MONITORING YEAR 2 ANNUAL REPORT
Final

DEVIL'S RACETRACK MITIGATION SITE
Johnston County, NC
NCDEQ Contract 003989
NCDMS Project Number 95021

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EXECUTIVE SUMMARY

Wildlands Engineering (Wildlands) completed a full-delivery project for the North Carolina Division of Mitigation Services (NCDMS) to restore and enhance a total of 18,936 linear feet (LF) of stream and restore 63.3 acres (ac) of wetlands in Johnston County, North Carolina. The project streams consist of five unnamed tributaries (UTs) to the Neuse River. The largest of these streams, Devil's Racetrack Creek (East and West), drains directly to the Neuse River. The other four streams are small headwater tributaries to Devil's Racetrack Creek (Southwest Branch, Middle Branch, Southeast Branch, and North Branch). The project proposes to provide 18,381 stream mitigation units (SMU's) and 62.1 wetland mitigation units (WMU's). At the downstream limits of the project, the drainage area is 831 acres (1.30 square miles).

The Devil's Racetrack Mitigation Site, hereafter referred to as the Site, is located in eastern Johnston County along Devil's Racetrack Road just east of its intersection with U.S. Highway 701 and approximately one mile east of Interstate 95 (Figure 1). The Site is located in the western portion of the Inner Coastal Plain Physiographic Province (USGS, 1998). The Site is located within the North Carolina Division of Water Resources (NCDWR) subbasin 03-04-02 of the Neuse River Basin (United States Geological Survey (USGS) Hydrologic Unit 03020201140010).

Prior to construction activities, the streams had been relocated and channelized and the surrounding wetland complex had been drained for agricultural purposes. The primary objectives of the project were to promote wetland hydrology; restore a Coastal Plain Small Stream Swamp wetland community; restore a Coastal Plain stream system to promote hydrologic connectivity with the floodplains and wetlands; stabilize stream banks; promote instream habitat and aeration; restore riparian buffers; and further improve water quality through removing existing agricultural practices. Figure 2 and Table 1 present the restoration and enhancement design for the Site.

The following project goals were established to address the effects listed above from watershed and project site stressors:

- Restore a large wetland complex to a naturally occurring community to improve riparian habitat and water quality;
- Restore a network of badly degraded stream channels, including multiple headwaters streams, to create aquatic habitat and further improve water quality to receiving waters; and
- Restore riparian buffers along stream corridors for additional habitat and water quality benefits.

Stream and wetland restoration and enhancement construction efforts were completed in February 2014. Baseline as-built monitoring activities (MY0) were completed between January and February 2014. A conservation easement is in place on 96.065 acres of the stream and wetland riparian corridors to protect them in perpetuity.

Monitoring Year 2 (MY2) assessment and site visits were completed between the months of April and October 2015 to assess the conditions of the project. Overall, the Site has met the required vegetation, hydrology, and stream success criteria for MY2. The overall MY2 average planted stem density for the Site is 645 stems/ acre which is greater than the year three interim density requirement of 320 stems/ acre. All restored and enhanced streams are stable and functioning as designed. Southeast Branch, Southwest Branch, and Middle Branch all had pressure transducers installed to monitor stream flow. Two of the three stream gages (Southwest and Middle Branch) met the hydrologic criteria for MY2. Of the 38 groundwater monitoring wells on the Site, 35 met the success criteria (water table with 12 inches of the

ground surface for 8.5% of the growing season consecutively) and three did not. Of the three wells that did not meet the success criteria, two showed a water table within 12 inches of the ground surface for greater than 6% of the growing season consecutively. Nineteen wells that did not meet the success criteria in MY1 did meet in MY2 as well as four wells that were added in MY2. This trend appears to demonstrate that the Site was heavily drained prior to restoration and groundwater is slowly recharging throughout the Site. It is anticipated that the wetland areas will continue to recharge and meet hydrologic success criteria in the upcoming monitoring years.

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APPENDICES

Section 1: PROJECT OVERVIEW

The Devil's Racetrack Mitigation Site, hereafter referred to as the Site, is located in eastern Johnston County within the Neuse River Basin (USGS Hydrologic Unit 03020201) near the town of Four Oaks, North Carolina. The Site is located along Devil's Racetrack Road just east of its intersection with U.S. Highway 701 and approximately one mile east of Interstate 95. The Site is located in the western portion of the Inner Coastal Plain Physiographic Province (USGS, 1998). The project watershed consists primarily of agricultural lands and forest. The only significant development in the watershed is a campground adjacent to Devil's Racetrack Creek on the western portion of the project site, a middle school in the upper portion of the watershed, a low-density subdivision with single family homes, and a small section of I-95. The drainage area for the project site is 831 acres (1.30 square miles) at the lower end of Devil's Racetrack Creek (East).

The project stream reaches include Devil's Racetrack Creek (East and West), Southwest Branch, Middle Branch, Southeast Branch, and North Branch, (stream restoration and/or enhancement level I/II approach). Mitigation work within the Site included restoration and enhancement of 18,936 linear feet (LF) of perennial and intermittent stream channel and restoration of 63.3 acres (ac) of riparian wetland. The stream and wetland areas were also planted with native vegetation to improve habitat and protect water quality. The final mitigation plan was submitted and accepted by the NCDMS in January of 2013. Construction activities were completed by Land Mechanic Designs, Inc. (East Side) and Fluvial Solutions (West Side) in February 2014. Planting and seeding activities were completed by Bruton Natural Systems, Inc. in February 2014. Baseline monitoring (MY0) was conducted between December 2013 and April 2014. Annual monitoring will be conducted for seven years with the close-out anticipated to commence in 2021 given the success criteria are met. Appendix 1 provides more detailed project activity, history, contact information, and watershed/site background information for this project.

A conservation easement has been recorded and is in place along the stream and wetland riparian corridors to protect them in perpetuity; 96.065 ac (Deed Book 4221, Page 419-433) within two tracts owned by Nell Howell Revocable Trust. The project provides 18,381 stream mitigation units (SMU's) and 62.1 wetland mitigation units (WMU's). Directions and a map of the Site are provided in Figure 1 and project components are illustrated in Figures 2a and 2b.

1.1 Project Goals and Objectives

Prior to construction activities, the streams had been relocated and channelized and the surrounding wetland complex had been drained for agricultural purposes. Stream valleys and other low areas were filled to raise wet areas and even out the fields. At the same time the streams were straightened and riparian vegetation was also removed. The project area west of Devil's Racetrack Road was used for row crop agriculture and the eastern portion was used for timber production.

The channelization of streams on the Site resulted in severely over-enlarged channels that were extremely deep in many locations. The alterations of the Site to promote farming practices resulted in complete elimination of the ecological function of this small stream/wetland complex. Specifically, functional losses at the Site include degraded aquatic habitat, altered hydrology (related to loss of floodplain connection and lowered water table), and reduction of quality and amount of riparian wetland habitats and related water quality benefits. Ongoing bank erosion was also occurring at some locations due to high, overly steep banks and lack of bank vegetation. Table 4 in Appendix 1 and Tables 10a through 10f in Appendix 4 present the pre-restoration conditions in detail.

The Site was designed to meet the over-arching goals as described in the mitigation plan (Wildlands, 2013). The project is intended to provide numerous ecological benefits within the Neuse River Basin. While many of these benefits are limited to the Devil's Racetrack Creek Site project area, others, such as pollutant removal and improved aquatic and terrestrial habitat, have more far-reaching effects. The following project specific goals established in the mitigation plan include:

- Restore a large wetland complex to a naturally occurring community to improve riparian habitat and water quality;
- Restore a network of badly degraded stream channels, including multiple headwaters streams, to create aquatic habitat and further improve water quality to receiving waters; and
- Restore riparian buffers along stream corridors for additional habitat and water quality benefits.

Secondary project goals established in the mitigation plan were to restore fish passage from the Neuse River to Devil's Racetrack Creek. This is a secondary goal because success will not be measured during monitoring.

The primary project goals were addressed through the following project objectives:

- Promote wetland hydrology by raising channelized stream beds and filling drainage ditches;
- Plant wetland areas with native tree species to restore a Coastal Plain Small Stream Swamp – Blackwater Subtype community;
- Reconstruct stream channels to have the appropriate slope, planform, and cross-sectional geometry for the region of the Coastal Plain in which the project is located;
- Size reconstructed stream channels to flood floodplains and wetlands frequently;
- Stabilize stream banks using bioengineering, natural channel design techniques, and grading to reduce bank angles and bank height;
- Install in-stream structures and woody debris to promote aeration of water, create habitat, and influence the creation of bed forms commonly found in sand bed channels;
- Restore riparian buffer areas with native tree species to stabilize channels, filter flood flows and runoff, and supplement wetland plantings; and
- Remove project area from agricultural production further improving water quality.

The design streams and wetlands were restored to the appropriate type based on the surrounding landscape, climate, and natural vegetation communities but also with strong consideration to existing watershed conditions and trajectory. The mitigation project was developed to restore a large stream/wetland complex directly adjacent to the Neuse River to a naturally occurring community to create riparian and wetland habitat and improve water quality. Other key factors addressed in the design were to create stable habitats, improve riparian buffers, and restore the natural migration patterns for anadromous and other fish for spawning.

1.2 Monitoring Year 2 Data Assessment

Annual monitoring and quarterly site visits were conducted during MY2 to assess the condition of the project. The stream and wetland mitigation success criteria for the Site follow the approved success criteria presented in the Devil's Racetrack Mitigation Plan (Wildlands, 2013).

1.2.1 Vegetative Assessment

A total of 51 vegetation plots were established during the baseline monitoring within the project easement areas. All of the plots were installed using a standard 10 meter by 10 meter plot. The final

vegetative success criteria will be the survival of 210 planted stems per acre in the riparian corridor along restored and enhanced reaches and within the wetland restoration areas at the end of the seven year monitoring period (MY7). The interim measure of vegetative success for the Site will be the survival of at least 320 planted stems per acre at the end of year three of the monitoring period (MY3) and at least 260 stems per acre at the end of the fifth year of monitoring (MY5).

The MY2 vegetative survey was completed in June 2015. The 2015 vegetation monitoring resulted in an average planted stem density of 645 stems per acre, which is greater than the interim requirement of 320 stems/acre required at MY3, but approximately 8% less than the baseline density recorded at MY0, 702 stems/acre, in January 2014. When including volunteer stems, the average stems/acre is 722. This is well above the MY3 interim requirement of 320 stems/ acre. There was an average of 16 stems per plot which is a slight decrease from 17 stems per plot in MY1. All 51 of the vegetation plots individually met success criteria for MY2, and are on track to meet the success criteria required for MY7 (Table 9, Appendix 3). Refer to Appendix 2 for vegetation plot photographs and the vegetation condition assessment table and Appendix 3 for vegetation data tables.

1.2.2 Vegetation Areas of Concern

Along the lower section of Devil's Racetrack (East), there are several bare areas (approximately 15.5% of the planted acreage). In these bare areas, the planted trees appear healthy and volunteer trees have sprouted, but the herbaceous ground cover is still deficient and not well established. This area was graded down several feet during construction which removed the top soil, leaving a more acidic subsoil. Wildlands incorporated liquid and pelletized lime into the soil during construction with the expectation that the pH would increase over the first year or two and would provide better herbaceous growing conditions. As of MY2, this area still has low pH soils, but continues to improve as the herbaceous ground cover density develops. Additional permanent seed, temporary seed, lime, and fertilizer was added during MY2 to promote better ground cover. Wildlands will continue to monitor these areas and will reapply seed and soil amendments as necessary. Refer to Appendix 2 for the vegetation condition assessment table, the Integrated Current Condition Plan View (CCPV), and reference photographs.

1.2.3 Stream Assessment

Morphological surveys for MY2 were conducted in April 2015. All streams within the Site are stable and met success criteria for MY2. In general, cross sections for all streams showed little to no change in bankfull area, maximum depth ratio, or width-to-depth ratio. Surveyed riffle cross sections fell within the parameters defined for channels of the appropriate Rosgen stream type.

Cross section 8 on Devil's Racetrack (West) has maintained a consistent bankfull width, but has increased in depth and area. This is due to the location of the cross section within the shallow. The shallow was built with logs buried at the stream bed elevation, perpendicular to the stream banks, for grade control. These logs create downstream micro pools within the shallow. Cross section 8 was placed downstream of one of these logs in a micro pool. These micro pools are expected and the increase in depth and area of cross section 8 is typical in micro pools. Cross Section 8 is stable and performing as expected, even though there is an increase in depth and area.

Longitudinal profile surveys are not required on the project unless visual inspection indicates reach wide vertical stability concerns. Refer to Appendix 2 for the visual stability assessment table, the CCPV map, and reference photographs. Refer to Appendix 4 for the morphological data and plots.

1.2.4 Stream Areas of Concern

In the spring of 2015 minor bank erosion was repaired between stations 103+00 and 107+00 on Devils Racetrack Creek (East). The repair work consisted of regrading banks, seeding, matting, addition of native transplants and live staking. As of the fall of 2015, the vegetation is better established in this area and the stream banks appear to be stable.

Southeast Branch also had minor repair work performed in the spring of 2015. Several areas between stations 309+00 and 315+00 required repairs to log grade control structures. These structures were sealed with native stone to stabilize them. Also, several meander bends were repaired by installing native sod mats and transplants for bank stabilization. Below this area where the stream slope decreases, sediment that had accumulated in the channel was removed and deposited on the adjacent, stabilized floodplain. Wildlands assumes that the sediment deposition resulted from runoff of the adjacent farm fields prior to the riparian buffer becoming well established. Wildlands will continue to monitor the sediment deposition along Southeast Branch in future monitoring years.

1.2.5 Hydrology Assessment

At the end of the seven year monitoring period, two or more bankfull events must have occurred in separate years within the restoration reaches. Multiple bankfull events were recorded on all the streams with crest gages and pressure transducers during the MY2 data collection. All streams on the Site had multiple bankfull events during MY1. Therefore, the Site has met the required stream hydrology success criteria.

Pressure transducers were also installed on Southwest Branch, Southeast Branch, and Middle Branch to measure stream flow. These pressure transducers were installed to show that the streams have adequate flow throughout the year, and are not ephemeral ditches. Per discussion with the Interagency Review Team (IRT), on these three streams, consistent flow must be documented for at least 30 consecutive days under normal circumstances. Stream flow must be documented to occur intermittently in all months other than July through September. Southwest and Middle Branch showed consistent flow throughout MY2. Southeast Branch had a malfunction with the pressure transducer and Wildlands was unable to retrieve the data from the pressure transducer. The pressure transducer was replaced on July 30, 2015 and data has been recorded from this point on during MY2. Since being replaced, the pressure transducer on Southeast Branch has recorded multiple bankfull events and flow for a maximum of 16 consecutive days. During MY1 one pressure transducer was lost during a flood, so Wildlands decided to make the other pressure transducers more secure during MY2. The pressure transducer for Southwest and Middle Branch were reinstalled to make them more secure, and keep them from washing away. Two of the three streams have met the flow success criteria for MY2. The third stream had a malfunction with the pressure transducer for part of the year so it is unknown if it met flow success criteria. Refer to Appendix 5 for hydrologic data.

1.2.6 Wetland Assessment

Thirty four groundwater monitoring gages were established during the baseline monitoring within the wetland restoration zones. During MY2 four more gages were added to help assess groundwater levels on the Site. All the gages were installed at appropriate locations so that the data collected will provide an indication of groundwater levels throughout the Site. To provide data for the determination of the growing season, one soil temperature probe was installed. A barotroll logger (to measure barometric pressure used in the calculations of groundwater levels with well transducer data) and a rain gage were also installed on the Site. All monitoring gages were downloaded on a quarterly basis and maintained on an as needed basis. The success criteria for wetland hydrology is to have a free groundwater surface

within 12 inches of the ground surface for 8.5 percent of the growing season, which is measured in consecutive days under typical precipitation conditions. During MY1 NRCS WETS Data was used to determine the growing season for the Site. After discussions with the United States Army Corps of Engineers (USACE), it was agreed to use on-site soil temperature data to determine the beginning of the growing season and use NRCS WETS data to determine the end of the growing season. During MY2 the beginning of the growing season was extended by 18 days based on soil temperatures staying above 41 degrees Fahrenheit at 12 inches below the ground surface.

The USACE also requested pre-construction groundwater well data be overlaid on hydrographs with the current monitoring year groundwater well data. USACE requested this data to see how groundwater levels are recharging after rain events on the Site. Wildlands overlaid the pre-construction groundwater well data with the closest monitoring groundwater well data and rain data. It is evident from these overlays that the Site drained more rapidly and to greater depths prior to restoration. Refer to Appendix 5 for pre and post construction groundwater gage comparison plots.

Of the 38 groundwater monitoring wells on the Site, 35 met the success criteria and 3 did not for MY2. The 35 wells that met the success criteria generally exceeded the standard significantly. The measured hydroperiod ranged from 12.0% to 32.4% with 17 wells exceeding 20% of the growing season. Prior to project construction, Wildlands anticipated that it might take a year or two to see hydrology rebound on the site due to the heavily ditched and drained pre-restoration conditions. A comparison of MY1 and MY2 monitoring results appears to support this concept. The MY2 hydrology results are significantly wetter than the MY1 results where only 12 of 34 wells met the success criteria. This improved performance came despite the fact that the 2014 rainfall total through October was 22 inches greater than the measured rainfall total in 2015 through the same period.

Of the 3 wells that did not meet the success criteria, two (Gage 1 and 34) showed the water table within 12 inches of the ground surface for 6% of the growing season consecutively. It is also worth noting that these two wells would have met for approximately 12% of the growing season had they not dropped to approximately 13 inches for two consecutive days in March. The third well (Gage 10) that did not meet showed the water table within 12 inches of the ground surface 4% of the growing season. This well was very dry in MY1 as well (0.6% hydroperiod). While the 2015 results are an improvement, this well will be monitored closely during the remainder of the monitoring period.

Groundwater wells 8 and 32 were placed outside of proposed wetland restoration boundaries to provide data to potentially increase the wetland restoration boundary. The wetland restoration area around well 8 was modified during Mitigation Plan review due to concerns about drainage from a section of the abandoned Devils Racetrack Creek that could not be filled. Since this channel was left open and could possibly drain the proposed wetlands, a conservative wetland restoration boundary was agreed upon. The MY2 well 8 results appear to indicate that the channel is not draining the area around the well, and that wetland restoration boundaries extend farther than expected. Similarly, groundwater well 32 was placed downstream of proposed wetland restoration boundaries to see if wetland restoration boundaries extended farther than the hydrology model indicated they would. During MY2 well 32 showed a similar hydrograph to wells upstream in a wetland restoration area that met success criteria. These results appear to indicate that wetland restoration boundaries extend farther downstream than expected. Refer to Appendix 2 for the groundwater gage locations and Appendix 5 for groundwater hydrology data and plots.

1.2.7 Maintenance Plan

No maintenance plan is necessary at this time. Wildlands will continue to monitor Southeast Branch and the floodplain area adjacent to the lower section of Devil's Racetrack (East). A maintenance plan will be

developed if it becomes apparent that Southeast Branch continues to have aggradation and degradation problems. In addition, if the floodplain area adjacent to the lower portion of Devil's Racetrack (East) does not continue to improve herbaceous cover, Wildlands will develop a maintenance plan to establish grasses.

1.3 Monitoring Year 2 Summary

All streams within the Site are stable and functioning as designed. There were a few areas on Southeast Branch and Devil's Racetrack (East) that were repaired during MY2. These areas will be monitored for any future issues and a maintenance plan will be prepared if necessary. The average stem density for the Site is on track to meeting the MY7 success criteria; all individual vegetation plots meet the MY2 success criteria as noted in the CCPV. There have been at least two documented bankfull events recorded by the crest gages on each of the streams on the Site. A total of 35 out of 38 groundwater gages met the wetland hydrology success criteria, and the Site is showing a significant trend in groundwater recharge. This trend is fully expected to continue in the future.

Summary information and data related to the success of various project and monitoring elements can be found in the tables and figures in the report appendices. Narrative background and supporting information formerly found in these reports can be found in the Mitigation Plan documents available on NCDMS's website. All raw data supporting the tables and figures in the appendices are available from NCDMS upon request.

Section 2: METHODOLOGY

Geomorphic data was collected following the standards outlined in The Stream Channel Reference Site: An Illustrated Guide to Field Techniques (Harrelson et al., 1994) and in the Stream Restoration: A Natural Channel Design Handbook (Doll et al., 2003). All the Integrated Current Condition Mapping was recorded using a Trimble handheld GPS with sub-meter accuracy and processed using Pathfinder and ArcGIS. Crest gages and pressure transducers were installed in surveyed riffle cross sections and monitored quarterly. Hydrology attainment installation and monitoring methods are in accordance with the USACE (2003) standards. Vegetation monitoring protocols followed the Carolina Vegetation Survey-NCDMS Level 2 Protocol (Lee et al., 2008).

Section 3: REFERENCES

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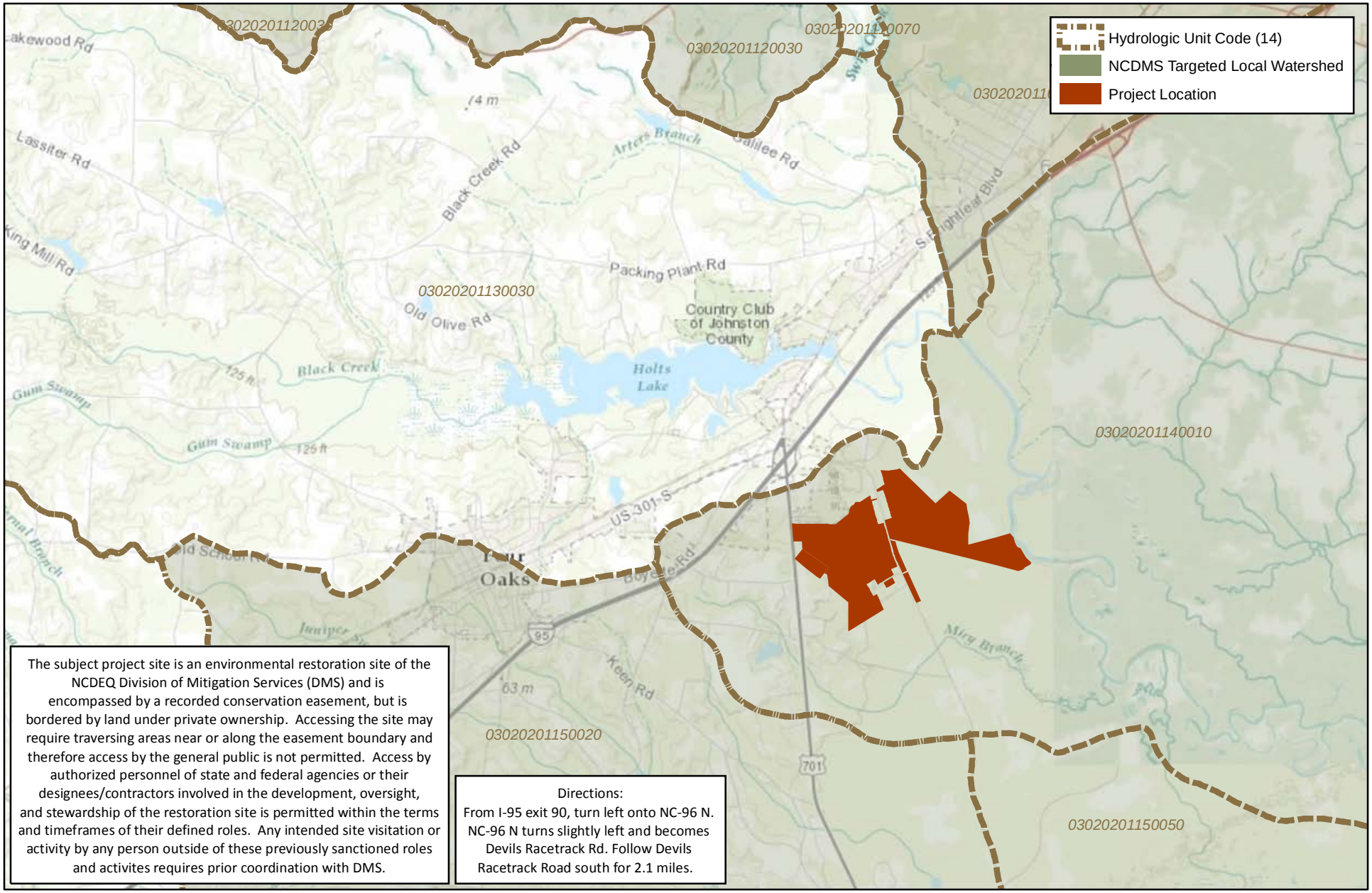
APPENDIX 1. General Tables and Figures



WILDLANDS ENGINEERING

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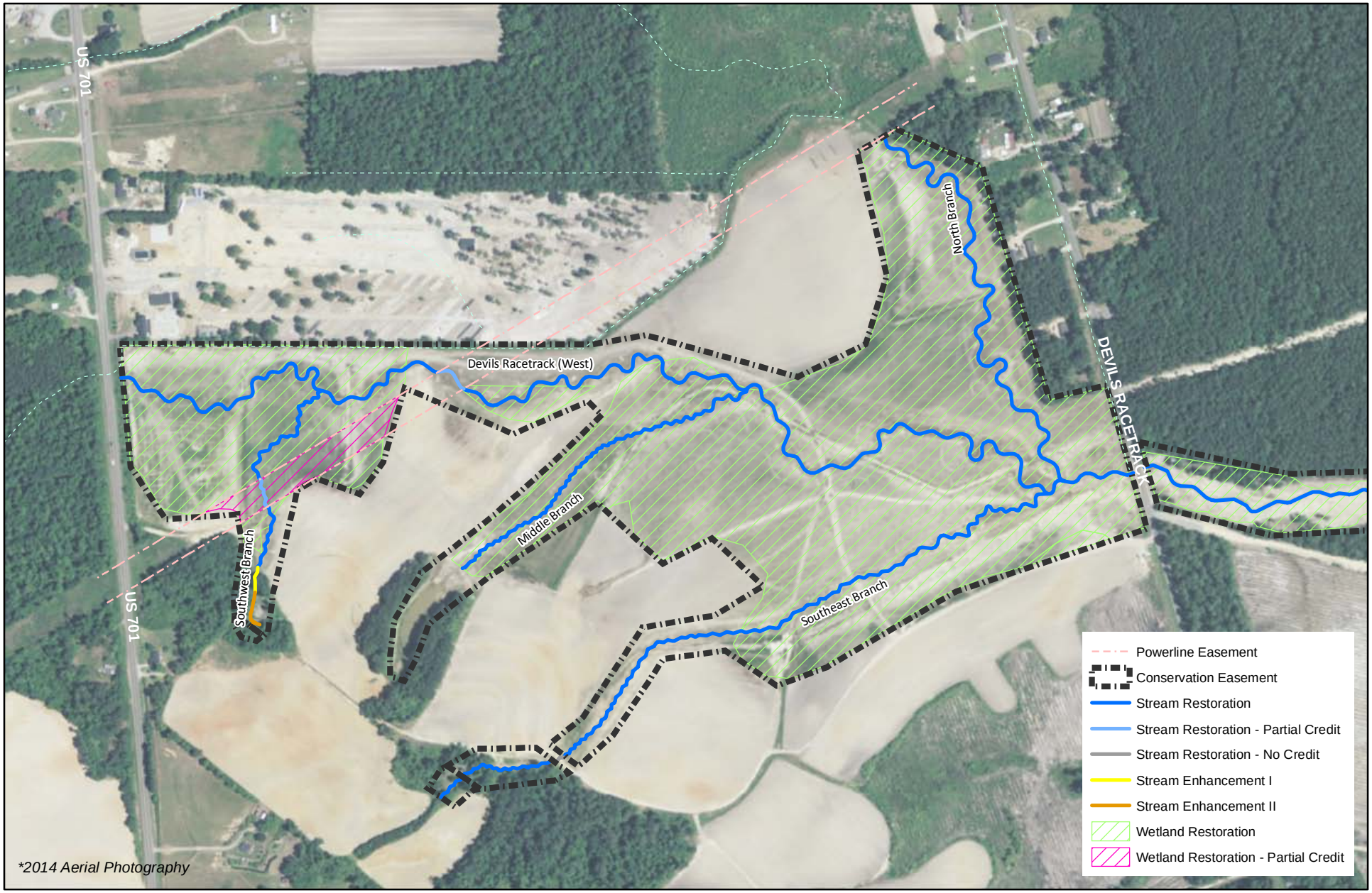
Figure 1. Project Vicinity Map
Devil's Racetrack Mitigation Site
NCDMS Project No. 95021
Monitoring Year 2 - 2015
Johnston County, NC



WILDLANDS ENGINEERING

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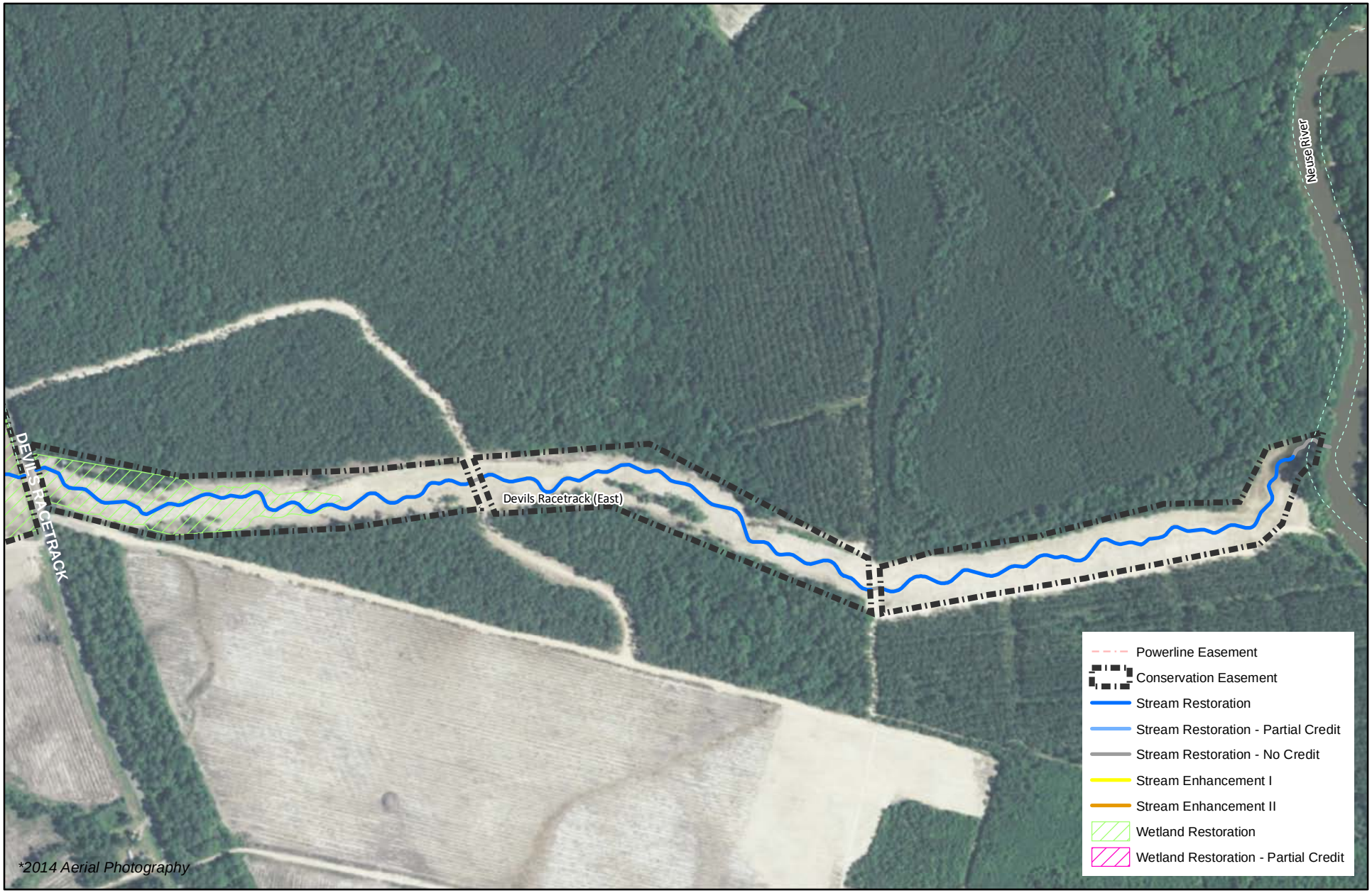
Figure 2a. Project Component/Asset Map
Devil's Racetrack Mitigation Site
NCDMS Project No.95021
Monitoring Year 2 - 2015
Johnston County, NC



WILDLANDS ENGINEERING

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Figure 2b. Project Component/Asset Map
Devil's Racetrack Mitigation Site
NCDMS Project No.95021
Monitoring Year 2 - 2015
Johnston County, NC

Table 1. Project Components and Mitigation Credits
Devil's Racetrack Mitigation Site (NCDMS Project No.95021)
Monitoring Year 2 - 2015

Mitigation Credits

	Stream		Riparian Wetland		Non-Riparian Wetland		Buffer	Nitrogen Nutrient Offset	Phosphorous Nutrient Offset
Type	R	RE	R	RE	R	RE			
Totals	18,381[2]	0	62.1	0	N/A	N/A	N/A	N/A	N/A

Project Components

Reach ID	As-Built Stationing/ Location	Existing Footage/ Acreage	Approach	Restoration or Restoration Equivalent	Restoration Footage/ Acreage	Mitigation Ratio	Credits (SMU/ WMU)
Streams							
Devil's Racetrack Creek (West) (DOT ROW)	0+00-0+20	20 LF	P1	Restoration (No Credit)	20	N/A	N/A
Devil's Racetrack Creek (West)	0+20-16+47 & 17+74-52+69	4,755 LF	P1	Restoration	5,122	1:1	5,122[2]
Devil's Racetrack Creek (West) (Power Line Easement)	16+47-17+74	196 LF	P1	Restoration (Partial Credit)	127	4:1[1]	32[2]
Devil's Racetrack Creek (West) (DOT ROW)	52+69-52+73	5 LF	P1	Restoration (No Credit)	4	N/A	N/A
Devil's Racetrack (East) (DOT ROW)	52+59-52+66	5 LF	P1	Restoration (No Credit)	7	N/A	N/A
Devil's Racetrack (East)	52+66-70+72 & 71+12-88+12 & 88+53-107+11	4,778 LF	P1/2	Restoration	5,364	1:1	5,364[2]
Devil's Racetrack (East) (Easement Break)	70+72-71+12	30 LF	P1/2	Restoration (No Credit)	40	N/A	N/A
Devil's Racetrack (East) (Easement Break)	88+12 to 88+53	31 LF	P1/2	Restoration (No Credit)	41	N/A	N/A
Devil's Racetrack (East)	107+11-108+21	0 LF	P1/2	Restoration (No Credit)	110	N/A	N/A
Southwest Branch	500+00-501+31 600+00-600+23	154 LF	EII	Enhancement	154	2.5:1	62
Southwest Branch	501+31-502+07	75 LF	EI	Enhancement	76	1.5:1	51
Southwest Branch	502+07-504+89 506+05-511+52	740 LF	P1/2	Restoration	829	1:1	829[2]
Southwest Branch (Power Line Easement)	504+89-506+05	111 LF	P1/2	Restoration (Partial Credit)	116	4:1[1]	29
Middle Branch	200+00-204+00	410 LF		Headwater Wetland	410	1:1	410[2]
Middle Branch	204+00-219+05	1,326 LF	P1/2	Restoration	1,505	1:1	1,505[2]
Southeast Branch	300+00-305+03 305+48-329+61	2,946 LF	P1	Restoration	2,916	1:1	2,916[2]
Southeast Branch (Easement Break)	305+03-305+48	30 LF	P1	Restoration (Partial Credit)	45	4:1[1]	11
North Branch	403+89-424+39	---	P1	Restoration	2,050	1:1	2,050[2]
Wetlands							
Riparian Wetlands (West)	N/A	0.0 ac	N/A	Restoration	57.9	1:1	57.9
Riparian Wetlands (West) (Power Line Easement)	N/A	0.0 ac	N/A	Restoration (Partial Credit)	1.6	4:1	0.4
Riparian Wetlands (East)	N/A	0.0 ac	N/A	Restoration	3.8	1:1	3.8

Component Summation

Restoration Level	Stream (LF)	Riparian Wetland (acres)		Non-Riparian Wetland (acres)	Buffer(square feet)	Upland (acres)
		Riverine	Non-Riverine			
Restoration	18,706	63.3	-	-	-	-
Enhancement		-	-	-	-	-
Enhancement I	76					
Enhancement II	154					
Creation		-	-	-		
Preservation	-	-	-	-		-
High Quality Preservation	-	-	-	-		-

N/A: not applicable
1. Ratio of 4:1 based on an expected 75% reduction in credits for stream restoration with shrub buffer zone in power line easements
2. Credits updated from baseline report during monitoring year 1 due to errors in calculations.

Table 2. Project Activity and Reporting History
Devil's Racetrack Mitigation Site (NCDMS Project No.95021)
Monitoring Year 2 - 2015

Activity or Report	Date Collection Complete	Completion or Scheduled Delivery
Mitigation Plan	September 2011-March 2012	January 2013
Final Design - Construction Plans	September 2011-March 2012	August 2013
Construction	December 2013-February 2014	February 2014
Temporary S&E mix applied to entire project area [1]	February 2014	February 2014
Permanent seed mix applied to reach/segments	February 2014	February 2014
Bare root and live stake plantings for reach/segments	February 2014	February 2014
Baseline Monitoring Document (Year 0)	December 2013-February 2014	May 2014
Year 1 Monitoring	August 2014	December 2014
Year 2 Monitoring	October 2015	December 2015
Year 3 Monitoring	2016	December 2016
Year 4 Monitoring	2017	December 2017
Year 5 Monitoring	2018	December 2018
Year 6 Monitoring	2019	December 2019
Year 7 Monitoring	2020	December 2020

[1]Seed and mulch is added as each section of construction is completed.

Table 3. Project Contact Table
Devil's Racetrack Mitigation Site (NCDMS Project No.95021)
Monitoring Year 2 - 2015

Designer	**Wildlands Engineering, Inc.**
Jeff Keaton, PE	312 West Millbrook Road, Suite 225 Raleigh, NC 27609 919.851.9986
Construction Contractor (East Side)	**Land Mechanic Designs, Inc.** 126 Circle G Lane Willow Spring, NC 27592
Construction Contractor (West Side)	**Fluvial Solutions** P.O. Box 28749 Raleigh, NC 27611
Planting Contractor	**Bruton Natural Systems, Inc** P.O. Box 1197 Fremont, NC 27830
Seeding Contractor	**Bruton Natural Systems, Inc** P.O. Box 1197 Fremont, NC 27830
Seed Mix Sources	**Green Resource, LLC**
Nursery Stock Suppliers	
Bare Roots	**Dykes and Son Nursery and NC Forest Service (Claridge Nursery)**
Live Stakes	**Bruton Natural Systems, Inc**
Monitoring Performers	**Wildlands Engineering, Inc.**
Stream, Vegetation, and Wetland Monitoring, POC	Jason Lorch 919.851.9986, ext. 107

Table 4. Project Information and Attributes
Devil's Racetrack Mitigation Site (NCDMS Project No.95021)
Monitoring Year 2 - 2015

Project Information	
Project Name	Devil's Racetrack Mitigation Site
County	Johnston County
Project Area (acres)	96.065 ac
Project Coordinates (latitude and longitude)	35° 27'01.58" N, 78° 23' 18.08" W
Project Watershed Summary Information	
Physiographic Province	Upper Coastal Plain
River Basin	Neuse
USGS Hydrologic Unit 8-digit	03020201
USGS Hydrologic Unit 14-digit	03020201140010
DWR Sub-basin	03-04-02
Project Drainiage Area (acres)	831 ac
Project Drainage Area Percentage of Impervious Area	<1%
CGIA Land Use Classification	62% forest/wetland, 34% farm land, 4% developed

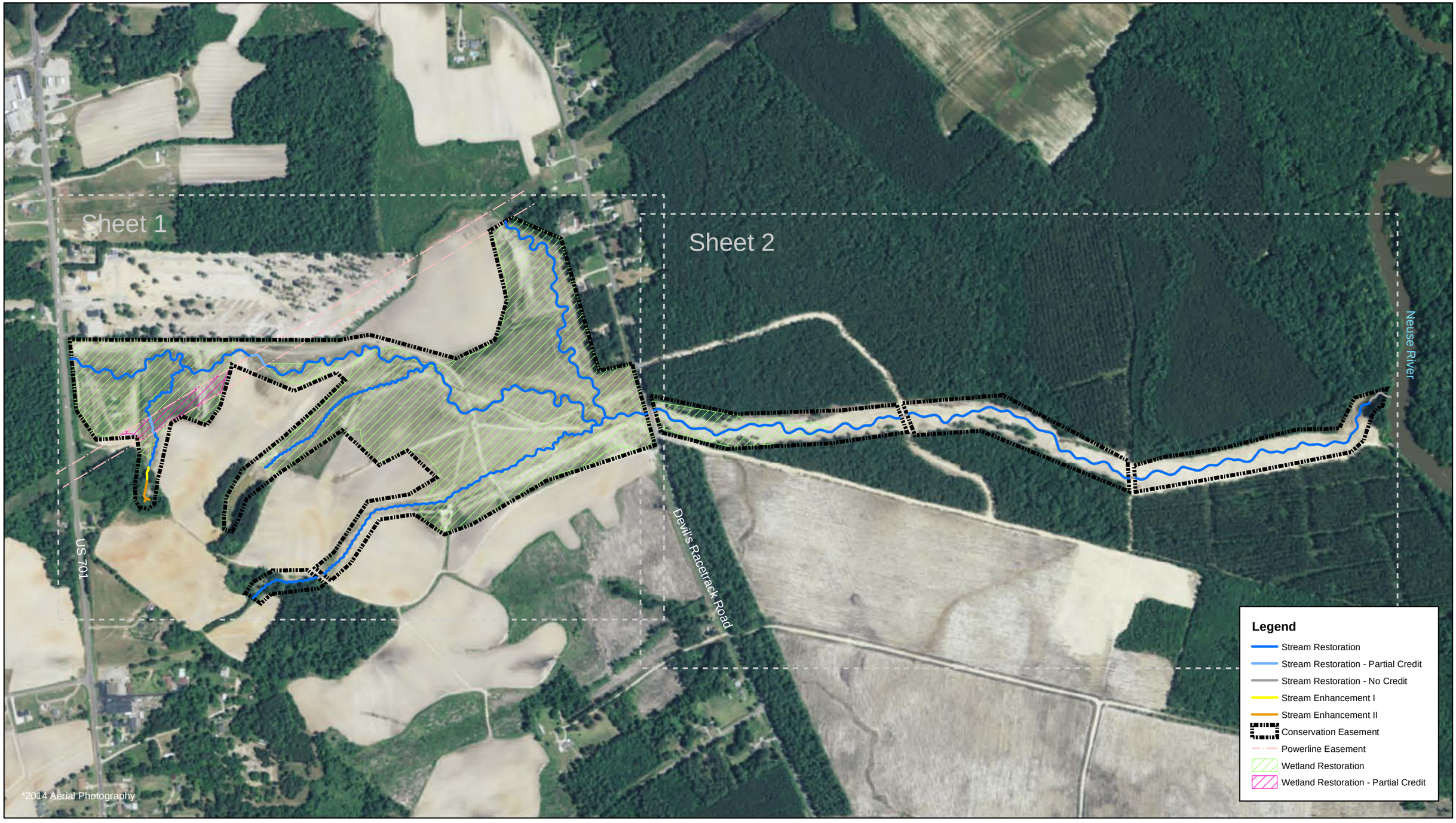
Reach Summary Information

Parameters	Southwest Branch	Middle Branch	Southeast Branch	North Branch	Devil's Racetrack Creek (west)	Devil's Racetrack Creek (east)
Length of reach (linear feet) - Post-Restoration	0	0	0	0	5,273	5,562
Drainage area (acres)	20.6	10.8	69.9	49.9	493.5	831.4
NCDWR stream identification score	34.5 - 37	30	29 - 30.75	32	38	37.5
NCDWR Water Quality Classification	C/NSW					
Morphological Desription (stream type)	P	P	P/I	P	P	P
Evolutionary trend (Simon's Model) - Pre- Restoration	---	---	---	---	---	---
Underlying mapped soils	Altavista fine sandy loam, Bibb sandy loam, Cecil loam, Goldsboro sandy loam, Leaf silt loam, Lynchburg sandy loam, Nason silt loam, Norfolk loamy sand, and Rains sandy loam.					
Drainage class	---	---	---	---	---	---
Soil Hydric status	---	---	---	---	---	---
Slope	---	---	---	---	---	---
FEMA classification	None					
Native vegetation community	Coastal Plain bottomland riparian forest					
Percent composition exotic invasive vegetation -Post-Restoration	0%					

Regulatory Considerations

Regulation	Applicable?	Resolved?	Supporting Documentation
Waters of the United States - Section 404	X	X	USACE Nationwide Permit No.27 and DWQ 401 Water Quality Certification No. 3885.
Waters of the United States - Section 401	X	X	
Division of Land Quality (Dam Safety)	N/A	N/A	N/A
Endangered Species Act	X	X	Devils Racetrack Mitigation Plan; Wildlands determined "no effect" on Johnston County listed endangered species.
Historic Preservation Act	X	X	No historic resources were found to be impacted (letter from SHPO dated 7/20/2011).
Coastal Zone Management Act (CZMA)/Coastal Area Management Act (CAMA)	N/A	N/A	N/A
FEMA Floodplain Compliance	N/A	N/A	The project streams do not have an associated regulatory flooplaing; however the downstream end of Devil's Racetrack Creek is located within the floodwasy and flood fringe of the Neuse River (FEMA Zone AE, FIRM panel 1680).
Essential Fisheries Habitat	N/A	N/A	N/A

APPENDIX 2. Visual Assessment Data



WILDLANDS ENGINEERING

0 500 1,000 Feet

N

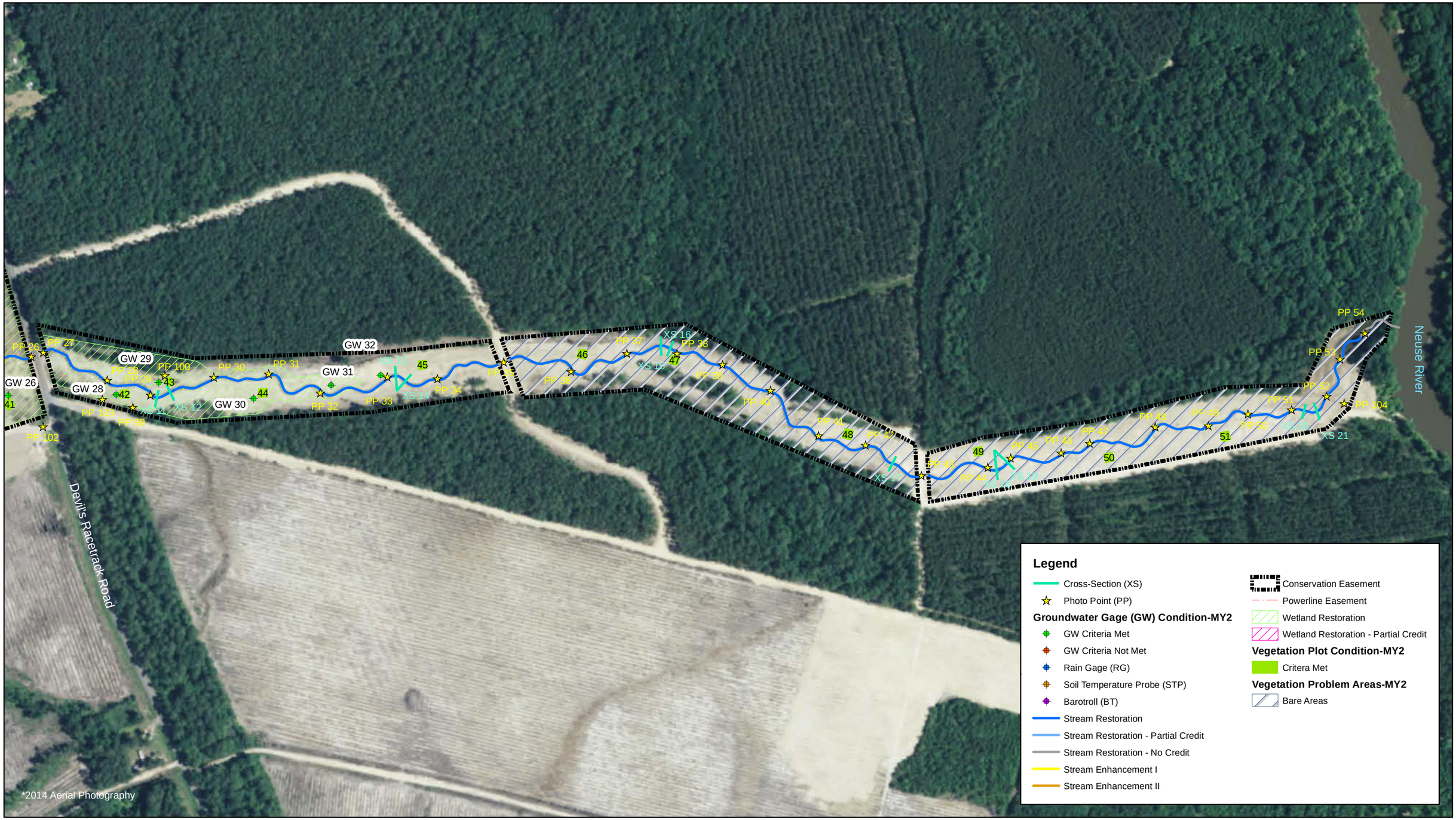
Figure 3.0 Integrated Current Condition Plan View (Key)
Devil's Racetrack Mitigation Site
NCDMS Project No. 95021
Monitoring Year 2 - 2015
Johnston County, NC

WILDLANDS ENGINEERING

0 250 500 Feet

N

Figure 3.1 Integrated Current Condition Plan View
(Sheet 1 of 2)
Devil's Racetrack Mitigation Site
NCDMS Project No. 95021
Monitoring Year 2 - 2015
Johnston County, NC



WILDLANDS ENGINEERING

0 250 500 Feet

N

Figure 3.2 Integrated Current Condition Plan View
(Sheet 2 of 2)
Devil's Racetrack Mitigation Site
NCDMS Project No. 95021
Monitoring Year 2 - 2015
Johnston County, NC

Table 5a. Visual Stream Morphology Stability Assessment Table

Devil's Racetrack Mitigation Site (NCDMS Project No. 95021)

Monitoring Year 2 - 2015

Devil's Racetrack (West) (5,211 LF)

Major Channel Category	Channel Sub-Category	Metric	Number Stable, Performing as Intended	Total Number in As-Built	Number of Unstable Segments	Amount of Unstable Footage	% Stable, Performing as Intended	Number with Stabilizing Woody Vegetation	Footage with Stabilizing Woody Vegetation	Adjust % for Stabilizing Woody Vegetation
1. Bed	**1. Vertical Stability (Riffle and Run units)**	Aggradation			0	0	100%			
		Degradation			0	0	100%			
	2. Riffle Condition	Texture/Substrate	74	74			100%			
	3. Meander Pool Condition	Depth Sufficient	74	74			100%			
		Length Appropriate	74	74			100%			
	4. Thalweg Position	Thalweg centering at upstream of meander bend (Run)	74	74			100%			
		Thalweg centering at downstream of meander bend (Glide)	74	74			100%			
2. Bank	**1. Scoured/Eroded**	Bank lacking vegetative cover resulting simply from poor growth and/or scour and erosion			0	0	100%	n/a	n/a	n/a
	2. Undercut	Banks undercut/overhanging to the extent that mass wasting appears likely. Does NOT include undercuts that are modest, appear sustainable and are providing habitat			0	0	100%	n/a	n/a	n/a
	3. Mass Wasting	Bank slumping, caving, or collapse			0	0	100%	n/a	n/a	n/a
				Totals	0	0	100%	n/a	n/a	n/a
3. Engineered Structures[1]	**1. Overall Integrity**	Structures physically intact with no dislodged boulders or logs	6	6			100%			
	2. Grade Control	Grade control structures exhibiting maintenance of grade across the sill	6	6			100%			
	2a. Piping	Structures lacking any substantial flow underneath sills or arms.	6	6			100%			
	3. Bank Protection	Bank erosion within the structures extent of influence does not exceed 15%	6	6			100%			
	4. Habitat	Pool forming structures maintaining ~Max Pool Depth : Bankfull Depth ≥ 1.6 Rootwads/logs providing some cover at baseflow	6	6			100%			

[1]Excludes constructed riffles since they are evaluated in section 1.

Table 5b. Visual Stream Morphology Stability Assessment Table

Devil's Racetrack Mitigation Site (NCDMS Project No. 95021)

Monitoring Year 2 - 2015

Devil's Racetrack (East) (5,547 LF)

Major Channel Category	Channel Sub-Category	Metric	Number Stable, Performing as Intended	Total Number in As-Built	Number of Unstable Segments	Amount of Unstable Footage	% Stable, Performing as Intended	Number with Stabilizing Woody Vegetation	Footage with Stabilizing Woody Vegetation	Adjust % for Stabilizing Woody Vegetation
1. Bed	1. Vertical Stability (Riffle and Run units)	Aggradation			0	0	100%			
		Degradation			0	0	100%			
	2. Riffle Condition	Texture/Substrate	85	85			100%			
	3. Meander Pool Condition	Depth Sufficient	85	85			100%			
		Length Appropriate	85	85			100%			
	4. Thalweg Position	Thalweg centering at upstream of meander bend (Run)	85	85			100%			
		Thalweg centering at downstream of meander bend (Glide)	85	85			100%			
2. Bank	1. Scoured/Eroded	Bank lacking vegetative cover resulting simply from poor growth and/or scour and erosion			0	0	100%	n/a	n/a	n/a
	2. Undercut	Banks undercut/overhanging to the extent that mass wasting appears likely. Does NOT include undercuts that are modest, appear sustainable and are providing habitat			0	0	100%	n/a	n/a	n/a
	3. Mass Wasting	Bank slumping, caving, or collapse			0	0	100%	n/a	n/a	n/a
				Totals	0	0	100%	n/a	n/a	n/a
3. Engineered Structures[1]	1. Overall Integrity	Structures physically intact with no dislodged boulders or logs	17	17			100%			
	2. Grade Control	Grade control structures exhibiting maintenance of grade across the sill	17	17			100%			
	2a. Piping	Structures lacking any substantial flow underneath sills or arms.	17	17			100%			
	3. Bank Protection	Bank erosion within the structures extent of influence does not exceed 15%	17	17			100%			
	4. Habitat	Pool forming structures maintaining ~Max Pool Depth : Bankfull Depth ≥ 1.6 Rootwads/logs providing some cover at baseflow	17	17			100%			

[1]Excludes constructed riffles since they are evaluated in section 1.

Table 5c. Visual Stream Morphology Stability Assessment Table

Devil's Racetrack Mitigation Site (NCDMS Project No. 95021)

Monitoring Year 2 - 2015

Southeast Branch (2,891 LF)

Major Channel Category	Channel Sub-Category	Metric	Number Stable, Performing as Intended	Total Number in As-Built	Number of Unstable Segments	Amount of Unstable Footage	% Stable, Performing as Intended	Number with Stabilizing Woody Vegetation	Footage with Stabilizing Woody Vegetation	Adjust % for Stabilizing Woody Vegetation
1. Bed	1. Vertical Stability (Riffle and Run units)	Aggradation			0	0	100%			
		Degradation			0	0	100%			
	2. Riffle Condition	Texture/Substrate	121	121			100%			
	3. Meander Pool Condition	Depth Sufficient	120	120			100%			
		Length Appropriate	120	120			100%			
	4. Thalweg Position	Thalweg centering at upstream of meander bend (Run)	120	120			100%			
		Thalweg centering at downstream of meander bend (Glide)	120	120			100%			
2. Bank	1. Scoured/Eroded	Bank lacking vegetative cover resulting simply from poor growth and/or scour and erosion			0	0	100%	n/a	n/a	n/a
	2. Undercut	Banks undercut/overhanging to the extent that mass wasting appears likely. Does NOT include undercuts that are modest, appear sustainable and are providing habitat			0	0	100%	n/a	n/a	n/a
	3. Mass Wasting	Bank slumping, caving, or collapse			0	0	100%	n/a	n/a	n/a
				Totals	0	0	100%	n/a	n/a	n/a
3. Engineered Structures[1]	1. Overall Integrity	Structures physically intact with no dislodged boulders or logs	67	67			100%			
	2. Grade Control	Grade control structures exhibiting maintenance of grade across the sill	67	67			100%			
	2a. Piping	Structures lacking any substantial flow underneath sills or arms.	67	67			100%			
	3. Bank Protection	Bank erosion within the structures extent of influence does not exceed 15%	67	67			100%			
	4. Habitat	Pool forming structures maintaining ~Max Pool Depth : Bankfull Depth ≥ 1.6 Rootwads/logs providing some cover at baseflow	67	67			100%			

[1]Excludes constructed riffles since they are evaluated in section 1.

Table 5d. Visual Stream Morphology Stability Assessment Table

Devil's Racetrack Mitigation Site (NCDMS Project No. 95021)

Monitoring Year 2 - 2015

Middle Branch (1,906 LF)

Major Channel Category	Channel Sub-Category	Metric	Number Stable, Performing as Intended	Total Number in As-Built	Number of Unstable Segments	Amount of Unstable Footage	% Stable, Performing as Intended	Number with Stabilizing Woody Vegetation	Footage with Stabilizing Woody Vegetation	Adjust % for Stabilizing Woody Vegetation
1. Bed	**1. Vertical Stability (Riffle and Run units)**	Aggradation			0	0	100%			
		Degradation			0	0	100%			
	2. Riffle Condition	Texture/Substrate	79	79			100%			
	3. Meander Pool Condition	Depth Sufficient	78	78			100%			
		Length Appropriate	78	78			100%			
	4. Thalweg Position	Thalweg centering at upstream of meander bend (Run)	78	78			100%			
		Thalweg centering at downstream of meander bend (Glide)	78	78			100%			
2. Bank	**1. Scoured/Eroded**	Bank lacking vegetative cover resulting simply from poor growth and/or scour and erosion			0	0	100%	n/a	n/a	n/a
	2. Undercut	Banks undercut/overhanging to the extent that mass wasting appears likely. Does NOT include undercuts that are modest, appear sustainable and are providing habitat			0	0	100%	n/a	n/a	n/a
	3. Mass Wasting	Bank slumping, caving, or collapse			0	0	100%	n/a	n/a	n/a
				Totals	0	0	100%	n/a	n/a	n/a
3. Engineered Structures[1]	**1. Overall Integrity**	Structures physically intact with no dislodged boulders or logs	52	52			100%			
	2. Grade Control	Grade control structures exhibiting maintenance of grade across the sill	52	52			100%			
	2a. Piping	Structures lacking any substantial flow underneath sills or arms.	52	52			100%			
	3. Bank Protection	Bank erosion within the structures extent of influence does not exceed 15%	52	52			100%			
	4. Habitat	Pool forming structures maintaining ~Max Pool Depth : Bankfull Depth ≥ 1.6 Rootwads/logs providing some cover at baseflow	52	52			100%			

[1]Excludes constructed riffles since they are evaluated in section 1.

Table 5e. Visual Stream Morphology Stability Assessment Table

Devil's Racetrack Mitigation Site (NCDMS Project No. 95021)

Monitoring Year 2 - 2015

Southwest Branch (1,155 LF)

Major Channel Category	Channel Sub-Category	Metric	Number Stable, Performing as Intended	Total Number in As-Built	Number of Unstable Segments	Amount of Unstable Footage	% Stable, Performing as Intended	Number with Stabilizing Woody Vegetation	Footage with Stabilizing Woody Vegetation	Adjust % for Stabilizing Woody Vegetation
1. Bed	1. Vertical Stability (Riffle and Run units)	Aggradation			0	0	100%			
		Degradation			0	0	100%			
	2. Riffle Condition	Texture/Substrate	48	48			100%			
	3. Meander Pool Condition	Depth Sufficient	47	47			100%			
		Length Appropriate	47	47			100%			
	4. Thalweg Position	Thalweg centering at upstream of meander bend (Run)	47	47			100%			
		Thalweg centering at downstream of meander bend (Glide)	47	47			100%			
2. Bank	1. Scoured/Eroded	Bank lacking vegetative cover resulting simply from poor growth and/or scour and erosion			0	0	100%	n/a	n/a	n/a
	2. Undercut	Banks undercut/overhanging to the extent that mass wasting appears likely. Does NOT include undercuts that are modest, appear sustainable and are providing habitat			0	0	100%	n/a	n/a	n/a
	3. Mass Wasting	Bank slumping, caving, or collapse			0	0	100%	n/a	n/a	n/a
				Totals	0	0	100%	n/a	n/a	n/a
3. Engineered Structures[1]	1. Overall Integrity	Structures physically intact with no dislodged boulders or logs	28	28			100%			
	2. Grade Control	Grade control structures exhibiting maintenance of grade across the sill	28	28			100%			
	2a. Piping	Structures lacking any substantial flow underneath sills or arms.	28	28			100%			
	3. Bank Protection	Bank erosion within the structures extent of influence does not exceed 15%	28	28			100%			
	4. Habitat	Pool forming structures maintaining ~Max Pool Depth : Bankfull Depth ≥ 1.6 Rootwads/logs providing some cover at baseflow	28	28			100%			

[1]Excludes constructed riffles since they are evaluated in section 1.

Table 5f. Visual Stream Morphology Stability Assessment Table

Devil's Racetrack Mitigation Site (NCDMS Project No. 95021)

Monitoring Year 2 - 2015

North Branch (2,418 LF)

Major Channel Category	Channel Sub-Category	Metric	Number Stable, Performing as Intended	Total Number in As-Built	Number of Unstable Segments	Amount of Unstable Footage	% Stable, Performing as Intended	Number with Stabilizing Woody Vegetation	Footage with Stabilizing Woody Vegetation	Adjust % for Stabilizing Woody Vegetation
1. Bed	1. Vertical Stability (Riffle and Run units)	Aggradation			0	0	100%			
		Degradation			0	0	100%			
	2. Riffle Condition	Texture/Substrate	35	35			100%			
	3. Meander Pool Condition	Depth Sufficient	34	34			100%			
		Length Appropriate	34	34			100%			
	4. Thalweg Position	Thalweg centering at upstream of meander bend (Run)	34	34			100%			
		Thalweg centering at downstream of meander bend (Glide)	34	34			100%			
2. Bank	1. Scoured/Eroded	Bank lacking vegetative cover resulting simply from poor growth and/or scour and erosion			0	0	100%	n/a	n/a	n/a
	2. Undercut	Banks undercut/overhanging to the extent that mass wasting appears likely. Does NOT include undercuts that are modest, appear sustainable and are providing habitat			0	0	100%	n/a	n/a	n/a
	3. Mass Wasting	Bank slumping, caving, or collapse			0	0	100%	n/a	n/a	n/a
				Totals	0	0	100%	n/a	n/a	n/a
3. Engineered Structures[1]	1. Overall Integrity	Structures physically intact with no dislodged boulders or logs	10	10			100%			
	2. Grade Control	Grade control structures exhibiting maintenance of grade across the sill	10	10			100%			
	2a. Piping	Structures lacking any substantial flow underneath sills or arms.	10	10			100%			
	3. Bank Protection	Bank erosion within the structures extent of influence does not exceed 15%	10	10			100%			
	4. Habitat	Pool forming structures maintaining ~Max Pool Depth : Bankfull Depth ≥ 1.6 Rootwads/logs providing some cover at baseflow	10	10			100%			

[1]Excludes constructed riffles since they are evaluated in section 1.

Table 6. Vegetation Condition Assessment Table
Devil's Racetrack Mitigation Site (NCDMS Project No. 95021)
Monitoring Year 2 - 2015

Planted Acreage **96**

Vegetation Category	Definitions	Mapping Threshold (Ac)	Number of Polygons	Combined Acreage	% of Planted Acreage
Bare Areas	Very limited cover of both woody and herbaceous material	0.1	2	14.9	15.5%
Low Stem Density Areas	Woody stem densities clearly below target levels based on MY3, 4, or 5 stem count criteria.	0.1	0	0.0	0.0%
		Total	**2**	**14.9**	**15.5%**
Areas of Poor Growth Rates or Vigor	Areas with woody stems of a size class that are obviously small given the monitoring year.	0.25 Ac	0	0	0%
		Cumulative Total	**2**	**14.9**	**15.5%**

Easement Acreage **96**

Vegetation Category	Definitions	Mapping Threshold (SF)	Number of Polygons	Combined Acreage	% of Planted Acreage
Invasive Areas of Concern	Areas of points (if too small to render as polygons at map scale).	1,000	0	0	0.0%
Easement Encroachment Areas	Areas of points (if too small to render as polygons at map scale).	none	0	0	0%

STREAM PHOTOGRAPHS
Devil's Racetrack West
Monitoring Year 2

	
PHOTO POINT 1 – looking upstream *(04/06/2015)*	**PHOTO POINT 1** – looking downstream *(04/06/2015)*
	
PHOTO POINT 2 – looking upstream *(04/06/2015)*	**PHOTO POINT 2** – looking downstream *(04/06/2015)*

	
PHOTO POINT 3 – looking upstream *(04/06/2015)*	**PHOTO POINT 3** – looking downstream *(04/06/2015)*
	
PHOTO POINT 4 – looking upstream *(04/06/2015)*	**PHOTO POINT 4** – looking downstream *(04/06/2015)*
	
PHOTO POINT 5 – looking upstream *(04/06/2015)*	**PHOTO POINT 5** – looking downstream *(04/06/2015)*

	
PHOTO POINT 6 – looking upstream *(04/06/2015)*	**PHOTO POINT 6** – looking downstream *(04/06/2015)*
	
PHOTO POINT 7 – looking upstream *(04/06/2015)*	**PHOTO POINT 7** – looking downstream *(04/06/2015)*
	
PHOTO POINT 8 – looking upstream *(04/06/2015)*	**PHOTO POINT 8** – looking downstream *(04/06/2015)*

	
PHOTO POINT 9 – looking upstream *(04/06/2015)*	**PHOTO POINT 9** – looking downstream *(04/06/2015)*
	
PHOTO POINT 10 – looking upstream *(04/06/2015)*	**PHOTO POINT 10** – looking downstream *(04/06/2015)*
	
PHOTO POINT 11 – looking upstream *(04/06/2015)*	**PHOTO POINT 11** – looking downstream *(04/06/2015)*

	
PHOTO POINT 12 – looking upstream *(04/06/2015)*	**PHOTO POINT 12** – looking downstream *(04/06/2015)*
	
PHOTO POINT 13 – looking upstream *(04/06/2015)*	**PHOTO POINT 13** – looking downstream *(04/06/2015)*
	
PHOTO POINT 14 – looking upstream *(04/06/2015)*	**PHOTO POINT 14** – looking downstream *(04/06/2015)*

	
PHOTO POINT 15 – looking upstream *(04/06/2015)*	**PHOTO POINT 15** – looking downstream *(04/06/2015)*
	
PHOTO POINT 16 – looking upstream *(04/06/2015)*	**PHOTO POINT 16** – looking downstream *(04/06/2015)*
	
PHOTO POINT 17 – looking upstream *(04/06/2015)*	**PHOTO POINT 17** – looking downstream *(04/06/2015)*

	
PHOTO POINT 18 – looking upstream *(04/06/2015)*	**PHOTO POINT 18** – looking downstream *(04/06/2015)*
	
PHOTO POINT 19 – looking upstream *(04/06/2015)*	**PHOTO POINT 19** – looking downstream *(04/06/2015)*
	
PHOTO POINT 20 – looking upstream *(04/06/2015)*	**PHOTO POINT 20** – looking downstream *(04/06/2015)*

	
PHOTO POINT 21 – looking upstream *(04/06/2015)*	**PHOTO POINT 21** – looking downstream *(04/06/2015)*
	
PHOTO POINT 22 – looking upstream *(04/06/2015)*	**PHOTO POINT 22** – looking downstream *(04/06/2015)*
	
PHOTO POINT 23 – looking upstream *(04/06/2015)*	**PHOTO POINT 23** – looking downstream *(04/06/2015)*

PHOTO POINT 24 – looking upstream *(04/06/2015)*

PHOTO POINT 24 – looking downstream *(04/06/2015)*

PHOTO POINT 25 – looking upstream *(04/06/2015)*

PHOTO POINT 25 – looking downstream *(04/06/2015)*

PHOTO POINT 26 *(04/06/2015)*

STREAM PHOTOGRAPHS
Devil's Racetrack East
Monitoring Year 2

PHOTO POINT 27 *(04/23/2015)*

PHOTO POINT 28 – looking upstream *(04/23/2015)*

PHOTO POINT 28 – looking downstream *(04/23/2015)*

	
PHOTO POINT 29 – looking upstream *(04/23/2015)*	**PHOTO POINT 29** – looking downstream *(04/23/2015)*
	
PHOTO POINT 30 – looking upstream *(05/22/2015)*	**PHOTO POINT 30** – looking downstream *(05/22/2015)*
	
PHOTO POINT 31 – looking upstream*(04/23/2015)*	**PHOTO POINT 31** – looking downstream*(04/23/2015)*

	
PHOTO POINT 32 – looking upstream *(04/23/2015)*	**PHOTO POINT 32** – looking downstream*(04/23/2015)*
	
PHOTO POINT 33 – looking upstream *(04/23/2015)*	**PHOTO POINT 33** – looking downstream *(04/23/2015)*
	
PHOTO POINT 34 – looking upstream *(04/23/2015)*	**PHOTO POINT 34** – looking downstream *(04/23/2015)*

	
PHOTO POINT 35 – looking upstream *(04/23/2015)*	**PHOTO POINT 35** – looking downstream *(04/23/2015)*
	
PHOTO POINT 36 – looking upstream *(04/23/2015)*	**PHOTO POINT 36** – looking downstream *(04/23/2015)*
	
PHOTO POINT 37 – looking upstream *(04/23/2015)*	**PHOTO POINT 37** – looking downstream *(04/23/2015)*

	
PHOTO POINT 38 – looking upstream *(04/23/2015)*	**PHOTO POINT 38** – looking downstream *(04/23/2015)*
	
PHOTO POINT 39 – looking upstream *(04/23/2015)*	**PHOTO POINT 39** – looking downstream *(04/23/2015)*
	
PHOTO POINT 40 – looking upstream *(04/23/2015)*	**PHOTO POINT 40** – looking downstream *(04/23/2015)*

	
PHOTO POINT 41 – looking upstream *(04/23/2015)*	**PHOTO POINT 41** – looking downstream *(04/23/2015)*
	
PHOTO POINT 42 – looking upstream *(04/23/2015)*	**PHOTO POINT 42** – looking downstream *(04/23/2015)*
	
PHOTO POINT 43 – looking upstream *(04/23/2015)*	**PHOTO POINT 43** – looking downstream *(04/23/2015)*

	
PHOTO POINT 44 – looking upstream *(04/23/2015)*	**PHOTO POINT 44** – looking downstream *(04/23/2015)*
	
PHOTO POINT 45 – looking upstream *(04/23/2015)*	**PHOTO POINT 45** – looking downstream *(04/23/2015)*
	
PHOTO POINT 46 – looking upstream *(04/23/2015)*	**PHOTO POINT 46** – looking downstream *(04/23/2015)*

	
PHOTO POINT 47 – looking upstream *(04/23/2015)*	**PHOTO POINT 47** – looking downstream *(04/23/2015)*
	
PHOTO POINT 48 – looking upstream *(04/23/2015)*	**PHOTO POINT 48** – looking downstream *(04/23/2015)*
	
PHOTO POINT 49 – looking upstream *(04/23/2015)*	**PHOTO POINT 49** – looking downstream *(04/23/2015)*

	
PHOTO POINT 50 – looking upstream *(04/23/2015)*	**PHOTO POINT 50** – looking downstream *(04/23/2015)*
	
PHOTO POINT 51 – looking upstream *(04/23/2015)*	**PHOTO POINT 51** – looking downstream *(04/23/2015)*
	
PHOTO POINT 52 – looking upstream *(04/23/2015)*	**PHOTO POINT 52** – looking downstream *(04/23/2015)*

	
PHOTO POINT 53 – looking upstream *(05/26/2015)*	**PHOTO POINT 53** – looking downstream *(05/26/2015)*
	
PHOTO POINT 54 – looking upstream *(05/26/2015)*	**PHOTO POINT 54 –** looking downstream *(05/26/2015)*

STREAM PHOTOGRAPHS
Southwest Branch
Monitoring Year 2

	
PHOTO POINT 55 – looking upstream *(04/14/2015)*	**PHOTO POINT 55** – looking downstream *(04/14/2015)*
	
PHOTO POINT 56 – looking upstream *(04/14/2015)*	**PHOTO POINT 56** – looking downstream *(04/14/2015)*

	
PHOTO POINT 57 – looking upstream *(04/06/2015)*	**PHOTO POINT 57** – looking downstream *(04/06/2015)*
	
PHOTO POINT 58 – looking upstream *(04/06/2015)*	**PHOTO POINT 58** – looking downstream *(04/06/2015)*
	
PHOTO POINT 59 – looking upstream *(04/06/2015)*	**PHOTO POINT 59** – looking downstream *(04/06/2015)*

	
PHOTO POINT 60 – looking upstream *(04/06/2015)*	**PHOTO POINT 60** – looking downstream *(04/06/2015)*

STREAM PHOTOGRAPHS
Middle Branch
Monitoring Year 2

	
PHOTO POINT 61 – looking upstream *(04/06/2015)*	**PHOTO POINT 61** – looking downstream *(04/06/2015)*
	
PHOTO POINT 62 – looking upstream *(04/06/2015)*	**PHOTO POINT 62** – looking downstream *(04/06/2015)*

	
PHOTO POINT 63 – looking upstream *(04/06/2015)*	**PHOTO POINT 63** – looking downstream *(04/06/2015)*
	
PHOTO POINT 64 – looking upstream *(04/06/2015)*	**PHOTO POINT 64** – looking downstream *(04/06/2015)*
	
PHOTO POINT 65 – looking upstream *(04/06/2015)*	**PHOTO POINT 65** – looking downstream *(04/06/2015)*

	
PHOTO POINT 66 – looking upstream *(04/06/2015)*	**PHOTO POINT 66** – looking downstream *(04/06/2015)*
	
PHOTO POINT 67 – looking upstream *(04/06/2015)*	**PHOTO POINT 67** – looking downstream *(04/06/2015)*
	
PHOTO POINT 68 – looking upstream *(04/06/2015)*	**PHOTO POINT 68** – looking downstream *(04/06/2015)*

	
PHOTO POINT 69 – looking upstream *(04/06/2015)*	**PHOTO POINT 69** – looking downstream *(04/06/2015)*

STREAM PHOTOGRAPHS
Southeast Branch
Monitoring Year 2

	
PHOTO POINT 70 – looking upstream *(04/23/2015)*	**PHOTO POINT 70** – looking downstream *(04/23/2015)*
	
PHOTO POINT 71 – looking upstream *(04/23/2015)*	**PHOTO POINT 71** – looking downstream *(04/23/2015)*

	
PHOTO POINT 72 – looking upstream *(04/23/2015)*	**PHOTO POINT 72** – looking downstream *(04/23/2015)*
	
PHOTO POINT 73 – looking upstream *(04/14/2015)*	**PHOTO POINT 73** – looking downstream *(04/14/2015)*
	
PHOTO POINT 74 – looking upstream *(04/14/2015)*	**PHOTO POINT 74** – looking downstream *(04/14/2015)*

	
PHOTO POINT 75 – looking upstream *(04/14/2015)*	**PHOTO POINT 75** – looking downstream *(04/14/2015)*
	
PHOTO POINT 76 – looking upstream *(04/14/2015)*	**PHOTO POINT 76** – looking downstream *(04/14/2015)*
	
PHOTO POINT 77 – looking upstream *(04/14/2015)*	**PHOTO POINT 77** – looking downstream *(04/14/2015)*

	
PHOTO POINT 78 – looking upstream *(04/14/2015)*	**PHOTO POINT 78** – looking downstream *(04/14/2015)*
	
PHOTO POINT 79 – looking upstream *(04/14/2015)*	**PHOTO POINT 79** – looking downstream *(04/14/2015)*
	
PHOTO POINT 80 – looking upstream *(04/23/2015)*	**PHOTO POINT 80** – looking downstream *(04/23/2015)*

	
PHOTO POINT 81 – looking upstream *(04/23/2015)*	**PHOTO POINT 81** – looking downstream *(04/23/2015)*
	
PHOTO POINT 82 – looking upstream *(04/23/2015)*	**PHOTO POINT 82** – looking downstream *(04/23/2015)*
	
PHOTO POINT 83 – looking upstream *(04/23/2015)*	**PHOTO POINT 83** – looking downstream *(04/23/2015)*

STREAM PHOTOGRAPHS
North Branch
Monitoring Year 2

	
PHOTO POINT 84 – looking upstream *(04/06/2015)*	**PHOTO POINT 84** – looking downstream *(04/06/2015)*
	
PHOTO POINT 85 – looking upstream *(04/06/2015)*	**PHOTO POINT 85** – looking downstream *(04/06/2015)*

	
PHOTO POINT 86 – looking upstream *(04/06/2015)*	**PHOTO POINT 86** – looking downstream *(04/06/2015)*
	
PHOTO POINT 87 – looking upstream *(04/06/2015)*	**PHOTO POINT 87** – looking downstream *(04/06/2015)*
	
PHOTO POINT 88 – looking upstream *(04/06/2015)*	**PHOTO POINT 88** – looking downstream *(04/06/2015)*

	
PHOTO POINT 89 – looking upstream *(04/06/2015)*	**PHOTO POINT 89** – looking downstream *(04/06/2015)*
	
PHOTO POINT 90 – looking upstream *(04/06/2015)*	**PHOTO POINT 90** – looking downstream *(04/06/2015)*
	
PHOTO POINT 91 – looking upstream *(04/06/2015)*	**PHOTO POINT 91** – looking downstream *(04/06/2015)*

	
PHOTO POINT 92 – looking upstream *(04/06/2015)*	**PHOTO POINT 92** – looking downstream *(04/06/2015)*
	
PHOTO POINT 93 – looking upstream *(04/06/2015)*	**PHOTO POINT 93** – looking downstream *(04/06/2015)*
	
PHOTO POINT 94 – looking upstream *(04/06/2015)*	**PHOTO POINT 94** – looking downstream *(04/06/2015)*

VEGETATION PHOTOGRAPHS
Devil's Racetrack
Monitoring Year 2

	
VEG PLOT 1 *(06/02/2015)*	**VEG PLOT 2** *(06/02/2015)*
	
VEG PLOT 3 *(06/02/2015)*	**VEG PLOT 4** *(06/02/2015)*

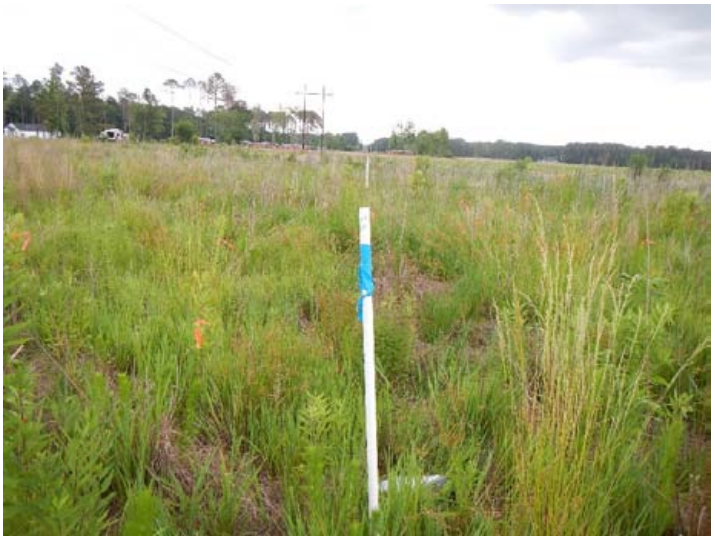
VEG PLOT 5 *(06/02/2015)*

VEG PLOT 6 *(06/02/2015)*

VEG PLOT 7 *(06/02/2015)*

VEG PLOT 8 *(06/02/2015)*

VEG PLOT 9 *(06/02/2015)*



VEG PLOT 10 *(06/02/2015)*

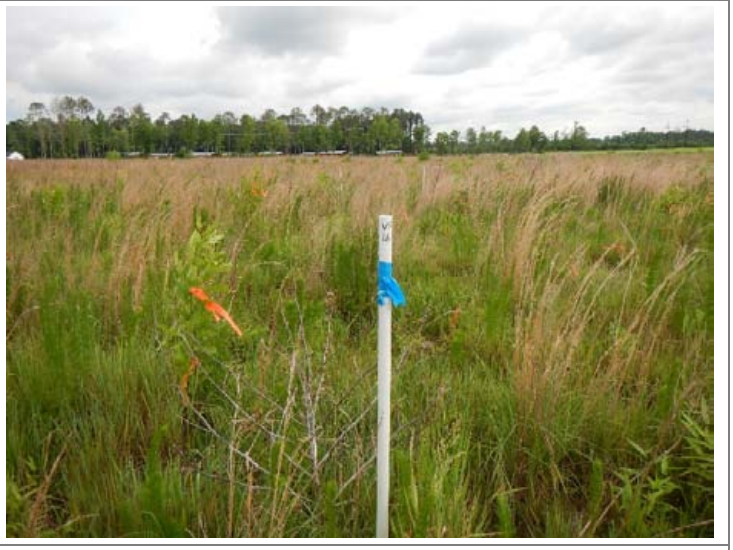
VEG PLOT 11 *(06/02/2015)*

VEG PLOT 12 *(06/02/2015)*

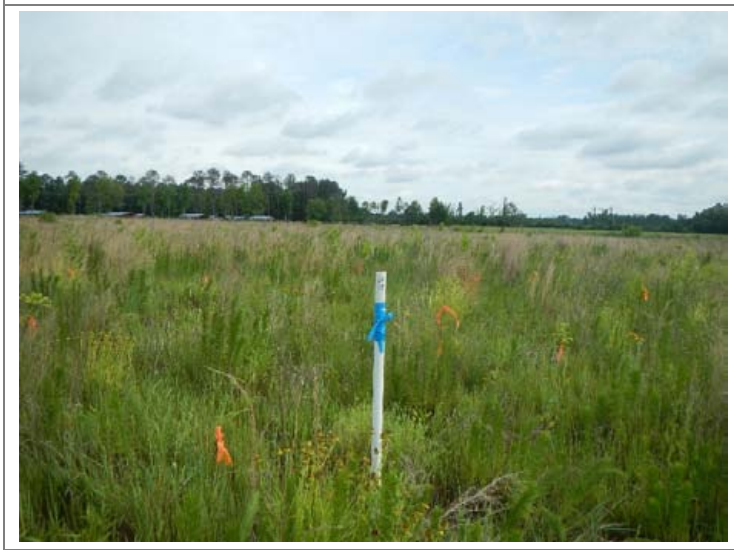
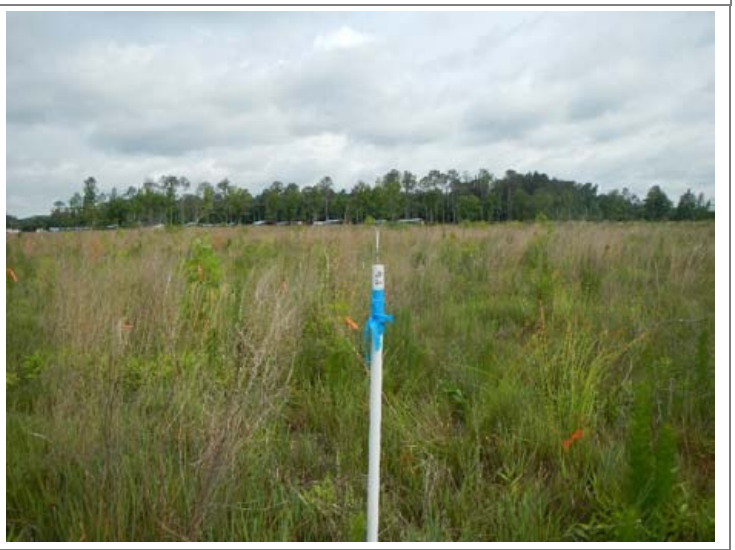
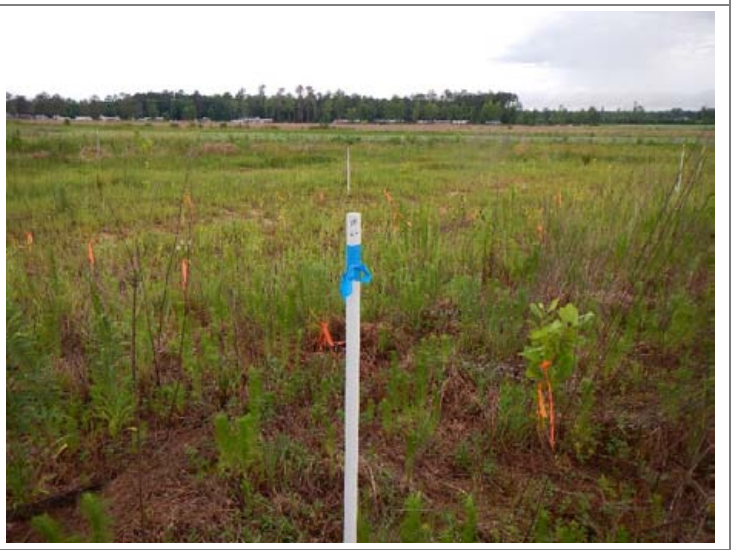
VEG PLOT 13 *(06/02/2015)*

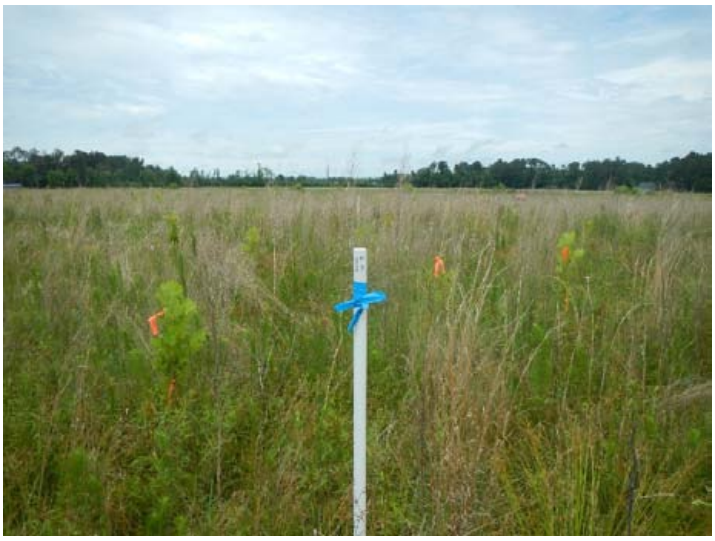
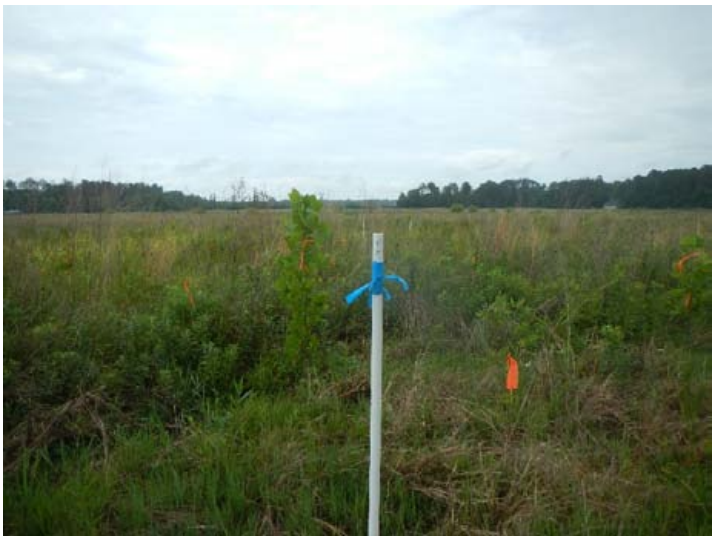
VEG PLOT 14 *(06/02/2015)*

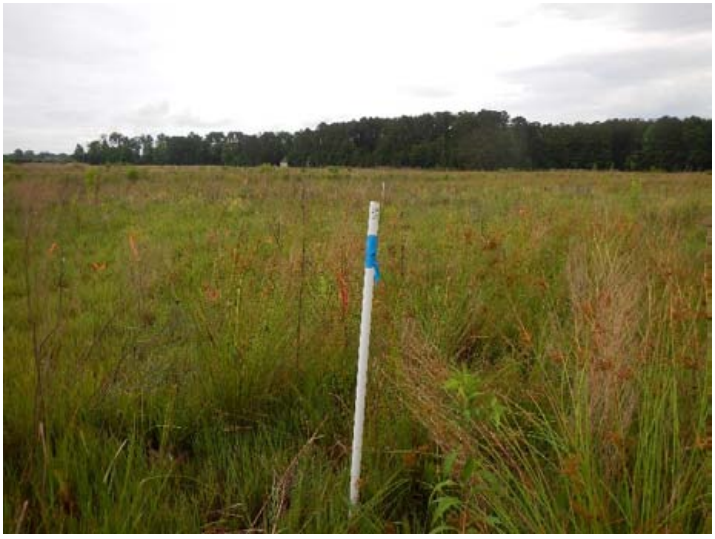
VEG PLOT 15 *(06/02/2015)*



VEG PLOT 16 *(06/02/2015)*

	
VEG PLOT 17 *(06/02/2015)*	**VEG PLOT 18** *(06/02/2015)*
	
VEG PLOT 19 *(06/02/2015)*	**VEG PLOT 20** *(06/02/2015)*
	
VEG PLOT 21 *(06/02/2015)*	**VEG PLOT 22** *(06/02/2015)*

	
VEG PLOT 23 *(06/02/2015)*	**VEG PLOT 24** *(06/02/2015)*
	
VEG PLOT 25 *(06/02/2015)*	**VEG PLOT 26** *(06/02/2015)*
	
VEG PLOT 27 *(06/02/2015)*	**VEG PLOT 28** *(06/02/2015)*



VEG PLOT 29 *(06/02/2015)*

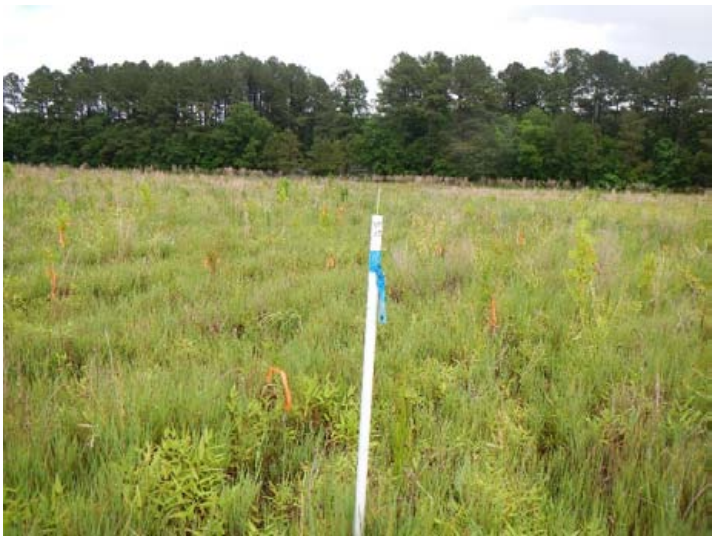
VEG PLOT 30 *(06/02/2015)*

VEG PLOT 31 *(06/02/2015)*

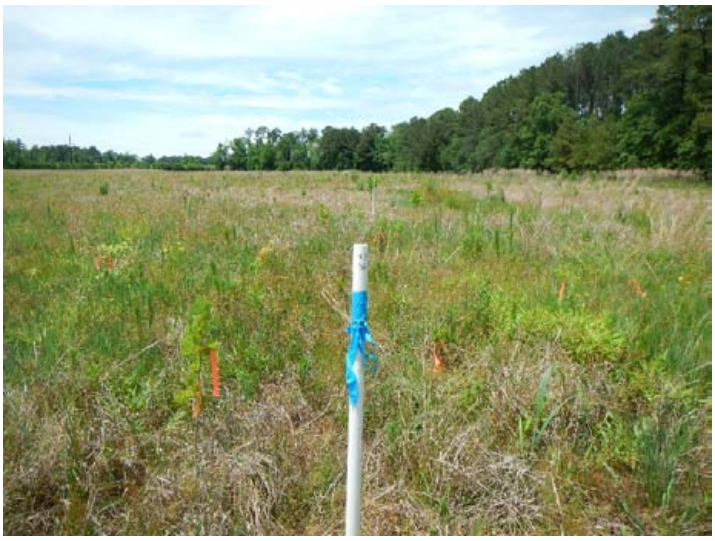
VEG PLOT 32 *(06/02/2015)*

VEG PLOT 33 *(06/02/2015)*

VEG PLOT 34 *(06/02/2015)*

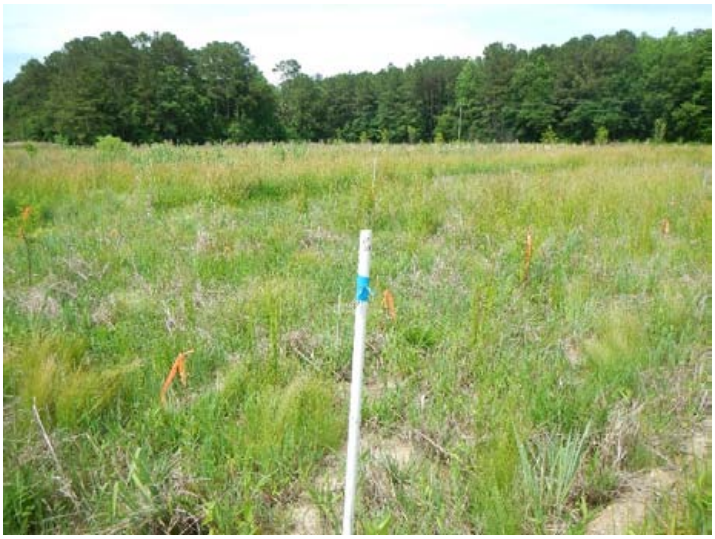


VEG PLOT 35 *(06/02/2015)*

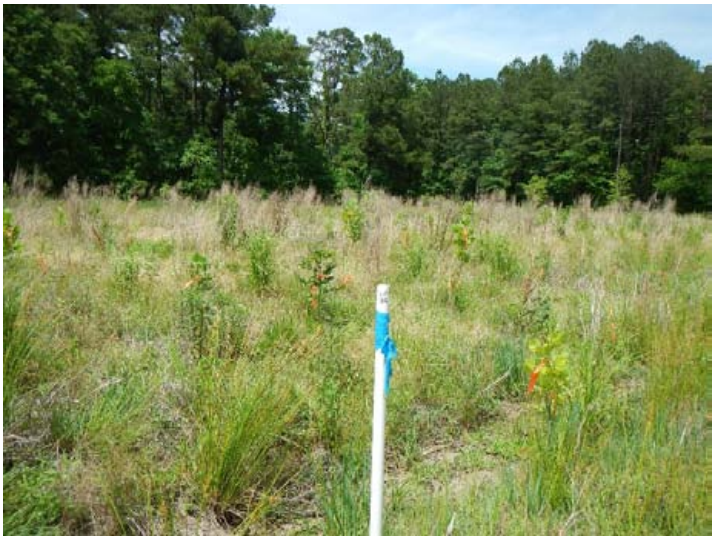


VEG PLOT 36 *(06/02/2015)*

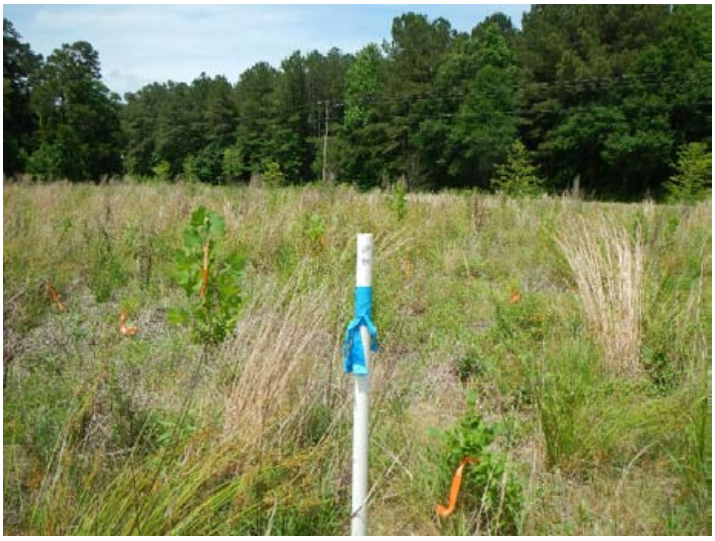
VEG PLOT 37 *(06/02/2015)*



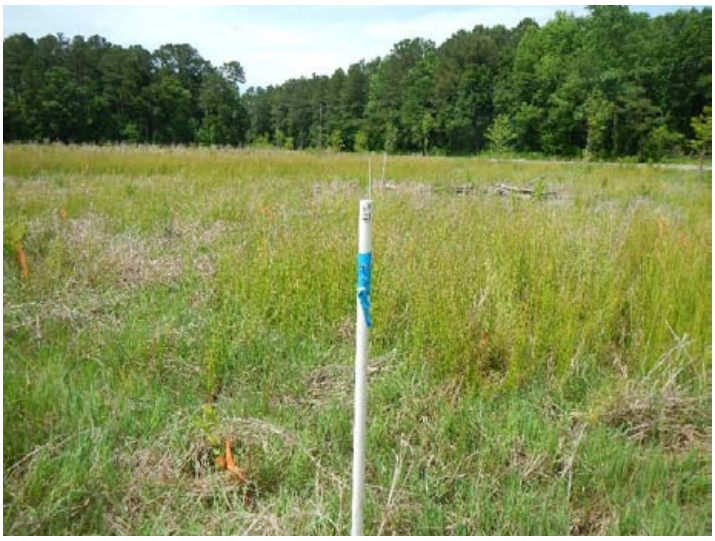
VEG PLOT 38 *(06/02/2015)*



VEG PLOT 39 *(06/02/2015)*



VEG PLOT 40 *(06/02/2015)*



VEG PLOT 41 *(06/02/2015)*

VEG PLOT 42 *(06/18/2015)*

VEG PLOT 43 *(06/18/2015)*

VEG PLOT 44 *(06/18/2015)*

VEG PLOT 45 *(06/18/2015)*

VEG PLOT 46 *(06/18/2015)*

VEG PLOT 47 *(06/18/2015)*

VEG PLOT 48 *(06/18/2015)*

VEG PLOT 49 *(06/18/2015)*

VEG PLOT 50 *(06/18/2015)*

VEG PLOT 51 *(06/18/2015)*

APPENDIX 3. Vegetation Plot Data

Table 7. Vegetation Plot Criteria Attainment
Devil's Racetrack Mitigation Site (NCDMS Project No. 95021)
Monitoring Year 2 - 2015

Plot	MY2 Success Criteria Met (Y/N)	Tract Mean
1	Y	
2	Y	
3	Y	
4	Y	
5	Y	
6	Y	
7	Y	
8	Y	
9	Y	
10	Y	
11	Y	
12	Y	
13	Y	
14	Y	
15	Y	
16	Y	
17	Y	
18	Y	
19	Y	
20	Y	
21	Y	
22	Y	
23	Y	
24	Y	
25	Y	
26	Y	100%
27	Y	
28	Y	
29	Y	
30	Y	
31	Y	
32	Y	
33	Y	
34	Y	
35	Y	
36	Y	
37	Y	
38	Y	
39	Y	
40	Y	
41	Y	
42	Y	
43	Y	
44	Y	
45	Y	
46	Y	
47	Y	
48	Y	
49	Y	
50	Y	
51	Y	

Table 8. CVS Vegetation Table - Metadata

Devil's Racetrack Mitigation Site (NCDMS Project No. 95021)

Monitoring Year 2 - 2015

Database name	Devils Racetrack MY2 cvs-eep-entrytool-v2.3.1.mdb
Database location	F:\Projects\005-02129 Devil's Racetrack\Monitoring\Monitoring Year 2\Vegetation Assessment
Computer name	JASON-PC
File size	52690944
DESCRIPTION OF WORKSHEETS IN THIS DOCUMENT----------	
Metadata	Description of database file, the report worksheets, and a summary of project(s) and project data.
Proj, planted	Each project is listed with its PLANTED stems per acre, for each year. This excludes live stakes.
Proj, total stems	Each project is listed with its TOTAL stems per acre, for each year. This includes live stakes, all planted stems, and all natural/volunteer stems.
Plots	List of plots surveyed with location and summary data (live stems, dead stems, missing, etc.).
Vigor	Frequency distribution of vigor classes for stems for all plots.
Vigor by Spp	Frequency distribution of vigor classes listed by species.
Damage	List of most frequent damage classes with number of occurrences and percent of total stems impacted by each.
Damage by Spp	Damage values tallied by type for each species.
Damage by Plot	Damage values tallied by type for each plot.
Planted Stems by Plot and Spp	A matrix of the count of PLANTED living stems of each species for each plot; dead and missing stems are excluded.
ALL Stems by Plot and spp	A matrix of the count of total living stems of each species (planted and natural volunteers combined) for each plot; dead and missing stems are excluded.
PROJECT SUMMARY----------	
Project Code	95021
project Name	Devils Racetrack Mitigation Site
Description	Stream and Wetland Mitigation
River Basin	Neuse
Sampled Plots	51

Table 9. Planted and Total Stem Counts

Devil's Racetrack Mitigation Site (NCDMS Project Code 95021)

Monitoring Year 2 - 2015

			Current Plot Data (MY2 - 6/2015)														
			95021-01-0001			95021-01-0002			95021-01-0003			95021-01-0004			95021-01-0005		
Scientific Name	**Common Name**	**Species Type**	**PnoLS**	**P-all**	**T**	**PnoLS**	**P-all**	**T**	**PnoLS**	**P-all**	**T**	**PnoLS**	**P-all**	**T**	**PnoLS**	**P-all**	**T**
Acer rubrum	red maple	Tree															
Betula nigra	river birch	Tree	1	1	1	1	1	1	3	3	3	2	2	2	2	2	2
Cephalanthus occidentalis	common buttonbush	Shrub															
Fraxinus pennsylvanica	green ash	Tree	3	3	3	4	4	4	3	3	3	1	1	1	2	2	2
Liquidambar styraciflua	sweetgum	Tree						20			6			20			
Liriodendron tulipifera	tuliptree	Tree															
Nyssa biflora	swamp tupelo	Tree				1	1	1	1	1	1						
Nyssa sylvatica	blackgum	Tree	3	3	3	1	1	1	4	4	4						
Platanus occidentalis	American sycamore	Tree	2	2	2	2	2	2	2	2	2	3	3	3			
Quercus michauxii	swamp chestnut oak	Tree	3	3	3							2	2	2	3	3	3
Quercus pagoda	cherrybark oak	Tree										1	1	1	1	1	1
Quercus phellos	willow oak	Tree	3	3	3	5	5	5	1	1	1	2	2	2	2	2	2
Quercus rubra	northern red oak	Tree															
Salix sericea	silky willow	Shrub															
Taxodium distichum	bald cypress	Tree	2	2	2	3	3	3	3	3	3	3	3	3	4	4	4
		Stem count	17	17	17	17	17	37	17	17	23	14	14	34	14	14	14
		size (ares)		1			1			1			1			1	
		size (ACRES)		0.02			0.02			0.02			0.02			0.02	
		Species count	7	7	7	7	7	8	7	7	8	7	7	8	6	6	6
		Stems per ACRE	688	688	688	688	688	1497	688	688	930.8	566.6	566.6	1376	566.6	566.6	566.6

Color Coding for Table

Exceeds requirements by 10%

Exceeds requirements, but by less than 10%

Fails to meet requirements, by less than 10%

Fails to meet requirements by more than 10%

Volunteers

PnoLS: Number of Planted stems excluding live stakes

P-all: Number of planted stems including live stakes,

T: Total Stems

Table 9. Planted and Total Stem Counts

Devil's Racetrack Mitigation Site (NCDMS Project Code 95021)

Monitoring Year 2 - 2015

			Current Plot Data (MY2 - 6/2015)														
			95021-01-0006			95021-01-0007			95021-01-0008			95021-01-0009			95021-01-0010		
Scientific Name	**Common Name**	**Species Type**	**PnoLS**	**P-all**	**T**	**PnoLS**	**P-all**	**T**	**PnoLS**	**P-all**	**T**	**PnoLS**	**P-all**	**T**	**PnoLS**	**P-all**	**T**
Acer rubrum	red maple	Tree															
Betula nigra	river birch	Tree	5	5	5	6	6	6	2	2	2	2	2	2	1	1	1
Cephalanthus occidentalis	common buttonbush	Shrub															
Fraxinus pennsylvanica	green ash	Tree	2	2	2	1	1	1	4	4	4	1	1	1	3	3	3
Liquidambar styraciflua	sweetgum	Tree			15												
Liriodendron tulipifera	tuliptree	Tree				7	7	7									
Nyssa biflora	swamp tupelo	Tree										1	1	1			
Nyssa sylvatica	blackgum	Tree															
Platanus occidentalis	American sycamore	Tree	2	2	2	2	2	2	3	3	3	5	5	5	5	5	5
Quercus michauxii	swamp chestnut oak	Tree	1	1	1				2	2	2	1	1	1	1	1	1
Quercus pagoda	cherrybark oak	Tree							1	1	1						
Quercus phellos	willow oak	Tree	1	1	1				1	1	1	2	2	2	2	2	2
Quercus rubra	northern red oak	Tree															
Salix sericea	silky willow	Shrub															
Taxodium distichum	bald cypress	Tree	5	5	5				4	4	4	5	5	5	3	3	3
		Stem count	16	16	31	16	16	16	17	17	17	17	17	17	15	15	15
		size (ares)		1			1			1			1			1	
		size (ACRES)		0.02			0.02			0.02			0.02			0.02	
		Species count	6	6	7	4	4	4	7	7	7	7	7	7	6	6	6
		Stems per ACRE	647.5	647.5	1255	647.5	647.5	647.5	688	688	688	688	688	688	607	607	607

Color Coding for Table

Exceeds requirements by 10%

Exceeds requirements, but by less than 10%

Fails to meet requirements, by less than 10%

Fails to meet requirements by more than 10%

Volunteers

PnoLS: Number of Planted stems excluding live stakes

P-all: Number of planted stems including live stakes,

T: Total Stems

Table 9. Planted and Total Stem Counts

Devil's Racetrack Mitigation Site (NCDMS Project Code 95021)

Monitoring Year 2 - 2015

			Current Plot Data (MY2 - 6/2015)														
			95021-01-0011			95021-01-0012			95021-01-0013			95021-01-0014			95021-01-0015		
Scientific Name	**Common Name**	**Species Type**	**PnoLS**	**P-all**	**T**	**PnoLS**	**P-all**	**T**	**PnoLS**	**P-all**	**T**	**PnoLS**	**P-all**	**T**	**PnoLS**	**P-all**	**T**
Acer rubrum	red maple	Tree												2			
Betula nigra	river birch	Tree	2	2	2	1	1	1	2	2	2						
Cephalanthus occidentalis	common buttonbush	Shrub															
Fraxinus pennsylvanica	green ash	Tree	5	5	5	4	4	4				2	2	2	1	1	1
Liquidambar styraciflua	sweetgum	Tree						10									5
Liriodendron tulipifera	tuliptree	Tree															
Nyssa biflora	swamp tupelo	Tree							1	1	1				2	2	2
Nyssa sylvatica	blackgum	Tree															
Platanus occidentalis	American sycamore	Tree	2	2	2	5	5	5	3	3	3	3	3	3	4	4	4
Quercus michauxii	swamp chestnut oak	Tree							1	1	1				2	2	2
Quercus pagoda	cherrybark oak	Tree															
Quercus phellos	willow oak	Tree				4	4	4	5	5	5						
Quercus rubra	northern red oak	Tree															
Salix sericea	silky willow	Shrub															3
Taxodium distichum	bald cypress	Tree	2	2	2	2	2	2	5	5	5	10	10	10	8	8	8
		Stem count	11	11	11	16	16	26	17	17	17	15	15	17	17	17	25
		size (ares)		1			1			1			1			1	
		size (ACRES)		0.02			0.02			0.02			0.02			0.02	
		Species count	4	4	4	5	5	6	6	6	6	3	3	4	5	5	7
		Stems per ACRE	445.2	445.2	445.2	647.5	647.5	1052	688	688	688	607	607	688	688	688	1012

Color Coding for Table

Exceeds requirements by 10%

Exceeds requirements, but by less than 10%

Fails to meet requirements, by less than 10%

Fails to meet requirements by more than 10%

Volunteers

PnoLS: Number of Planted stems excluding live stakes

P-all: Number of planted stems including live stakes,

T: Total Stems

Table 9. Planted and Total Stem Counts

Devil's Racetrack Mitigation Site (NCDMS Project Code 95021)

Monitoring Year 2 - 2015

			Current Plot Data (MY2 - 6/2015)														
			95021-01-0016			95021-01-0017			95021-01-0018			95021-01-0019			95021-01-0020		
Scientific Name	**Common Name**	**Species Type**	**PnoLS**	**P-all**	**T**	**PnoLS**	**P-all**	**T**	**PnoLS**	**P-all**	**T**	**PnoLS**	**P-all**	**T**	**PnoLS**	**P-all**	**T**
Acer rubrum	red maple	Tree															
Betula nigra	river birch	Tree	6	6	6	2	2	2									
Cephalanthus occidentalis	common buttonbush	Shrub															
Fraxinus pennsylvanica	green ash	Tree	3	3	3	2	2	2	1	1	1	2	2	2			
Liquidambar styraciflua	sweetgum	Tree						5									
Liriodendron tulipifera	tuliptree	Tree															
Nyssa biflora	swamp tupelo	Tree	4	4	4				2	2	2	2	2	2	3	3	3
Nyssa sylvatica	blackgum	Tree															
Platanus occidentalis	American sycamore	Tree	1	1	1	1	1	1							4	4	4
Quercus michauxii	swamp chestnut oak	Tree	2	2	2				4	4	4	6	6	6	2	2	2
Quercus pagoda	cherrybark oak	Tree															
Quercus phellos	willow oak	Tree	1	1	1				4	4	4				1	1	1
Quercus rubra	northern red oak	Tree				1	1	1									
Salix sericea	silky willow	Shrub															
Taxodium distichum	bald cypress	Tree				10	10	10	5	5	5	4	4	4	7	7	7
		Stem count	17	17	17	16	16	21	16	16	16	14	14	14	17	17	17
		size (ares)		1			1			1			1			1	
		size (ACRES)		0.02			0.02			0.02			0.02			0.02	
		Species count	6	6	6	5	5	6	5	5	5	4	4	4	5	5	5
		Stems per ACRE	688	688	688	647.5	647.5	849.8	647.5	647.5	647.5	566.6	566.6	566.6	688	688	688

Color Coding for Table

Exceeds requirements by 10%

Exceeds requirements, but by less than 10%

Fails to meet requirements, by less than 10%

Fails to meet requirements by more than 10%

Volunteers

PnoLS: Number of Planted stems excluding live stakes

P-all: Number of planted stems including live stakes,

T: Total Stems

Table 9. Planted and Total Stem Counts

Devil's Racetrack Mitigation Site (NCDMS Project Code 95021)

Monitoring Year 2 - 2015

			Current Plot Data (MY2 - 6/2015)														
			95021-01-0021			95021-01-0022			95021-01-0023			95021-01-0024			95021-01-0025		
Scientific Name	**Common Name**	**Species Type**	**PnoLS**	**P-all**	**T**	**PnoLS**	**P-all**	**T**	**PnoLS**	**P-all**	**T**	**PnoLS**	**P-all**	**T**	**PnoLS**	**P-all**	**T**
Acer rubrum	red maple	Tree															
Betula nigra	river birch	Tree	3	3	3				3	3	3				2	2	2
Cephalanthus occidentalis	common buttonbush	Shrub															
Fraxinus pennsylvanica	green ash	Tree	5	5	5	3	3	3				6	6	6	3	3	3
Liquidambar styraciflua	sweetgum	Tree															
Liriodendron tulipifera	tuliptree	Tree															
Nyssa biflora	swamp tupelo	Tree													1	1	1
Nyssa sylvatica	blackgum	Tree															
Platanus occidentalis	American sycamore	Tree				1	1	1	7	7	7	4	4	4	4	4	4
Quercus michauxii	swamp chestnut oak	Tree										2	2	2			
Quercus pagoda	cherrybark oak	Tree				2	2	2									
Quercus phellos	willow oak	Tree				4	4	4	1	1	1	1	1	1	1	1	1
Quercus rubra	northern red oak	Tree															
Salix sericea	silky willow	Shrub															
Taxodium distichum	bald cypress	Tree	5	5	5	7	7	7	3	3	3	4	4	4	6	6	6
		Stem count	13	13	13	17	17	17	14	14	14	17	17	17	17	17	17
		size (ares)		1			1			1			1			1	
		size (ACRES)		0.02			0.02			0.02			0.02			0.02	
		Species count	3	3	3	5	5	5	4	4	4	5	5	5	6	6	6
		Stems per ACRE	526.1	526.1	526.1	688	688	688	566.6	566.6	566.6	688	688	688	688	688	688

Color Coding for Table

Exceeds requirements by 10%

Exceeds requirements, but by less than 10%

Fails to meet requirements, by less than 10%

Fails to meet requirements by more than 10%

Volunteers

PnoLS: Number of Planted stems excluding live stakes

P-all: Number of planted stems including live stakes,

T: Total Stems

Table 9. Planted and Total Stem Counts

Devil's Racetrack Mitigation Site (NCDMS Project Code 95021)

Monitoring Year 2 - 2015

			Current Plot Data (MY2 - 6/2015)														
			95021-01-0026			95021-01-0027			95021-01-0028			95021-01-0029			95021-01-0030		
Scientific Name	**Common Name**	**Species Type**	**PnoLS**	**P-all**	**T**	**PnoLS**	**P-all**	**T**	**PnoLS**	**P-all**	**T**	**PnoLS**	**P-all**	**T**	**PnoLS**	**P-all**	**T**
Acer rubrum	red maple	Tree															
Betula nigra	river birch	Tree	2	2	2				2	2	2	1	1	1	1	1	1
Cephalanthus occidentalis	common buttonbush	Shrub															
Fraxinus pennsylvanica	green ash	Tree	4	4	4	1	1	1	1	1	1				1	1	1
Liquidambar styraciflua	sweetgum	Tree															
Liriodendron tulipifera	tuliptree	Tree															
Nyssa biflora	swamp tupelo	Tree							2	2	2	2	2	2			
Nyssa sylvatica	blackgum	Tree															
Platanus occidentalis	American sycamore	Tree	1	1	1	1	1	1	3	3	3	2	2	2			
Quercus michauxii	swamp chestnut oak	Tree	4	4	4	4	4	4				1	1	1	8	8	8
Quercus pagoda	cherrybark oak	Tree															
Quercus phellos	willow oak	Tree	1	1	1	1	1	1	7	7	7	5	5	5	4	4	4
Quercus rubra	northern red oak	Tree															
Salix sericea	silky willow	Shrub															
Taxodium distichum	bald cypress	Tree	3	3	3	9	9	9	1	1	1	6	6	6	3	3	3
		Stem count	15	15	15	16	16	16	16	16	16	17	17	17	17	17	17
		size (ares)		1			1			1			1			1	
		size (ACRES)		0.02			0.02			0.02			0.02			0.02	
		Species count	6	6	6	5	5	5	6	6	6	6	6	6	5	5	5
		Stems per ACRE	607	607	607	647.5	647.5	647.5	647.5	647.5	647.5	688	688	688	688	688	688

Color Coding for Table

Exceeds requirements by 10%

Exceeds requirements, but by less than 10%

Fails to meet requirements, by less than 10%

Fails to meet requirements by more than 10%

Volunteers

PnoLS: Number of Planted stems excluding live stakes

P-all: Number of planted stems including live stakes,

T: Total Stems

Table 9. Planted and Total Stem Counts

Devil's Racetrack Mitigation Site (NCDMS Project Code 95021)

Monitoring Year 2 - 2015

			Current Plot Data (MY2 - 6/2015)														
			95021-01-0031			95021-01-0032			95021-01-0033			95021-01-0034			95021-01-0035		
Scientific Name	**Common Name**	**Species Type**	**PnoLS**	**P-all**	**T**	**PnoLS**	**P-all**	**T**	**PnoLS**	**P-all**	**T**	**PnoLS**	**P-all**	**T**	**PnoLS**	**P-all**	**T**
Acer rubrum	red maple	Tree															
Betula nigra	river birch	Tree	4	4	4				3	3	3	3	3	3	4	4	4
Cephalanthus occidentalis	common buttonbush	Shrub									2						
Fraxinus pennsylvanica	green ash	Tree	1	1	1	8	8	8	2	2	2	2	2	2	2	2	2
Liquidambar styraciflua	sweetgum	Tree															
Liriodendron tulipifera	tuliptree	Tree															
Nyssa biflora	swamp tupelo	Tree	3	3	3				2	2	2	5	5	5	4	4	4
Nyssa sylvatica	blackgum	Tree															
Platanus occidentalis	American sycamore	Tree	4	4	4	2	2	2	4	4	4	1	1	1	7	7	7
Quercus michauxii	swamp chestnut oak	Tree	2	2	2	2	2	2	1	1	1	4	4	4			
Quercus pagoda	cherrybark oak	Tree															
Quercus phellos	willow oak	Tree	1	1	1				2	2	2						
Quercus rubra	northern red oak	Tree															
Salix sericea	silky willow	Shrub															
Taxodium distichum	bald cypress	Tree	2	2	2	7	7	7	4	4	4	2	2	2	2	2	2
		Stem count	17	17	17	19	19	19	18	18	20	17	17	17	19	19	19
		size (ares)		1			1			1			1			1	
		size (ACRES)		0.02			0.02			0.02			0.02			0.02	
		Species count	7	7	7	4	4	4	7	7	8	6	6	6	5	5	5
		Stems per ACRE	688	688	688	768.9	768.9	768.9	728.4	728.4	809.4	688	688	688	768.9	768.9	768.9

Color Coding for Table

Exceeds requirements by 10%

Exceeds requirements, but by less than 10%

Fails to meet requirements, by less than 10%

Fails to meet requirements by more than 10%

Volunteers

PnoLS: Number of Planted stems excluding live stakes

P-all: Number of planted stems including live stakes,

T: Total Stems

Table 9. Planted and Total Stem Counts

Devil's Racetrack Mitigation Site (NCDMS Project Code 95021)

Monitoring Year 2 - 2015

			Current Plot Data (MY2 - 6/2015)														
			95021-01-0036			95021-01-0037			95021-01-0038			95021-01-0039			95021-01-0040		
Scientific Name	**Common Name**	**Species Type**	**PnoLS**	**P-all**	**T**	**PnoLS**	**P-all**	**T**	**PnoLS**	**P-all**	**T**	**PnoLS**	**P-all**	**T**	**PnoLS**	**P-all**	**T**
Acer rubrum	red maple	Tree															
Betula nigra	river birch	Tree	4	4	4	2	2	2	2	2	2	2	2	2	1	1	1
Cephalanthus occidentalis	common buttonbush	Shrub															
Fraxinus pennsylvanica	green ash	Tree	1	1	1	2	2	2	2	2	2	2	2	2	1	1	1
Liquidambar styraciflua	sweetgum	Tree															
Liriodendron tulipifera	tuliptree	Tree															
Nyssa biflora	swamp tupelo	Tree	1	1	1	3	3	3	2	2	2						
Nyssa sylvatica	blackgum	Tree															
Platanus occidentalis	American sycamore	Tree	2	2	2	2	2	2	2	2	2	5	5	5	5	5	5
Quercus michauxii	swamp chestnut oak	Tree	1	1	1							2	2	2	1	1	1
Quercus pagoda	cherrybark oak	Tree															
Quercus phellos	willow oak	Tree	6	6	6	1	1	1	2	2	2	1	1	1	4	4	4
Quercus rubra	northern red oak	Tree															1
Salix sericea	silky willow	Shrub															
Taxodium distichum	bald cypress	Tree	3	3	3	3	3	3	6	6	6	4	4	4	5	5	5
		Stem count	18	18	18	13	13	13	16	16	16	16	16	16	17	17	18
		size (ares)		1			1			1			1			1	
		size (ACRES)		0.02			0.02			0.02			0.02			0.02	
		Species count	7	7	7	6	6	6	6	6	6	6	6	6	6	6	7
		Stems per ACRE	728.4	728.4	728.4	526.1	526.1	526.1	647.5	647.5	647.5	647.5	647.5	647.5	688	688	728.4

Color Coding for Table

Exceeds requirements by 10%

Exceeds requirements, but by less than 10%

Fails to meet requirements, by less than 10%

Fails to meet requirements by more than 10%

Volunteers

PnoLS: Number of Planted stems excluding live stakes

P-all: Number of planted stems including live stakes,

T: Total Stems

Table 9. Planted and Total Stem Counts

Devil's Racetrack Mitigation Site (NCDMS Project Code 95021)

Monitoring Year 2 - 2015

			Current Plot Data (MY2 - 6/2015)														
			95021-01-0041			95021-01-0042			95021-01-0043			95021-01-0044			95021-01-0045		
Scientific Name	**Common Name**	**Species Type**	**PnoLS**	**P-all**	**T**	**PnoLS**	**P-all**	**T**	**PnoLS**	**P-all**	**T**	**PnoLS**	**P-all**	**T**	**PnoLS**	**P-all**	**T**
Acer rubrum	red maple	Tree															
Betula nigra	river birch	Tree	1	1	1	3	3	3	3	3	3	1	1	1	2	2	2
Cephalanthus occidentalis	common buttonbush	Shrub															
Fraxinus pennsylvanica	green ash	Tree	3	3	3				4	4	4	4	4	4	1	1	3
Liquidambar styraciflua	sweetgum	Tree															5
Liriodendron tulipifera	tuliptree	Tree															
Nyssa biflora	swamp tupelo	Tree	1	1	1	6	6	6	2	2	2	8	8	8			
Nyssa sylvatica	blackgum	Tree															
Platanus occidentalis	American sycamore	Tree	3	3	3	1	1	1							4	4	4
Quercus michauxii	swamp chestnut oak	Tree	1	1	1	1	1	1	1	1	1	1	1	1			
Quercus pagoda	cherrybark oak	Tree															
Quercus phellos	willow oak	Tree	2	2	2	3	3	3				1	1	1	4	4	4
Quercus rubra	northern red oak	Tree						1									
Salix sericea	silky willow	Shrub															
Taxodium distichum	bald cypress	Tree	6	6	6	1	1	1	4	4	4				6	6	6
		Stem count	17	17	17	15	15	16	14	14	14	15	15	15	17	17	24
		size (ares)		1			1			1			1			1	
		size (ACRES)		0.02			0.02			0.02			0.02			0.02	
		Species count	7	7	7	6	6	7	5	5	5	5	5	5	5	5	6
		Stems per ACRE	688	688	688	607	607	647.5	566.6	566.6	566.6	607	607	607	688	688	971.2

Color Coding for Table

Exceeds requirements by 10%

Exceeds requirements, but by less than 10%

Fails to meet requirements, by less than 10%

Fails to meet requirements by more than 10%

Volunteers

PnoLS: Number of Planted stems excluding live stakes

P-all: Number of planted stems including live stakes,

T: Total Stems

Table 9. Planted and Total Stem Counts

Devil's Racetrack Mitigation Site (NCDMS Project Code 95021)

Monitoring Year 2 - 2015

			Current Plot Data (MY2 - 6/2015)																	
			95021-01-0046			95021-01-0047			95021-01-0048			95021-01-0049			95021-01-0050			95021-01-0051		
Scientific Name	**Common Name**	**Species Type**	**PnoLS**	**P-all**	**T**	**PnoLS**	**P-all**	**T**	**PnoLS**	**P-all**	**T**	**PnoLS**	**P-all**	**T**	**PnoLS**	**P-all**	**T**	**PnoLS**	**P-all**	**T**
Acer rubrum	red maple	Tree																		
Betula nigra	river birch	Tree	4	4	4							5	5	5	5	5	5	3	3	3
Cephalanthus occidentalis	common buttonbush	Shrub																		
Fraxinus pennsylvanica	green ash	Tree				4	4	4	6	6	6	5	5	5	3	3	3	2	2	2
Liquidambar styraciflua	sweetgum	Tree																		
Liriodendron tulipifera	tuliptree	Tree							2	2	2				3	3	3	2	2	2
Nyssa biflora	swamp tupelo	Tree																		
Nyssa sylvatica	blackgum	Tree																		
Platanus occidentalis	American sycamore	Tree	2	2	2	1	1	1				3	3	3	3	3	3	5	5	5
Quercus michauxii	swamp chestnut oak	Tree	3	3	3	2	2	2	1	1	1	1	1	1	1	1	1	3	3	3
Quercus pagoda	cherrybark oak	Tree							5	5	5				1	1	1	1	1	1
Quercus phellos	willow oak	Tree	2	2	2	4	4	4	2	2	2	1	1	1	1	1	1	1	1	1
Quercus rubra	northern red oak	Tree																		
Salix sericea	silky willow	Shrub																		
Taxodium distichum	bald cypress	Tree	2	2	2							1	1	1						
		Stem count	13	13	13	11	11	11	16	16	16	16	16	16	17	17	17	17	17	17
		size (ares)		1			1			1			1			1			1	
		size (ACRES)		0.02			0.02			0.02			0.02			0.02			0.02	
		Species count	5	5	5	4	4	4	5	5	5	6	6	6	7	7	7	7	7	7
		Stems per ACRE	526.1	526.1	526.1	445.2	445.2	445.2	647.5	647.5	647.5	647.5	647.5	647.5	688	688	688	688	688	688

Color Coding for Table

Exceeds requirements by 10%

Exceeds requirements, but by less than 10%

Fails to meet requirements, by less than 10%

Fails to meet requirements by more than 10%

Volunteers

PnoLS: Number of Planted stems excluding live stakes

P-all: Number of planted stems including live stakes,

T: Total Stems

Table 9. Planted and Total Stem Counts

Devil's Racetrack Mitigation Site (NCDMS Project Code 95021)

Monitoring Year 2 - 2015

			Annual Means								
			MY2 (2015)			MY1 (2014)			MY0 (2014)		
Scientific Name	**Common Name**	**Species Type**	**PnoLS**	**P-all**	**T**	**PnoLS**	**P-all**	**T**	**PnoLS**	**P-all**	**T**
Acer rubrum	red maple	Tree			2						
Betula nigra	river birch	Tree	104	104	104	106	106	106	106	106	106
Cephalanthus occidentalis	common buttonbush	Shrub			2						
Fraxinus pennsylvanica	green ash	Tree	123	123	125	124	124	124	126	126	126
Liquidambar styraciflua	sweetgum	Tree			86						
Liriodendron tulipifera	tuliptree	Tree	14	14	14	25	25	25	20	20	20
Nyssa biflora	swamp tupelo	Tree	59	59	59	64	64	64	60	60	60
Nyssa sylvatica	blackgum	Tree	8	8	8	9	9	9	10	10	10
Platanus occidentalis	American sycamore	Tree	128	128	128	124	124	124	124	124	124
Quercus michauxii	swamp chestnut oak	Tree	77	77	77	91	91	91	108	108	108
Quercus pagoda	cherrybark oak	Tree	12	12	12	14	14	14			
Quercus phellos	willow oak	Tree	97	97	97	104	104	104	125	125	125
Quercus rubra	northern red oak	Tree	1	1	3						
Salix sericea	silky willow	Shrub			3						
Taxodium distichum	bald cypress	Tree	190	190	190	189	189	189	206	206	206
		Stem count	813	813	910	850	850	850	885	885	885
		size (ares)		51			51			51	
		size (ACRES)		1.26			1.26			1.26	
		Species count	11	11	15	10	10	10	9	9	9
		Stems per ACRE	645.1	645.1	722.1	674.5	674.5	674.5	702.2	702.2	702.2

Color Coding for Table

Exceeds requirements by 10%

Exceeds requirements, but by less than 10%

Fails to meet requirements, by less than 10%

Fails to meet requirements by more than 10%

Volunteers

PnoLS: Number of Planted stems excluding live stakes

P-all: Number of planted stems including live stakes,

T: Total Stems

APPENDIX 4. Morphological Summary Data and Plots

Table 10a. Baseline Stream Data Summary
Devil's Racetrack Mitigation Site (NCDMS Project No. 95021)
Monitoring Year 2 - 2015

Devils Racetrack- West

		Pre-Restoration Condition		Reference Reach Data										Design				As-Built/Baseline			
Parameter	**Gage**	**Devil's Racetrack - West**		**Scout West 1**		**Scout East 2**		**Scout West 2**		**Johanna Creek**		**Jarman Oak**		**Devil's Racetrack - West (Reach 1)**		**Devil's Racetrack - West (Reach 2)**		**Devil's Racetrack - West (Reach 1)**		**Devil's Racetrack - West (Reach 2)**	
		Min	**Max**	**Min**	**Max**	**Min**	**Max**	**Min**	**Max**	**Min**	**Max**	**Min**	**Max**	**Min**	**Max**	**Min**	**Max**	**Min**	**Max**	**Min**	**Max**
Dimension and Substrate - Shallow																					
Bankfull Width (ft)		4.8	8.0	2.6	6.3	4.7	6.1	5.6	7.6	9.7		9.3		9.0		11.5		4.7	9.6	7.7	
Floodprone Width (ft)		7.8	18.0	>20		>50		>50		>75		>150		100	300	100	300	>200		>200	
Bankfull Mean Depth		0.8	1.2	0.3	0.5	1.1	1.3	0.7	1.0	0.8		1.2		0.6		0.8		0.4	0.9	0.5	
Bankfull Max Depth		1.3	1.6	0.5	0.7	1.7	1.8	1.2	1.3	1.1		2.3		0.9	1.1	1.1	1.5	1.1	1.4	0.7	
Bankfull Cross Sectional Area (ft^2)	N/A	5.7	6.3	1.3	2.0	6.0	6.9	5.3	5.4	7.2	7.8	11.6		5.8		9.5		2.1	8.5	4.0	
Width/Depth Ratio		4.0	10.5	5.4	19.4	3.6	5.4	5.7	11.0	10.1	19.7	7.4		14.0	14.5	14.0		10.6	14.8	14.5	
Entrenchment Ratio		1.6	2.2	>2.2		>2.2		>2.2		8.0	9.6	16.1	26.9	11.1	33.3	8.7	26.1	>20.9	>42.5	>26.1	
Bank Height Ratio		1.9	4.5	1.1	1.3	1.0		1.1	1.2	1.0		1.0		1.0	1.1	1.0	1.1	1.0		1.0	
D50 (mm)		0.464																N/A		N/A	
Profile																					
Shallow Length (ft)				---		---		---		---		---		---		---		3.7	86.8	7.4	54.2
Shallow Slope (ft/ft)		---		0.026	0.047	N/A		0.033	0.051	N/A		0.0129		0.0036	0.0277	0.0023	0.0072	0.0013	0.0593	0.0008	0.0195
Pool Length (ft)	N/A			---		---		---		---		---		---		---		5.5	63.1	18.7	72.9
Pool Max Depth (ft)		1.2		0.6		N/A		1.7	1.9	1.5		3.1		0.9	2.1	1.1	2.5	1.1	2.9	1.4	1.9
Pool Spacing (ft)^		---		27	67	N/A		21	27	16	59	32	55	14	63	18	81	9	132	38	104
Pool Volume (ft^3)																					
Pattern																					
Channel Beltwidth (ft)		---		8.7	14.3	7.2	16.2	9.1	9.8	14.0	20.0	21.0	36.0	12.0	72.0	15.0	92.0	13.0	53.0	16.0	73.0
Radius of Curvature (ft)		---		3.1	9.0	5.5	16.0	5.4	6.8	15.0	27.0	13.7	18.6	14.0	43.0	17.0	55.0	12.0	40.0	17.0	35.0
Rc:Bankfull Width (ft/ft)	N/A	---		0.6	1.6	1.0	3.0	0.8	1.0	1.5	2.8	1.5	2.0	1.5	4.8	1.5	4.8	2.6	4.2	2.2	4.5
Meander Length (ft)		---		39.8	84.8	36.5	63.2	32.5	36.9	50.0		N/A		27	153	35	196	52	133	70	137
Meander Width Ratio		---		1.6	2.6	1.3	3.0	1.4	1.5	1.4	2.1	2.3	2.9	1.3	8.0	1.3	8.0	2.8	5.5	2.1	9.5
Substrate, Bed and Transport Parameters																					
Ri%/Ru%/P%/G%/S%																					
SC%/Sa%/G%/C%/B%/Be%																					
d16/d35/d50/d84/d95/d100	N/A	0.168/0.33/0.464/1.23/2.0/9.6		---		---		---		---		---						N/A		N/A	
Reach Shear Stress (Competency) lb/ft^2		0.18	0.23											---		---		N/A		N/A	
Max part size (mm) mobilized at bankfull																					
Stream Power (Capacity) W/m^2																					
Additional Reach Parameters																					
Drainage Area (SM)		0.77		0.06		0.67		0.34		0.90		1.27		0.60		0.70		0.60		0.70	
Watershed Impervious Cover Estimate (%)		<1%		---		---		---		---		---		<1%		<1%		<1%		<1%	
Rosgen Classification		Gc5		E/C5b		E5		E5		E5/C5		E6		E/C5		E/C5		E/C5		C	
Bankfull Velocity (fps)		1.5	1.8	1.3	2.0	2.5	2.9	1.2	1.2	1.8	1.9	0.95		1.7		1.2		1.2	4.8	3.3	
Bankfull Discharge (cfs)		9.2	10.6	2.6		17.5		6.4		14.0		11.0		10.0		13.0		10.0		13.0	
Q-NFF regression		---																			
Q-USGS extrapolation	N/A	---																			
Q-Mannings		---																			
Valley Length (ft)		---		---		---		---		---		---		---		---					
Channel Thalweg Length (ft)		4,976		---		---		---		---		---		4,245		966		4,239		962	
Sinuosity		1.0		1.1		1.2		1.2		1.2		1.4		1.2	1.6	1.2	1.6	1.2		1.4	
Water Surface Slope $(ft/ft)^2$		---		---		---		---		---		---		---		---		0.0054		0.0015	
Bankfull Slope (ft/ft)		0.0041		0.0260		0.0170		0.0040		0.0022		0.0040		0.0025	0.0087	0.0016	0.0022	0.0053	0.0054	0.0017	0.0023

(---): Data was not provided
N/A: Not Applicable

Table 10b. Baseline Stream Data Summary
Devil's Racetrack Mitigation Site (NCDMS Project No. 95021)
Monitoring Year 2 - 2015

Devils Racetrack- East

		Pre-Restoration Condition		Reference Reach Data										Design						As-Built/Baseline					
Parameter	**Gage**	**Devil's Racetrack - East**		**Scout West 1**		**Scout East 2**		**Scout West 2**		**Johanna Creek**		**Jarman Oak**		**Devil's Racetrack - East (Reach 1)**		**Devil's Racetrack - East (Reach 2)**		**Devil's Racetrack - East (Reach 3)**		**Devil's Racetrack - East (Reach 1)**		**Devil's Racetrack - East (Reach 2)**		**Devil's Racetrack - East (Reach 3)**	
		Min	**Max**	**Min**	**Max**	**Min**	**Max**	**Min**	**Max**	**Min**	**Max**	**Min**	**Max**	**Min**	**Max**	**Min**	**Max**	**Min**	**Max**	**Min**	**Max**	**Min**	**Max**	**Min**	**Max**
Dimension and Substrate - Shallow																									
Bankfull Width (ft)		8.1	10.4	2.6	6.3	4.7	6.1	5.6	7.6	9.7		9.3		13.0		8.0		8.0		12.2	13.7	8.2		---	
Floodprone Width (ft)		14.2	18.6	>20		>50		>50		>75		>150		100	500	100	500	100	500	>300		>300		---	
Bankfull Mean Depth		1.0	1.8	0.3	0.5	1.1	1.3	0.7	1.0	0.8		1.2		1.0		0.6		---		0.8	1.1	0.7		---	
Bankfull Max Depth		2.1	2.8	0.5	0.7	1.7	1.8	1.2	1.3	1.1		2.3		1.4	1.8	0.8	1.0	0.9		1.3	1.7	1.1		---	
Bankfull Cross Sectional Area (ft^2)	N/A	14.2	19.1	1.3	2.0	6.0	6.9	5.3	5.4	7.2	7.8	11.6		12.8		4.8		---		10.3	13.9	5.7		---	
Width/Depth Ratio		5.0	7.8	5.4	19.4	3.6	5.4	5.7	11.0	10.1	19.7	7.4		13.0	13.5	14.0	14.5	---		12.1	14.6	11.9		---	
Entrenchment Ratio		1.6	1.8	>2.2		>2.2		>2.2		8.0	9.6	16.1	26.9	7.7	38.5	12.5	62.6	---		>21.9	>24.5	>36.5		---	
Bank Height Ratio		2.6	4.3	1.1	1.3	1.0		1.1	1.2	1.0		1.0		1.0	1.1	1.0	1.1	---		1.0		1.0		---	
D50 (mm)		0.179																		N/A		N/A		---	
Profile																									
Shallow Length (ft)				---		---		---		---		---		---		---		---		13.0	80.1	20.8	42.4	11.3	25.9
Shallow Slope (ft/ft)		---		0.026	0.047	N/A		0.033	0.051	N/A		0.0129		0.0007	0.0025	0.0377	0.0671	---		0.0004	0.0099	0.0192	0.0318	0.0072	0.0675
Pool Length (ft)	N/A			---		---		---		---		---		---		---		---		16.0	77.3	16.5	66.1	13.0	34.2
Pool Max Depth (ft)		---		0.6		N/A		1.7	1.9	1.5		3.1		1.4	3.2	0.8	2.0	1.2		1.9	3.4	1.7	2.7	1.4	2.5
Pool Spacing (ft)^		---		27	67	N/A		21	27	16	59	32	55	21	91	39	64	---		26	131	43	73	25	70
Pool Volume (ft^3)																									
Pattern																									
Channel Beltwidth (ft)		---		8.7	14.3	7.2	16.2	9.1	9.8	14.0	20.0	21.0	36.0	17.0	65.0	10.0	40.0	---		15.0	55.0	21	41	12	32
Radius of Curvature (ft)		---		3.1	9.0	5.5	16.0	5.4	6.8	15.0	27.0	13.7	18.6	20.0	62.0	12.0	36.0	---		18.0	65.0	12	26	10	35
Rc:Bankfull Width (ft/ft)	N/A	---		0.6	1.6	1.0	3.0	0.8	1.0	1.5	2.8	1.5	2.0	1.5	4.8	1.5	4.5	---		1.5	4.7	1.5	3.2	---	
Meander Length (ft)		---		39.8	84.8	36.5	63.2	32.5	36.9	50.0		N/A		39	221	64	136	---		62	203	101	140	52	112
Meander Width Ratio		---		1.6	2.6	1.3	3.0	1.4	1.5	1.4	2.1	2.3	2.9	1.3	5.0	1.3	5.0	---		1.2	4.0	2.6	5.0	---	
Substrate, Bed and Transport Parameters																									
Ri%/Ru%/P%/G%/S%																									
SC%/Sa%/G%/C%/B%/Be%																									
d16/d35/d50/d84/d95/d100	N/A	-/-/0.179/0.642/1.0/9.6		---		---		---		---		---								N/A		N/A		N/A	
Reach Shear Stress (Competency) lb/ft^2		0.01												---		---		---		N/A		N/A		N/A	
Max part size (mm) mobilized at bankfull																									
Stream Power (Capacity) W/m^2																									
Additional Reach Parameters																									
Drainage Area (SM)		1.30		0.06		0.67		0.34		0.90		1.27		1.14		1.30		---		1.14		1.30		---	
Watershed Impervious Cover Estimate (%)		<1%		---		---		---		---		---		<1%		<1%		<1%		<1%		<1%		<1%	
Rosgen Classification		Gc5		E/C5b		E5		E5		E5/C5		E6		E/C5		E/C5		E/C5		C		C		---	
Bankfull Velocity (fps)		0.3	0.4	1.3	2.0	2.5	2.9	1.2	1.2	1.8	1.9	0.95		1.2		3.5		---		1.2	1.6	3.0		---	
Bankfull Discharge (cfs)		8.5		2.6		17.5		6.4		14.0		11.0		16.0		17.0		---		16.0		17.0		---	
Q-NFF regression		---																							
Q-USGS extrapolation	N/A	---																							
Q-Mannings		---																							
Valley Length (ft)		---		---		---		---		---		---		---		---		---							
Channel Thalweg Length (ft)		4,844		---		---		---		---		---		4,840		313		385		4,833		310		372	
Sinuosity		1.0		1.1		1.2		1.2		1.2		1.4		1.1	1.3	1.1	1.2	---		1.1		1.1		1.1	
Water Surface Slope $(ft/ft)^2$		---		---		---		---		---		---		---		---		---		---		---		---	
Bankfull Slope (ft/ft)		0.0003		0.0260		0.0170		0.0040		0.0022		0.0040		0.0004	0.0008	0.0224	0.0251	---		0.0007	0.0008	0.0153	0.0166	0.0219	0.0231

(---): Data was not provided
N/A: Not Applicable

Table 10c. Baseline Stream Data Summary
Devil's Racetrack Mitigation Site (NCDMS Project No. 95021)
Monitoring Year 2 - 2015

Southeast Branch

		Pre-Restoration Condition		Reference Reach Data										Design						As-Built/Baseline					
Parameter	**Gage**	**Southeast Branch**		**Scout West 1**		**Scout East 2**		**Scout West 2**		**Johanna Creek**		**Jarman Oak**		**Southeast Branch (Reach 1)**		**Southeast Branch (Reach 2)**		**Southeast Branch (Reach 3)**		**Southeast Branch (Reach 1)**		**Southeast Branch (Reach 2)**		**Southeast Branch (Reach 3)**	
		Min	**Max**	**Min**	**Max**	**Min**	**Max**	**Min**	**Max**	**Min**	**Max**	**Min**	**Max**	**Min**	**Max**	**Min**	**Max**	**Min**	**Max**	**Min**	**Max**	**Min**	**Max**	**Min**	**Max**
Dimension and Substrate - Shallow																									
Bankfull Width (ft)		2.7	5.7	2.6	6.3	4.7	6.1	5.6	7.6	9.7		9.3		3.0		4.0		5.4		3.0		3.8		5.3	
Floodprone Width (ft)		8.6	11.4	>20		>50		>50		>75		>150		25	35	50	70	100	300	>30		>60		>200	
Bankfull Mean Depth		0.2	0.4	0.3	0.5	1.1	1.3	0.7	1.0	0.8		1.2		0.5		0.6		1.0		0.3		0.4		0.4	
Bankfull Max Depth		0.4	1.4	0.5	0.7	1.7	1.8	1.2	1.3	1.1		2.3		0.4	0.6	0.5	0.7	0.8	1.2	0.5		0.5		0.6	
Bankfull Cross Sectional Area (ft^2)	N/A	1.1	1.4	1.3	2.0	6.0	6.9	5.3	5.4	7.2	7.8	11.6		1.0		1.5		2.5		0.8		1.3		2.1	
Width/Depth Ratio		6.8	24.3	5.4	19.4	3.6	5.4	5.7	11.0	10.1	19.7	7.4		9.0	10.0	10.0	12.0	11.0	12.0	11.4		10.8		13.8	
Entrenchment Ratio		1.5	4.2	>2.2		>2.2		>2.2		8.0	9.6	16.1	26.9	8.3	11.7	12.5	17.5	18.5	55.6	>9.9		>15.8		>37.5	
Bank Height Ratio		2.2	6.0	1.1	1.3	1.0		1.1	1.2	1.0		1.0		1.0	1.1	1.0	1.1	1.0	1.2	1.0		1.0		1.0	
D50 (mm)		0.409																		N/A		N/A		N/A	
Profile																									
Shallow Length (ft)				---		---		---		---		---		---		---		---		2.1	64.4	3.4	144.4	6.0	47.3
Shallow Slope (ft/ft)		---		0.026	0.047	N/A		0.033	0.051	N/A		0.0129		0.0162	0.0681	0.0144	0.0384	0.0035	0.0285	0.0010	0.0803	0.0021	0.0272	0.0005	0.0168
Pool Length (ft)	N/A			---		---		---		---		---		---		---		---		2.1	36.7	3.1	33.6	3.2	61.3
Pool Max Depth (ft)		0.4		0.6		N/A		1.7	1.9	1.5		3.1		0.5	1.1	0.4	1.2	0.5	1.5	0.7	1.5	0.5	1.0	0.5	1.1
Pool Spacing (ft)^		---		27	67	N/A		21	27	16	59	32	55	15	24	20	32	9	38	4	76	8	90	14	52
Pool Volume (ft^3)																									
Pattern																									
Channel Beltwidth (ft)		---		8.7	14.3	7.2	16.2	9.1	9.8	14.0	20.0	21.0	36.0	4.0	9.0	5.0	12.0	7.0	43.0	5.3	11.2	6.8	14.3	12.7	32.8
Radius of Curvature (ft)		---		3.1	9.0	5.5	16.0	5.4	6.8	15.0	27.0	13.7	18.6	5.0	14.0	6.0	18.0	8.0	26.0	5.0	23.5	10.0	25.6	10.4	29.5
Rc:Bankfull Width (ft/ft)	N/A	---		0.6	1.6	1.0	3.0	0.8	1.0	1.5	2.8	1.5	2.0	1.5	4.5	1.5	4.5	1.5	4.8	1.7	7.8	2.6	6.7	2.0	5.6
Meander Length (ft)		---		39.8	84.8	36.5	63.2	32.5	36.9	50.0		N/A		24	51	32	68	16	92	22	63	33	70	32	74
Meander Width Ratio		---		1.6	2.6	1.3	3.0	1.4	1.5	1.4	2.1	2.3	2.9	1.3	3.0	1.3	3.0	1.3	8.0	1.8	3.7	1.8	3.8	2.4	6.2
Substrate, Bed and Transport Parameters																									
Ri%/Ru%/P%/G%/S%																									
SC%/Sa%/G%/C%/B%/Be%																									
d16/d35/d50/d84/d95/d100	N/A	0.08/0.28/0.41/0.94/1.6/9.6		---		---		---		---		---										N/A		N/A	
Reach Shear Stress (Competency) lb/ft^2		0.51												---		---		---		N/A		N/A		N/A	
Max part size (mm) mobilized at bankfull																									
Stream Power (Capacity) W/m^2																									
Additional Reach Parameters																									
Drainage Area (SM)		0.19		0.06		0.67		0.34		0.90		1.27		0.03		0.07		0.10		0.03		0.07		0.10	
Watershed Impervious Cover Estimate (%)		<1%		---		---		---		---		---		<1%		<1%		<1%		<1%		<1%		<1%	
Rosgen Classification		G/F5		E/C5b		E5		E5		E5/C5		E6		---		---		E/C5		E/C5		E/C5		E/C5	
Bankfull Velocity (fps)		2.2		1.3	2.0	2.5	2.9	1.2	1.2	1.8	1.9	0.95		1.7		1.4		1.4		1.9		1.5		1.4	
Bankfull Discharge (cfs)		2.4		2.6		17.5		6.4		14.0		11.0		1.5		2.0		3.0		1.5		2.0		3.0	
Q-NFF regression		---																							
Q-USGS extrapolation	N/A	---																							
Q-Mannings		---																							
Valley Length (ft)		---		---		---		---		---		---		---		---		---							
Channel Thalweg Length (ft)		2,976		---		---		---		---		---		1,559		716		617		1,559		713		616	
Sinuosity		1.0		1.1		1.2		1.2		1.2		1.4		1.1	1.2	1.1	1.2	1.2	1.6	1.6		1.1		1.3	
Water Surface Slope $(ft/ft)^2$		---		---		---		---		---		---		---		---		---		0.0221		0.0174		0.0030	
Bankfull Slope (ft/ft)		0.0230		0.0260		0.0170		0.0040		0.0022		0.0040		0.0108	0.0227	0.0096	0.0128	0.0025	0.0089	0.0222		0.0015	0.0119	0.0028	0.0030

(---): Data was not provided
N/A: Not Applicable

Table 10d. Baseline Stream Data Summary
Devil's Racetrack Mitigation Site (NCDMS Project No. 95021)
Monitoring Year 2 - 2015

Middle Branch

		Pre-Restoration Condition		Reference Reach Data										Design				As-Built/Baseline			
Parameter	**Gage**	**Middle Branch**		**Scout West 1**		**Scout East 2**		**Scout West 2**		**Johanna Creek**		**Jarman Oak**		**Middle Branch (Reach 1)**		**Middle Branch (Reach 2)**		**Middle Branch (Reach 1)**		**Middle Branch (Reach 2)**	
		Min	**Max**	**Min**	**Max**	**Min**	**Max**	**Min**	**Max**	**Min**	**Max**	**Min**	**Max**	**Min**	**Max**	**Min**	**Max**	**Min**	**Max**	**Min**	**Max**
Dimension and Substrate - Shallow																					
Bankfull Width (ft)		1.8	2.3	2.6	6.3	4.7	6.1	5.6	7.6	9.7		9.3		3.0		4.0		2.2		3.4	
Floodprone Width (ft)		4.6	6.8	>20		>50		>50		>75		>150		40	60	100	300	>50		>200	
Bankfull Mean Depth		0.2	0.3	0.3	0.5	1.1	1.3	0.7	1.0	0.8		1.2		0.3		0.3		0.3		0.3	
Bankfull Max Depth		0.3	0.6	0.5	0.7	1.7	1.8	1.2	1.3	1.1		2.3		0.4	0.5	0.5	0.6	0.5		0.5	
Bankfull Cross Sectional Area (ft^2)	N/A	0.4	0.5	1.3	2.0	6.0	6.9	5.3	5.4	7.2	7.8	11.6		0.9		1.5		0.7		1.1	
Width/Depth Ratio		6.9	12.0	5.4	19.4	3.6	5.4	5.7	11.0	10.1	19.7	7.4		10.0	10.5	10.0	12.0	6.7		10.1	
Entrenchment Ratio		2.0	3.8	>2.2		>2.2		>2.2		8.0	9.6	16.1	26.9	33.3	100.0	22.2	66.7	>22.9		>58.8	
Bank Height Ratio		5.3	6.5	1.1	1.3	1.0		1.1	1.2	1.0		1.0		1.0	1.1	1.0	1.1	1.0		1.0	
D50 (mm)		0.083																N/A		N/A	
Profile																					
Shallow Length (ft)				---		---		---		---		---		---		---		2.5	46.6	7.9	16.1
Shallow Slope (ft/ft)		---		0.026	0.047	N/A		0.033	0.051	N/A		0.0129		0.0144	0.0489	0.0002	0.0074	0.0008	0.0492	0.0059	0.0236
Pool Length (ft)	N/A			---		---		---		---		---		---		---		2.9	17.3	11.2	19.8
Pool Max Depth (ft)		---		0.6		N/A		1.7	1.9	1.5		3.1		0.4	1.0	0.5	1.0	0.5	1.2	0.6	0.9
Pool Spacing (ft)^		---		27	67	N/A		21	27	16	59	32	55	15	24	5	22	8	56	18	24
Pool Volume (ft^3)																					
Pattern																					
Channel Beltwidth (ft)		---		8.7	14.3	7.2	16.2	9.1	9.8	14.0	20.0	21.0	36.0	4.0	9.0	6.0	36.0	4.1	9.4	6.7	20.9
Radius of Curvature (ft)		---		3.1	9.0	5.5	16.0	5.4	6.8	15.0	27.0	13.7	18.6	5.0	14.0	7.0	22.0	7.0	23.9	9.2	23.5
Rc:Bankfull Width (ft/ft)	N/A	---		0.6	1.6	1.0	3.0	0.8	1.0	1.5	2.8	1.5	2.0	1.7	4.5	1.5	4.8	3.2	10.9	2.7	6.9
Meander Length (ft)		---		39.8	84.8	36.5	63.2	32.5	36.9	50.0		N/A		24	51	14	77	23	44	32	57
Meander Width Ratio		---		1.6	2.6	1.3	3.0	1.4	1.5	1.4	2.1	2.3	2.9	1.3	3.0	1.3	8.0	2.2	4.3	2.0	6.1
Substrate, Bed and Transport Parameters																					
Ri%/Ru%/P%/G%/S%																					
SC%/Sa%/G%/C%/B%/Be%																					
d16/d35/d50/d84/d95/d100	N/A	-/-/0.083/0.498/0.9/9.6		---		---		---		---		---						N/A		N/A	
Reach Shear Stress (Competency) lb/ft^2		0.24	0.27											---		---		N/A		N/A	
Max part size (mm) mobilized at bankfull																					
Stream Power (Capacity) W/m^2																					
Additional Reach Parameters																					
Drainage Area (SM)		0.02		0.06		0.67		0.34		0.90		1.27		0.01		0.01		0.01		0.01	
Watershed Impervious Cover Estimate (%)		<1%		---		---		---		---		---		<1%		<1%		<1%		<1%	
Rosgen Classification		G5		E/C5b		E5		E5		E5/C5		E6		N/A		E/C5		E/C5		E/C5	
Bankfull Velocity (fps)		1.4	1.5	1.3	2.0	2.5	2.9	1.2	1.2	1.8	1.9	0.95		1.3		0.8		1.4		0.9	
Bankfull Discharge (cfs)		0.6	0.7	2.6		17.5		6.4		14.0		11.0		1.0		1.0		1.0		1.0	
Q-NFF regression		---																			
Q-USGS extrapolation	N/A	---																			
Q-Mannings		---																			
Valley Length (ft)		---		---		---		---		---		---		---		---		985			
Channel Thalweg Length (ft)		1,736		---		---		---		---		---		1,060		436		1,058		432	
Sinuosity		1.0		1.1		1.2		1.2		1.2		1.4		1.1	1.2	1.2	1.5	1.1		1.2	
Water Surface Slope $(ft/ft)^2$		---		---		---		---		---		---		---		---		0.0145		0.0064	
Bankfull Slope (ft/ft)		0.0240		0.0260		0.0170		0.0040		0.0022		0.0040		0.0096	0.0163	0.0024	0.0077	0.0148		0.0024	0.0066

(---): Data was not provided
N/A: Not Applicable

Table 10e. Baseline Stream Data Summary
Devil's Racetrack Mitigation Site (NCDMS Project No. 95021)
Monitoring Year 2 - 2015

Southwest Branch

		Pre-Restoration Condition		Reference Reach Data										Design				As-Built/Baseline			
Parameter	**Gage**	**Southwest Branch**		**Scout West 1**		**Scout East 2**		**Scout West 2**		**Johanna Creek**		**Jarman Oak**		**Southwest Branch (Reaches 1 - 3)**		**Southwest Branch (Reach 4)**		**Southwest Branch (Reaches 1 - 3)**		**Southwest Branch (Reach 4)**	
		Min	**Max**	**Min**	**Max**	**Min**	**Max**	**Min**	**Max**	**Min**	**Max**	**Min**	**Max**	**Min**	**Max**	**Min**	**Max**	**Min**	**Max**	**Min**	**Max**
Dimension and Substrate - Shallow																					
Bankfull Width (ft)		2.8	3.4	2.6	6.3	4.7	6.1	5.6	7.6	9.7		9.3		3.0		3.3		---		2.4	
Floodprone Width (ft)		4.9	6.2	>20		>50		>50		>75		>150		40	60	100	300	---		>200	
Bankfull Mean Depth		0.2	0.3	0.3	0.5	1.1	1.3	0.7	1.0	0.8		1.2		0.3		0.3		---		0.3	
Bankfull Max Depth		0.3	0.9	0.5	0.7	1.7	1.8	1.2	1.3	1.1		2.3		0.5	0.6	0.4	0.5	---		0.4	
Bankfull Cross Sectional Area (ft^2)	N/A	0.8	0.9	1.3	2.0	6.0	6.9	5.3	5.4	7.2	7.8	11.6		1.0		1.0		---		0.6	
Width/Depth Ratio		10.0	14.0	5.4	19.4	3.6	5.4	5.7	11.0	10.1	19.7	7.4		9.0	10.0	10.0	12.0	---		9.7	
Entrenchment Ratio		1.5	1.9	>2.2		>2.2		>2.2		8.0	9.6	16.1	26.9	13.3	20.0	30.3	90.9	---		82.3	
Bank Height Ratio		10.0	10.7	1.1	1.3	1.0		1.1	1.2	1.0		1.0		1.0	1.1	1.0	1.1	---		1.0	
D50 (mm)		0.105																---		N/A	
Profile																					
Shallow Length (ft)				---		---		---		---		---		---		---		3.8	51.6	8.3	44.1
Shallow Slope (ft/ft)		---		0.026	0.047	N/A		0.033	0.051	N/A		0.0129		0.0257	0.0648	0.0109	0.0308	0.0015	0.0339	0.0032	0.0228
Pool Length (ft)	N/A			---		---		---		---		---		---		---		1.7	19.9	4.3	23.4
Pool Max Depth (ft)		---		0.6		N/A		1.7	1.9	1.5		3.1		0.5	1.1	0.4	1.0	0.3	1.2	0.6	1.4
Pool Spacing (ft)^		---		27	67	N/A		21	27	16	59	32	55	15	24	5	23	8	53	12	51
Pool Volume (ft^3)																					
Pattern																					
Channel Beltwidth (ft)		---		8.7	14.3	7.2	16.2	9.1	9.8	14.0	20.0	21.0	36.0	4.0	9.0	4.0	26.0	3.9	10.2	5.2	18.9
Radius of Curvature (ft)		---		3.1	9.0	5.5	16.0	5.4	6.8	15.0	27.0	13.7	18.6	5.0	14.0	5.0	16.0	10.0	19.0	7.4	20.3
Rc:Bankfull Width (ft/ft)	N/A	---		0.6	1.6	1.0	3.0	0.8	1.0	1.5	2.8	1.5	2.0	1.7	4.5	1.5	4.8	---		3.1	8.5
Meander Length (ft)		---		39.8	84.8	36.5	63.2	32.5	36.9	50.0		N/A		24	51	10	56	27	50	28	54
Meander Width Ratio		---		1.6	2.6	1.3	3.0	1.4	1.5	1.4	2.1	2.3	2.9	1.3	3.0	1.3	8.0	---		2.2	7.9
Substrate, Bed and Transport Parameters																					
Ri%/Ru%/P%/G%/S%																					
SC%/Sa%/G%/C%/B%/Be%																					
d16/d35/d50/d84/d95/d100	N/A	-/0.065/0.105/0.336/0.4/9.6		---		---		---		---		---						N/A		N/A	
Reach Shear Stress (Competency) lb/ft^2		0.37	0.42											---		---		N/A		N/A	
Max part size (mm) mobilized at bankfull																					
Stream Power (Capacity) W/m^2																					
Additional Reach Parameters																					
Drainage Area (SM)		0.03		0.06		0.67		0.34		0.90		1.27		0.02		0.02		0.02		0.02	
Watershed Impervious Cover Estimate (%)		<1%		---		---		---		---		---		<1%		<1%		<1%		<1%	
Rosgen Classification		G5		E/C5b		E5		E5		E5/C5		E6		NA		E/C5		N/A		E/C5	
Bankfull Velocity (fps)		1.8	1.9	1.3	2.0	2.5	2.9	1.2	1.2	1.8	1.9	0.95		1.7		1.3		N/A		2.5	
Bankfull Discharge (cfs)		1.6	1.7	2.6		17.5		6.4		14.0		11.0		1.5		1.5		1.5		1.5	
Q-NFF regression		---																			
Q-USGS extrapolation	N/A	---																			
Q-Mannings		---																			
Valley Length (ft)		---		---		---		---		---		---		---		---					
Channel Thalweg Length (ft)		1,080		---		---		---		---		---		650		482		646		479	
Sinuosity		1.0		1.1		1.2		1.2		1.2		1.4		1.1	1.2	1.1	1.5	1.0		1.3	
Water Surface Slope $(ft/ft)^2$		---		---		---		---		---		---		---		---		0.0191		0.0090	
Bankfull Slope (ft/ft)		0.0320		0.0260		0.0170		0.0040		0.0022		0.0040		0.0171	0.0216	0.0078	0.0096	0.0186	0.0191	0.0085	0.0088

(---): Data was not provided
N/A: Not Applicable

Table 10f. Baseline Stream Data Summary
Devil's Racetrack Mitigation Site (NCDMS Project No. 95021)
Monitoring Year 2 - 2015

North Branch

		Pre-Restoration Condition	Reference Reach Data										Design		As-Built/Baseline	
Parameter	**Gage**	**North Branch**	**Scout West 1**		**Scout East 2**		**Scout West 2**		**Johanna Creek**		**Jarman Oak**		**North Branch**		**North Branch**	
		Min	**Min**	**Max**	**Min**	**Max**	**Min**	**Max**	**Min**	**Max**	**Min**	**Max**	**Min**	**Max**	**Min**	**Max**
Dimension and Substrate - Shallow																
Bankfull Width (ft)	N/A	---	2.6	6.3	4.7	6.1	5.6	7.6	9.7		9.3		9.2		8.6	9.3
Floodprone Width (ft)		---	>20		>50		>50		>75		>150		100	300	>200	
Bankfull Mean Depth		---	0.3	0.5	1.1	1.3	0.7	1.0	0.8		1.2		0.6		0.7	0.7
Bankfull Max Depth		---	0.5	0.7	1.7	1.8	1.2	1.3	1.1		2.3		0.9	1.1	1.0	1.2
Bankfull Cross Sectional Area (ft^2)		---	1.3	2.0	6.0	6.9	5.3	5.4	7.2	7.8	11.6		5.9		5.7	6.5
Width/Depth Ratio		---	5.4	19.4	3.6	5.4	5.7	11.0	10.1	19.7	7.4		14.0	14.5	13.1	13.2
Entrenchment Ratio		---	>2.2		>2.2		>2.2		8.0	9.6	16.1	26.9	10.9	32.6	>21.6	>23.2
Bank Height Ratio		---	1.1	1.3	1.0		1.1	1.2	1.0		1.0		1.0	1.1	1.0	
D50 (mm)		---													N/A	
Profile																
Shallow Length (ft)	N/A		---		---		---		---		---		---		5.3	35.8
Shallow Slope (ft/ft)		---	0.026	0.047	N/A		0.033	0.051	N/A		0.0129		0.0010	0.0065	0.0013	0.0163
Pool Length (ft)			---		---		---		---		---		---		8.5	80.8
Pool Max Depth (ft)		---	0.6		N/A		1.7	1.9	1.5		3.1		0.9	2.1	1.0	3.8
Pool Spacing (ft)^		---	27	67	N/A		21	27	16	59	32	55	15	64	17	101
Pool Volume (ft^3)																
Pattern																
Channel Beltwidth (ft)	N/A	---	8.7	14.3	7.2	16.2	9.1	9.8	14.0	20.0	21.0	36.0	12.0	74.0	16	72
Radius of Curvature (ft)		---	3.1	9.0	5.5	16.0	5.4	6.8	15.0	27.0	13.7	18.6	14.0	44.0	15	40
Rc:Bankfull Width (ft/ft)		---	0.6	1.6	1.0	3.0	0.8	1.0	1.5	2.8	1.5	2.0	1.5	4.8	1.7	4.3
Meander Length (ft)		---	39.8	84.8	36.5	63.2	32.5	36.9	50.0		N/A		28	156	79	129
Meander Width Ratio		---	1.6	2.6	1.3	3.0	1.4	1.5	1.4	2.1	2.3	2.9	1.3	8.0	1.9	7.7
Substrate, Bed and Transport Parameters																
Ri%/Ru%/P%/G%/S%	N/A															
SC%/Sa%/G%/C%/B%/Be%																
d16/d35/d50/d84/d95/d100		---	---		---		---		---		---				N/A	
Reach Shear Stress (Competency) lb/ft^2		---											---		N/A	
Max part size (mm) mobilized at bankfull																
Stream Power (Capacity) W/m^2																
Additional Reach Parameters																
Drainage Area (SM)	N/A	0.08	0.06		0.67		0.34		0.90		1.27		0.19		0.19	
Watershed Impervious Cover Estimate (%)		<1%	---		---		---		---		---		<1%		<1%	
Rosgen Classification		N/A	E/C5b		E5		E5		E5/C5		E6		E/C5		C5	
Bankfull Velocity (fps)		---	1.3	2.0	2.5	2.9	1.2	1.2	1.8	1.9	0.95		0.9		0.8	0.9
Bankfull Discharge (cfs)		---	2.6		17.5		6.4		14.0		11.0		5.0		5.0	
Q-NFF regression		---														
Q-USGS extrapolation		---														
Q-Mannings		---														
Valley Length (ft)		---	---		---		---		---		---		---			
Channel Thalweg Length (ft)		---	---		---		---		---		---		2,418		2,410	
Sinuosity		---	1.1		1.2		1.2		1.2		1.4		1.2	1.6	1.31	
Water Surface Slope ($ft/ft)^2$		---	---		---		---		---		---		---		0.0016	
Bankfull Slope (ft/ft)		---	0.0260		0.0170		0.0040		0.0022		0.0040		0.0007	0.0020	0.0004	0.0020

(---): Data was not provided
N/A: Not Applicable

Table 11a. Morphology and Hydraulic Summary (Dimensional Parameters - Cross Section)

Devil's Racetrack Mitigation Site (NCDMS Project No. 95021)

Monitoring Year 2 - 2015

Devil's Racetrack (West)

	Cross Section 1 (Shallow)								Cross Section 2 (Pool)								Cross Section 3 (Shallow)								Cross Section 4 (Pool)							
Dimension and Substrate	**Base**	**MY1**	**MY2**	**MY3**	**MY4**	**MY5**	**MY6**	**MY7**	**Base**	**MY1**	**MY2**	**MY3**	**MY4**	**MY5**	**MY6**	**MY7**	**Base**	**MY1**	**MY2**	**MY3**	**MY4**	**MY5**	**MY6**	**MY7**	**Base**	**MY1**	**MY2**	**MY3**	**MY4**	**MY5**	**MY6**	**MY7**
based on fixed bankfull elevation	135.4	135.4	135.4						135.1	135.1	135.1						131.0	131.0	131.0						130.6	130.6	130.6					
Bankfull Width (ft)	9.6	7.6	7.7						10.7	10.1	10.2						9.5	10.0	10.0						11.1	11.4	11.4					
Floodprone Width (ft)	>200	>200	>200						N/A	N/A	N/A						>200	>200	>200						N/A	N/A	N/A					
Bankfull Mean Depth (ft)	0.6	0.7	0.8						0.7	0.8	0.8						0.9	0.8	0.8						1.0	0.8	0.9					
Bankfull Max Depth (ft)	1.1	1.5	1.5						1.7	1.9	2.0						1.4	1.4	1.4						1.7	1.7	1.7					
Bankfull Cross Sectional Area (ft^2)	6.2	5.6	5.8						7.8	7.6	8.6						8.5	8.1	8.2						10.7	9.4	9.9					
Bankfull Width/Depth Ratio	14.8	10.4	10.1						14.6	13.4	12.2						10.6	12.3	12.2						11.4	13.9	13.1					
Bankfull Entrenchment Ratio	>20.9	>26.2	>26.1						N/A	N/A	N/A						>21.1	>20.0	>20.1						N/A	N/A	N/A					
Bankfull Bank Height Ratio	1.0	1.0	1.0						1.0	1.0	1.0						1.0	1.0	1.0						1.0	1.0	1.0					

	Cross Section 5 (Pool)								Cross Section 6 (Shallow)								Cross Section 7 (Pool)								Cross Section 8 (Shallow)							
Dimension and Substrate	**Base**	**MY1**	**MY2**	**MY3**	**MY4**	**MY5**	**MY6**	**MY7**	**Base**	**MY1**	**MY2**	**MY3**	**MY4**	**MY5**	**MY6**	**MY7**	**Base**	**MY1**	**MY2**	**MY3**	**MY4**	**MY5**	**MY6**	**MY7**	**Base**	**MY1**	**MY2**	**MY3**	**MY4**	**MY5**	**MY6**	**MY7**
based on fixed bankfull elevation	125.3	125.3	125.3						124.7	124.7	124.7						120.8	120.8	120.8						119.9	119.9	119.9					
Bankfull Width (ft)	8.9	8.6	8.6						8.7	8.2	8.6						9.5	8.0	8.0						4.7	4.8	4.8					
Floodprone Width (ft)	N/A	N/A	N/A						>200	>200	>200						N/A	N/A	N/A						>200	>200	>200					
Bankfull Mean Depth (ft)	0.8	0.8	0.8						0.7	0.7	0.6						0.8	0.9	0.9						0.4	0.7	1.2					
Bankfull Max Depth (ft)	1.5	1.5	1.5						1.1	1.2	1.2						1.6	1.7	1.7						1.3	1.3	1.7					
Bankfull Cross Sectional Area (ft^2)	7.5	7.0	6.8						6.0	5.3	5.6						7.6	7.4	7.3						2.1	3.3	5.7					
Bankfull Width/Depth Ratio	10.7	10.6	10.9						12.6	12.6	13.4						11.7	8.7	8.8						10.6	6.9	4.0					
Bankfull Entrenchment Ratio	N/A	N/A	N/A						>23.0	>24.4	>23.2						N/A	N/A	N/A						>42.5	>42.1	>41.9					
Bankfull Bank Height Ratio	1.0	1.0	1.0						1.0	1.0	1.0						1.0	1.0	1.0						1.0	1.0	1.0					

	Cross Section 9 (Shallow)								Cross Section 10 (Pool)							
Dimension and Substrate	**Base**	**MY1**	**MY2**	**MY3**	**MY4**	**MY5**	**MY6**	**MY7**	**Base**	**MY1**	**MY2**	**MY3**	**MY4**	**MY5**	**MY6**	**MY7**
based on fixed bankfull elevation	116.4	116.4	116.4						116.1	116.1	116.1					
Bankfull Width (ft)	7.7	7.5	7.5						6.8	5.9	5.9					
Floodprone Width (ft)	>200	>200	>200						N/A	N/A	N/A					
Bankfull Mean Depth (ft)	0.5	0.7	0.7						0.6	0.8	0.8					
Bankfull Max Depth (ft)	0.7	1.0	1.0						0.9	1.0	1.0					
Bankfull Cross Sectional Area (ft^2)	4.0	5.4	4.9						4.4	4.7	4.6					
Bankfull Width/Depth Ratio	14.5	10.4	11.4						10.6	7.5	7.6					
Bankfull Entrenchment Ratio	>26.1	>26.7	>26.7						N/A	N/A	N/A					
Bankfull Bank Height Ratio	1.0	1.0	1.0						1.0	1.0	1.0					

Table 11b. Morphology and Hydraulic Summary (Dimensional Parameters - Cross Section)

Devil's Racetrack Mitigation Site (NCDMS Project No. 95021)

Monitoring Year 2 - 2015

Devil's Racetrack (East)

	Cross Section 11 (Pool)								Cross Section 12 (Shallow)								Cross Section 13 (Pool)								Cross Section 14 (Shallow)							
Dimension and Substrate	**Base**	**MY1**	**MY2**	**MY3**	**MY4**	**MY5**	**MY6**	**MY7**	**Base**	**MY1**	**MY2**	**MY3**	**MY4**	**MY5**	**MY6**	**MY7**	**Base**	**MY1**	**MY2**	**MY3**	**MY4**	**MY5**	**MY6**	**MY7**	**Base**	**MY1**	**MY2**	**MY3**	**MY4**	**MY5**	**MY6**	**MY7**
based on fixed bankfull elevation	115.4	115.4	115.4						115.1	115.1	115.1						115.0	115.0	115.0						114.6	114.6	114.6					
Bankfull Width (ft)	15.0	15.1	15.1						12.2	12.5	12.3						19.8	20.5	20.8						12.7	11.8	12.4					
Floodprone Width (ft)	N/A	N/A	N/A						>300	>300	>300						N/A	N/A	N/A						>300	>300	>300					
Bankfull Mean Depth (ft)	1.2	1.1	1.1						0.8	0.7	0.8						1.5	1.2	1.3						1.1	0.9	0.9					
Bankfull Max Depth (ft)	2.1	2.0	2.0						1.3	1.3	1.3						2.7	2.5	2.5						1.6	1.6	1.6					
Bankfull Cross Sectional Area (ft^2)	18.8	16.5	17.3						10.3	8.9	9.3						30.2	24.6	26.2						13.3	10.4	10.9					
Bankfull Width/Depth Ratio	12.0	13.8	13.1						14.6	17.6	16.1						13.0	17.1	16.6						12.1	13.4	14.0					
Bankfull Entrenchment Ratio	N/A	N/A	N/A						>24.5	>23.9	>24.5						N/A	N/A	N/A						>23.7	>25.4	>24.3					
Bankfull Bank Height Ratio	1.0	1.0	1.0						1.0	1.0	1.0						1.0	1.0	1.0						1.0	1.0	1.0					

	Cross Section 15 (Pool)								Cross Section 16 (Shallow)								Cross Section 17 (Shallow)								Cross Section 18 (Pool)							
Dimension and Substrate	**Base**	**MY1**	**MY2**	**MY3**	**MY4**	**MY5**	**MY6**	**MY7**	**Base**	**MY1**	**MY2**	**MY3**	**MY4**	**MY5**	**MY6**	**MY7**	**Base**	**MY1**	**MY2**	**MY3**	**MY4**	**MY5**	**MY6**	**MY7**	**Base**	**MY1**	**MY2**	**MY3**	**MY4**	**MY5**	**MY6**	**MY7**
based on fixed bankfull elevation	114.2	114.2	114.2						114.1	114.1	114.1						113.3	113.3	113.3						112.6	112.6	112.6					
Bankfull Width (ft)	15.6	12.4	12.4						13.4	12.6	12.7						13.7	12.5	12.7						15.5	15.3	15.3					
Floodprone Width (ft)	N/A	N/A	N/A						>300	>300	>300						>300	>300	>300						N/A	N/A	N/A					
Bankfull Mean Depth (ft)	1.1	1.2	1.2						1.0	1.0	1.0						1.0	1.0	1.0						1.6	1.5	1.4					
Bankfull Max Depth (ft)	2.1	1.9	1.9						1.7	1.8	1.7						1.7	1.7	1.7						2.8	2.7	2.6					
Bankfull Cross Sectional Area (ft^2)	17.3	14.5	14.3						13.2	12.0	12.3						13.9	12.5	12.7						25.0	22.4	21.0					
Bankfull Width/Depth Ratio	14.0	10.6	10.7						13.6	13.2	13.0						13.4	12.5	12.6						9.5	10.5	11.2					
Bankfull Entrenchment Ratio	N/A	N/A	N/A						>22.3	>23.9	>23.6						>21.9	>24.0	>23.6						N/A	N/A	N/A					
Bankfull Bank Height Ratio	1.0	1.0	1.0						1.0	1.0	1.0						1.0	1.0	1.0						1.0	1.0	1.0					

	Cross-Section 19 (Shallow)								Cross Section 20 (Shallow)								Cross Section 21 (Pool)							
Dimension and Substrate	**Base**	**MY1**	**MY2**	**MY3**	**MY4**	**MY5**	**MY6**	**MY7**	**Base**	**MY1**	**MY2**	**MY3**	**MY4**	**MY5**	**MY6**	**MY7**	**Base**	**MY1**	**MY2**	**MY3**	**MY4**	**MY5**	**MY6**	**MY7**
based on fixed bankfull elevation	112.7	112.7	112.7						109.0	109.0	109.0						108.1	108.1	108.1					
Bankfull Width (ft)	13.3	14.3	14.2						8.2	7.9	7.9						8.8	8.9	9.1					
Floodprone Width (ft)	>300	>300	>300						>300	>300	>300						N/A	N/A	N/A					
Bankfull Mean Depth (ft)	0.9	0.8	0.8						0.7	0.7	0.8						1.2	1.1	1.3					
Bankfull Max Depth (ft)	1.6	1.6	1.6						1.1	1.1	1.2						2.0	1.9	2.1					
Bankfull Cross Sectional Area (ft^2)	12.5	11.2	11.9						5.7	5.9	6.1						10.8	9.7	11.5					
Bankfull Width/Depth Ratio	14.1	18.4	17.1						11.9	10.6	10.3						7.3	8.1	7.2					
Bankfull Entrenchment Ratio	>22.6	>20.9	>21.1						>36.5	>37.8	>37.8						N/A	N/A	N/A					
Bankfull Bank Height Ratio	1.0	1.0	1.0						1.0	1.0	1.0						1.0	1.0	1.0					

Table 11c. Morphology and Hydraulic Summary (Dimensional Parameters - Cross Section)

Devil's Racetrack Mitigation Site (NCDMS Project No. 95021)

Monitoring Year 2 - 2015

Southeast Branch

	Cross Section 28 (Pool)								Cross Section 29 (Shallow)								Cross Section 30 (Pool)							
Dimension and Substrate	**Base**	**MY1**	**MY2**	**MY3**	**MY4**	**MY5**	**MY6**	**MY7**	**Base**	**MY1**	**MY2**	**MY3**	**MY4**	**MY5**	**MY6**	**MY7**	**Base**	**MY1**	**MY2**	**MY3**	**MY4**	**MY5**	**MY6**	**MY7**
based on fixed bankfull elevation	137.7	137.7	137.7						137.1	137.1	137.1						122.8	122.8	122.8					
Bankfull Width (ft)	3.8	3.3	3.3						3.0	2.9	2.6						3.8	4.1	3.5					
Floodprone Width (ft)	N/A	N/A	N/A						>30	>30	>30						N/A	N/A	N/A					
Bankfull Mean Depth (ft)	0.4	0.5	0.5						0.3	0.4	0.3						0.3	0.4	0.3					
Bankfull Max Depth (ft)	0.8	1.2	1.2						0.5	0.7	0.7						0.4	0.7	0.5					
Bankfull Cross Sectional Area (ft^2)	1.5	1.7	1.6						0.8	1.1	0.8						1.3	1.7	1.1					
Bankfull Width/Depth Ratio	9.3	6.6	7.1						11.4	7.7	8.3						11.2	9.4	11.7					
Bankfull Entrenchment Ratio	N/A	N/A	N/A						>9.9	>10.4	>11.4						N/A	N/A	N/A					
Bankfull Bank Height Ratio	1.0	1.0	1.0						1.0	1.0	1.0						1.0	1.0	1.0					
	Cross Section 31 (Shallow)								**Cross Section 32 (Shallow)**								**Cross Section 33 (Pool)**							
Dimension and Substrate	**Base**	**MY1**	**MY2**	**MY3**	**MY4**	**MY5**	**MY6**	**MY7**	**Base**	**MY1**	**MY2**	**MY3**	**MY4**	**MY5**	**MY6**	**MY7**	**Base**	**MY1**	**MY2**	**MY3**	**MY4**	**MY5**	**MY6**	**MY7**
based on fixed bankfull elevation	122.7	122.7	122.7						116.5	116.5	116.5						116.4	116.4	116.4					
Bankfull Width (ft)	3.8	3.9	3.8						5.3	5.1	3.9						6.3	5.8	5.0					
Floodprone Width (ft)	>60	>60	>60						>200	>200	>200						N/A	N/A	N/A					
Bankfull Mean Depth (ft)	0.4	0.5	0.3						0.4	0.4	0.3						0.4	0.3	0.4					
Bankfull Max Depth (ft)	0.5	0.8	0.5						0.6	0.5	0.5						0.8	0.6	0.6					
Bankfull Cross Sectional Area (ft^2)	1.3	2.0	1.3						2.1	1.8	1.2						2.4	1.7	1.8					
Bankfull Width/Depth Ratio	10.8	7.8	11.2						13.8	14.6	13.0						16.8	19.7	13.7					
Bankfull Entrenchment Ratio	>15.8	>15.4	>15.8						>37.5	>38.9	>51.3						N/A	N/A	N/A					
Bankfull Bank Height Ratio	1.0	1.0	1.0						1.0	1.0	1.0						1.0	1.0	1.0					

Table 11d. Morphology and Hydraulic Summary (Dimensional Parameters - Cross Section)

Devil's Racetrack Mitigation Site (NCDMS Project No. 95021)

Monitoring Year 2 - 2015

Middle Branch

	Cross Section 24 (Shallow)								Cross Section 25 (Pool)								Cross Section 26 (Pool)							
Dimension and Substrate	**Base**	**MY1**	**MY2**	**MY3**	**MY4**	**MY5**	**MY6**	**MY7**	**Base**	**MY1**	**MY2**	**MY3**	**MY4**	**MY5**	**MY6**	**MY7**	**Base**	**MY1**	**MY2**	**MY3**	**MY4**	**MY5**	**MY6**	**MY7**
based on fixed bankfull elevation	136.4	136.4	136.4						136.4	136.4	136.4						124.7	124.7	124.7					
Bankfull Width (ft)	2.2	2.3	2.2						3.1	3.1	3.2						4.1	4.8	5.0					
Floodprone Width (ft)	>50	>50	>50						N/A	N/A	N/A						N/A	N/A	N/A					
Bankfull Mean Depth (ft)	0.3	0.3	0.3						0.4	0.5	0.3						0.3	0.2	0.2					
Bankfull Max Depth (ft)	0.5	0.6	0.6						0.7	0.9	0.6						0.9	0.5	0.5					
Bankfull Cross Sectional Area (ft^2)	0.7	0.8	0.7						1.2	1.6	1.1						1.4	1.0	1.0					
Bankfull Width/Depth Ratio	6.7	6.8	6.8						8.1	6.0	9.1						>11.9	>21.9	>24.3					
Bankfull Entrenchment Ratio	>22.9	>21.5	>23.2						N/A	N/A	N/A						N/A	N/A	N/A					
Bankfull Bank Height Ratio	1.0	1.0	1.0						1.0	1.0	1.0						1.0	1.0	1.0					

	Cross Section 27 (Shallow)							
Dimension and Substrate	**Base**	**MY1**	**MY2**	**MY3**	**MY4**	**MY5**	**MY6**	**MY7**
based on fixed bankfull elevation	124.6	124.6	124.6					
Bankfull Width (ft)	3.4	3.2	3.1					
Floodprone Width (ft)	>200	>200	>200					
Bankfull Mean Depth (ft)	0.3	0.3	0.3					
Bankfull Max Depth (ft)	0.5	0.6	0.6					
Bankfull Cross Sectional Area (ft^2)	1.1	1.0	1.0					
Bankfull Width/Depth Ratio	10.1	10.7	10.2					
Bankfull Entrenchment Ratio	>58.8	>62.5	>64.3					
Bankfull Bank Height Ratio	1.0	1.0	1.0					

Table 11e. Morphology and Hydraulic Summary (Dimensional Parameters - Cross Section)

Devil's Racetrack Mitigation Site (NCDMS Project No. 95021)

Monitoring Year 2 - 2015

Southwest Branch

	Cross Section 22 (Pool)								Cross Section 23 (Shallow)							
Dimension and Substrate	**Base**	**MY1**	**MY2**	**MY3**	**MY4**	**MY5**	**MY6**	**MY7**	**Base**	**MY1**	**MY2**	**MY3**	**MY4**	**MY5**	**MY6**	**MY7**
based on fixed bankfull elevation	136.4	136.4	136.4						136.4	136.4	136.4					
Bankfull Width (ft)	4.9	4.8	5.0						2.4	2.9	3.0					
Floodprone Width (ft)	N/A	N/A	N/A						>200	>200	>200					
Bankfull Mean Depth (ft)	0.4	0.4	0.4						0.3	0.3	0.3					
Bankfull Max Depth (ft)	0.8	1.0	0.9						0.4	0.4	0.5					
Bankfull Cross Sectional Area (ft^2)	1.8	1.9	2.1						0.6	0.8	0.9					
Bankfull Width/Depth Ratio	13.2	11.9	11.7						9.7	11.2	10.1					
Bankfull Entrenchment Ratio	N/A	N/A	N/A						>82.3	>68.6	>67.5					
Bankfull Bank Height Ratio	1.0	1.0	1.0						1.0	1.0	1.0					

Table 11f. Morphology and Hydraulic Summary (Dimensional Parameters - Cross Section)

Devil's Racetrack Mitigation Site (NCDMS Project No. 95021)

Monitoring Year 2 - 2015

North Branch

	Cross Section 34 (Pool)								Cross Section 35 (Shallow)								Cross Section 36 (Shallow)							
Dimension and Substrate	**Base**	**MY1**	**MY2**	**MY3**	**MY4**	**MY5**	**MY6**	**MY7**	**Base**	**MY1**	**MY2**	**MY3**	**MY4**	**MY5**	**MY6**	**MY7**	**Base**	**MY1**	**MY2**	**MY3**	**MY4**	**MY5**	**MY6**	**MY7**
based on fixed bankfull elevation	118.6	118.6	118.6						118.73	118.7	118.7						116.8	116.8	116.8					
Bankfull Width (ft)	9.8	10.0	10.2						8.6	9.2	9.2						9.3	9.0	9.0					
Floodprone Width (ft)	N/A	N/A	N/A						>200	>200	>200						>200	>200	>200					
Bankfull Mean Depth (ft)	0.8	0.7	0.7						0.7	0.7	0.7						0.7	0.8	0.8					
Bankfull Max Depth (ft)	1.3	1.4	1.4						1.0	1.2	1.2						1.2	1.4	1.4					
Bankfull Cross Sectional Area (ft^2)	7.5	7.2	7.5						5.7	6.0	6.4						6.5	7.0	6.9					
Bankfull Width/Depth Ratio	12.8	14.0	13.9						13.1	14.1	13.2						13.2	11.5	11.7					
Bankfull Entrenchment Ratio	N/A	N/A	N/A						>23.2	>21.7	>21.7						>21.6	>22.2	>22.2					
Bankfull Bank Height Ratio	1.0	1.0	1.0						1.0	1.0	1.0						1.0	1.0	1.0					

	Cross Section 37 (Pool)							
Dimension and Substrate	**Base**	**MY1**	**MY2**	**MY3**	**MY4**	**MY5**	**MY6**	**MY7**
based on fixed bankfull elevation	116.5	116.5	116.5					
Bankfull Width (ft)	10.6	11.1	10.7					
Floodprone Width (ft)	N/A	N/A	N/A					
Bankfull Mean Depth (ft)	0.9	0.8	0.9					
Bankfull Max Depth (ft)	1.4	1.4	1.5					
Bankfull Cross Sectional Area (ft^2)	9.2	9.2	9.2					
Bankfull Width/Depth Ratio	12.3	13.4	12.5					
Bankfull Entrenchment Ratio	N/A	N/A	N/A					
Bankfull Bank Height Ratio	1.0	1.0	1.0					

Table 12a. Monitoring Data - Stream Reach Data Summary
Devil's Racetrack Mitigation Site (NCDMS Project No. 95021)
Monitoring Year 2 - 2015

Devil's Racetrack (West)

Parameter	As-Built/Baseline		MY1		MY2		MY3		MY4		MY5		MY6		MY7	
	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max
Dimension and Substrate - Shallow																
Bankfull Width (ft)	4.7	11.1	4.8	11.4	4.8	11.4										
Floodprone Width (ft)	>200	>200	>200	>200	>200	>200										
Bankfull Mean Depth	0.4	1.0	0.7	0.9	0.6	1.2										
Bankfull Max Depth	0.7	1.7	1.0	1.9	1.0	2.0										
Bankfull Cross Sectional Area (ft^2)	2.1	10.7	3.3	9.4	4.6	9.9										
Width/Depth Ratio	10.6	13.9	6.9	13.9	4.0	13.4										
Entrenchment Ratio	>20.9	>42.5	>20	>42.1	>20.1	>41.9										
Bank Height Ratio	1.0	1.0	1.0	1.0	1.0	1.0										
D50 (mm)																
Profile																
Shallow Length (ft)																
Shallow Slope (ft/ft)																
Pool Length (ft)																
Pool Max Depth (ft)																
Pool Spacing (ft)																
Pool Volume (ft^3)																
Pattern																
Channel Beltwidth (ft)																
Radius of Curvature (ft)																
Rc:Bankfull Width (ft/ft)																
Meander Wave Length (ft)																
Meander Width Ratio																
Additional Reach Parameters																
Rosgen Classification																
Channel Thalweg Length (ft)																
Sinuosity (ft)																
Water Surface Slope (ft/ft)																
Bankfull Slope (ft/ft)																
Ri%/Ru%/P%/G%/S%																
SC%/Sa%/G%/C%/B%/Be%																
d16/d35/d50/d84/d95/d100																
% of Reach with Eroding Banks			0%		0%											

Table 12b. Monitoring Data - Stream Reach Data Summary
Devil's Racetrack Mitigation Site (NCDMS Project No. 95021)
Monitoring Year 2 - 2015

Devil's Racetrack (East)

Parameter	As-Built/Baseline		MY1		MY2		MY3		MY4		MY5		MY6		MY7	
	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max
Dimension and Substrate - Shallow																
Bankfull Width (ft)	8.2	19.8	7.9	20.5	7.9	20.8										
Floodprone Width (ft)	>300	>300	>300	>300	>300	>300										
Bankfull Mean Depth	0.7	1.6	0.7	1.5	0.8	1.4										
Bankfull Max Depth	1.1	2.8	1.1	2.5	1.2	2.6										
Bankfull Cross Sectional Area (ft^2)	5.7	30.2	5.9	24.6	6.1	26.2										
Width/Depth Ratio	7.3	14.6	8.1	18.4	7.2	17.1										
Entrenchment Ratio	>21.9	>36.5	>20.9	>37.8	>21.1	>37.8										
Bank Height Ratio	1.0	1.0	1.0	1.0	1.0	1.0										
D50 (mm)																
Profile																
Shallow Length (ft)																
Shallow Slope (ft/ft)																
Pool Length (ft)																
Pool Max Depth (ft)																
Pool Spacing (ft)																
Pool Volume (ft^3)																
Pattern																
Channel Beltwidth (ft)																
Radius of Curvature (ft)																
Rc:Bankfull Width (ft/ft)																
Meander Wave Length (ft)																
Meander Width Ratio																
Additional Reach Parameters																
Rosgen Classification																
Channel Thalweg Length (ft)																
Sinuosity (ft)																
Water Surface Slope (ft/ft)																
Bankfull Slope (ft/ft)																
Ri%/Ru%/P%/G%/S%																
SC%/Sa%/G%/C%/B%/Be%																
d16/d35/d50/d84/d95/d100																
% of Reach with Eroding Banks			0%		0%											

Table 12c. Monitoring Data - Stream Reach Data Summary
Devil's Racetrack Mitigation Site (NCDMS Project No. 95021)
Monitoring Year 2 - 2015

Southeast Branch

Parameter	As-Built/Baseline		MY1		MY2		MY3		MY4		MY5		MY6		MY7	
	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max
Dimension and Substrate - Shallow																
Bankfull Width (ft)	3.0	6.3	2.9	5.8	2.6	5.0										
Floodprone Width (ft)	>30	>200	>30	>200	>30	>200										
Bankfull Mean Depth	0.3	0.4	0.3	0.5	0.3	0.5										
Bankfull Max Depth	0.4	0.8	0.5	1.2	0.5	1.2										
Bankfull Cross Sectional Area (ft^2)	0.8	2.4	1.1	2.0	0.8	1.8										
Width/Depth Ratio	9.3	16.8	6.6	19.7	7.1	13.7										
Entrenchment Ratio	>9.9	>37.5	>10.4	>38.9	>11.4	>51.3										
Bank Height Ratio	1.0	1.0	1.0	1.0	1.0	1.0										
D50 (mm)																
Profile																
Shallow Length (ft)																
Shallow Slope (ft/ft)																
Pool Length (ft)																
Pool Max Depth (ft)																
Pool Spacing (ft)																
Pool Volume (ft^3)																
Pattern																
Channel Beltwidth (ft)																
Radius of Curvature (ft)																
Rc:Bankfull Width (ft/ft)																
Meander Wave Length (ft)																
Meander Width Ratio																
Additional Reach Parameters																
Rosgen Classification																
Channel Thalweg Length (ft)																
Sinuosity (ft)																
Water Surface Slope (ft/ft)																
Bankfull Slope (ft/ft)																
Ri%/Ru%/P%/G%/S%																
SC%/Sa%/G%/C%/B%/Be%																
d16/d35/d50/d84/d95/d100																
% of Reach with Eroding Banks			10%		0%											

Table 12d. Monitoring Data - Stream Reach Data Summary
Devil's Racetrack Mitigation Site (NCDMS Project No. 95021)
Monitoring Year 2 - 2015

Middle Branch

Parameter	As-Built/Baseline		MY1		MY2		MY3		MY4		MY5		MY6		MY7	
	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max
Dimension and Substrate - Shallow																
Bankfull Width (ft)	2.2	4.1	2.3	4.8	2.2	5.0										
Floodprone Width (ft)	>50	>200	>50	>200	>50	>200										
Bankfull Mean Depth	0.3	0.4	0.2	0.5	0.2	0.3										
Bankfull Max Depth	0.5	0.9	0.5	0.9	0.5	0.6										
Bankfull Cross Sectional Area (ft^2)	0.7	1.4	0.8	1.6	0.7	1.1										
Width/Depth Ratio	6.7	>11.9	6.0	>21.9	6.8	>24.3										
Entrenchment Ratio	>22.9	>58.8	>21.5	>62.5	>23.2	>64.3										
Bank Height Ratio	1.0	1.0	1.0	1.0	1.0	1.0										
D50 (mm)																
Profile																
Shallow Length (ft)																
Shallow Slope (ft/ft)																
Pool Length (ft)																
Pool Max Depth (ft)																
Pool Spacing (ft)																
Pool Volume (ft^3)																
Pattern																
Channel Beltwidth (ft)																
Radius of Curvature (ft)																
Rc:Bankfull Width (ft/ft)																
Meander Wave Length (ft)																
Meander Width Ratio																
Additional Reach Parameters																
Rosgen Classification																
Channel Thalweg Length (ft)																
Sinuosity (ft)																
Water Surface Slope (ft/ft)																
Bankfull Slope (ft/ft)																
Ri%/Ru%/P%/G%/S%																
SC%/Sa%/G%/C%/B%/Be%																
d16/d35/d50/d84/d95/d100																
% of Reach with Eroding Banks			0%		0%											

Table 12e. Monitoring Data - Stream Reach Data Summary
Devil's Racetrack Mitigation Site (NCDMS Project No. 95021)
Monitoring Year 2 - 2015

Southwest Branch

Parameter	As-Built/Baseline		MY1		MY2		MY3		MY4		MY5		MY6		MY7	
	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max
Dimension and Substrate - Shallow																
Bankfull Width (ft)	2.4	4.9	2.9	4.8	3.0	5.0										
Floodprone Width (ft)	>200	>200	>200	>200	>200	>200										
Bankfull Mean Depth	0.3	0.4	0.3	0.4	0.3	0.4										
Bankfull Max Depth	0.4	0.8	0.4	1.0	0.5	0.9										
Bankfull Cross Sectional Area (ft^2)	0.6	1.8	0.8	1.9	0.9	2.1										
Width/Depth Ratio	9.7	13.2	11.1	11.9	10.1	11.7										
Entrenchment Ratio	>82.3	>82.3	>68.6	>68.6	>67.5	>67.5										
Bank Height Ratio	1.0	1.0	1.0	1.0	1.0	1.0										
D50 (mm)																
Profile																
Shallow Length (ft)																
Shallow Slope (ft/ft)																
Pool Length (ft)																
Pool Max Depth (ft)																
Pool Spacing (ft)																
Pool Volume (ft^3)																
Pattern																
Channel Beltwidth (ft)																
Radius of Curvature (ft)																
Rc:Bankfull Width (ft/ft)																
Meander Wave Length (ft)																
Meander Width Ratio																
Additional Reach Parameters																
Rosgen Classification																
Channel Thalweg Length (ft)																
Sinuosity (ft)																
Water Surface Slope (ft/ft)																
Bankfull Slope (ft/ft)																
Ri%/Ru%/P%/G%/S%																
SC%/Sa%/G%/C%/B%/Be%																
d16/d35/d50/d84/d95/d100																
% of Reach with Eroding Banks			0%		0%											

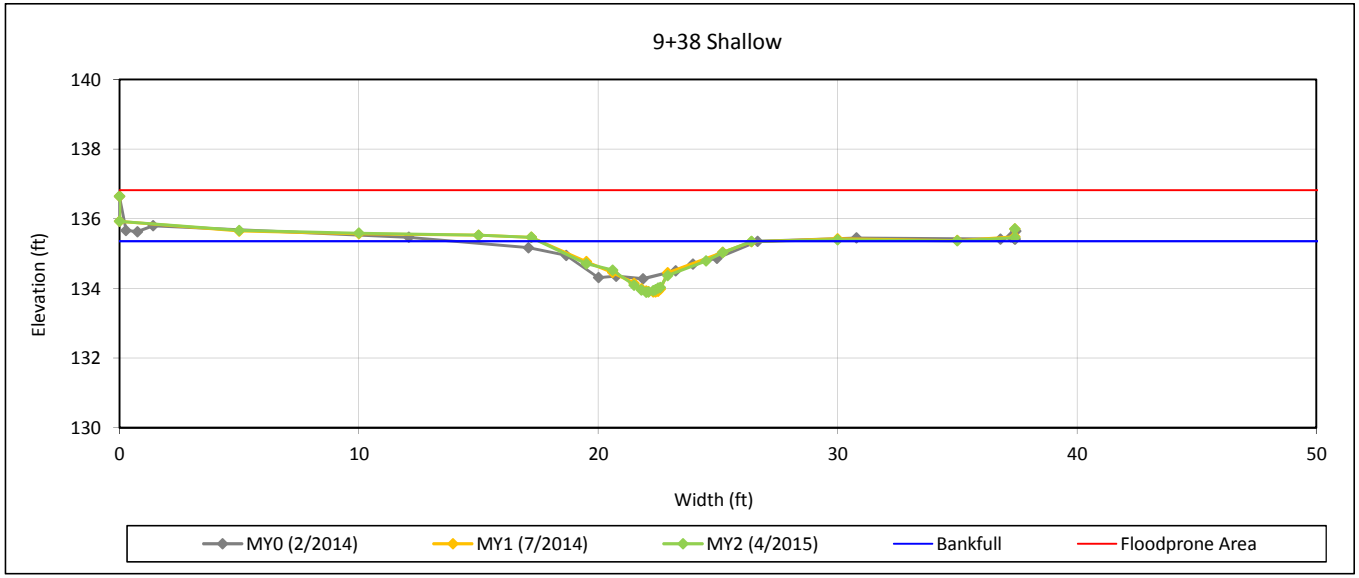
Table 12f. Monitoring Data - Stream Reach Data Summary
Devil's Racetrack Mitigation Site (NCDMS Project No. 95021)
Monitoring Year 2 - 2015

North Branch

Parameter	As-Built/Baseline		MY1		MY2		MY3		MY4		MY5		MY6		MY7	
	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max
Dimension and Substrate - Shallow																
Bankfull Width (ft)	8.6	10.7	9.0	10.0	9.0	10.7										
Floodprone Width (ft)	>200	>200	>200	>200	>200	>200										
Bankfull Mean Depth	0.7	0.9	0.7	0.9	0.7	0.9										
Bankfull Max Depth	1.0	1.4	1.2	1.4	1.2	1.5										
Bankfull Cross Sectional Area (ft^2)	5.7	9.2	6.0	8.7	6.4	9.2										
Width/Depth Ratio	12.4	13.2	9.7	14.1	11.7	13.9										
Entrenchment Ratio	>21.6	>23.2	>21.7	>22.2	>21.7	>22.2										
Bank Height Ratio	1.0	1.0	1.0	1.0	1.0	1.0										
D50 (mm)																
Profile																
Shallow Length (ft)																
Shallow Slope (ft/ft)																
Pool Length (ft)																
Pool Max Depth (ft)																
Pool Spacing (ft)																
Pool Volume (ft^3)																
Pattern																
Channel Beltwidth (ft)																
Radius of Curvature (ft)																
Rc:Bankfull Width (ft/ft)																
Meander Wave Length (ft)																
Meander Width Ratio																
Additional Reach Parameters																
Rosgen Classification																
Channel Thalweg Length (ft)																
Sinuosity (ft)																
Water Surface Slope (ft/ft)																
Bankfull Slope (ft/ft)																
Ri%/Ru%/P%/G%/S%																
SC%/Sa%/G%/C%/B%/Be%																
d16/d35/d50/d84/d95/d100																
% of Reach with Eroding Banks			0%		0%											

Cross Section Plots
Devil's Racetrack Mitigtion Site (NCDMS Project No. 95021)
Monitoring Year 2 -2015

Cross Section 1-DRC West



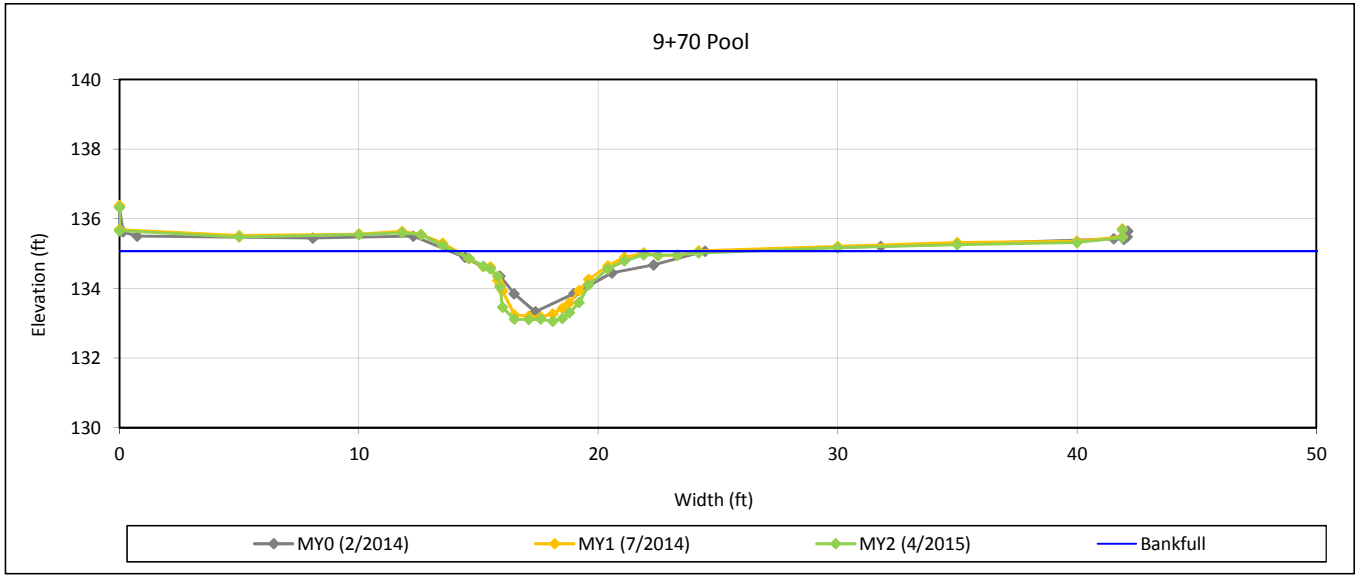
Bankfull Dimensions	
5.8	x-section area (ft.sq.)
7.7	width (ft)
0.8	mean depth (ft)
1.5	max depth (ft)
8.2	wetted parimeter (ft)
0.7	hyd radi (ft)
10.1	width-depth ratio
200.0	W flood prone area (ft)
26.1	entrenchment ratio
1.0	low bank height ratio

Survey Date: 4/2015
Field Crew: Wildlands Engineering

View Downstream

Cross Section Plots
Devil's Racetrack Mitigtion Site (NCDMS Project No. 95021)
Monitoring Year 2 -2015

Cross Section 2-DRC West



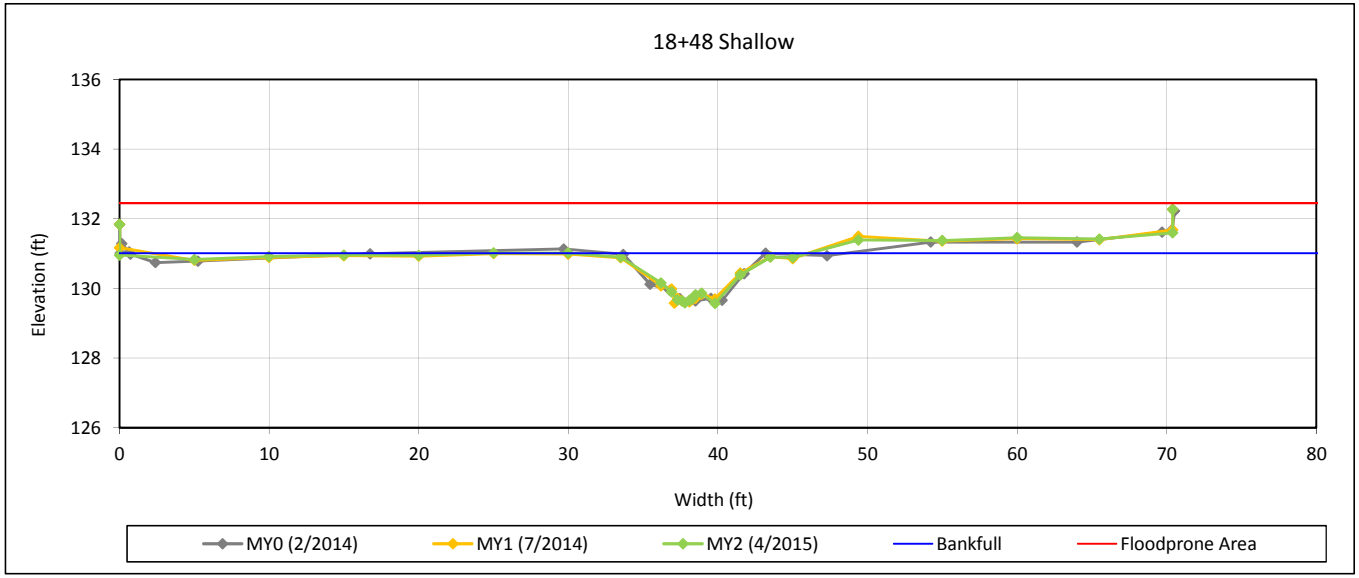
Bankfull Dimensions	
8.6	x-section area (ft.sq.)
10.2	width (ft)
0.8	mean depth (ft)
2.0	max depth (ft)
11.8	wetted parimeter (ft)
0.7	hyd radi (ft)
12.2	width-depth ratio

Survey Date: 4/2015
Field Crew: Wildlands Engineering

View Downstream

Cross Section Plots
Devil's Racetrack Mitigtion Site (NCDMS Project No. 95021)
Monitoring Year 2 -2015

Cross Section 3-DRC West



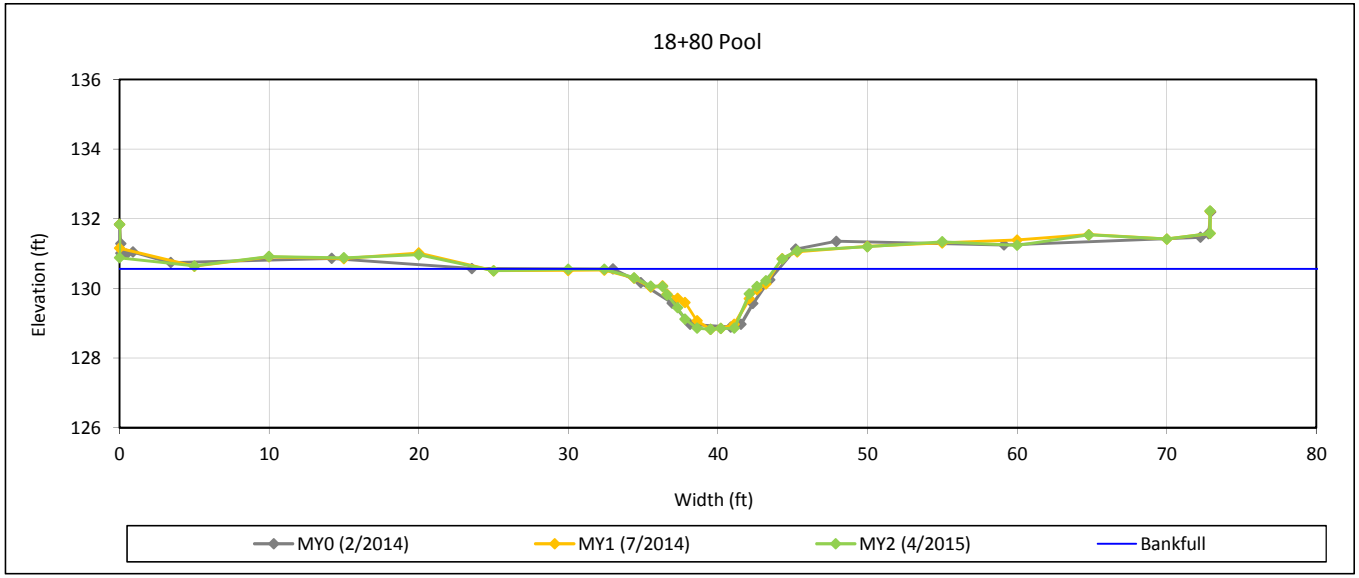
Bankfull Dimensions	
8.2	x-section area (ft.sq.)
10.0	width (ft)
0.8	mean depth (ft)
1.4	max depth (ft)
10.6	wetted parimeter (ft)
0.8	hyd radi (ft)
12.2	width-depth ratio
200.0	W flood prone area (ft)
20.0	entrenchment ratio
1.0	low bank height ratio

Survey Date: 4/2015
Field Crew: Wildlands Engineering

View Downstream

Cross Section Plots
Devil's Racetrack Mitigtion Site (NCDMS Project No. 95021)
Monitoring Year 2 -2015

Cross Section 4-DRC West



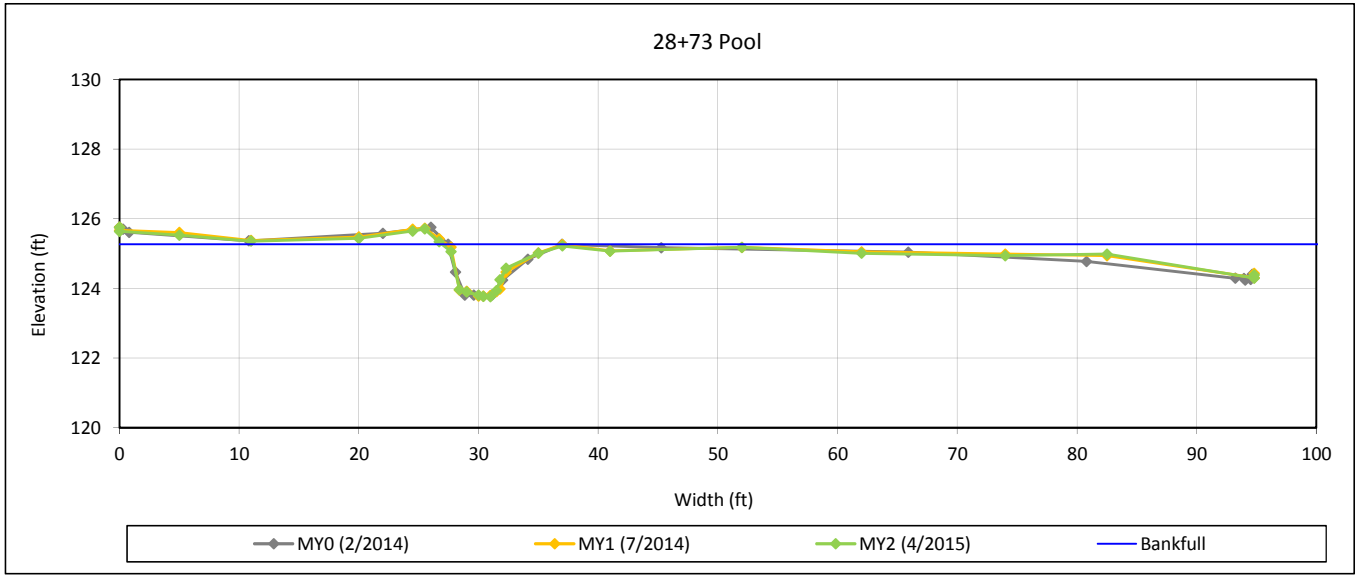
Bankfull Dimensions	
9.9	x-section area (ft.sq.)
11.4	width (ft)
0.9	mean depth (ft)
1.7	max depth (ft)
12.3	wetted parimeter (ft)
0.8	hyd radi (ft)
13.1	width-depth ratio

Survey Date: 4/2015
Field Crew: Wildlands Engineering

View Downstream

Cross Section Plots
Devil's Racetrack Mitigtion Site (NCDMS Project No. 95021)
Monitoring Year 2 -2015

Cross Section 5-DRC West



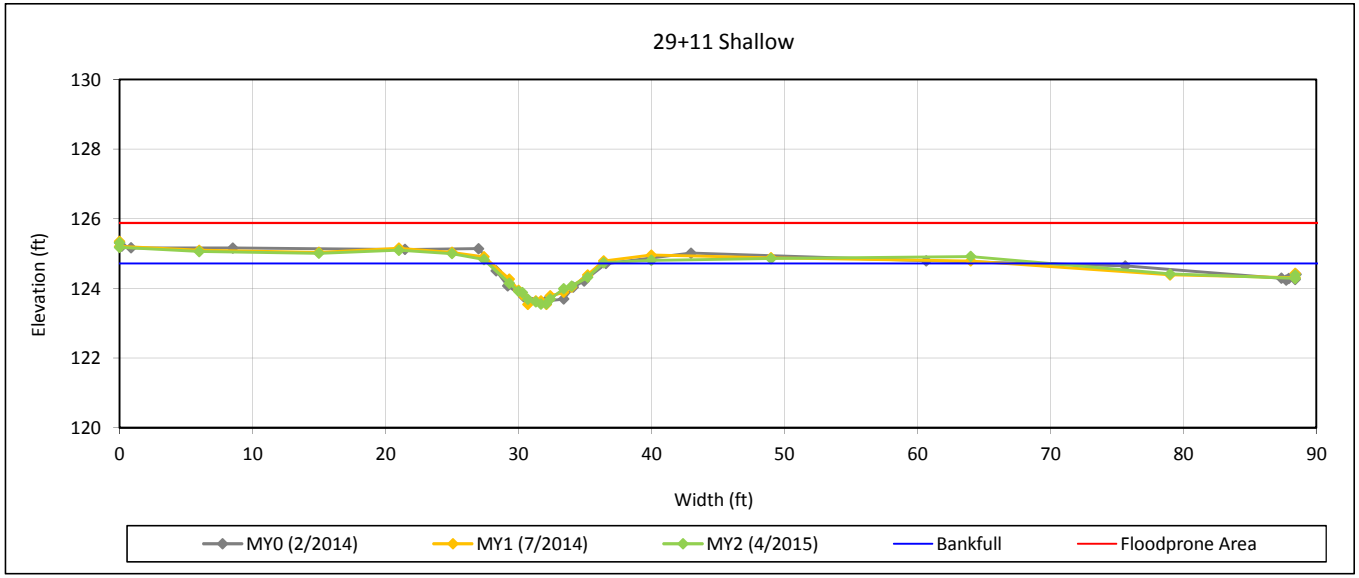
Bankfull Dimensions	
6.8	x-section area (ft.sq.)
8.6	width (ft)
0.8	mean depth (ft)
1.5	max depth (ft)
8.9	wetted parimeter (ft)
0.8	hyd radi (ft)
10.9	width-depth ratio

Survey Date: 4/2015
Field Crew: Wildlands Engineering

View Downstream

Cross Section Plots
Devil's Racetrack Mitigtion Site (NCDMS Project No. 95021)
Monitoring Year 2 -2015

Cross Section 6-DRC West



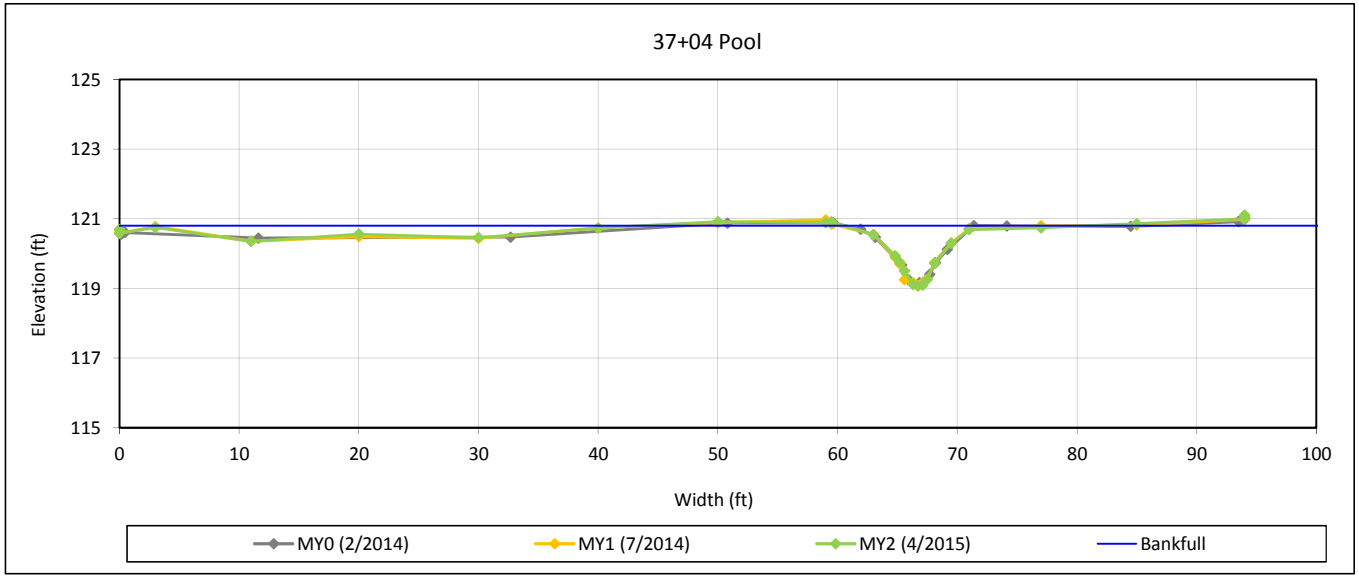
Bankfull Dimensions	
5.6	x-section area (ft.sq.)
8.6	width (ft)
0.6	mean depth (ft)
1.2	max depth (ft)
9.0	wetted parimeter (ft)
0.6	hyd radi (ft)
13.4	width-depth ratio
200.0	W flood prone area (ft)
23.2	entrenchment ratio
1.0	low bank height ratio

Survey Date: 4/2015
Field Crew: Wildlands Engineering

View Downstream

Cross Section Plots
Devil's Racetrack Mitigtion Site (NCDMS Project No. 95021)
Monitoring Year 2 -2015

Cross Section 7-DRC West



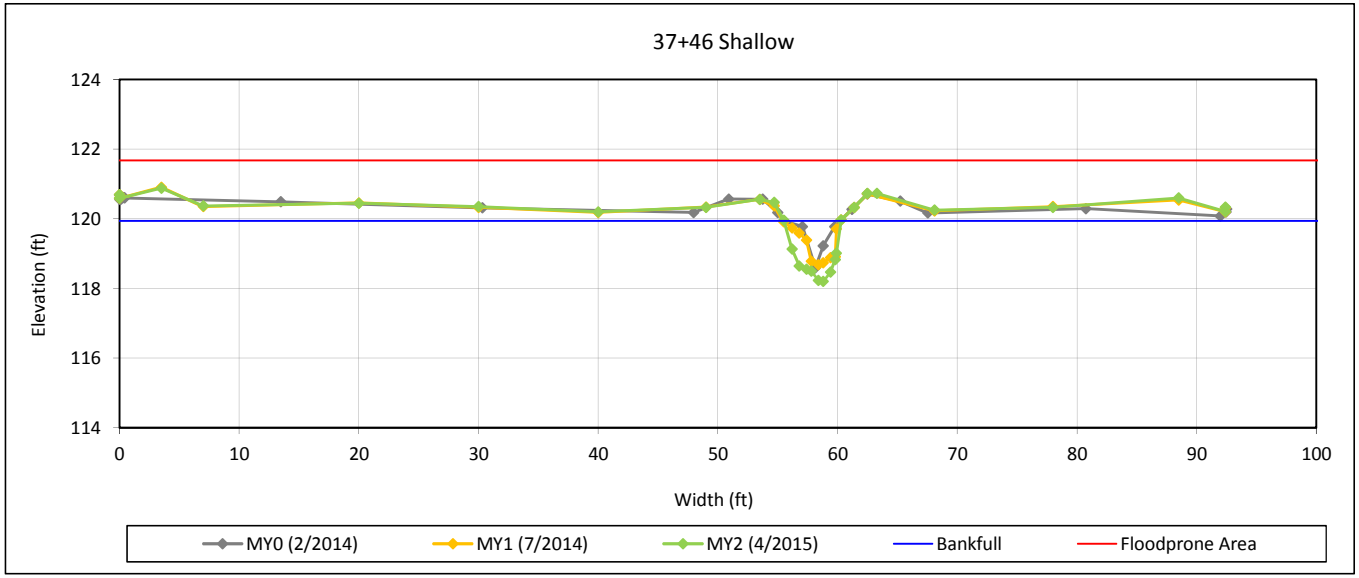
Bankfull Dimensions	
7.3	x-section area (ft.sq.)
8.0	width (ft)
0.9	mean depth (ft)
1.7	max depth (ft)
8.7	wetted parimeter (ft)
0.8	hyd radi (ft)
8.8	width-depth ratio

Survey Date: 4/2015
Field Crew: Wildlands Engineering

View Downstream

Cross Section Plots
Devil's Racetrack Mitigtion Site (NCDMS Project No. 95021)
Monitoring Year 2 -2015

Cross Section 8-DRC West



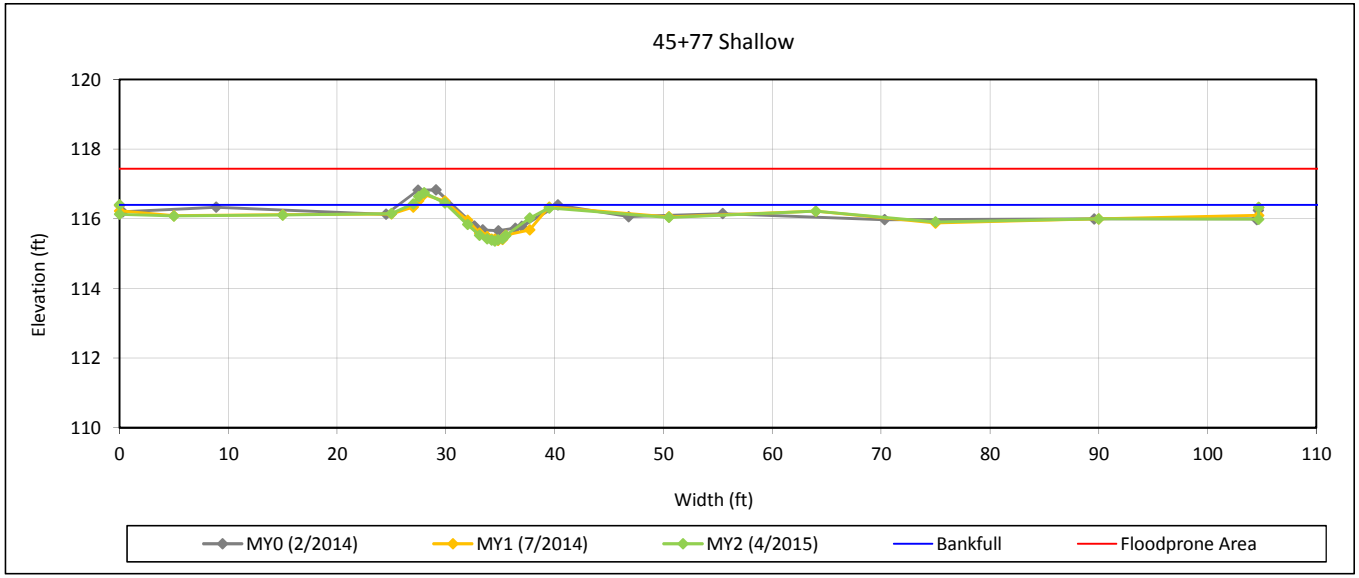
Bankfull Dimensions	
5.7	x-section area (ft.sq.)
4.8	width (ft)
1.2	mean depth (ft)
1.7	max depth (ft)
6.3	wetted parimeter (ft)
0.9	hyd radi (ft)
4.0	width-depth ratio
200.0	W flood prone area (ft)
41.9	entrenchment ratio
1.0	low bank height ratio

Survey Date: 4/2015
Field Crew: Wildlands Engineering

View Downstream

Cross Section Plots
Devil's Racetrack Mitigtion Site (NCDMS Project No. 95021)
Monitoring Year 2 -2015

Cross Section 9-DRC West



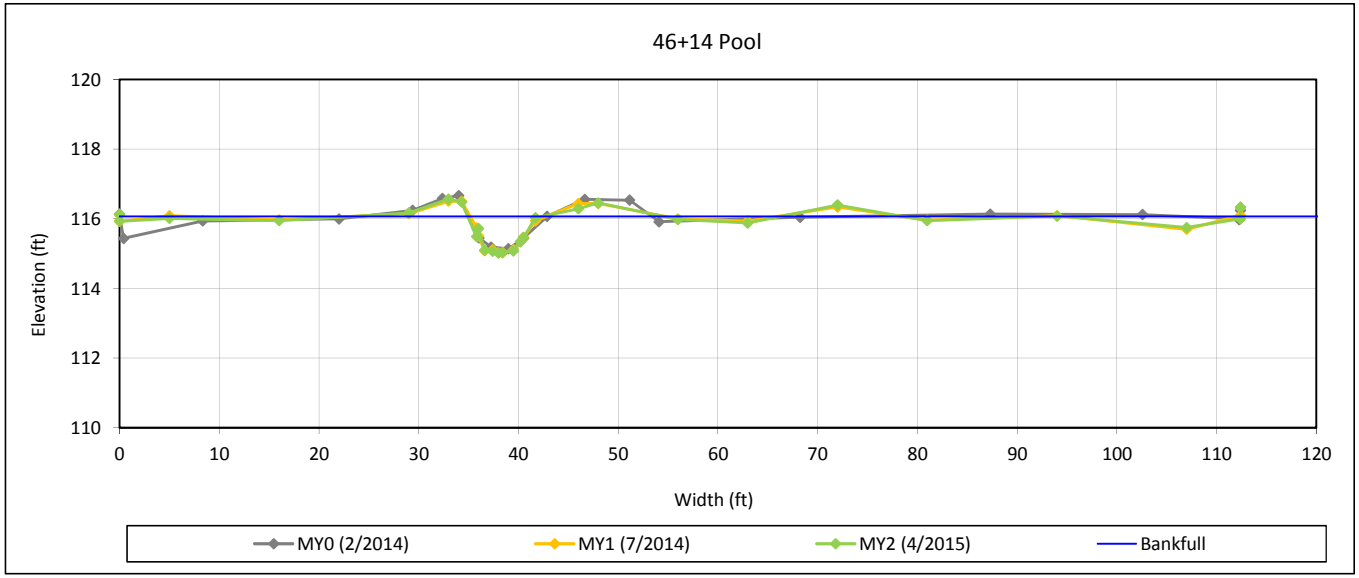
Bankfull Dimensions	
4.9	x-section area (ft.sq.)
7.5	width (ft)
0.7	mean depth (ft)
1.0	max depth (ft)
8.0	wetted parimeter (ft)
0.6	hyd radi (ft)
11.4	width-depth ratio
200.0	W flood prone area (ft)
26.7	entrenchment ratio
1.0	low bank height ratio

Survey Date: 4/2015
Field Crew: Wildlands Engineering

View Downstream

Cross Section Plots
Devil's Racetrack Mitigtion Site (NCDMS Project No. 95021)
Monitoring Year 2 -2015

Cross Section 10-DRC West



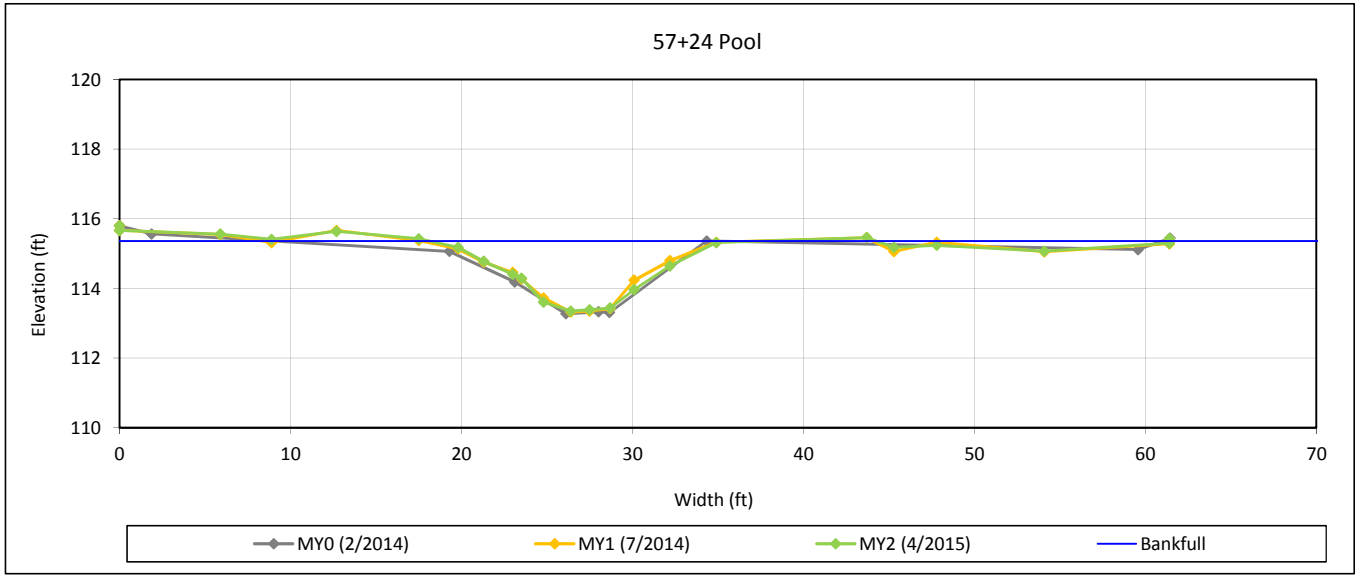
Bankfull Dimensions	
4.6	x-section area (ft.sq.)
5.9	width (ft)
0.8	mean depth (ft)
1.0	max depth (ft)
6.5	wetted parimeter (ft)
0.7	hyd radi (ft)
7.6	width-depth ratio

Survey Date: 4/2015
Field Crew: Wildlands Engineering

View Downstream

Cross Section Plots
Devil's Racetrack Mitigtion Site (NCDMS Project No. 95021)
Monitoring Year 2 - 2015

Cross Section 11-DRC East



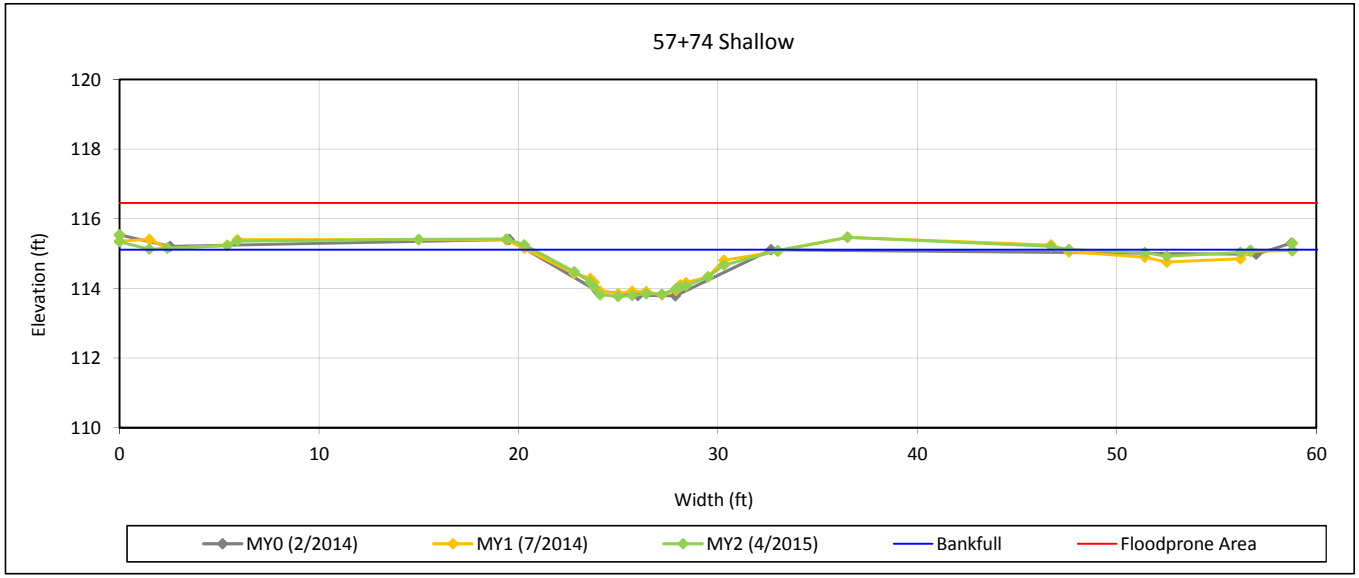
Bankfull Dimensions	
17.3	x-section area (ft.sq.)
15.1	width (ft)
1.1	mean depth (ft)
2.0	max depth (ft)
15.7	wetted parimeter (ft)
1.1	hyd radi (ft)
13.1	width-depth ratio

Survey Date: 4/2015
Field Crew: Wildlands Engineering

View Downstream

Cross Section Plots
Devil's Racetrack Mitigtion Site (NCDMS Project No. 95021)
Monitoring Year 2 - 2015

Cross Section 12-DRC East



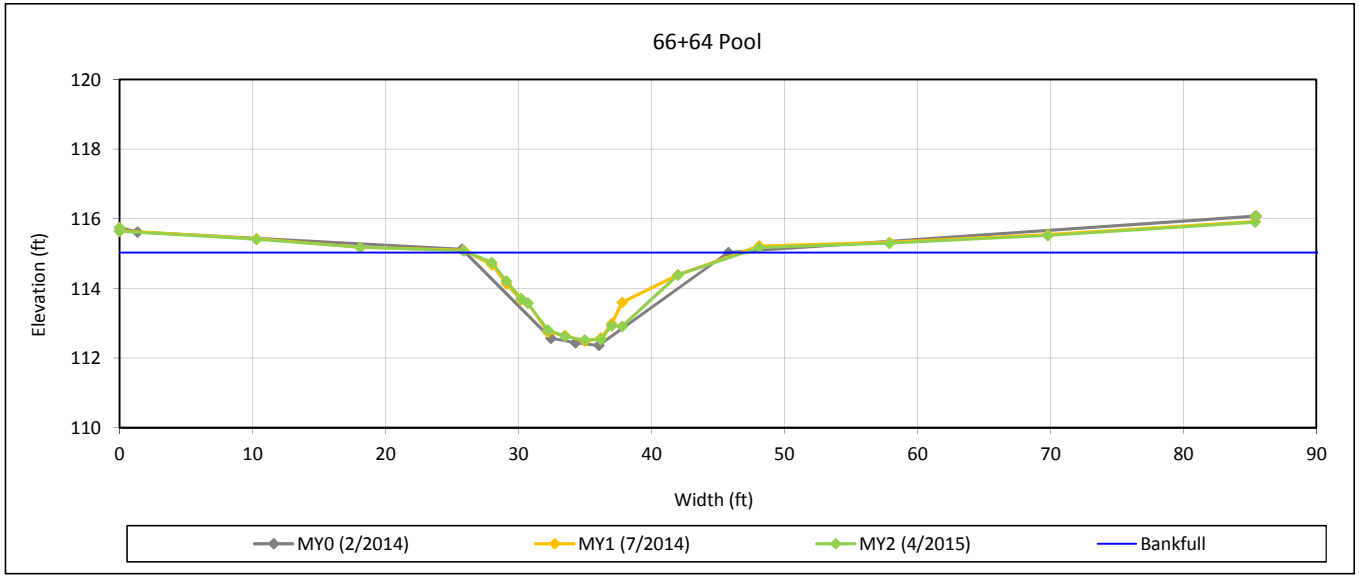
Bankfull Dimensions	
9.3	x-section area (ft.sq.)
12.3	width (ft)
0.8	mean depth (ft)
1.3	max depth (ft)
12.7	wetted parimeter (ft)
0.7	hyd radi (ft)
16.1	width-depth ratio
300.0	W flood prone area (ft)
24.5	entrenchment ratio
1.0	low bank height ratio

Survey Date: 4/2015
Field Crew: Wildlands Engineering

View Downstream

Cross Section Plots
Devil's Racetrack Mitigtion Site (NCDMS Project No. 95021)
Monitoring Year 2 - 2015

Cross Section 13-DRC East



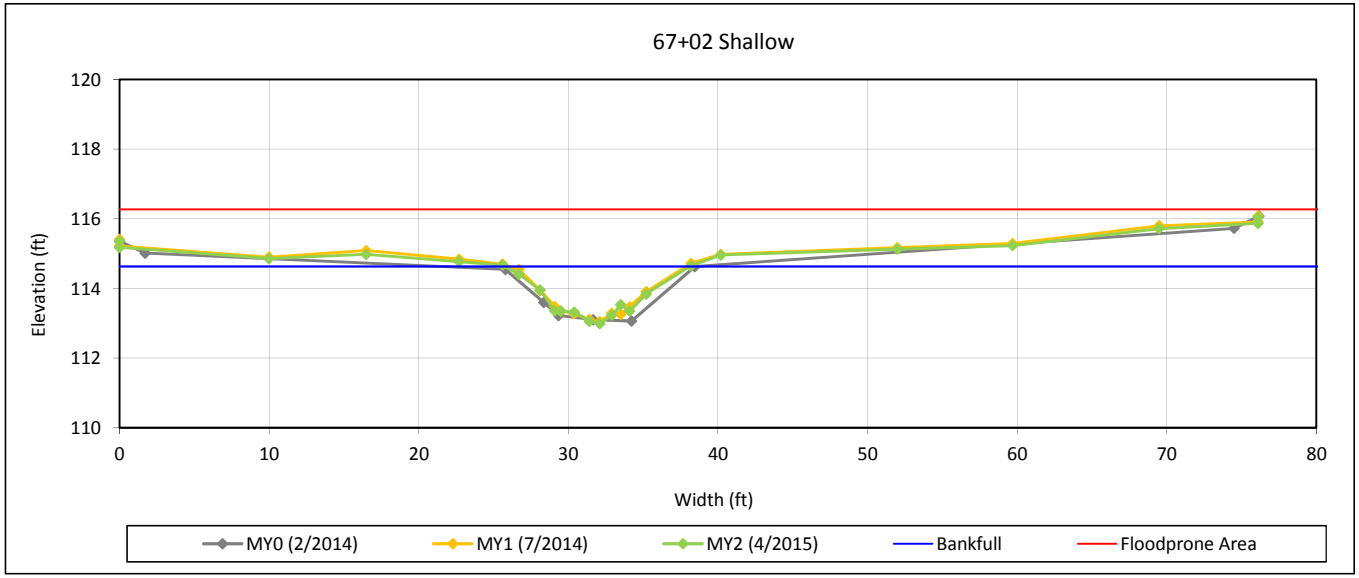
Bankfull Dimensions	
26.2	x-section area (ft.sq.)
20.8	width (ft)
1.3	mean depth (ft)
2.5	max depth (ft)
21.7	wetted parimeter (ft)
1.2	hyd radi (ft)
16.6	width-depth ratio

Survey Date: 4/2015
Field Crew: Wildlands Engineering

View Downstream

Cross Section Plots
Devil's Racetrack Mitigtion Site (NCDMS Project No. 95021)
Monitoring Year 2 - 2015

Cross Section 14-DRC East



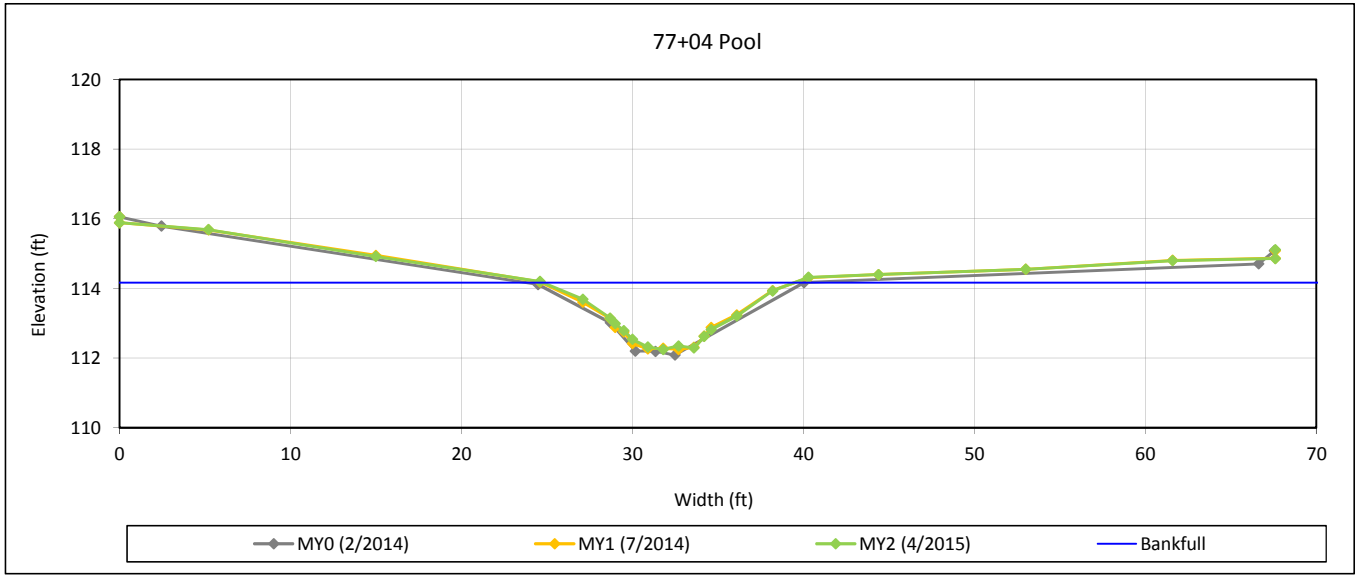
Bankfull Dimensions	
10.9	x-section area (ft.sq.)
12.4	width (ft)
0.9	mean depth (ft)
1.6	max depth (ft)
13.0	wetted parimeter (ft)
0.8	hyd radi (ft)
14.0	width-depth ratio
300.0	W flood prone area (ft)
24.3	entrenchment ratio
1.0	low bank height ratio

Survey Date: 4/2015
Field Crew: Wildlands Engineering

View Downstream

Cross Section Plots
Devil's Racetrack Mitigtion Site (NCDMS Project No. 95021)
Monitoring Year 2 - 2015

Cross Section 15-DRC East



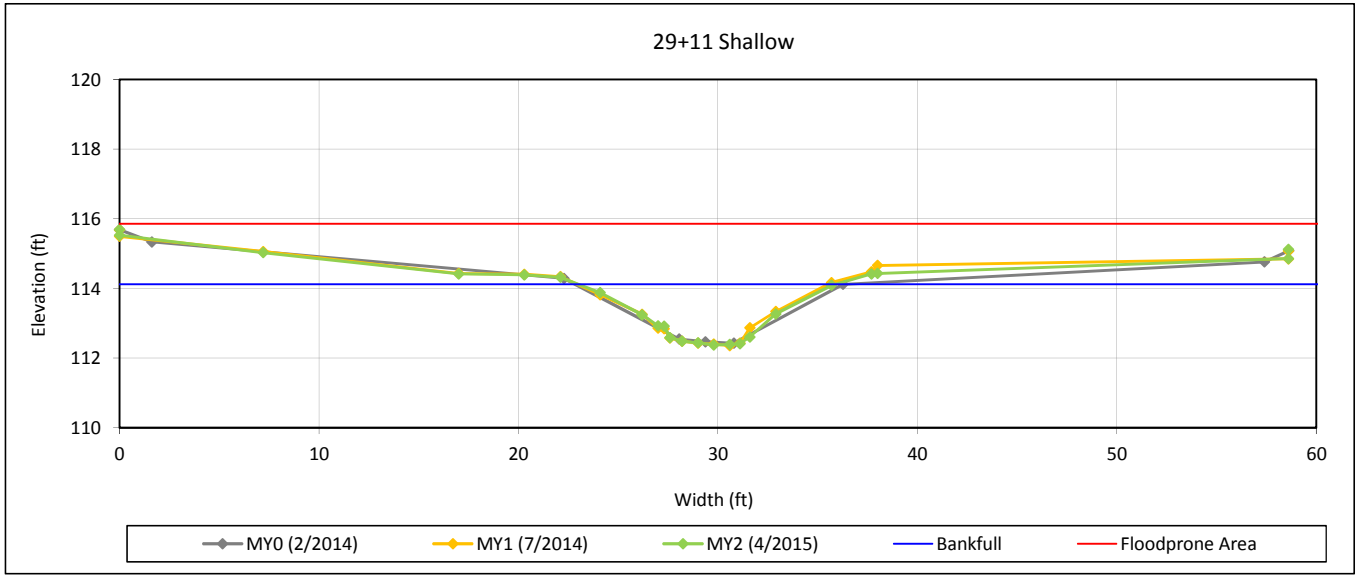
Bankfull Dimensions	
14.3	x-section area (ft.sq.)
12.4	width (ft)
1.2	mean depth (ft)
1.9	max depth (ft)
13.0	wetted parimeter (ft)
1.1	hyd radi (ft)
10.7	width-depth ratio

Survey Date: 4/2015
Field Crew: Wildlands Engineering

View Downstream

Cross Section Plots
Devil's Racetrack Mitigtion Site (NCDMS Project No. 95021)
Monitoring Year 2 - 2015

Cross Section 16-DRC East



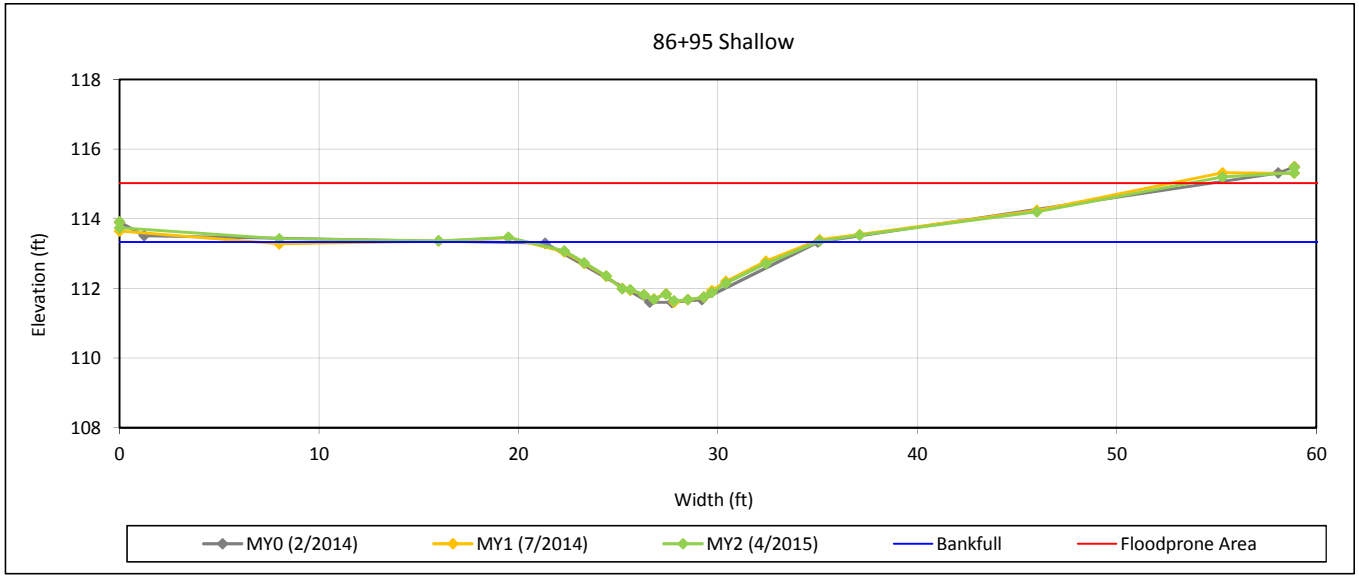
Bankfull Dimensions	
12.3	x-section area (ft.sq.)
12.7	width (ft)
1.0	mean depth (ft)
1.7	max depth (ft)
13.3	wetted parimeter (ft)
0.9	hyd radi (ft)
13.0	width-depth ratio
300.0	W flood prone area (ft)
23.6	entrenchment ratio
1.0	low bank height ratio

Survey Date: 4/2015
Field Crew: Wildlands Engineering

View Downstream

Cross Section Plots
Devil's Racetrack Mitigtion Site (NCDMS Project No. 95021)
Monitoring Year 2 - 2015

Cross Section 17-DRC East



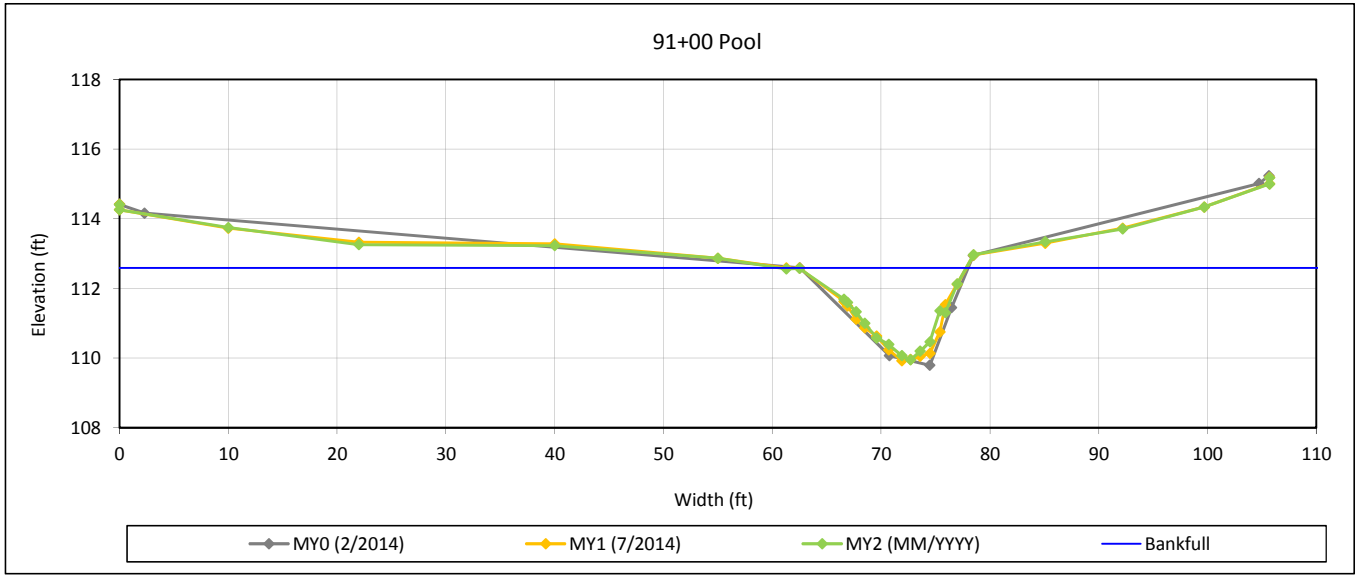
Bankfull Dimensions	
12.7	x-section area (ft.sq.)
12.7	width (ft)
1.0	mean depth (ft)
1.7	max depth (ft)
13.2	wetted parimeter (ft)
1.0	hyd radi (ft)
12.6	width-depth ratio
300.0	W flood prone area (ft)
23.6	entrenchment ratio
1.0	low bank height ratio

Survey Date: 4/2015
Field Crew: Wildlands Engineering

View Downstream

Cross Section Plots
Devil's Racetrack Mitigtion Site (NCDMS Project No. 95021)
Monitoring Year 2 - 2015

Cross Section 18-DRC East



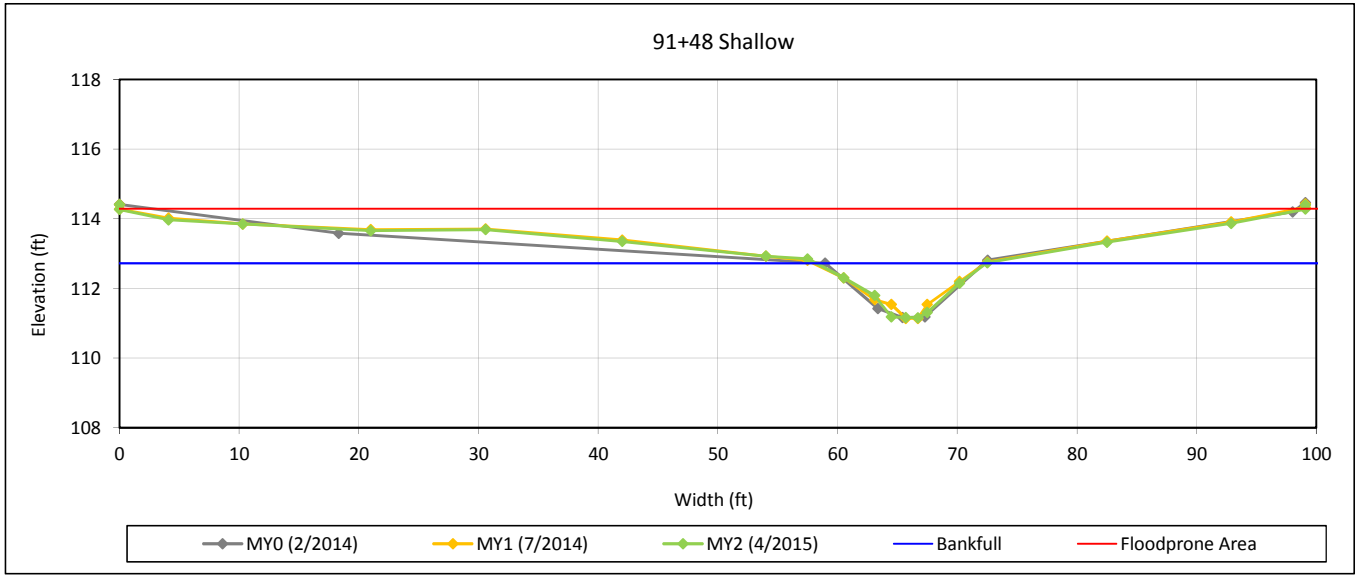
Bankfull Dimensions	
21.0	x-section area (ft.sq.)
15.3	width (ft)
1.4	mean depth (ft)
2.6	max depth (ft)
16.5	wetted parimeter (ft)
1.3	hyd radi (ft)
11.2	width-depth ratio

Survey Date:
Field Crew: Wildlands Engineering

View Downstream

Cross Section Plots
Devil's Racetrack Mitigtion Site (NCDMS Project No. 95021)
Monitoring Year 2 - 2015

Cross Section 19-DRC East



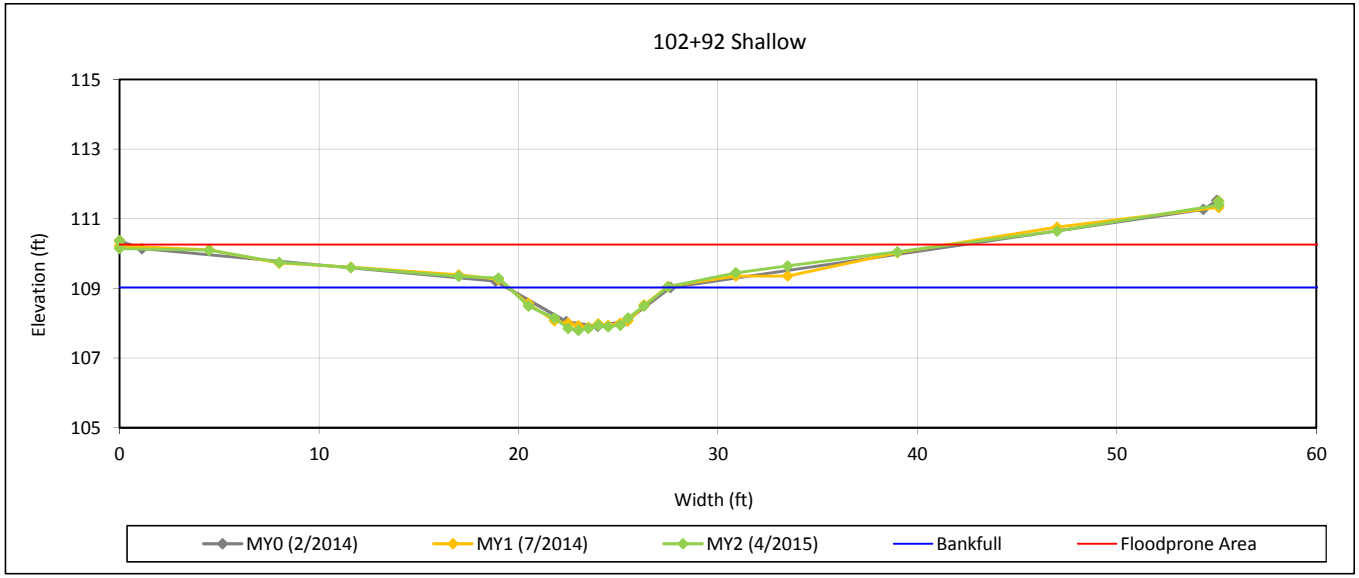
Bankfull Dimensions	
11.9	x-section area (ft.sq.)
14.2	width (ft)
0.8	mean depth (ft)
1.6	max depth (ft)
14.7	wetted parimeter (ft)
0.8	hyd radi (ft)
17.1	width-depth ratio
300.0	W flood prone area (ft)
21.1	entrenchment ratio
1.0	low bank height ratio

Survey Date: 4/2015
Field Crew: Wildlands Engineering

View Downstream

Cross Section Plots
Devil's Racetrack Mitigtion Site (NCDMS Project No. 95021)
Monitoring Year 2 - 2015

Cross Section 20-DRC East



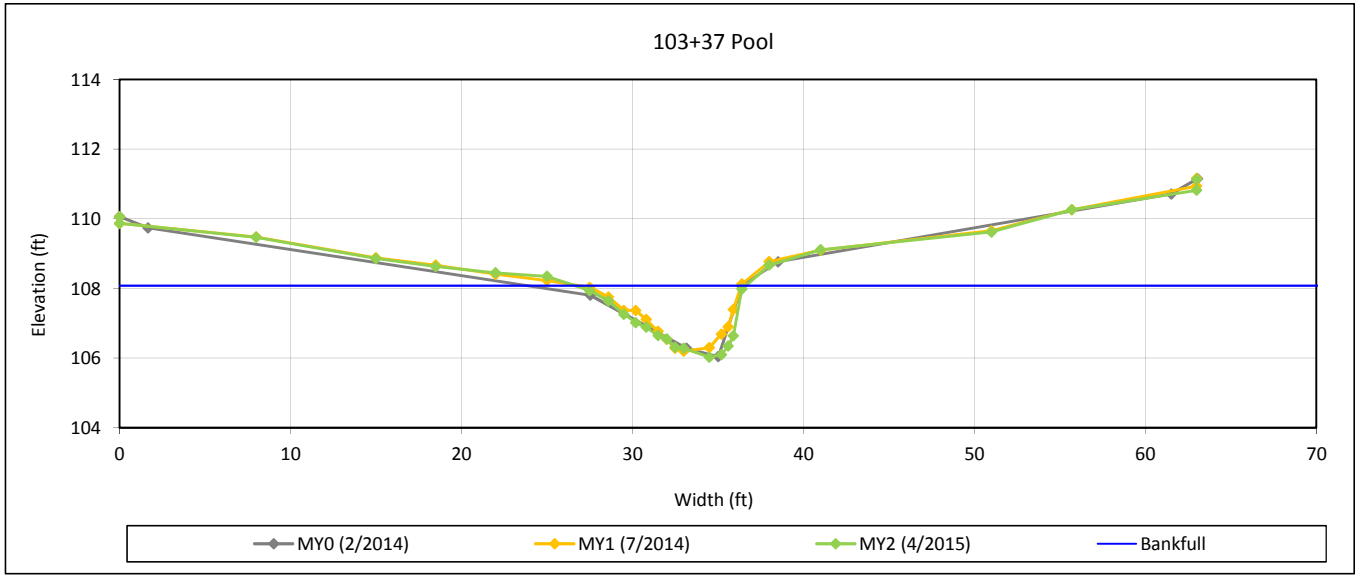
Bankfull Dimensions	
6.1	x-section area (ft.sq.)
7.9	width (ft)
0.8	mean depth (ft)
1.2	max depth (ft)
8.4	wetted parimeter (ft)
0.7	hyd radi (ft)
10.3	width-depth ratio
300.0	W flood prone area (ft)
37.8	entrenchment ratio
1.0	low bank height ratio

Survey Date: 4/2015
Field Crew: Wildlands Engineering

View Downstream

Cross Section Plots
Devil's Racetrack Mitigtion Site (NCDMS Project No. 95021)
Monitoring Year 2 - 2015

Cross Section 21-DRC East



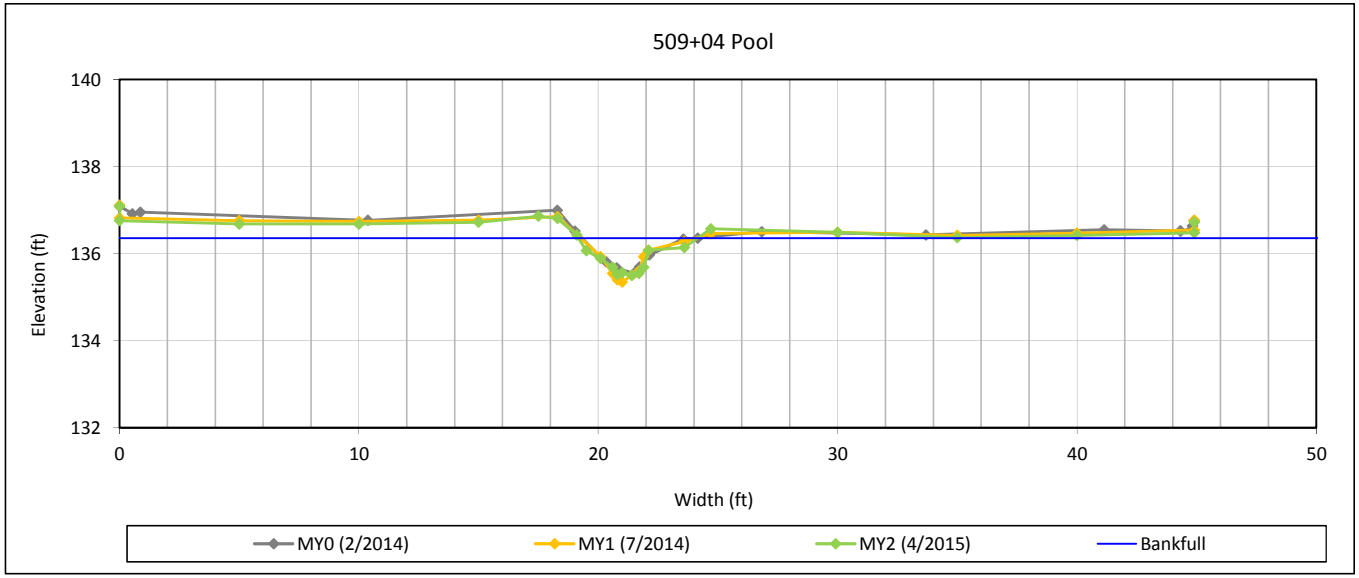
Bankfull Dimensions	
11.5	x-section area (ft.sq.)
9.1	width (ft)
1.3	mean depth (ft)
2.1	max depth (ft)
10.6	wetted parimeter (ft)
1.1	hyd radi (ft)
7.2	width-depth ratio

Survey Date: 4/2015
Field Crew: Wildlands Engineering

View Downstream

Cross Section Plots
Devil's Racetrack Mitigtion Site (NCDMS Project No. 95021)
Monitoring Year 2 - 2015

Cross Section 22-Southwest Branch



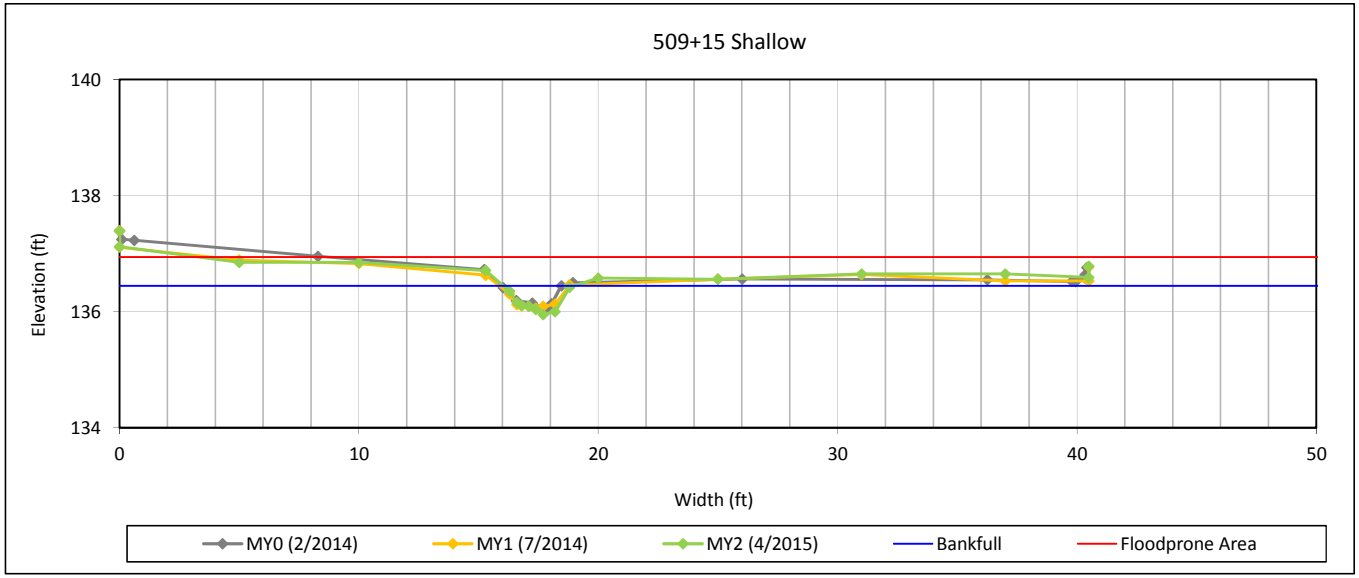
Bankfull Dimensions	
2.1	x-section area (ft.sq.)
5.0	width (ft)
0.4	mean depth (ft)
0.9	max depth (ft)
5.5	wetted parimeter (ft)
0.4	hyd radi (ft)
11.7	width-depth ratio

Survey Date: 4/2015
Field Crew: Wildlands Engineering

View Downstream

Cross Section Plots
Devil's Racetrack Mitigtion Site (NCDMS Project No. 95021)
Monitoring Year 2 - 2015

Cross Section 23-Southwest Branch



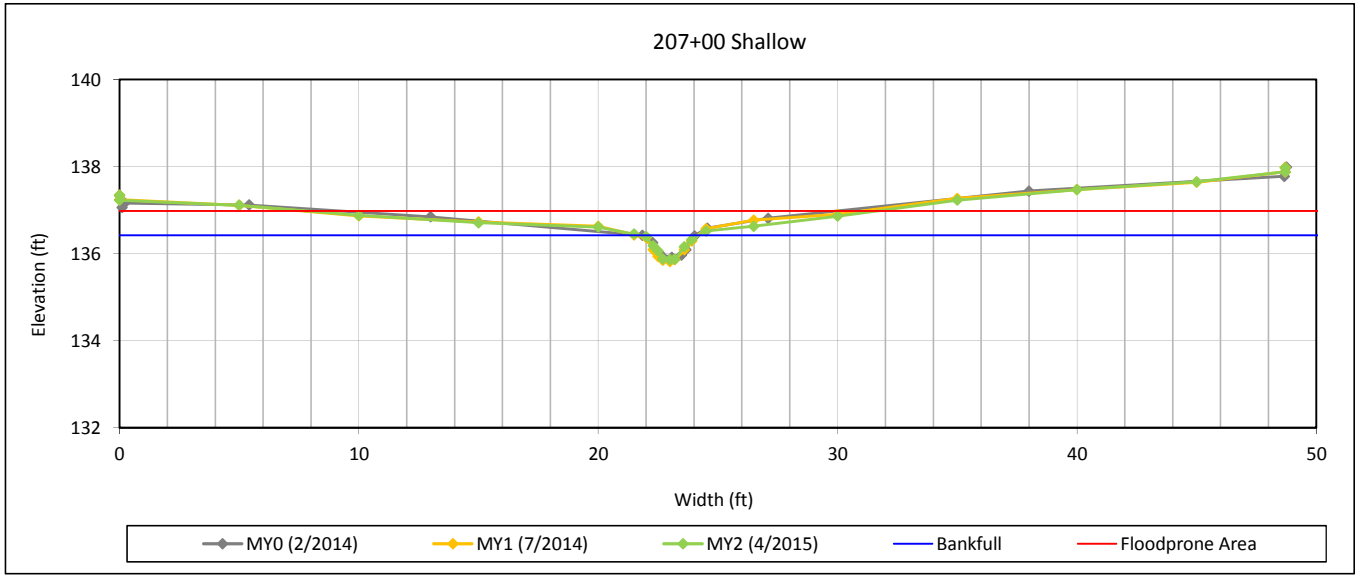
Bankfull Dimensions	
0.9	x-section area (ft.sq.)
3.0	width (ft)
0.3	mean depth (ft)
0.5	max depth (ft)
3.2	wetted parimeter (ft)
0.3	hyd radi (ft)
10.1	width-depth ratio
200.0	W flood prone area (ft)
67.5	entrenchment ratio
1.0	low bank height ratio

Survey Date: 4/2015
Field Crew: Wildlands Engineering

View Downstream

Cross Section Plots
Devil's Racetrack Mitigtion Site (NCDMS Project No. 95021)
Monitoring Year 2 - 2015

Cross Section 24-Middle Branch



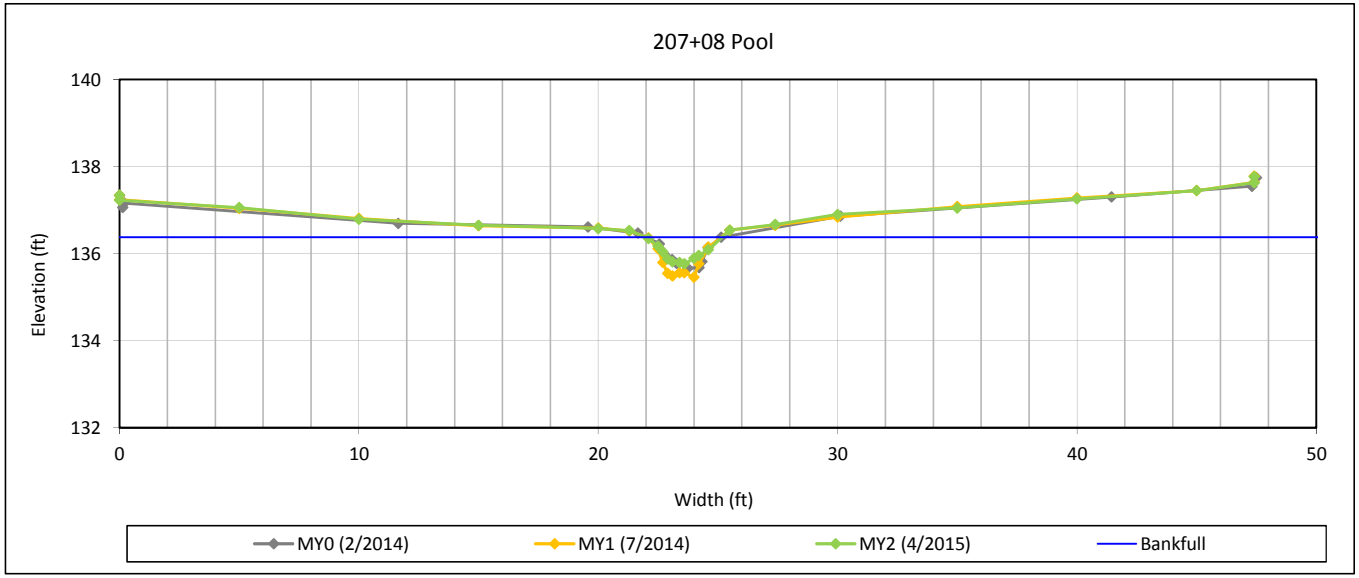
Bankfull Dimensions	
0.7	x-section area (ft.sq.)
2.2	width (ft)
0.3	mean depth (ft)
0.6	max depth (ft)
2.5	wetted parimeter (ft)
0.3	hyd radi (ft)
6.8	width-depth ratio
50.0	W flood prone area (ft)
23.2	entrenchment ratio
1.0	low bank height ratio

Survey Date: 4/2015
Field Crew: Wildlands Engineering

View Downstream

Cross Section Plots
Devil's Racetrack Mitigtion Site (NCDMS Project No. 95021)
Monitoring Year 2 - 2015

Cross Section 25-Middle Branch



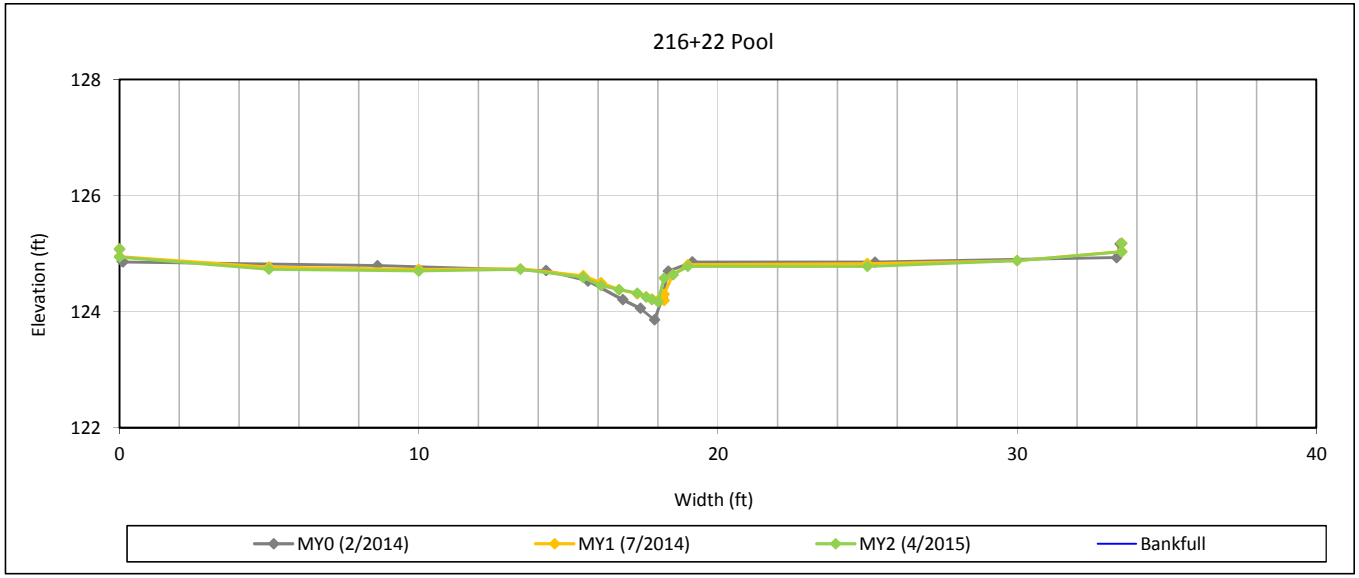
Bankfull Dimensions	
1.1	x-section area (ft.sq.)
3.2	width (ft)
0.3	mean depth (ft)
0.6	max depth (ft)
3.5	wetted parimeter (ft)
0.3	hyd radi (ft)
9.1	width-depth ratio

Survey Date: 4/2015
Field Crew: Wildlands Engineering

View Downstream

Cross Section Plots
Devil's Racetrack Mitigtion Site (NCDMS Project No. 95021)
Monitoring Year 2 - 2015

Cross Section 26-Middle Branch



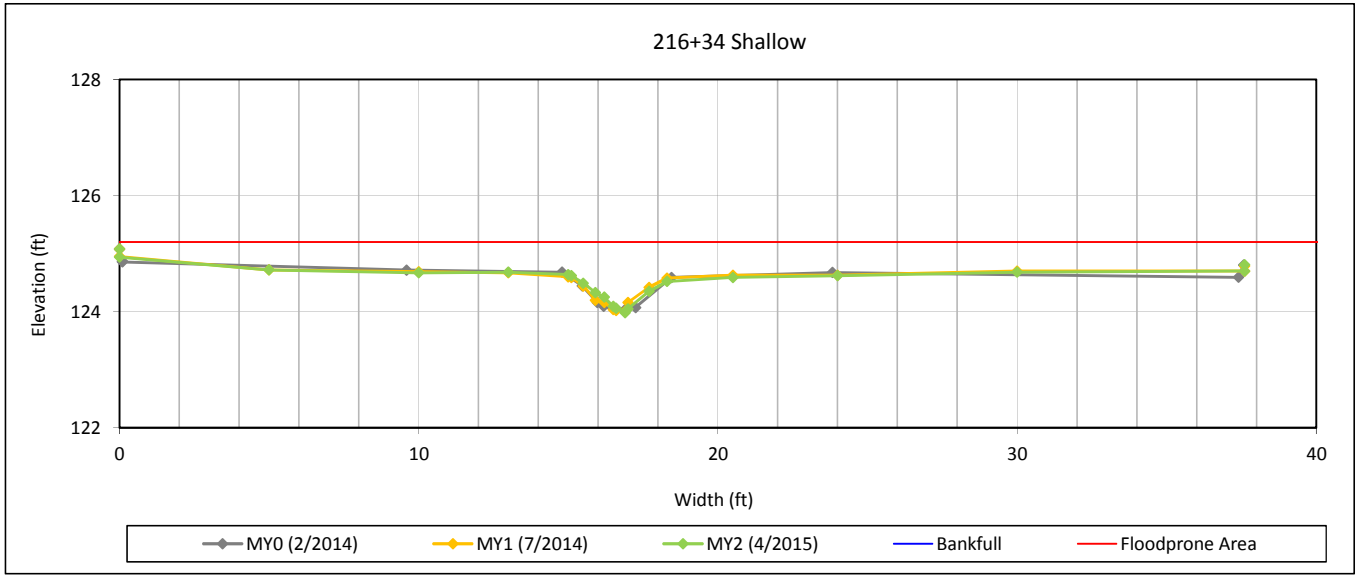
Bankfull Dimensions	
1.0	x-section area (ft.sq.)
5.0	width (ft)
0.2	mean depth (ft)
0.5	max depth (ft)
5.4	wetted parimeter (ft)
0.2	hyd radi (ft)
24.3	width-depth ratio

Survey Date: 4/2015
Field Crew: Wildlands Engineering

View Downstream

Cross Section Plots
Devil's Racetrack Mitigtion Site (NCDMS Project No. 95021)
Monitoring Year 2 - 2015

Cross Section 27-Middle Branch



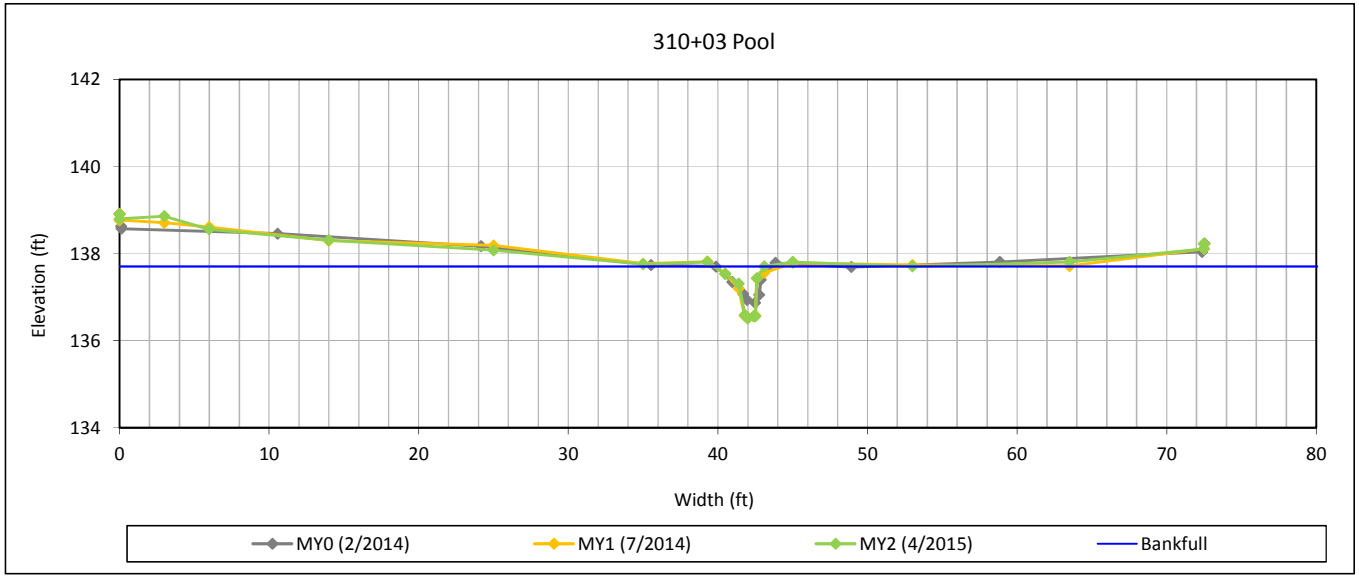
Bankfull Dimensions	
1.0	x-section area (ft.sq.)
3.1	width (ft)
0.3	mean depth (ft)
0.6	max depth (ft)
3.3	wetted parimeter (ft)
0.3	hyd radi (ft)
10.2	width-depth ratio
200.0	W flood prone area (ft)
64.3	entrenchment ratio
1.0	low bank height ratio

Survey Date: 4/2015
Field Crew: Wildlands Engineering

View Downstream

Cross Section Plots
Devil's Racetrack Mitigtion Site (NCDMS Project No. 95021)
Monitoring Year 2 - 2015

Cross Section 28-Southeast Branch



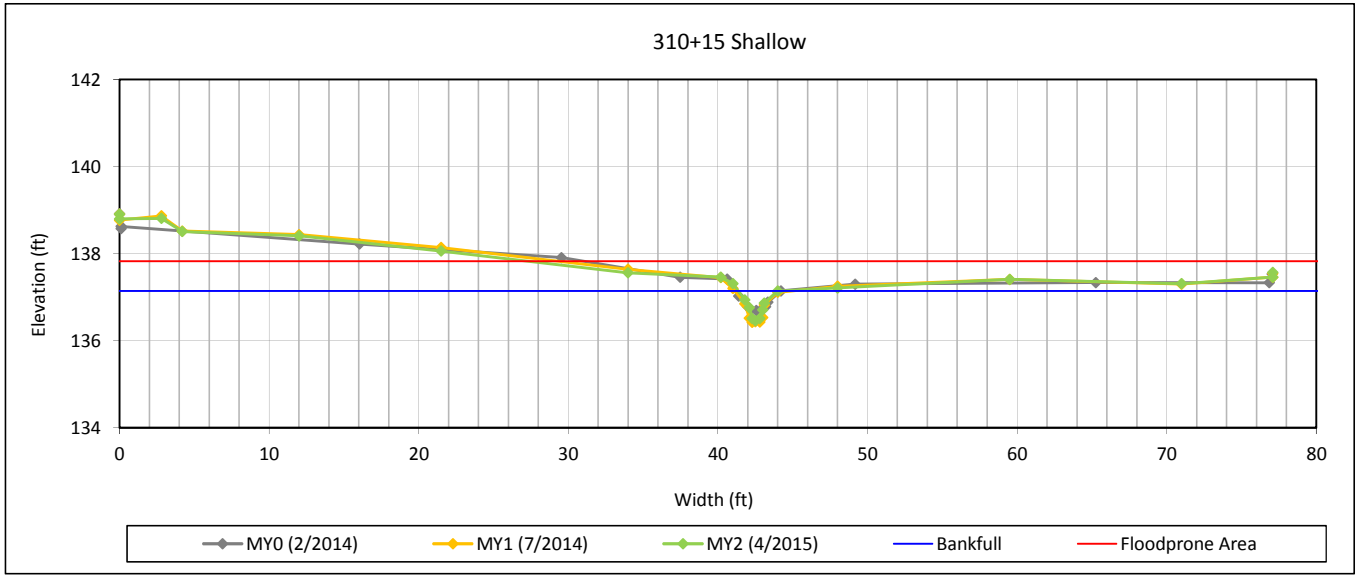
Bankfull Dimensions	
1.6	x-section area (ft.sq.)
3.3	width (ft)
0.5	mean depth (ft)
1.2	max depth (ft)
4.7	wetted parimeter (ft)
0.3	hyd radi (ft)
7.1	width-depth ratio

Survey Date: 4/2015
Field Crew: Wildlands Engineering

View Downstream

Cross Section Plots
Devil's Racetrack Mitigtion Site (NCDMS Project No. 95021)
Monitoring Year 2 - 2015

Cross Section 29-Southeast Branch



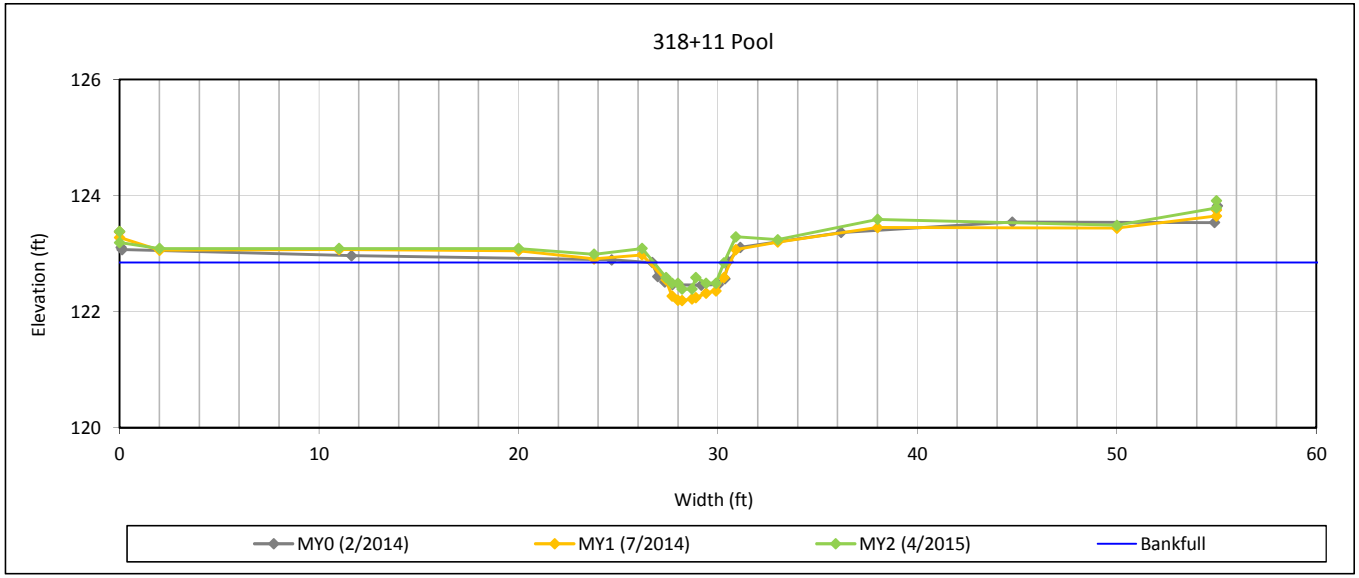
Bankfull Dimensions	
0.8	x-section area (ft.sq.)
2.6	width (ft)
0.3	mean depth (ft)
0.7	max depth (ft)
3.1	wetted parimeter (ft)
0.3	hyd radi (ft)
8.3	width-depth ratio
30.0	W flood prone area (ft)
11.4	entrenchment ratio
1.0	low bank height ratio

Survey Date: 4/2015
Field Crew: Wildlands Engineering

View Downstream

Cross Section Plots
Devil's Racetrack Mitigtion Site (NCDMS Project No. 95021)
Monitoring Year 2 - 2015

Cross Section 30-Southeast Branch



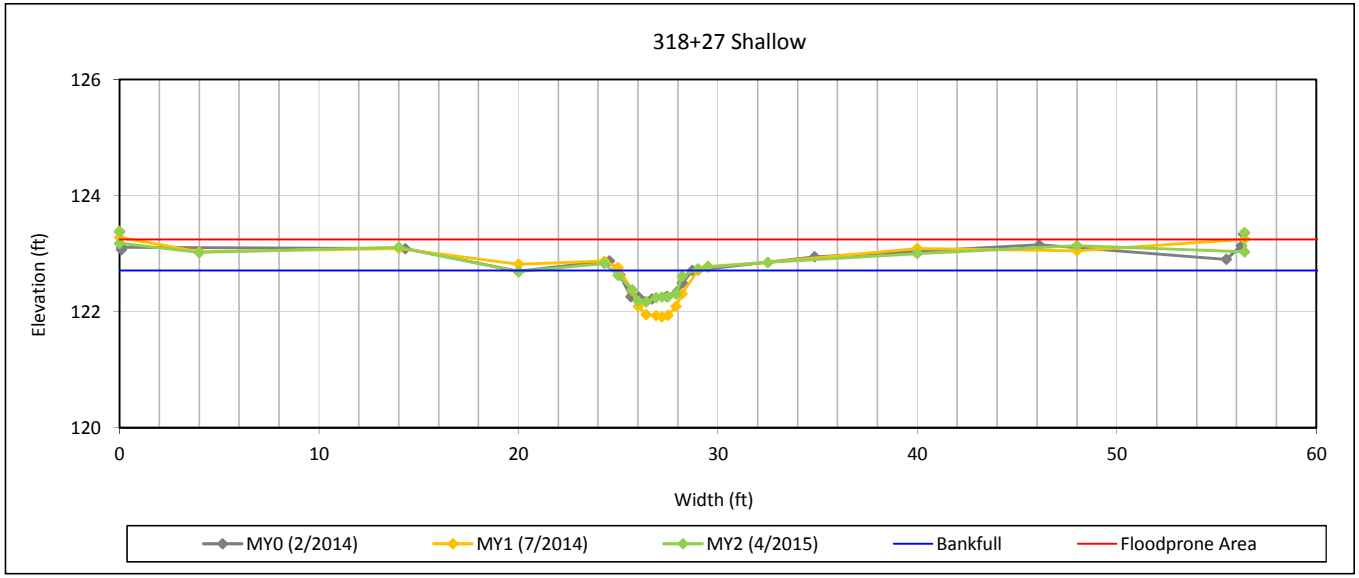
Bankfull Dimensions	
1.1	x-section area (ft.sq.)
3.5	width (ft)
0.3	mean depth (ft)
0.5	max depth (ft)
3.8	wetted parimeter (ft)
0.3	hyd radi (ft)
11.7	width-depth ratio

Survey Date: 4/2015
Field Crew: Wildlands Engineering

View Downstream

Cross Section Plots
Devil's Racetrack Mitigtion Site (NCDMS Project No. 95021)
Monitoring Year 2 - 2015

Cross Section 31-Southeast Branch



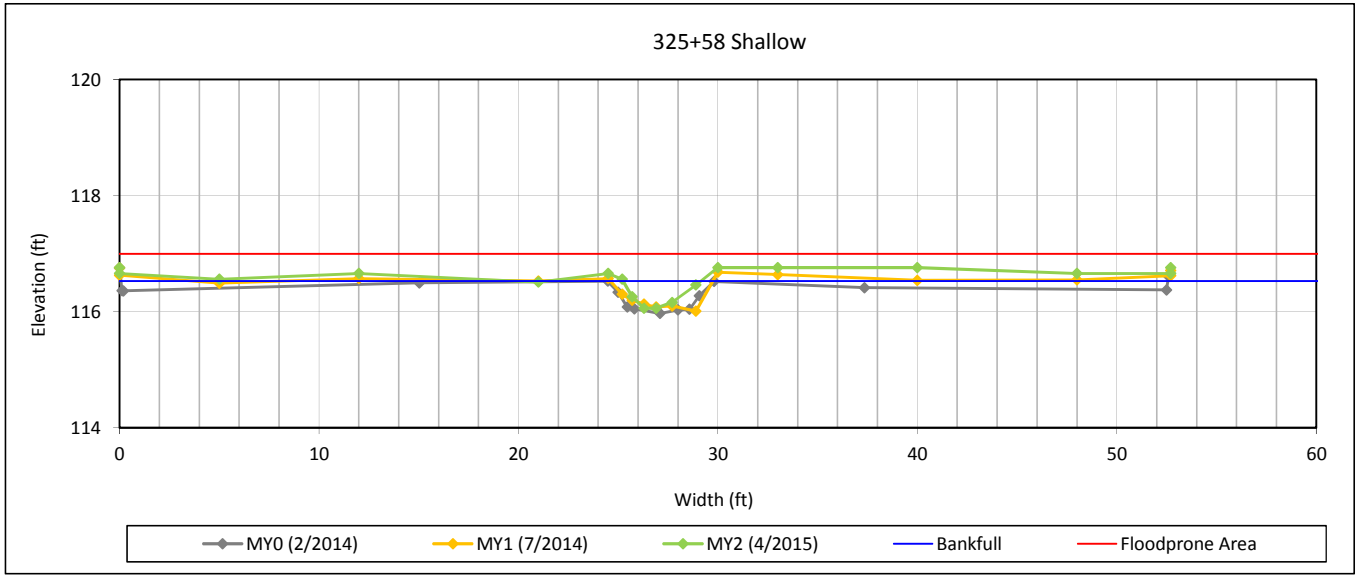
Bankfull Dimensions	
1.3	x-section area (ft.sq.)
3.8	width (ft)
0.3	mean depth (ft)
0.5	max depth (ft)
4.1	wetted parimeter (ft)
0.3	hyd radi (ft)
11.2	width-depth ratio
60.0	W flood prone area (ft)
15.8	entrenchment ratio
1.0	low bank height ratio

Survey Date: 4/2015
Field Crew: Wildlands Engineering

View Downstream

Cross Section Plots
Devil's Racetrack Mitigtion Site (NCDMS Project No. 95021)
Monitoring Year 2 - 2015

Cross Section 32-Southeast Branch



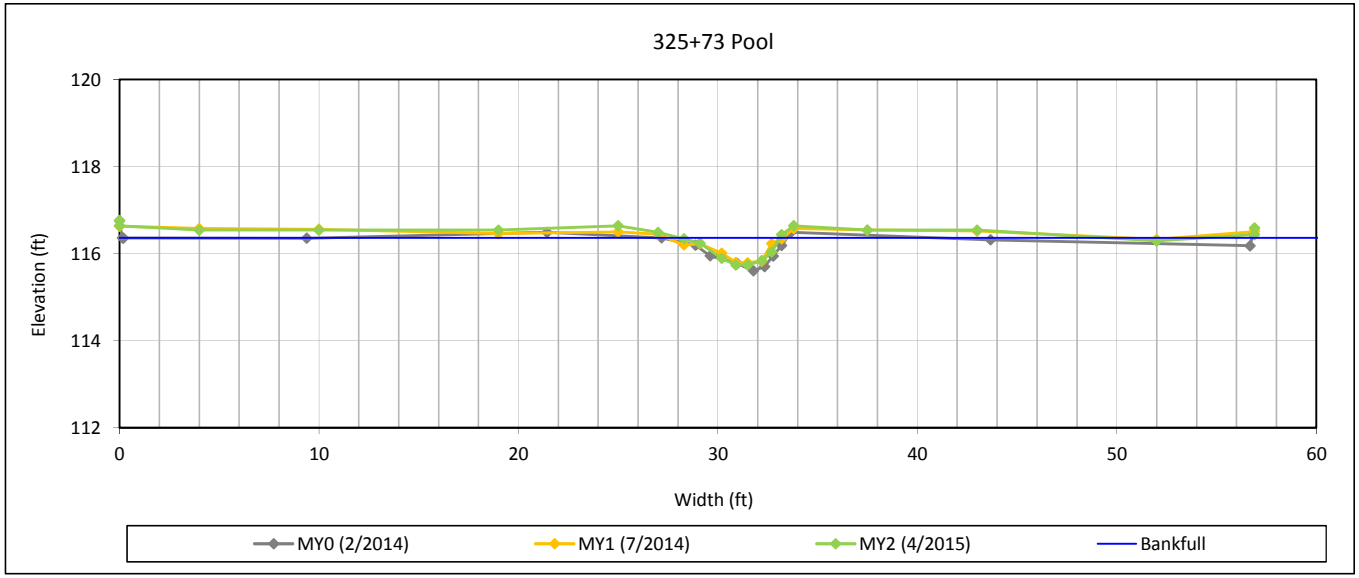
Bankfull Dimensions	
1.2	x-section area (ft.sq.)
3.9	width (ft)
0.3	mean depth (ft)
0.5	max depth (ft)
4.1	wetted parimeter (ft)
0.3	hyd radi (ft)
13.0	width-depth ratio
200.0	W flood prone area (ft)
51.3	entrenchment ratio
1.0	low bank height ratio

Survey Date: 4/2015
Field Crew: Wildlands Engineering

View Downstream

Cross Section Plots
Devil's Racetrack Mitigtion Site (NCDMS Project No. 95021)
Monitoring Year 2 - 2015

Cross Section 33-Southeast Branch



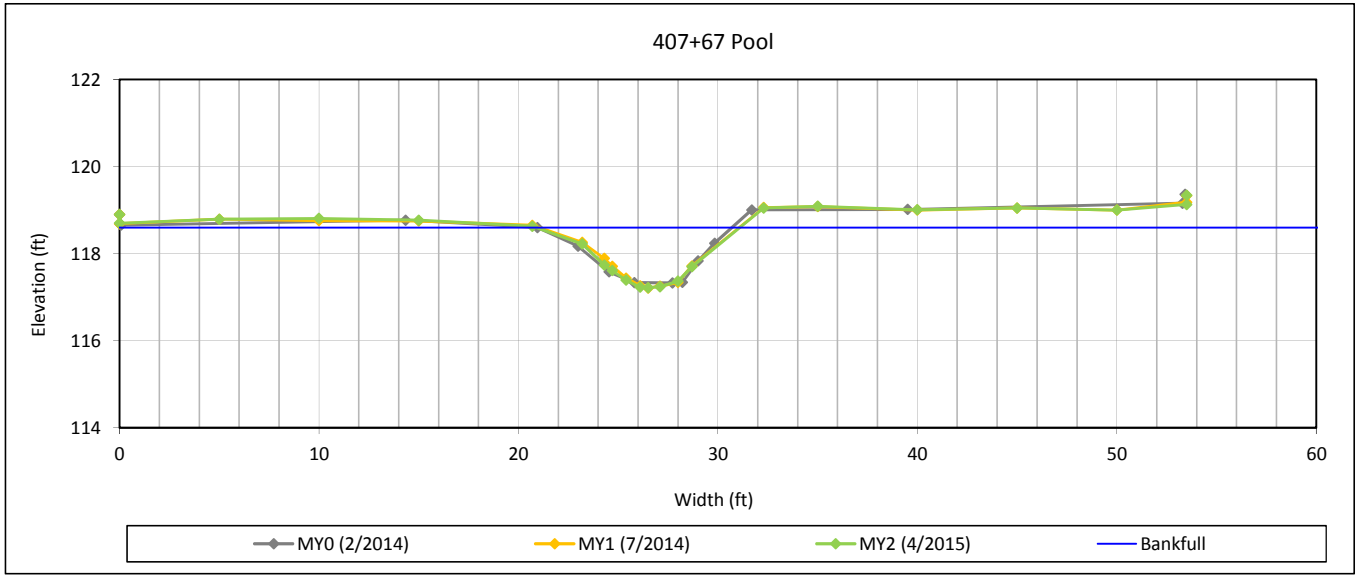
Bankfull Dimensions	
1.8	x-section area (ft.sq.)
5.0	width (ft)
0.4	mean depth (ft)
0.6	max depth (ft)
5.2	wetted parimeter (ft)
0.3	hyd radi (ft)
13.7	width-depth ratio

Survey Date: 4/2015
Field Crew: Wildlands Engineering

View Downstream

Cross Section Plots
Devil's Racetrack Mitigtion Site (NCDMS Project No. 95021)
Monitoring Year 2 - 2015

Cross Section 34-North Branch



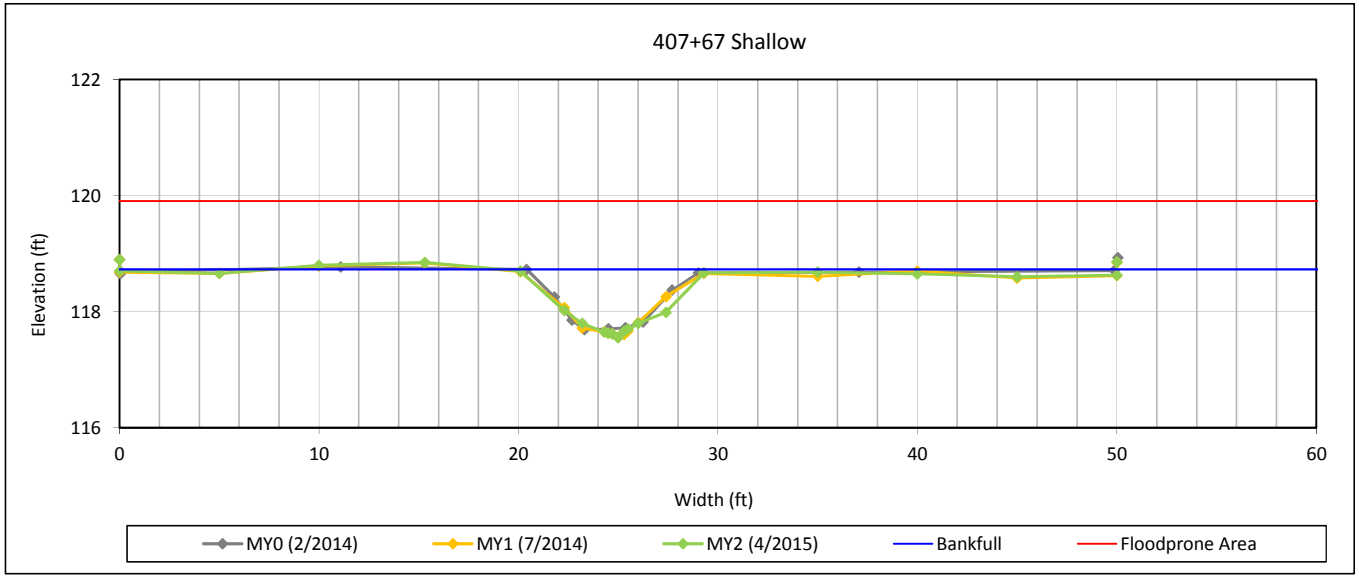
Bankfull Dimensions	
7.5	x-section area (ft.sq.)
10.2	width (ft)
0.7	mean depth (ft)
1.4	max depth (ft)
10.7	wetted parimeter (ft)
0.7	hyd radi (ft)
13.9	width-depth ratio

Survey Date: 4/2015
Field Crew: Wildlands Engineering

View Downstream

Cross Section Plots
Devil's Racetrack Mitigtion Site (NCDMS Project No. 95021)
Monitoring Year 2 - 2015

Cross Section 35-North Branch



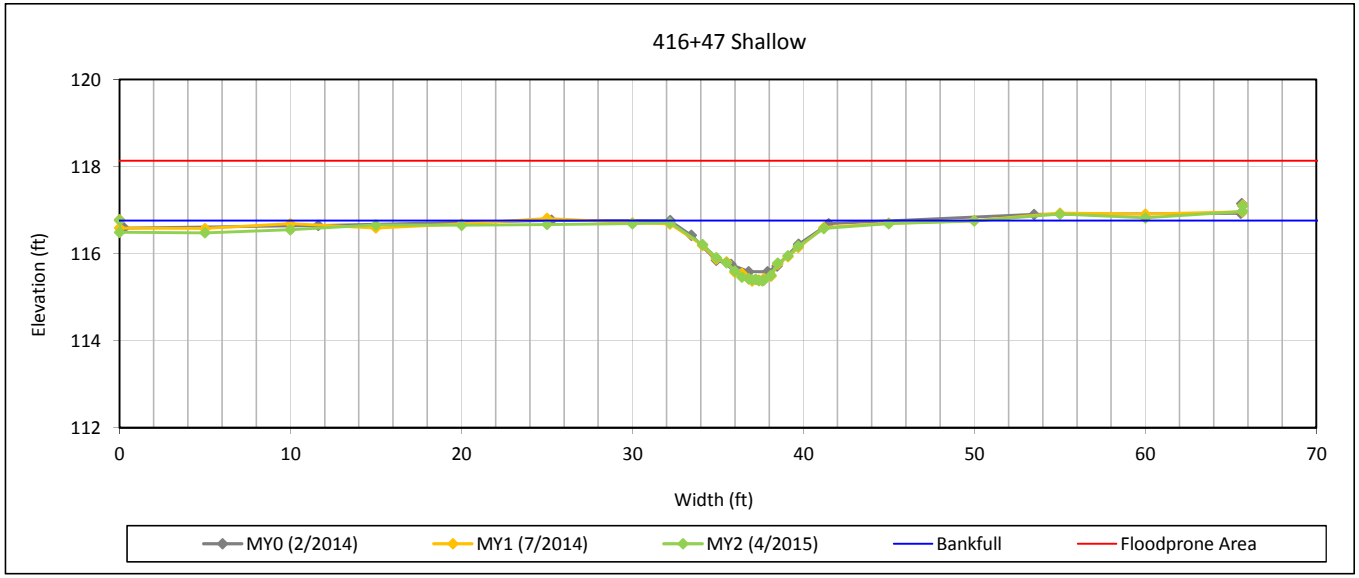
Bankfull Dimensions	
6.4	x-section area (ft.sq.)
9.2	width (ft)
0.7	mean depth (ft)
1.2	max depth (ft)
9.5	wetted parimeter (ft)
0.7	hyd radi (ft)
13.2	width-depth ratio
200.0	W flood prone area (ft)
21.7	entrenchment ratio
1.0	low bank height ratio

Survey Date: 4/2015
Field Crew: Wildlands Engineering

View Downstream

Cross Section Plots
Devil's Racetrack Mitigtion Site (NCDMS Project No. 95021)
Monitoring Year 2 - 2015

Cross Section 36-North Branch



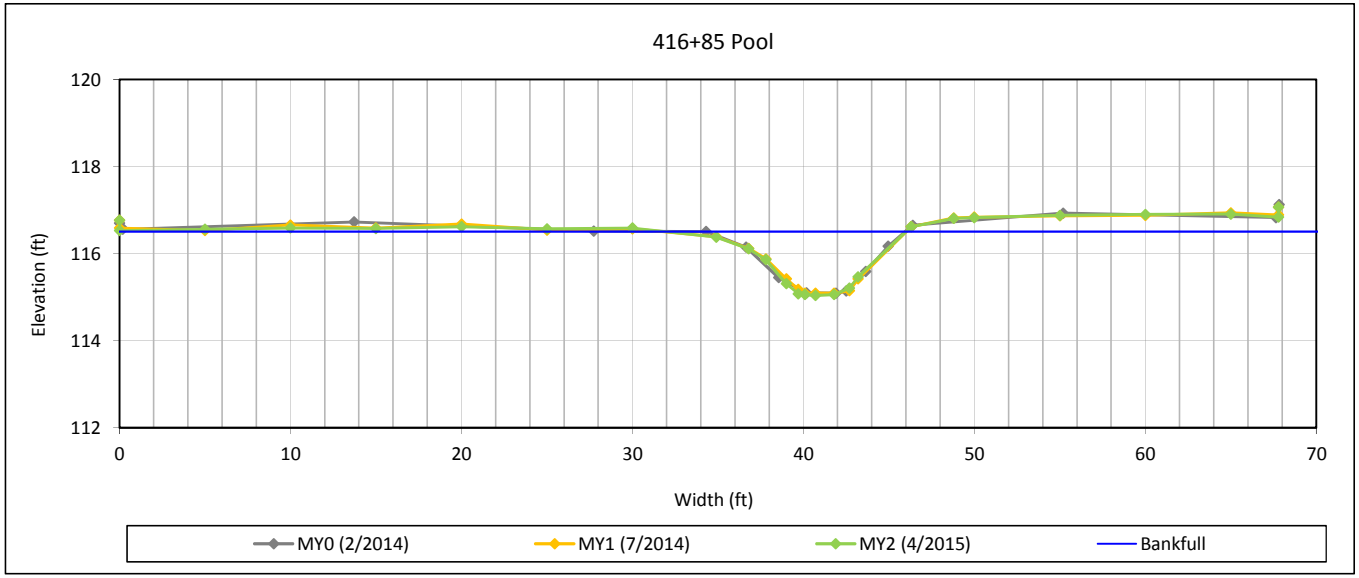
Bankfull Dimensions	
6.9	x-section area (ft.sq.)
9.0	width (ft)
0.8	mean depth (ft)
1.4	max depth (ft)
9.4	wetted parimeter (ft)
0.7	hyd radi (ft)
11.7	width-depth ratio
200.0	W flood prone area (ft)
22.2	entrenchment ratio
1.0	low bank height ratio

Survey Date: 4/2015
Field Crew: Wildlands Engineering

View Downstream

Cross Section Plots
Devil's Racetrack Mitigtion Site (NCDMS Project No. 95021)
Monitoring Year 2 - 2015

Cross Section 37-North Branch



Bankfull Dimensions	
9.2	x-section area (ft.sq.)
10.7	width (ft)
0.9	mean depth (ft)
1.5	max depth (ft)
11.2	wetted parimeter (ft)
0.8	hyd radi (ft)
12.5	width-depth ratio

Survey Date: 4/2015
Field Crew: Wildlands Engineering

View Downstream

APPENDIX 5. Hydrology Summary Data and Plots

Table 13. Verification of Bankfull Events
Devil's Racetrack Mitigation Site (NCDMS Project No. 95021)
Monitoring Year 2 - 2015

Reach	Date of Data Collection	Date of Occurrence	Method
Devil's Racetrach (West)	5/19/2015	3/5/2015	Crest Gage/ Pressure Transducer
	7/30/2015	6/3/2015	
	10/30/2015	10/2/2015	
Devil's Racetrach (East)	5/19/2015	2/26/2015	
	7/30/2015	6/3/2015	
	10/30/2015	10/2/2015	
Southwest Branch	5/19/2015	3/5/2015	
	7/30/2015	6/3/2015	
	10/30/2015	10/2/2015	
Middle Branch	5/19/2015	3/5/2015	
	7/30/2015	6/3/2015	
	10/30/2015	10/2/2015	
Southeast Branch	7/30/2015	u	
	10/30/2015	10/2/2015	
North Branch	5/19/2015	3/5/2015	
	7/30/2015	6/3/2015	
	10/30/2015	10/1/2015	

u: unknown

Table 14. Wetland Gage Attainment Summary
Devil's Racetrack Mitigation Site (NCDMS Project No. 95021)
Monitoring Year 2 - 2015

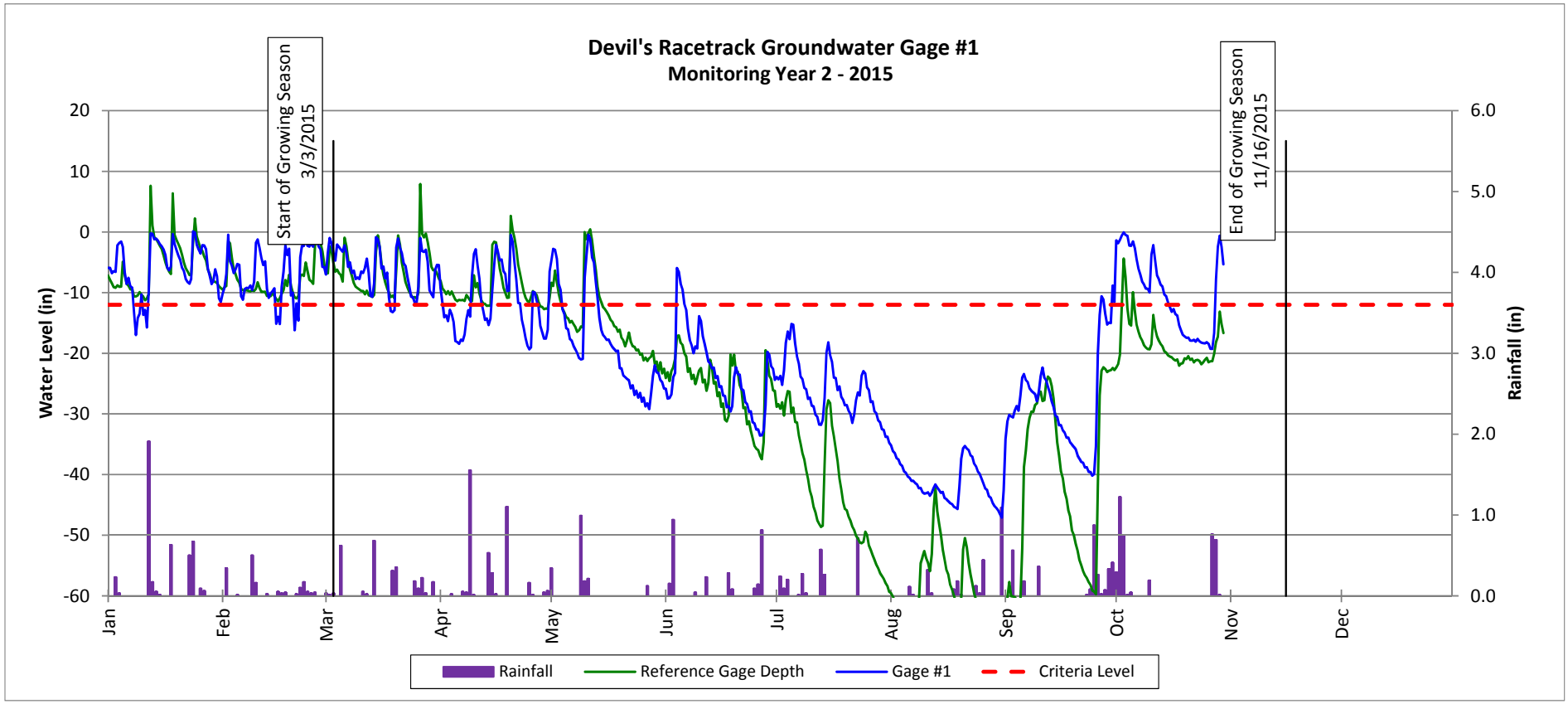
Summary of Groundwater Gage Results for Monitoring Years 1 through 7							
Gage	Success Criteria Achieved/Max Consecutive Days During Growing Season (Percentage)						
	Year 1 (2014)*	Year 2 (2015)	Year 3 (2016)	Year 4 (2017)	Year 5 (2018)	Year 6 (2019)	Year 7 (2020)
1	No/7.5 Days (3.1%)	No/16 Days (6.0%)					
2	No/14.5 Days (6.0%)	Yes/ 58 Days (22.3%)					
3	No/2.5 Days (1.0%)	Yes/33 Days (12.8%)					
4	No/13.5 Days (5.6%)	Yes/57 Days (21.9%)					
5	No/12.5 Days (5.2%)	Yes/34 Days (13.0%)					
6	No/11.0 Days (4.6%)	Yes/53 Days (20.3%)					
7	Yes/21.5 Days (9.0%)	Yes/66 Days (25.6%)					
8	No/5.0 Days (2.1%)	Yes/31 Days (12.0%)					
9	Yes/ 22.0 Days (9.2%)	Yes/80 Days (31.0%)					
10	No/ 1.5 Days (0.6%)	No/10 Days (3.9%)					
11	No/9.0 Days (3.8%)	Yes/65 Days (25.2%)					
12	No/7.5 Days (3.1%)	Yes/31 Days (12.0%)					
13	No/8.0 Days (3.3%)	Yes/34 Days (13.0%)					
14	No/ 8.5 Days (3.5%)	Yes/32 Days (12.4%)					
15	No/12.5 Days (5.2%)	Yes/33 Days (12.8%)					
16	No/12.5 Days (5.2%)	Yes/33 Days (12.8%)					
17	No/15.0 Days (6.3%)	Yes/34 Days (13.2%)					
18	Yes/69.5 Days (29.0%)	Yes/66 Days (25.6%)					
19	Yes/31.5 Days (13.1%)	Yes/66 Days (25.6%)					
20	No/19.5 Days (8.1%)	Yes/35 Days (13.4%)					
21	Yes/69.5 Days (29.0%)	Yes/79 Days (30.4%)					
22	Yes/ 31.0 Days (12.9%)	Yes/66 Days (25.6%)					
23	No/8.0 Days (3.3%)	Yes/31 Days (11.8%)					
24	No/13.0 Days (5.4%)	Yes/33 Days (12.8%)					
25	Yes/25.5 Days (10.6%)	Yes/66 Days (25.6%)					
26	Yes/39.0 Days (16.3%)	Yes/83 Days (32.2%)					
27	Yes/29.5 Days (12.3%)	Yes/67 Days (26.0%)					
28	No/19.5 Days (8.1%)	Yes/81 Days (31.2%)					
29	Yes/70.0 Days (29.2%)	Yes/81 Days (31.4%)					
30	Yes/52.5 Days (21.9%)	Yes/83 Days (32.0%)					
31	No/9.0 Days (3.8%)	Yes/77 Days (29.7%)					
32	No/ 7.0 Days (2.9%)	Yes/78 Days (30.2%)					
33	Yes/69.5 Days (29.0%)	Yes/84 Days (32.4%)					
34	No/2.0 Days (0.8%)	No/16 Days (6.0%)					
35	Added During MY2	Yes/33 Days (12.8%)					
36	Added During MY2	Yes/34 Days (13.0%)					
37	Added During MY2	Yes/33 Days (12.8%)					
38	Added During MY2	Yes/33 Days (12.8%)					

* NRCS WETS data was used to determine the growing season for monitorg year 1. After discussions with the US Army Corps of Engineers, on-site soil temperature probe data is being used to determine the beginning of the growing season.

Groundwater Gage Plots

Devil's Racetrack Mitigation Site (NCDMS Project No. 95021)

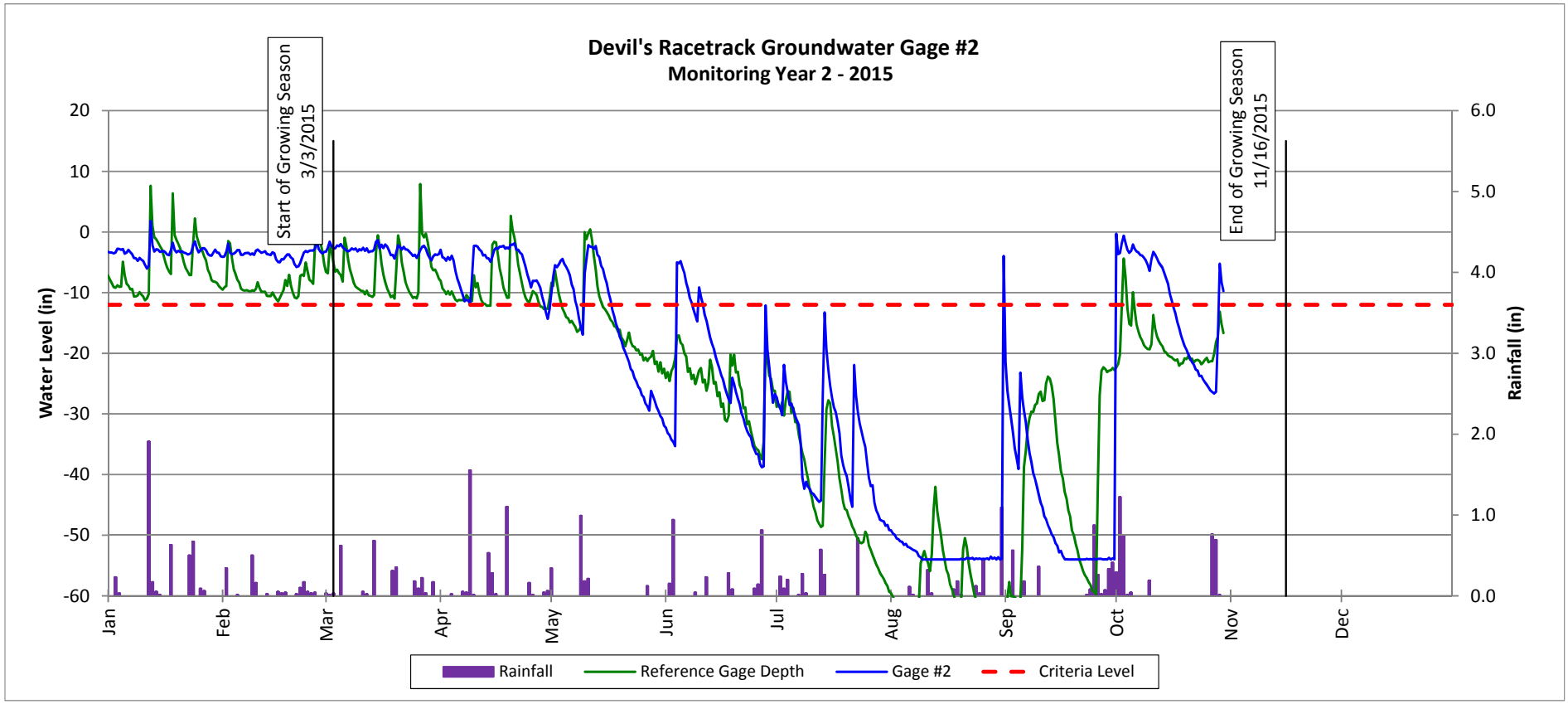
Monitoring Year 2 - 2015



Groundwater Gage Plots

Devil's Racetrack Mitigation Site (NCDMS Project No. 95021)

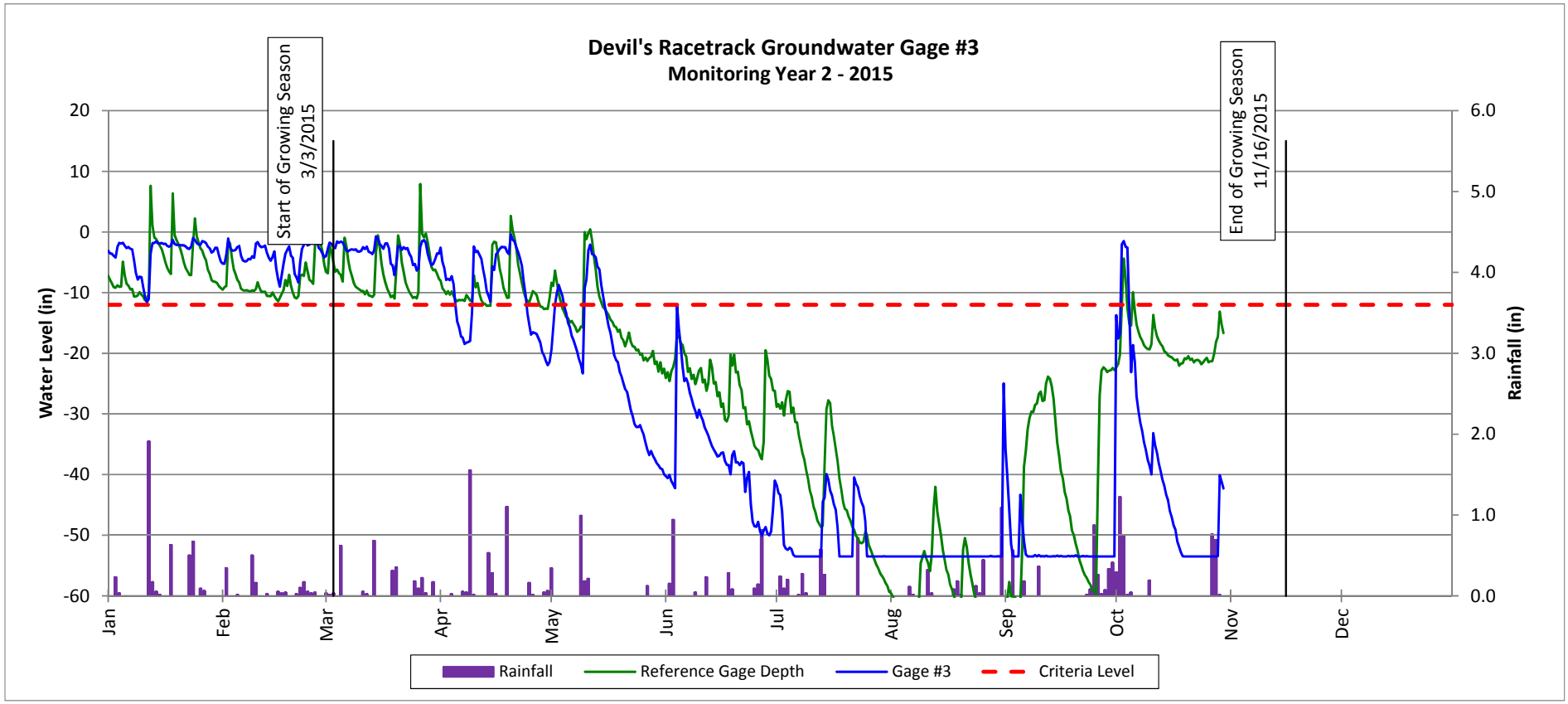
Monitoring Year 2 - 2015



Groundwater Gage Plots

Devil's Racetrack Mitigation Site (NCDMS Project No. 95021)

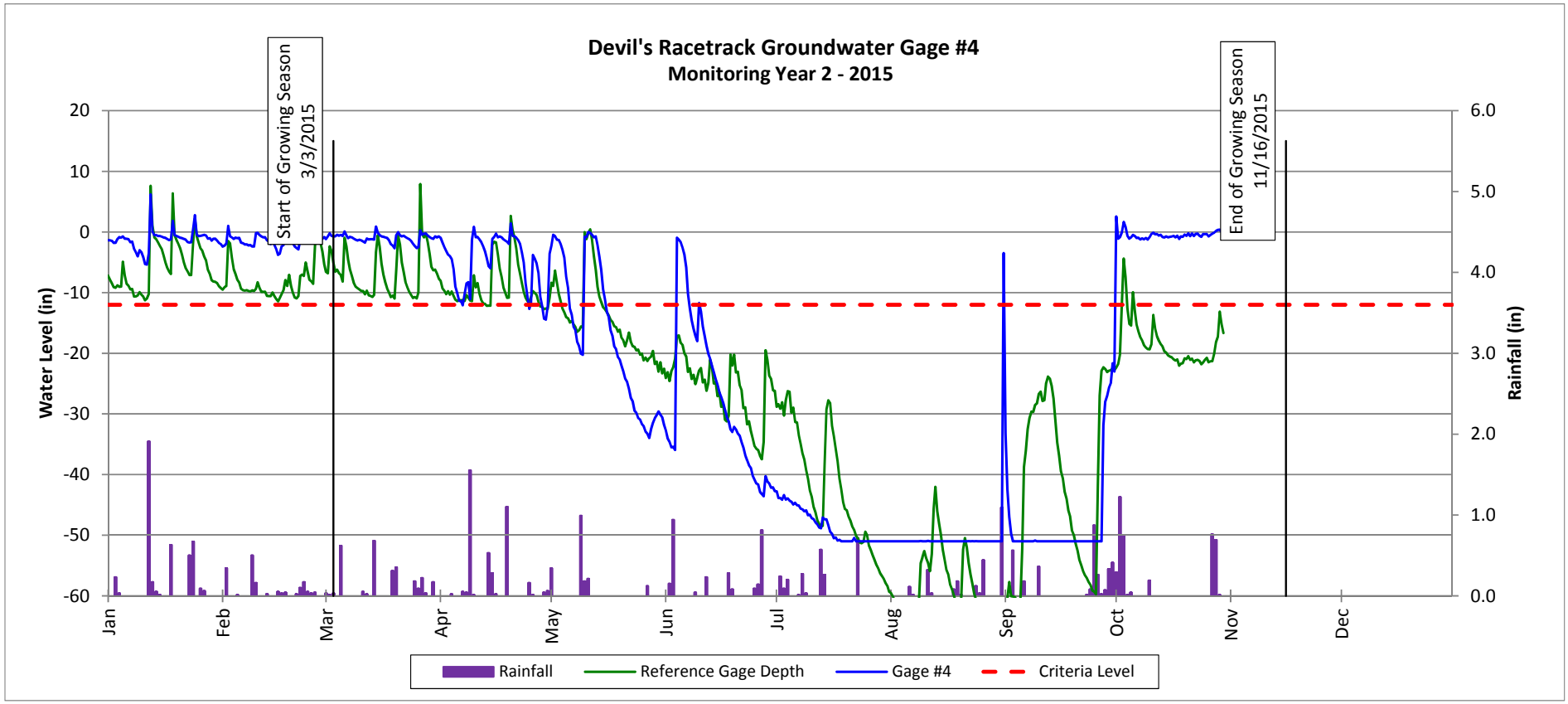
Monitoring Year 2 - 2015



Groundwater Gage Plots

Devil's Racetrack Mitigation Site (NCDMS Project No. 95021)

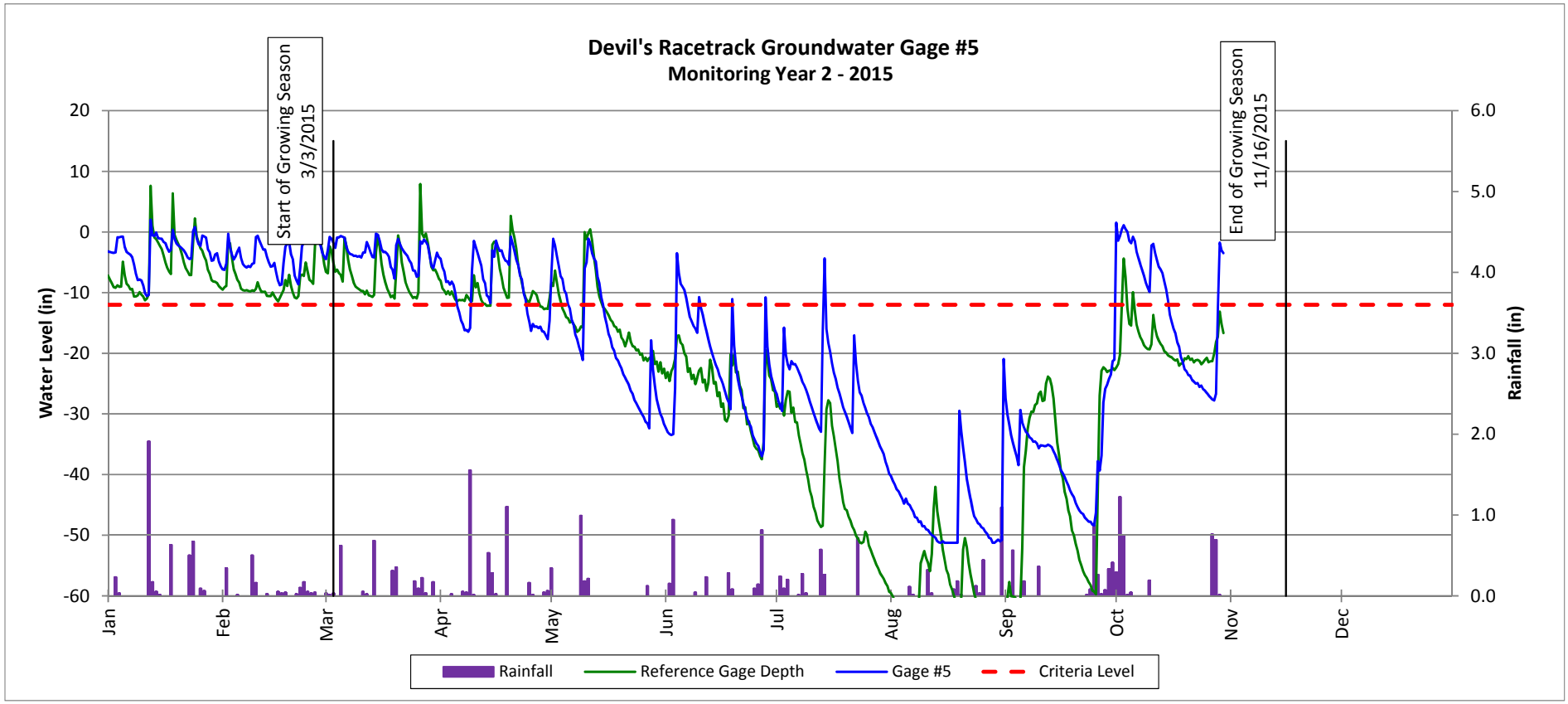
Monitoring Year 2 - 2015



Groundwater Gage Plots

Devil's Racetrack Mitigation Site (NCDMS Project No. 95021)

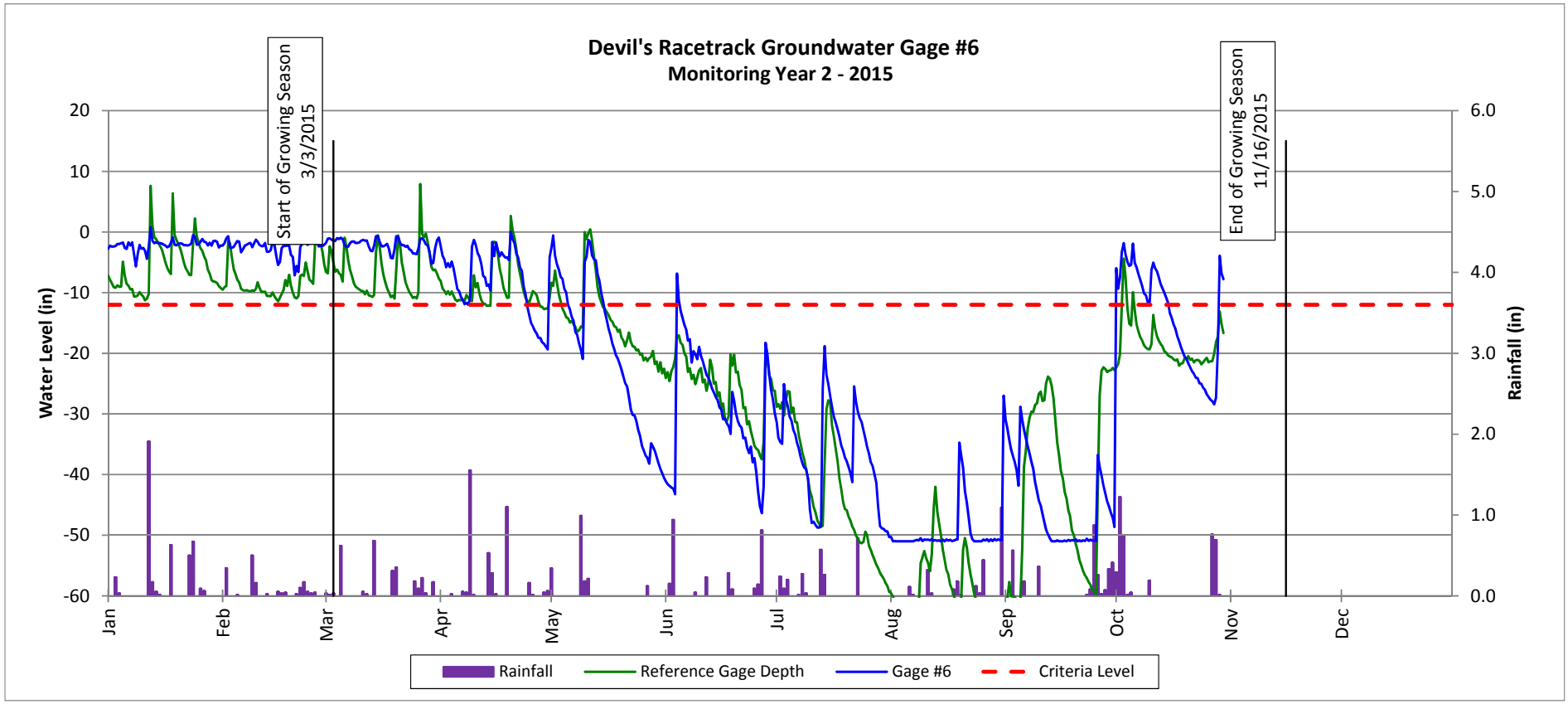
Monitoring Year 2 - 2015



Groundwater Gage Plots

Devil's Racetrack Mitigation Site (NCDMS Project No. 95021)

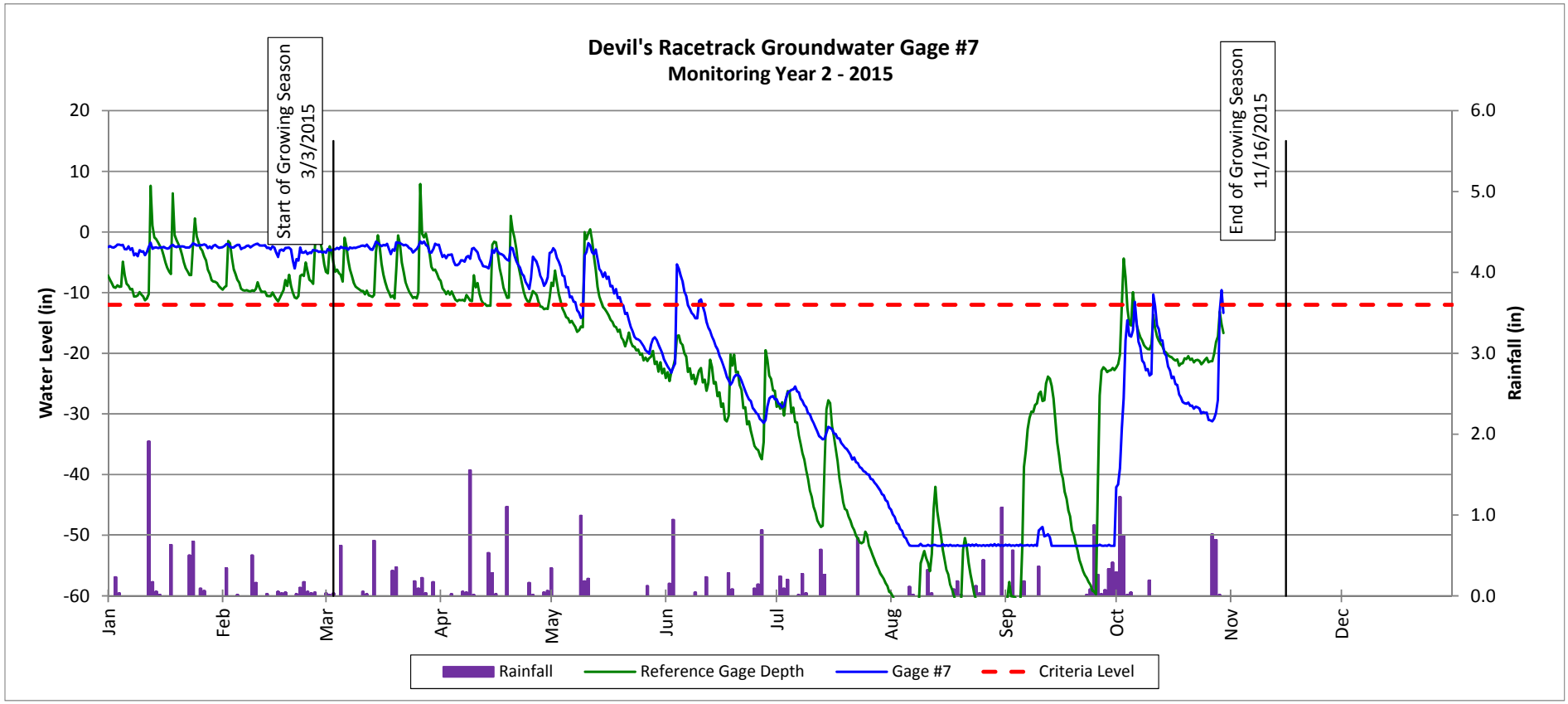
Monitoring Year 2 - 2015



Groundwater Gage Plots

Devil's Racetrack Mitigation Site (NCDMS Project No. 95021)

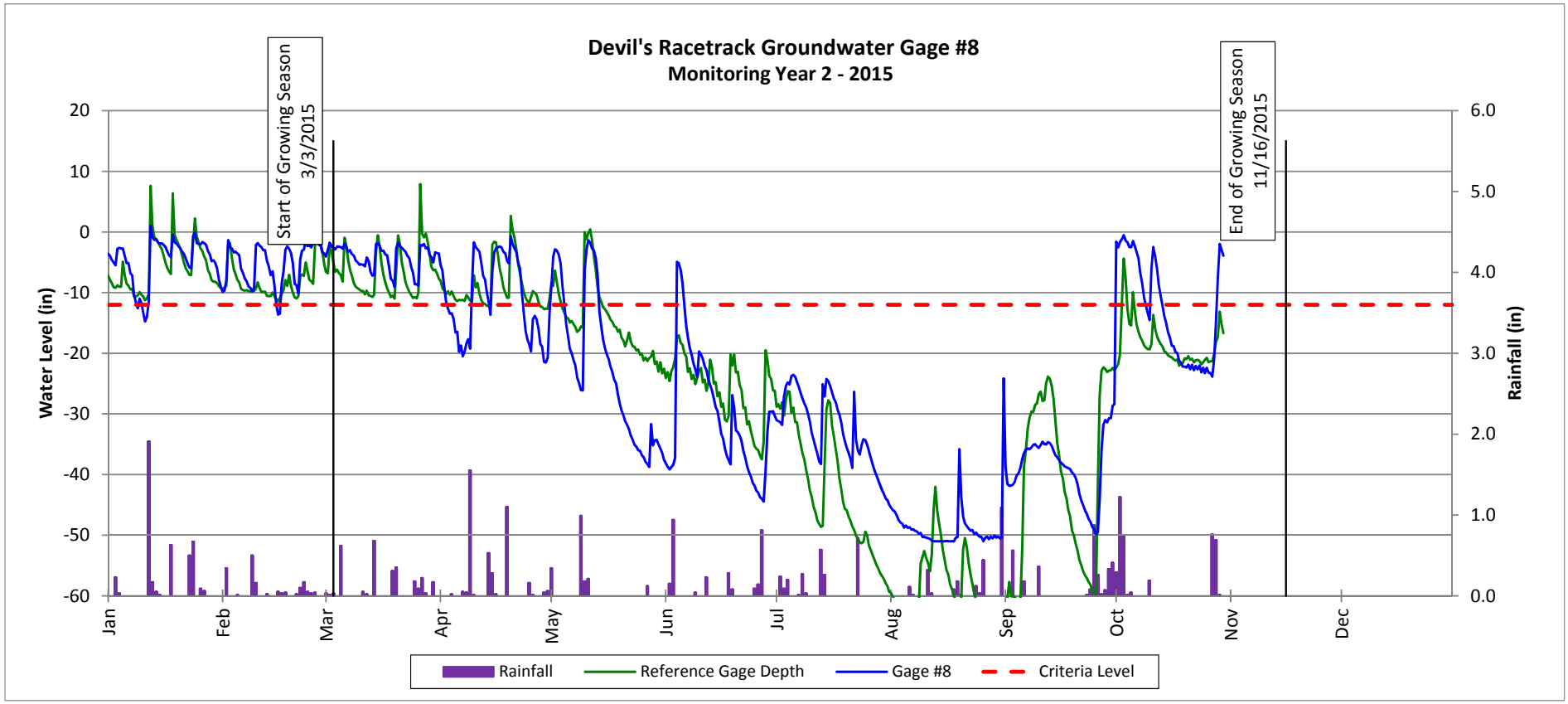
Monitoring Year 2 - 2015



Groundwater Gage Plots

Devil's Racetrack Mitigation Site (NCDMS Project No. 95021)

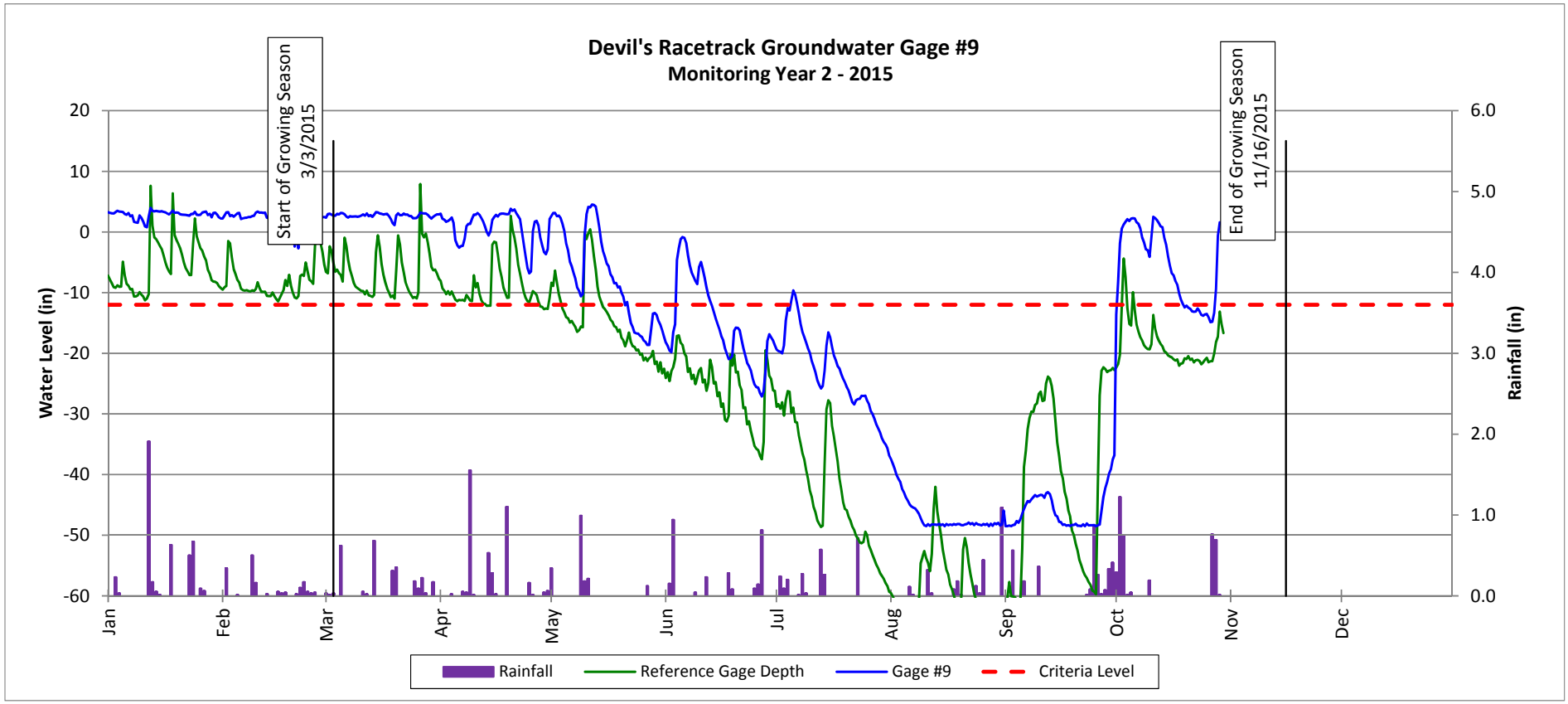
Monitoring Year 2 - 2015



Groundwater Gage Plots

Devil's Racetrack Mitigation Site (NCDMS Project No. 95021)

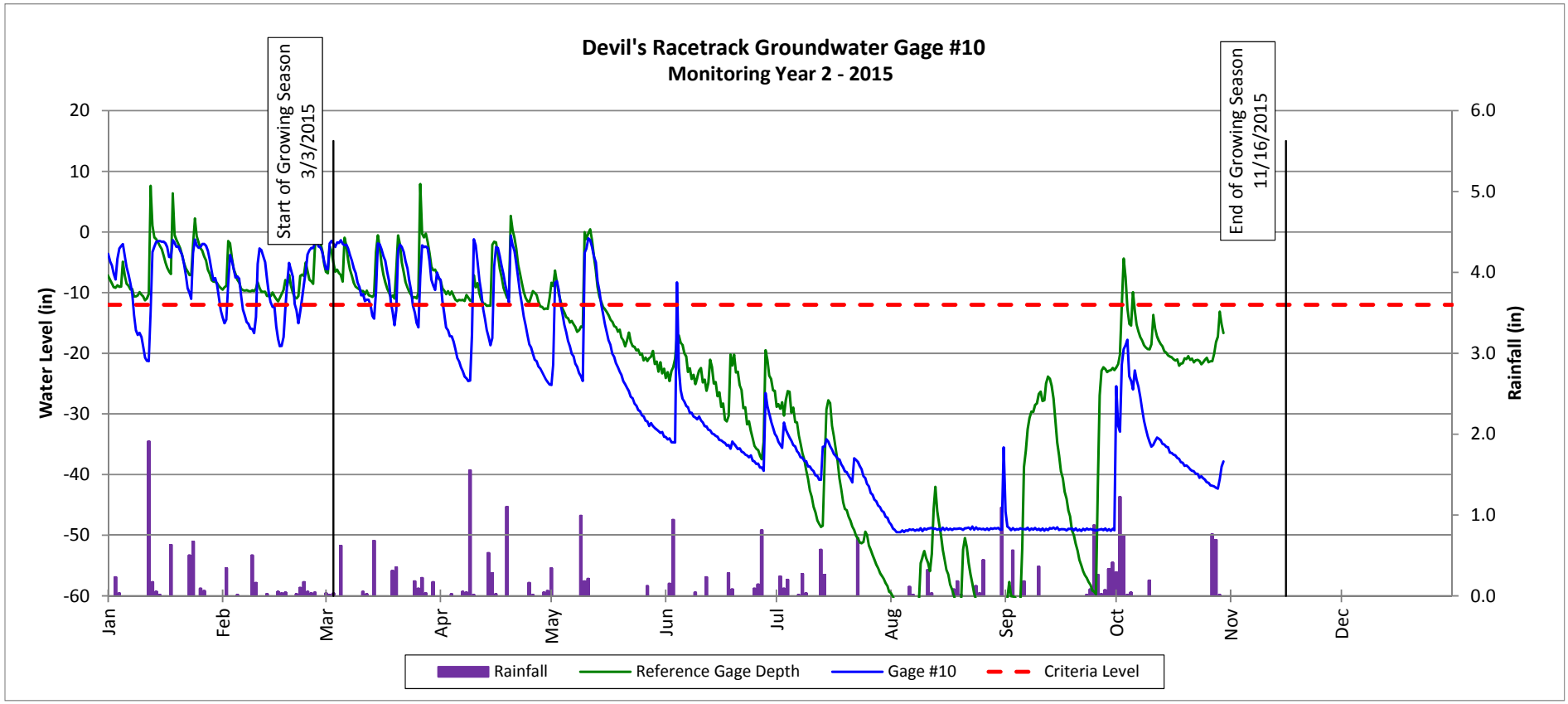
Monitoring Year 2 - 2015



Groundwater Gage Plots

Devil's Racetrack Mitigation Site (NCDMS Project No. 95021)

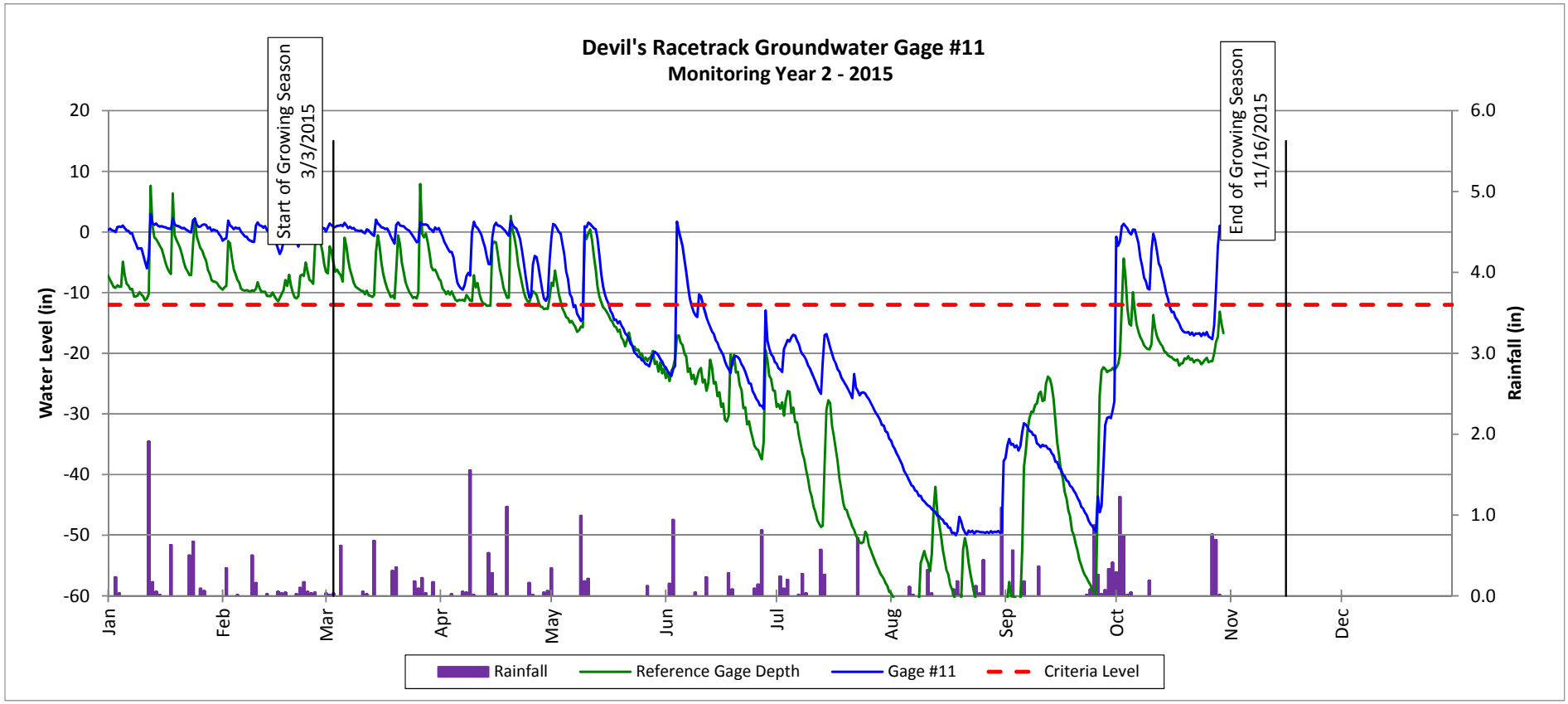
Monitoring Year 2 - 2015



Groundwater Gage Plots

Devil's Racetrack Mitigation Site (NCDMS Project No. 95021)

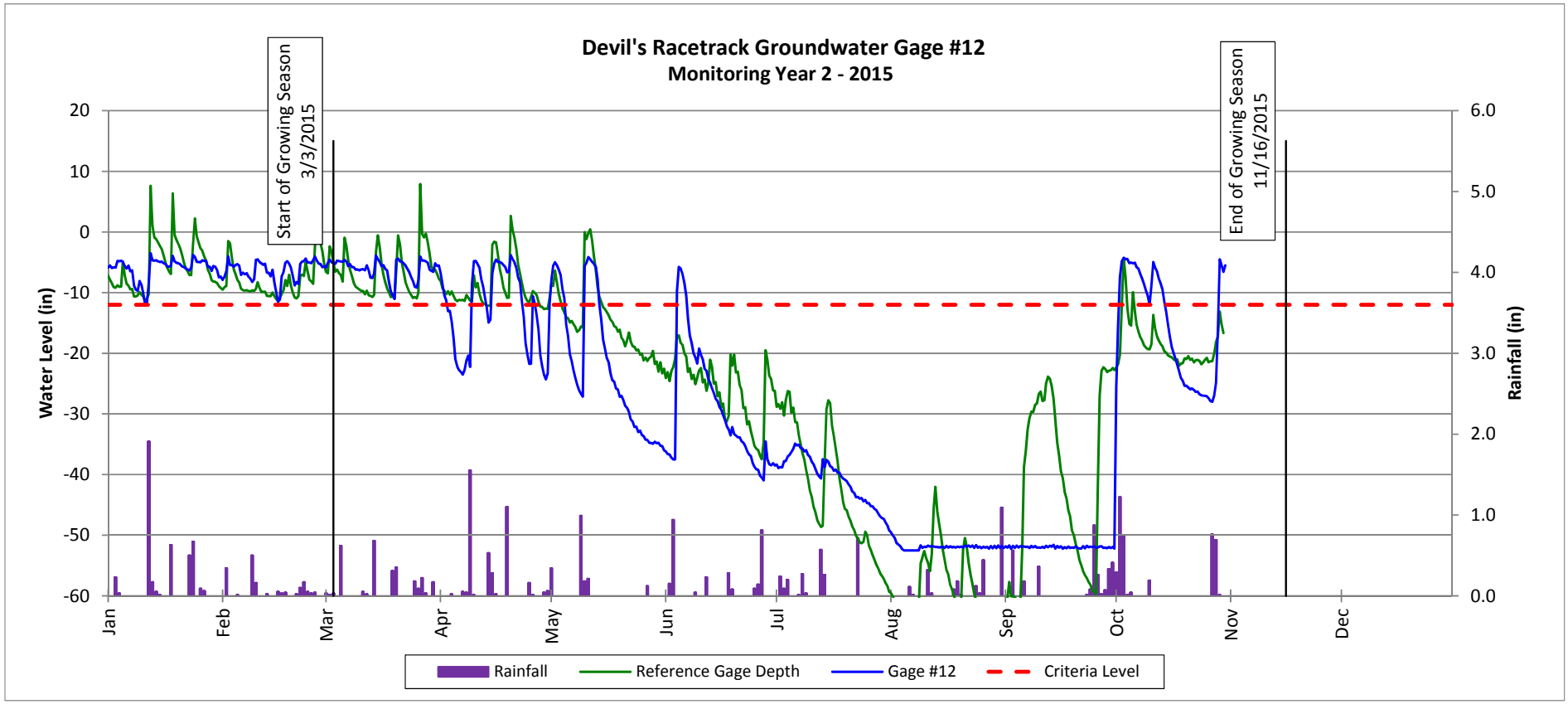
Monitoring Year 2 - 2015



Groundwater Gage Plots

Devil's Racetrack Mitigation Site (NCDMS Project No. 95021)

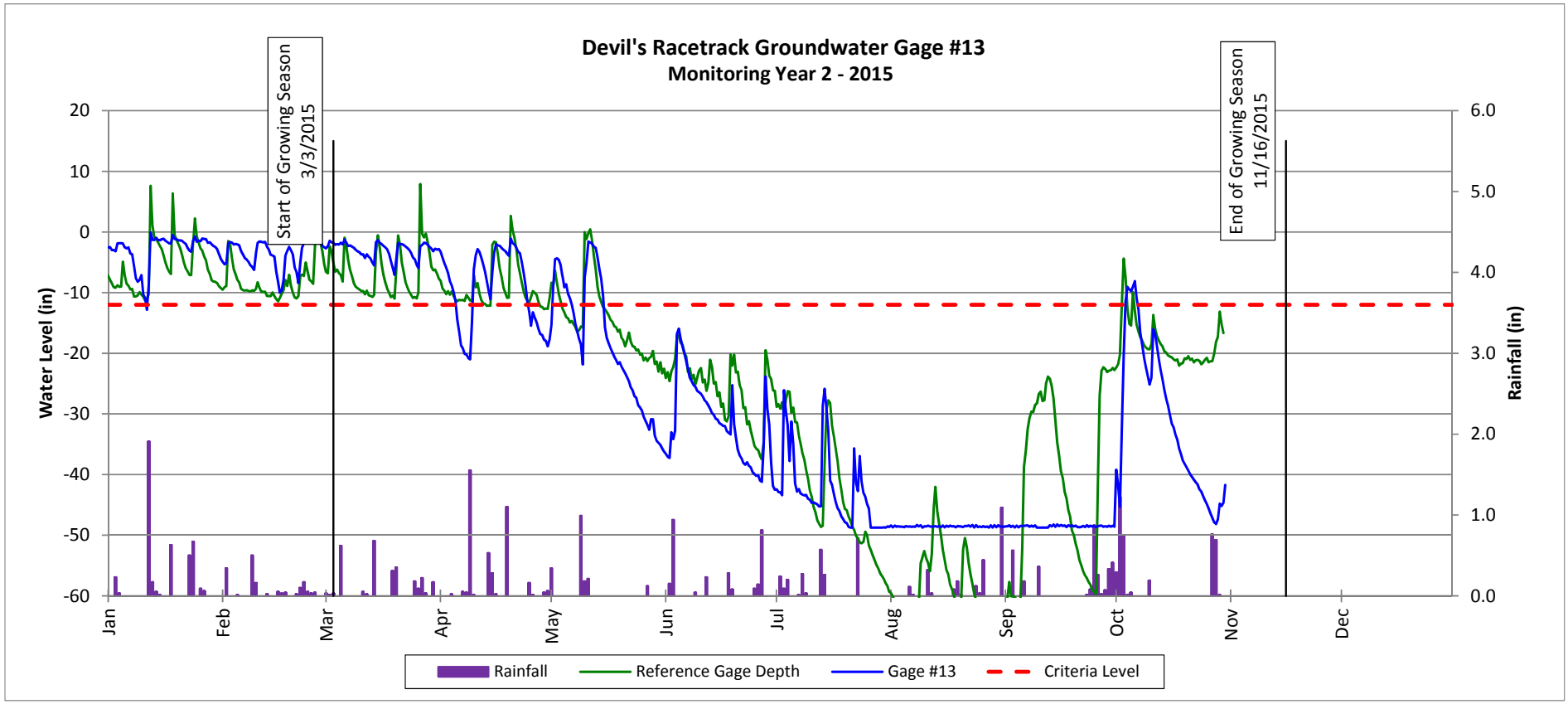
Monitoring Year 2 - 2015



Groundwater Gage Plots

Devil's Racetrack Mitigation Site (NCDMS Project No. 95021)

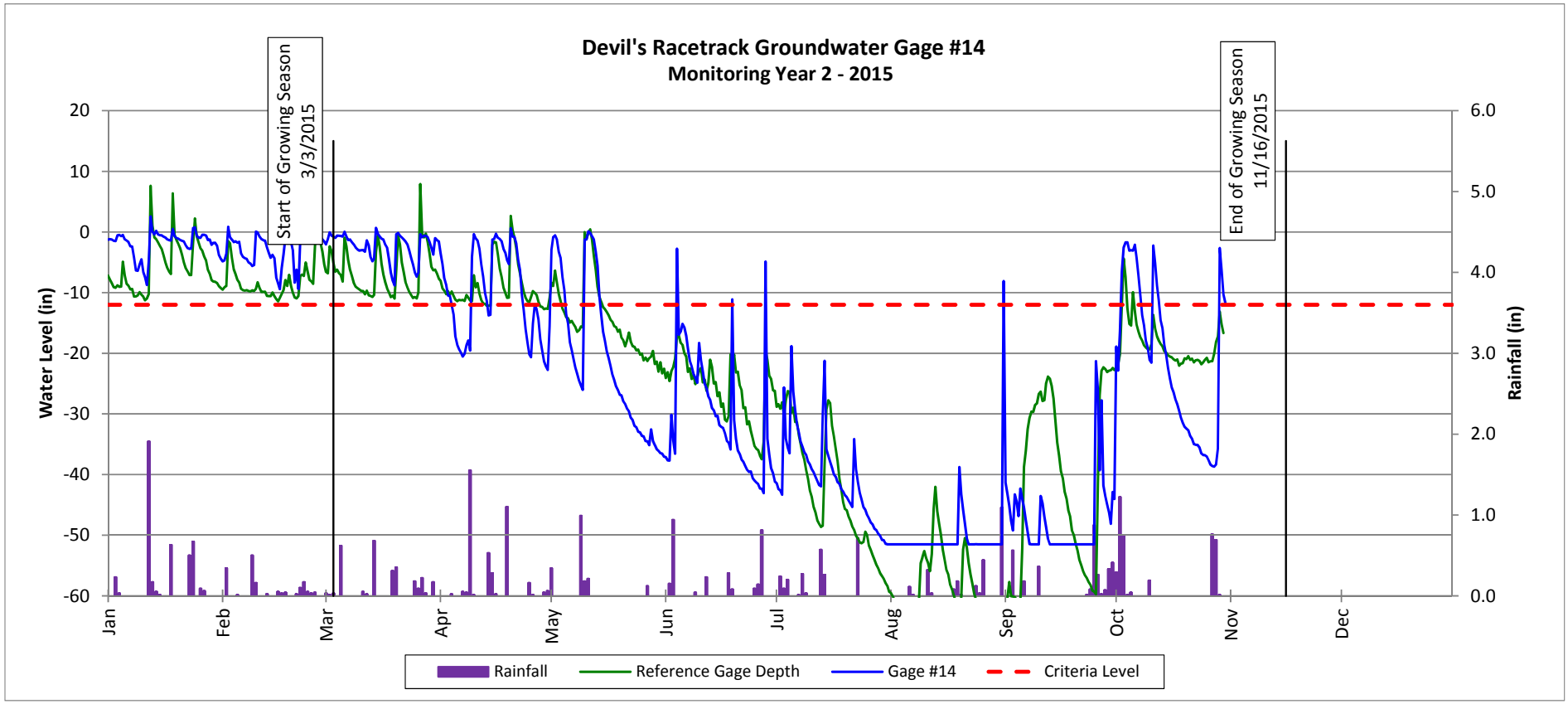
Monitoring Year 2 - 2015



Groundwater Gage Plots

Devil's Racetrack Mitigation Site (NCDMS Project No. 95021)

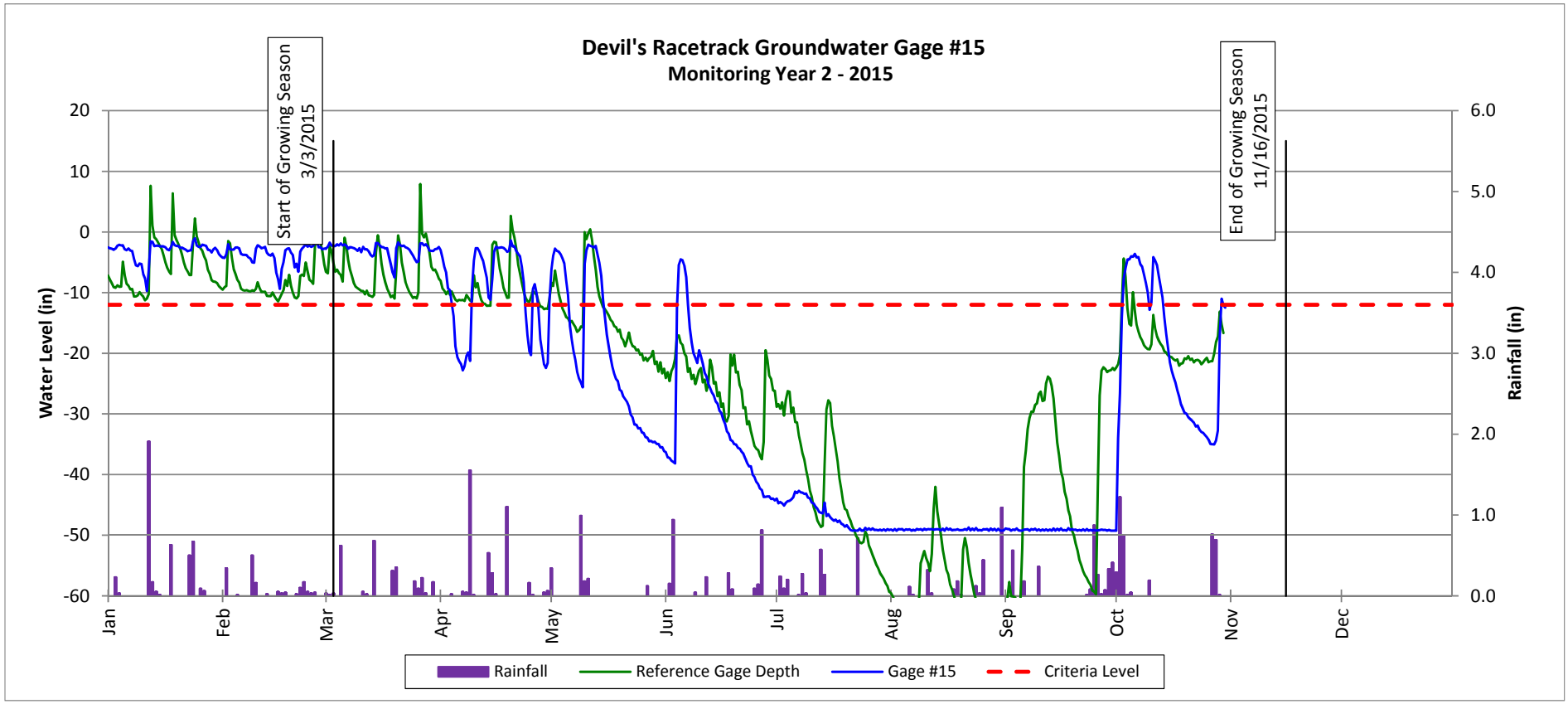
Monitoring Year 2 - 2015



Groundwater Gage Plots

Devil's Racetrack Mitigation Site (NCDMS Project No. 95021)

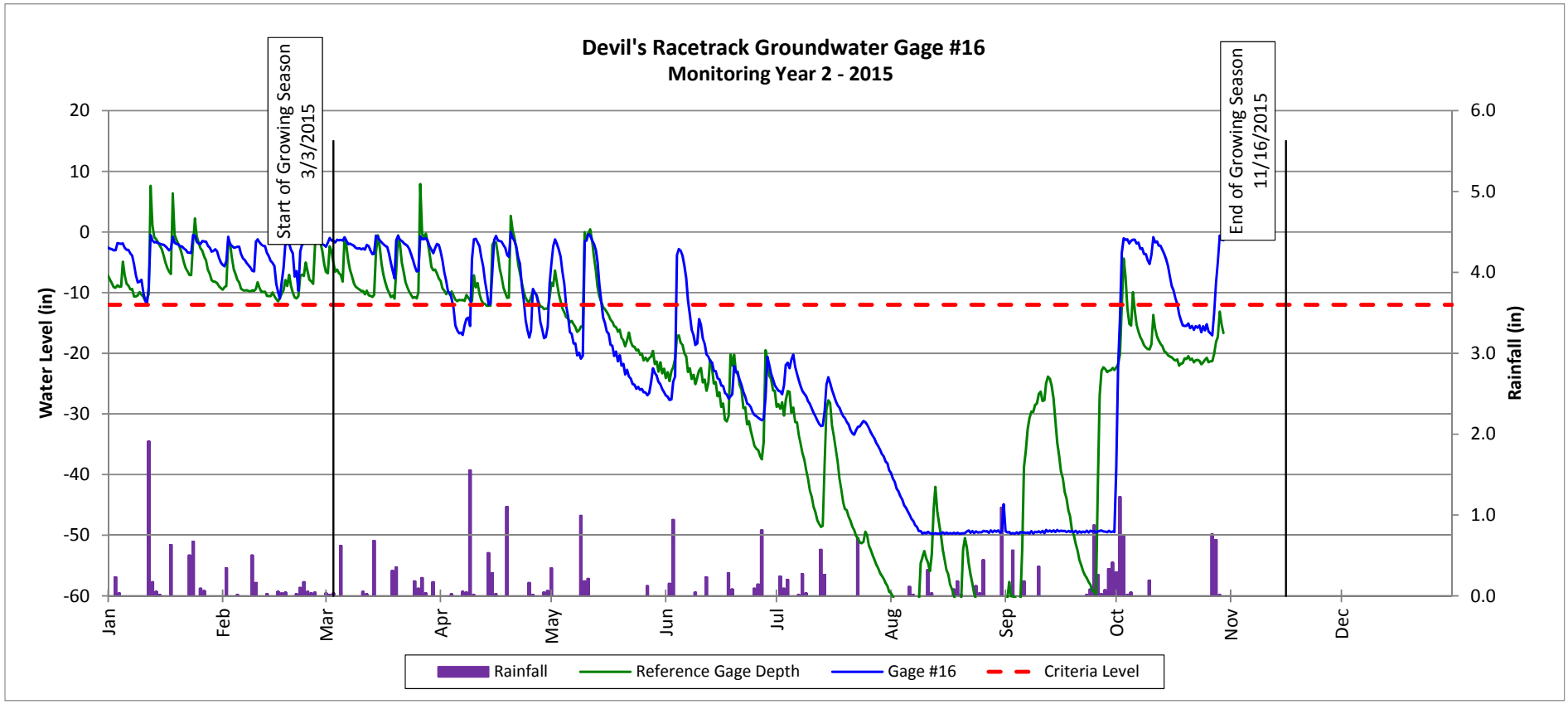
Monitoring Year 2 - 2015



Groundwater Gage Plots

Devil's Racetrack Mitigation Site (NCDMS Project No. 95021)

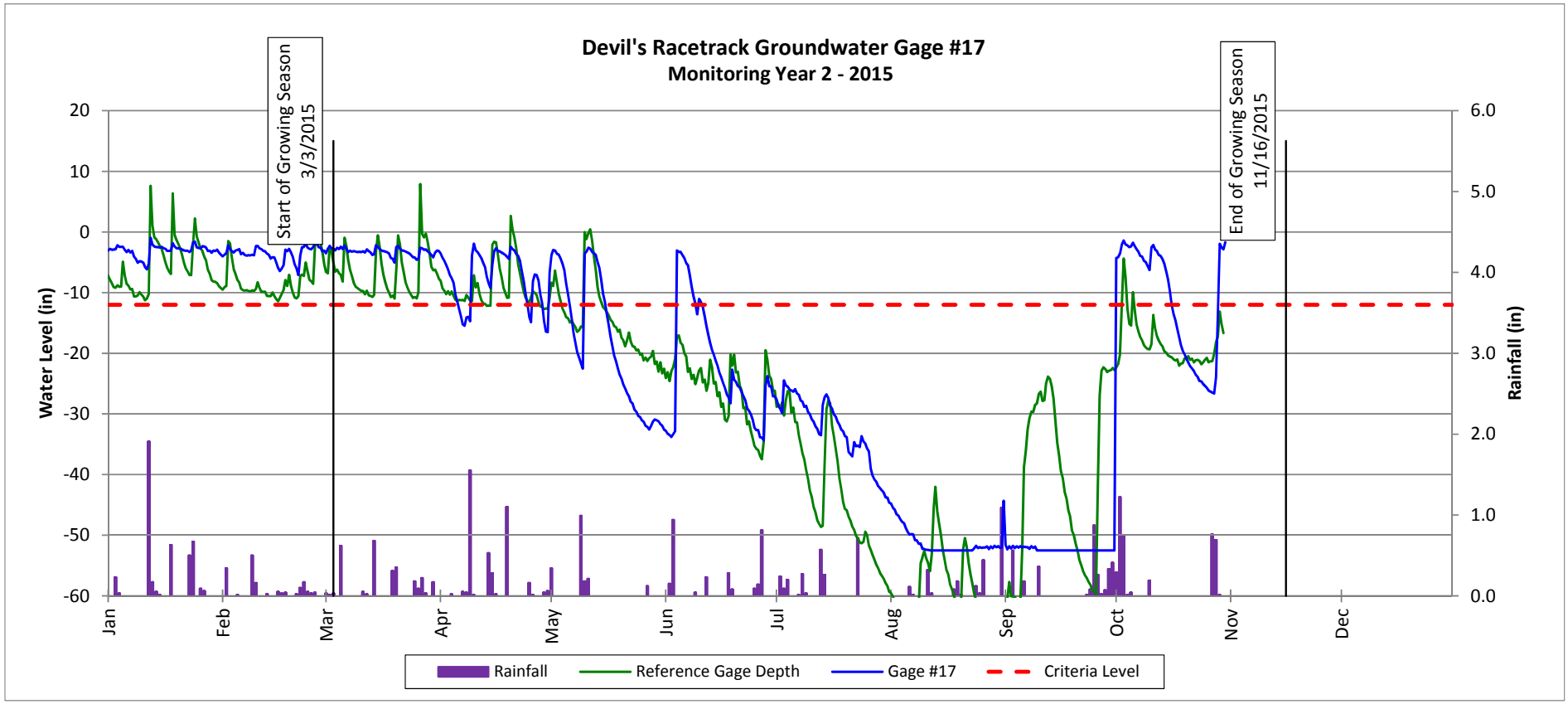
Monitoring Year 2 - 2015



Groundwater Gage Plots

Devil's Racetrack Mitigation Site (NCDMS Project No. 95021)

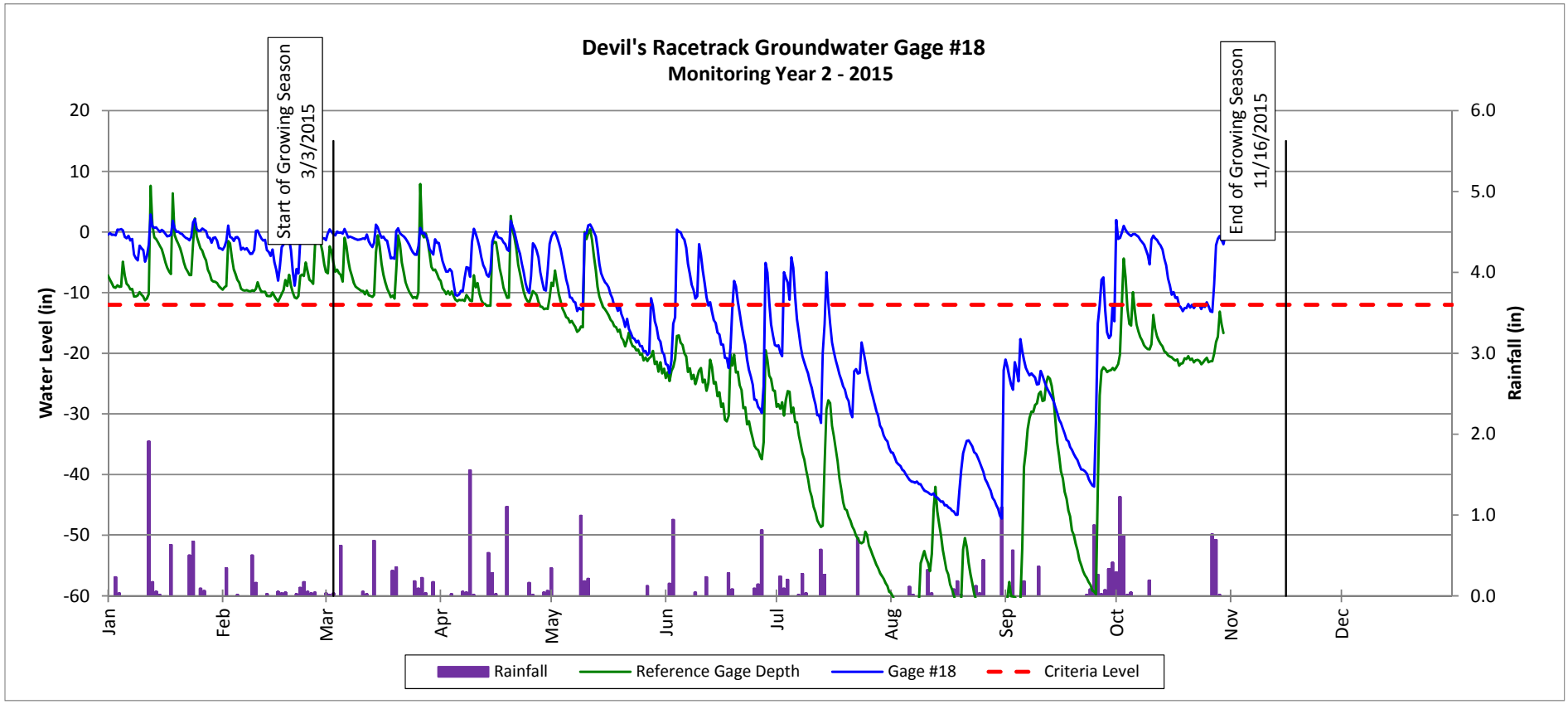
Monitoring Year 2 - 2015



Groundwater Gage Plots

Devil's Racetrack Mitigation Site (NCDMS Project No. 95021)

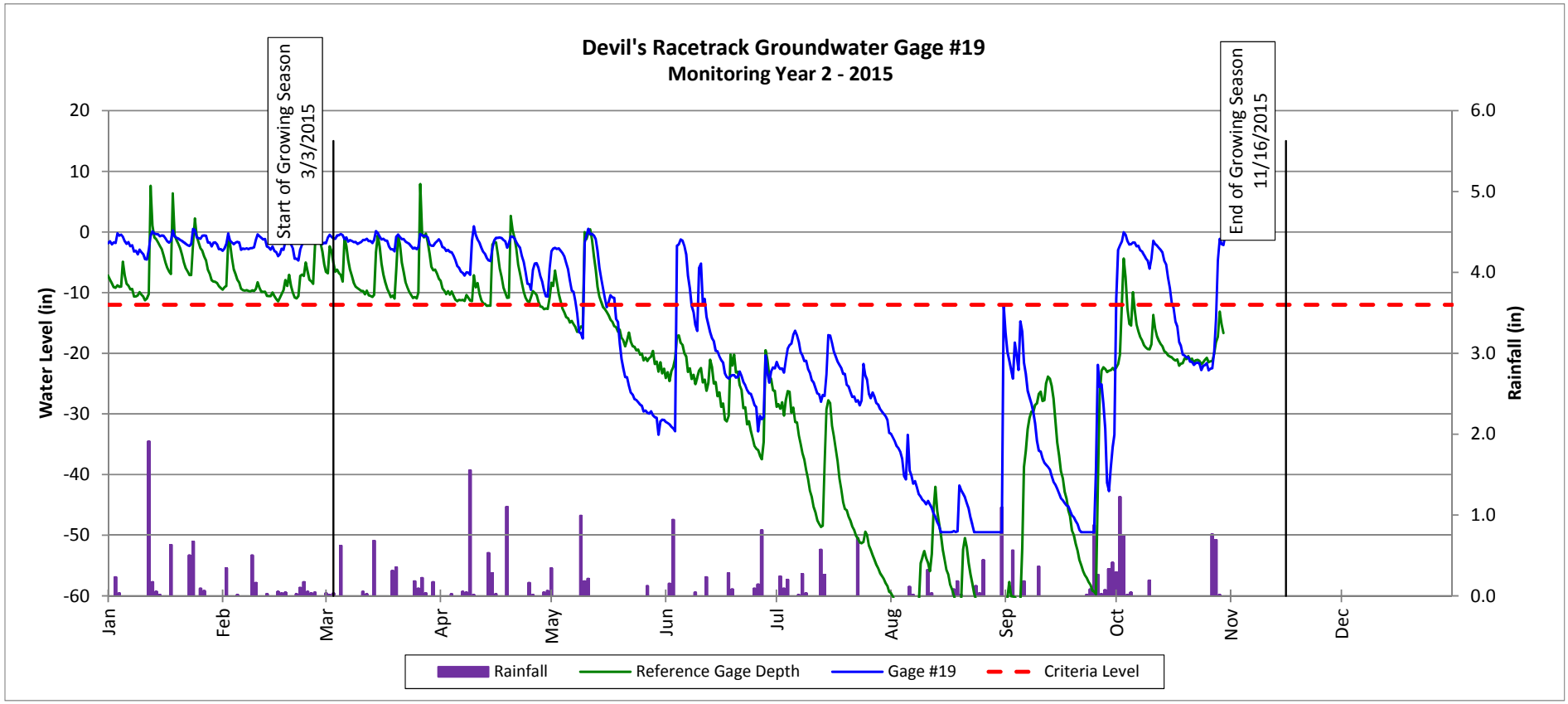
Monitoring Year 2 - 2015



Groundwater Gage Plots

Devil's Racetrack Mitigation Site (NCDMS Project No. 95021)

Monitoring Year 2 - 2015



Groundwater Gage Plots

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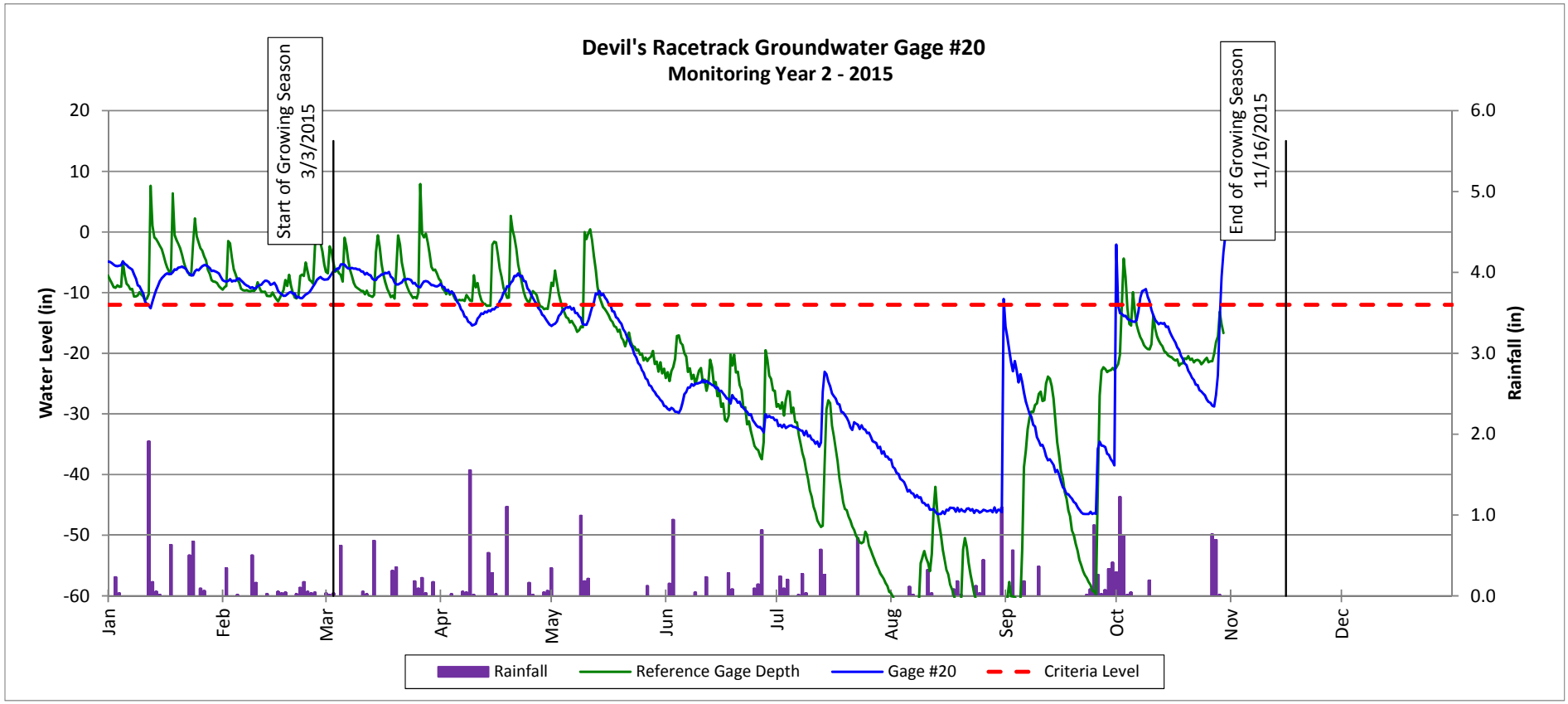
Monitoring Year 2 - 2015



Groundwater Gage Plots

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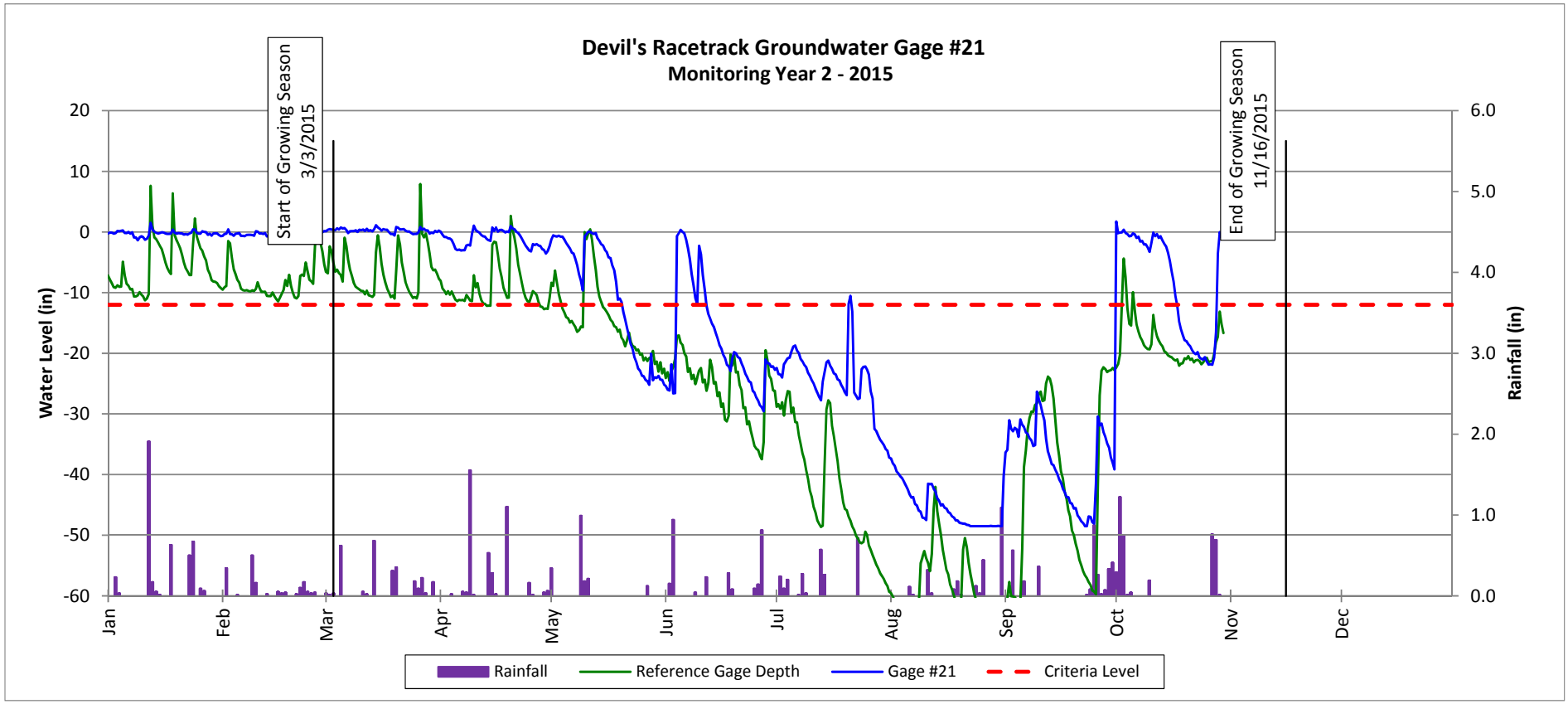
Monitoring Year 2 - 2015



Groundwater Gage Plots

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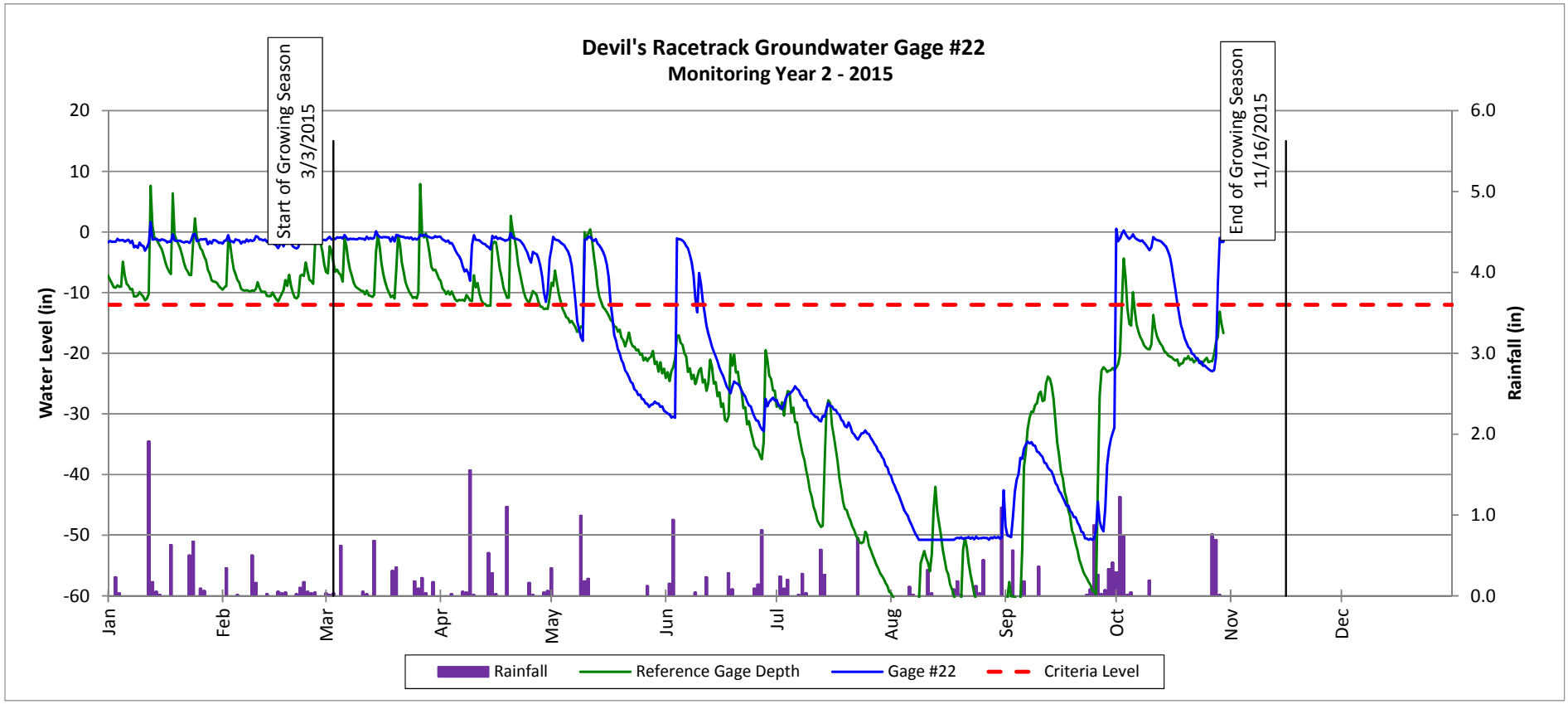
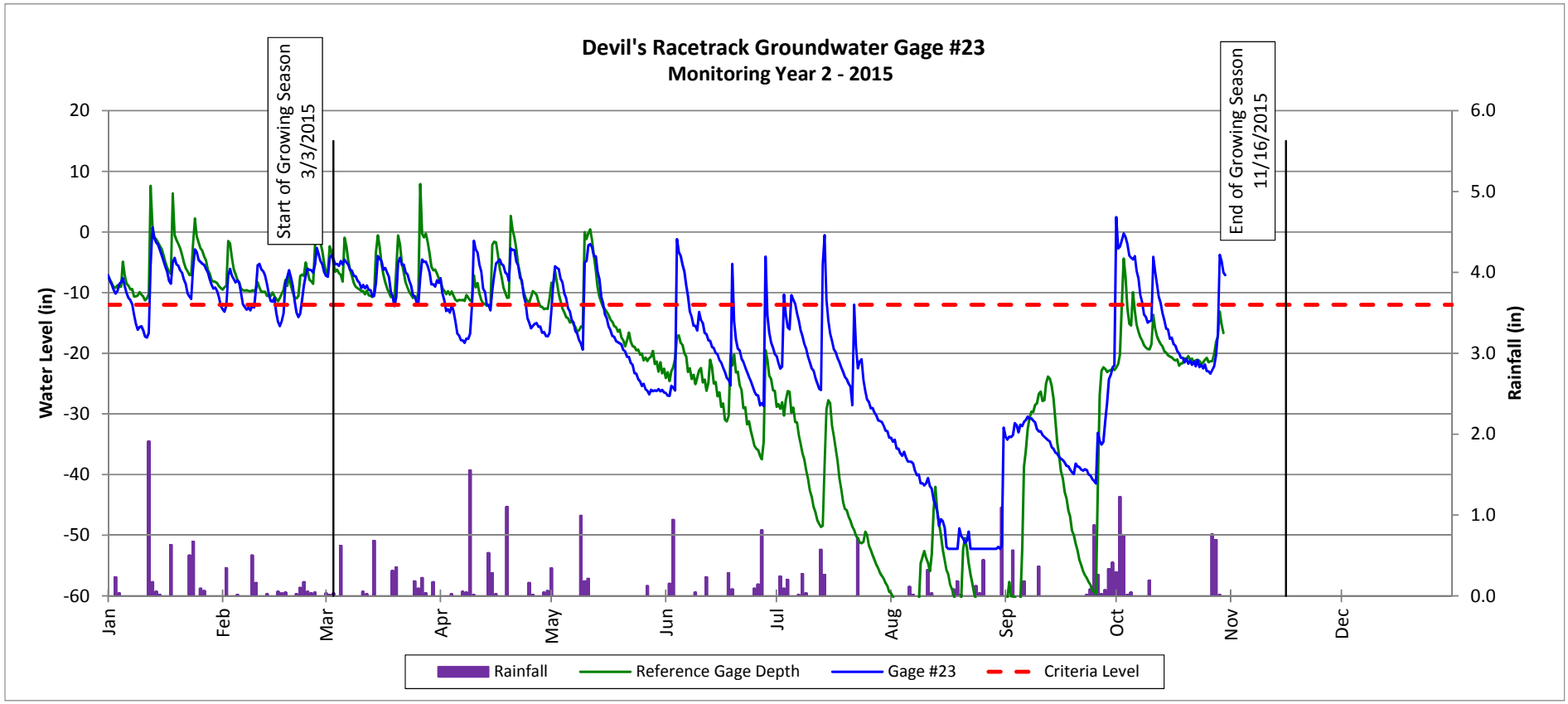
Monitoring Year 2 - 2015



Groundwater Gage Plots

Devil's Racetrack Mitigation Site (NCDMS Project No. 95021)

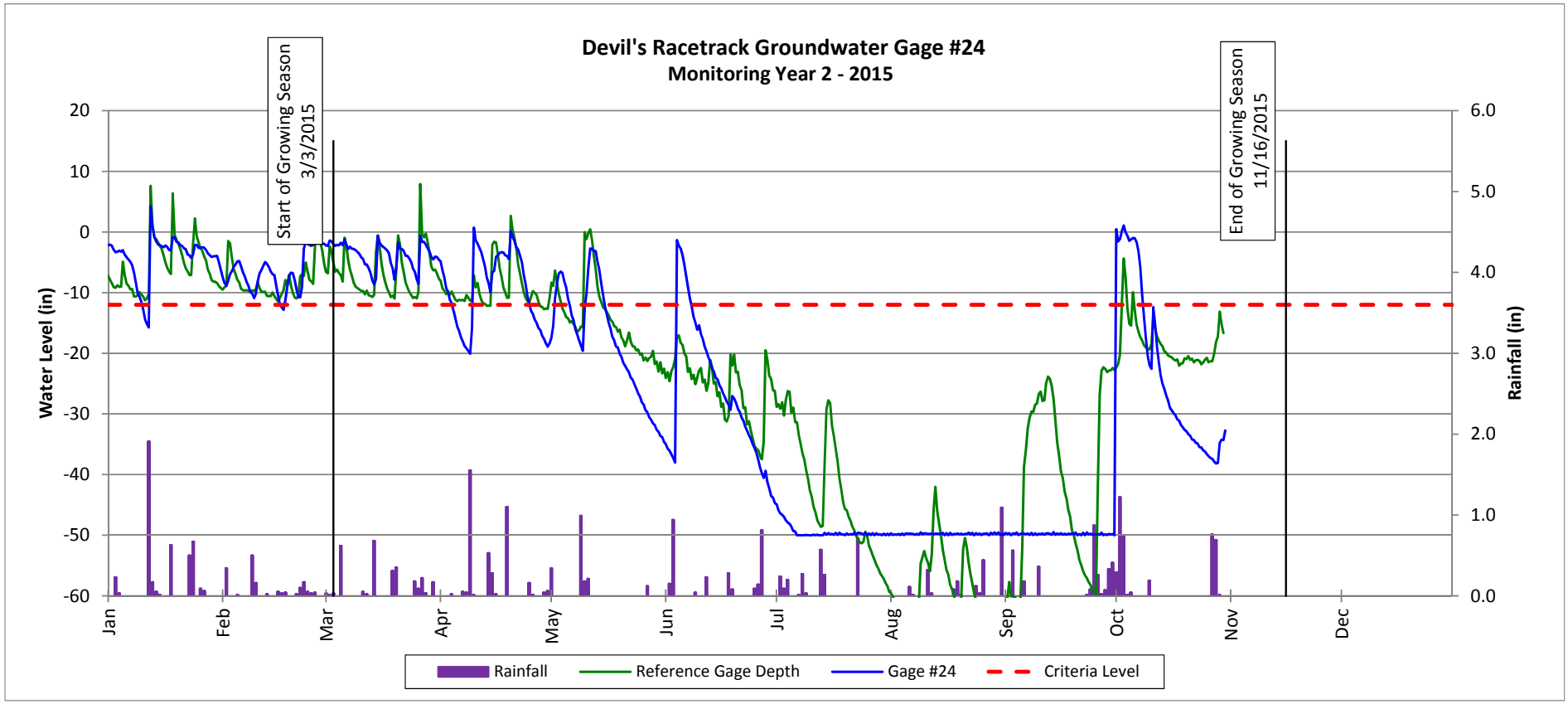
Monitoring Year 2 - 2015



Groundwater Gage Plots

Devil's Racetrack Mitigation Site (NCDMS Project No. 95021)

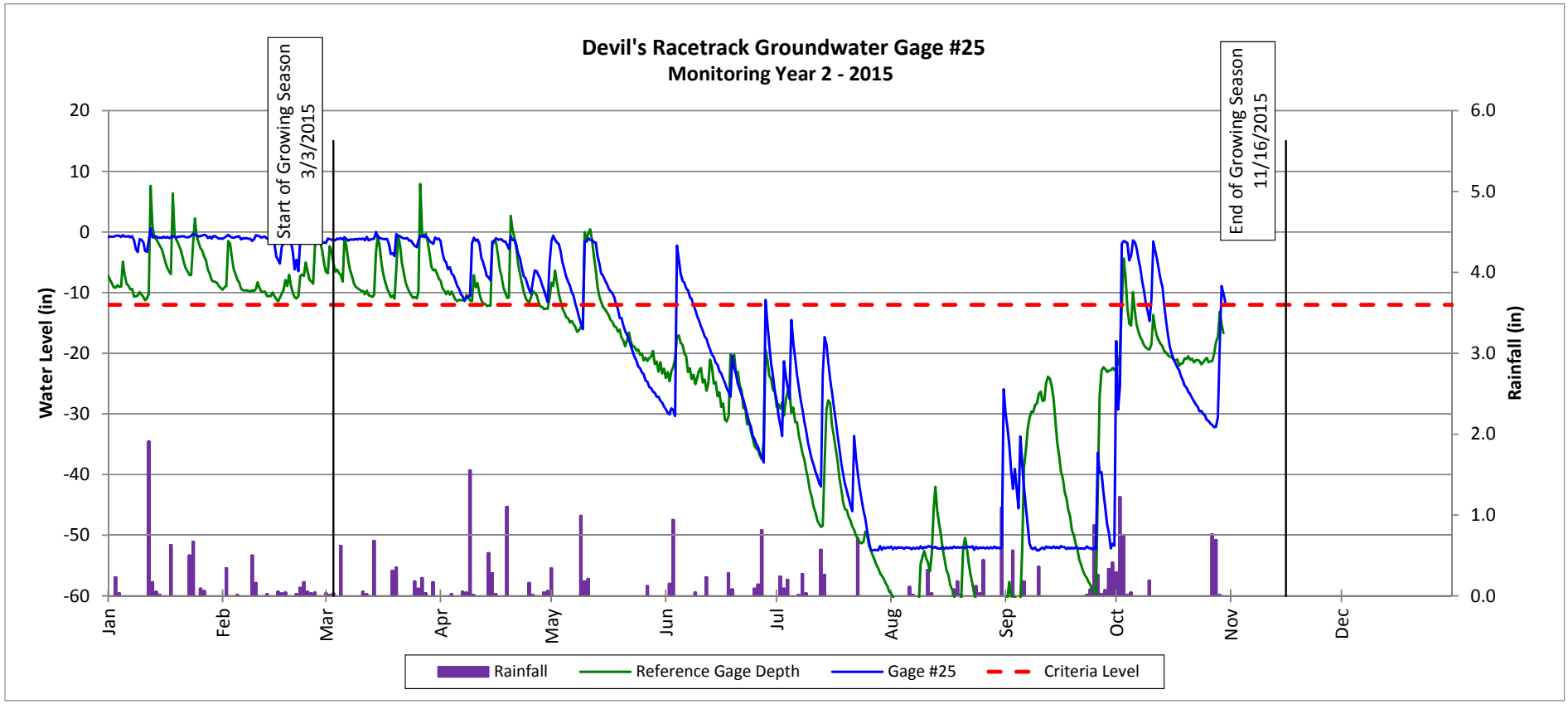
Monitoring Year 2 - 2015



Groundwater Gage Plots

Devil's Racetrack Mitigation Site (NCDMS Project No. 95021)

Monitoring Year 2 - 2015



Groundwater Gage Plots

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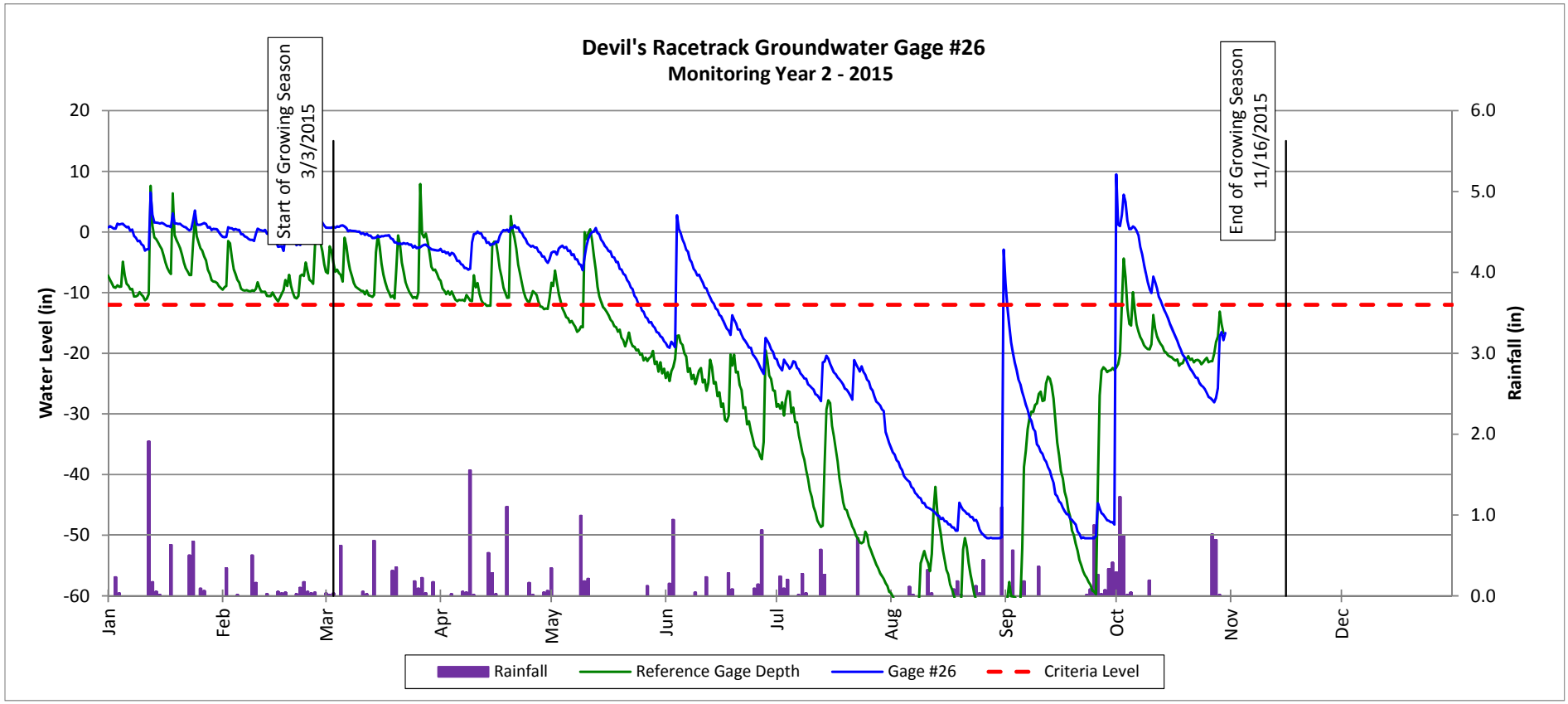
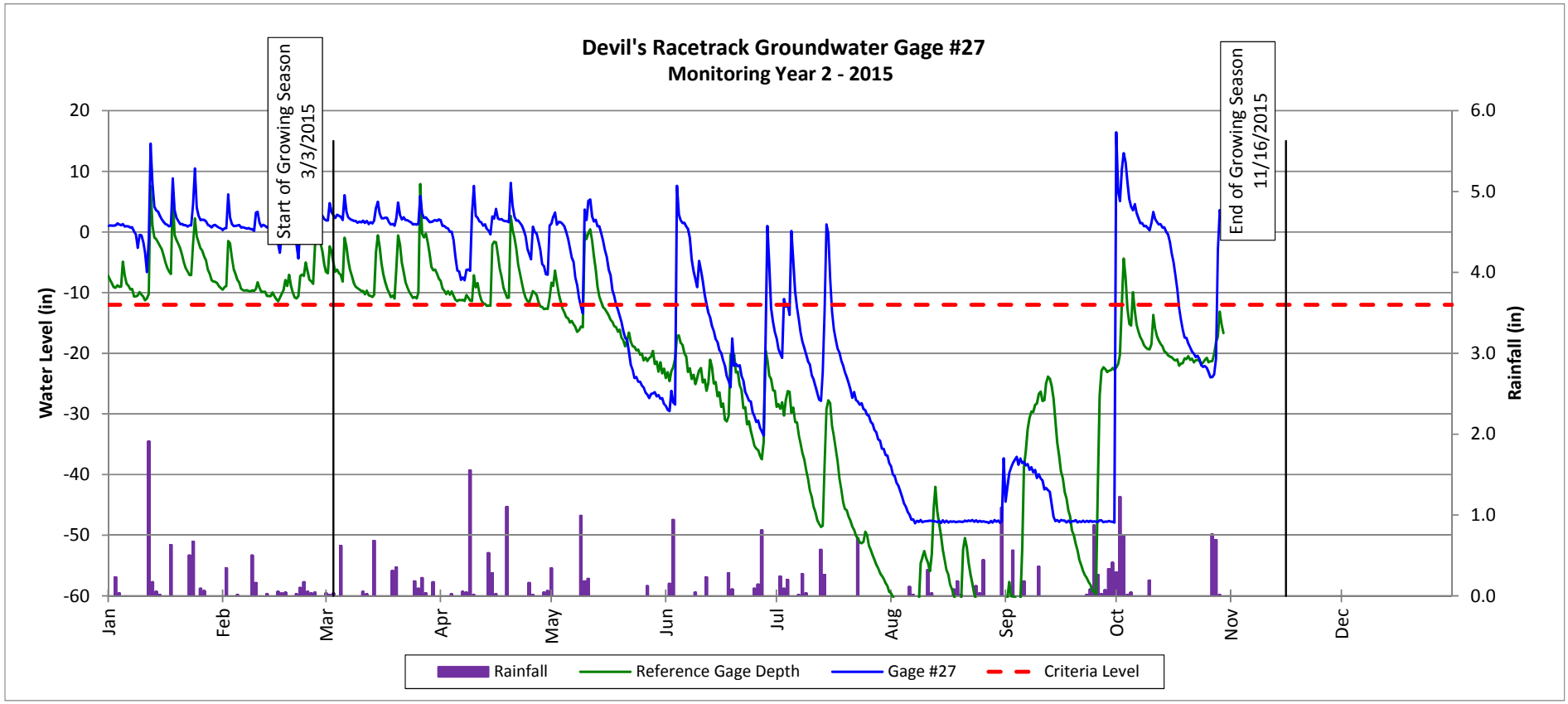
Monitoring Year 2 - 2015



Groundwater Gage Plots

Devil's Racetrack Mitigation Site (NCDMS Project No. 95021)

Monitoring Year 2 - 2015



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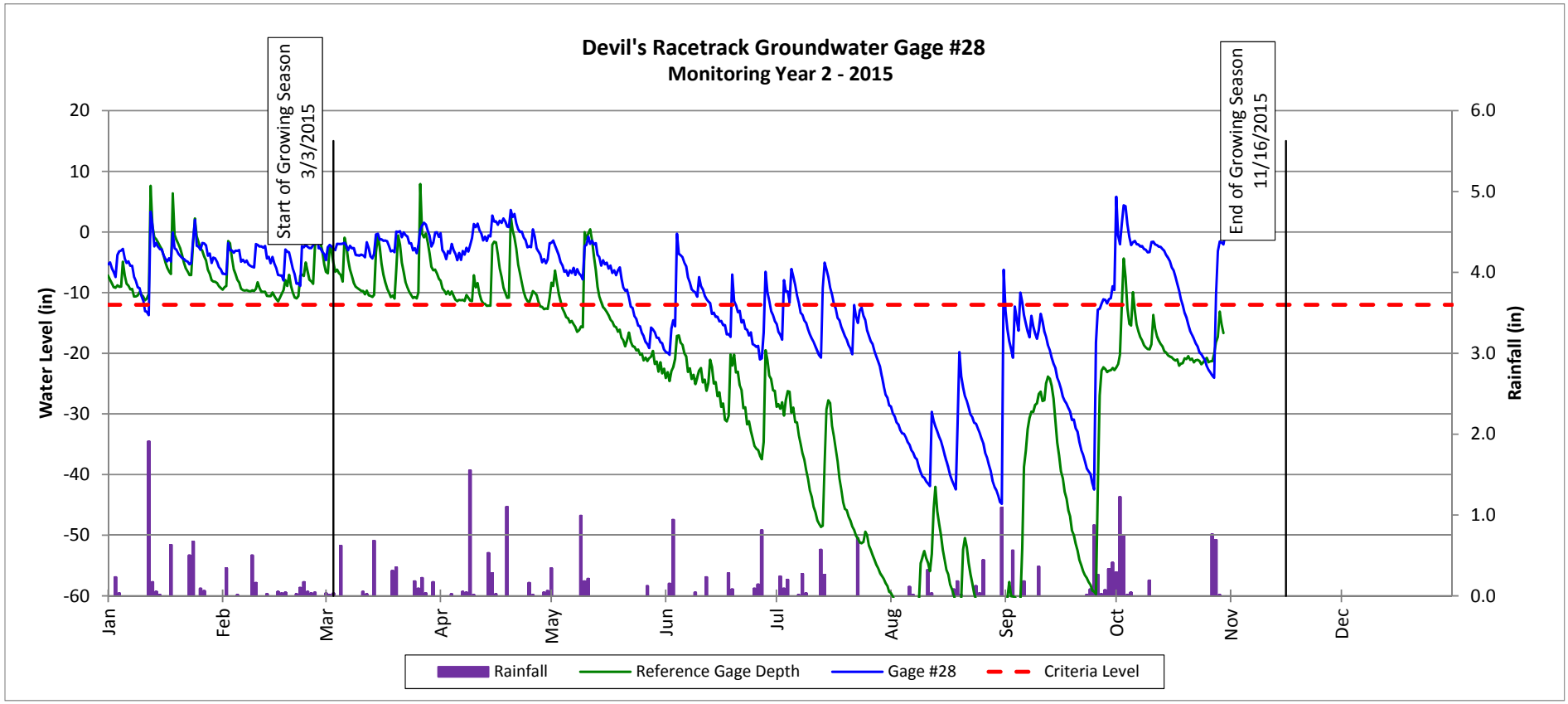
Monitoring Year 2 - 2015



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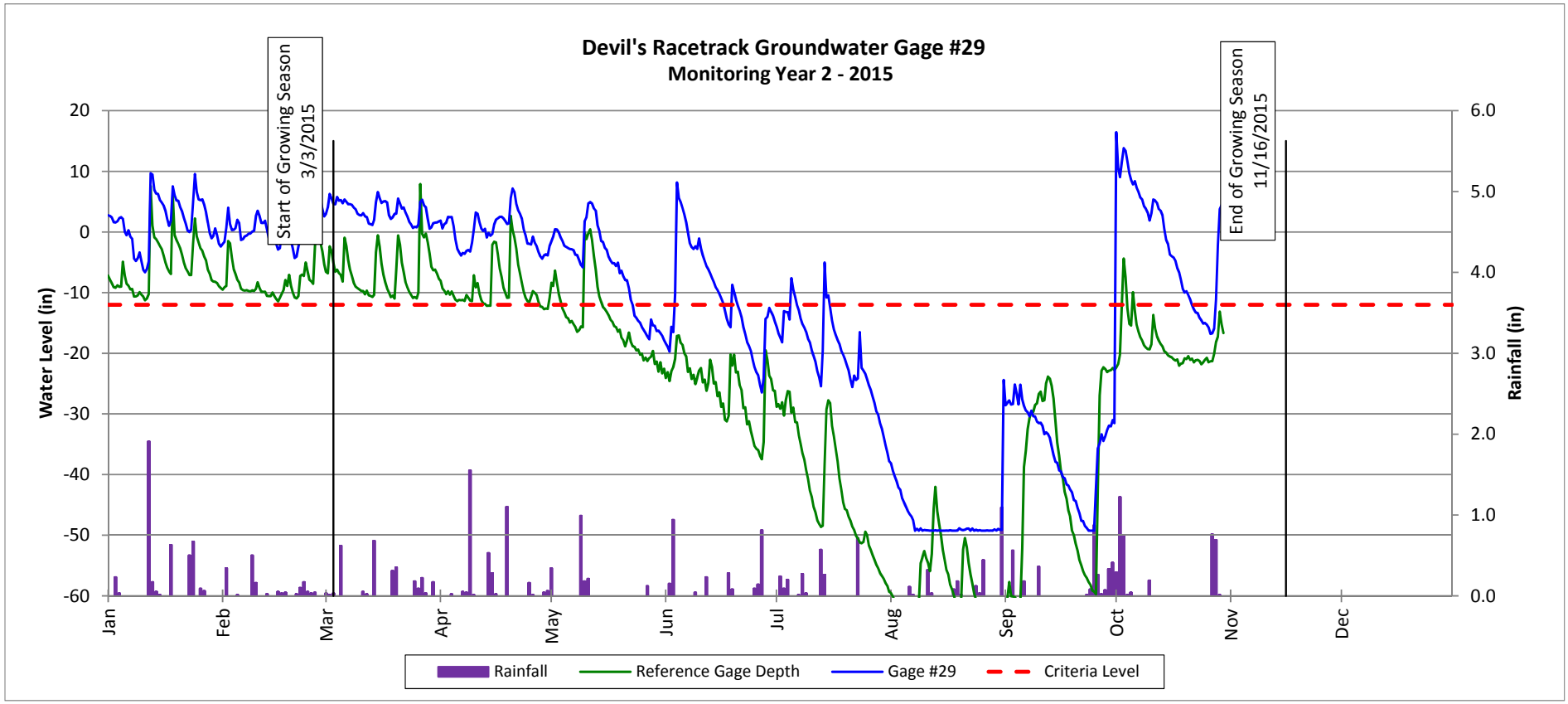
Monitoring Year 2 - 2015



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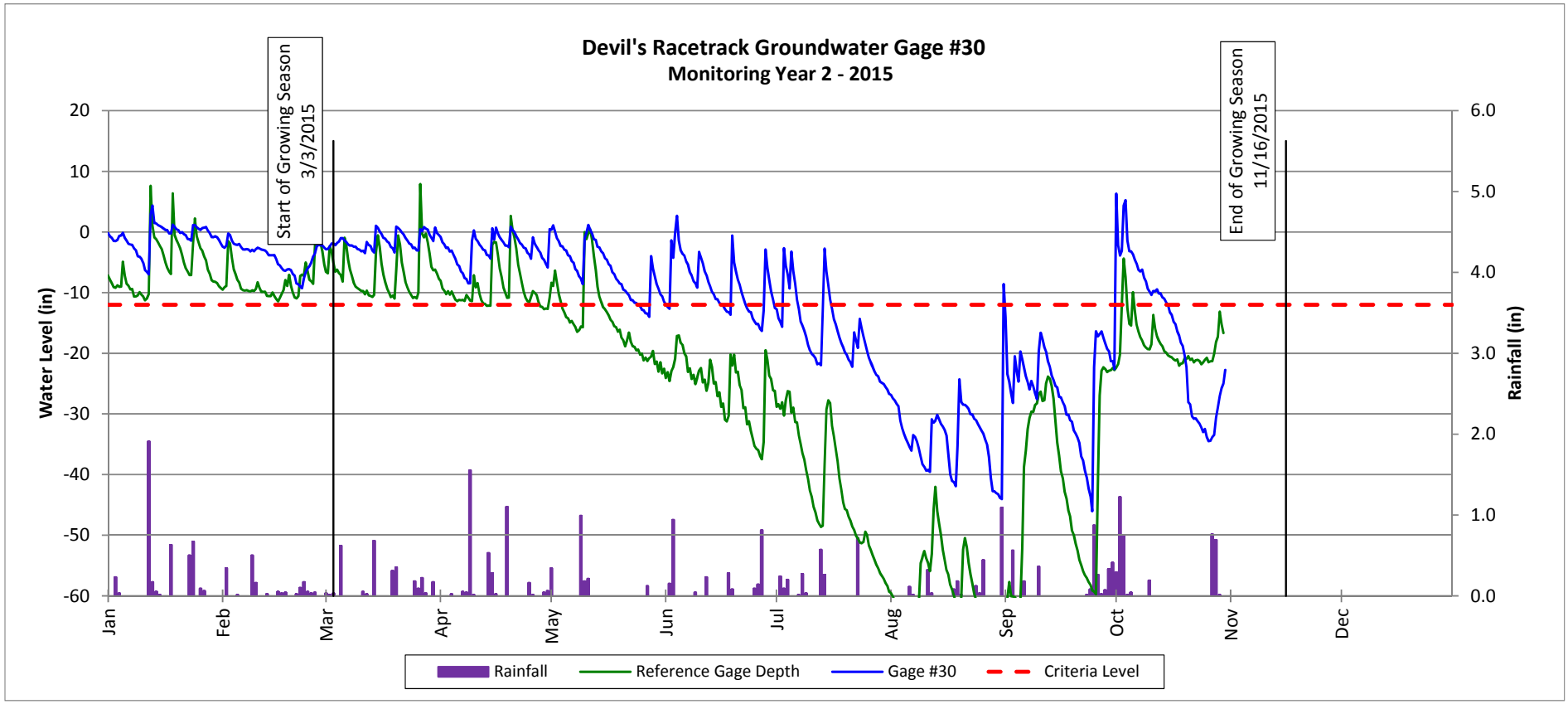
Monitoring Year 2 - 2015



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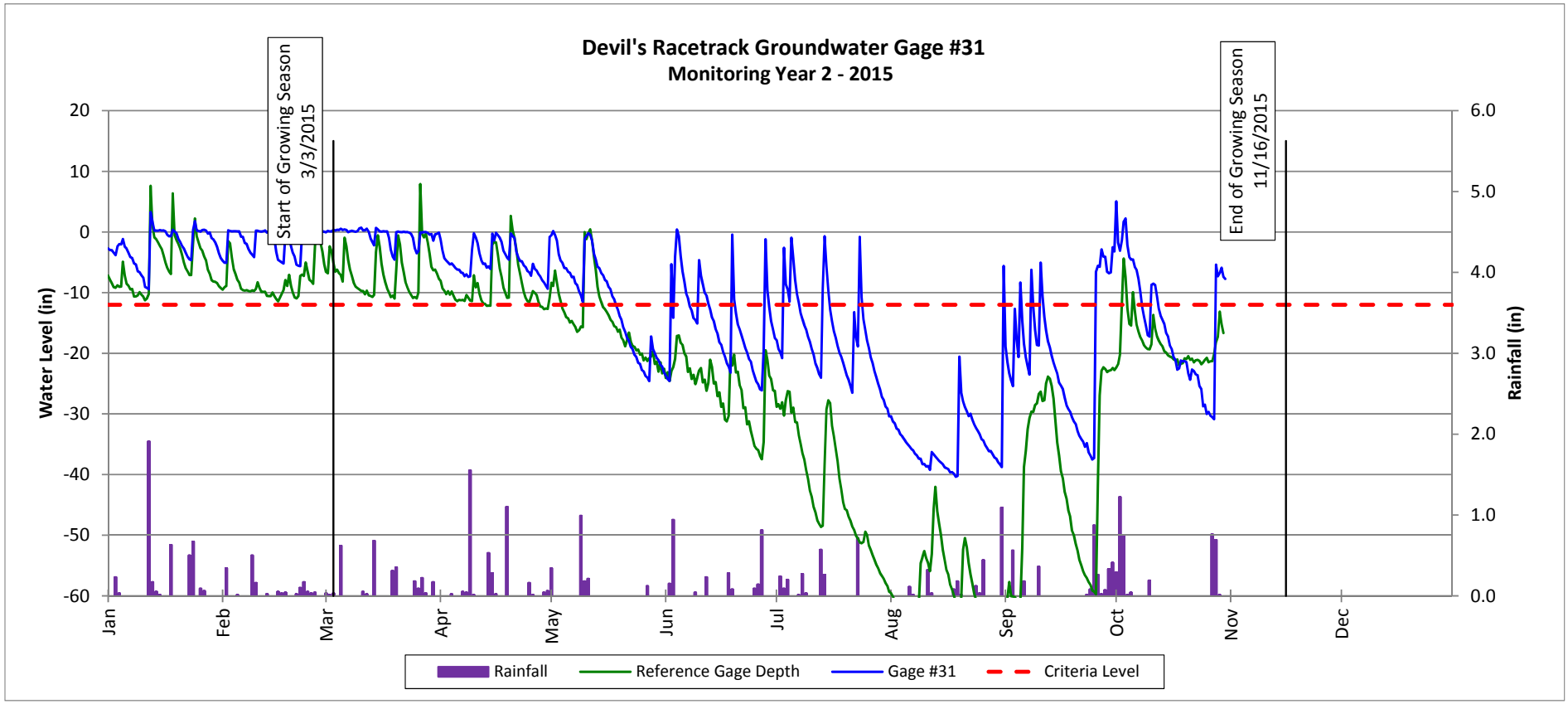
Monitoring Year 2 - 2015



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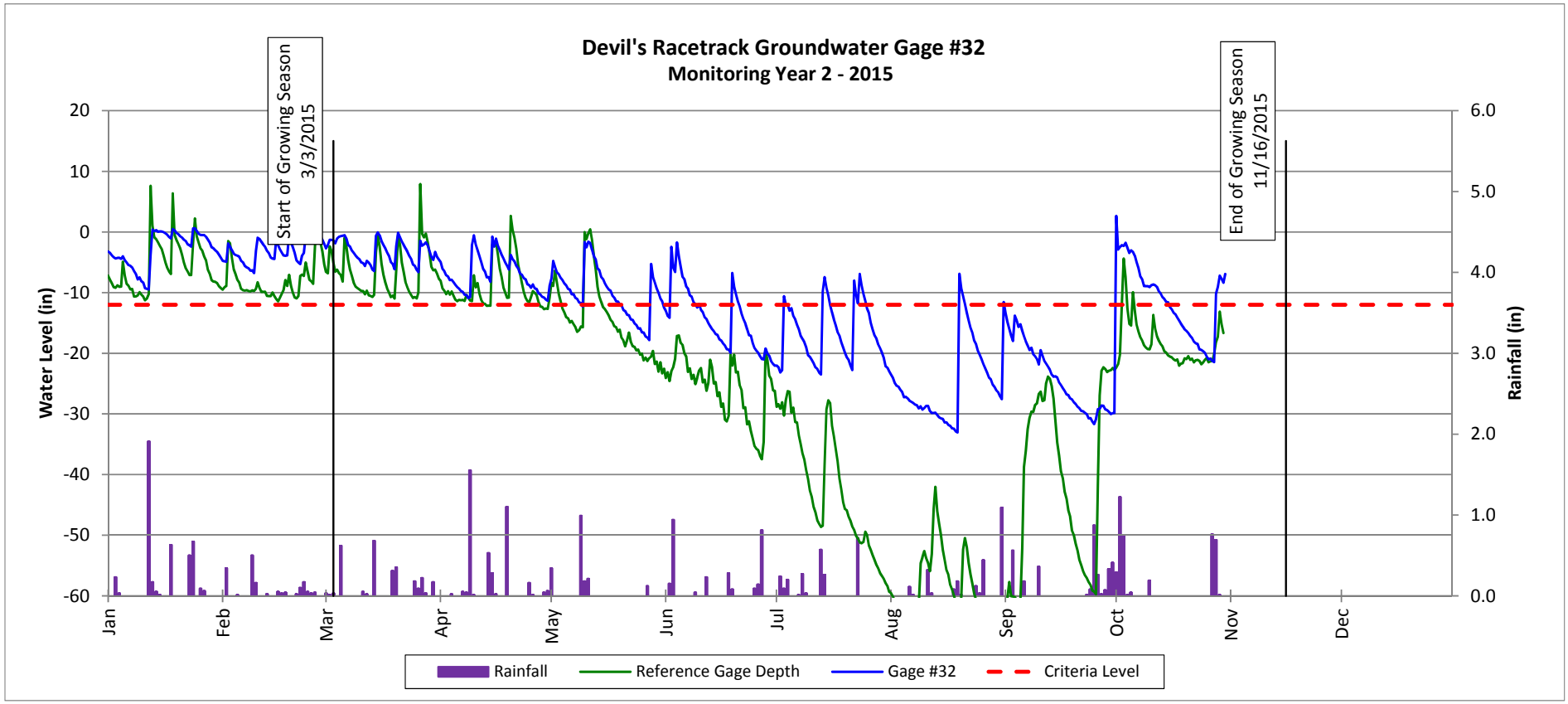
Monitoring Year 2 - 2015



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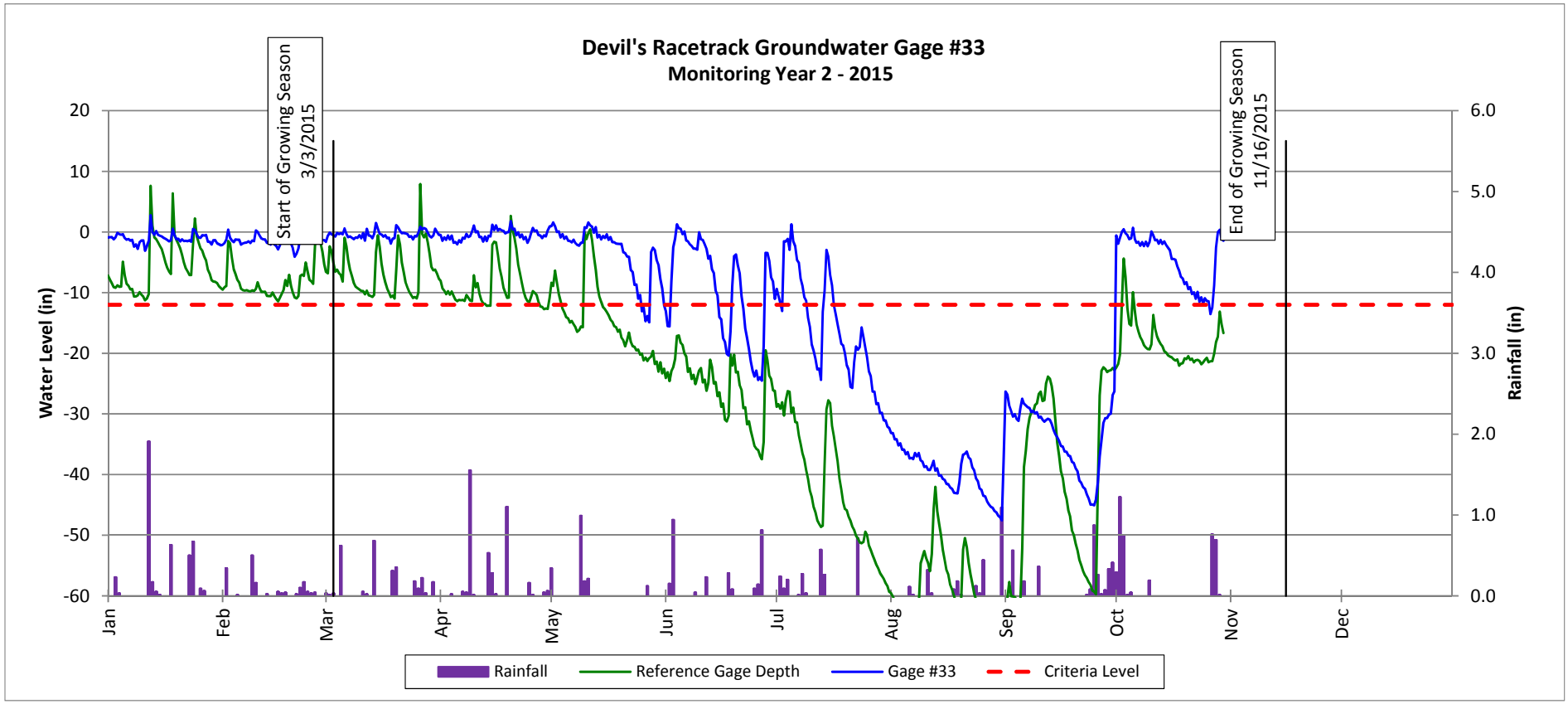
Devil's Racetrack Mitigation Site (NCDMS Project No. 95021)

Monitoring Year 2 - 2015



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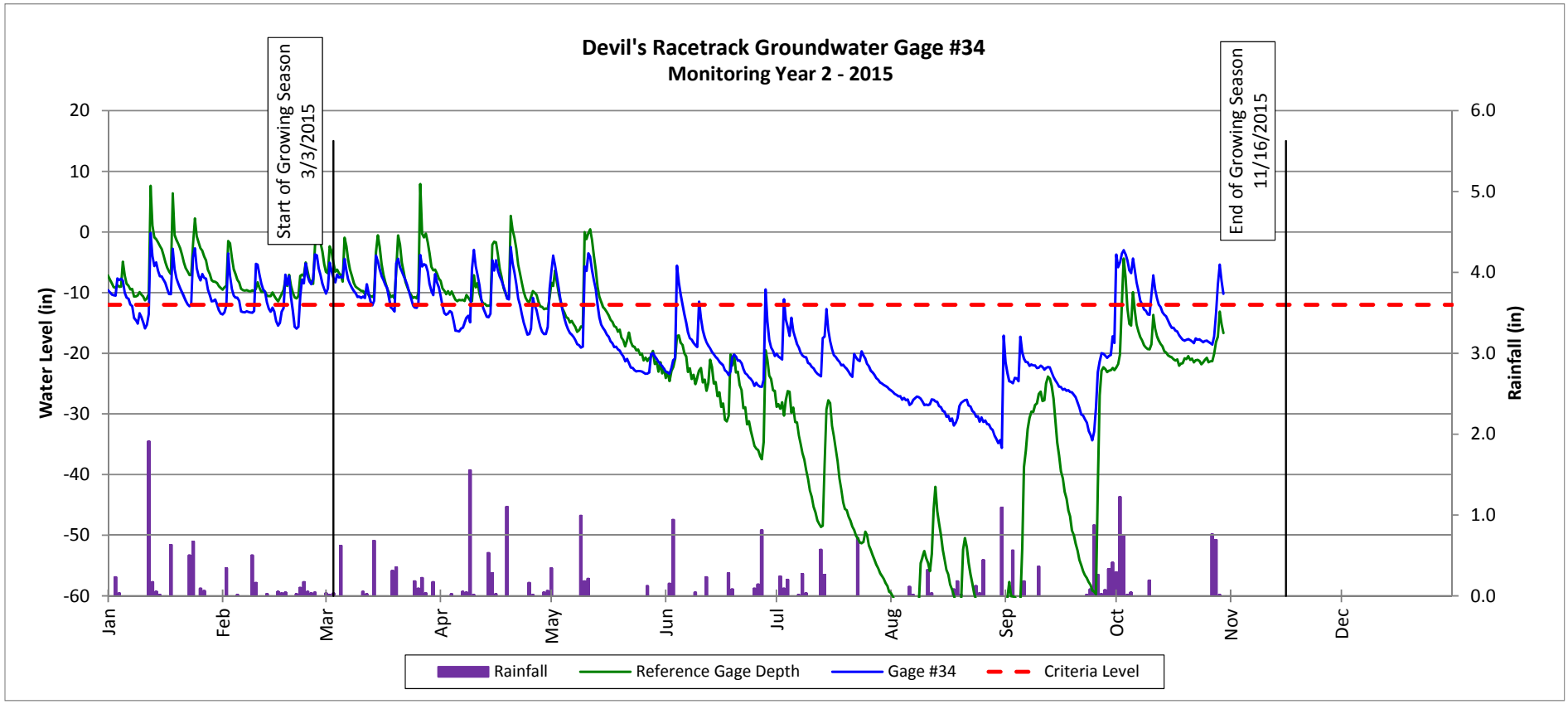
Monitoring Year 2 - 2015



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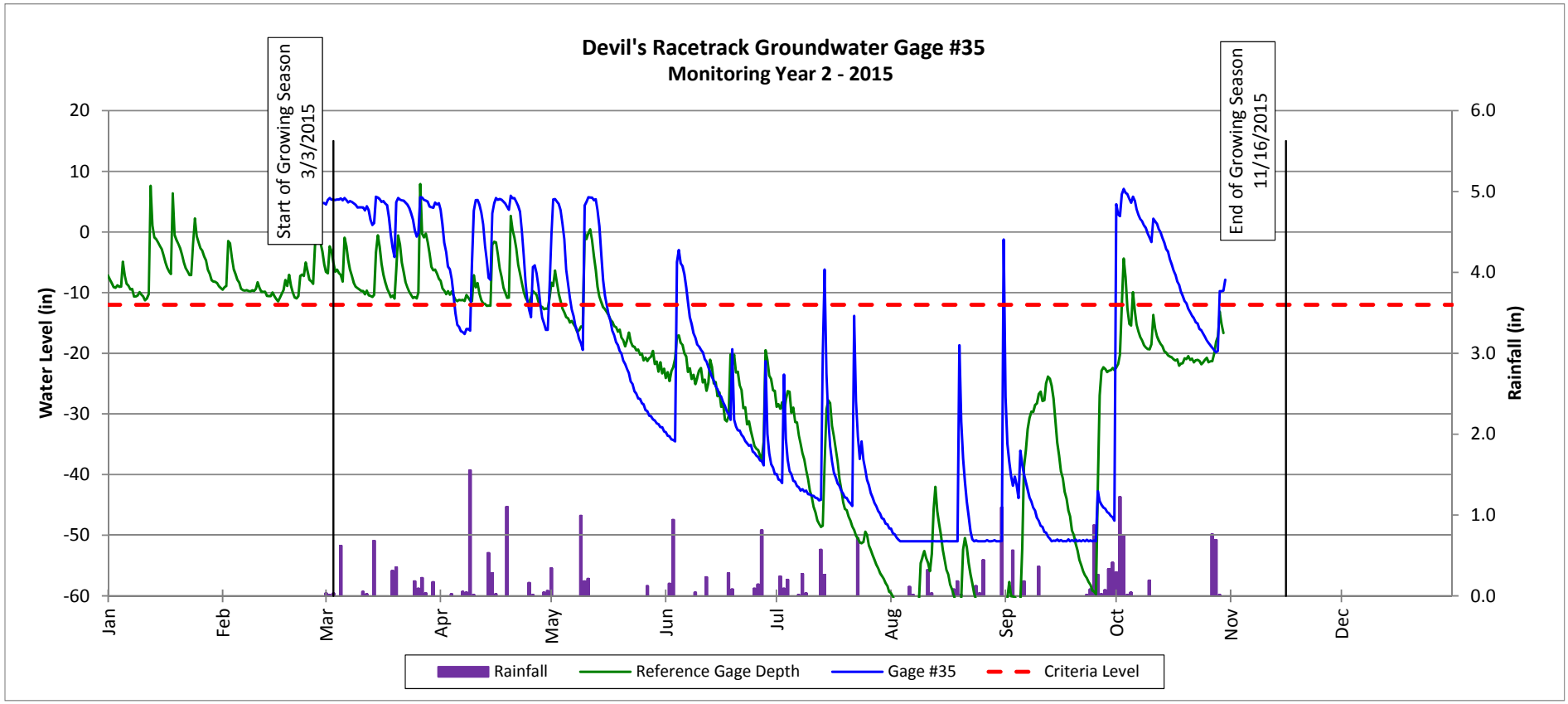
Monitoring Year 2 - 2015



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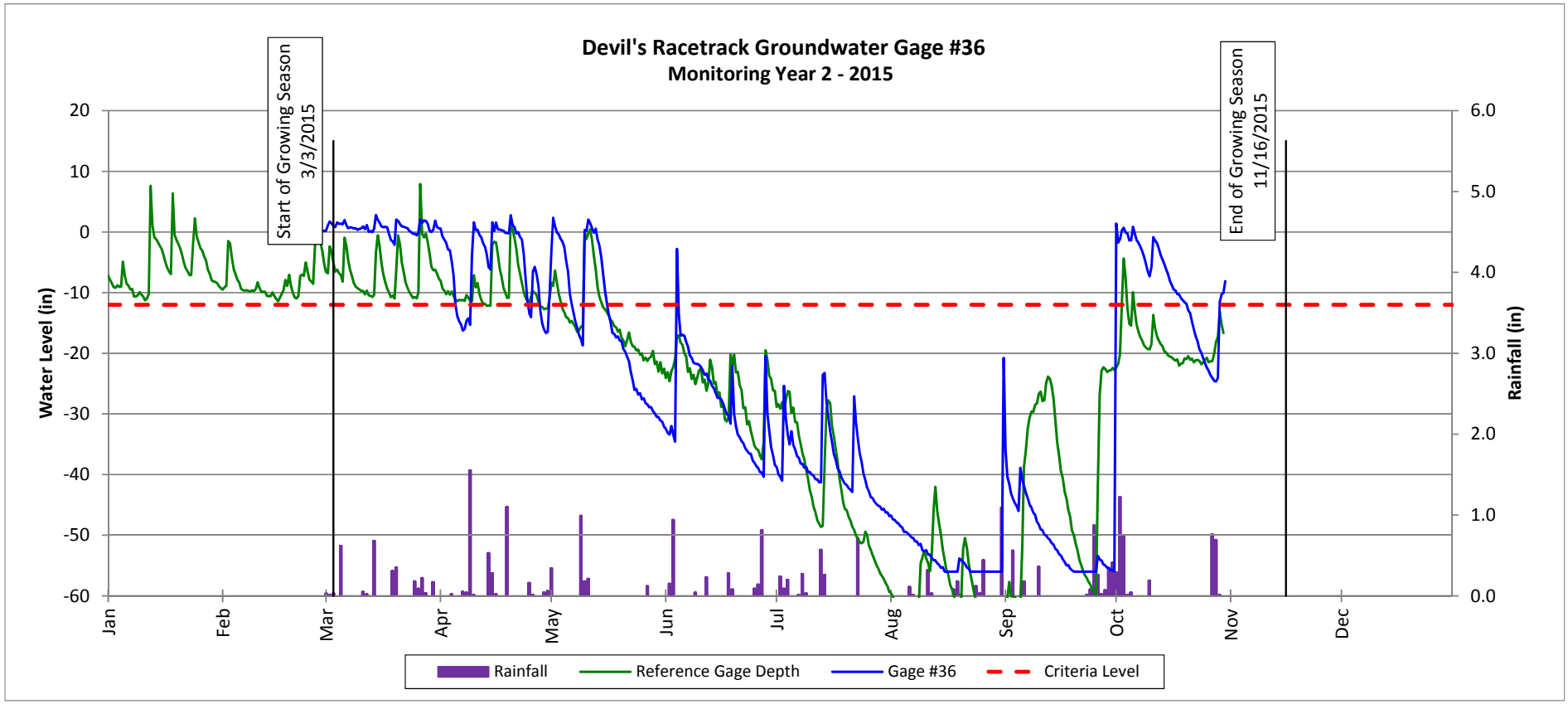
Monitoring Year 2 - 2015



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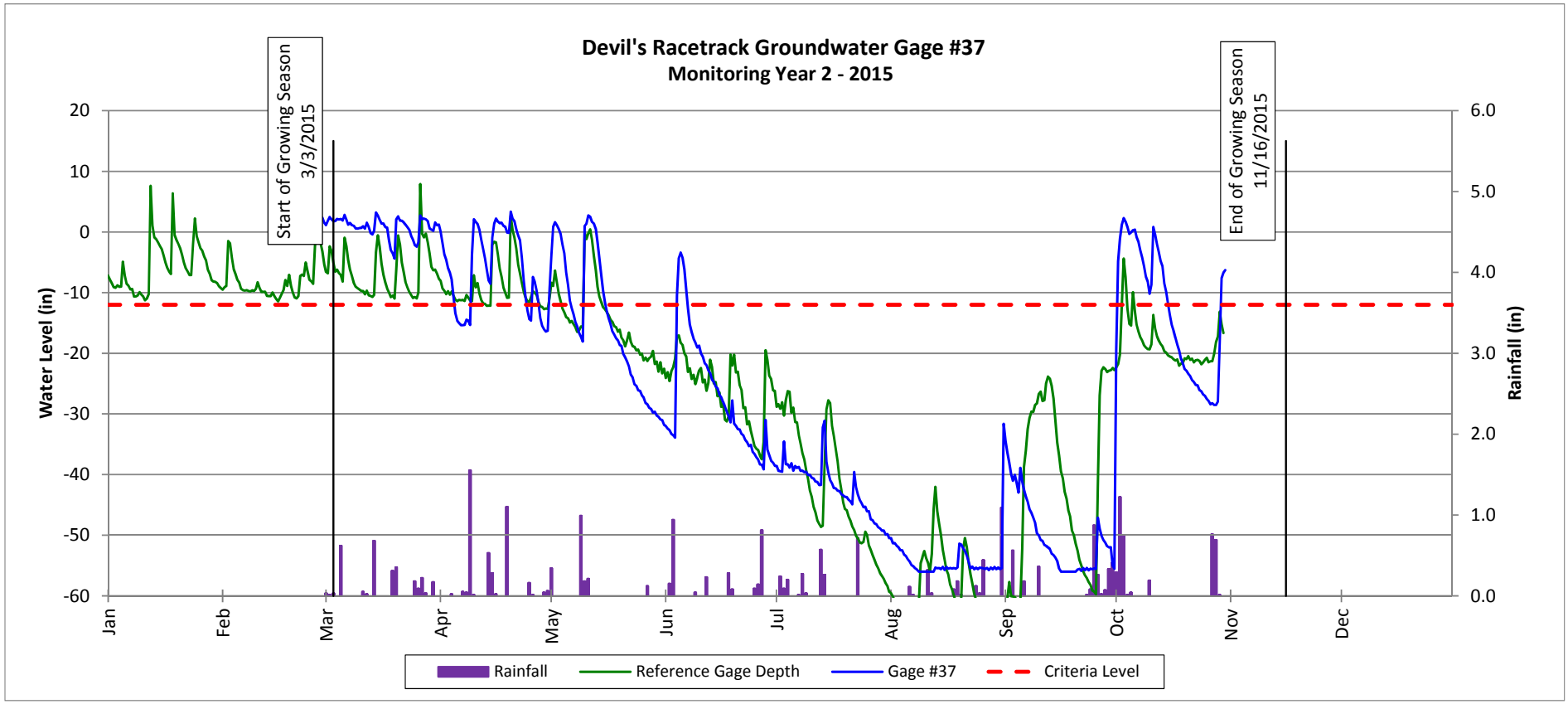
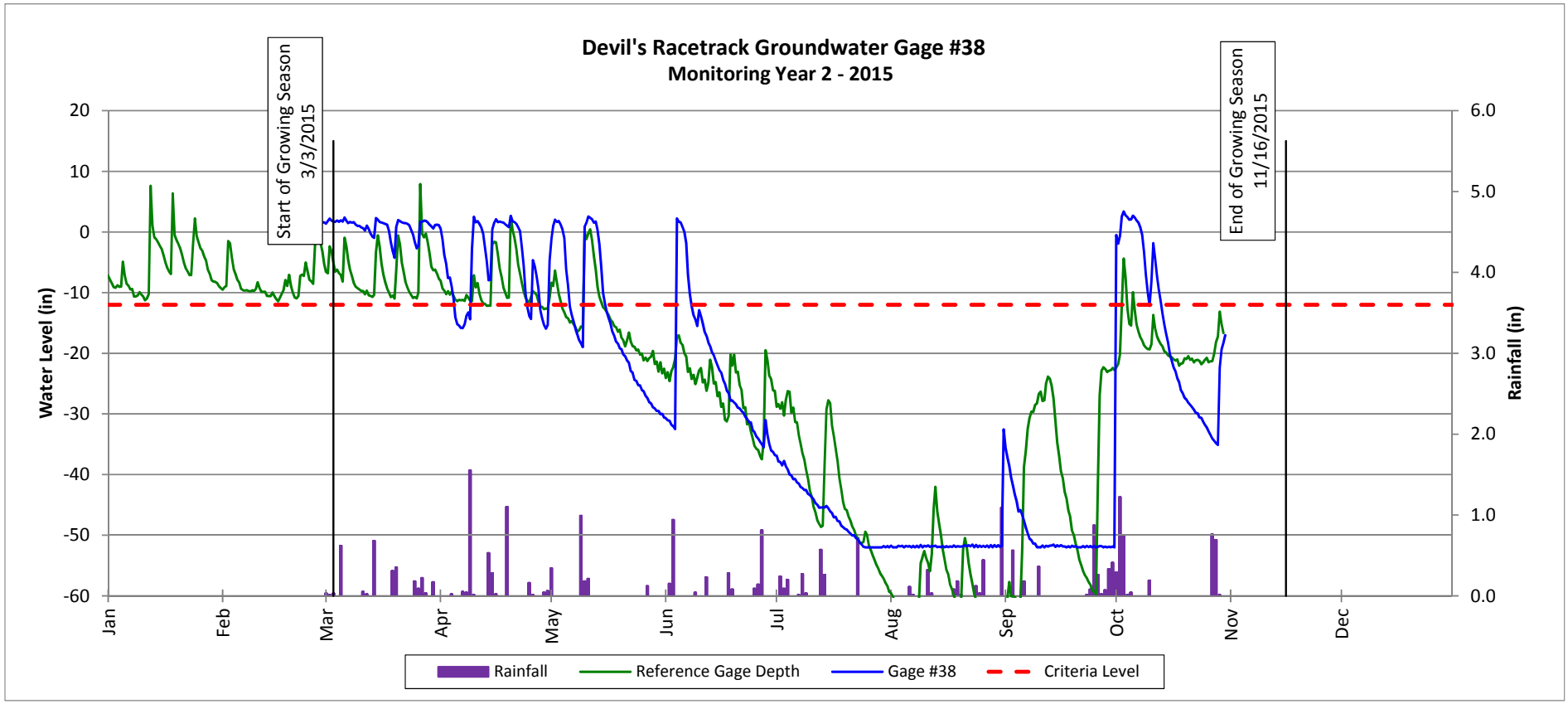
Monitoring Year 2 - 2015



Groundwater Gage Plots

Devil's Racetrack Mitigation Site (NCDMS Project No. 95021)

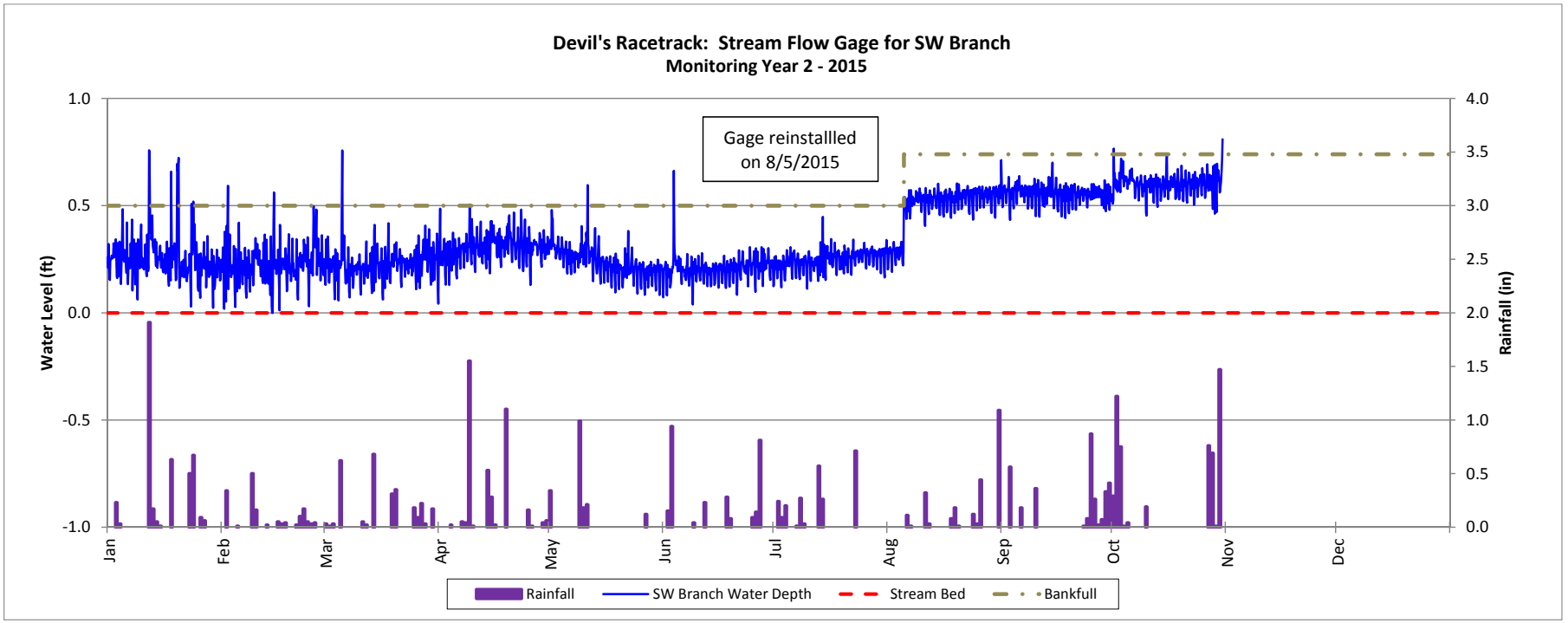
Monitoring Year 2 - 2015



Stream Flow Gage Plots

Devil's Racetrack Mitigation Site (NCDMS Project No. 95021)

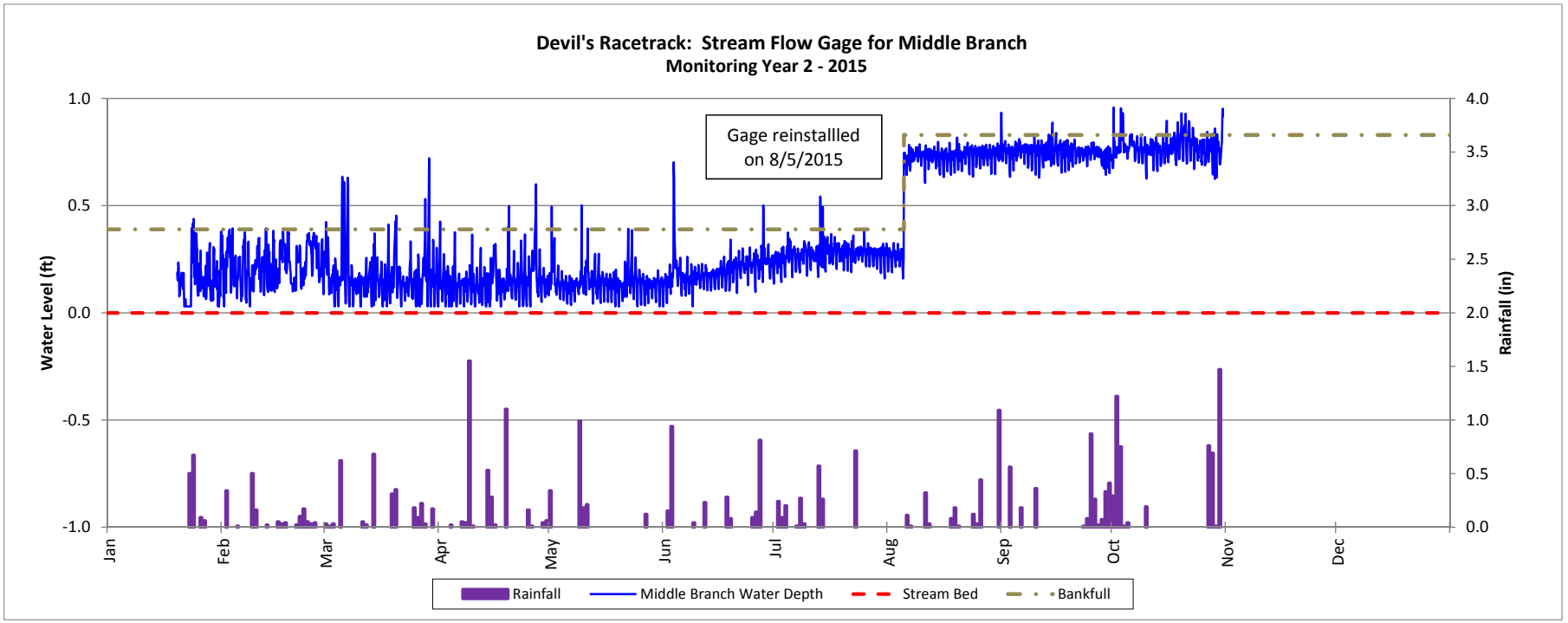
Monitoring Year 2 - 2015



Stream Flow Gage Plots

Devil's Racetrack Mitigation Site (NCDMS Project No. 95021)

Monitoring Year 2 - 2015



Stream Flow Gage Plots

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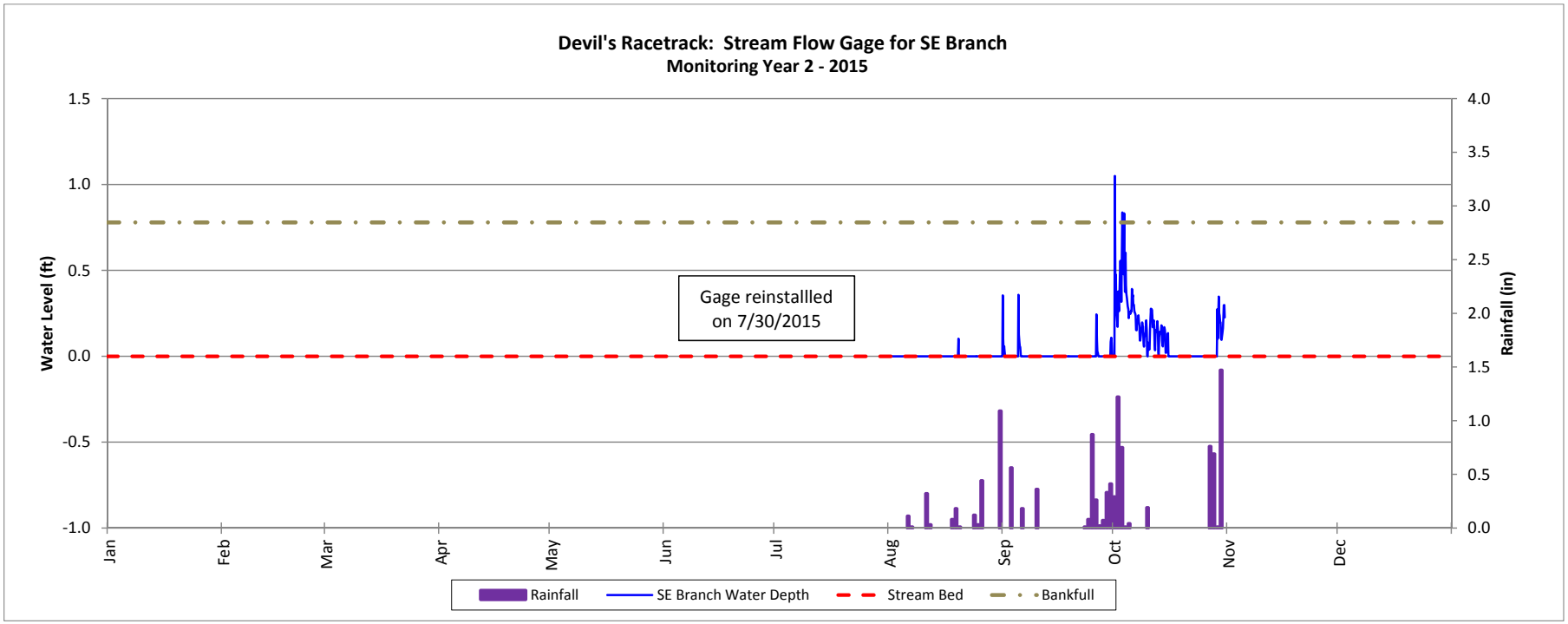
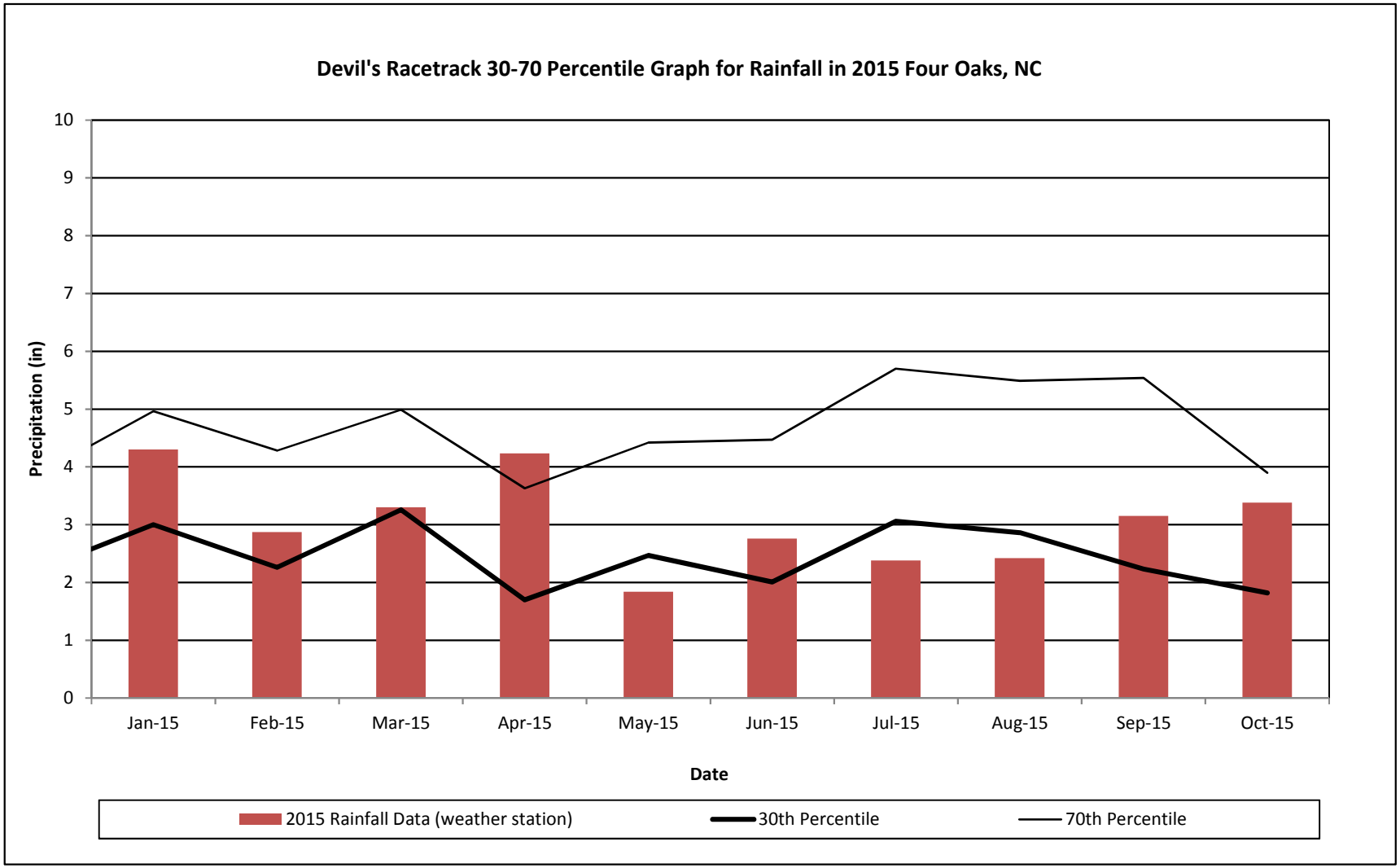


Monthly Rainfall Data

Devil's Racetrack Mitigation Site (NCDMS Project No. 95021)

Monitoring Year 2 - 2015



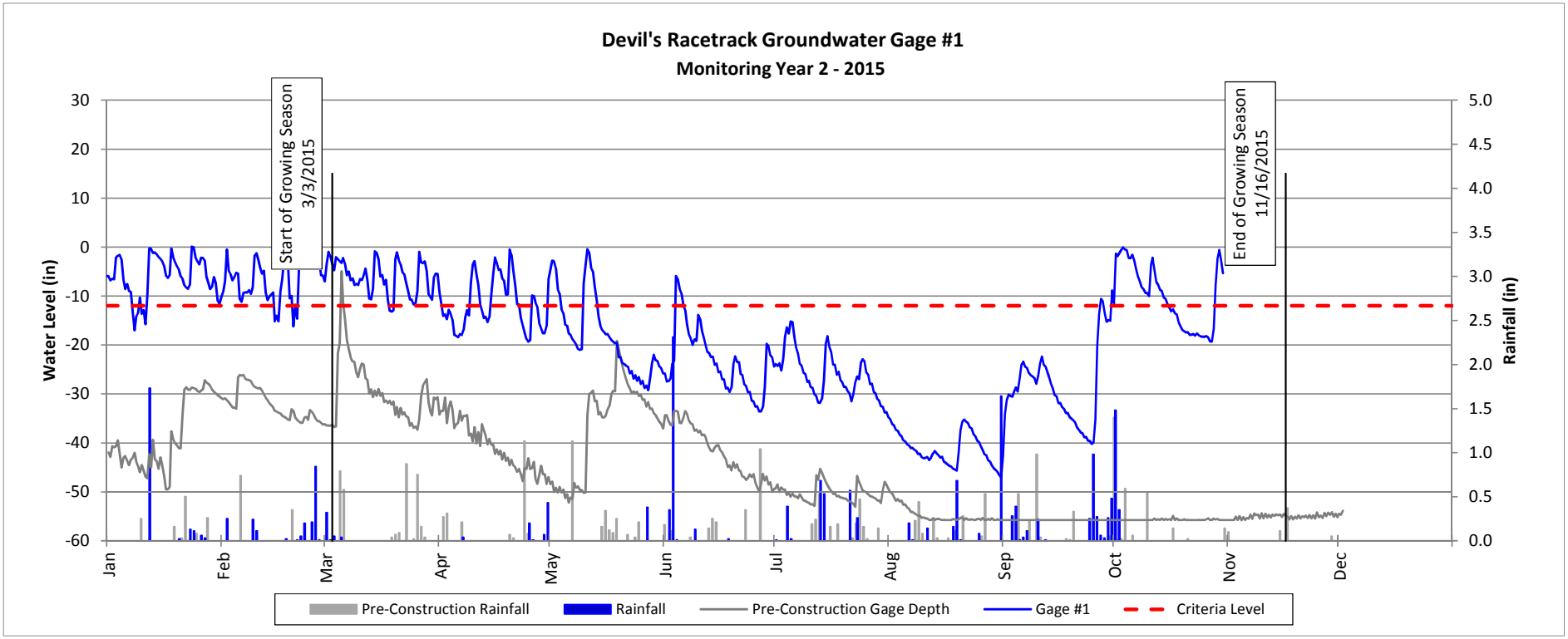
[1] 2015 monthly rainfall collected by Weather Underground Station KNCFOUR02 (Four Oaks, NC).

[2] 30th and 70th percentile rainfall data collected from weather station NC1820, in Clayton, NC (USDA, 2002).

Pre and Post Construction Groundwater Gage Comparison Plots

Devil's Racetrack Mitigation Site (NCDMS Project No. 95021)

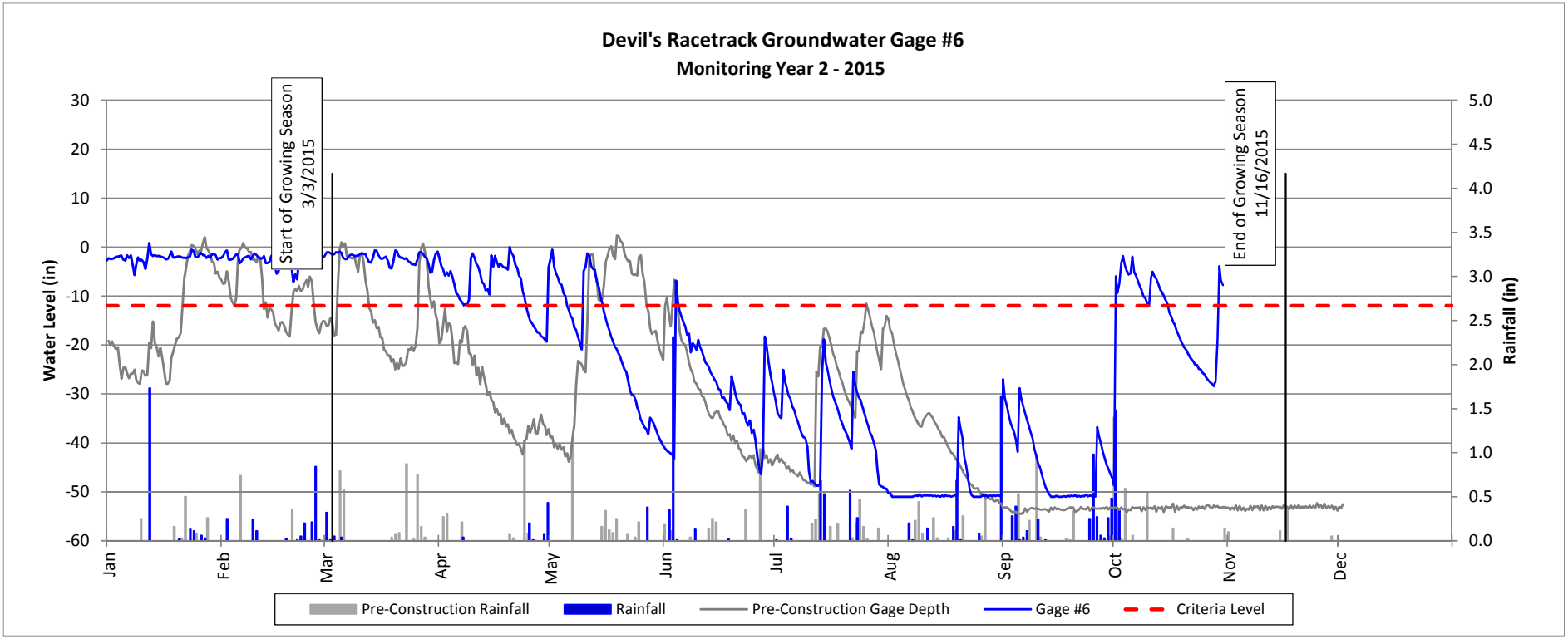
Monitoring Year 2 - 2015

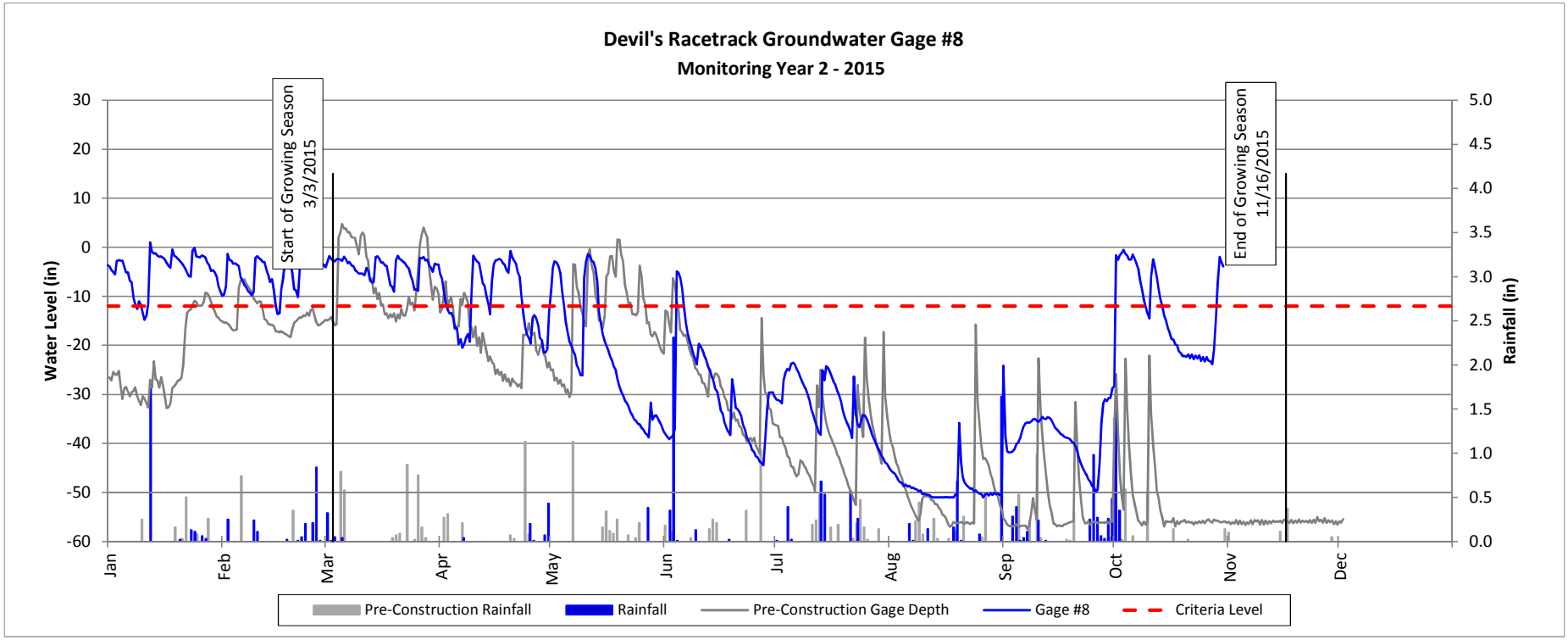


Pre and Post Construction Groundwater Gage Comparison Plots

Devil's Racetrack Mitigation Site (NCDMS Project No. 95021)

Monitoring Year 2 - 2015

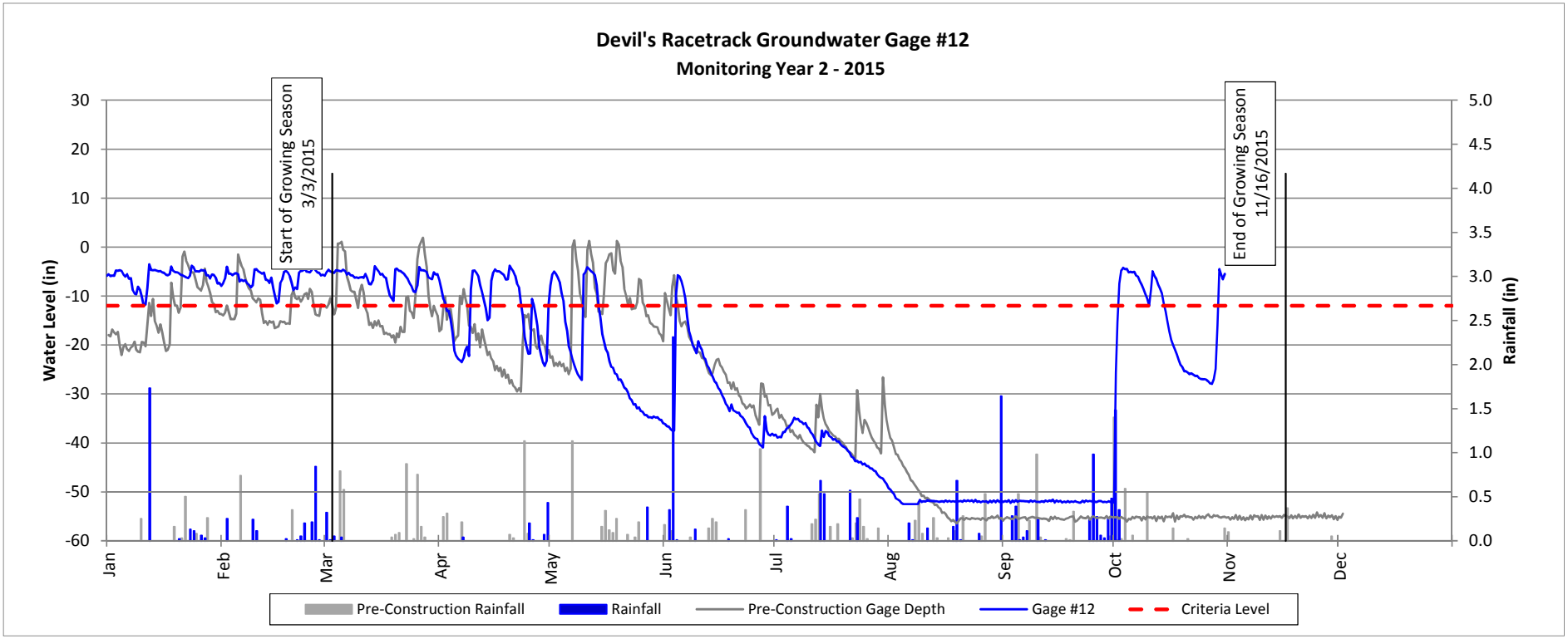



Devil's Racetrack Groundwater Gage #8
Monitoring Year 2 - 2015
Start of Growing Season 3/3/2015
End of Growing Season 11/16/2015
Water Level (in)
Rainfall (in)
30
20
10
0
-10
-20
-30
-40
-50
-60
5.0
4.5
4.0
3.5
3.0
2.5
2.0
1.5
1.0
0.5
0.0
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
Oct
Nov
Dec
Pre-Construction Rainfall
Rainfall
Pre-Construction Gage Depth
Gage #8
Criteria Level

Pre and Post Construction Groundwater Gage Comparison Plots

Devil's Racetrack Mitigation Site (NCDMS Project No. 95021)

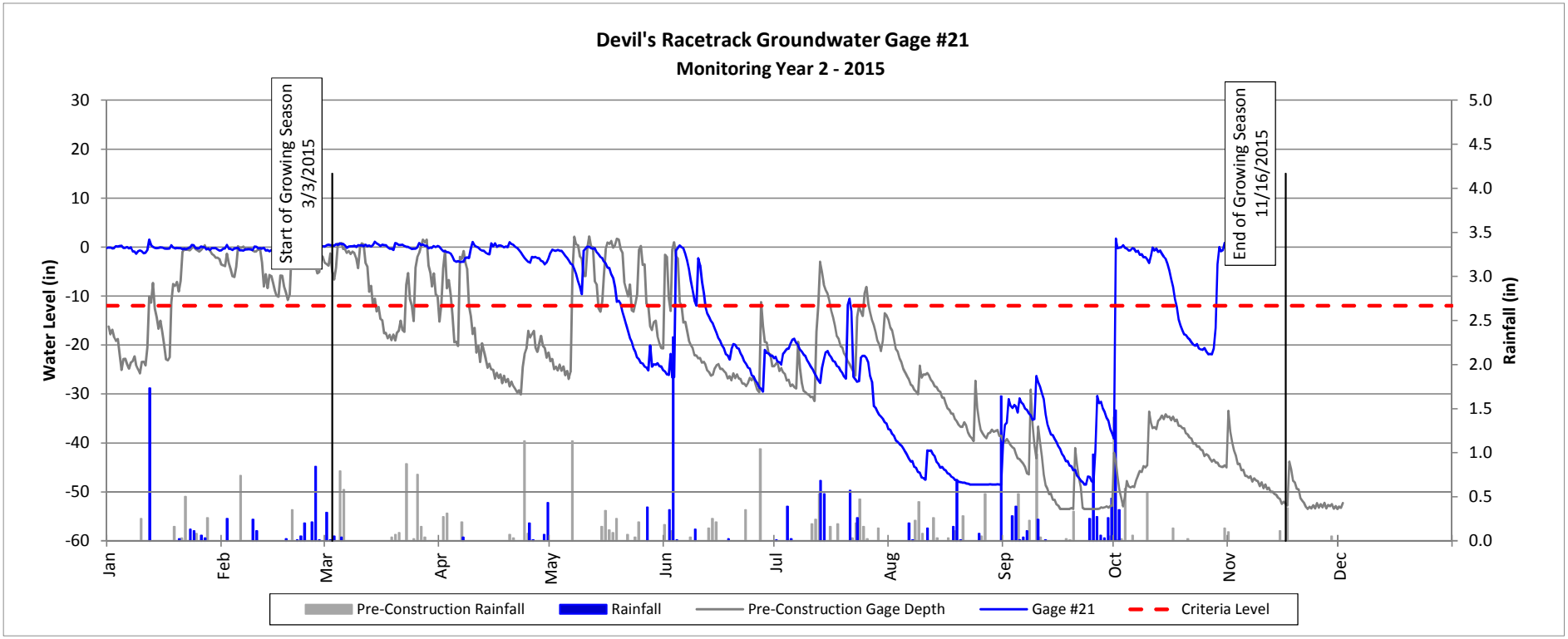
Monitoring Year 2 - 2015



Pre and Post Construction Groundwater Gage Comparison Plots

Devil's Racetrack Mitigation Site (NCDMS Project No. 95021)

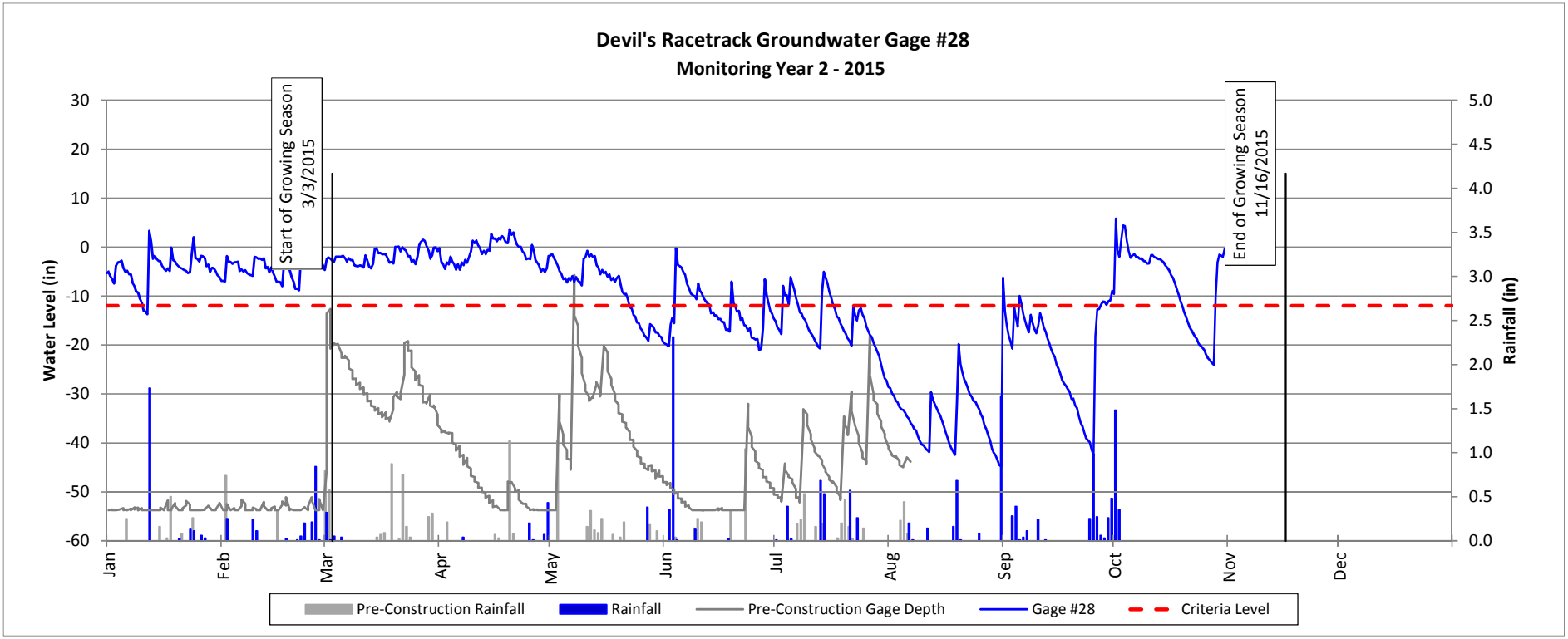
Monitoring Year 2 - 2015



Pre and Post Construction Groundwater Gage Comparison Plots

Devil's Racetrack Mitigation Site (NCDMS Project No. 95021)

Monitoring Year 2 - 2015



Pre and Post Construction Groundwater Gage Comparison Plots

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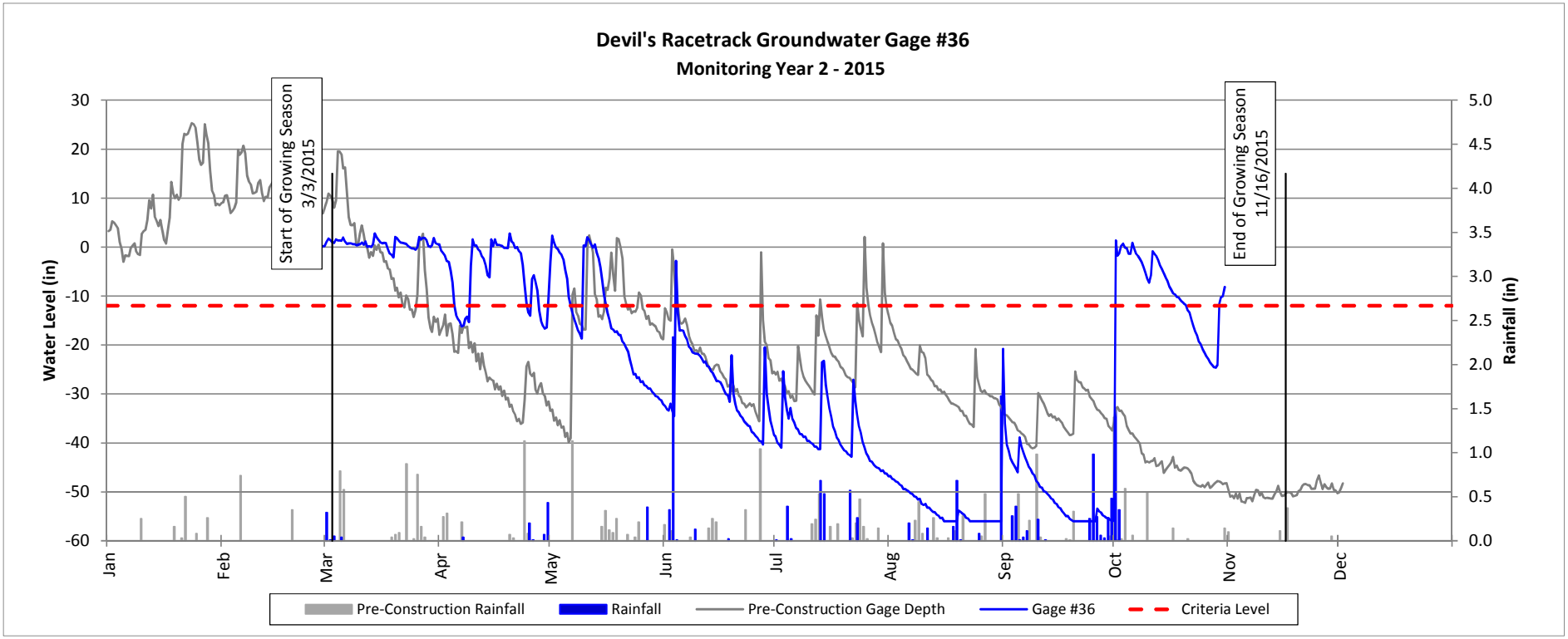

Pre and Post Construction Groundwater Gage Comparison Plots

Devil's Racetrack Mitigation Site (NCDMS Project No. 95021)

Monitoring Year 2 - 2015