**ENVIRONMENTAL ACCOUNT**
**2013 WATER YEAR ANNUAL OPERATING PLAN**
**NOVEMBER 2012 - DRAFT PLAN**

## SUMMARY

This upcoming water year, the U.S. Fish and Wildlife Service plans on utilizing Environmental Account water for three high priority purposes: (1) groundwater recharge; (2) a modified short duration high flow; and (3) a spring whooping crane release. Medium priority releases have also been identified and are listed below.

## BACKGROUND

An Environmental Account (EA) of water in Lake McConaughy in Nebraska was established on October 1, 1999, as per Central Nebraska Public Power and Irrigation District (CNPPID) and Nebraska Public Power District (NPPD) (collectively, Districts) Federal Energy Regulatory Commission (FERC) licenses, for Project 1417 and Project 1835, respectively. The EA is managed by an EA Manager appointed by the U.S. Fish and Wildlife Service (Service) and was established primarily to benefit four federally listed threatened or endangered "target" species (*i.e.*, whooping crane, interior least tern, piping plover, and pallid sturgeon). The EA Manager is required to develop an Annual Operating Plan (AOP) for releases from the EA in coordination with the EA Committee (a subcommittee of the Platte River Recovery Implementation Program [PRRIP or Program]) by the end of October of each year. Guidelines and operating rules for the EA are described in the FERC licenses and in Attachment 5, *An Environmental Account for Storage Reservoirs on the Platte River System in Nebraska*, of the *Platte River Recovery Implementation Program*.

Water Year 2013 Environmental Account Release Priorities

Release priorities for the EA are based on the 1994 Service document titled: *"Instream flow recommendations for the Central Platte River, Nebraska (Instream Flow document)."* EA release priorities for water year 2013 (WY13) are listed below.

| *Date* | *Target Flow (cubic feet/sec [cfs])* | | *Purpose* | *Priority* |
|---|---|---|---|---|
| | Dry | Normal | | |
| **Nov 10-Jan 31** | - | - | Groundwater recharge | High |
| **Feb 1-Apr 30** | - | - | Short duration high flow (SDHF) | High |
| **Feb 15-Mar 15** | 2,250 | 3,350 | Channel maintenance & wet meadow recharge | Medium |
| **Mar 23-May 10** | 1,700 | 2,400 | Whooping crane | High |
| **May 11-Sept 15** | 800 | 1,200 | Terns and plovers | Medium |
| **Oct 1-Nov 15** | 1,300 | 1,800 | Whooping crane; waterfowl | Medium |

An estimate of the WY13 EA carry-over is included below.

| *Source* | *Volume (acre feet)* |
|---|---|
| WY2012 Carry-Over | 75,575[1]* |
| 10% Storable Natural Inflows (projected) | +33,700 |
| Evaporation & Seepage Loss (median 2000-2011) | -10,000* |
| Nov 1-Jan 31 (groundwater recharge) Release | -5,500[2] |
| Feb 1-Apr 30 (modified SDHF) Release | -23,000[3] |
| Mar 23-May 10 (whooping crane) Release | -71,000[4] |
| **WY13 EA Carry-Over** | **To be determined** |

*Estimated
[1]WY 2012 carryover includes 69,765 acre feet of existing EA water, 5496 acre feet from the Pathfinder account, and 314 acre feet as a result of an EA credit per the FERC license.
[2]Amount used during the 2011-2012 pilot project
[3]Amount used during the 2009 SDHF test
[4]Median for dry years (1943 to 1992); the upcoming 2013 release may be significantly below median.

Summary of Water Year 2013 Release Priorities

The high priority releases for the upcoming WY are for groundwater recharge, SDHF, and the spring whooping crane migration. If conditions are not favorable for the high priority releases, the Service will consider the medium priority releases from February 15 through March 15, May 11 through September 15, and October 1 through November 15. Information about both the high and medium priority releases is summarized below.

**November 10 to January 31 (Groundwater Recharge) Release***

*Purpose* – to provide water for the Phelps County canal recharge demonstration project. From September 28, 2011 through January 5, 2012, the successful pilot project revealed that groundwater can be efficiently recharged through the Phelps County canal during the non-irrigation season. If excess water is not available during WY13, the EA will supply water for the demonstration project. The time span for the demonstration project may be extended further into the winter than the pilot project and will be extended 3.5 miles further down the canal. An initial estimate of 5,500 acre feet (ac-ft) of EA water to be used, approximately 40-50 percent of the water should reduce program shortages to target flows at Grand Island.

*Good Neighbor Conflicts and Other Conflicts* – Upstream maintenance issues in the Keystone Canal and at the Lake McConaughy outlet will result in limited use of the EA before November 10.

If in the vicinity of the canal, groundwater levels rise to a level that may cause potential harm to neighbors, the recharge demonstration project will terminate. In addition, the project will end in time to reduce the threat of wet fields for agricultural producers.

*Details on the Groundwater Recharge Release can be found in a 26 November 2012 Memo from the PRRIP Executive Director's Office to the Service entitled "Use of Environmental Account Water for Groundwater Recharge."

Cold weather and possible icing is also a threat and may cause the recharge demonstration to be terminated as well. Frequent coordination with CNPPID and NPPD officials should reduce canal icing concerns.

*Research and Monitoring* – The following monitoring will occur for the groundwater recharge release.

1. Continuously monitor groundwater levels in six PRRIP wells, nine Tri-Basin Natural Resource District (TBNRD) wells, and eight CNPPID wells that were recently equipped with recording pressure transducers. Recent groundwater level data collected at the PRRIP monitoring wells indicate that water levels at the end of September 2012 were 1.5 to 3.4 feet lower than what was observed prior to the start of recharge operations in 2011. Similarly, water levels in the TBNRD wells at the end of September 2012 were substantially lower than what was observed at the same time in 2011 as well.
2. Analyze data on a monthly basis and distribute updated plots to the Groundwater Recharge Workgroup of the PRRIP Water Advisory Committee. The frequency of data analysis and reporting can be increased if concerns arise.
3. CNPPID will immediately communicate any concerns about adverse effects from Phelps Canal recharge operations on neighboring landowners to U.S. Fish and Wildlife Service and the ED Office.

The following triggers for termination of the release have been identified as well.

1. Potential termination of recharge operations will be discussed with the Service, CNPPID, and the Groundwater Recharge Workgroup if the groundwater levels in PRRIP monitoring wells #1 and #2 reach their initial elevations for 2011-2012 operations of 2,312.8 feet and 2,312.4 feet, respectively. These two wells are located near the lands where high groundwater was reported last year, and their groundwater levels showed a noticeable response to the pilot project recharge operations.
2. If groundwater levels in any of the PRRIP monitoring wells consistently approach their initial elevation for 2011-2012 operations, then potential termination of recharge operations to prevent waterlogged fields will be discussed with the Service, CNPPID, and the Groundwater Recharge Workgroup. Recharge operations will not be terminated because of short-term water level increases in response to precipitation events.

*Recommended Actions Prior to EA Release* – No additional actions needed prior to EA release.

**February 1 to April 30 (Modified SDHF) Release**

*Purpose* – this release should provide a peak flow of 3 to 5 days in duration at Grand Island, Nebraska and ideally, the flow magnitude should range between 5,000 and 8,000 cfs. Chokepoint challenges at North Platte limit the peak flow at Grand Island to between 3,500 and 4,000 cfs. There is a slight chance that a peak flow of 5,000 cfs may be reached if flow from the South Platte River is available.

*Good Neighbor Conflicts and Other Conflicts*- The document: "2009 Platte River Flow Routing Test: Results, Information Gleaned, Lessons Learned (Flow Routing document)" is a useful document to assist in planning. It points out many of the issues the Program may face, some of which are listed below.

Early coordination is critical in avoiding conflicts with canal operations or contractor's work. Ramp rates for the North Platte River should be coordinated with canal operators to avoid conflicts with canal operations. The flows that bypass the CNPPID diversion are likely not to exceed the 3,000 cfs threshold that would cause concern for downstream sand dams. Advance notification of release would prevent the temporary stranding of livestock during the peak flow event. The Program should have a budget in place to offset for possible damages caused by the release and to reimburse CNPPID for power interference.

The high magnitude release could reach or exceed flood stage for the North Platte River at the North Platte gage if proper planning is not done in order to minimize effects of sudden rain events.. In addition, this release will not be made if there is a presence of ice on the river that may result in ice jamming and subsequent flooding.

*Research and Monitoring* – Existing PRRIP monitoring will be used to monitor the SDHF event. <*coordinate with TAC for additional monitoring details*>

*Recommended Actions Prior to EA Release* – A SDHF Committee should be formed to develop an action plan. The action plan should be developed, in part, by utilizing the 2009 Flow Routing document. The action plan should identify operational logistics such as ramp rates for the North Platte River, the quantities and magnitudes of water that would bypass the CNPPID diversion, and quantities and release rates of re-regulated water in Johnson Reservoir etc.. The action plan should also project EA conveyance at selected sites that would allow for verification with measured data. For the 2009 Flow Routing Test, EA conveyance was projected in an Excel spreadsheet using best professional judgment. The Service will encourage the development and application of new tools that could improve the prediction of EA conveyance for the SDHF event.

To avoid good neighbor conflicts, the action plan should identify the river stage at North Platte that is not to be exceeded as well as identify contingency plans in case of a rain event. Coordination with landowners, canal operators, county emergency officials, and the National Weather Service should occur in advance of the release.

**February 15 to March 15 (Channel Maintenance/Wet Meadow Recharge) Release**

*Purpose* - Referencing the Service's 1994 Instream Flow document, the February 15 to March 15 EA release is based on the Service priorities of: a) maintaining channel habitats for target bird species; and b) recharge of wet meadows.

*Good Neighbor Conflicts and Other Conflicts* - The release would not require bypass at the CNPPID diversion. Flow releases would maintain ramp rates at safe levels for the Keystone Canal and the North Platte River. The priority release would not require the retiming of water at Lake Maloney, Jeffrey Reservoir, or Johnson Lake.

The release has the potential to impact canal operators along the upper reaches of the central Platte River. In addition, this release will not be made if there is a presence of ice on the river that may result in ice jamming and subsequent flooding.

*Research and Monitoring* – <*coordinate with TAC for monitoring details*>

*Recommended Actions Prior to EA Release* – An EA Committee should be formed to develop an action plan for this release. The action plan should identify operational logistics such as ramp rates for the North Platte River and ice conditions that would terminate the release. The action plan should also project EA conveyance at selected sites that would allow for verification with measured data. Coordination with landowners, canal operators, county emergency officials, and the National Weather Service should occur in advance of the release.

**March 23 to May 10 (Whooping Crane) Release**

*Purpose* – A flow of 1,700 cfs (under a dry year type), is intended to maintain weighted usable area above a critical threshold. Flows below 1,700 cfs would result in significant reductions in weighted usable area. A flow of 2,400 cfs is expected to optimize in-channel habitat for the whooping crane under a normal year type.

*Good Neighbor Conflicts and Other Conflicts* - The priority release would not require bypass at the CNPPID diversion. Flow releases would maintain ramp rates at safe levels for the Keystone Canal and the North Platte River. The release would not require the retiming of water at Lake Maloney, Jeffrey Reservoir, or Johnson Lake.

*Research and Monitoring* – <*coordinate with TAC for monitoring details*>

*Recommended Actions Prior to EA Release* – No additional actions needed prior to EA release.

**May 11 to September 15 (Tern and Plover) Release**

*Purpose* - During a dry type year, maintenance of 800 cfs would reduce significant declines in fish habitat and reduce the probability of fish kills. The target flow of 1,200 cfs under normal year types is required for the least tern and piping plover nesting season to maintain an adequate forage base and to provide nesting birds with some security from terrestrial predators and other disturbances.

*Good Neighbor Conflicts and Other Conflicts* - The release would not require bypass at the CNPPID diversion. Flow releases would maintain ramp rates at safe levels for the Keystone Canal and the North Platte River. The priority release would not require the retiming of water at Lake Maloney, Jeffrey Reservoir, or Johnson Lake.

*Research and Monitoring* – <*coordinate with TAC for monitoring details*>

*Recommended Actions Prior to EA Release* – No additional actions needed prior to EA release.

DRAFT

**October 1 to November 15 (Whooping Crane) Release**

*Purpose* - A flow of 1,300 cfs, under a dry year type, is intended to maintain wetted channel widths above a critical threshold. Flows below 1,300 cfs would result in significant reductions in wetted widths, which reduces habitat suitability. A flow of 1,800 cfs is expected to maintain in-channel habitat for the whooping crane under a normal year type below which there is steep declines in weighted usable area.

*Good Neighbor Conflicts and Other Conflicts* - The release would not require bypass at the CNPPID diversion. Flow releases would maintain ramp rates at safe levels for the Keystone Canal and the North Platte River. The release would not require the retiming of water at Lake Maloney, Jeffrey Reservoir, or Johnson Lake.

*Research and Monitoring* – <*coordinate with TAC for monitoring details*>

*Recommended Actions Prior to EA Release* – No additional actions needed prior to EA release.

DRAFT

**TO:** U.S. FISH AND WILDLIFE SERVICE

**FROM:** PRRIP EXECUTIVE DIRECTOR'S OFFICE

**SUBJECT:** USE OF ENVIRONMENTAL ACCOUNT WATER FOR GROUNDWATER RECHARGE

Groundwater recharge was classified as a "high" priority in the Draft Environmental Account (EA) 2013 Water Year Annual Operating Plan (AOP) dated November 6, 2012. If excesses to target flows are not available during the 2012-2013 non-irrigation season, then EA releases may be the only source of water available for the Phelps Canal recharge project. The Draft AOP lists the potential EA groundwater recharge operating period as November 10, 2012 to January 31, 2013; however, the start date is contingent on receiving approval from Nebraska Department of Natural Resources (NDNR) and maintenance activities on the Keystone Canal and Lake McConaughy outlet being completed. Recharge operations may continue past January 31, 2013 if water is available and physical conditions permit, so it is recommended that the operating period listed in the Draft AOP be extended through March 2013. The Draft AOP estimates that up to 5,500 acre-feet (ac-ft) of EA water may be released for Platte River Recovery Implementation Program (PRRIP) groundwater recharge purposes; however, the application that was submitted to NDNR by Central Nebraska Public Power and Irrigation District (CNPPID) requests approval for the release of up to 6,000 ac-ft for recharge purposes.

As outlined in the Draft AOP, recharge operations in the Phelps Canal will be terminated if groundwater levels rise to an elevation that may cause potential harm to neighboring landowners. Additionally, the project must end in time to reduce the threat of waterlogged fields for agricultural producers. The Draft 2013 AOP requires that groundwater levels and project end dates be identified to serve as thresholds for triggering project termination in accordance with U.S. Fish and Wildlife's Good Neighbor policy.

The Phelps Canal pilot groundwater recharge operations commenced on September 28, 2011 and were terminated on January 5, 2012 to allow for the monitoring of receding water levels prior to the start of the irrigation season. High groundwater levels were not reported by neighboring landowners until after the start of the 2011 pilot recharge operations, which indicates that initial water level elevations from September 2011 would provide conservative project termination triggers for the proposed 2012-2013 recharge operations.

Plots of the groundwater level data collected at the six PRRIP monitoring wells that were installed for the Phelps Canal pilot testing project are provided in **Appendix A**. The 99 days of recharge operations in 2011-2012 caused groundwater levels to increase by 0.1 to 2.6 feet, and groundwater levels receded to pre-recharge conditions approximately 2 to 4 months after operations were suspended (Appendix A).

More recent groundwater level data collected at the PRRIP monitoring wells indicate that water levels at the end of September 2012 were 1.5 to 3.4 feet lower than what was observed prior to the start of recharge operations in 2011. This suggests that if 2012-2013 recharge operations produce a water level response

comparable to what was observed during the 2011-2012 pilot testing, then the maximum water level elevations will remain below the initial conditions for the 2011-2012 operations.

Historical groundwater level data have also been compiled and reviewed for nine monitoring wells in the vicinity of the Phelps Canal that are maintained by Tri-Basin Natural Resources District (TBNRD). As with the PRRIP monitoring wells, water levels in the TBNRD wells at the end of September 2012 were substantially lower than what was observed at the same time in 2011 (Appendix A).

The recent groundwater data indicate that 2012-2013 recharge operations are unlikely to elevate groundwater levels to a point that will lead to negative landowner impacts. In the interest of good neighbor relations, the following monitoring plan and project termination triggers are proposed for the Phelps Canal recharge operations:

Monitoring Plan

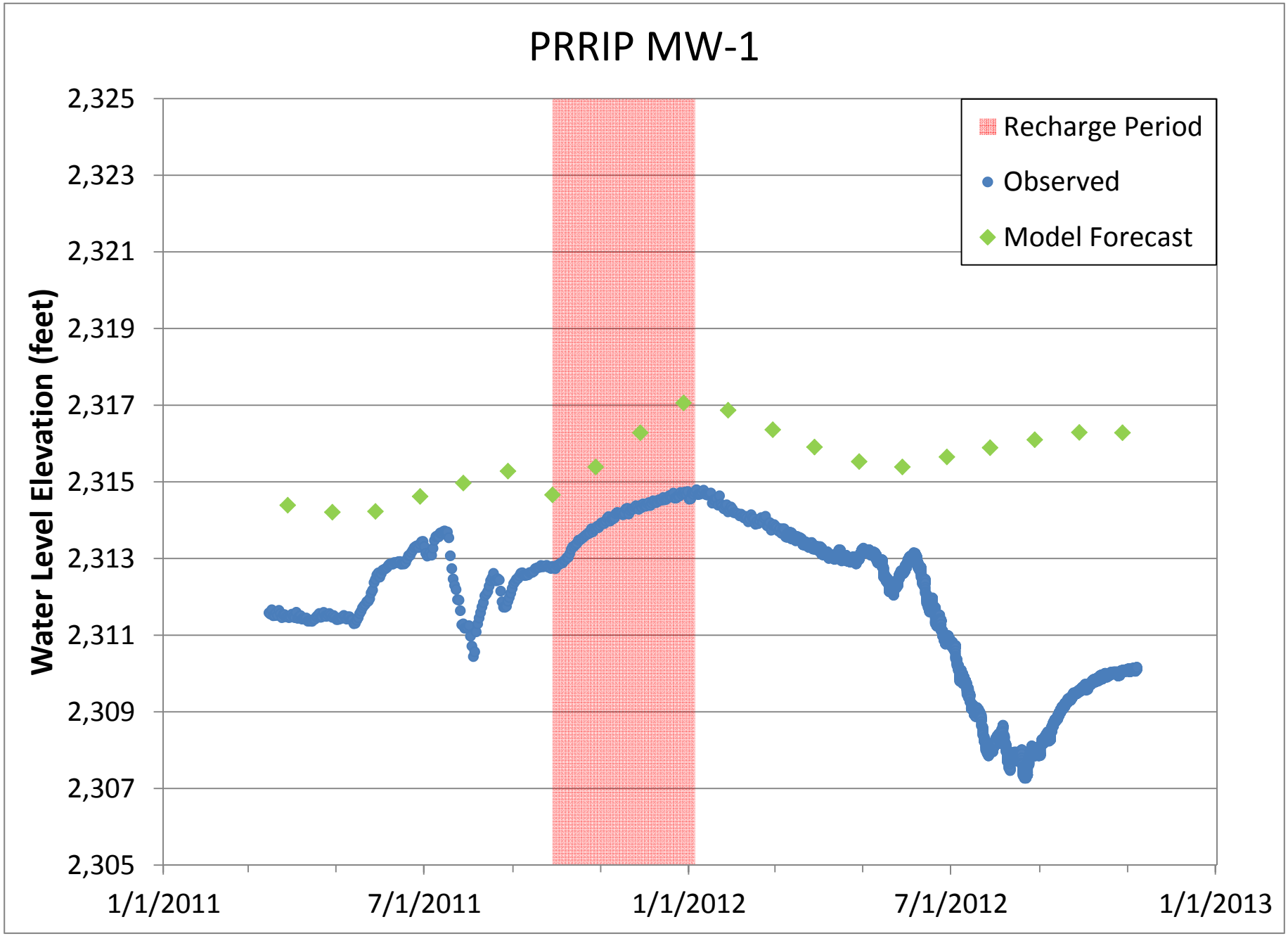
1. Continuously monitor groundwater levels in six PRRIP wells, nine TBNRD wells, and eight CNPPID wells that were recently equipped with recording pressure transducers (see **Figure 1** for locations).
2. Analyze data on a monthly basis and distribute updated plots to the Groundwater Recharge Workgroup of the PRRIP Water Advisory Committee. The frequency of data analysis and reporting can be increased if concerns arise.
3. CNPPID will immediately communicate any concerns about adverse effects from Phelps Canal recharge operations on neighboring landowners to U.S. Fish and Wildlife Service and the ED Office.

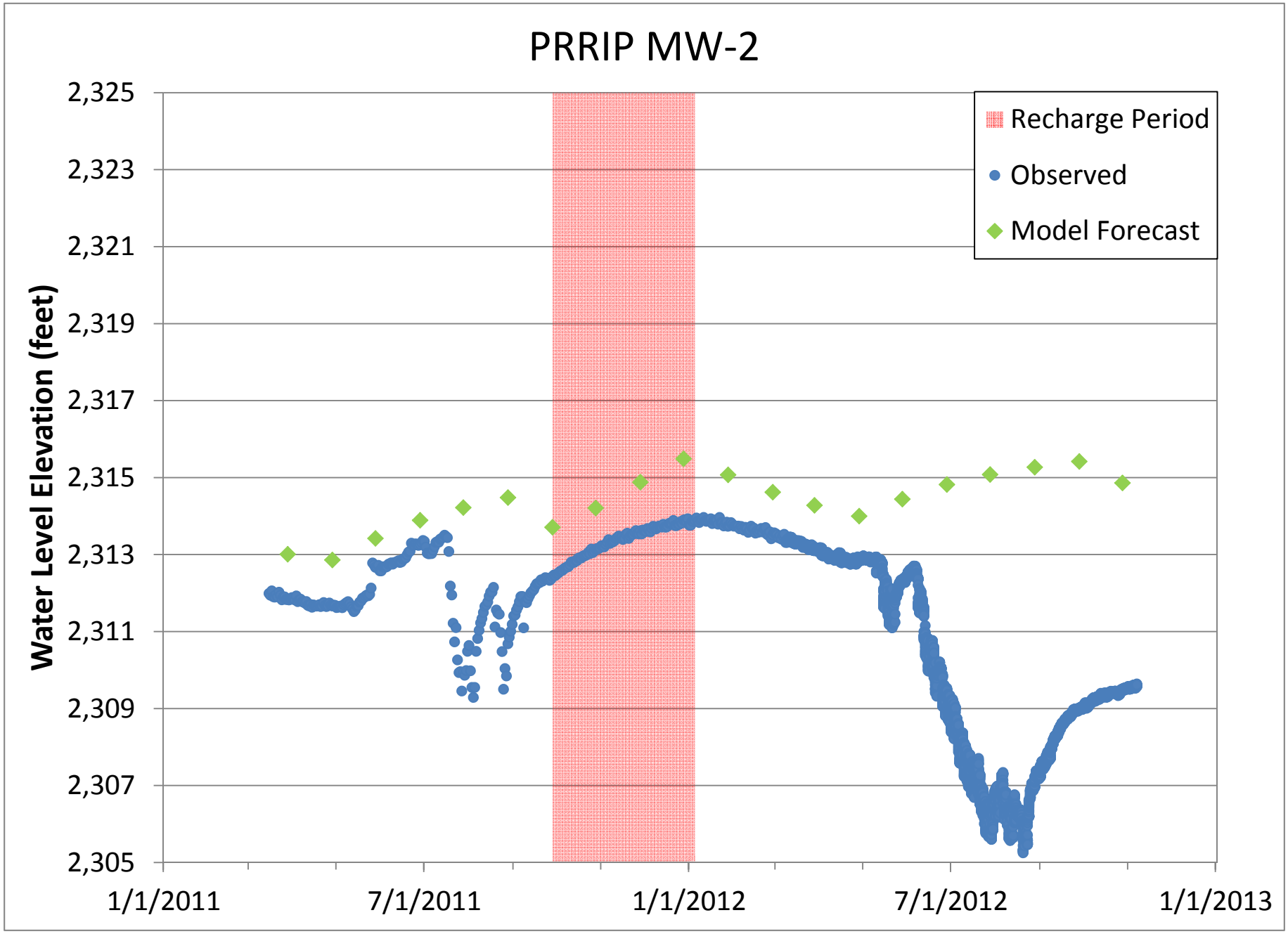
Project Termination Triggers

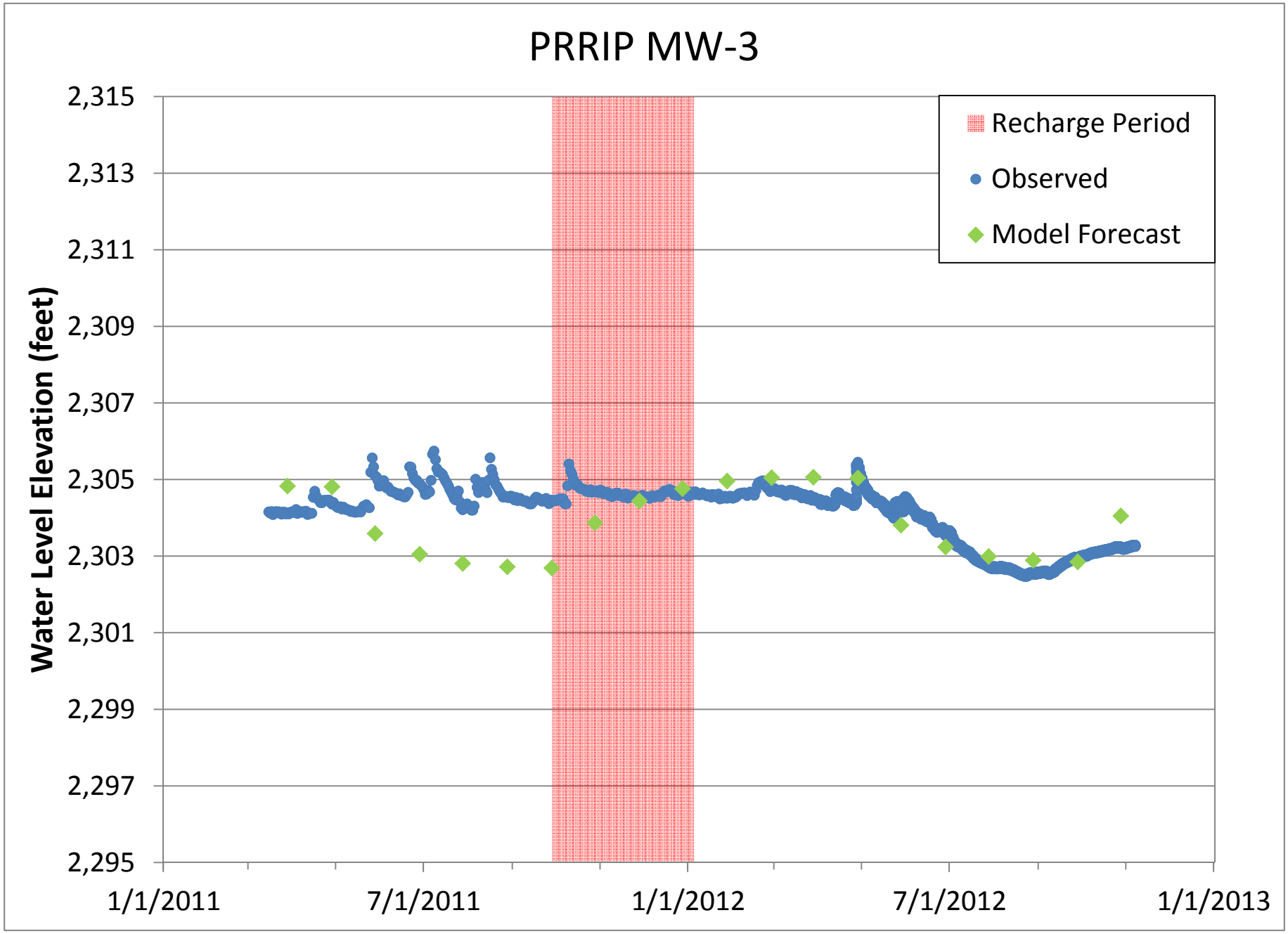
1. Potential termination of recharge operations will be discussed with U.S. Fish and Wildlife, CNPPID, and the Groundwater Recharge Workgroup if the groundwater levels in PRRIP monitoring wells #1 and #2 reach their initial elevations for 2011-2012 operations of 2,312.8 feet and 2,312.4 feet, respectively. These two wells are located near the lands where high groundwater was reported last year, and their groundwater levels showed a noticeable response to the pilot project recharge operations.
2. If groundwater levels in any of the PRRIP monitoring wells consistently approach their initial elevation for 2011-2012 operations, then potential termination of recharge operations to prevent waterlogged fields will be discussed with U.S. Fish and Wildlife, CNPPID, and the Groundwater Recharge Workgroup. Recharge operations will not be terminated because of short-term water level increases in response to precipitation events.

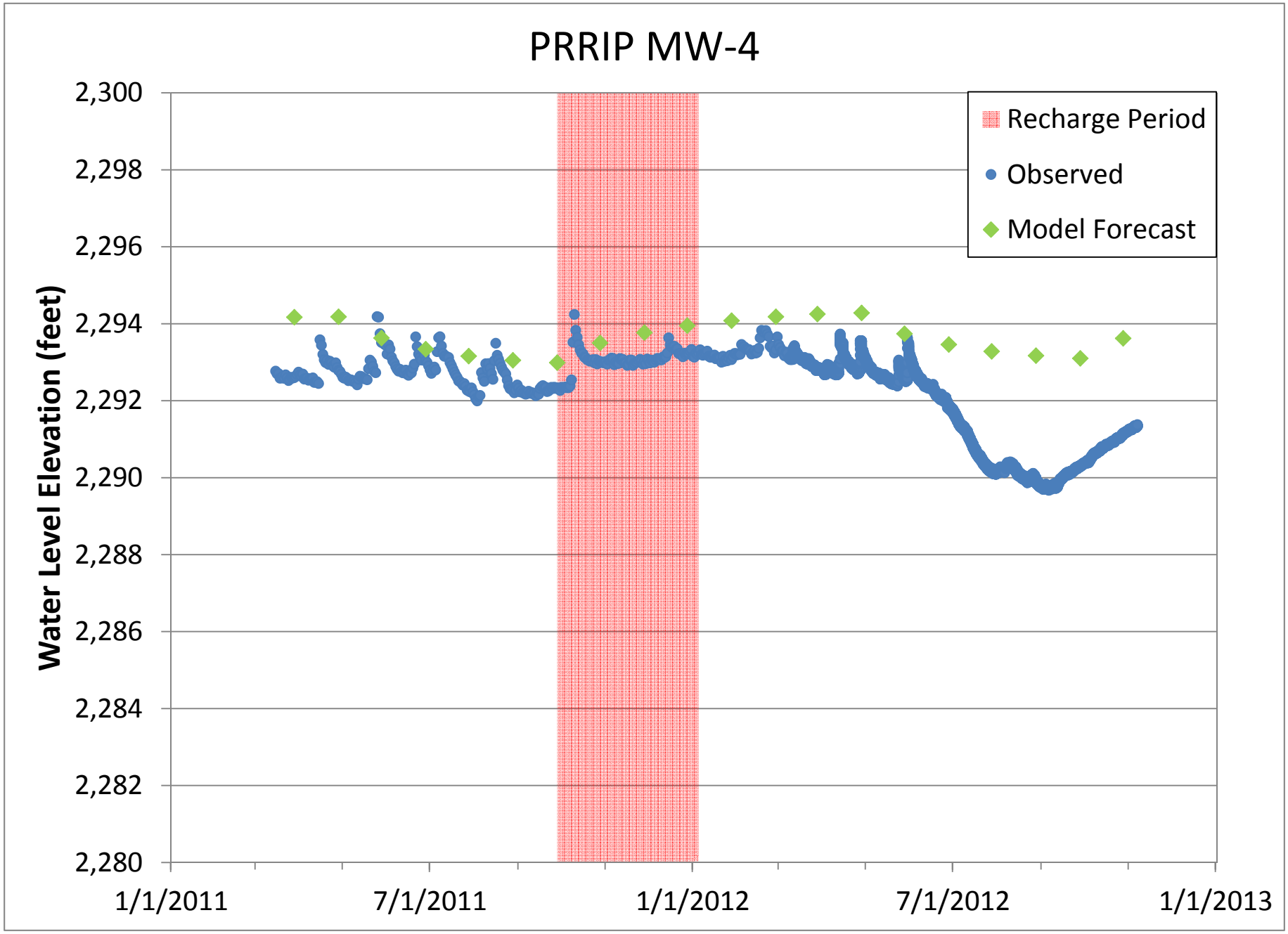
Please contact Jerry Kenny or Beorn Courtney if you need any additional information.

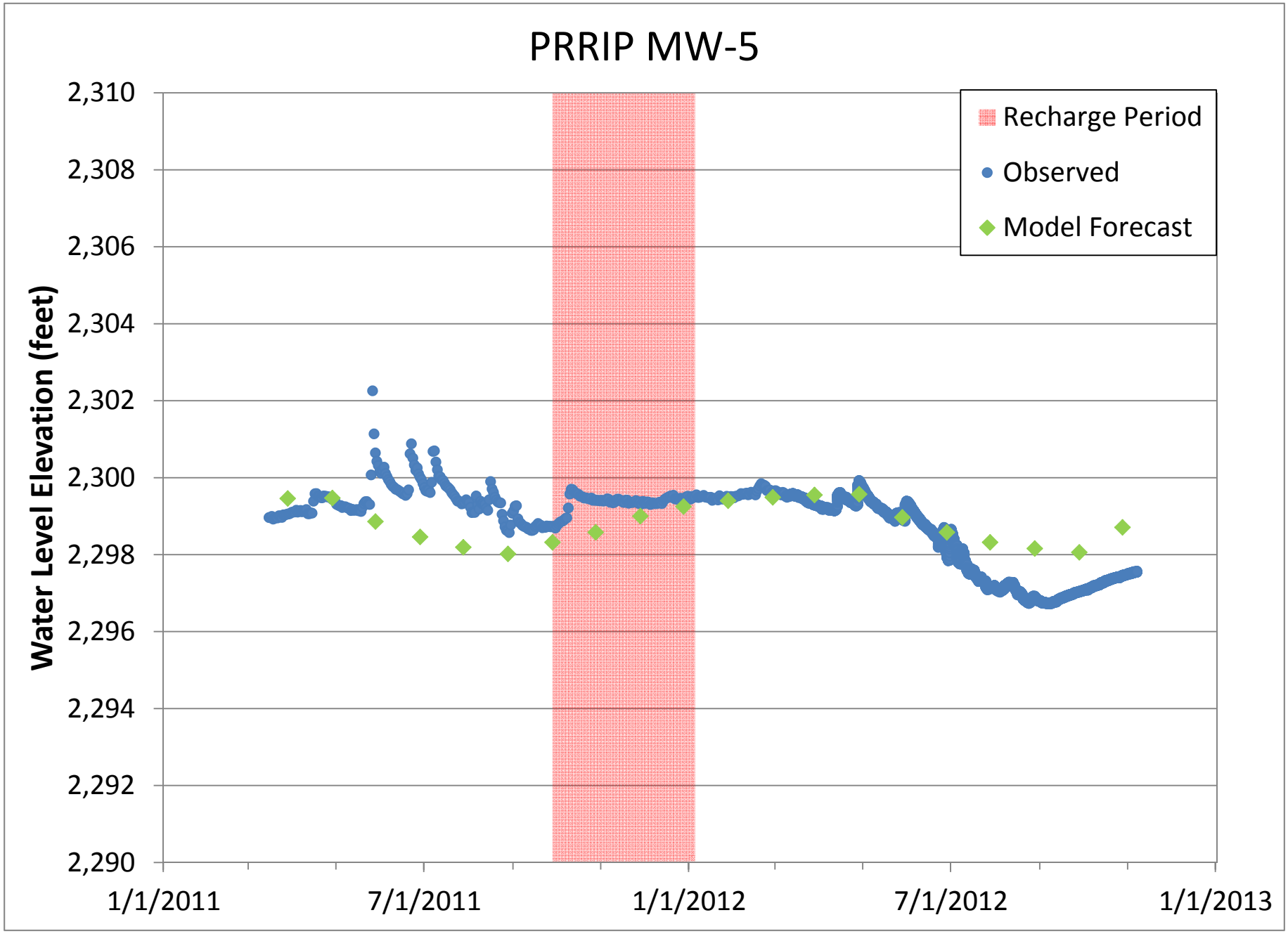
# Appendix A

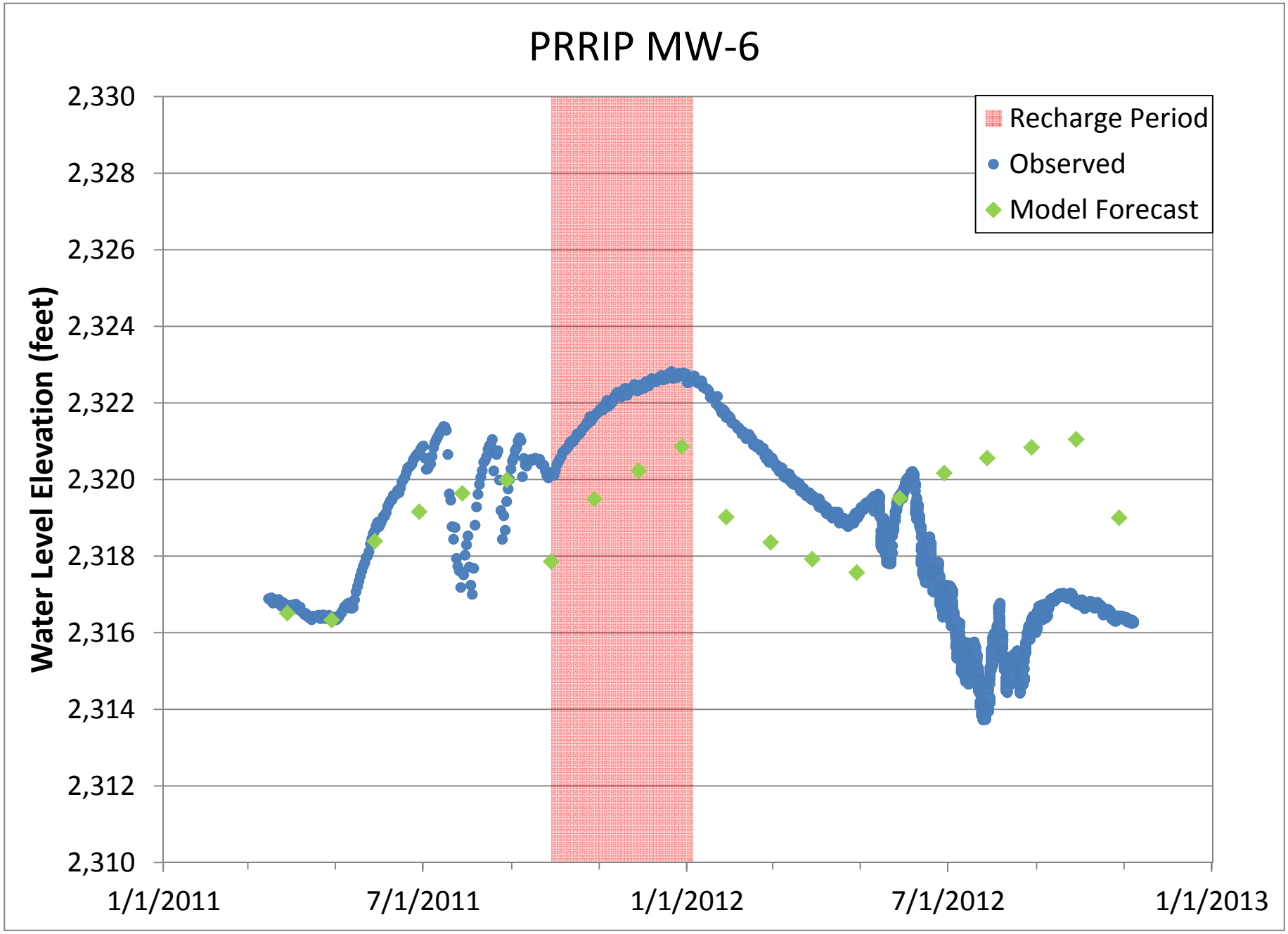

PRRIP MW-1
Water Level Elevation (feet)
2,325
2,323
2,321
2,319
2,317
2,315
2,313
2,311
2,309
2,307
2,305
1/1/2011
7/1/2011
1/1/2012
7/1/2012
1/1/2013
Recharge Period
Observed
Model Forecast

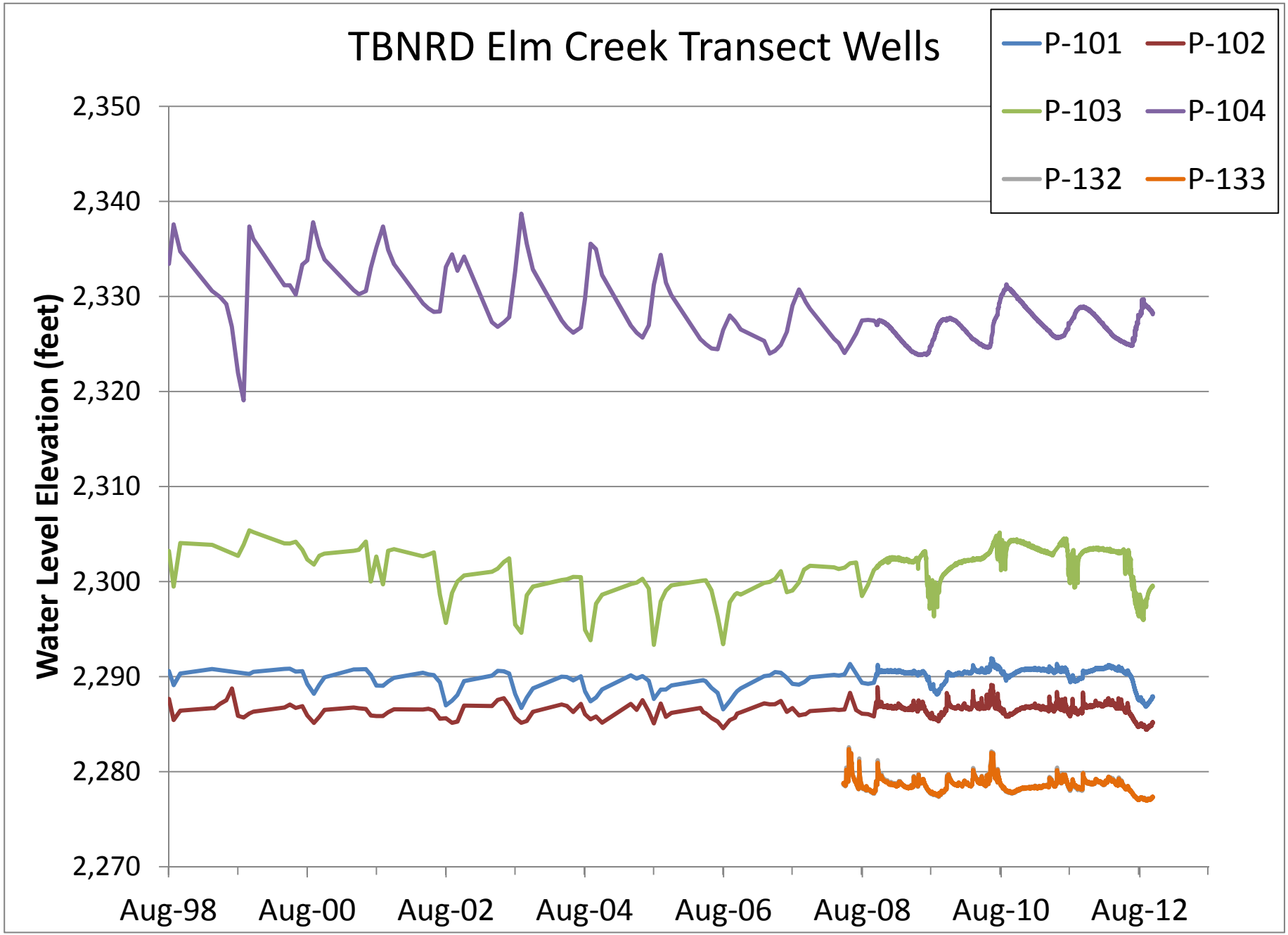

PRRIP MW-2
Water Level Elevation (feet)
2,325
2,323
2,321
2,319
2,317
2,315
2,313
2,311
2,309
2,307
2,305
1/1/2011
7/1/2011
1/1/2012
7/1/2012
1/1/2013
Recharge Period
Observed
Model Forecast

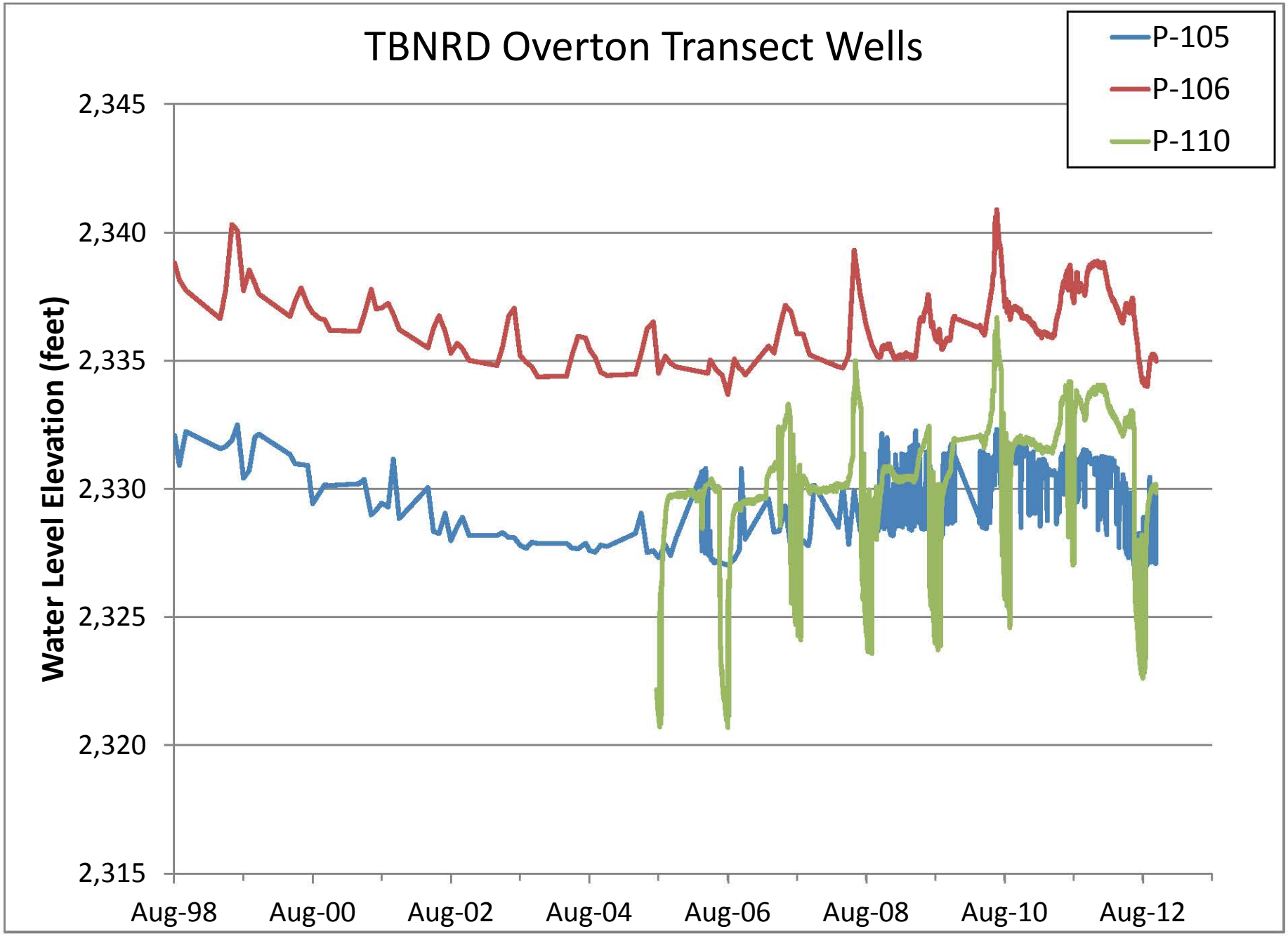

PRRIP MW-3
Water Level Elevation (feet)
2,315
2,313
2,311
2,309
2,307
2,305
2,303
2,301
2,299
2,297
2,295
1/1/2011
7/1/2011
1/1/2012
7/1/2012
1/1/2013
Recharge Period
Observed
Model Forecast

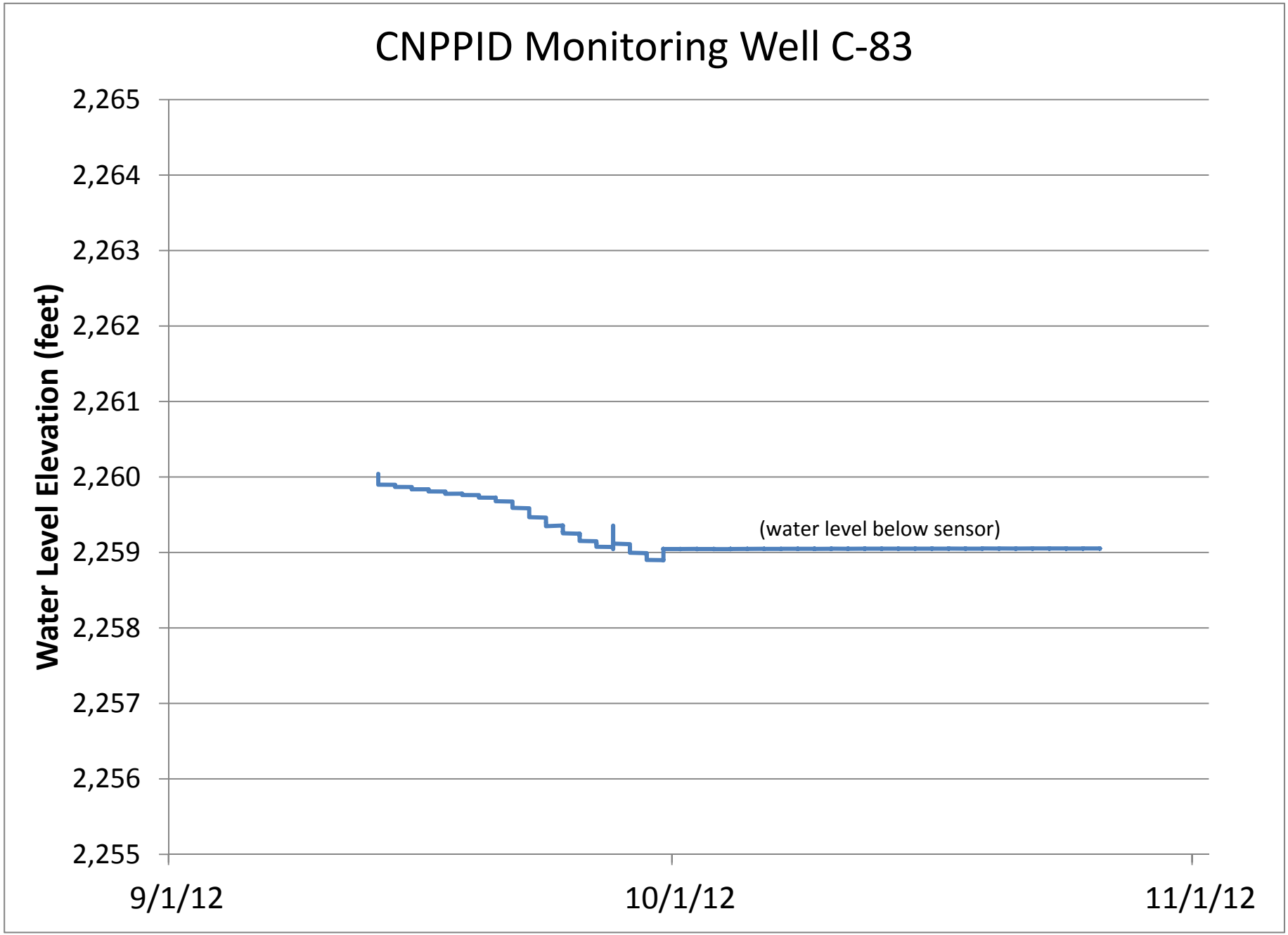

PRRIP MW-4
Water Level Elevation (feet)
2,300
2,298
2,296
2,294
2,292
2,290
2,288
2,286
2,284
2,282
2,280
1/1/2011
7/1/2011
1/1/2012
7/1/2012
1/1/2013
Recharge Period
Observed
Model Forecast

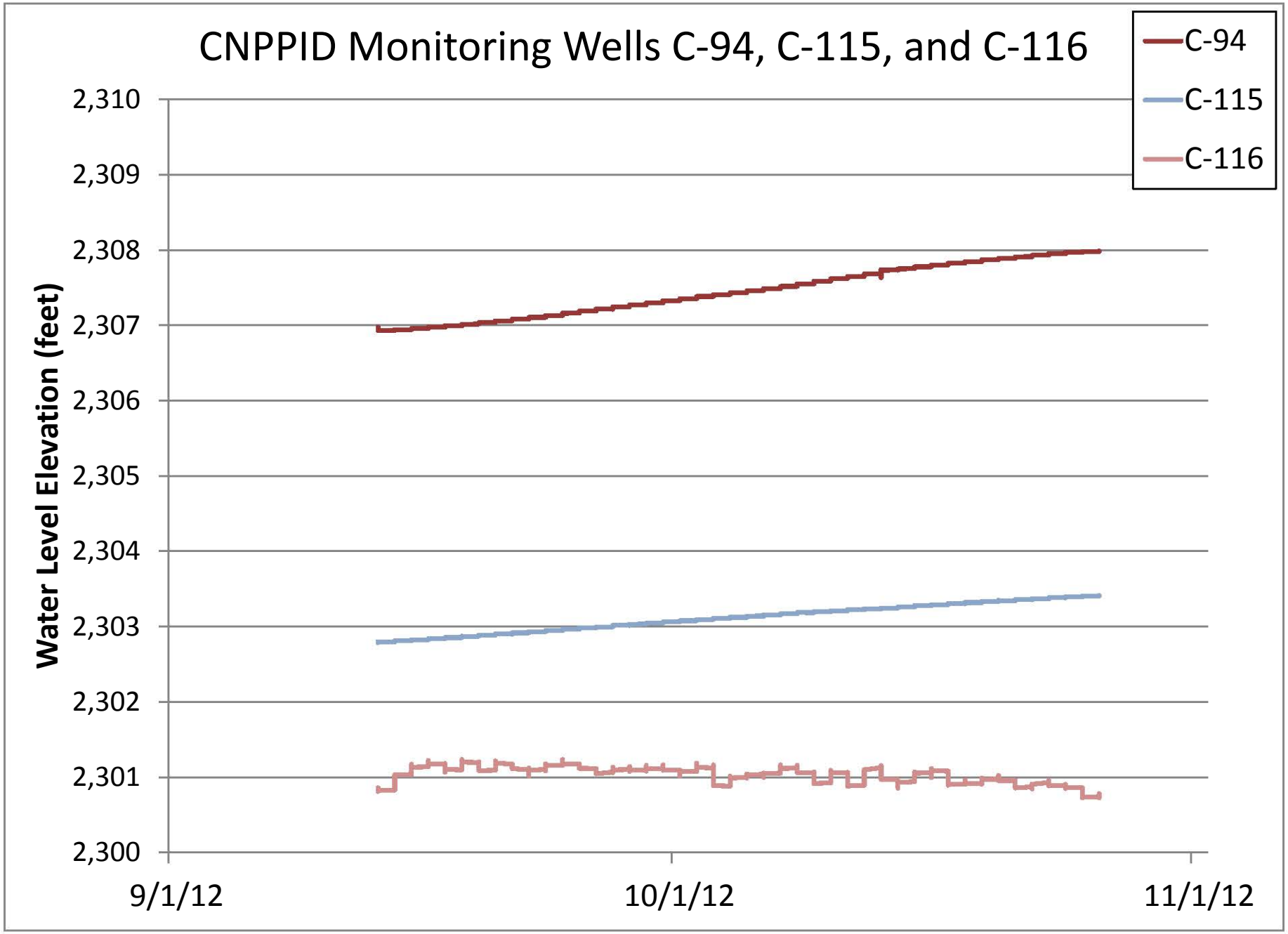

PRRIP MW-5
Water Level Elevation (feet)
2,310
2,308
2,306
2,304
2,302
2,300
2,298
2,296
2,294
2,292
2,290
1/1/2011
7/1/2011
1/1/2012
7/1/2012
1/1/2013
Recharge Period
Observed
Model Forecast

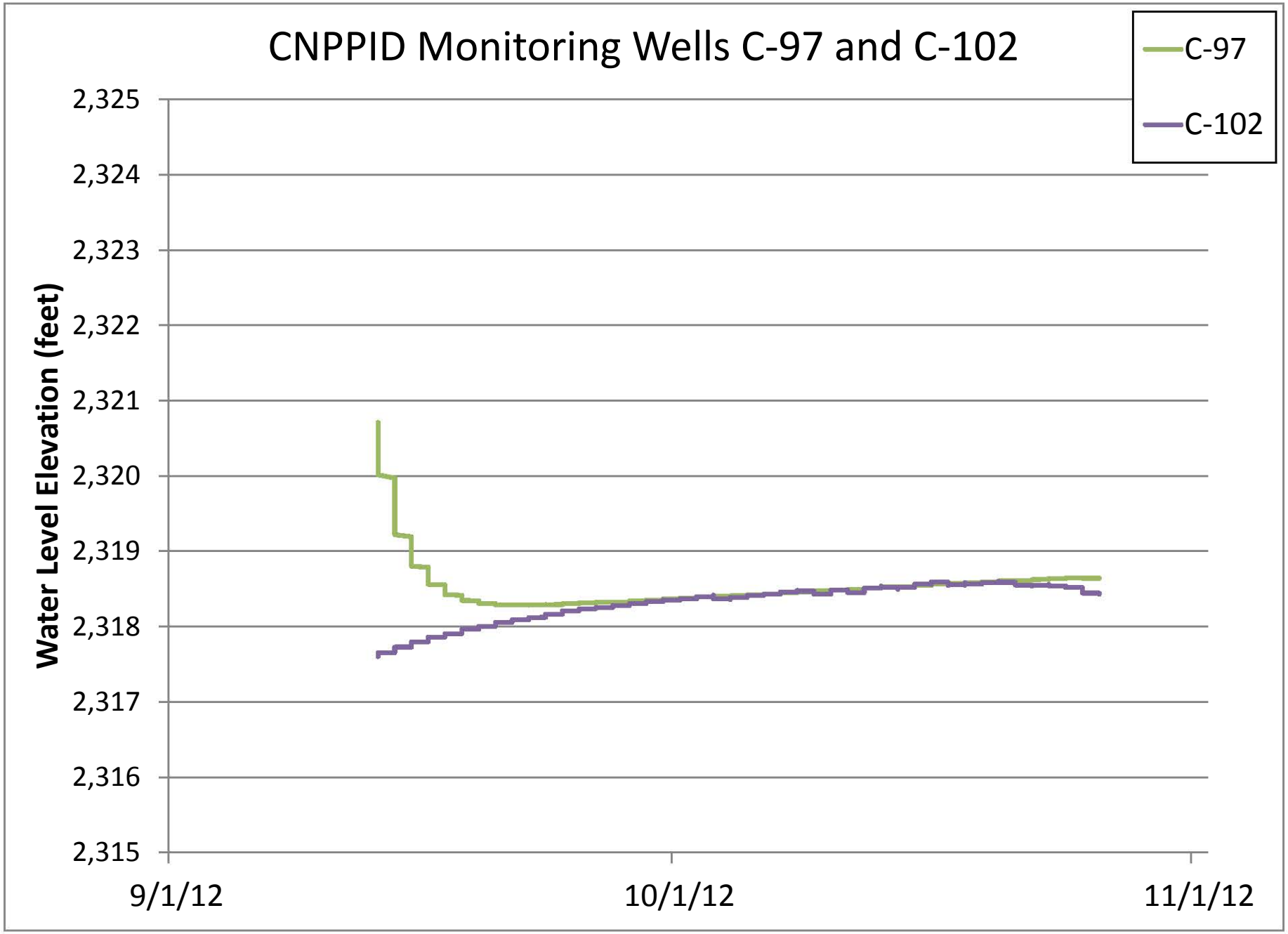

PRRIP MW-6
Water Level Elevation (feet)
2,330
2,328
2,326
2,324
2,322
2,320
2,318
2,316
2,314
2,312
2,310
1/1/2011
7/1/2011
1/1/2012
7/1/2012
1/1/2013
Recharge Period
Observed
Model Forecast

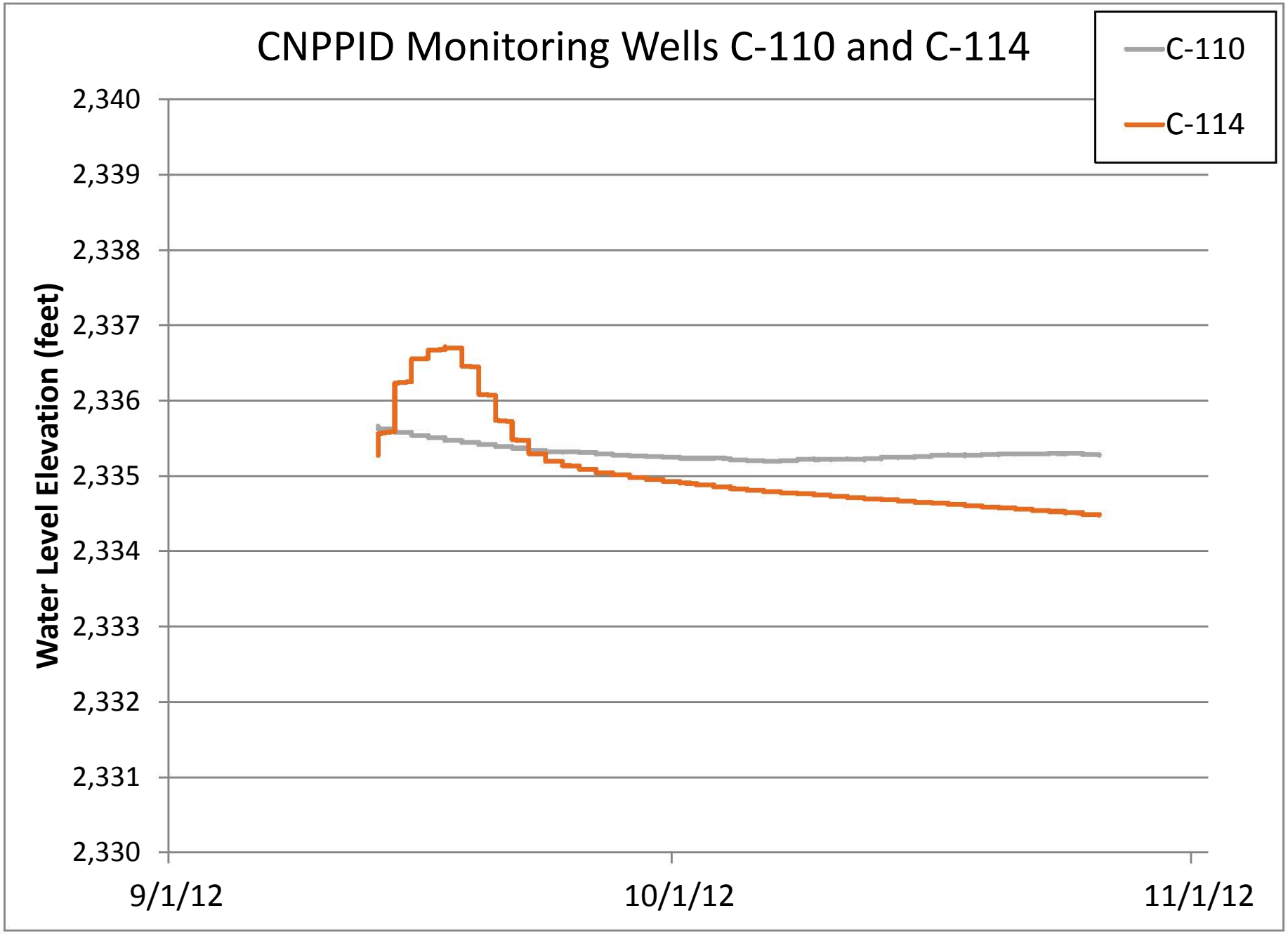

TBNRD Elm Creek Transect Wells
P-101
P-102
P-103
P-104
P-132
P-133
Water Level Elevation (feet)
2,350
2,340
2,330
2,320
2,310
2,300
2,290
2,280
2,270
Aug-98
Aug-00
Aug-02
Aug-04
Aug-06
Aug-08
Aug-10
Aug-12


TBNRD Overton Transect Wells
P-105
P-106
P-110
Water Level Elevation (feet)
2,345
2,340
2,335
2,330
2,325
2,320
2,315
Aug-98
Aug-00
Aug-02
Aug-04
Aug-06
Aug-08
Aug-10
Aug-12

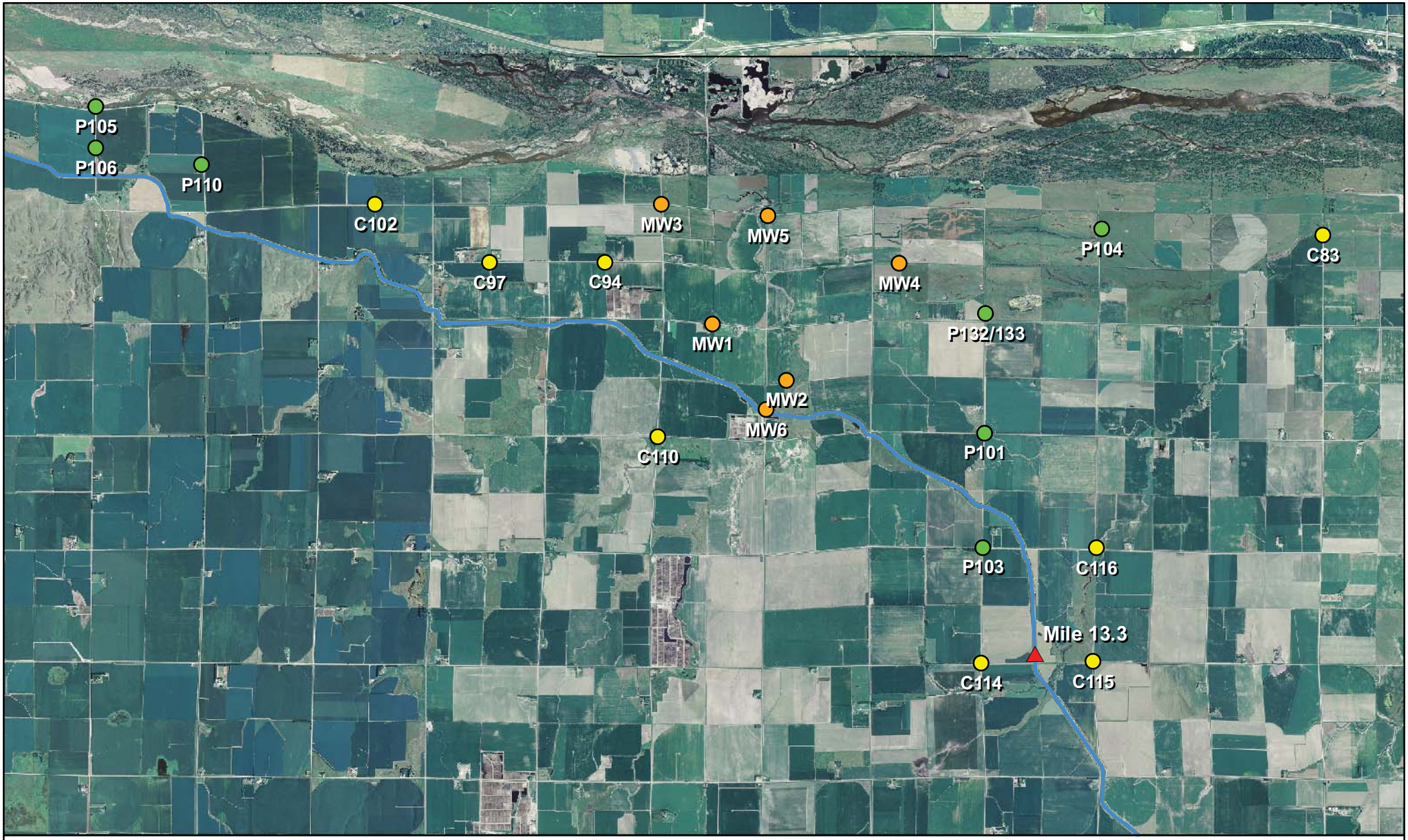

CNPPID Monitoring Well C-83
Water Level Elevation (feet)
2,265
2,264
2,263
2,262
2,261
2,260
2,259
2,258
2,257
2,256
2,255
(water level below sensor)
9/1/12
10/1/12
11/1/12


CNPPID Monitoring Wells C-94, C-115, and C-116
C-94
C-115
C-116
Water Level Elevation (feet)
2,310
2,309
2,308
2,307
2,306
2,305
2,304
2,303
2,302
2,301
2,300
9/1/12
10/1/12
11/1/12


CNPPID Monitoring Wells C-97 and C-102
C-97
C-102
Water Level Elevation (feet)
2,325
2,324
2,323
2,322
2,321
2,320
2,319
2,318
2,317
2,316
2,315
9/1/12
10/1/12
11/1/12


CNPPID Monitoring Wells C-110 and C-114
C-110
C-114
Water Level Elevation (feet)
2,340
2,339
2,338
2,337
2,336
2,335
2,334
2,333
2,332
2,331
2,330
9/1/12
10/1/12
11/1/12

# Appendix B




PLATTE RIVER
RECOVERY IMPLEMENTATION PROGRAM

**Legend**

- Mile 13.3
- PRRIP Monitoring Well
- TBNRD Monitoring Well
- CNPPID Monitoring Well
- Phelps County Canal

N

0 0.5 1 2 Miles

APPENDIX B
PHELPS CANAL
GROUNDWATER RECHARGE
MONITORING SITES

Date: 11/12/12
By: REP