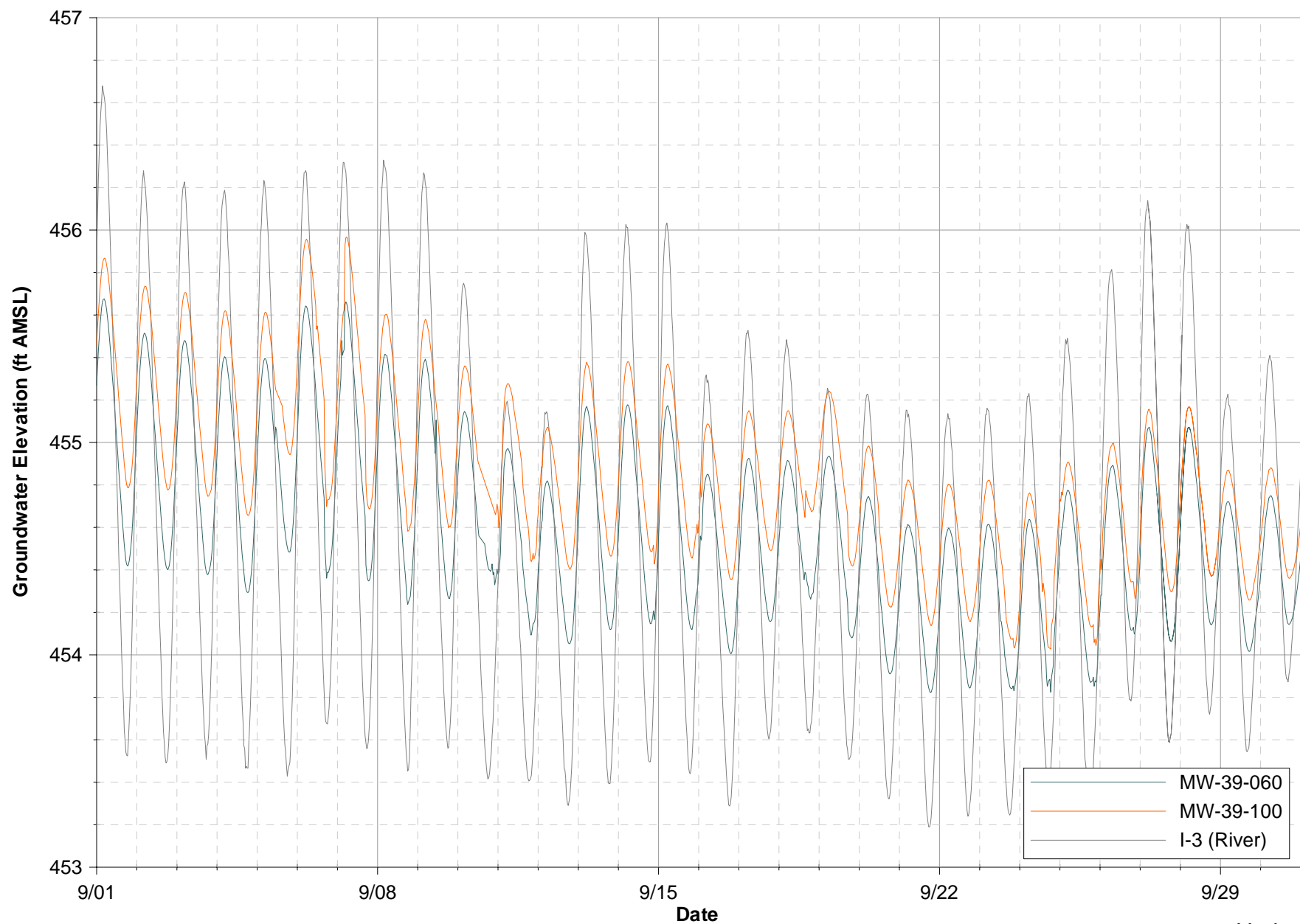
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