ANNUAL REPORT FOR 2006

Dowd Dairy Farm Mitigation Site
Bladen County
Project No. 8.1241802
TIP No. R-2204WM

Ecosystem Enhancement Program

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Raleigh, North Carolina
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EXECUTIVE SUMMARY

The following report summarizes (1) 2006 monitoring activities at the Dowd Dairy Farm Mitigation Site and (2) overall results and conclusions based on six years of monitoring data. Phase I of this site was constructed in 1998 and Phase II was completed in 2000. Monitoring of the site began in 1999 following Phase I site construction. The monitoring activities in 2006 represent the sixth, and final, official year of monitoring following completion of activities during Phase II. The site demonstrated hydrologic and vegetation success after six years and could be deemed successful.

The site was being monitored with 39 groundwater-monitoring gauges, two rain gauges, and 38 vegetation plots.

Rainfall data has been acquired from onsite rain gauges. Also, monthly rainfall data recorded from a rain gauge maintained by the North Carolina State Climate Office in Elizabethtown was used for the historical data.

Hydrological monitoring for year 2006 found 79% of the all gauges met jurisdictional hydrologic success of at least 12.5% during the growing season; conversely, 21% did not meet jurisdictional hydrologic success.

Overall mean hydrological monitoring results from the past six years show that 81.6% of all site monitoring gauges met the jurisdictional hydrologic success of at least 12.5% during the growing season, of which more than half recorded periods of inundation between 25% and 50% of the growing season.

The 2006 vegetation monitoring of the 619 acres of planted areas revealed an average density of 448 trees per acre, which is above the minimum requirement of 320 trees per acre.

Overall mean annual site density for each of the six monitoring activities was greater than the minimum 320 trees per acre, averaging 503 trees per acre. The number of character tree species in each of the five Zones was greater than the minimum requirement of five species, ranging from seven to 13 species. Only three of the 13 species exceeded the established 20% composition limit in their respective planted areas.

As per the letter dated August 25, 2004 to the NCDOT, Ecosystem Enhancement Program (EEP) has accepted the transfer of all offsite mitigation projects. As a result, EEP is responsible for fulfilling the remaining monitoring requirements and any future remediation for this project. This report summarizes the sampling activities for the sixth and final (close-out) year of monitoring.

1.0 INTRODUCTION

1.1 Project Description

The Dowd Dairy Farm Wetland Mitigation Site is located 7 miles north of Elizabethtown and 2 miles east of White Oak in Bladen County (Figure 1). It is bounded by SR 1324 (Dowd Dairy Farm Road) to the north, SR 1332 (Oak Grove Church Road) to the west, and dense forest to the south and east. The site represents a Coastal Plain interstream divide converted for agricultural use. The site receives drainage from elevated sandy terraces and discharges into Ellis Creek and Panther Branch, tributaries of the Cape Fear River.

The site encompasses approximately 658 acres and is designed as a mitigation site for the Cape Fear River Basin (HUC#: 03030005).

1.2 Purpose

In order to demonstrate successful mitigation, hydrologic and vegetative monitoring must be conducted for a minimum of five years or until success criteria are fulfilled. Success criteria are based on federal guidelines for wetland mitigation. These guidelines stipulate criteria for both hydrologic conditions and vegetation survival. The following report details the results of hydrologic and vegetative monitoring during 2006 on the Dowd Dairy Farm Mitigation Site.

Activities in 2006 reflect the sixth year of monitoring following the construction of Phase II at the site. Included in this report are analyses of both hydrologic and vegetative monitoring results, as well as local climate conditions throughout the growing season.

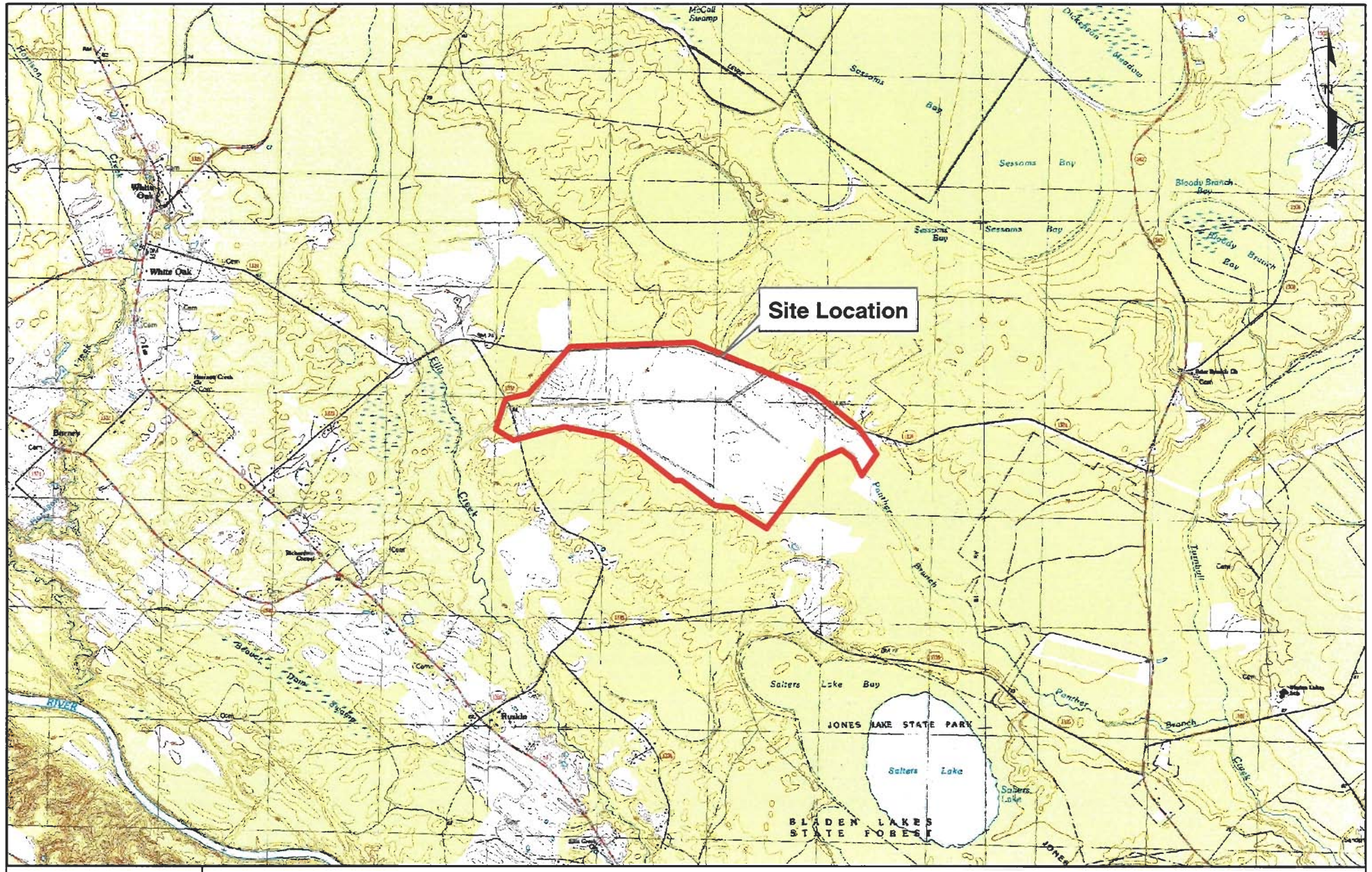


Figure 1. Site Location Map

Dowd Dairy Farm Mitigation Site (Year 6 of 6)
Bladen County, NC
Project No. 8.1241802
TIP No. R-2204WM

SCALE
4,000 2,000 0
Feet

Ecosystem Enhancement Program

The Louis Berger Group, Inc.
NOVEMBER 2006

1.3 Project History

Summer 1998	Construction – Phase I
Spring 1999	Tree Planting – Phase I
February – April 1999	Installation of Monitoring Gauges
March – November 1999	Hydrologic Monitoring (Year 1)
September 1999	Construction Begins – Phase II
November 1999	Vegetation Monitoring (Year 1)
March – November 2000	Hydrologic Monitoring (Year 2)
June 2000	Construction Completed – Phase II
November 2000	Vegetation Monitoring (Year 2)
February 2001	Tree Planting – Phase II
March – November 2001	Hydrologic Monitoring (Restart Year 1)
October 2001	Vegetation Monitoring (Restart Year 1)
August 2002	Vegetation Monitoring (Year 2)
March – November 2002	Hydrologic Monitoring (Year 2)
May 2003	Onsite Agency Meeting
August 2003	Vegetation Monitoring (Year 3)
March – November 2003	Hydrologic Monitoring (Year 3)
July 2004	Vegetation Monitoring (Year 4)
March – November 2004	Hydrologic Monitoring (Year 4)
October 2005	Vegetation Monitoring (Year 5)
March – November 2005	Hydrologic Monitoring (Year 5)
September 2005	Vegetation Monitoring (Year 6)
March – October 2006	Hydrologic Monitoring (Year 6)

Phase I construction consisted of clearing, grubbing, ripping, filling lateral ditches, and adding ditch plugs. Phase II construction consisted of filling in the central canal. Completion of the site was delayed to June 2000 due to the saturated conditions from the hurricane activity in the fall of 1999.

2.0 HYDROLOGY

2.1 Success Criteria

In accordance with federal guidelines for wetland mitigation, the success criteria for hydrology state that the area must be inundated or saturated (within 12" of the surface) by surface or groundwater for at least 12.5% of the growing season. Areas inundated less than 5% of the growing season are always classified as non-wetlands. Areas inundated between 5% - 12.5% of the growing season can be classified as wetlands depending upon other factors, such as the presence of hydrophytic vegetation and hydric soils.

The growing season in Bladen County begins March 16 and ends November 14. The dates correspond to a 50% probability that temperatures will drop to 28^{o} F or lower after March 16 and before November 14.[1] The growing season is 244 days; therefore the optimum duration for wetland hydrology is 31 days. Also, local climate must represent average conditions for the area.

2.2 Hydrologic Description

Historically, wetlands on the tract were created by a combination of radial groundwater and surface water flow from adjacent terraces, as well as precipitation and vertical groundwater fluctuations maintained within the site. After an extensive study of the site's hydrology, it was concluded that blocking and filling the drainage ditches within the site would elevate the groundwater to a level that would saturate the soil stratum within the required twelve inches. It was predicted that this, in addition to surface water and runoff, would be sufficient to restore wetland hydrology.

Thirty-one groundwater-monitoring gauges and 2 rain gauges were installed in 1999 (Figure 2). Five additional gauges were installed in transects along the main channel in 2001 to examine potential drainage effects of the large remaining canal. In June 2003, two additional groundwater gauges were installed. The rain gauges and groundwater monitoring gauges record daily readings of rainfall and depth to groundwater, respectively.

[1] Natural Resources Conversation Service, Soil Survey of Bladen County, North Carolina, p. 123.

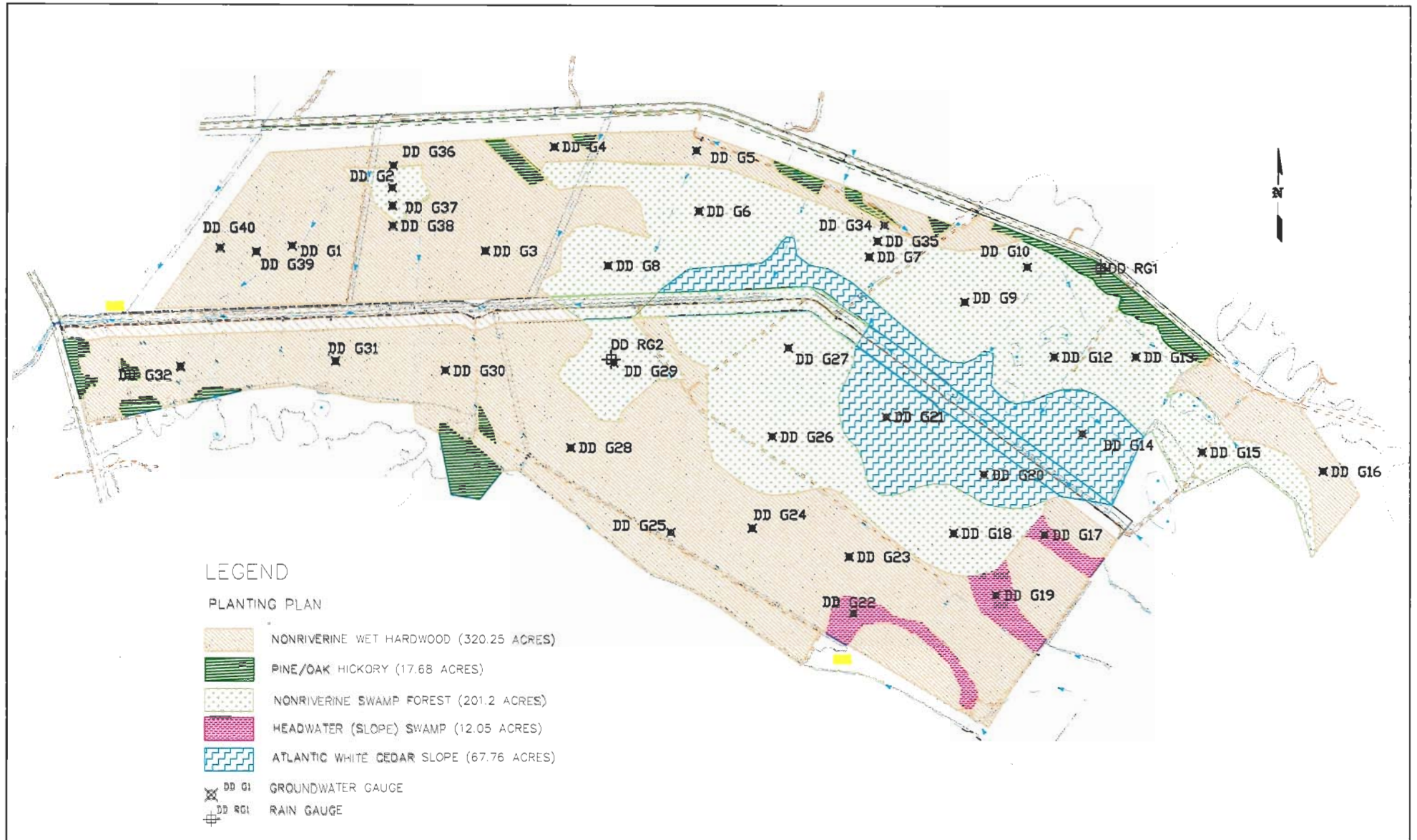


Figure 2. Gauge Location Map

Dowd Dairy Farm Mitigation Site (Year 6 of 6)
Bladen County, NC
Project No. 8.1241802
TIP No. R-2204WM

SCALE (ft.)
0 575 1150

2.3 Results of Hydrologic Monitoring

2.3.1 Site Data

The maximum number of consecutive days that the groundwater was within twelve inches of the surface was determined for each groundwater gauge. This number was converted into a percentage of the 244-day growing season. Table 1 presents the hydrologic monitoring results for 2006.

Figure 3 provides a graphical representation of the hydrologic results. Gauges highlighted in blue indicate wetland hydrology for more than 12.5% of the growing season. Gauges highlighted in red show hydrology between 8% and 12.5% of the growing season, while those in green indicate hydrology between 5% and 8%. Gauges highlighted in black indicate no wetland hydrology (less than 5% of the growing season).

Appendix A contains a plot of the groundwater depth for each monitoring gauge. Daily rainfall is included on each graph as bars (recorded by rain gauges located on the site). The maximum number of consecutive days that the groundwater was within 12 inches of the surface is noted on each graph.

Hydrological monitoring for year 2006 found 79% of the all gauges met jurisdictional hydrologic success of at least 12.5% during the growing season; conversely, 21% did not meet jurisdictional hydrologic success.

Table 1. Hydrological monitoring results for year 2006.

Monitoring Gauge	% of Growing Season at Saturation (< 12" below surface)				Actual	Dates Meeting Success
	< 5%	5 - 8%	8 - 12.5%	> 12.5%		
DD1				X	17.6	4/18 – 5/30
DD2	X				4.9	
DD3		X			7.8	
DD4	X				1.6	
DD5				X	18.9	3/16 – 4/15; 4/18 – 6/2
DD6				X	41.4	3/16 – 6/24; 9/1 – 11/6
DD7			X		11.1	
DD8				X	32.8	3/16 – 6/3
DD9				X	33.6	3/16 – 6/5
DD10				X	35.2	3/16 – 6/9; 9/1 – 8/6
DD12				X	33.6	3/16 – 6/5; 9/1 – 8/3
DD13	X				1.2	
DD14				X	16.4	3/16 – 4/24
DD15				X	42.2	3/16 – 6/26
DD16				X	27.5	3/16 – 4/16; 4/18 – 6/7; 9/1 – 11/6
DD17				X	42.6	3/16 – 6/27
DD18				X	49.6	3/16 – 7/14; 7/16 – 8/29; 8/31 -11/8
DD19				X	28.3	9/1 – 11/8
DD20				X	54.5	7/28 – 11/7
DD21				X	68.4	3/16 – 8/29; 8/31 – 11/7
DD22				X	14.8	4/18 – 5/23
DD23				X	51.2	3/17 – 7/19; 7/21 – 11/8
DD24				X	27.9	3/16 – 4/23; 9/1 – 11/7
DD25				X	43.9	3/16 – 7/30
DD26				X	50.8	3/17 – 7/18; 7/21 – 8/26; 9/1 – 11/8
DD27				X	48.8	3/16 – 7/12; 7/21 – 8/20; 9/1 – 11/7
DD28				X	48.0	3/18 – 7/12; 7/21 – 8/25; 9/1 – 11/7
DD29				X	67.6	3/17 – 8/28; 9/1 – 11/7
DD30				X	18.0	3/17 – 4/16; 4/18 – 5/31; 9/1 – 10/5; 10/8 - 11/7
DD31				X	34.0	3/17 – 6/7; 7/21 – 8/20; 9/1 – 11/6
DD32				X	21.3	7/9 – 8/29; 9/1 – 10/3
DD34		X			7.8	
DD35				X	15.6	4/18 – 5/25
DD36	X				3.7	
DD37				X	16.4	3/16 – 4/24
DD38				X	12.7	3/16 – 4/15
DD39			X		12.3	
DD40				X	14.3	4/26 – 5/30; 9/1 – 10/3

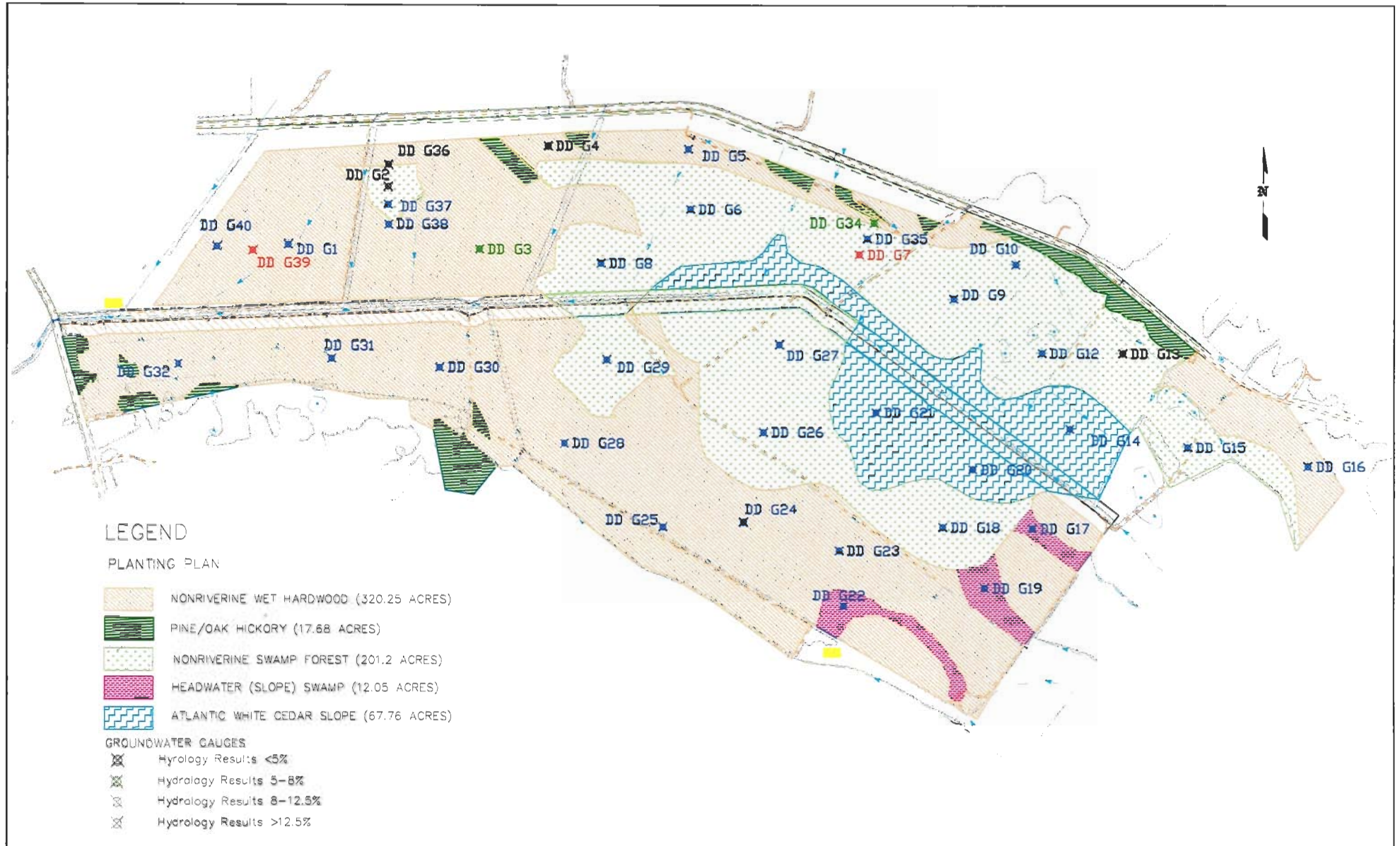


Figure 3. Hydrologic Monitoring Results

Dowd Dairy Farm Mitigation Site (Year 6 of 6)
Bladen County, NC
Project No. 8.1241802
TIP No. R-2204WM

SCALE (ft.)
0 575 1150

2.3.2 Climatic Data

Figure 4 represents an evaluation of the local climate in comparison with historical data in order to determine whether 2006 was "average" in terms of climate conditions. The two lines represent the 30th and 70th percentiles of monthly precipitation for Elizabethtown, NC. The bars are monthly rainfall totals for 2006. The historical data was collected from the State Climate Office of North Carolina.

The site experienced above average rainfall during April, May, and June of 2006. Average rainfall was observed during the months of January, February, July, August, September, and October. Below average rainfall was observed for March. Overall, 2006 experienced an average to above average rainfall year.

2.4 Conclusions

Hydrological monitoring for year 2006 found 79% of the all gauges met jurisdictional hydrologic success of at least 12.5% during the growing season; conversely, 21% did not meet jurisdictional hydrologic success.

Overall mean hydrological monitoring results from the past six years show that a majority of all site monitoring gauges met the jurisdictional hydrologic success of at least 12.5% during the growing season (Figure 5). Monitoring gauges, and indirectly the areas in which the gauges were installed, were characterized using the Army Corps of Engineers (ACOE) zonal criteria (Table 2):

Table 2. Hydrologic zones in nontidal areas.

Zone	Name	Duration[1]	Comments
I[2]	Permanently inundated	100 percent	Inundation >6.6 ft. mean water depth
II	Semipermanently to nearly permanently inundated or saturated	>75 - <100 percent	Inundation defined as ≤6.6 ft. mean water depth
III	Regularly inundated or saturated	>25 – 75 percent	
IV	Seasonally inundated or saturated	>12.5 – 25 percent	
V	Irregularly inundated or saturated	≥5 – 12.5 percent	Many areas having these hydrologic characteristics are not wetlands
VI	Intermittently or never inundated or saturated	< 5 percent	Areas with these hydrologic characteristics are not wetlands

[1] Refers to duration of inundation and/or soil saturation during the growing season.

[2] This defines an aquatic habitat zone.

Of the 38 monitoring gauges on site, 81.6% of all monitoring gauges (31) met the jurisdictional hydrologic success of at least 12.5% during the growing season, of which more than half recorded periods of inundation between 25% and 50% of the growing season. Areas where three of the monitoring gauges (DD3, DD34, and DD39) recorded periods of inundation between 5% – 12.5% of the growing season could be considered wetlands because of the observed presence of hydrophytic vegetation. Based on analysis of past data, the remaining four monitoring gauges

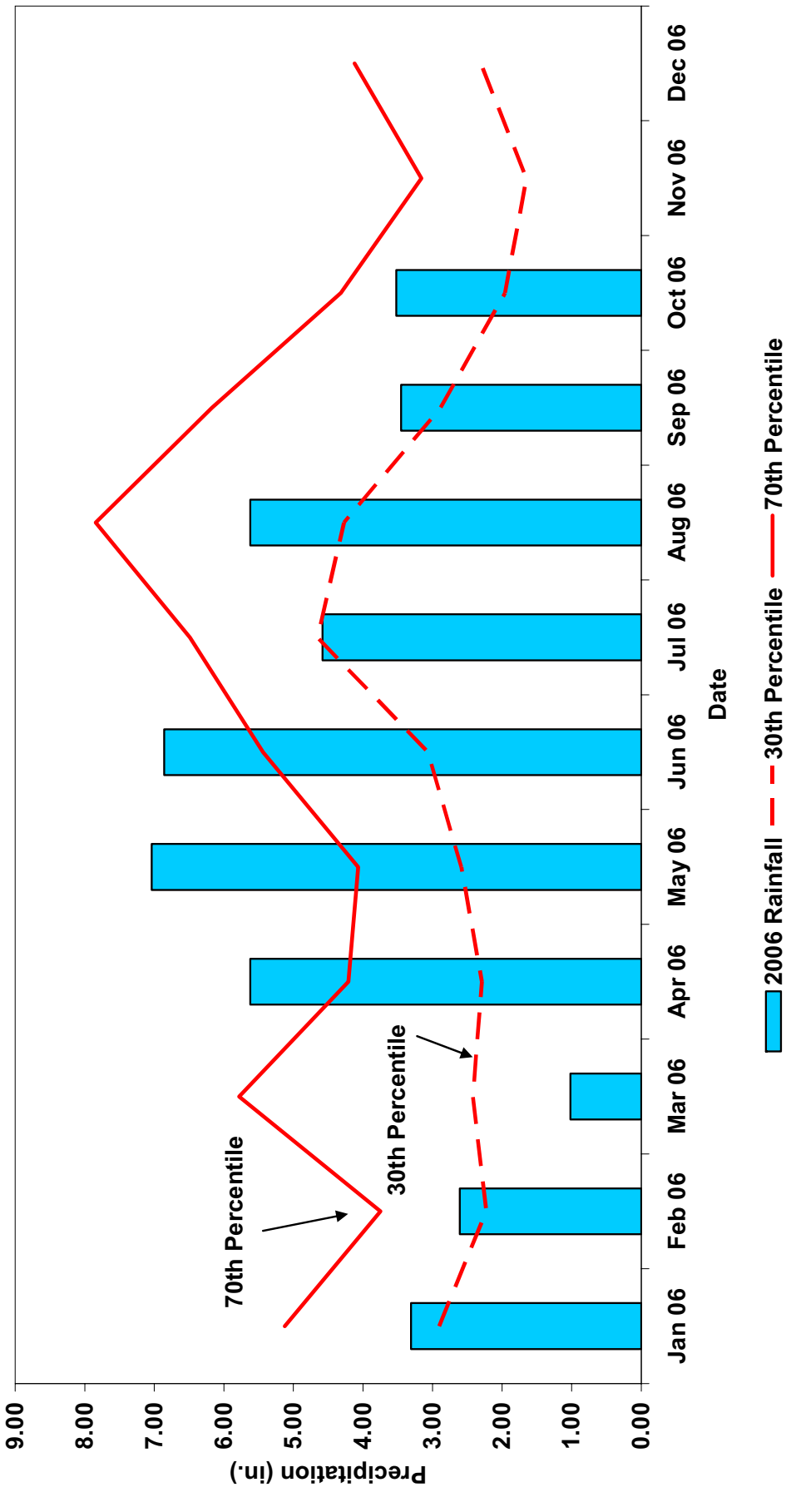


Figure 4. 30-70 percentile graph.

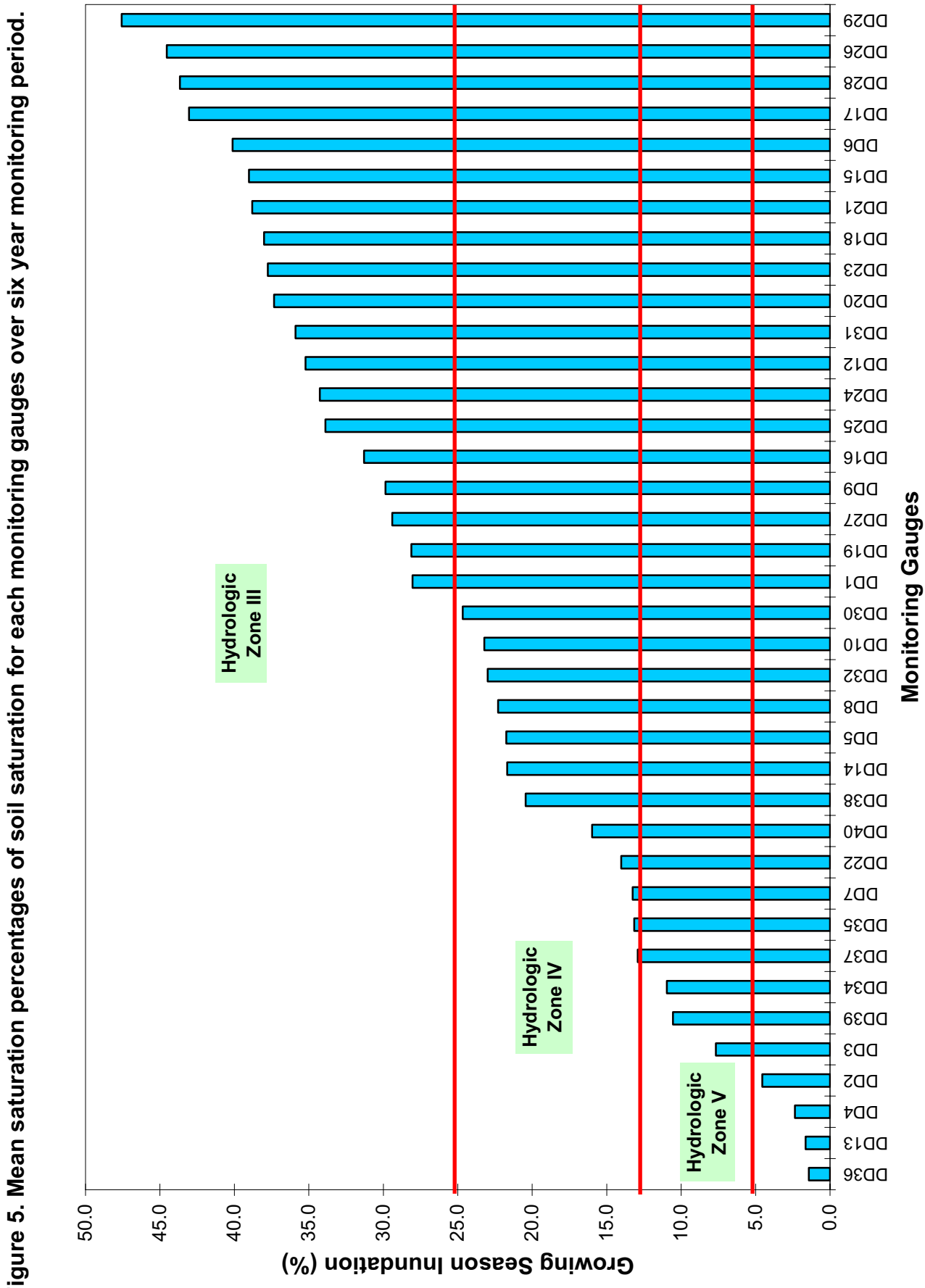


Figure 5. Mean saturation percentages of soil saturation for each monitoring gauges over six year monitoring period.

(DD2, DD4, DD13, and DD36) appear to have been installed in isolated areas of upland topography.

3.0 VEGETATION: DOWD DAIRY MITIGATION SITE (YEAR 6 MONITORING)

3.1 Success Criteria

Success criteria state that there must be a minimum of 320 trees per acre for at least three consecutive years. A minimum of five character tree species must be present, with no more than 20% of any one species present, with the exception of Atlantic White Cedar, which may comprise up to 75% of the swamp forest restoration. Loblolly Pine cannot comprise more than 10% of the 320 trees per acre requirement.

3.2 Description of Species

The following tree species were planted in the Wetland Planting Areas:

Zone 1: Non-Riverine Wet Hardwood Forest (320.25 acres)

Fraxinus pennsylvanica, Green Ash

Nyssa aquatica, Water Tupelo

Quercus falcata var. *pagodaefolia*, Cherrybark Oak

Quercus laurifolia, Laurel Oak

Quercus lyrata, Overcup Oak

Quercus michauxii, Swamp Chestnut Oak

Quercus nigra, Water Oak

Quercus phellos, Willow Oak

Zone 2: Pine/Oak/Hickory (17.68 acres)

Juglans nigra, Black Walnut

Nyssa sylvatica var. *sylvatica*, Blackgum

Pinus palustris, Longleaf Pine

Liriodendron tulipifera, Tulip Poplar

Quercus alba, White Oak

Quercus falcata var. *falcata*, Southern Red Oak

Quercus lyrata, Overcup Oak

Quercus nigra, Water Oak

Quercus phellos, Willow Oak

Zone 3: Non-Riverine Swamp Forest (201.2 acres)

Chamaecyparis thyoides, Atlantic White Cedar

Fraxinus pennsylvanica, Green Ash

Taxodium distichum, Bald cypress

Nyssa aquatica, Water Tupelo

Quercus falcata var. *pagodaefolia*, Cherrybark Oak

Quercus laurifolia, Laurel Oak

Quercus lyrata, Overcup Oak

Quercus nigra, Water Oak

Quercus phellos, Willow Oak

Zone 4: Headwater (Slope) Swamp (12.05 acres)

Liriodendron tulipifera, Tulip Poplar

Quercus falcata var. *pagodaefolia*, Cherrybark Oak

Quercus laurifolia, Laurel Oak

Quercus lyrata, Overcup Oak

Quercus michauxii, Swamp Chestnut Oak

Quercus nigra, Water Oak

Quercus phellos, Willow Oak

Taxodium distichum, Bald cypress

Zone 5: Atlantic White Cedar Slope (67.76 acres)

Chamaecyparis thyoides, Atlantic White Cedar

Fraxinus pennsylvanica, Green Ash

Nyssa aquatica, Water Tupelo

Liriodendron tulipifera, Tulip Poplar

Pinus serotina, Pond Pine

Quercus falcata var. *pagodaefolia*, Cherrybark Oak

Quercus laurifolia, Laurel Oak

Quercus lyrata, Overcup Oak

Quercus michauxii, Swamp Chestnut Oak

Quercus phellos, Willow Oak

Taxodium Distichum, Bald cypress

3.3 Results of Vegetation Monitoring

Thirty-eight plots measuring 0.05-acres in size were established in year 2000 to represent a 0.3% sample of the planting area (Figure 5). Overall plot and zone densities, tree counts for individual plots and zones, and species counts are all presented in Table 2. Overall average tree density for all Zones was 448 trees per acre. Plots with densities below the minimum requirement of 320 trees per acre were observed in all but one of the zones (Zone 4), ranging from 160 trees/acre (Zone 1) to 300 trees/acre (Zone 5). Nearly half of the plots with densities below the minimum requirement were observed in Zone 3.

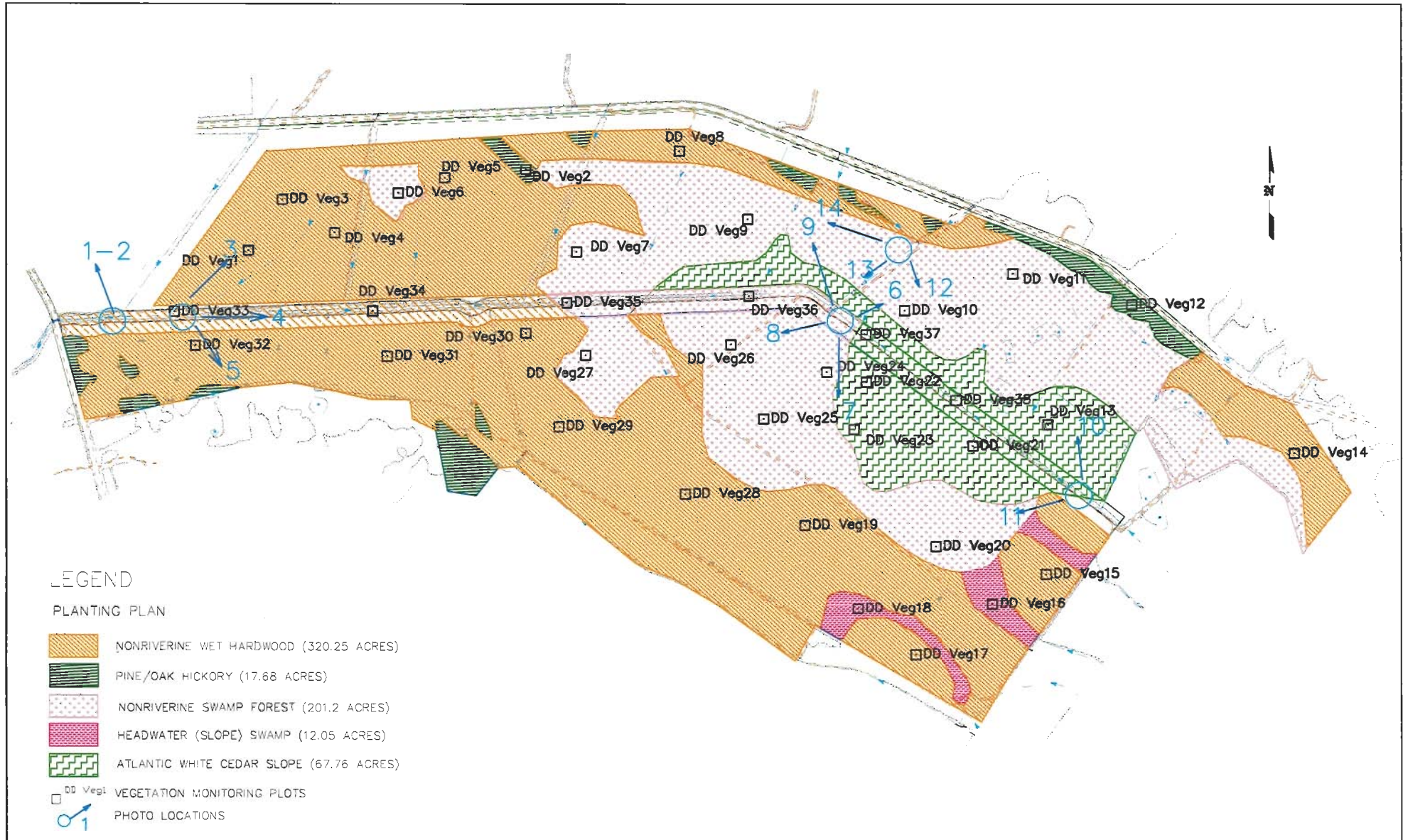


Figure 6. Planting Zones, Vegetation Plots, Photo Locations

Dowd Dairy Farm Mitigation Site (Year 6 of 6)
Bladen County, NC
Project No. 8.1241802
TIP No. R-2204WM

SCALE (ft.)
0 575 1150

Table 2. Vegetation monitoring results.

ZONE	PLOT	SPECIES [1]												TOTALS		DENSITY
		swamp chestnut oak	laurel oak	willow oak	cherrybark oak	water tupelo	water oak	green ash	overcup oak	pond pine	black gum	bald cypress	Atlantic white cedar	Year 6	Initial Planting	(trees/acre)
1	1	0	0	8	1	0	0	6	11	0	0	0	0	26	37	520
	3	4	0	6	0	1	0	0	2	0	0	0	0	13	40	260
	4	3	3	1	0	0	0	1	19	0	0	0	0	27	28	540
	5	0	7	3	2	2	1	12	9	0	0	0	0	36	39	720
	8	4	0	3	0	3	1	7	0	0	0	0	0	18	38	360
	14	5	1	6	5	0	0	0	0	1	0	0	0	18	39	360
	15	1	2	8	0	0	0	0	0	0	0	0	0	11	32	220
	17	13	2	1	4	0	0	0	1	0	0	0	0	21	41	420
	19	3	0	2	0	1	0	0	2	0	0	0	0	8	35	160
	28	2	0	10	0	3	0	7	4	0	0	0	0	26	37	520
	29	4	2	2	0	0	0	6	18	0	0	0	0	32	41	640
	30	0	6	7	0	0	0	19	2	0	0	0	0	34	39	680
	31	15	0	1	0	0	0	6	5	0	0	0	0	27	37	540
	32	3	0	3	0	0	0	13	3	0	0	0	0	22	38	440
	33	0	0	1	1	5	0	22	9	0	0	0	0	38	44	760
	34	4	0	1	0	0	0	7	9	0	0	0	0	21	39	420
															Zone Average	473
2	2	0	0	1	0	0	0	0	21	0	0	0	0	22	25	440
	12	0	0	2	6	0	1	0	0	0	0	0	0	9	26	180
															Zone Average	310
3	6	0	2	2	4	0	2	2	3	0	0	5	7	27	30	540
	7	0	0	0	0	0	0	9	2	0	0	18	0	29	40	580
	9	0	3	1	0	0	0	0	0	0	0	9	4	17	34	340
	10	0	6	2	3	0	0	0	9	0	0	10	1	31	44	620
	11	0	1	14	1	0	0	0	4	0	0	7	1	28	28	560
	20	0	0	3	0	0	0	10	0	0	0	0	0	13	37	260
	24	0	0	7	0	0	0	1	0	0	0	4	0	12	34	240
	25	0	0	3	3	0	0	5	5	0	0	1	4	21	31	420
	26	0	0	2	0	0	0	20	1	0	0	4	3	30	35	600
	27	0	3	2	0	0	0	0	10	0	0	4	0	19	36	380
	35	0	0	0	1	4	0	6	2	0	0	0	0	13	37	260
	36	0	4	4	0	0	0	4	0	1	0	2	0	15	36	300
															Zone Average	425

ZONE	PLOT	SPECIES [1]												TOTALS		DENSITY
		swamp chestnut oak	laurel oak	willow oak	cherrybark oak	water tupelo	water oak	green ash	overcup oak	pond pine	black gum	bald cypress	Atlantic white cedar	Year 6	Initial Planting	(trees/acre)
4	16	4	1	0	0	0	0	0	5	0	0	12	0	22	31	440
	18	7	4	1	0	0	0	0	1	0	0	10	0	23	35	460
															Zone Average	450
5	0	0	1	3	2	0	4	3	0	0	0	0	13	24	260	0
	0	0	4	0	0	0	0	0	4	0	16	0	24	29	480	0
	2	0	2	0	3	0	0	0	0	0	8	0	15	27	300	2
	1	0	9	0	4	0	0	0	5	0	13	0	32	38	640	1
	9	0	9	0	0	0	0	0	1	0	14	0	33	47	660	9
	20	1	14	0	0	0	0	4	2	14	3	0	58	50	1160	20
															Zone Average	583
															Total Average for all Zones	448

[1] white oak, longleaf pine, black walnut, and tulip poplar were not observed during year 2006 monitoring activities and are not included in this table

3.4 Site Notes of Observed Herbaceous Cover and Volunteer Woody Stems

Zone 1: Herbaceous cover ranged between 60 and 100% and consisted of the following observed species: blackberry (*Rubus*), goldenrod (*Solidago*), sedges (*Carex*), broad-leaved cattails (*Typha latifolia*), trumpet creeper (*Campsis radicans*), smartweed (*Polygonum*), fennel grass (*Foeniculum*), rush (*Juncus*), marsh fleabane (*Pluchea*), cane (*Arundinaria gigantea*), aster (*Aster*), and bluestem (*Andropogon virginicus*). Volunteer woody species observed included: black willow (*Salix nigra*), red maple (*Acer rubrum*), loblolly pine (*Pinus taeda*), sweetgum (*Liquidambar styraciflua*), staghorn sumac (*Rhus typhina*), winged sumac (*R. copallina*), and groundsel bush (*Baccharis halimifolia*).

Zone 2: Herbaceous cover averaged 90% and consisted of the following observed species: broomsedge, bluestem, goldenrod, and blackberry. Volunteer woody species observed included tulip poplar (*Liriodendron tulipifera*).

Zone 3: Herbaceous cover ranged between 25 and 100% and consisted of the following observed species: blackberry, goldenrod, sedges, inkberry (*Ilex glabra*), cattails, rush, aster, southern bayberry (*Myrica heterophylla*), cane, marsh fleabane, bluestem, peashrub (*Caragana*), broomsedge bluestem, and woolgrass (*Scirpus cyperinus*). Volunteer woody species observed included: black willow, red maple, baccharis, groundsel bush, sweetgum, staghorn sumac, and water tupelo (*Nyssa aquatica*).

Zone 4: Herbaceous cover averaged 90% and consisted of the following observed species: trumpet creeper, blackberry, goldenrod, and rush. Volunteer woody species observed included red maple, sweetgum and loblolly pine.

Zone 5: Herbaceous cover ranged between 90 and 100% and consisted of the following observed species: blackberry, goldenrod, trumpet creeper, cattail, rush, woolgrass, sedges, marsh fleabane, and smartweed. Volunteer woody species consisted of black willow, staghorn sumac, red maple, and loblolly pine.

3.5 Conclusions

Of the 658 acres on this site, approximately 619 acres involved tree planting. Thirty-eight test plots were established throughout the planting areas, covering all plant communities. Vegetation monitoring of the planted areas for monitoring year 6 revealed an average density of 448 trees per acre, which is above the minimum requirement of 320 trees per acre. It should be noted that since this was a phased project, the majority of the plots contain 6-year old trees. The site was wet at the time of monitoring.

Field observations noted that natural recruitment of pioneer species such as red maple, sweetgum, and loblolly pine has occurred around the periphery of the site

that border existing forest and in the cut-over area. Stem densities of these species varied, but in at least three locations, sweetgum and loblolly pine formed dense, pole-stage stands. These areas are not particularly extensive within the site. Natural succession patterns will, in time, result in a more diverse stand of tree species in these areas. No additional management activities are recommended in these areas.

Overall mean annual site density for each of the six monitoring activities was greater than the minimum 320 trees per acre, averaging 503 trees per acre (Figure 7). Site density appeared to peak in monitoring year 2 (2002) and then decrease every year as expected. Total percent change in tree density from monitoring year 2 to monitoring year 6 was 11.9 percent, with annual decreases ranging from 0.6 to 5.0 percent.

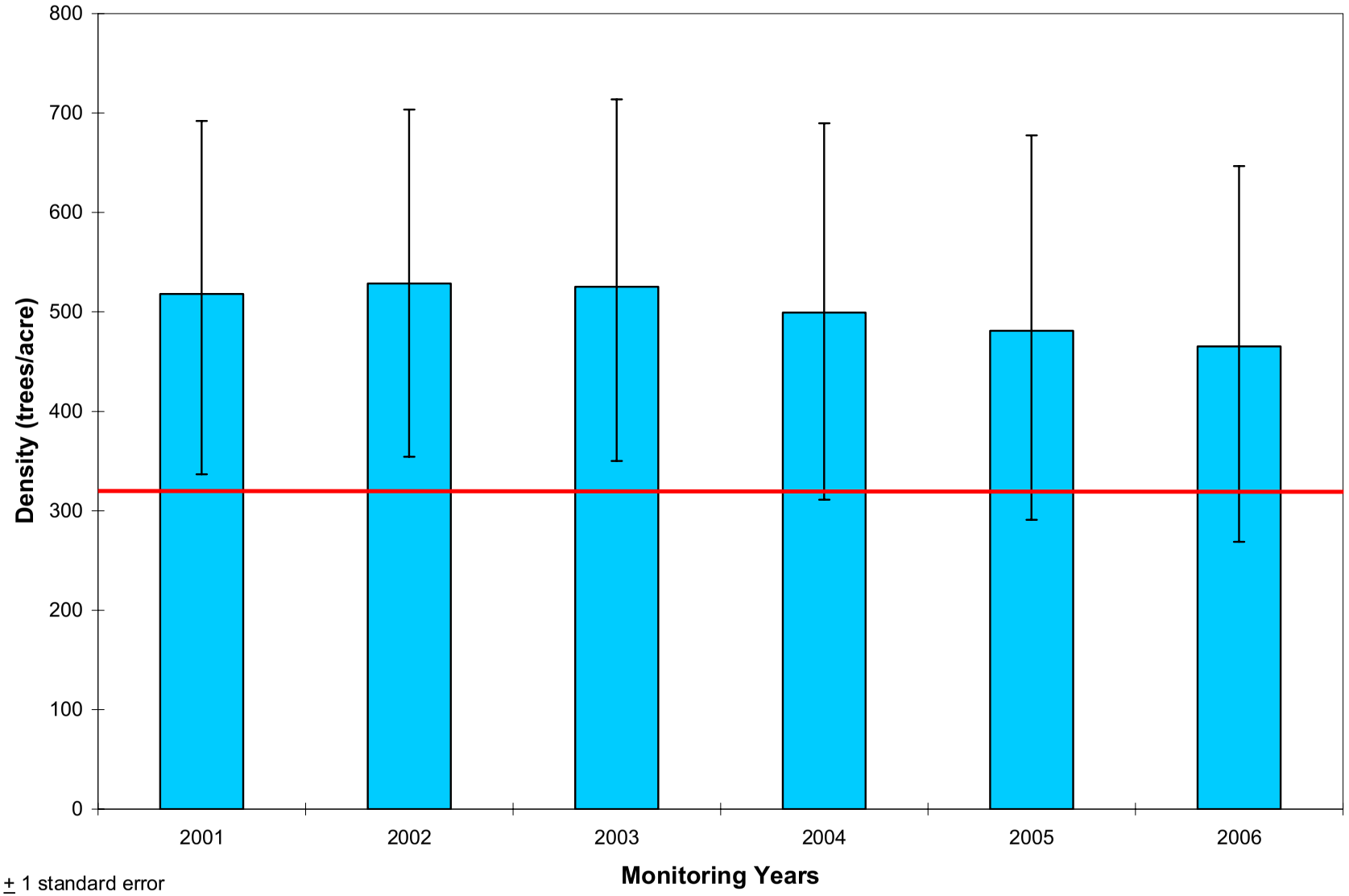
For all six monitoring activities (Appendix D), the number of character tree species in each of the five Zones was greater than the minimum requirement of five species, ranging from seven to 13 species. Changes in the number of character tree species did not vary significantly since planting activities were completed. Pond pine (Zones 3 and 5) and black gum (Zone 5) were the only two species not originally identified as 'planted'.

Three species significantly exceeded the established 20% composition limit in their respective planted areas: swamp chestnut oak, overcup oak, southern red oak, and bald cypress (Figure 8). Species misidentification, site adaptability, and overplanting could explain the discrepancies in site composition.

Species identification relies heavily on leaf morphology. The presence or absence of leaves could affect species identification dependent on when annual monitoring activities were completed. In addition, leaves of tree species within certain families may appear similar to leaves of other family members, such as oak. Southern red oak and overcup oak percent composition values appeared to increase as other oak species values decreased, even when the total number of surviving trees remained relatively constant. This could suggest that certain oaks were misidentified as southern red or overcup, artificially elevating their respective percent composition values.

Percent composition of bald cypress in zones 3, 4, and 5 appeared to increase after monitoring year 3 (2003), during which the site experienced the longest recorded period of inundation. Past recorded data indicates that initial percent composition values for bald cypress were high, which could imply overplanting. Coupled with the ability to tolerate extended periods of inundation, expected decreases in bald cypress populations were not as evident when compared to other planted species.

Figure 7. Mean site density values over six year monitoring period.



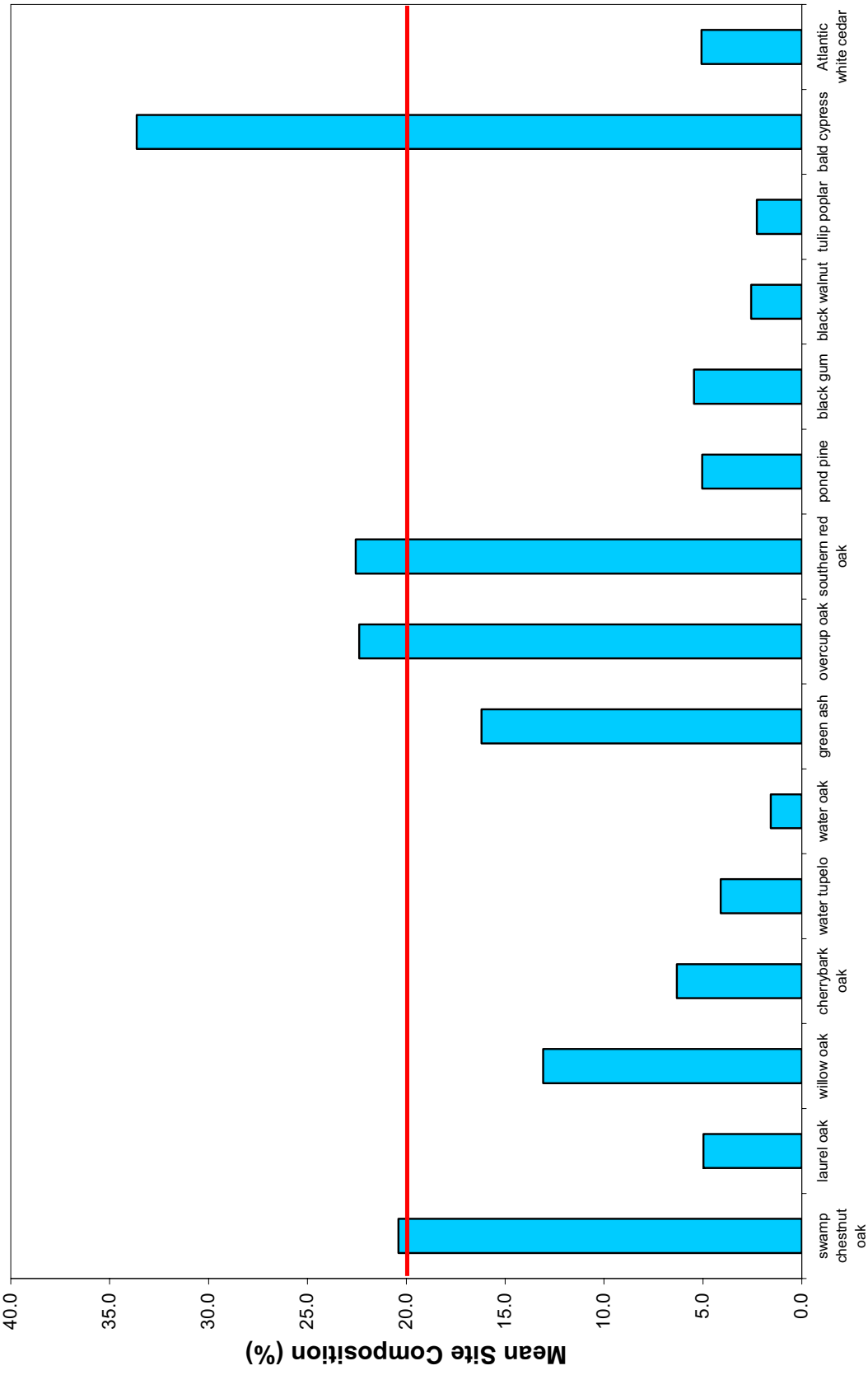


Figure 8. Mean site species composition over six year monitoring period.

4.0 OVERALL CONCLUSIONS/ RECOMMENDATIONS

Hydrological monitoring for year 2006 found 68% of the all gauges met jurisdictional hydrologic success of at least 12.5% during the growing season; conversely, 31% did not meet jurisdictional hydrologic success. Areas where three of the monitoring gauges (DD3, DD34, and DD39) recorded periods of inundation between 5% and 12.5% of the growing season could be considered wetlands because of the observed presence of hydrophytic vegetation. Replacing three of the latter monitoring gauges (DD7, 20, and 25) during late June monitoring activities resulted in incomplete data and preventing an overall accurate description of the hydrological conditions of portions the site.

Overall mean hydrological monitoring results from the past six years show that 81.6% of all site monitoring gauges met the jurisdictional hydrologic success of at least 12.5% during the growing season, of which more than half recorded periods of inundation between 25% and 50% of the growing season. An additional three gauges indicated soil saturation between 5% and 12.5% of the growing season. Consistent with field observations of hydrophytic vegetation, these areas could also be considered wetlands. Only four gauges consistently had soil saturation for less than 5% of the growing season.

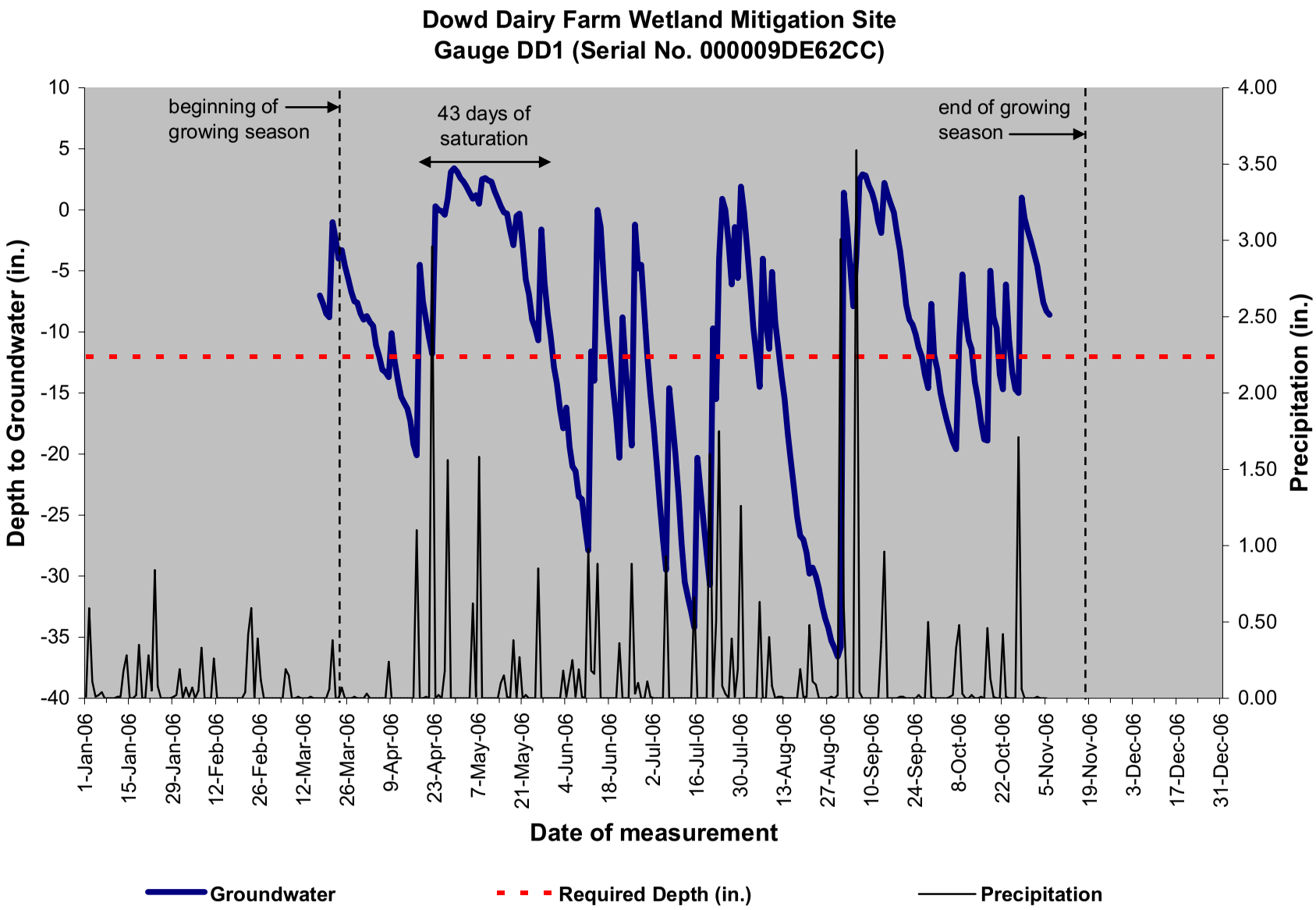
The 2006 vegetation monitoring of the 619 acres of planted areas revealed an average density of 448 trees per acre, which is above the minimum requirement of 320 trees per acre. It should be noted that since this was a phased project, the majority of the plots contain 6-year old trees.

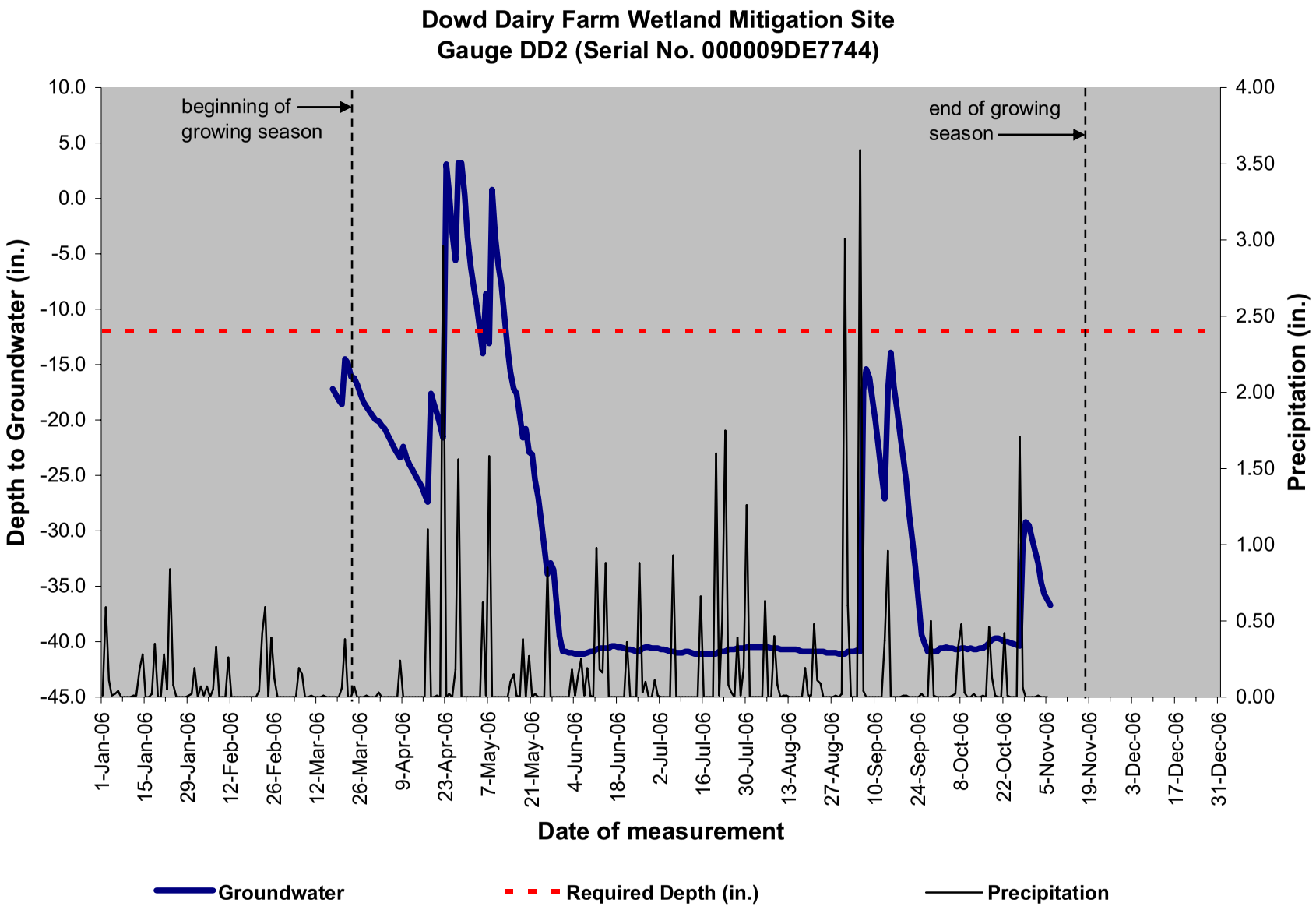
Field observations noted that natural recruitment of pioneer species such as red maple, sweetgum, and loblolly pine has occurred around the periphery of the site that border existing forest and in the cut-over area. Stem densities of these species varied, but in at least three locations, sweetgum and loblolly pine formed dense, pole-stage stands. However, as the areas where these species were noted are not extensive in size, it is probable that natural succession patterns will, in time, resulting in a more diverse stand of the species in these areas. No additional management activities are recommended in these areas.

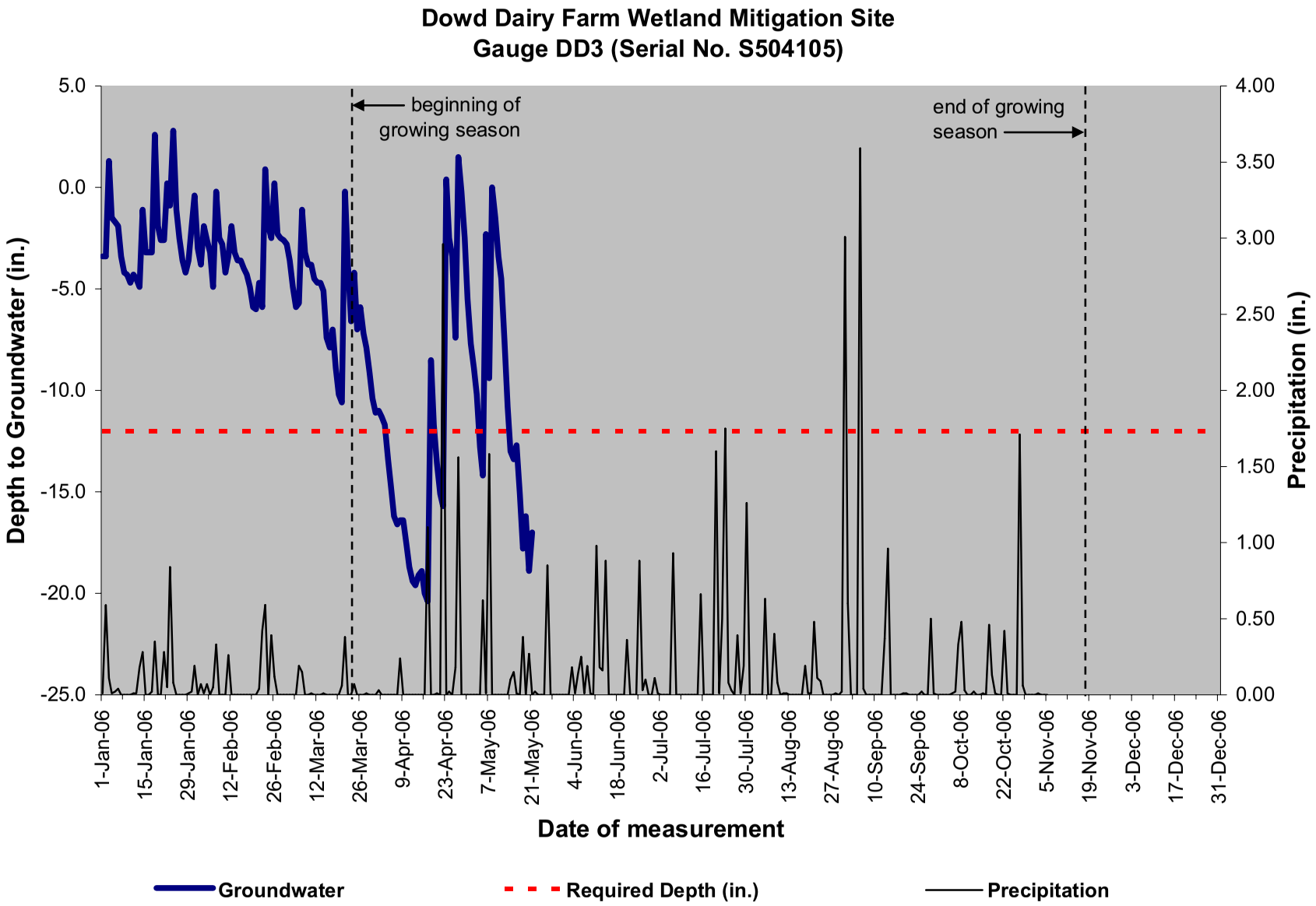
Overall mean annual site density for each of the six year monitoring period was greater than the minimum 320 trees per acre, averaging 503 trees per acre. The number of character tree species in each of the five Zones was greater than the minimum requirement of five species, ranging from seven to 13 species. Only three of the 13 species exceeded the established 20% composition limit in their respective planted areas.

APPENDIX A

GAUGE DATA GRAPHS


Dowd Dairy Farm Wetland Mitigation Site
Gauge DD1 (Serial No. 000009DE62CC)
beginning of growing season
43 days of saturation
end of growing season
Depth to Groundwater (in.)
Precipitation (in.)
Date of measurement
10
5
0
-5
-10
-15
-20
-25
-30
-35
-40
4.00
3.50
3.00
2.50
2.00
1.50
1.00
0.50
0.00
1-Jan-06
15-Jan-06
29-Jan-06
12-Feb-06
26-Feb-06
12-Mar-06
26-Mar-06
9-Apr-06
23-Apr-06
7-May-06
21-May-06
4-Jun-06
18-Jun-06
2-Jul-06
16-Jul-06
30-Jul-06
13-Aug-06
27-Aug-06
10-Sep-06
24-Sep-06
8-Oct-06
22-Oct-06
5-Nov-06
19-Nov-06
3-Dec-06
17-Dec-06
31-Dec-06
Groundwater
Required Depth (in.)
Precipitation


Dowd Dairy Farm Wetland Mitigation Site
Gauge DD2 (Serial No. 000009DE7744)
beginning of growing season
end of growing season
Depth to Groundwater (in.)
Precipitation (in.)
10.0
5.0
0.0
-5.0
-10.0
-15.0
-20.0
-25.0
-30.0
-35.0
-40.0
-45.0
4.00
3.50
3.00
2.50
2.00
1.50
1.00
0.50
0.00
1-Jan-06
15-Jan-06
29-Jan-06
12-Feb-06
26-Feb-06
12-Mar-06
26-Mar-06
9-Apr-06
23-Apr-06
7-May-06
21-May-06
4-Jun-06
18-Jun-06
2-Jul-06
16-Jul-06
30-Jul-06
13-Aug-06
27-Aug-06
10-Sep-06
24-Sep-06
8-Oct-06
22-Oct-06
5-Nov-06
19-Nov-06
3-Dec-06
17-Dec-06
31-Dec-06
Date of measurement
Groundwater
Required Depth (in.)
Precipitation


Dowd Dairy Farm Wetland Mitigation Site
Gauge DD3 (Serial No. S504105)
beginning of growing season
end of growing season
Depth to Groundwater (in.)
Precipitation (in.)
Date of measurement
5.0
0.0
-5.0
-10.0
-15.0
-20.0
-25.0
4.00
3.50
3.00
2.50
2.00
1.50
1.00
0.50
0.00
1-Jan-06
15-Jan-06
29-Jan-06
12-Feb-06
26-Feb-06
12-Mar-06
26-Mar-06
9-Apr-06
23-Apr-06
7-May-06
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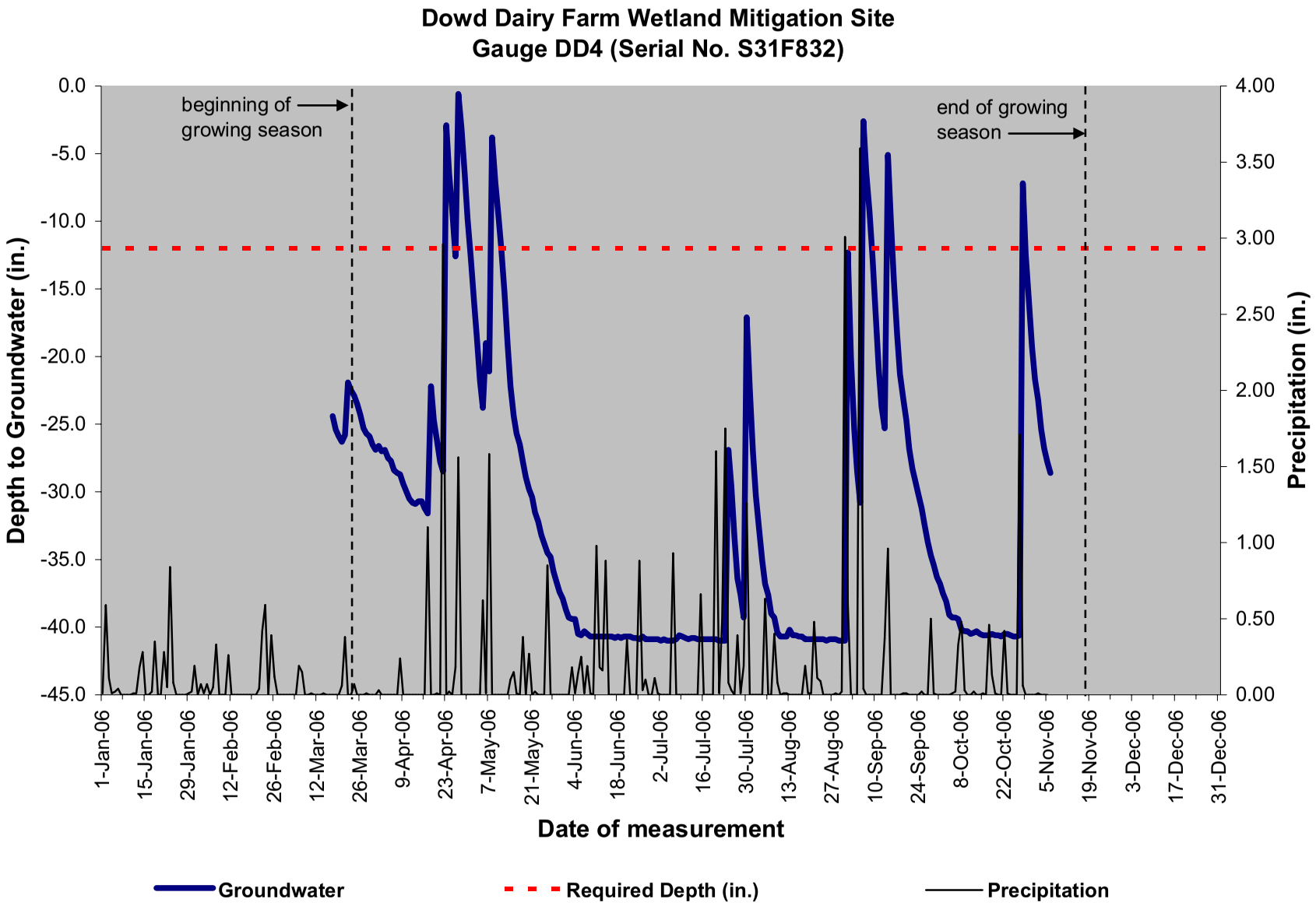
4-Jun-06
18-Jun-06
2-Jul-06
16-Jul-06
30-Jul-06
13-Aug-06
27-Aug-06
10-Sep-06
24-Sep-06
8-Oct-06
22-Oct-06
5-Nov-06
19-Nov-06
3-Dec-06
17-Dec-06
31-Dec-06
Groundwater
Required Depth (in.)
Precipitation


Dowd Dairy Farm Wetland Mitigation Site
Gauge DD4 (Serial No. S31F832)
beginning of growing season
end of growing season
Depth to Groundwater (in.)
Precipitation (in.)
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-5.0
-10.0
-15.0
-20.0
-25.0
-30.0
-35.0
-40.0
-45.0
4.00
3.50
3.00
2.50
2.00
1.50
1.00
0.50
0.00
1-Jan-06
15-Jan-06
29-Jan-06
12-Feb-06
26-Feb-06
12-Mar-06
26-Mar-06
9-Apr-06
23-Apr-06
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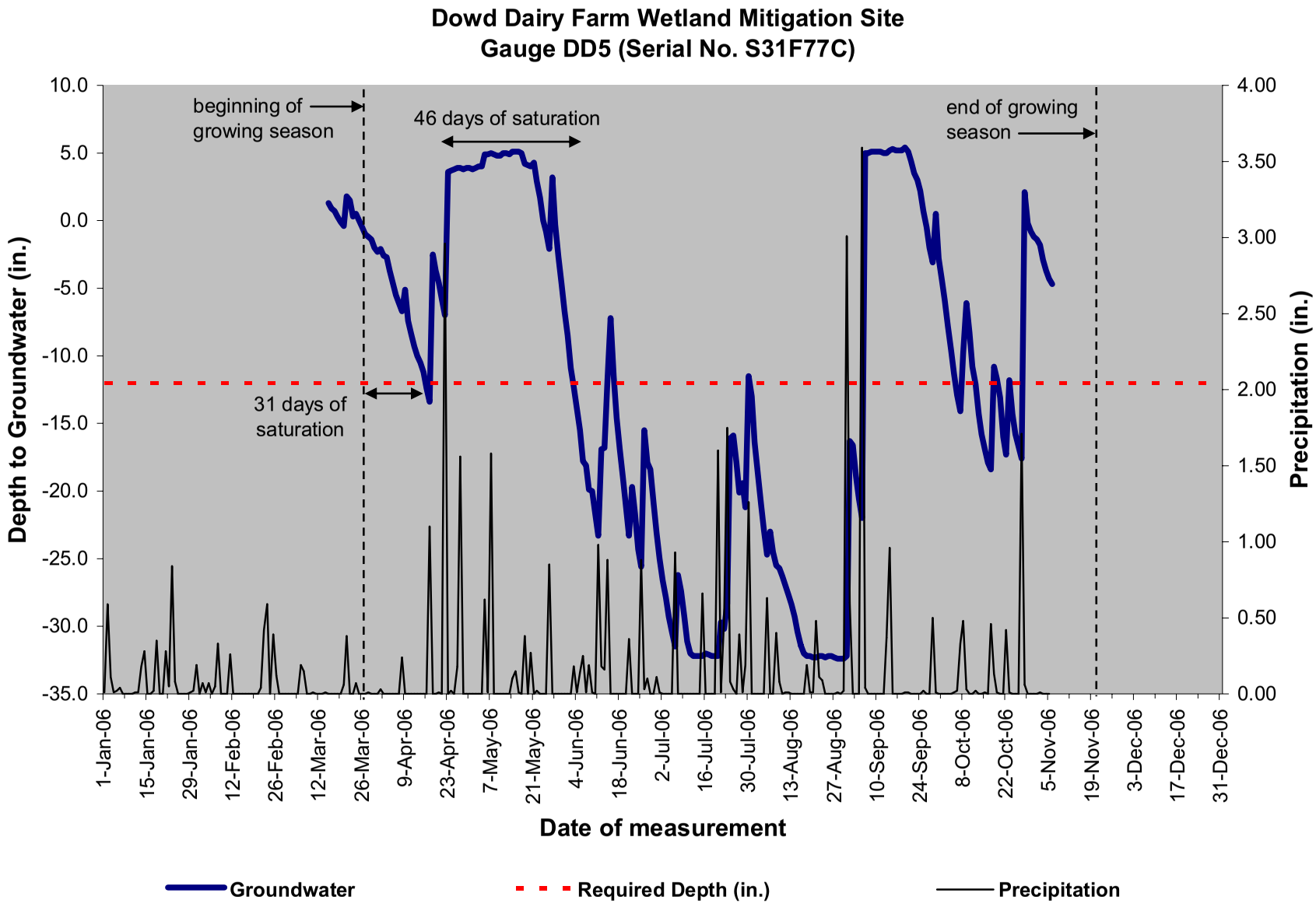
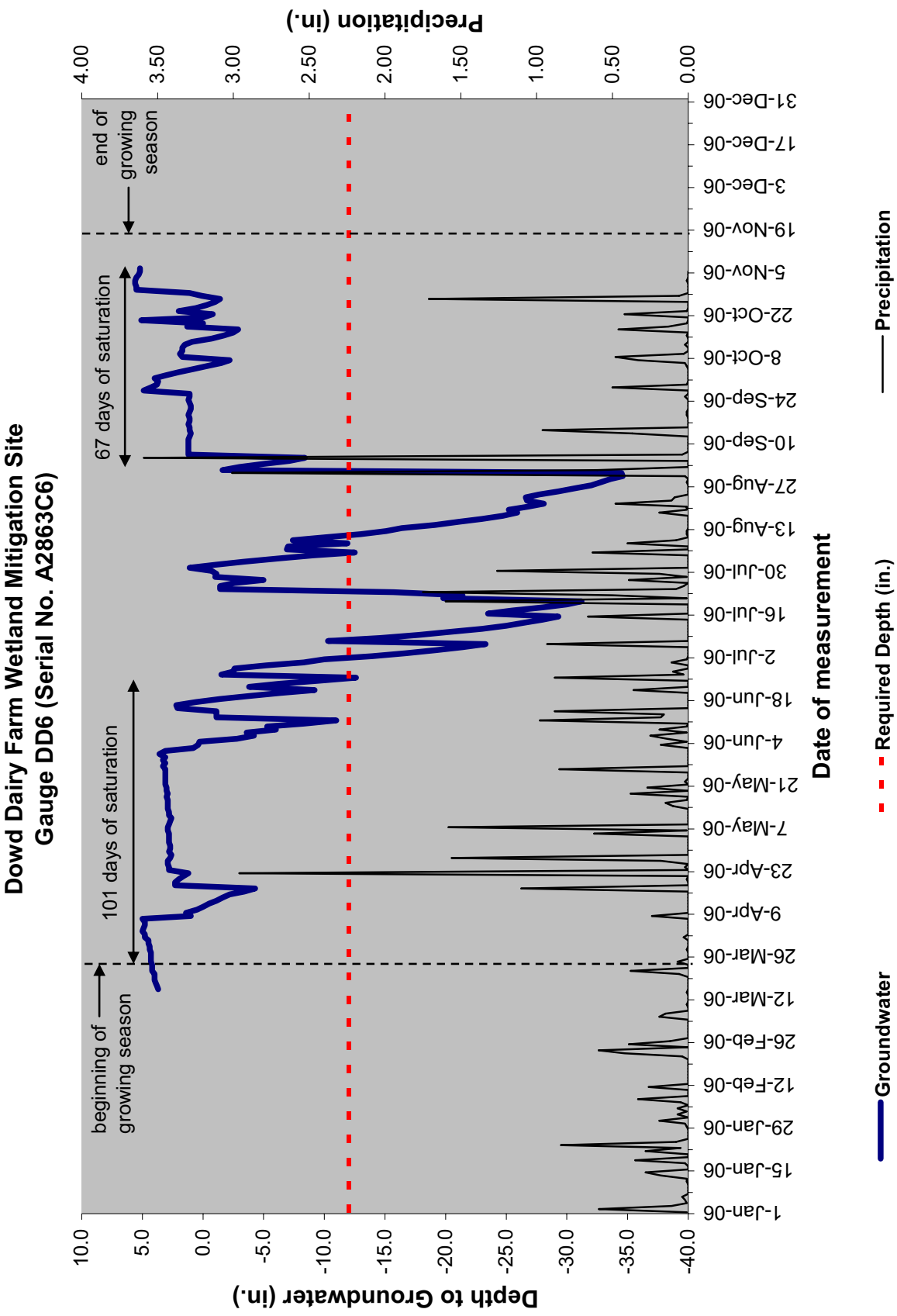
10-Sep-06
24-Sep-06
8-Oct-06
22-Oct-06
5-Nov-06
19-Nov-06
3-Dec-06
17-Dec-06
31-Dec-06
Date of measurement
Groundwater
Required Depth (in.)
Precipitation


Dowd Dairy Farm Wetland Mitigation Site
Gauge DD5 (Serial No. S31F77C)
beginning of growing season
46 days of saturation
end of growing season
31 days of saturation
Depth to Groundwater (in.)
Precipitation (in.)
Date of measurement
Groundwater
Required Depth (in.)
Precipitation


Dowd Dairy Farm Wetland Mitigation Site
Gauge DD6 (Serial No. A2863C6)
Depth to Groundwater (in.)
Precipitation (in.)
Date of measurement
Groundwater
Required Depth (in.)
Precipitation
beginning of growing season
101 days of saturation
67 days of saturation
end of growing season
10.0
5.0
0.0
-5.0
-10.0
-15.0
-20.0
-25.0
-30.0
-35.0
-40.0
4.00
3.50
3.00
2.50
2.00
1.50
1.00
0.50
0.00
1-Jan-06
15-Jan-06
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12-Feb-06
26-Feb-06
12-Mar-06
26-Mar-06
9-Apr-06
23-Apr-06
7-May-06
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27-Aug-06
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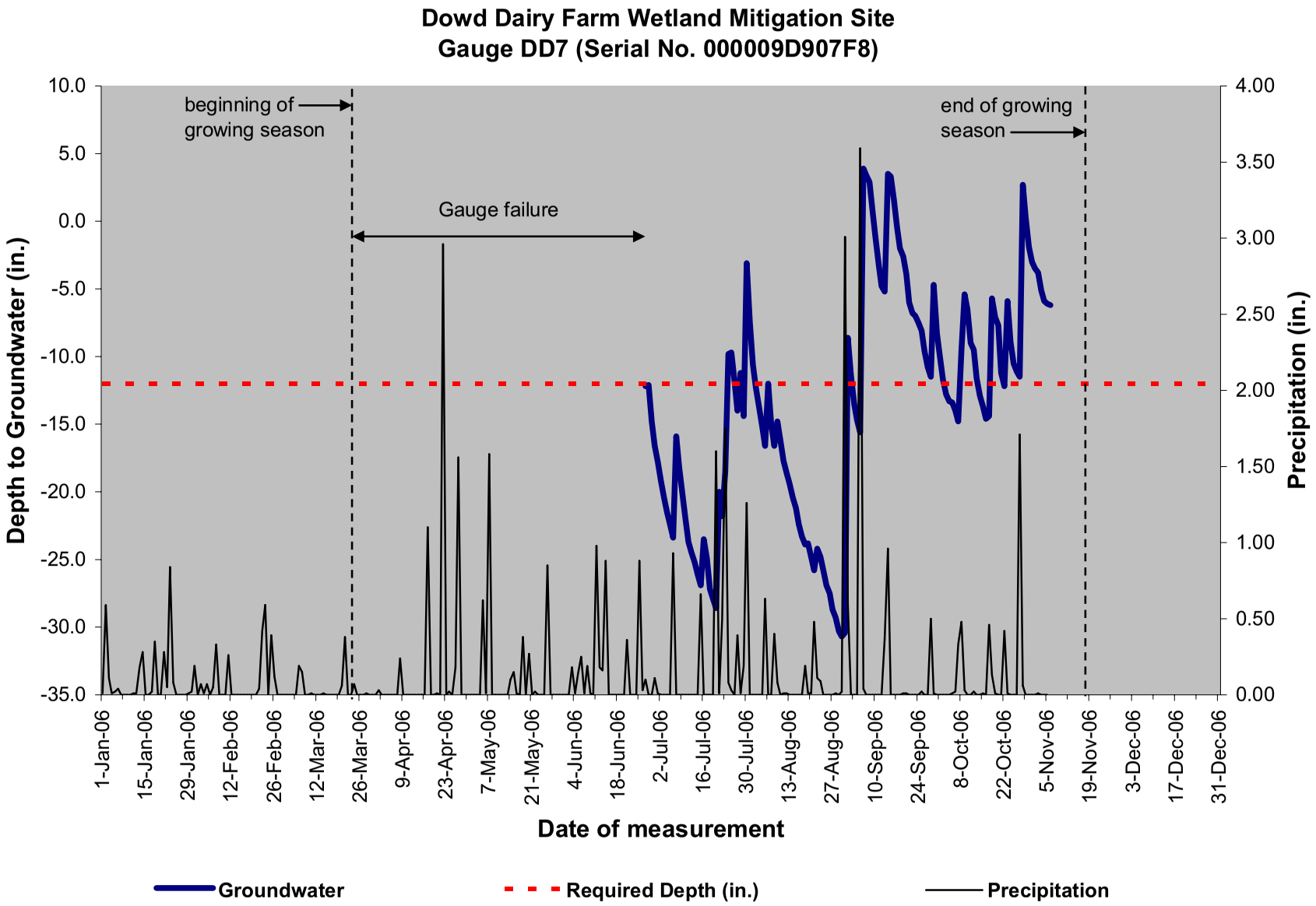
3-Dec-06
17-Dec-06
31-Dec-06


Dowd Dairy Farm Wetland Mitigation Site
Gauge DD7 (Serial No. 000009D907F8)
beginning of growing season
end of growing season
Gauge failure
Depth to Groundwater (in.)
Precipitation (in.)
10.0
5.0
0.0
-5.0
-10.0
-15.0
-20.0
-25.0
-30.0
-35.0
4.00
3.50
3.00
2.50
2.00
1.50
1.00
0.50
0.00
1-Jan-06
15-Jan-06
29-Jan-06
12-Feb-06
26-Feb-06
12-Mar-06
26-Mar-06
9-Apr-06
23-Apr-06
7-May-06
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18-Jun-06
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16-Jul-06
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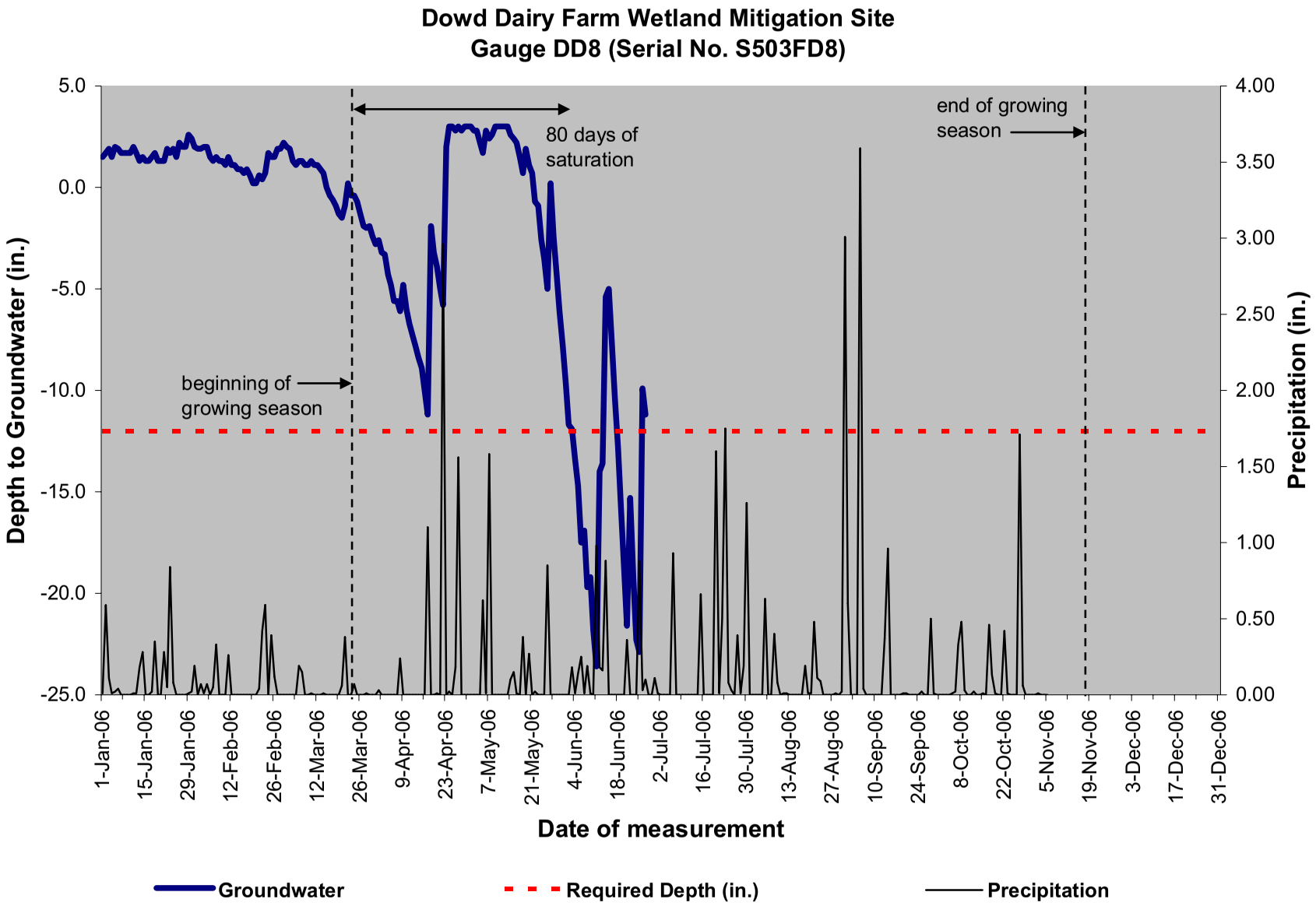
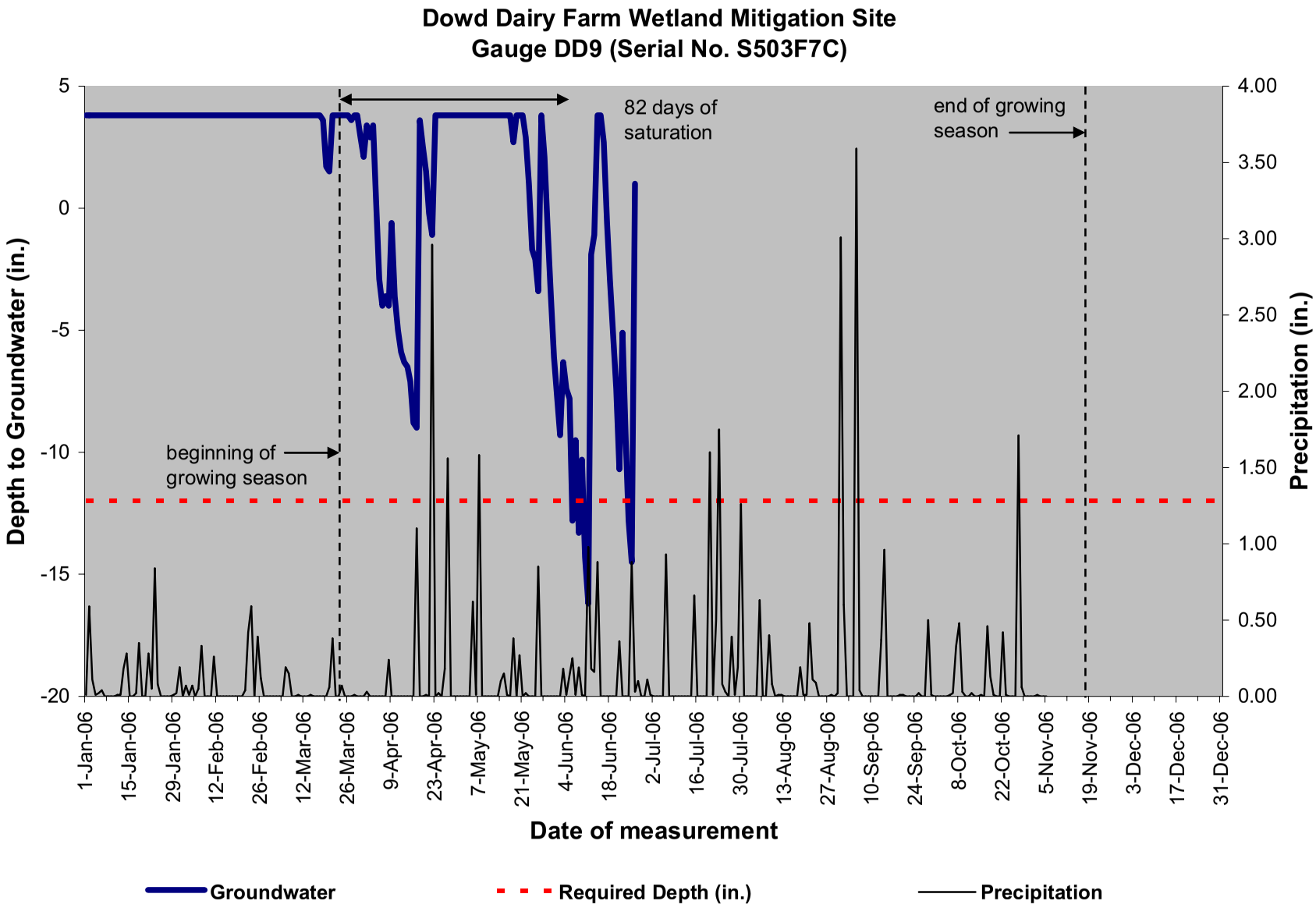
13-Aug-06
27-Aug-06
10-Sep-06
24-Sep-06
8-Oct-06
22-Oct-06
5-Nov-06
19-Nov-06
3-Dec-06
17-Dec-06
31-Dec-06
Date of measurement
Groundwater
Required Depth (in.)
Precipitation


Dowd Dairy Farm Wetland Mitigation Site
Gauge DD8 (Serial No. S503FD8)
Depth to Groundwater (in.)
Precipitation (in.)
Date of measurement
80 days of saturation
beginning of growing season
end of growing season
Groundwater
Required Depth (in.)
Precipitation


Dowd Dairy Farm Wetland Mitigation Site
Gauge DD9 (Serial No. S503F7C)
82 days of saturation
end of growing season
beginning of growing season
Depth to Groundwater (in.)
Precipitation (in.)
Date of measurement
5
0
-5
-10
-15
-20
4.00
3.50
3.00
2.50
2.00
1.50
1.00
0.50
0.00
1-Jan-06
15-Jan-06
29-Jan-06
12-Feb-06
26-Feb-06
12-Mar-06
26-Mar-06
9-Apr-06
23-Apr-06
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4-Jun-06
18-Jun-06
2-Jul-06
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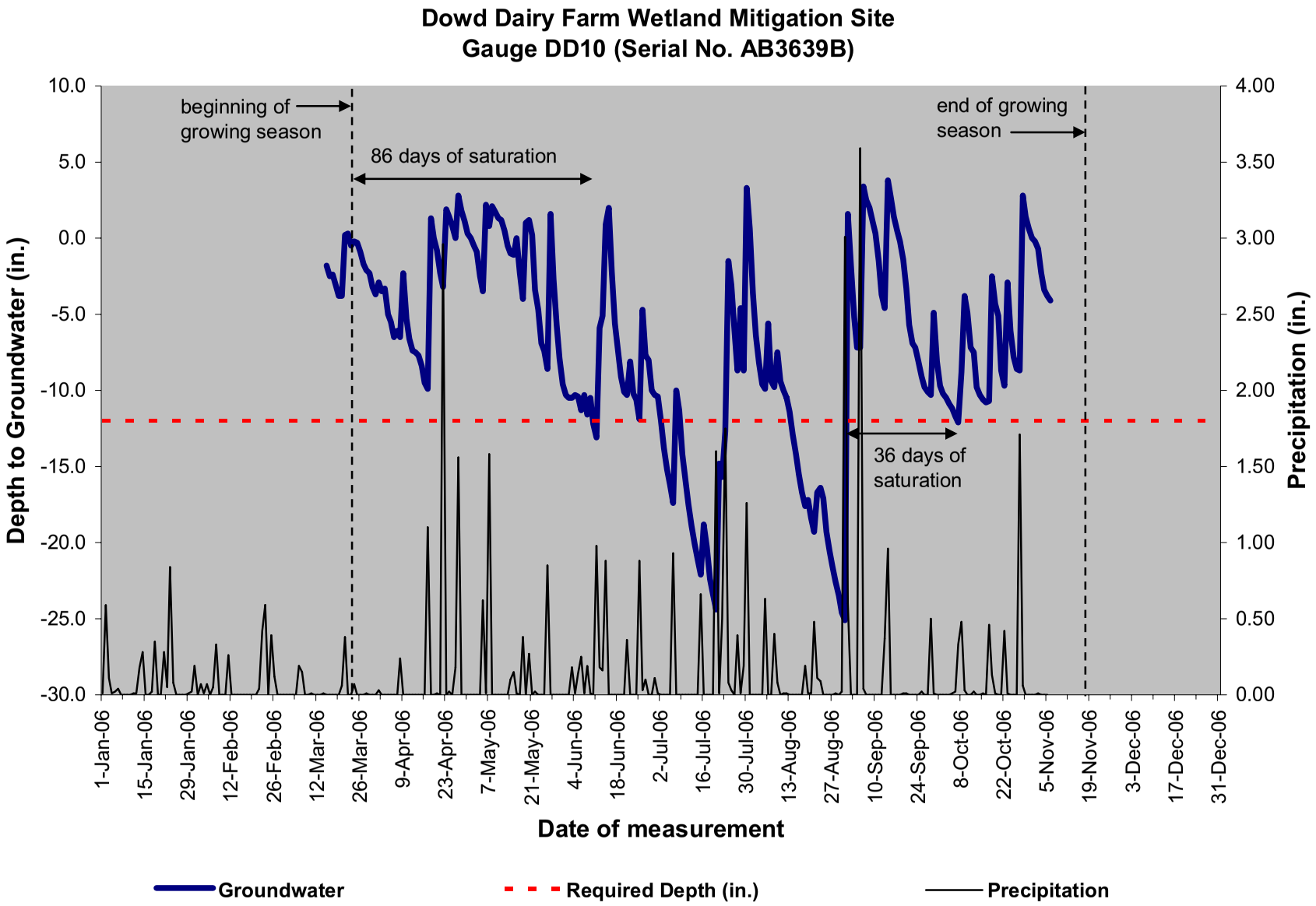
27-Aug-06
10-Sep-06
24-Sep-06
8-Oct-06
22-Oct-06
5-Nov-06
19-Nov-06
3-Dec-06
17-Dec-06
31-Dec-06
Groundwater
Required Depth (in.)
Precipitation


Dowd Dairy Farm Wetland Mitigation Site
Gauge DD10 (Serial No. AB3639B)
beginning of growing season
86 days of saturation
end of growing season
36 days of saturation
Depth to Groundwater (in.)
Precipitation (in.)
Date of measurement
10.0
5.0
0.0
-5.0
-10.0
-15.0
-20.0
-25.0
-30.0
4.00
3.50
3.00
2.50
2.00
1.50
1.00
0.50
0.00
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8-Oct-06
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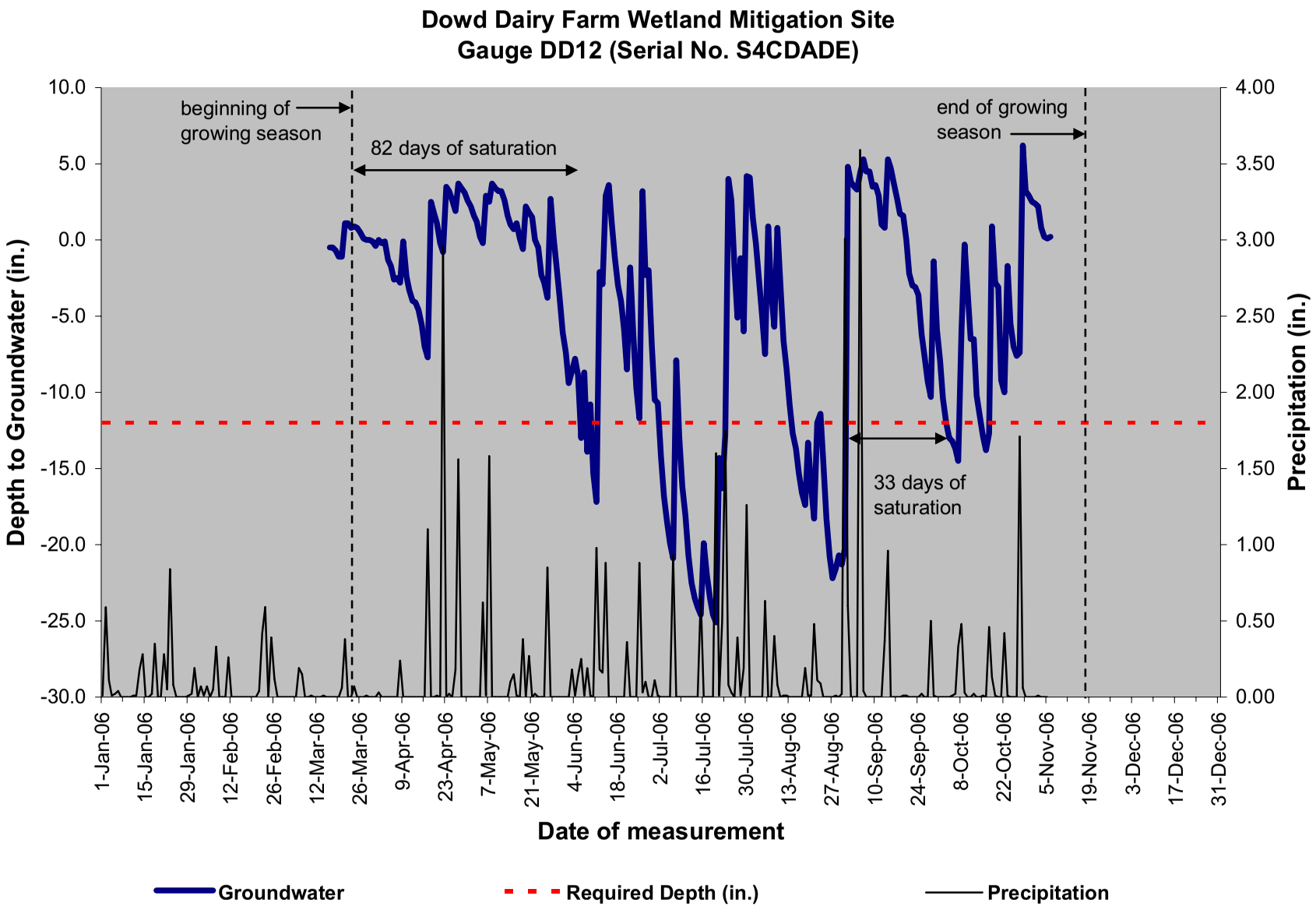
19-Nov-06
3-Dec-06
17-Dec-06
31-Dec-06
Groundwater
Required Depth (in.)
Precipitation


Dowd Dairy Farm Wetland Mitigation Site
Gauge DD12 (Serial No. S4CDADE)
beginning of growing season
82 days of saturation
end of growing season
33 days of saturation
Depth to Groundwater (in.)
Precipitation (in.)
Date of measurement
10.0
5.0
0.0
-5.0
-10.0
-15.0
-20.0
-25.0
-30.0
4.00
3.50
3.00
2.50
2.00
1.50
1.00
0.50
0.00
1-Jan-06
15-Jan-06
29-Jan-06
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23-Apr-06
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10-Sep-06
24-Sep-06
8-Oct-06
22-Oct-06
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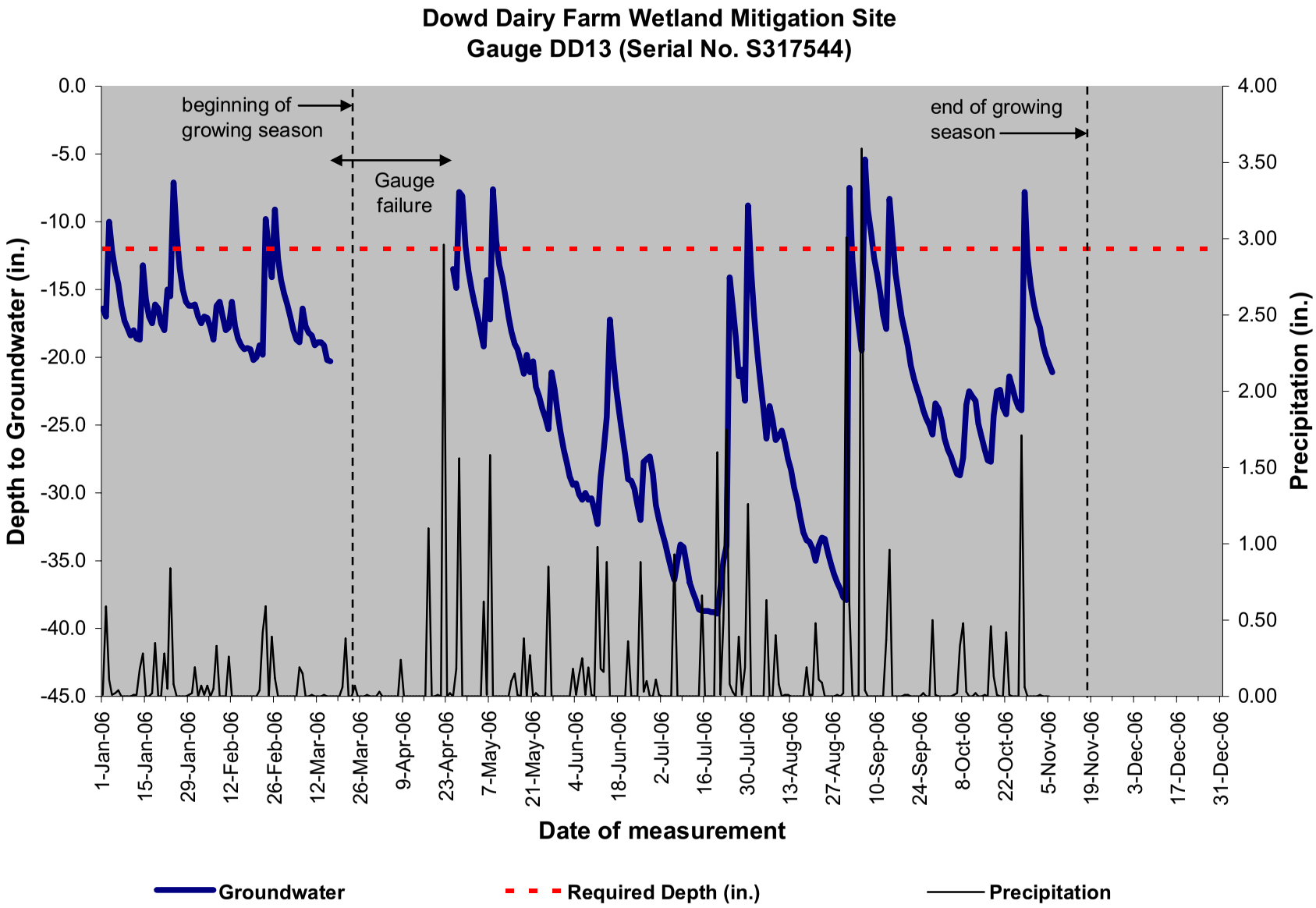
19-Nov-06
3-Dec-06
17-Dec-06
31-Dec-06
Groundwater
Required Depth (in.)
Precipitation


Dowd Dairy Farm Wetland Mitigation Site
Gauge DD13 (Serial No. S317544)
beginning of growing season
Gauge failure
end of growing season
Depth to Groundwater (in.)
Precipitation (in.)
0.0
-5.0
-10.0
-15.0
-20.0
-25.0
-30.0
-35.0
-40.0
-45.0
4.00
3.50
3.00
2.50
2.00
1.50
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0.50
0.00
1-Jan-06
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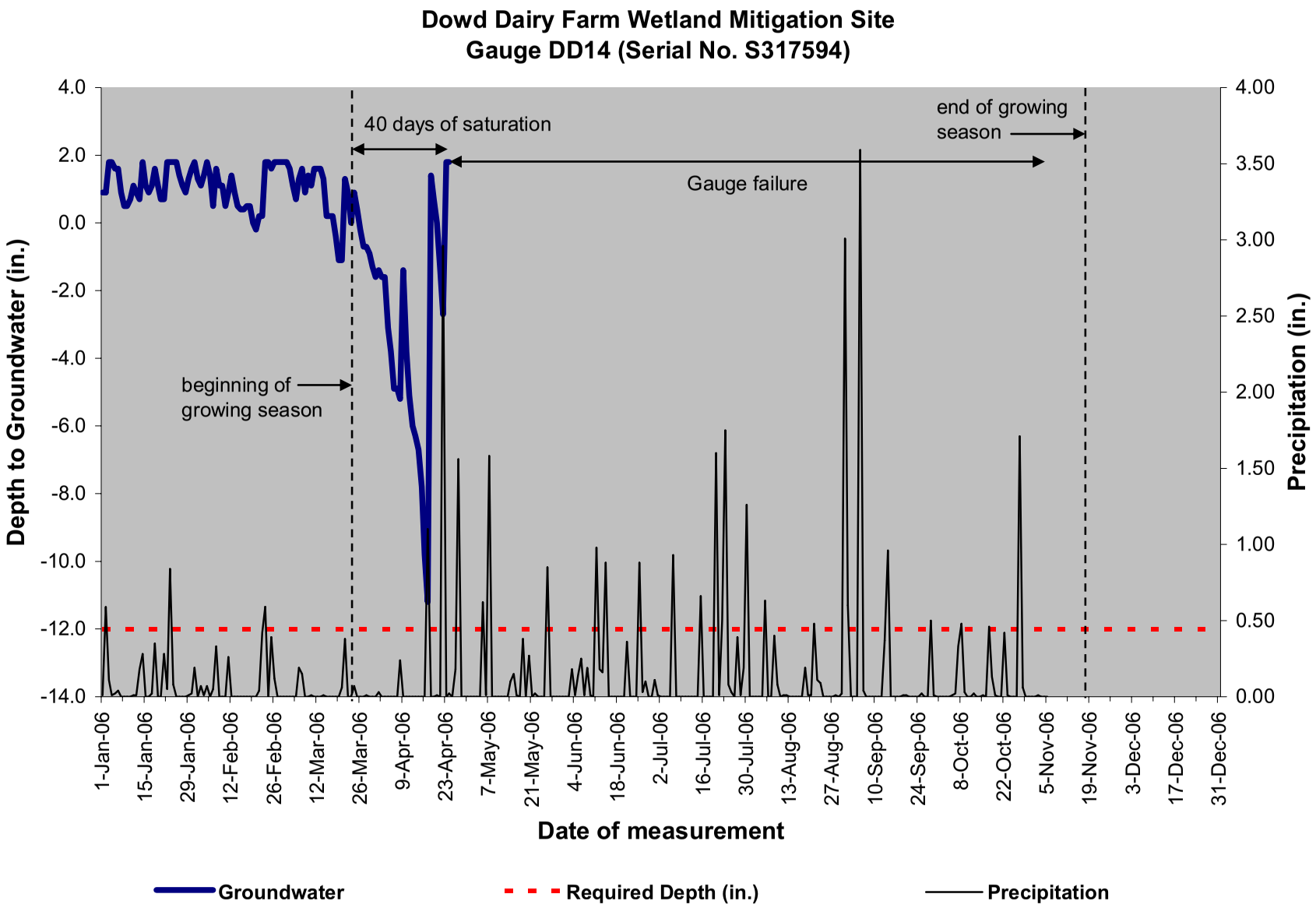
10-Sep-06
24-Sep-06
8-Oct-06
22-Oct-06
5-Nov-06
19-Nov-06
3-Dec-06
17-Dec-06
31-Dec-06
Date of measurement
Groundwater
Required Depth (in.)
Precipitation


Dowd Dairy Farm Wetland Mitigation Site
Gauge DD14 (Serial No. S317594)
40 days of saturation
end of growing season
Gauge failure
beginning of growing season
Depth to Groundwater (in.)
Precipitation (in.)
Date of measurement
4.0
2.0
0.0
-2.0
-4.0
-6.0
-8.0
-10.0
-12.0
-14.0
4.00
3.50
3.00
2.50
2.00
1.50
1.00
0.50
0.00
1-Jan-06
15-Jan-06
29-Jan-06
12-Feb-06
26-Feb-06
12-Mar-06
26-Mar-06
9-Apr-06
23-Apr-06
7-May-06
21-May-06
4-Jun-06
18-Jun-06
2-Jul-06
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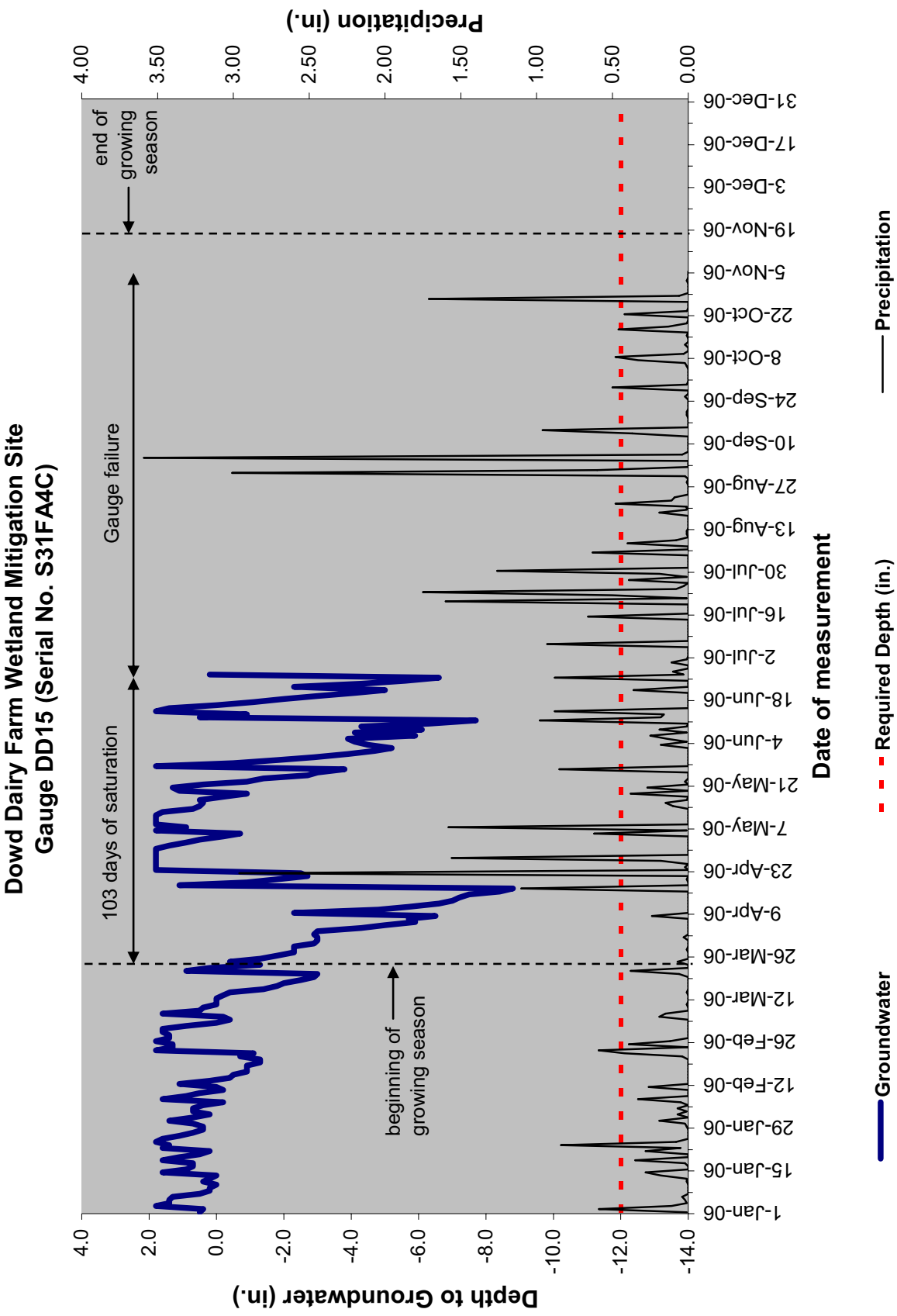
13-Aug-06
27-Aug-06
10-Sep-06
24-Sep-06
8-Oct-06
22-Oct-06
5-Nov-06
19-Nov-06
3-Dec-06
17-Dec-06
31-Dec-06
Groundwater
Required Depth (in.)
Precipitation


Dowd Dairy Farm Wetland Mitigation Site
Gauge DD15 (Serial No. S31FA4C)
Depth to Groundwater (in.)
Precipitation (in.)
Date of measurement
Groundwater
Required Depth (in.)
Precipitation
103 days of saturation
Gauge failure
beginning of growing season
end of growing season
4.0
2.0
0.0
-2.0
-4.0
-6.0
-8.0
-10.0
-12.0
-14.0
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3.00
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1-Jan-06
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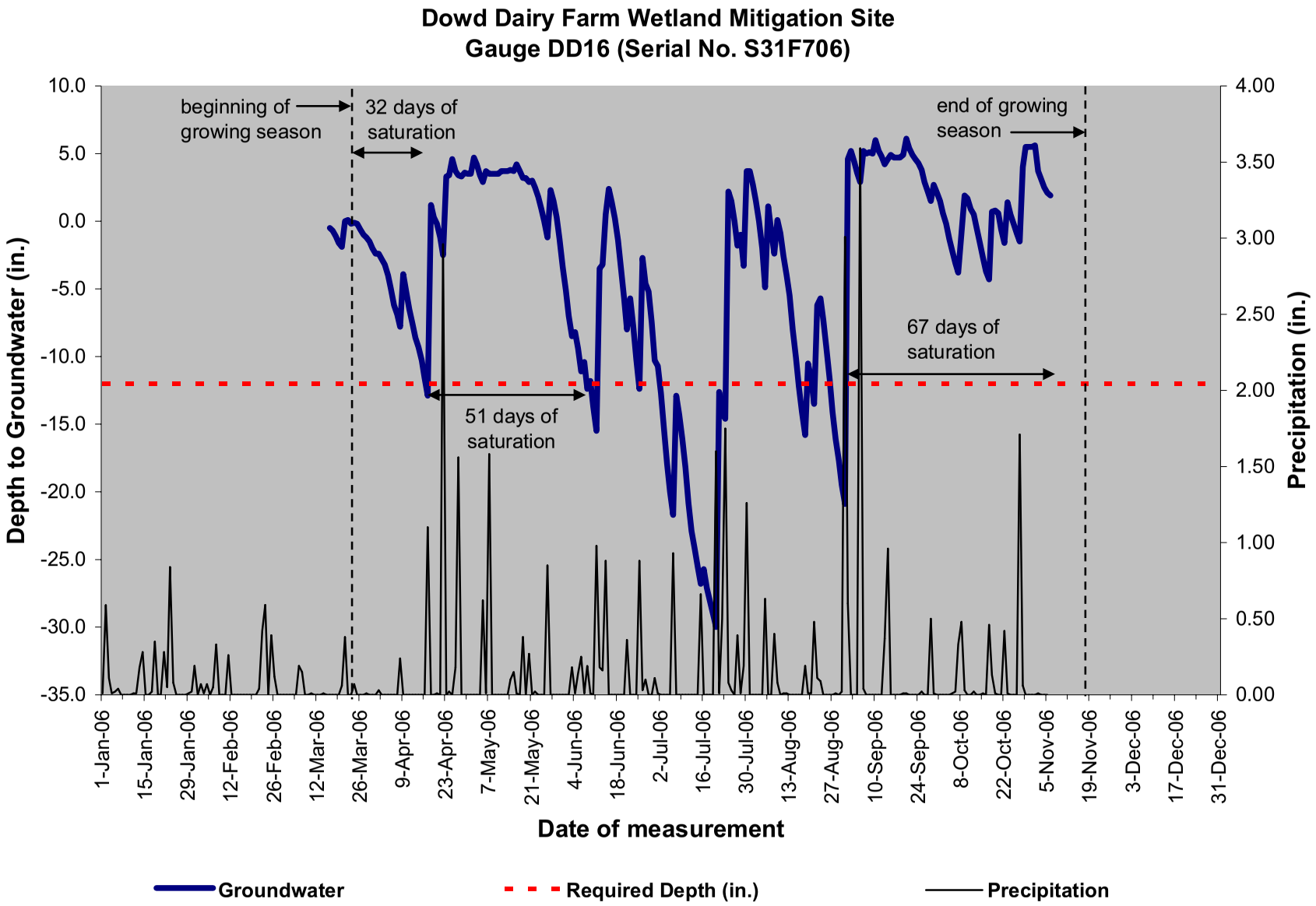
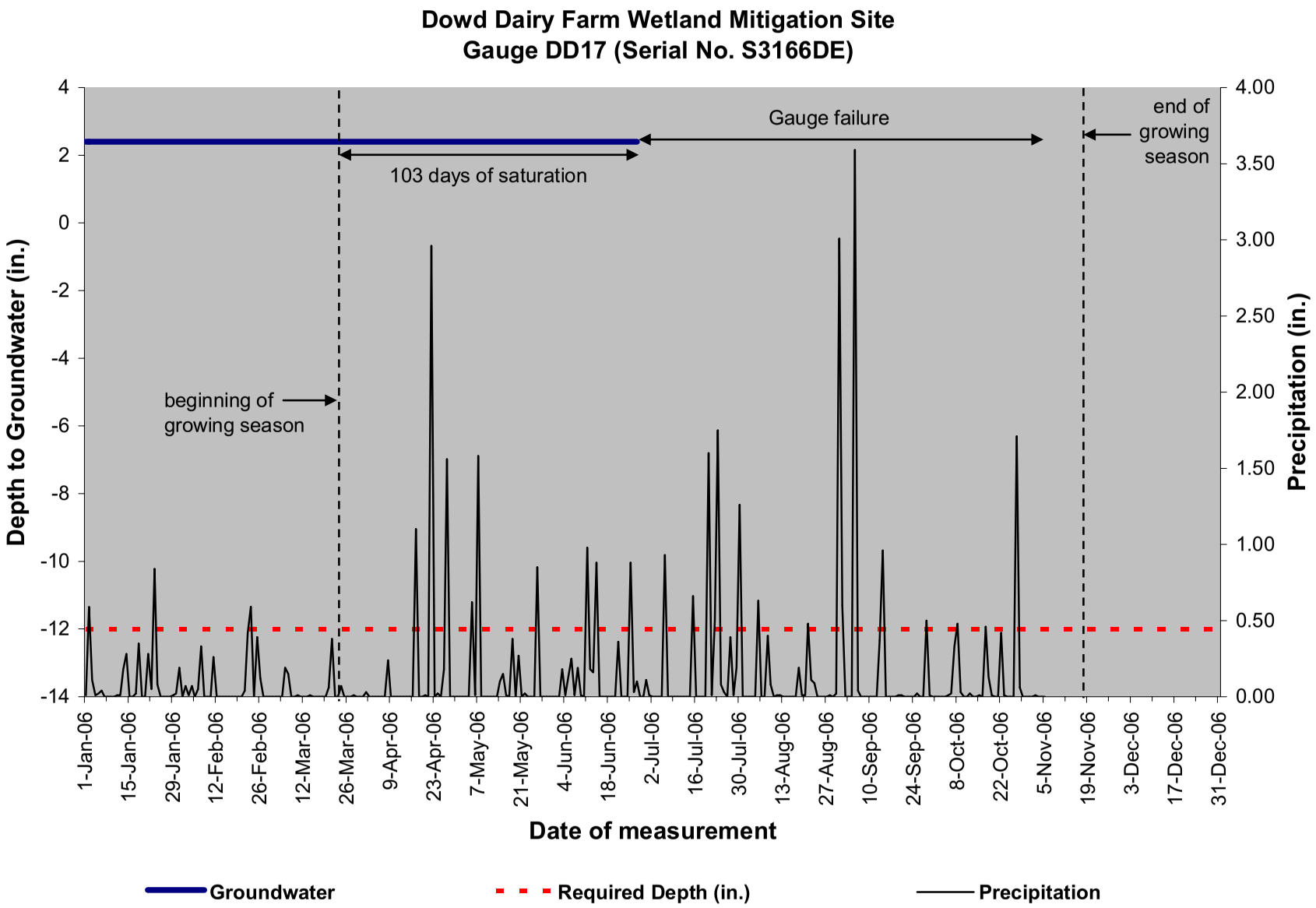
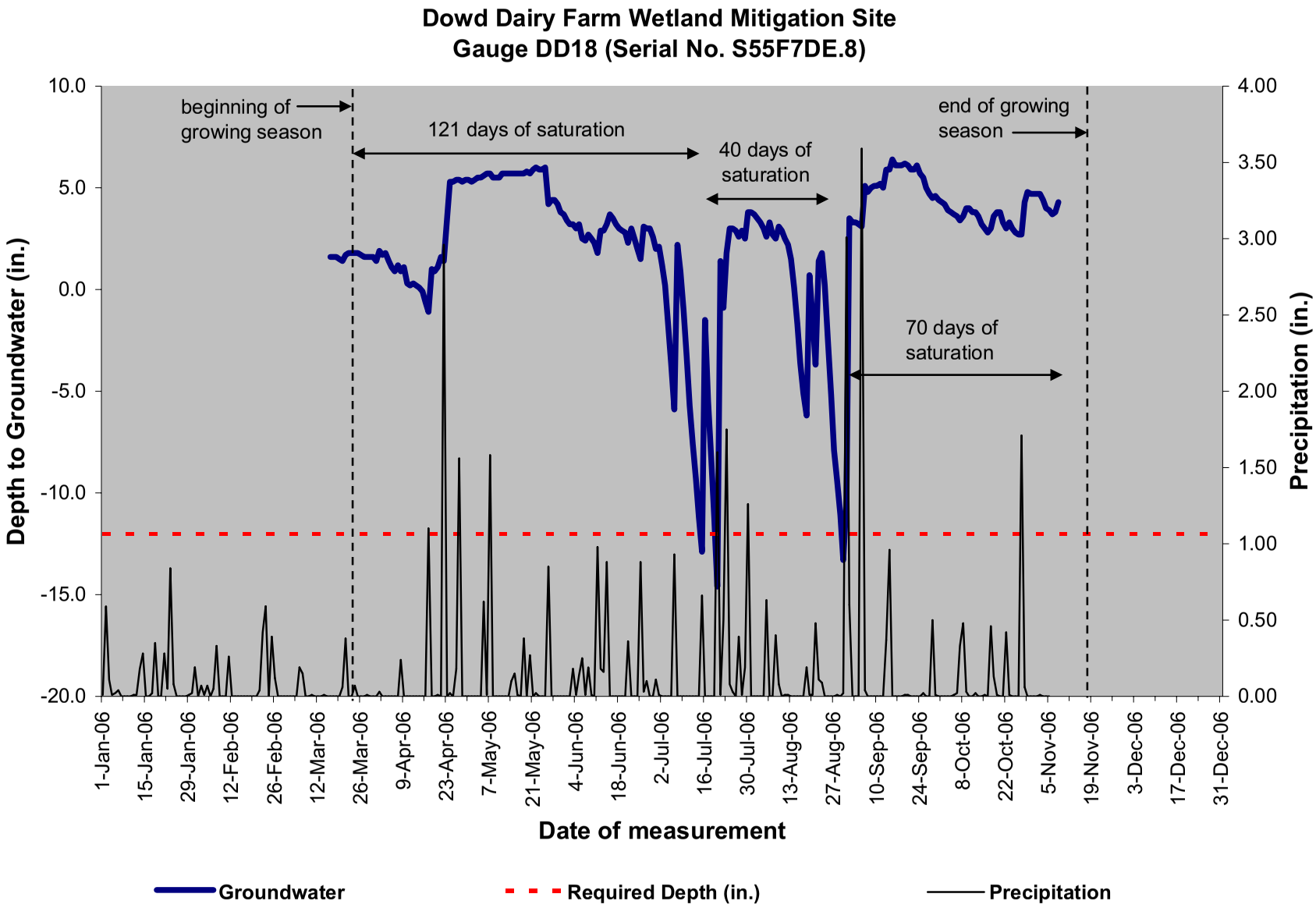
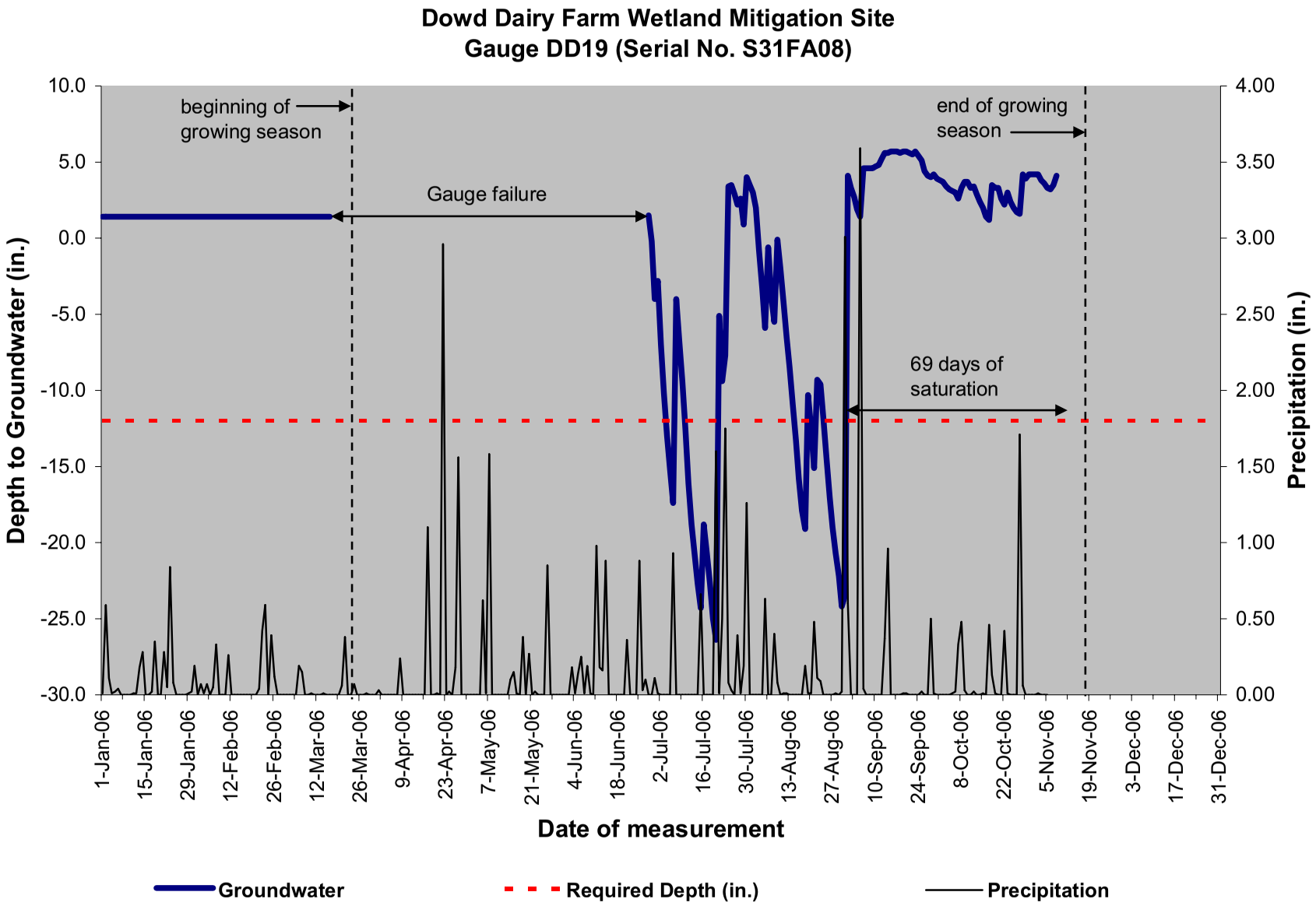
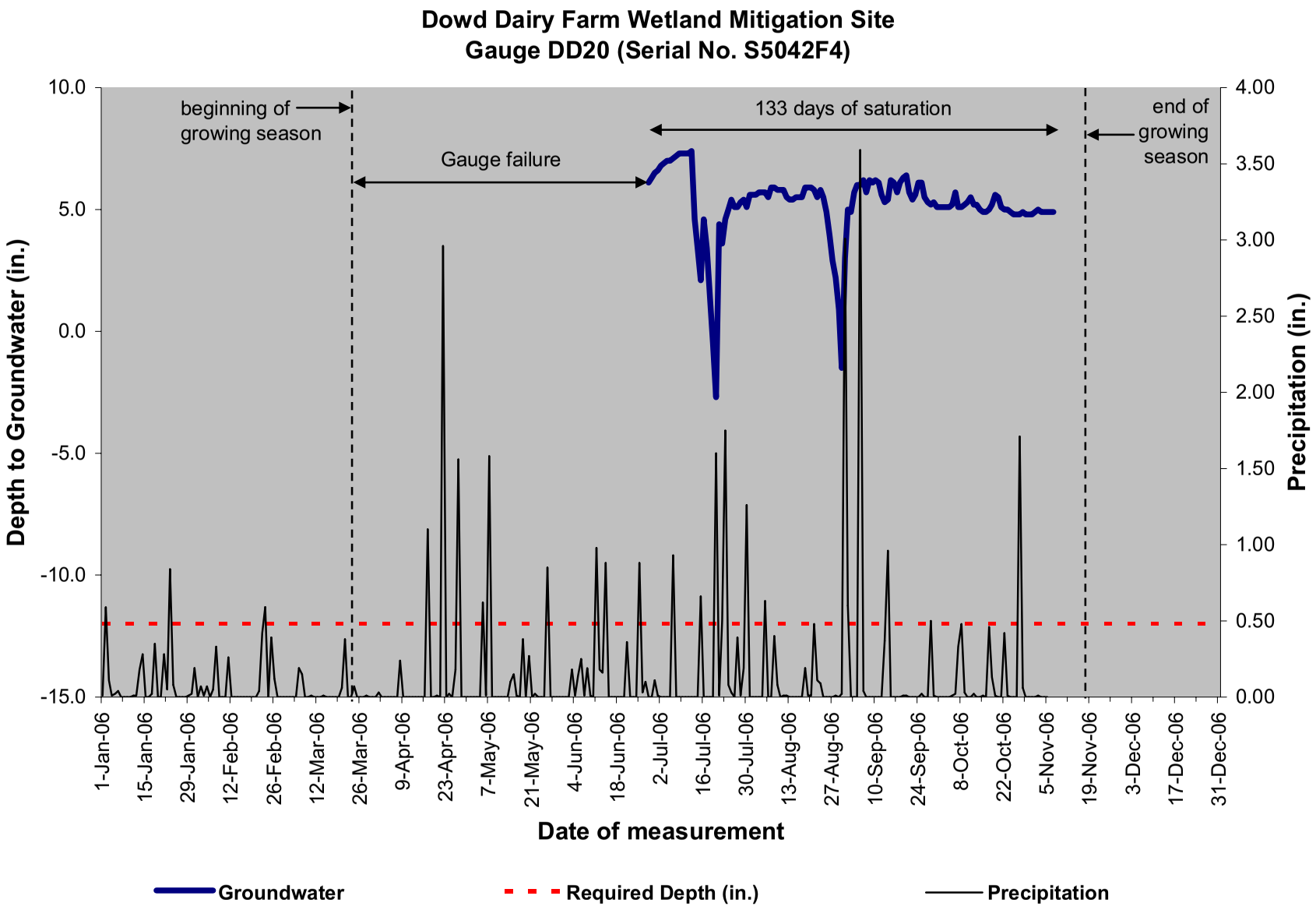
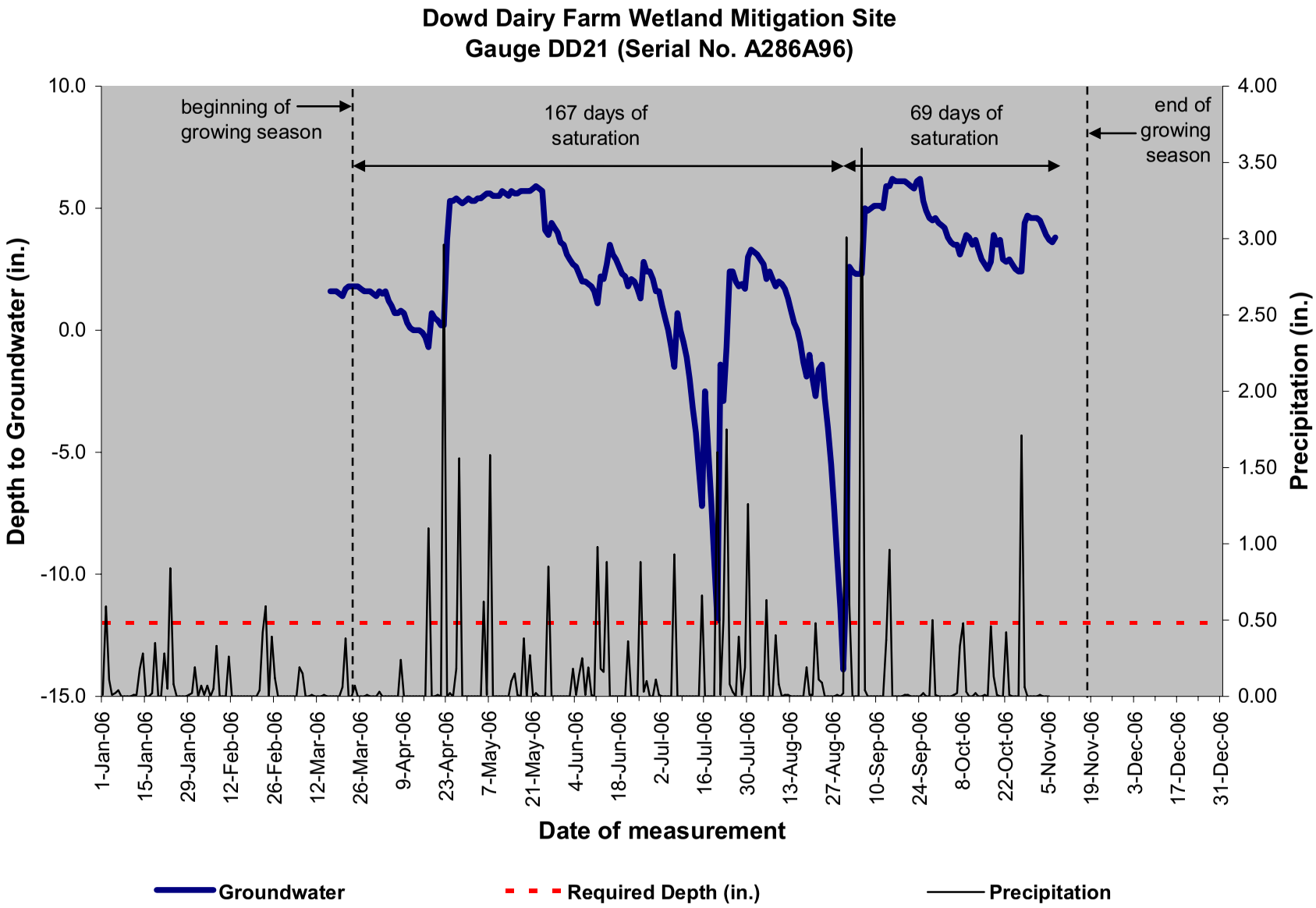

Dowd Dairy Farm Wetland Mitigation Site
Gauge DD16 (Serial No. S31F706)
beginning of growing season
32 days of saturation
end of growing season
67 days of saturation
51 days of saturation
Depth to Groundwater (in.)
Precipitation (in.)
Date of measurement
Groundwater
Required Depth (in.)
Precipitation

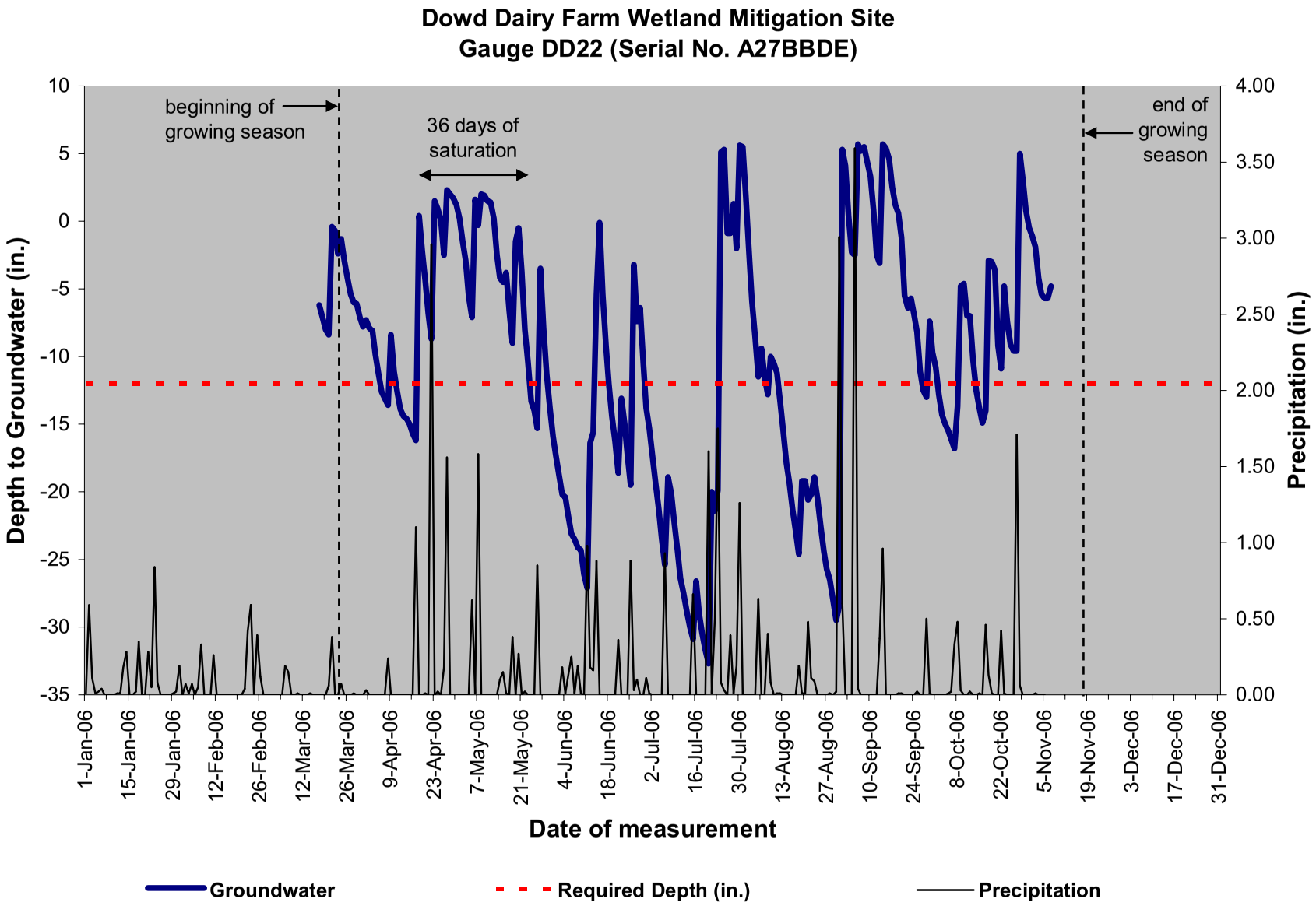

Dowd Dairy Farm Wetland Mitigation Site
Gauge DD17 (Serial No. S3166DE)
Depth to Groundwater (in.)
Precipitation (in.)
Date of measurement
beginning of growing season
103 days of saturation
Gauge failure
end of growing season
Groundwater
Required Depth (in.)
Precipitation

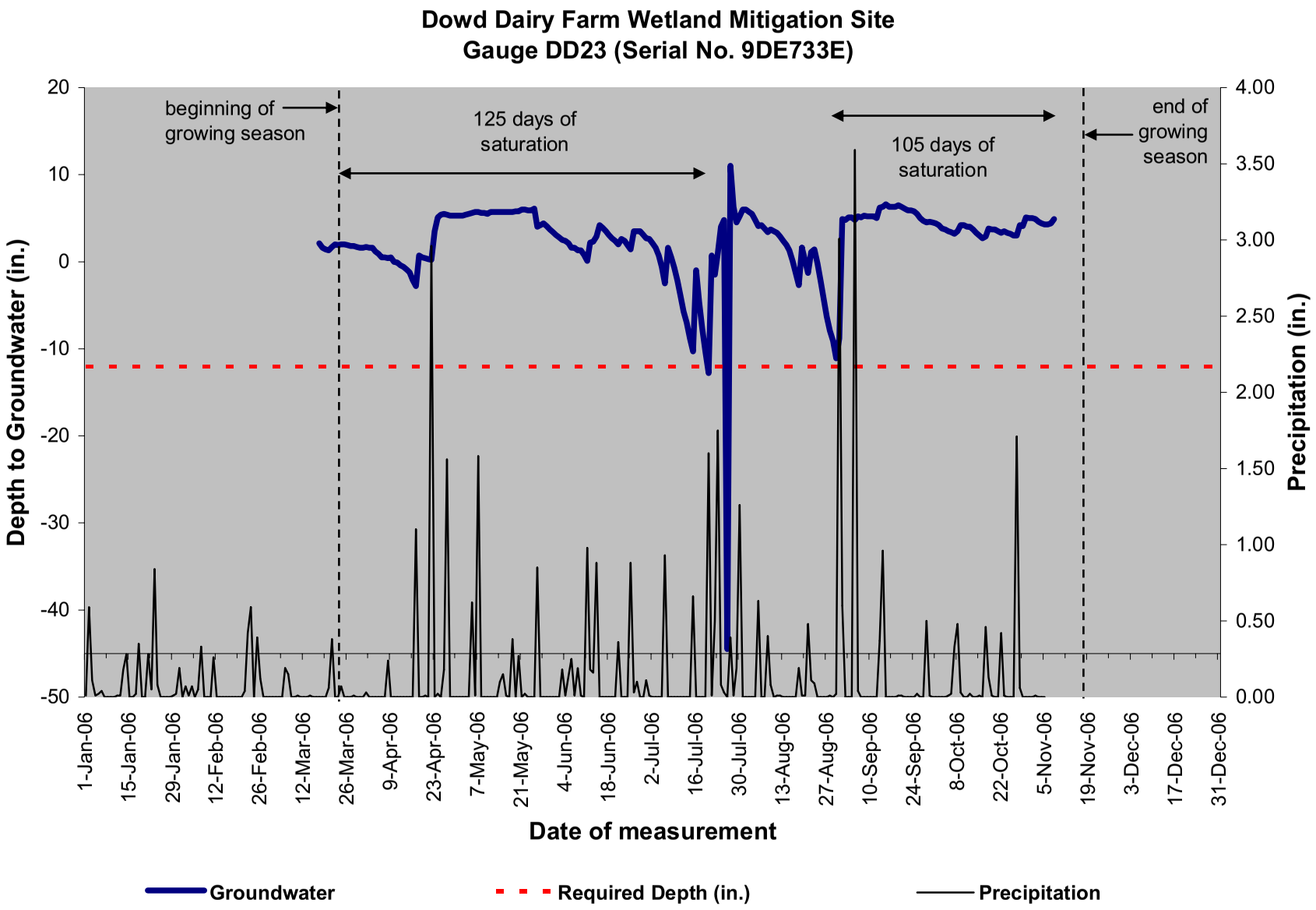

Dowd Dairy Farm Wetland Mitigation Site
Gauge DD18 (Serial No. S55F7DE.8)
beginning of growing season
121 days of saturation
40 days of saturation
end of growing season
70 days of saturation
Depth to Groundwater (in.)
Precipitation (in.)
10.0
5.0
0.0
-5.0
-10.0
-15.0
-20.0
4.00
3.50
3.00
2.50
2.00
1.50
1.00
0.50
0.00
1-Jan-06
15-Jan-06
29-Jan-06
12-Feb-06
26-Feb-06
12-Mar-06
26-Mar-06
9-Apr-06
23-Apr-06
7-May-06
21-May-06
4-Jun-06
18-Jun-06
2-Jul-06
16-Jul-06
30-Jul-06
13-Aug-06
27-Aug-06
10-Sep-06
24-Sep-06
8-Oct-06
22-Oct-06
5-Nov-06
19-Nov-06
3-Dec-06
17-Dec-06
31-Dec-06
Date of measurement
Groundwater
Required Depth (in.)
Precipitation

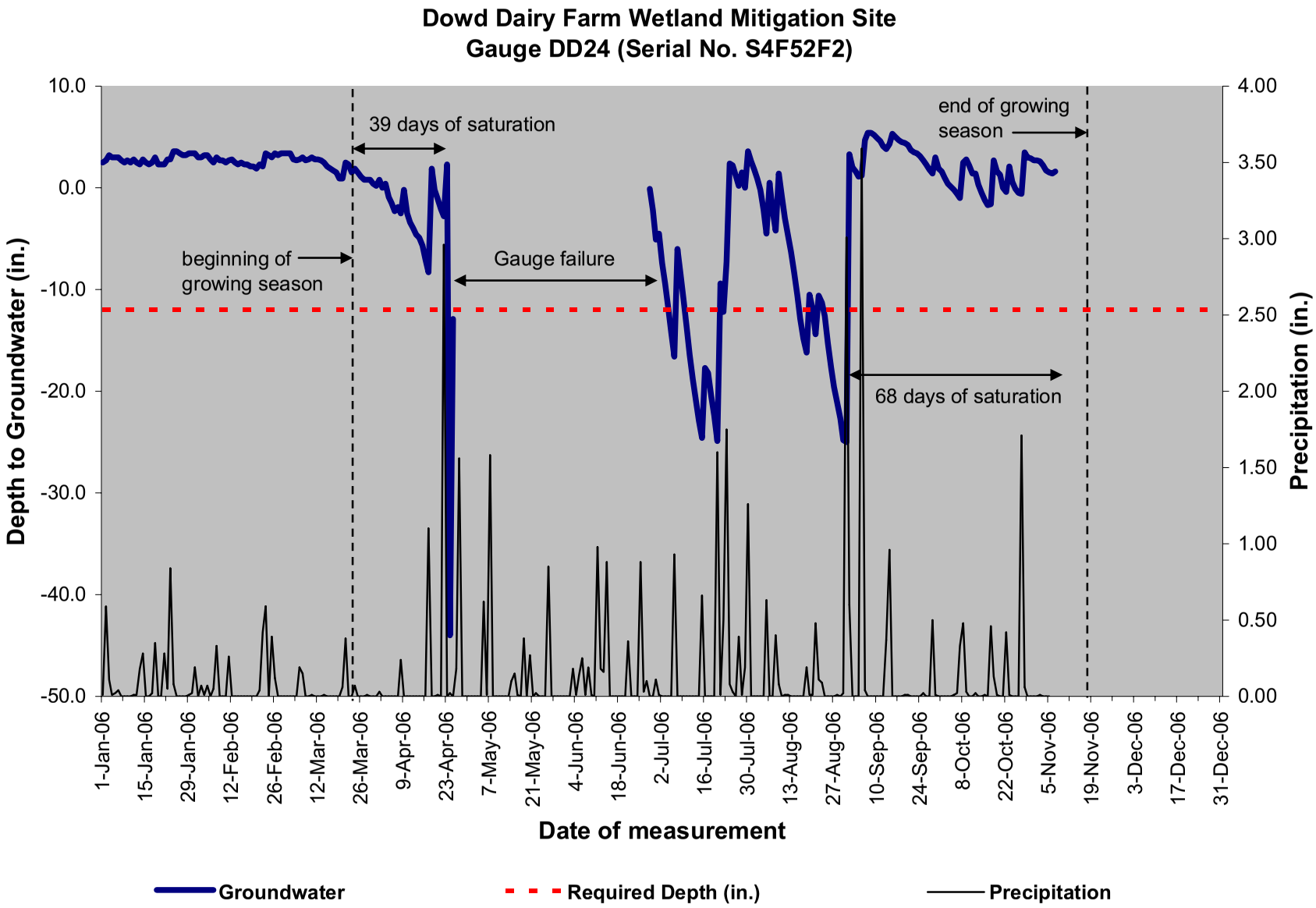

Dowd Dairy Farm Wetland Mitigation Site
Gauge DD19 (Serial No. S31FA08)
beginning of growing season
end of growing season
Gauge failure
69 days of saturation
Depth to Groundwater (in.)
Precipitation (in.)
Date of measurement
10.0
5.0
0.0
-5.0
-10.0
-15.0
-20.0
-25.0
-30.0
4.00
3.50
3.00
2.50
2.00
1.50
1.00
0.50
0.00
1-Jan-06
15-Jan-06
29-Jan-06
12-Feb-06
26-Feb-06
12-Mar-06
26-Mar-06
9-Apr-06
23-Apr-06
7-May-06
21-May-06
4-Jun-06
18-Jun-06
2-Jul-06
16-Jul-06
30-Jul-06
13-Aug-06
27-Aug-06
10-Sep-06
24-Sep-06
8-Oct-06
22-Oct-06
5-Nov-06
19-Nov-06
3-Dec-06
17-Dec-06
31-Dec-06
Groundwater
Required Depth (in.)
Precipitation

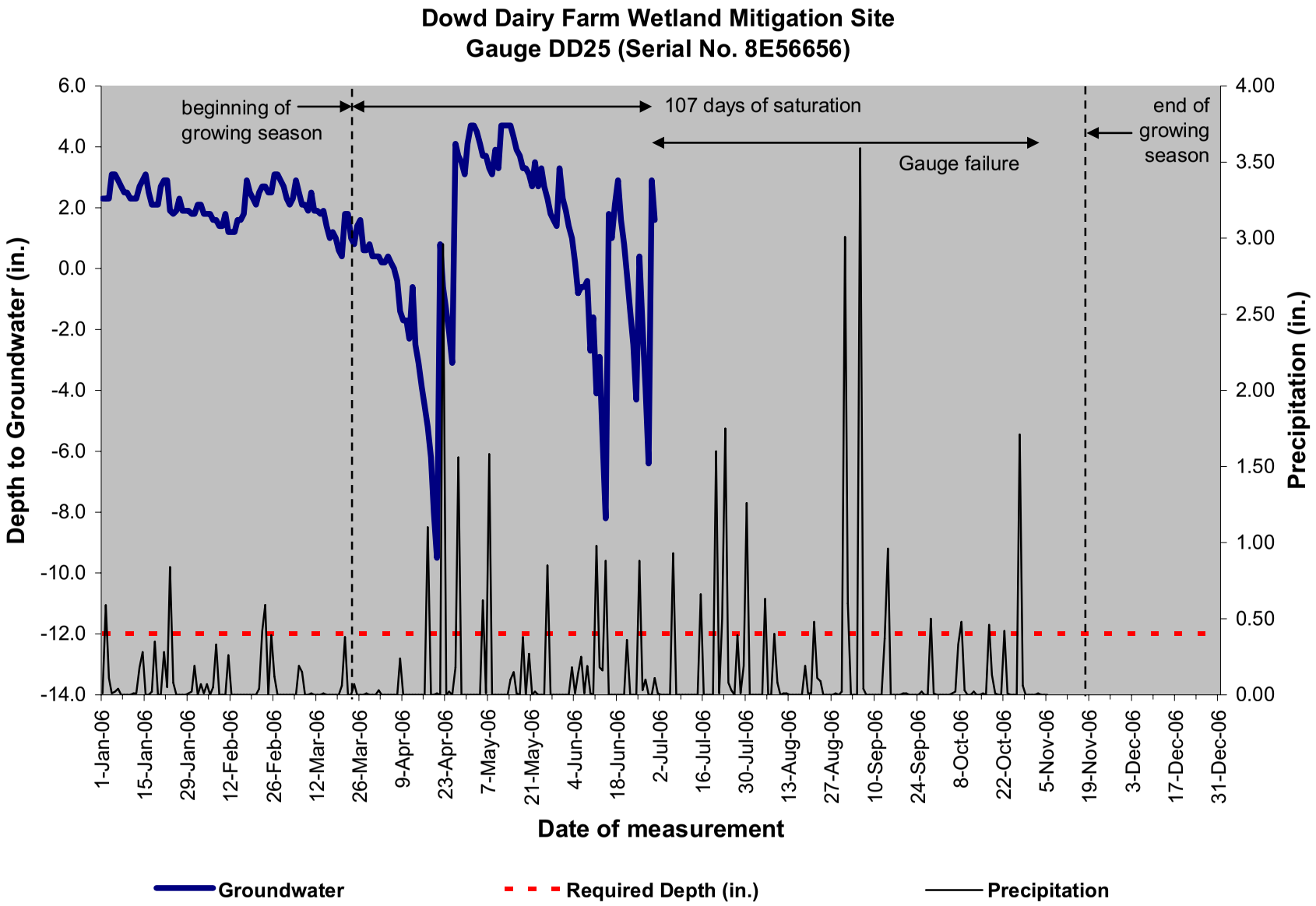

Dowd Dairy Farm Wetland Mitigation Site
Gauge DD20 (Serial No. S5042F4)
beginning of growing season
Gauge failure
133 days of saturation
end of growing season
Depth to Groundwater (in.)
Precipitation (in.)
10.0
5.0
0.0
-5.0
-10.0
-15.0
4.00
3.50
3.00
2.50
2.00
1.50
1.00
0.50
0.00
1-Jan-06
15-Jan-06
29-Jan-06
12-Feb-06
26-Feb-06
12-Mar-06
26-Mar-06
9-Apr-06
23-Apr-06
7-May-06
21-May-06
4-Jun-06
18-Jun-06
2-Jul-06
16-Jul-06
30-Jul-06
13-Aug-06
27-Aug-06
10-Sep-06
24-Sep-06
8-Oct-06
22-Oct-06
5-Nov-06
19-Nov-06
3-Dec-06
17-Dec-06
31-Dec-06
Date of measurement
Groundwater
Required Depth (in.)
Precipitation

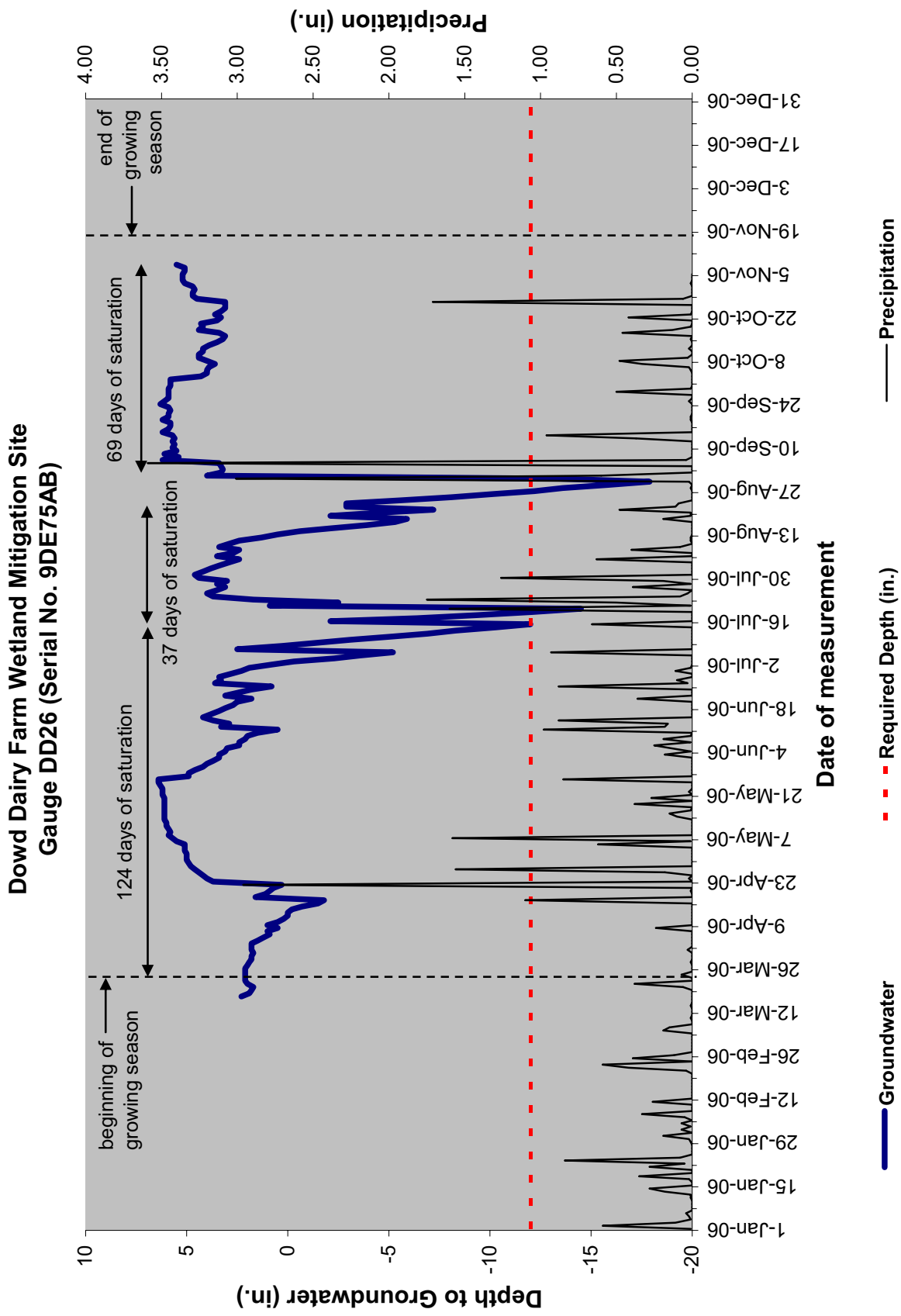

Dowd Dairy Farm Wetland Mitigation Site
Gauge DD21 (Serial No. A286A96)
beginning of growing season
167 days of saturation
69 days of saturation
end of growing season
Depth to Groundwater (in.)
Precipitation (in.)
10.0
5.0
0.0
-5.0
-10.0
-15.0
4.00
3.50
3.00
2.50
2.00
1.50
1.00
0.50
0.00
1-Jan-06
15-Jan-06
29-Jan-06
12-Feb-06
26-Feb-06
12-Mar-06
26-Mar-06
9-Apr-06
23-Apr-06
7-May-06
21-May-06
4-Jun-06
18-Jun-06
2-Jul-06
16-Jul-06
30-Jul-06
13-Aug-06
27-Aug-06
10-Sep-06
24-Sep-06
8-Oct-06
22-Oct-06
5-Nov-06
19-Nov-06
3-Dec-06
17-Dec-06
31-Dec-06
Date of measurement
Groundwater
Required Depth (in.)
Precipitation

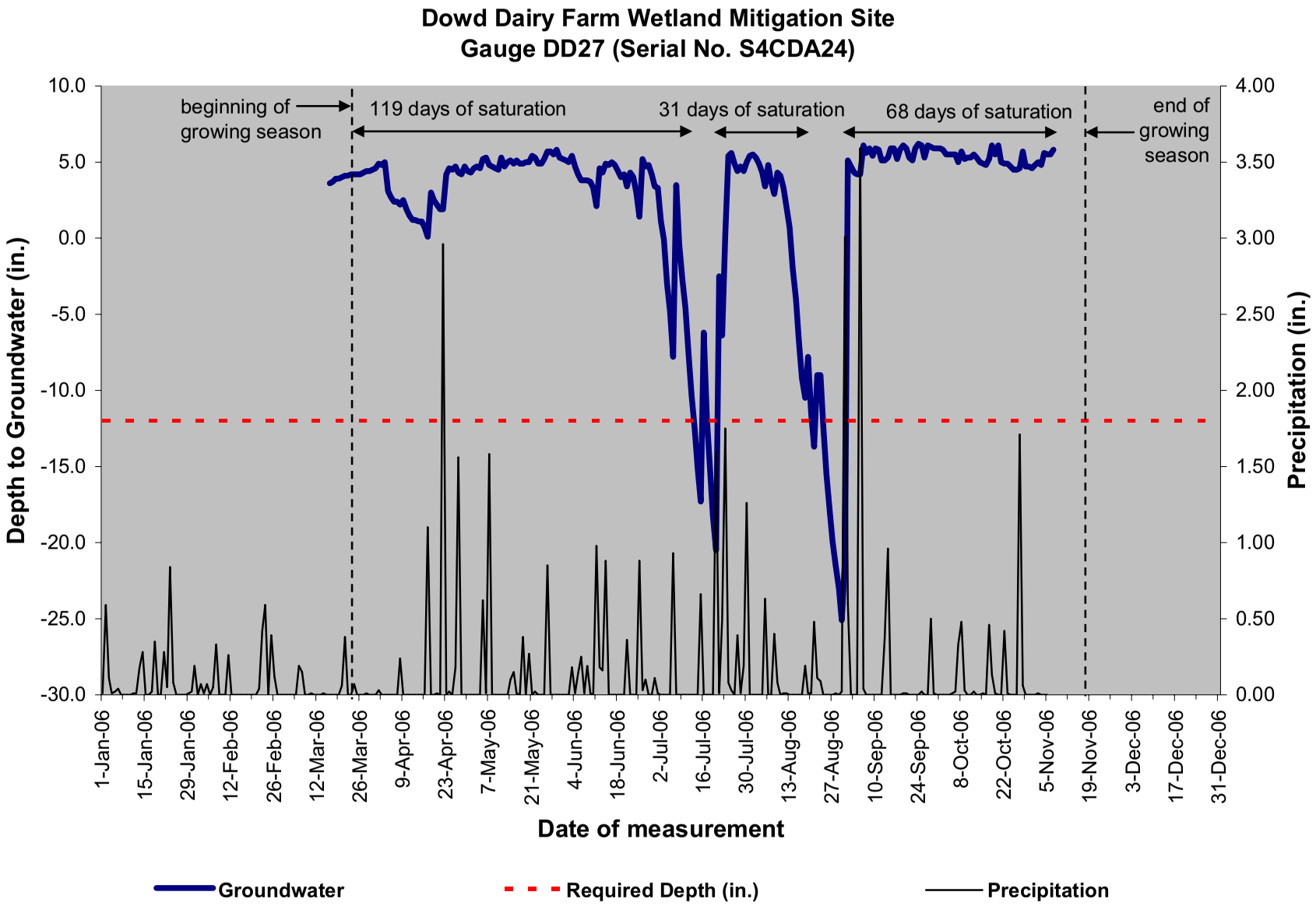

Dowd Dairy Farm Wetland Mitigation Site
Gauge DD22 (Serial No. A27BBDE)
beginning of growing season
36 days of saturation
end of growing season
Depth to Groundwater (in.)
Precipitation (in.)
Date of measurement
Groundwater
Required Depth (in.)
Precipitation

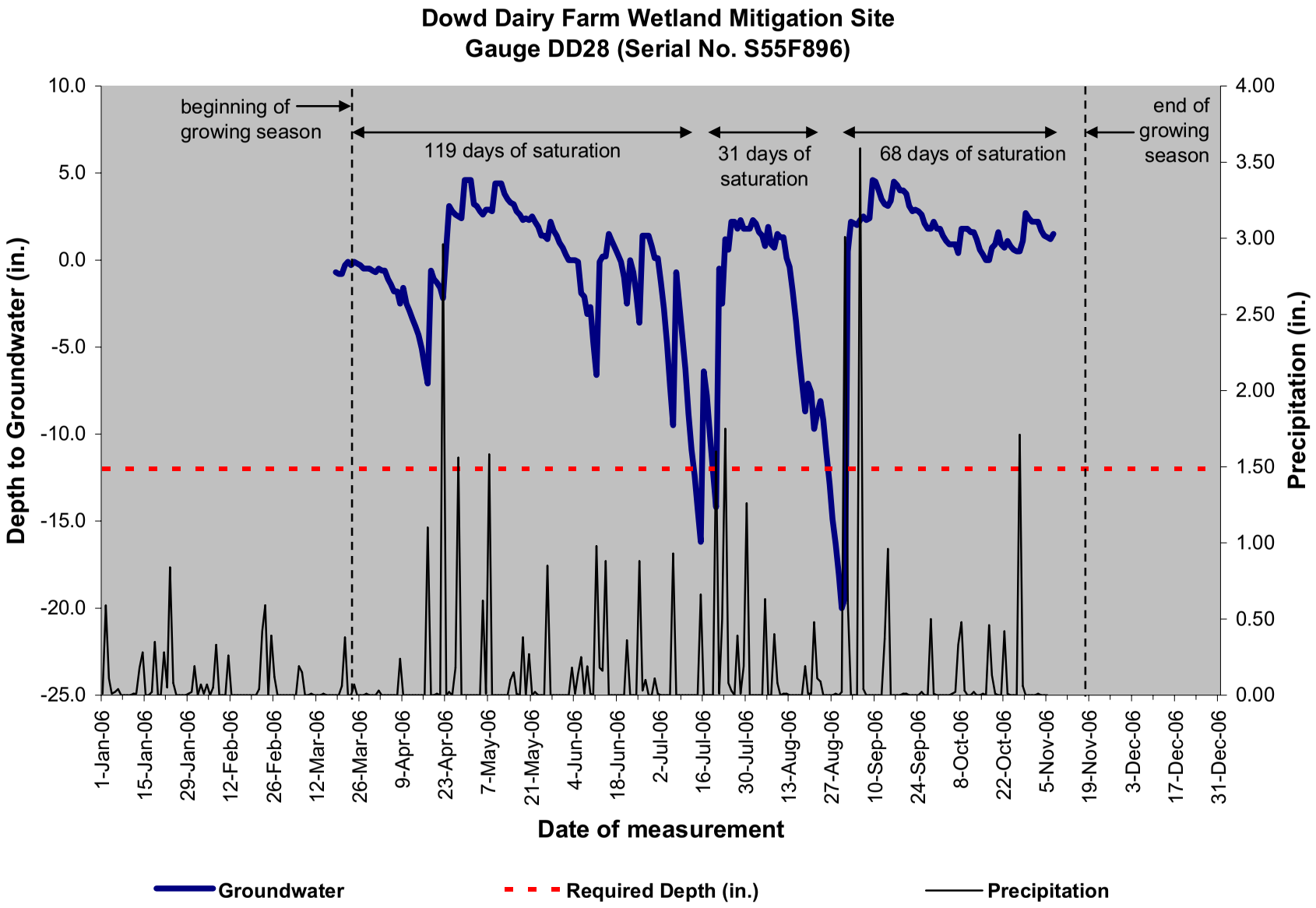

Dowd Dairy Farm Wetland Mitigation Site
Gauge DD23 (Serial No. 9DE733E)
beginning of growing season
125 days of saturation
105 days of saturation
end of growing season
Depth to Groundwater (in.)
Precipitation (in.)
Date of measurement
Groundwater
Required Depth (in.)
Precipitation

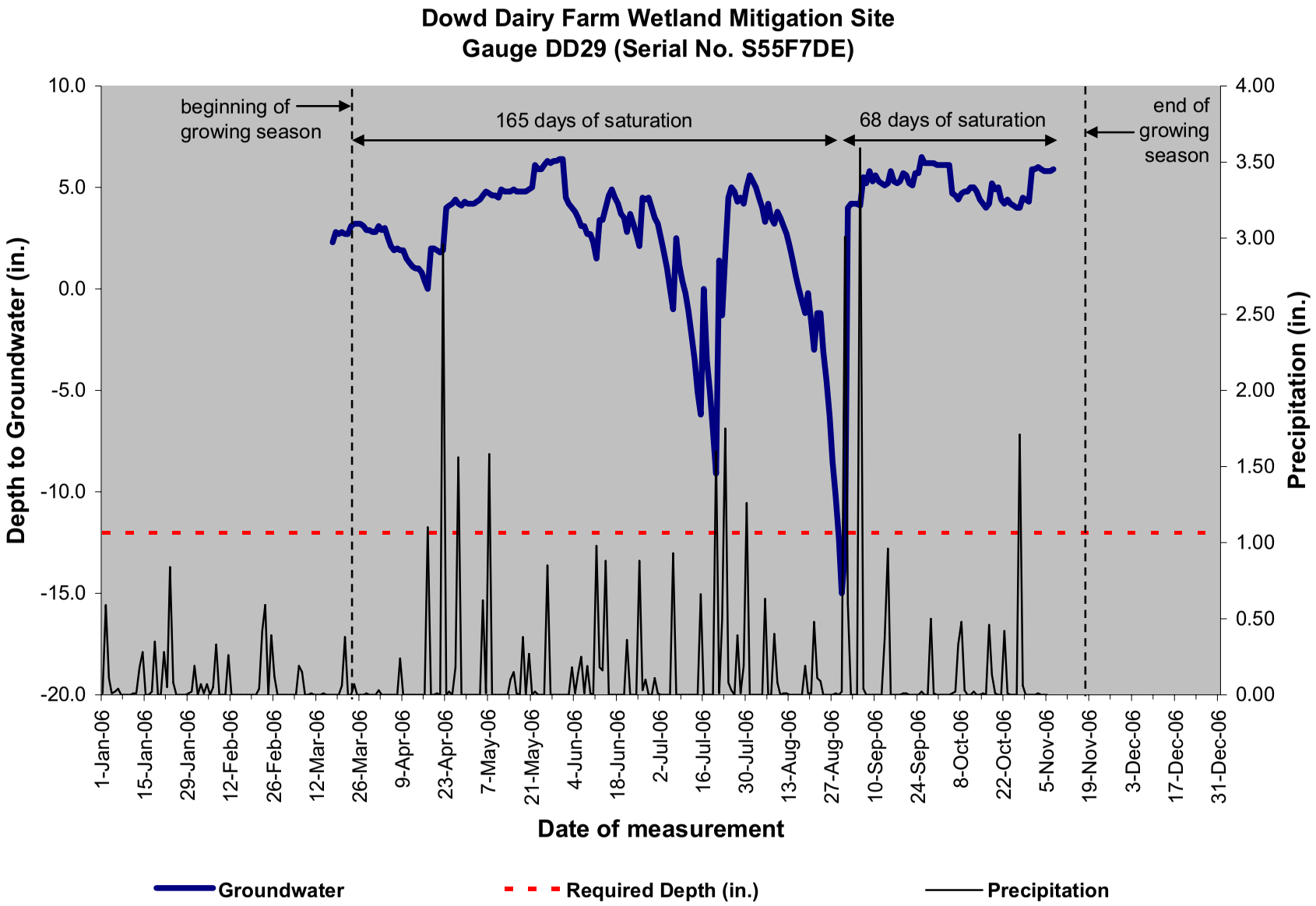

Dowd Dairy Farm Wetland Mitigation Site
Gauge DD24 (Serial No. S4F52F2)
39 days of saturation
end of growing season
beginning of growing season
Gauge failure
68 days of saturation
Depth to Groundwater (in.)
Precipitation (in.)
Date of measurement
Groundwater
Required Depth (in.)
Precipitation

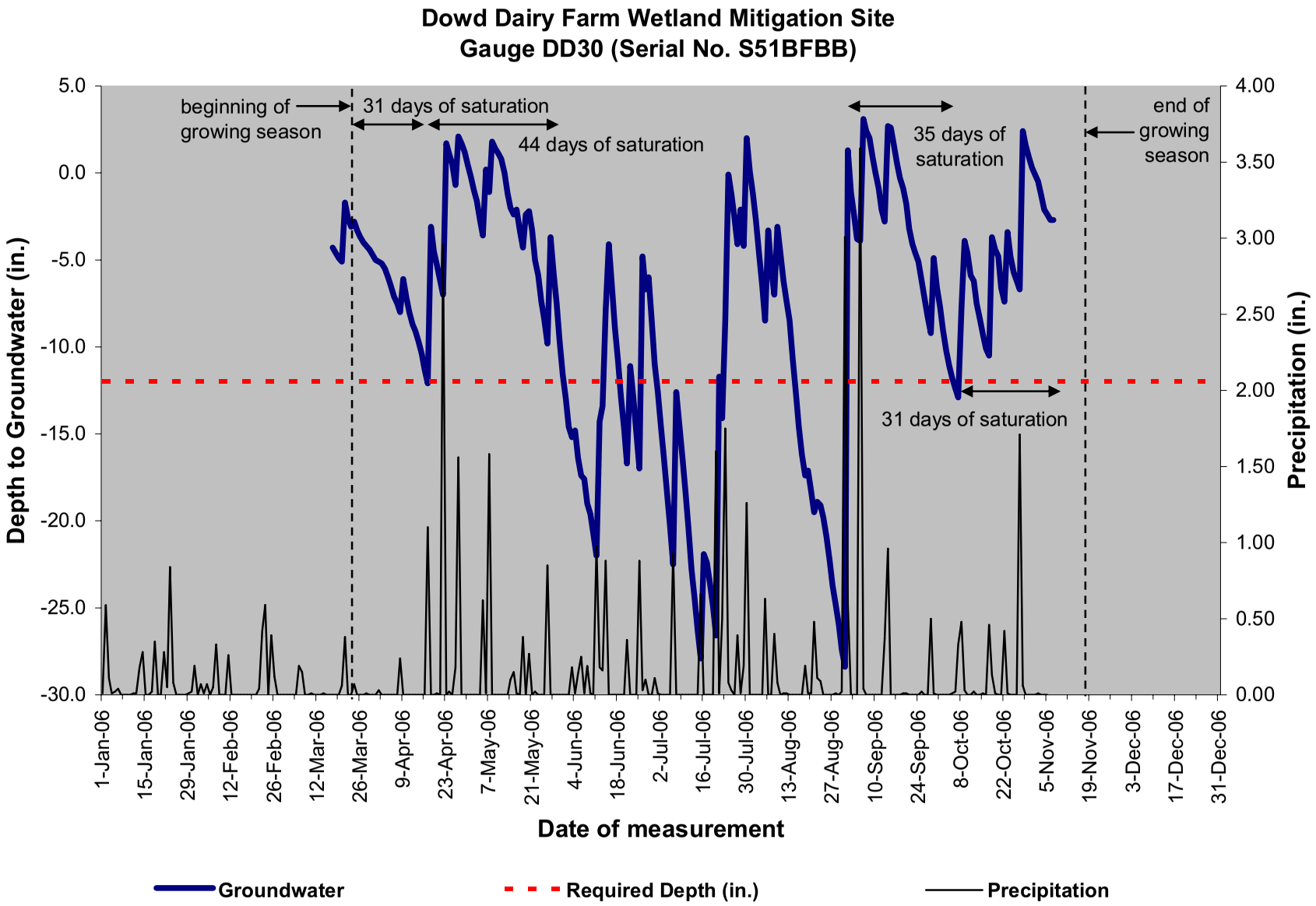

Dowd Dairy Farm Wetland Mitigation Site
Gauge DD25 (Serial No. 8E56656)
beginning of growing season
107 days of saturation
Gauge failure
end of growing season
Depth to Groundwater (in.)
Precipitation (in.)
6.0
4.0
2.0
0.0
-2.0
-4.0
-6.0
-8.0
-10.0
-12.0
-14.0
4.00
3.50
3.00
2.50
2.00
1.50
1.00
0.50
0.00
1-Jan-06
15-Jan-06
29-Jan-06
12-Feb-06
26-Feb-06
12-Mar-06
26-Mar-06
9-Apr-06
23-Apr-06
7-May-06
21-May-06
4-Jun-06
18-Jun-06
2-Jul-06
16-Jul-06
30-Jul-06
13-Aug-06
27-Aug-06
10-Sep-06
24-Sep-06
8-Oct-06
22-Oct-06
5-Nov-06
19-Nov-06
3-Dec-06
17-Dec-06
31-Dec-06
Date of measurement
Groundwater
Required Depth (in.)
Precipitation

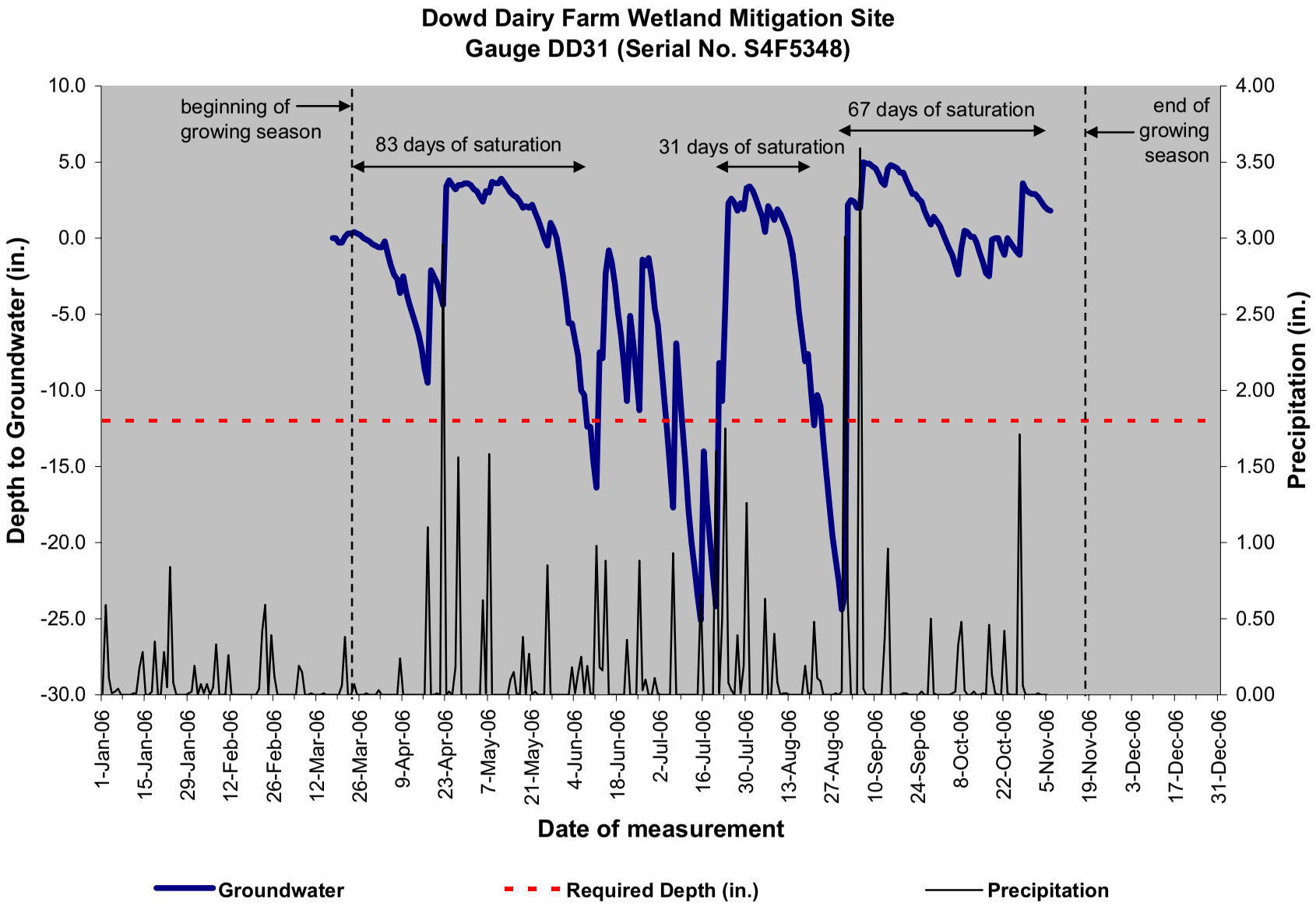

Dowd Dairy Farm Wetland Mitigation Site
Gauge DD26 (Serial No. 9DE75AB)
Depth to Groundwater (in.)
Precipitation (in.)
Date of measurement
beginning of growing season
124 days of saturation
37 days of saturation
69 days of saturation
end of growing season
Groundwater
Required Depth (in.)
Precipitation

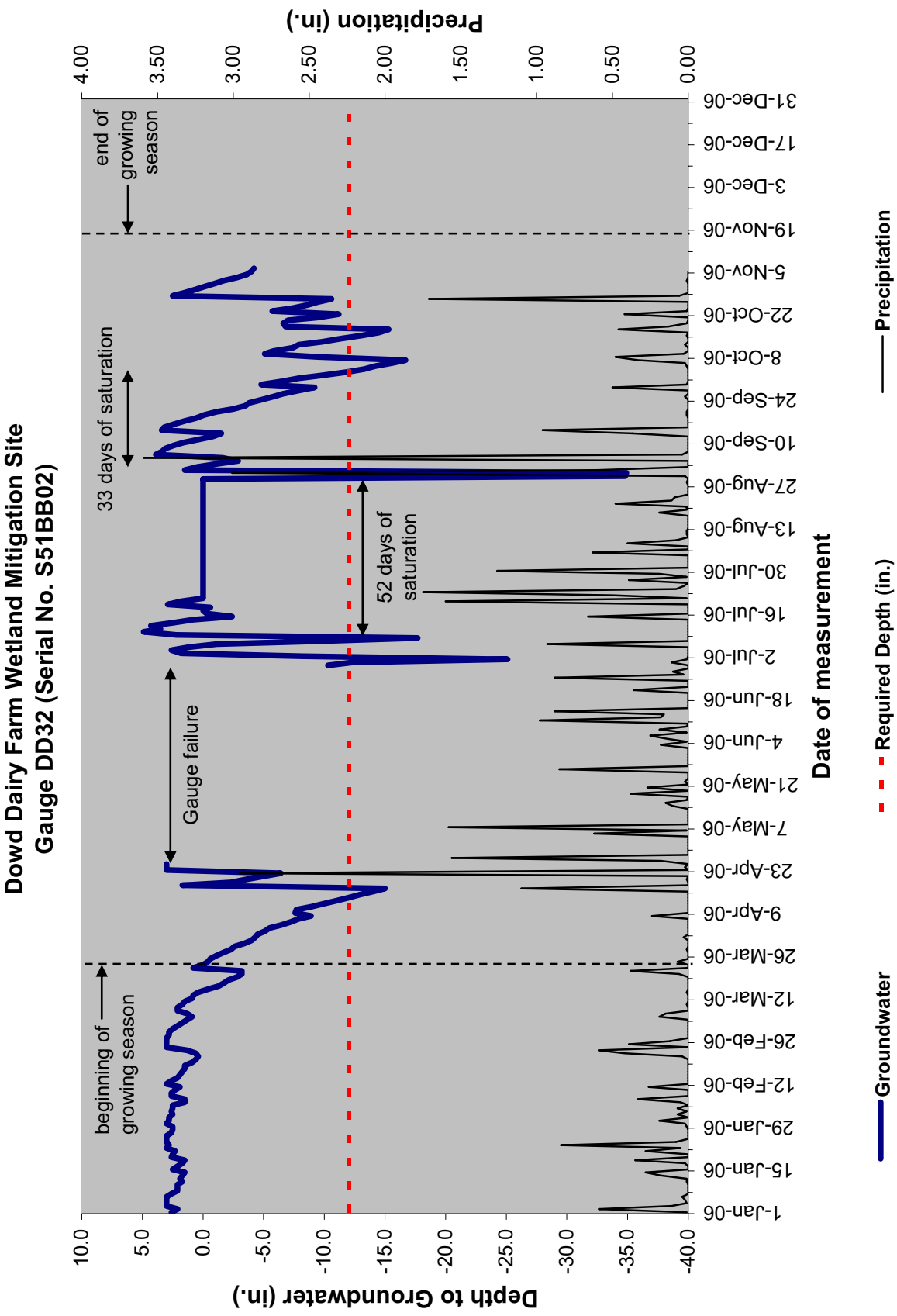

Dowd Dairy Farm Wetland Mitigation Site
Gauge DD27 (Serial No. S4CDA24)
beginning of growing season
119 days of saturation
31 days of saturation
68 days of saturation
end of growing season
Depth to Groundwater (in.)
Precipitation (in.)
Date of measurement
Groundwater
Required Depth (in.)
Precipitation


Dowd Dairy Farm Wetland Mitigation Site
Gauge DD28 (Serial No. S55F896)
beginning of growing season
119 days of saturation
31 days of saturation
68 days of saturation
end of growing season
Depth to Groundwater (in.)
Precipitation (in.)
Date of measurement
Groundwater
Required Depth (in.)
Precipitation


Dowd Dairy Farm Wetland Mitigation Site
Gauge DD29 (Serial No. S55F7DE)
beginning of growing season
165 days of saturation
68 days of saturation
end of growing season
Depth to Groundwater (in.)
Precipitation (in.)
10.0
5.0
0.0
-5.0
-10.0
-15.0
-20.0
4.00
3.50
3.00
2.50
2.00
1.50
1.00
0.50
0.00
1-Jan-06
15-Jan-06
29-Jan-06
12-Feb-06
26-Feb-06
12-Mar-06
26-Mar-06
9-Apr-06
23-Apr-06
7-May-06
21-May-06
4-Jun-06
18-Jun-06
2-Jul-06
16-Jul-06
30-Jul-06
13-Aug-06
27-Aug-06
10-Sep-06
24-Sep-06
8-Oct-06
22-Oct-06
5-Nov-06
19-Nov-06
3-Dec-06
17-Dec-06
31-Dec-06
Date of measurement
Groundwater
Required Depth (in.)
Precipitation


Dowd Dairy Farm Wetland Mitigation Site
Gauge DD30 (Serial No. S51BFBB)
beginning of growing season
31 days of saturation
44 days of saturation
35 days of saturation
31 days of saturation
end of growing season
Depth to Groundwater (in.)
Precipitation (in.)
Date of measurement
5.0
0.0
-5.0
-10.0
-15.0
-20.0
-25.0
-30.0
4.00
3.50
3.00
2.50
2.00
1.50
1.00
0.50
0.00
1-Jan-06
15-Jan-06
29-Jan-06
12-Feb-06
26-Feb-06
12-Mar-06
26-Mar-06
9-Apr-06
23-Apr-06
7-May-06
21-May-06
4-Jun-06
18-Jun-06
2-Jul-06
16-Jul-06
30-Jul-06
13-Aug-06
27-Aug-06
10-Sep-06
24-Sep-06
8-Oct-06
22-Oct-06
5-Nov-06
19-Nov-06
3-Dec-06
17-Dec-06
31-Dec-06
Groundwater
Required Depth (in.)
Precipitation


Dowd Dairy Farm Wetland Mitigation Site
Gauge DD31 (Serial No. S4F5348)
beginning of growing season
83 days of saturation
31 days of saturation
67 days of saturation
end of growing season
Depth to Groundwater (in.)
Precipitation (in.)
Date of measurement
Groundwater
Required Depth (in.)
Precipitation


Dowd Dairy Farm Wetland Mitigation Site
Gauge DD32 (Serial No. S51BB02)
Depth to Groundwater (in.)
Precipitation (in.)
Date of measurement
Groundwater
Required Depth (in.)
Precipitation
beginning of growing season
Gauge failure
33 days of saturation
52 days of saturation
end of growing season
10.0
5.0
0.0
-5.0
-10.0
-15.0
-20.0
-25.0
-30.0
-35.0
-40.0
4.00
3.50
3.00
2.50
2.00
1.50
1.00
0.50
0.00
1-Jan-06
15-Jan-06
29-Jan-06
12-Feb-06
26-Feb-06
12-Mar-06
26-Mar-06
9-Apr-06
23-Apr-06
7-May-06
21-May-06
4-Jun-06
18-Jun-06
2-Jul-06
16-Jul-06
30-Jul-06
13-Aug-06
27-Aug-06
10-Sep-06
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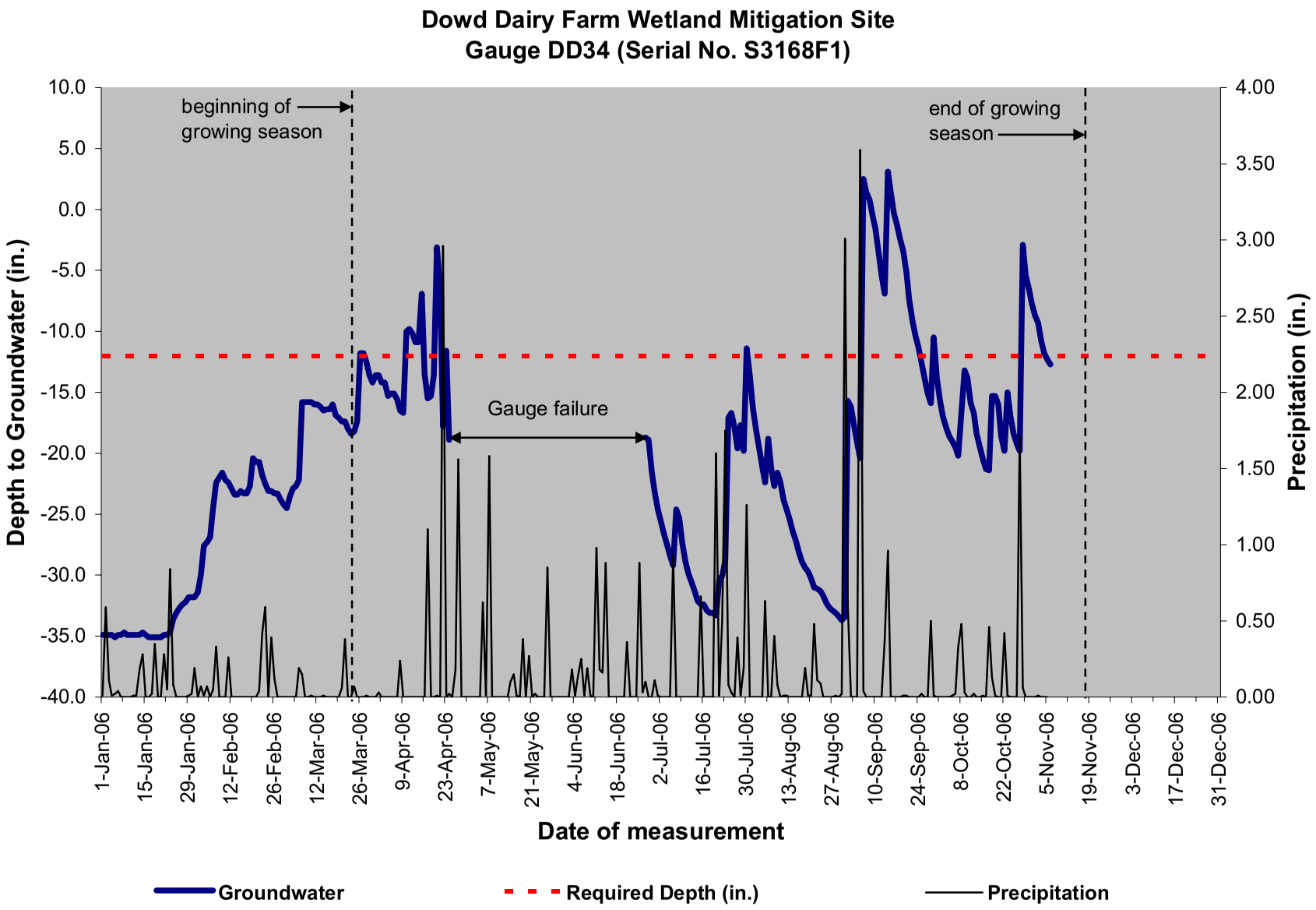
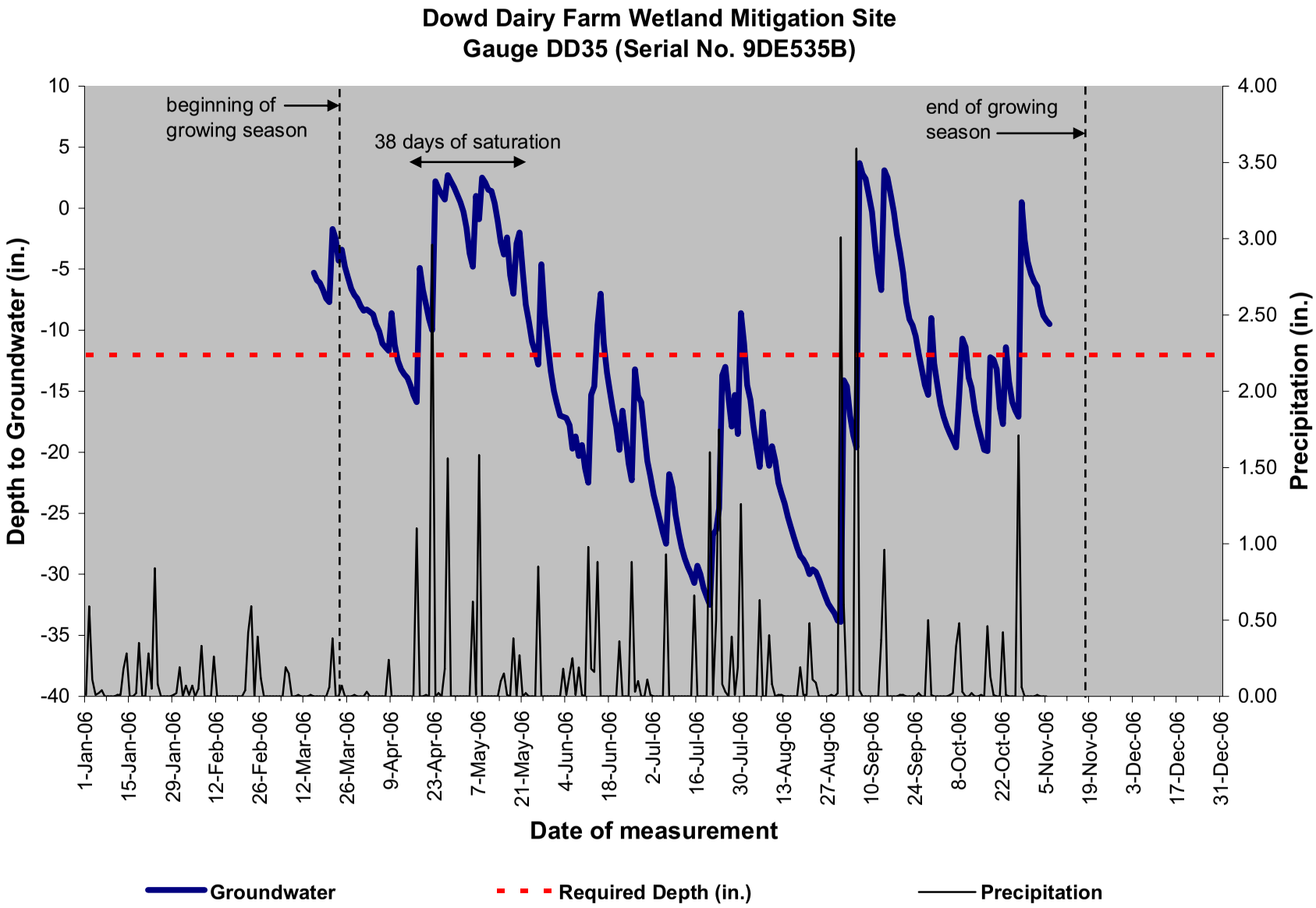
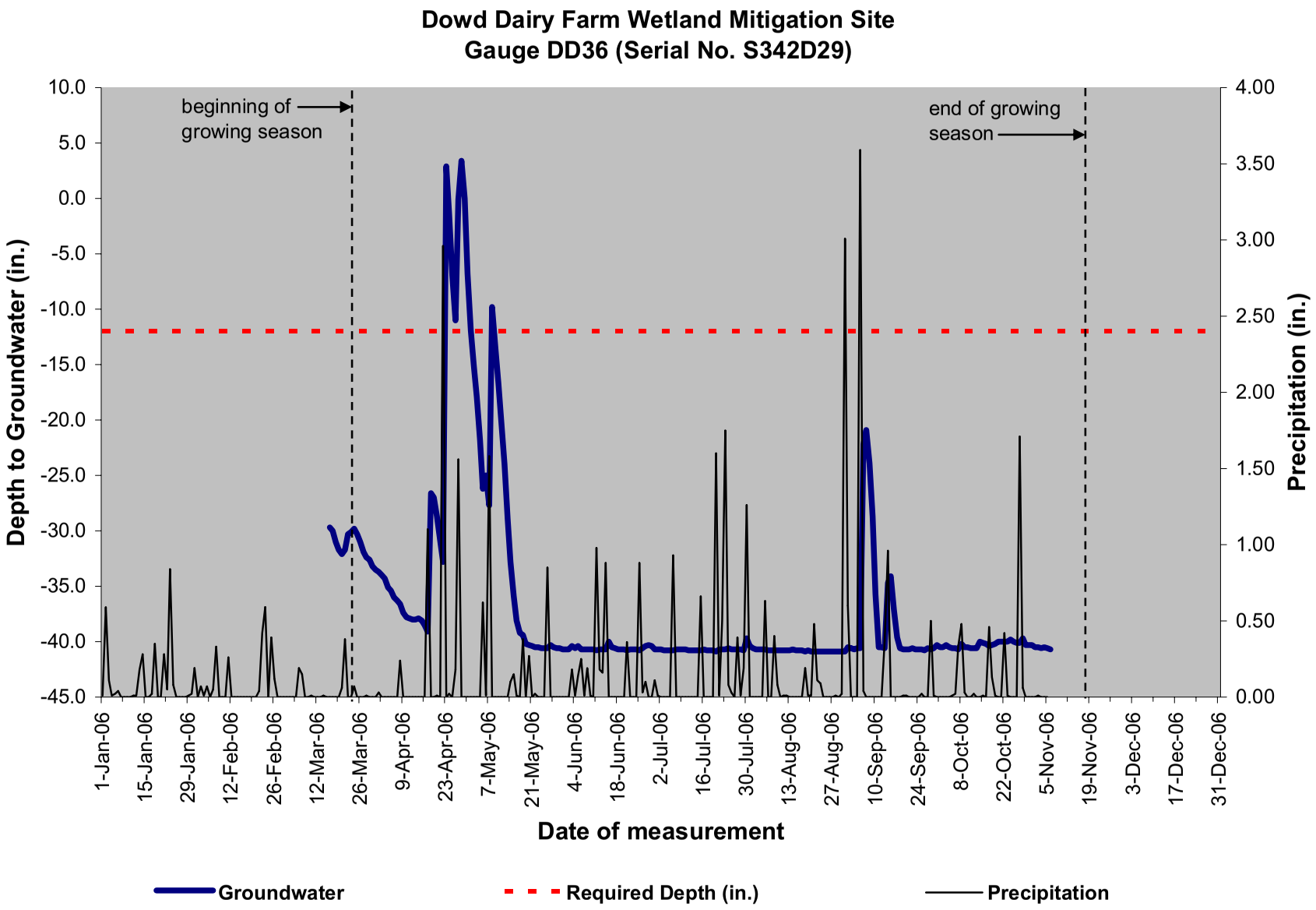
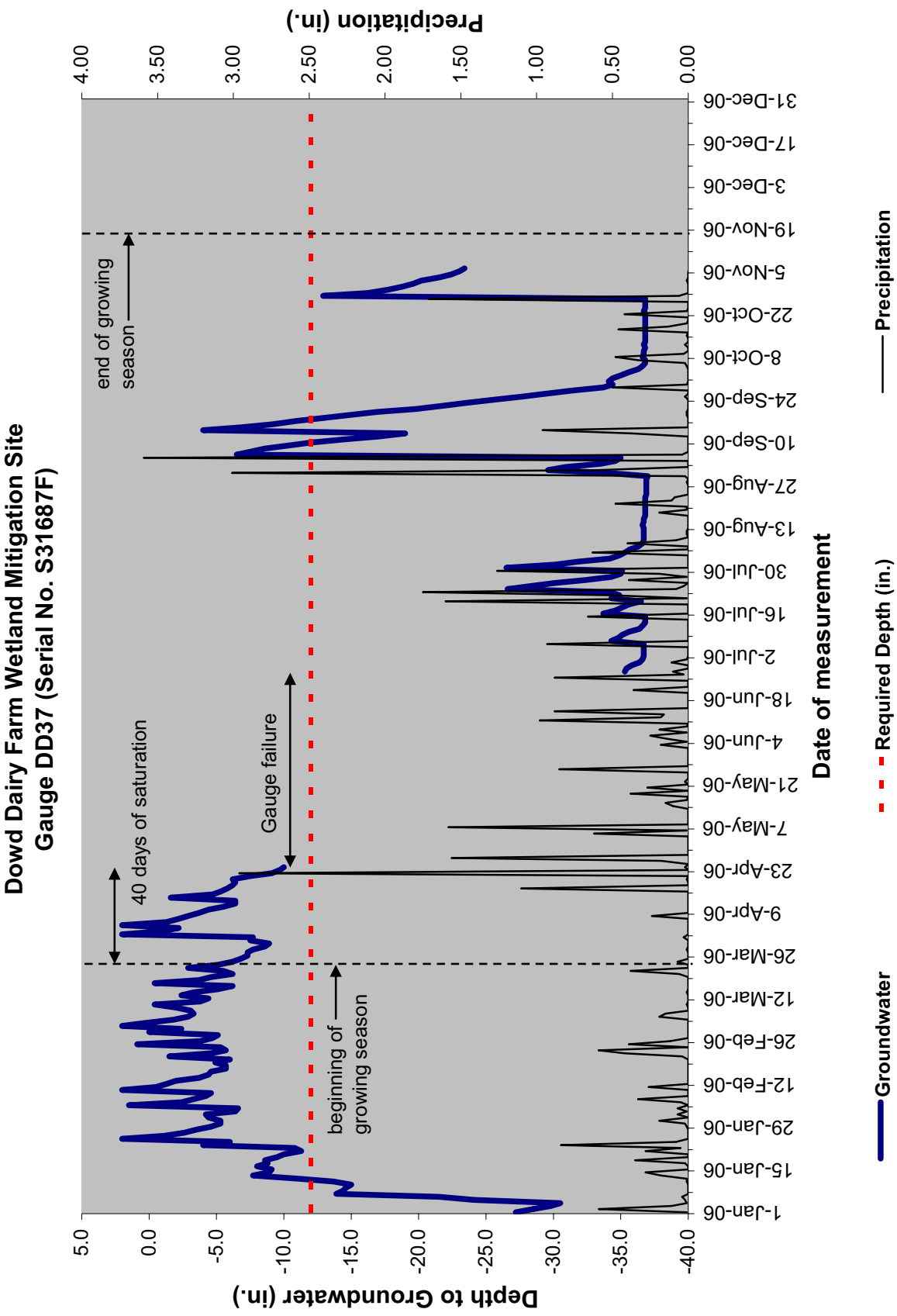
22-Oct-06
5-Nov-06
19-Nov-06
3-Dec-06
17-Dec-06
31-Dec-06


Dowd Dairy Farm Wetland Mitigation Site
Gauge DD34 (Serial No. S3168F1)
beginning of growing season
end of growing season
Gauge failure
Depth to Groundwater (in.)
Precipitation (in.)
Date of measurement
10.0
5.0
0.0
-5.0
-10.0
-15.0
-20.0
-25.0
-30.0
-35.0
-40.0
4.00
3.50
3.00
2.50
2.00
1.50
1.00
0.50
0.00
1-Jan-06
15-Jan-06
29-Jan-06
12-Feb-06
26-Feb-06
12-Mar-06
26-Mar-06
9-Apr-06
23-Apr-06
7-May-06
21-May-06
4-Jun-06
18-Jun-06
2-Jul-06
16-Jul-06
30-Jul-06
13-Aug-06
27-Aug-06
10-Sep-06
24-Sep-06
8-Oct-06
22-Oct-06
5-Nov-06
19-Nov-06
3-Dec-06
17-Dec-06
31-Dec-06
Groundwater
Required Depth (in.)
Precipitation


Dowd Dairy Farm Wetland Mitigation Site
Gauge DD35 (Serial No. 9DE535B)
beginning of growing season
38 days of saturation
end of growing season
Depth to Groundwater (in.)
Precipitation (in.)
Date of measurement
Groundwater
Required Depth (in.)
Precipitation


Dowd Dairy Farm Wetland Mitigation Site
Gauge DD36 (Serial No. S342D29)
beginning of growing season
end of growing season
Depth to Groundwater (in.)
Precipitation (in.)
10.0
5.0
0.0
-5.0
-10.0
-15.0
-20.0
-25.0
-30.0
-35.0
-40.0
-45.0
4.00
3.50
3.00
2.50
2.00
1.50
1.00
0.50
0.00
1-Jan-06
15-Jan-06
29-Jan-06
12-Feb-06
26-Feb-06
12-Mar-06
26-Mar-06
9-Apr-06
23-Apr-06
7-May-06
21-May-06
4-Jun-06
18-Jun-06
2-Jul-06
16-Jul-06
30-Jul-06
13-Aug-06
27-Aug-06
10-Sep-06
24-Sep-06
8-Oct-06
22-Oct-06
5-Nov-06
19-Nov-06
3-Dec-06
17-Dec-06
31-Dec-06
Date of measurement
Groundwater
Required Depth (in.)
Precipitation


Dowd Dairy Farm Wetland Mitigation Site
Gauge DD37 (Serial No. S31687F)
Depth to Groundwater (in.)
Precipitation (in.)
Date of measurement
Groundwater
Required Depth (in.)
Precipitation
beginning of growing season
40 days of saturation
Gauge failure
end of growing season
5.0
0.0
-5.0
-10.0
-15.0
-20.0
-25.0
-30.0
-35.0
-40.0
4.00
3.50
3.00
2.50
2.00
1.50
1.00
0.50
0.00
1-Jan-06
15-Jan-06
29-Jan-06
12-Feb-06
26-Feb-06
12-Mar-06
26-Mar-06
9-Apr-06
23-Apr-06
7-May-06
21-May-06
4-Jun-06
18-Jun-06
2-Jul-06
16-Jul-06
30-Jul-06
13-Aug-06
27-Aug-06
10-Sep-06
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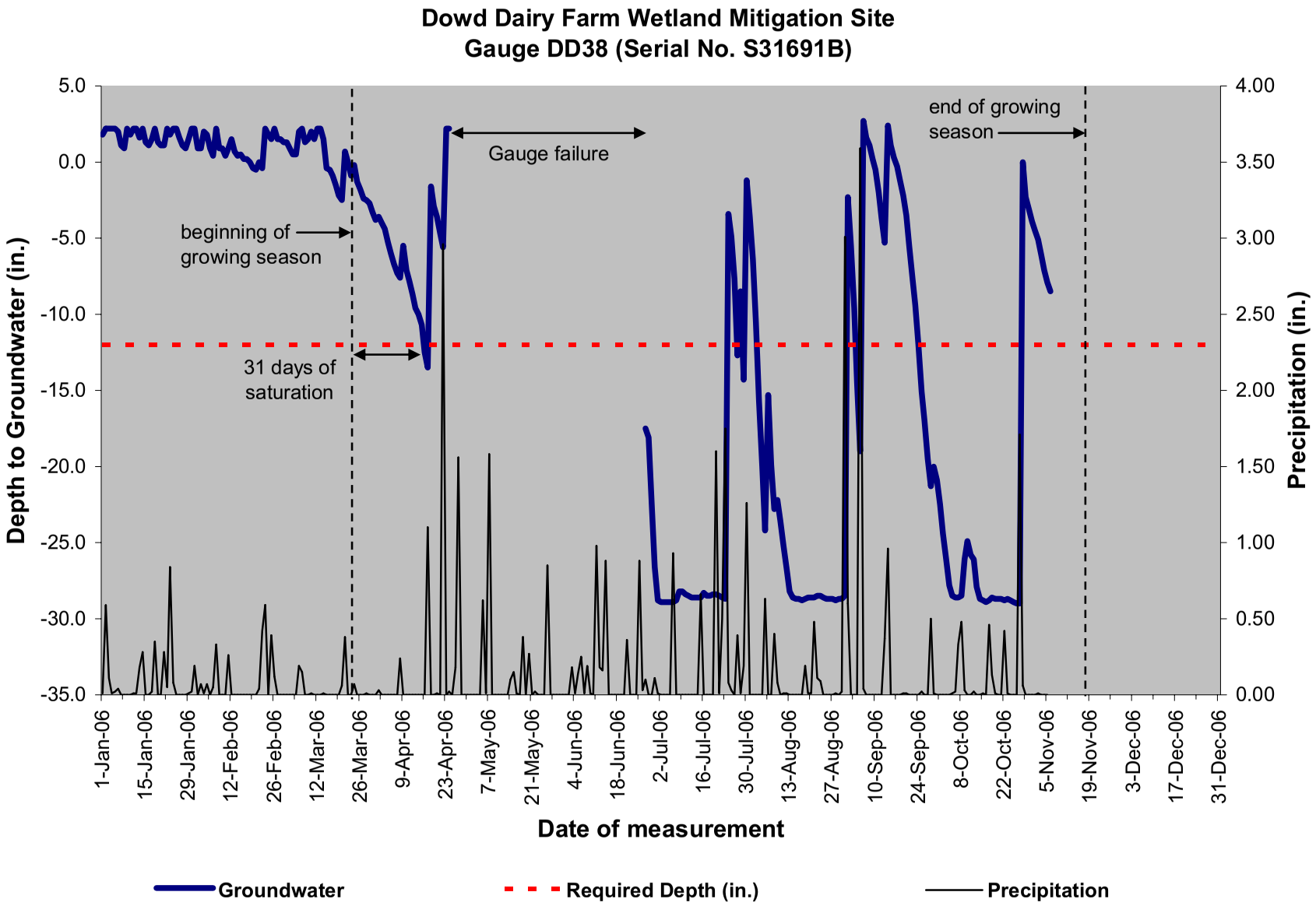
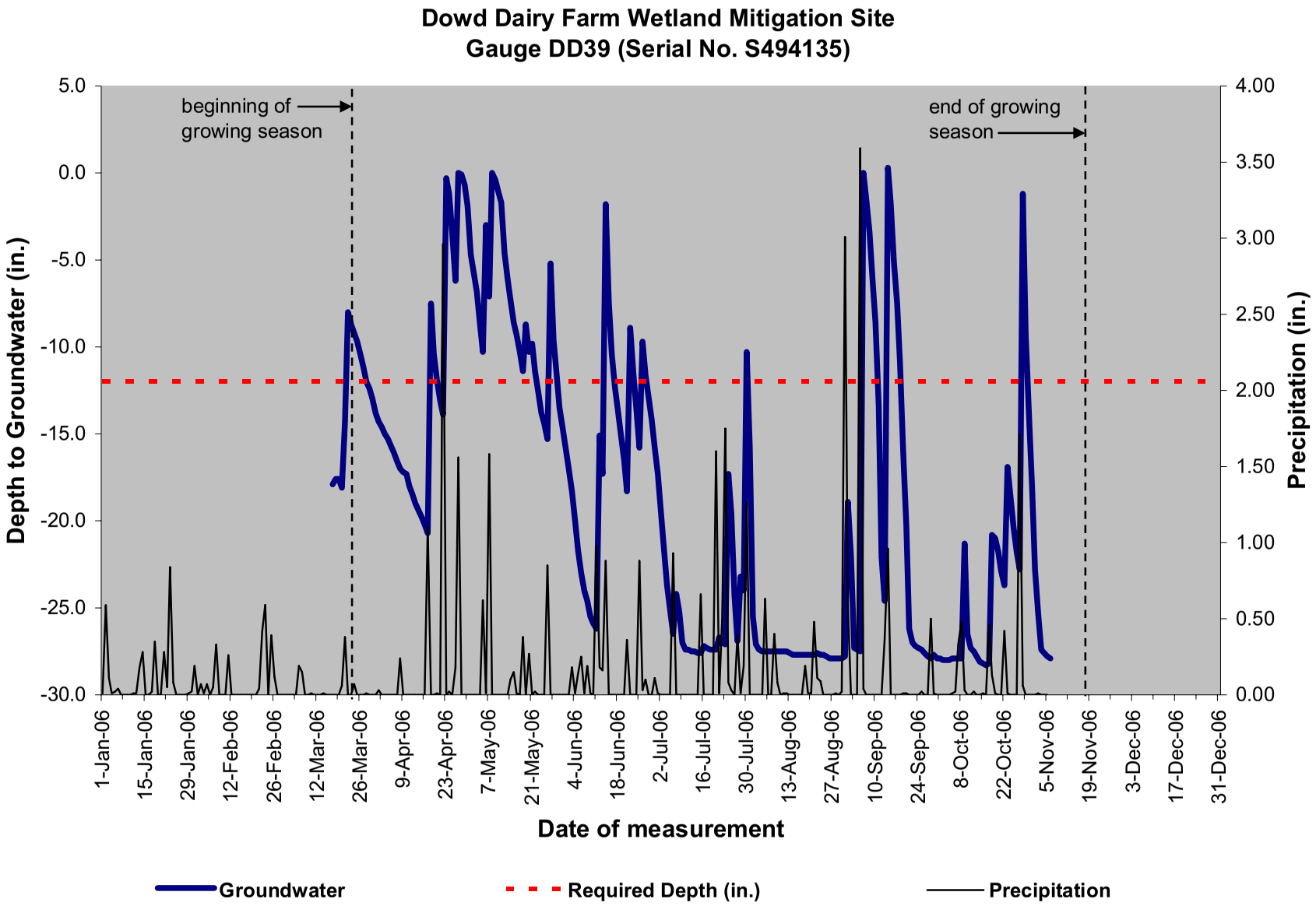
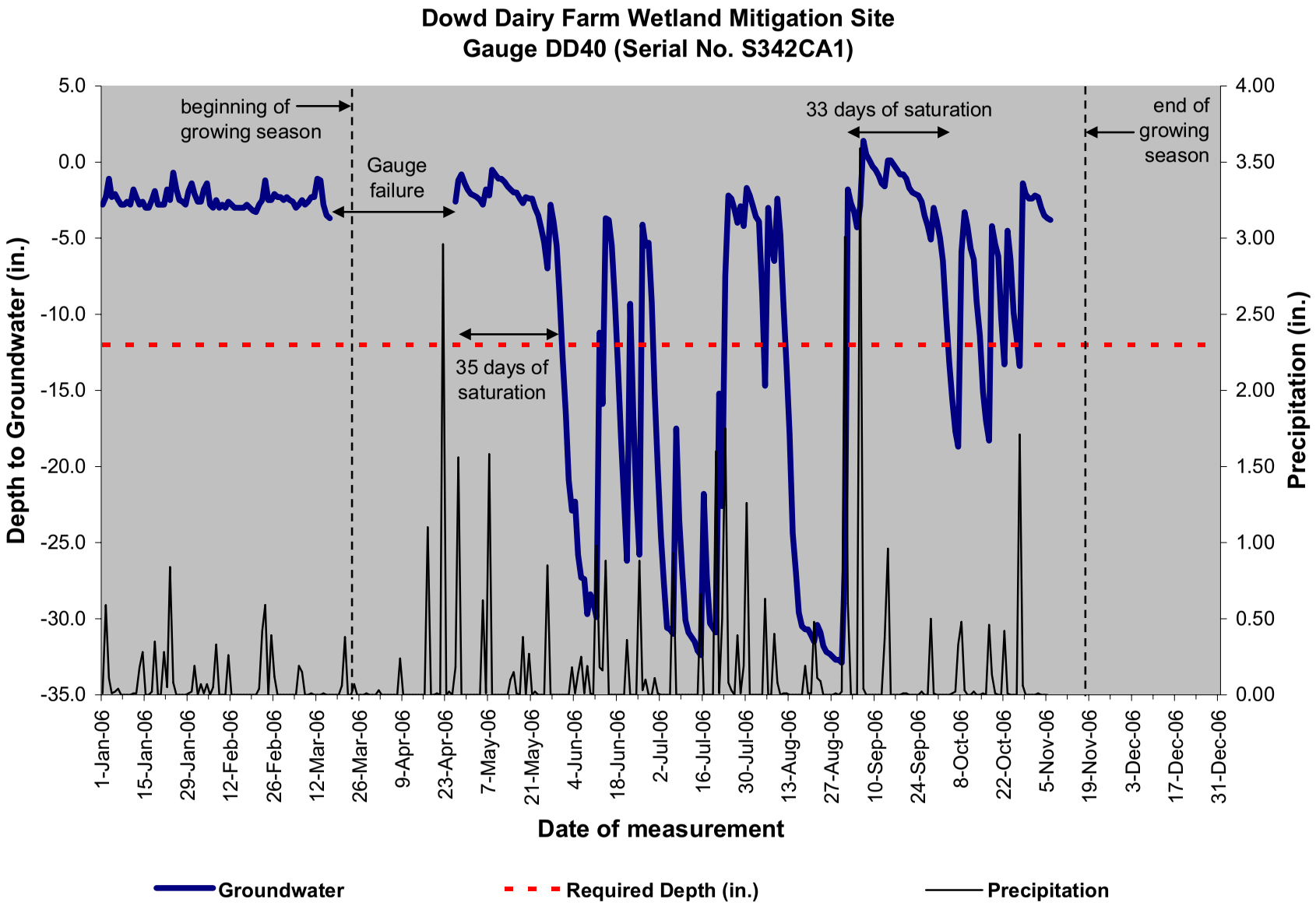
8-Oct-06
22-Oct-06
5-Nov-06
19-Nov-06
3-Dec-06
17-Dec-06
31-Dec-06


Dowd Dairy Farm Wetland Mitigation Site
Gauge DD38 (Serial No. S31691B)
Depth to Groundwater (in.)
Precipitation (in.)
Date of measurement
beginning of growing season
Gauge failure
end of growing season
31 days of saturation
Groundwater
Required Depth (in.)
Precipitation


Dowd Dairy Farm Wetland Mitigation Site
Gauge DD39 (Serial No. S494135)
beginning of growing season
end of growing season
Depth to Groundwater (in.)
Precipitation (in.)
5.0
0.0
-5.0
-10.0
-15.0
-20.0
-25.0
-30.0
4.00
3.50
3.00
2.50
2.00
1.50
1.00
0.50
0.00
1-Jan-06
15-Jan-06
29-Jan-06
12-Feb-06
26-Feb-06
12-Mar-06
26-Mar-06
9-Apr-06
23-Apr-06
7-May-06
21-May-06
4-Jun-06
18-Jun-06
2-Jul-06
16-Jul-06
30-Jul-06
13-Aug-06
27-Aug-06
10-Sep-06
24-Sep-06
8-Oct-06
22-Oct-06
5-Nov-06
19-Nov-06
3-Dec-06
17-Dec-06
31-Dec-06
Date of measurement
Groundwater
Required Depth (in.)
Precipitation


Dowd Dairy Farm Wetland Mitigation Site
Gauge DD40 (Serial No. S342CA1)
beginning of growing season
Gauge failure
35 days of saturation
33 days of saturation
end of growing season
Depth to Groundwater (in.)
Precipitation (in.)
Date of measurement
5.0
0.0
-5.0
-10.0
-15.0
-20.0
-25.0
-30.0
-35.0
4.00
3.50
3.00
2.50
2.00
1.50
1.00
0.50
0.00
1-Jan-06
15-Jan-06
29-Jan-06
12-Feb-06
26-Feb-06
12-Mar-06
26-Mar-06
9-Apr-06
23-Apr-06
7-May-06
21-May-06
4-Jun-06
18-Jun-06
2-Jul-06
16-Jul-06
30-Jul-06
13-Aug-06
27-Aug-06
10-Sep-06
24-Sep-06
8-Oct-06
22-Oct-06
5-Nov-06
19-Nov-06
3-Dec-06
17-Dec-06
31-Dec-06
Groundwater
Required Depth (in.)
Precipitation

APPENDIX B

SITE PHOTOS
PHOTO AND VEGETATION PLOT LOCATION

DOWD DAIRY

Photo Location 1-2 (a).

Photo Location 1-2 (b).

Photo Location 3.

Photo Location 5.

Photo Location 6.

DOWD DAIRY

Photo Location 8.

Photo Location 12.

Photo Locations 13.

Photo Location 14.

DOWD DAIRY

Vegetation Plot 1.

Vegetation Plot 2.

Vegetation Plot 3.

Vegetation Plot 4.

Vegetation Plot 5.

DOWD DAIRY

Vegetation Plot 6.

Vegetation Plot 7.

Vegetation Plot 8.

Vegetation Plot 9.

Vegetation Plot 10.

Vegetation Plot 11.

DOWD DAIRY

Vegetation Plot 12.

Vegetation Plot 13.

Vegetation Plot 14.

Vegetation Plot 15.

Vegetation Plot 16.

Vegetation Plot 17.

DOWD DAIRY

Vegetation Plot 18.

Vegetation Plot 19.

Vegetation Plot 20.

Vegetation Plot 21.

Vegetation Plot 22.

Vegetation Plot 23.

DOWD DAIRY

Vegetation Plot 24.

Vegetation Plot 25.

Vegetation Plot 26.

Vegetation Plot 27.

Vegetation Plot 28.

Vegetation Plot 29.

DOWD DAIRY

Vegetation Plot 30.

Vegetation Plot 31.

Vegetation Plot 32.

Vegetation Plot 33.

Vegetation Plot 34.

Vegetation Plot 35.

DOWD DAIRY

Vegetation Plot 36.

Vegetation Plot 37.

Vegetation Plot 38.

APPENDIX C

ANNUAL HYDROLOGICAL MONITORING DATA SUMMARY (2001 – 2005)

Monitoring Year 1 (2001)

Monitoring Gauge	Percentage of Growing Season at Saturation (< 12" below surface)				Actual	Dates Meeting Success
	< 5%	5 - 8%	8 - 12.5%	> 12.5%		
DD1				X	21.0	
DD2	X				2.9	
DD3		X			7.8	
DD4	X				1.6	
DD5				X	14.0	
DD6				X	18.1	
DD7			X		8.2	
DD8			X		12.3	
DD9				X	17.3	
DD10				X	20.2	
DD12				X	18.1	
DD13	X				1.2	
DD14				X	17.3	
DD15				X	19.3	
DD16				X	17.3	
DD17				X	17.7	
DD18				X	19.8	
DD19				X	15.6	
DD20				X	19.8	
DD21				X	19.3	
DD22			X		11.1	
DD23				X	20.2	
DD24				X	17.3	
DD25				X	19.8	
DD26				X	18.9	
DD27				X	18.9	
DD28				X	19.3	
DD29				X	21.0	
DD30				X	18.5	
DD31				X	17.3	
DD32				X	13.6	
DD34				X	13.2	
DD35				X	14.0	
DD36	X				0.0	
DD37			X		10.7	
DD38				X	14.0	
DD39					-	
DD40					-	

Monitoring Year 2 (2002)

Monitoring Gauge	Percentage of Growing Season at Saturation (< 12" below surface)					Dates Meeting Success
	< 5%	5 - 8%	8 - 12.5%	> 12.5%	Actual	
DD1				X	16.0	March 16 - April 23
DD2	X				2.5	
DD3	X				2.1	
DD4	X				1.6	
DD5				X	15.2	March 16 - April 21
DD6*				X	25.0	March 16 - May 15
DD7*				X	15.6	March 16 - April 22
DD8*				X	16.1	March 16 - April 23
DD9*				X	15.6	March 16 - April 22
DD10				X	18.5	March 16 - April 29
DD12				X	15.2	March 16 - April 21
DD13	X				0.4	
DD14				X	14.8	March 16 - April 20
DD15				X	18.5	March 16 - April 29; August 26 - October 7; October 11 - November 14
DD16				X	18.5	March 16 - April 29
DD17*				X	26.8	March 16 - May 19
DD18*				X	19.8	March 16 - May 2
DD19				X	15.6	March 16 - April 22
DD20*				X	25.5	March 16 - May 16
DD21*				X	19.8	March 16 - May 2
DD22				X	13.6	March 16 - April 17
DD23*				X	17.7	March 16 - April 27
DD24*				X	16.1	March 16 - April 23
DD25*				X	15.6	March 16 - April 22
DD26*				X	25.5	March 16 - May 16
DD27*				X	19.8	March 16 - May 2
DD28				X	16.9	March 16 - April 25
DD29				X	28.4	March 16 - May 23
DD30				X	25.5	March 16 - May 16
DD31				X	16.1	March 16 - April 23
DD32				X	16.5	March 16 - April 24
DD34	X				3.3	
DD35*				X	14.4	March 16 - April 19
DD36	X				0.0	
DD37			X		11.9	March 16 - April 13
DD38*				X	18.5	March 16 - April 29
DD39					-	
DD40					-	

* Gauge malfunctions at the beginning of the growing season. These gauges experienced data loss, but appeared to be inundated or saturated for more than 12 inches.

Monitoring Year 3 (2003)

Monitoring Gauge	Percentage of Growing Season at Saturation (< 12" below surface)				Actual	Dates Meeting Success
	< 5%	5 - 8%	8 - 12.5%	> 12.5%		
DD1+				X	43.0	March 17 - June 28
DD2			X		8.3	March 17 - April 5
DD3		X			7.4	March 17 - April 3
DD4	X				4.1	
DD5+				X	38.4	March 17 - May 17; May 23 - August 23
DD6+				X	69.8	March 17 - September 1
DD7*+				X	14.5	March 17 - April 20
DD8				X	24.0	March 17 - May 13; May 18 - June 23
DD9+				X	42.6	April 25 - August 9; September 14 - November 12
DD10+				X	17.8	July 15 - August 26
DD12+				X	68.2	March 17 - August 28
DD13	X				2.5	
DD14+				X	21.9	May 24 - June 26; July 21 - August 22
DD15+				X	65.7	March 17 - August 22; September 19 - November 13
DD16+				X	66.9	March 17 - August 25
DD17+				X	76.4	March 17 - September 17
DD18+				X	79.3	March 17 - September 24
DD19+				X	41.3	May 23 - August 30
DD20*					-	
DD21+				X	61.5	April 29 - September 25
DD22+				X	20.5	March 17 - April 23; July 2 - August 20
DD23+				X	75.5	March 17 - September 14
DD24+				X	69.7	March 17 - September 1
DD25+				X	44.3	March 17 - June 4; June 7 - September 22
DD26+				X	91.0	March 17 - October 23
DD27+				X	32.0	March 18 - June 3
DD28+				X	100.0	March 17 - November 14
DD29+				X	100.0	March 17 - November 14
DD30+				X	43.0	March 17 - June 28; July 1 - September 1
DD31+				X	73.4	March 17 - September 10
DD32+				X	27.5	March 17 - May 21; July 1 - August 31
DD34				X	23.4	March 17 - May 11
DD35*					-	
DD36*					-	
DD37				X	15.6	March 17 - April 22
DD38				X	24.6	March 17 - May 14; July 3 - August 11
DD39		X			7.8	
DD40		X			7.8	

* Gauges have been replaced or misplaced without proper documentation. Gauge data may not be available.

+ Gauges met the success criterion during an average rainfall month (May, August, and September).

Monitoring Year 4 (2004)

Monitoring Gauge	Percentage of Growing Season at Saturation (< 12" below surface)				Actual	Dates Meeting Success
	< 5%	5 - 8%	8 - 12.5%	> 12.5%		
DD1+				X	42.6	March 16 - June 26
DD2		X			5.0	
DD3		X			5.0	
DD4	X				2.9	
DD5+				X	22.3	April 11 - June 3
DD6+				X	46.3	March 16 - July 5
DD7+				X	16.9	April 11 - May 21
DD8+				X	22.3	April 11 - June 3
DD9+				X	40.9	March 16 - June 22
DD10+				X	47.5	March 16 - July 8; August 30 - October 4
DD12+				X	47.5	March 16 - July 8; August 30 - October 6
DD13	X				2.5	
DD14+				X	33.1	March 16 - June 3
DD15+				X	48.3	March 16 - July 10; August 13 - November 14
DD16+				X	28.1	March 16 - May 22; August 15 - October 18
DD17+				X	51.7	March 16 - July 18
DD18+				X	20.2	August 15 - October 2
DD19+				X	38.4	April 6 - July 7; August 14 - October 3
DD20+				X	45.5	April 6 - July 24; August 12 - October 9
DD21+				X	25.0	March 16 - May 15; August 14 - October 5
DD22			X		10.2	
DD23+				X	24.2	May 1 - June 28
DD24+				X	45.1	March 16 - July 3
DD25+				X	45.9	March 16 - July 5
DD26+				X	36.5	March 16 - June 12
DD27+				X	27.5	March 16 - May 21
DD28+				X	47.1	March 16 - July 8
DD29+				X	29.1	March 25 - June 3
DD30+				X	20.5	March 16 - May 4
DD31+				X	45.5	March 16 - July 4
DD32+				X	32.8	March 16 - June 3
DD34+				X	15.6	April 11 - May 18
DD35			X		8.6	
DD36	X				2.0	
DD37		X			5.3	
DD38+				X	27.0	March 16 - May 20
DD39		X			6.1	
DD40+				X	21.7	April 11 - June 2

+ Gauges met the success criterion during an average rainfall month (May, June, July, September, October, and November).

Monitoring Year 5 (2005)

Monitoring Gauge	Percentage of Growing Season at Saturation (< 12" below surface)				Actual	Dates Meeting Success
	< 5%	5 - 8%	8 - 12.5%	> 12.5%		
DD1*	X				0.0	
DD2	X				3.7	
DD3				X	16.0	March 16 – April 23
DD4+	X				0.0	
DD5+	X				0.0	
DD6+	X				0.0	
DD7~	X				2.9	
DD8				X	26.2	March 16 – May 18
DD9				X	29.1	March 16 – May 25
DD10*	X				0.0	
DD12				X	28.7	March 16 – May 24
DD13	X				2.0	
DD14				X	26.6	March 16 – May 19
DD15				X	63.5	March 16 – June 21; June 26 – August 21
DD16				X	29.5	March 16 – May 26
DD17*	X				0.0	
DD18				X	39.3	March 16 – June 19
DD19				X	29.5	March 16 – May 26
DD20				X	70.1	March 16 – June 24; June 26 - September 3
DD21*	X				0.0	
DD22*	X				0.0	
DD23*	X				0.0	
DD24				X	29.5	March 16 – May 26
DD25~	X				4.1	
DD26*	X				0.0	
DD27+	X				0.0	
DD28				X	45.5	March 16 – May 29; July 14 – August 18
DD29				X	39.3	March 16 – June 19
DD30				X	36.5	March 16 – May 9; May 23 – June 25
DD31				X	29.1	March 16 – May 25; July 14 – August 19
DD32				X	26.2	March 16 – May 18
DD34	X				2.5	
DD35*	X				0.0	
DD36	X				0.8	
DD37				X	17.6	March 16 – April 27
DD38				X	25.8	March 16 – May 17
DD39				X	16.0	March 16 – April 23
DD40				X	20.1	March 16 – May 3

* Gauges have been determined to be non-functional as of July 2005.

+ Gauge data for growing season absent due to gauge failure after July 2005.

~ Gauge data for growing season absent due to gauge failure prior July 2005.

Note: Gauges DD11, and DDRG-2 located near DD29, are rain gauges.

APPENDIX D

ANNUAL VEGETATION MONITORING DATA SUMMARY (2001 – 2005)

Monitoring Year 1 (2001)

ZONE	PLOT	SPECIES															TOTALS		DENSITY
		swamp chestnut oak	laurel oak	willow oak	cherrybark oak	water tupelo	water oak	green ash	overcup oak	southern red oak	pond pine	black gum	black walnut	tulip poplar	bald cypress	Atlantic white cedar	Year 1	Initial Planting	(trees/acre)
1	1	0	0	7	1	0	0	6	10	0	0	0	0	0	0	0	24	37	480
	3	6	1	4	0	1	0	0	3	0	0	0	0	0	0	0	15	40	300
	4	2	2	2	0	1	0	0	17	0	0	0	0	0	0	0	24	28	480
	5	0	3	3	1	4	0	13	7	0	0	0	0	0	0	0	31	39	620
	8	4	1	3	1	5	0	8	0	0	0	0	0	0	0	0	22	38	440
	14	5	1	6	10	0	0	0	0	0	0	0	0	0	0	0	22	39	440
	15	3	4	10	4	0	0	0	1	0	0	0	0	0	0	0	22	32	440
	17	14	3	1	9	3	0	0	1	0	0	0	0	0	0	0	31	41	620
	19	4	1	2	0	0	0	0	3	0	0	0	0	0	0	0	10	35	200
	28	3	0	9	0	3	0	7	4	0	0	0	0	0	0	0	26	37	520
	29	5	1	1	0	0	0	6	18	0	0	0	0	0	0	0	31	41	620
	30	0	3	9	0	0	0	18	2	0	0	0	0	0	0	0	32	39	640
	31	14	0	0	1	1	0	6	4	0	0	0	0	0	0	0	26	37	520
	32	7	4	4	1	1	0	8	3	0	0	0	0	0	0	0	28	38	560
	33	0	4	4	5	0	0	25	8	0	0	0	0	0	0	0	46	44	920
	34	7	1	1	1	7	0	7	8	0	0	0	0	0	0	0	32	39	640
Zone Average																			528
2	2	0	0	1	3	0	0	0	20	0	0	0	0	1	0	0	25	25	500
	12	0	0	4	0	0	2	0	0	7	0	0	0	0	0	0	13	26	260
Zone Average																			380
3	6	0	4	1	4	0	1	2	2	0	0	0	0	0	0	0	14	30	280
	7	0	0	0	1	0	0	9	2	0	0	0	0	0	19	0	31	40	620
	9	0	0	3	1	0	0	0	0	0	0	0	0	0	10	8	22	34	440
	10	0	3	0	5	0	2	0	10	0	0	0	0	0	12	0	32	44	640
	11	0	1	15	1	0	0	0	3	0	0	0	0	0	7	1	28	28	560
	20	0	1	1	0	0	0	10	0	0	0	0	0	0	0	0	12	37	240
	24	0	0	5	4	0	0	3	1	0	0	0	0	0	4	5	22	34	440
	25	0	1	6	6	0	0	7	5	0	0	0	0	0	1	5	31	31	620
	26	0	0	2	0	0	0	17	1	0	0	0	0	0	6	5	31	35	620
	27	0	1	11	1	0	0	1	9	0	0	0	0	0	0	4	27	36	540
	35	0	0	0	2	4	0	6	1	0	0	0	0	0	0	2	15	37	300
	36	0	6	5	0	0	0	2	0	0	0	0	0	0	2	0	15	36	300
Zone Average																			467

Monitoring Year 1 (2001) continued

ZONE	PLOT	SPECIES															TOTALS		DENSITY
		swamp chestnut oak	laurel oak	willow oak	cherrybark oak	water tupelo	water oak	green ash	overcup oak	southern red oak	pond pine	black gum	black walnut	tulip poplar	bald cypress	Atlantic white cedar	Year 1	Initial Planting	(trees/acre)
4	16	3	0	0	3	0	0	0	5	0	0	0	0	0	12	0	23	31	460
	18	6	0	3	0	0	0	0	1	0	0	0	0	2	9	0	21	35	420
Zone Average																			440
5	13	0	2	2	5	0	0	5	3	0	0	0	0	0	0	0	17	24	340
	21	0	0	4	0	0	0	0	0	0	10	0	0	0	15	0	29	29	580
	22	9	0	3	0	3	0	0	0	0	1	0	0	0	8	3	27	27	540
	23	1	0	9	0	2	0	0	0	0	6	0	0	0	12	0	30	38	600
	37	13	0	8	0	8	0	0	0	0	5	0	0	0	13	0	47	47	940
	38	21	0	9	0	0	0	0	4	0	0	13	0	1	2	0	50	50	1000
Zone Average																			667
Total Average for all Zones																			496

Monitoring Year 2 (2002)

ZONE	PLOT	SPECIES															TOTALS		DENSITY
		swamp chestnut oak	laurel oak	willow oak	cherrybark oak	water tupelo	water oak	green ash	overcup oak	southern red oak	pond pine	black gum	black walnut	tulip poplar	bald cypress	Atlantic white cedar	Year 2	Initial Planting	(trees/acre)
1	1	0	0	8	1	0	0	6	10	0	0	0	0	0	0	0	25	37	500
	3	7	1	6	0	1	0	0	3	0	0	0	0	0	0	0	18	40	360
	4	2	2	2	0	1	0	1	18	0	0	0	0	0	0	0	26	28	520
	5	0	6	3	0	4	1	9	12	0	0	0	0	0	0	0	35	39	700
	8	4	1	3	1	5	0	8	0	0	0	0	0	0	0	0	22	38	440
	14	5	3	6	8	0	0	0	0	0	0	0	0	0	0	0	22	39	440
	15	3	4	10	4	1	0	0	0	0	0	0	0	0	0	0	22	32	440
	17	13	3	1	11	0	0	0	0	0	0	0	0	0	0	0	28	41	560
	19	4	2	2	0	1	0	0	3	0	0	0	0	0	0	0	12	35	240
	28	3	0	9	0	3	0	7	4	0	0	0	0	0	0	0	26	37	520
	29	5	1	1	0	0	0	6	19	0	0	0	0	0	0	0	32	41	640
	30	0	3	10	0	0	0	18	2	0	0	0	0	0	0	0	33	39	660
	31	15	0	0	1	2	0	6	5	0	0	0	0	0	0	0	29	37	580
	32	7	0	5	0	2	0	8	3	0	0	0	0	0	0	0	25	38	500
	33	0	5	0	1	0	25	13	0	0	0	0	0	0	0	0	44	44	880
	34	7	3	1	0	6	0	6	10	0	0	0	0	0	0	0	33	39	660
Zone Average																			540
2	2	0	0	1	0	0	0	0	21	1	0	0	1	1	0	0	25	25	500
	12	0	0	4	0	0	1	0	0	9	0	0	0	0	0	0	14	26	280
Zone Average																			390
3	6	0	5	1	4	0	1	1	2	0	0	0	0	0	8	7	29	30	580
	7	0	0	0	1	0	0	10	2	0	0	0	0	0	19	0	32	40	640
	9	0	0	3	1	0	0	0	0	0	0	0	0	0	10	7	21	34	420
	10	0	5	0	2	0	2	0	10	0	0	0	0	0	12	1	32	44	640
	11	0	2	13	1	0	0	0	4	0	0	0	0	0	7	1	28	28	560
	20	0	1	1	0	0	0	10	0	0	0	0	0	0	0	0	12	37	240
	24	0	1	5	4	0	0	3	1	0	0	0	0	0	4	5	23	34	460
	25	0	1	6	6	0	0	7	5	0	0	0	0	0	1	5	31	31	620
	26	0	0	2	0	0	0	19	1	0	0	0	0	0	6	5	33	35	660
	27	0	1	4	1	0	0	1	9	0	0	0	0	0	4	0	20	36	400
	35	0	0	0	1	3	0	6	4	0	0	0	0	0	1	0	15	37	300
	36	0	3	5	0	0	0	3	0	0	0	0	0	0	2	0	13	36	260
Zone Average																			482

Monitoring Year 2 (2002) continued

ZONE	PLOT	SPECIES															TOTALS		DENSITY
		swamp chestnut oak	laurel oak	willow oak	cherrybark oak	water tupelo	water oak	green ash	overcup oak	southern red oak	pond pine	black gum	black walnut	tulip poplar	bald cypress	Atlantic white cedar	Year 2	Initial Planting	(trees/acre)
4	16	3	0	0	3	0	0	0	6	0	0	0	0	0	12	0	24	31	480
	18	6	3	1	0	0	0	0	1	0	0	0	0	2	9	0	22	35	440
Zone Average																			460
5	13	0	3	1	6	0	1	4	3	0	0	0	0	0	0	0	18	24	360
	21	0	0	6	0	0	0	0	0	0	10	0	0	0	13	0	29	29	580
	22	8	0	3	0	3	0	0	0	0	1	0	0	0	8	2	25	27	500
	23	1	0	9	0	2	0	0	0	0	6	0	0	0	12	0	30	38	600
	37	12	0	9	0	4	0	0	0	0	6	0	0	0	15	0	46	47	920
	38	21	0	12	0	0	0	0	4	0	1	8	0	1	3	0	50	50	1000
Zone Average																			660
Total Average for all Zones																			506

Monitoring Year 3 (2003)

ZONE	PLOT	SPECIES															TOTALS		DENSITY
		swamp chestnut oak	laurel oak	willow oak	cherrybark oak	water tupelo	water oak	green ash	overcup oak	southern red oak	pond pine	black gum	black walnut	tulip poplar	bald cypress	Atlantic white cedar	Year 3	Initial Planting	(trees/acre)
1	1	0	0	8	1	0	0	6	10	0	0	0	0	0	0	0	25	37	500
	3	5	0	5	0	1	0	0	4	0	0	0	0	0	0	0	15	40	300
	4	3	1	2	0	2	0	1	19	0	0	0	0	0	0	0	28	28	560
	5	0	5	3	0	4	1	9	12	0	0	0	0	0	0	0	34	39	680
	8	4	1	3	0	4	0	9	0	0	0	0	0	0	0	0	21	38	420
	14	5	3	6	9	0	0	0	0	0	0	0	0	0	0	0	23	39	460
	15	2	2	10	1	1	0	0	0	0	0	0	0	0	0	0	16	32	320
	17	14	3	0	7	0	0	0	1	0	0	0	0	0	0	0	25	41	500
	19	4	2	2	0	1	0	0	2	0	0	0	0	0	0	0	11	35	220
	28	3	0	10	0	3	0	8	3	0	0	0	0	0	0	0	27	37	540
	29	4	2	2	0	0	0	6	19	0	0	0	0	0	0	0	33	41	660
	30	0	3	10	0	0	0	18	2	0	0	0	0	0	0	0	33	39	660
	31	14	0	0	1	2	0	5	5	0	0	0	0	0	0	0	27	37	540
	32	6	0	5	0	2	0	9	3	0	0	0	0	0	0	0	25	38	500
	33	0	5	0	1	0	0	24	14	0	0	0	0	0	0	0	44	44	880
	34	7	3	1	0	6	0	6	10	0	0	0	0	0	0	0	33	39	660
Zone Average																			525
2	2	0	0	1	1	0	0	0	21	0	0	0	1	1	0	0	25	25	500
	12	0	0	4	0	0	1	0	0	9	0	0	0	0	0	0	14	26	280
Zone Average																			390
3	6	0	5	1	5	0	1	2	3	0	0	0	0	0	8	5	30	30	600
	7	0	0	0	0	0	0	10	2	0	0	0	0	0	20	0	32	40	640
	9	0	0	4	0	0	0	0	0	0	0	0	0	0	10	5	19	34	380
	10	0	5	0	3	0	2	0	10	0	0	0	0	0	12	1	33	44	660
	11	0	2	12	2	0	0	0	4	0	0	0	0	0	7	1	28	28	560
	20	0	1	2	0	0	0	10	0	0	0	0	0	0	0	0	13	37	260
	24	0	1	4	1	0	0	3	0	0	0	0	0	0	4	5	18	34	360
	25	0	0	6	6	0	0	6	6	0	0	0	0	0	1	6	31	31	620
	26	0	0	2	0	0	0	20	1	0	0	0	0	0	6	5	34	35	680
	27	0	1	6	0	0	0	1	10	0	0	0	0	0	4	0	22	36	440
	35	0	0	0	1	3	0	6	3	0	0	0	0	0	1	0	14	37	280
	36	0	4	6	1	0	0	3	0	0	0	0	0	0	2	0	16	36	320
Zone Average																			483

Monitoring Year 3 (2003) continued

ZONE	PLOT	SPECIES															TOTALS		DENSITY
		swamp chestnut oak	laurel oak	willow oak	cherrybark oak	water tupelo	water oak	green ash	overcup oak	southern red oak	pond pine	black gum	black walnut	tulip poplar	bald cypress	Atlantic white cedar	Year 3	Initial Planting	(trees/acre)
4	16	3	0	0	1	0	0	0	5	0	0	0	0	0	12	0	21	31	420
	18	7	3	1	0	0	0	0	1	0	0	0	0	1	9	0	22	35	440
Zone Average																			430
5	13	10	2	1	7	0	0	4	3	0	0	0	0	0	0	0	27	24	540
	21	1	0	6	0	0	0	0	0	0	10	0	0	0	13	0	30	29	600
	22	6	0	2	0	4	0	0	0	0	1	0	0	0	8	2	23	27	460
	23	6	0	9	0	5	0	0	0	0	6	0	0	0	13	0	39	38	780
	37	2	0	9	0	5	0	0	0	0	6	0	0	0	15	0	37	47	740
	38	21	0	12	0	0	0	0	4	0	2	8	0	0	3	0	50	50	1000
Zone Average																			687
Total Average for all Zones																			503

Monitoring Year 4 (2004)

ZONE	PLOT	SPECIES															TOTALS		DENSITY
		swamp chestnut oak	laurel oak	willow oak	cherrybark oak	water tupelo	water oak	green ash	overcup oak	southern red oak	pond pine	black gum	black walnut	tulip poplar	bald cypress	Atlantic white cedar	Year 4	Initial Planting	(trees/acre)
1	1	0	0	8	2	0	0	6	10	0	0	0	0	0	0	0	26	37	520
	3	4	0	6	0	1	0	0	3	0	0	0	0	0	0	0	14	40	280
	4	3	1	3	0	2	0	1	18	0	0	0	0	0	0	0	28	28	560
	5	0	6	3	0	4	1	9	12	0	0	0	0	0	0	0	35	39	700
	8	4	1	3	0	4	0	9	0	0	0	0	0	0	0	0	21	38	420
	14	5	3	6	9	0	0	0	0	0	0	0	0	0	0	0	23	39	460
	15	1	2	10	0	1	0	0	0	0	0	0	0	0	0	0	14	32	280
	17	13	3	1	6	0	0	0	1	0	0	0	0	0	0	0	24	41	480
	19	4	2	2	0	1	0	0	1	0	0	0	0	0	0	0	10	35	200
	28	2	0	10	0	3	0	8	4	0	0	0	0	0	0	0	27	37	540
	29	4	2	2	0	0	0	5	18	0	0	0	0	0	0	0	31	41	620
	30	0	3	10	0	0	0	18	2	0	0	0	0	0	0	0	33	39	660
	31	16	0	0	1	1	0	5	5	0	0	0	0	0	0	0	28	37	560
	32	6	0	3	0	1	0	10	3	0	0	0	0	0	0	0	23	38	460
	33	0	3	0	4	0	0	23	14	0	0	0	0	0	0	0	44	44	880
	34	4	3	1	0	5	0	7	10	0	0	0	0	0	0	0	30	39	600
Zone Average																			514
2	2	0	0	1	1	0	0	0	21	0	0	0	1	1	0	0	25	25	500
	12	0	0	4	0	0	1	0	0	9	0	0	0	0	0	0	14	26	280
Zone Average																			390
3	6	0	2	1	5	0	1	2	4	0	0	0	0	0	8	7	30	30	600
	7	0	0	0	0	0	0	10	3	0	0	0	0	0	20	0	33	40	660
	9	0	0	4	0	0	0	0	0	0	0	0	0	0	10	4	18	34	360
	10	0	5	0	3	0	2	0	10	0	0	0	0	0	12	1	33	44	660
	11	0	2	12	2	0	0	0	4	0	0	0	0	0	7	1	28	28	560
	20	0	1	2	0	0	0	10	0	0	0	0	0	0	0	0	13	37	260
	24	0	1	4	0	0	0	3	0	0	0	0	0	0	4	0	12	34	240
	25	0	0	4	5	0	0	6	5	0	0	0	0	0	1	6	27	31	540
	26	0	0	2	0	0	0	20	1	0	0	0	0	0	6	2	31	35	620
	27	0	1	5	0	0	0	1	10	0	0	0	0	0	4	0	21	36	420
	35	0	0	0	1	4	0	6	2	0	0	0	0	0	1	0	14	37	280
	36	0	4	5	1	0	0	3	0	0	0	0	0	0	2	0	15	36	300
Zone Average																			458

Monitoring Year 4 (2004) continued

ZONE	PLOT	SPECIES															TOTALS		DENSITY
		swamp chestnut oak	laurel oak	willow oak	cherrybark oak	water tupelo	water oak	green ash	overcup oak	southern red oak	pond pine	black gum	black walnut	tulip poplar	bald cypress	Atlantic white cedar	Year 4	Initial Planting	(trees/acre)
4	16	3	0	0	1	0	0	0	5	0	0	0	0	0	12	0	21	31	420
	18	7	3	1	0	0	0	0	2	0	0	0	0	0	9	0	22	35	440
Zone Average																			430
5	13	0	1	1	5	0	0	4	3	0	0	0	0	0	0	0	14	24	280
	21	0	0	4	0	0	0	0	0	0	6	0	0	0	16	0	26	29	520
	22	2	0	2	0	3	0	0	0	0	0	0	0	0	8	0	15	27	300
	23	1	0	9	0	5	0	0	0	0	5	0	0	0	13	0	33	38	660
	37	12	0	10	0	4	0	0	0	0	2	0	0	0	15	0	43	47	860
	38	21	0	12	0	0	0	0	4	0	2	8	0	0	3	0	50	50	1000
Zone Average																			603
Total Average for all Zones																			479

Monitoring Year 5 (2005)

ZONE	PLOT	SPECIES [1]												TOTALS		DENSITY
		swamp chestnut oak	laurel oak	willow oak	cherrybark oak	water tupelo	water oak	green ash	overcup oak	pond pine	black gum	bald cypress	Atlantic white cedar	Year 5	Initial Planting	(trees/acre)
1	1			8	1			6	11					26	37	520
	3	4		6		1			3					14	40	280
	4	3	3	1				1	19					27	28	540
	5		7	3	2	2	1	12	10					37	39	740
	8	4	1	3		3		9						20	38	400
	14	5	2	7	9									23	39	460
	15	1	3	9										13	32	260
	17	13	1	1	6		1		1					23	41	460
	19	4	1	1		1			2					9	35	180
	28	2		10		3		7	4					26	37	520
	29	4	2	1				5	18					30	41	600
	30		5					18	2					25	39	500
	31	15		8	1	1		6	5					36	37	720
	32	5		3	1	1		14	2					26	38	520
	33		1	2	9	4		25	3					44	44	880
	34	4	1			2		5	10					22	39	440
Zone Average																501
2	2			1	1				21					23	25	460
	12		1	2	9		1							13	26	260
Zone Average																360
3	6		2	2	6		2	2	2			8	7	31	30	620
	7							9	2			18		29	40	580
	9		2	2								10	4	18	34	360
	10		6	2	3		2		9			10	1	33	44	660
	11		1	12	1				4			7	1	26	28	520
	20			3				10						13	37	260
	24		1	4				2				4		11	34	220
	25			3	4			6	4			1	4	22	31	440
	26			2				20	1			6	2	31	35	620
	27		2	3				1	10			4		20	36	400
	35				2	3		6	1					12	37	240
	36		4	5	1			4				2		16	36	320
Zone Average																437

Monitoring Year 5 (2005) continued

ZONE	PLOT	SPECIES [1]												TOTALS		DENSITY
		swamp chestnut oak	laurel oak	willow oak	cherrybark oak	water tupelo	water oak	green ash	overcup oak	pond pine	black gum	bald cypress	Atlantic white cedar	Year 5	Initial Planting	(trees/acre)
4	16	4							6			12		22	31	440
	18	7	3	1					2			9		22	35	440
Zone Average																440
5	13		1		3			4	3					11	24	220
	21			4						4		16		24	29	480
	22	2		2		3						8		15	27	300
	23	1		9		4				5		13		32	38	640
	37	23		4						2	2	8		39	47	780
	38 [2]	21		12					4	2	8	3		50	50	1000
Zone Average																570
Total Average for all Zones																462

[1] white oak, longleaf pine, black walnut, and tulip poplar were not observed during year 2005 monitoring activities and are not included in this table

[2] vegetation plot 38 could not be located; data presented reflects year 4 values.