RESTORATION PLAN

DANIELS FARM WETLAND RESTORATION SITE

Franklin County, North Carolina

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EXECUTIVE SUMMARY

The Daniels Farm Wetland Restoration Site is located within the Tar-Pamlico River Watershed (USGS Hydrologic Unit 03020101 and North Carolina Division of Water Quality (NCDWQ) sub-basin 04-00-70). The watershed is located in the Raleigh Belt of the Piedmont physiographic region. The local watershed drains approximately 101 acres consisting of 56 acres of agriculture, 39 acres of forest and 6 acres of urban land uses.

The site is located approximately 1260 feet north of Egypt Church Road (SR 1604) along the western property line of the Clyde Daniels Farm, south-southeast of Louisburg in Franklin County, North Carolina. The 33.93 acres that comprise the site are situated on portions of Farm Tract T3792, Field 13 (25.4 acres) and Farm Tract T3791, Field 1 (20.6 acres). Current land use/land cover is agriculture, with mixed deciduous and evergreen forest around the perimeter to the west and east, and agricultural farm fields adjacent to the site to the north and south.

Historical site conditions were reviewed to understand the chronology of land use at the site and to assist in the development of an appropriate restoration strategy. Aerial photographs of the site were obtained from the U.S. Department of Agriculture, Natural Resources Conservation Service District Office in Franklin County for the years 1938, 1955, 1973, 1982, and 2000. Based on the historical aerial photographs reviewed, it appears that the Daniels Farm Wetland Restoration Site was forested until 1982, when it was cleared and utilized for agriculture. There is no visible evidence of other mass disturbance such as filling or mining on the site in any of the reviewed photographs.

A detailed soils investigation was conducted to determine the extent and distribution of the hydric soils on the site and to classify the predominate soils identified to the soil series level. The Franklin County Soil Survey classified the soils underlying the site as Altavista sandy loam. However, detailed soil mapping by KCI soil scientists identified the following primary soil series on the property: Altavista (Fine-loamy, mixed, semiactive, thermic Aquic Hapludults), Augusta (Fine-loamy, mixed, semiactive, thermic Aeric Endoaquults), Roanoke (Fine, mixed, semiactive, thermic Typic Endoaquults), and Toisnot (Coarse-loamy, siliceous, semiactive, thermic Typic Fragiaquults). The Roanoke and Toisnot soil series are listed as hydric soils in Franklin County because of saturation for a significant period during the growing season. Altavista and Augusta soils are not considered hydric but have inclusions of hydric soils within the soil mapping unit. The Roanoke and Toisnot hydric soils comprise approximately 89 percent of the site, while Altavista, Augusta and other non-hydric inclusions cover approximately 11 percent of the site.

Site hydrology was evaluated during field investigations and by applying a water budget analysis to the site. The hydrologic source for the site is based on high groundwater, overland surface flow, and groundwater seeps and springs; no natural streams are found in the proposed restoration area. An apparent topographic divide near the southern end of the site directs water to the western and northern sides of the site to existing drainage ditches that flow east. Water directed to the other side of the topographic divide flows toward the eastern and northern sides of the site, where there are smaller drainage features (grassed waterways) that direct water downslope to the north and offsite toward constructed ponds to the east.

Much of the water on the site is attributed to a relatively high water table and numerous groundwater seeps located in the central and eastern portions of the site. Several seeps or springs are found upslope of the project area, indicating groundwater discharge is prominent in the local vicinity seasonally from November to March. The site groundwater was evaluated by monitoring the water level with eight on-site Solinst Levelogger gages, a barometric control gage, and a Levelogger gage.

Both surface water and groundwater are removed from the site via grassed waterways and ditches. A significant portion of the surface water draining to the site is diverted around and away from the site via a ditched channel and a farm drainage ditch, which run parallel to each other along the western edge of the site, and eventually drain to the Tar River north of the site. Additionally, grassed waterways have been constructed to channel water away from groundwater seeps, draining the central and eastern parts of the site. The farm drainage ditch flows north then east into a lateral drainage ditch that bisects the site. The lateral ditch flows from the western site boundary to the eastern boundary, and then continues offsite.

Existing site hydrology was modeled by developing an annual water budget that calculates water inputs and outputs, and the change in storage on a monthly time step. The hydrographs for the average, dry, and wet years show a similar pattern of seasonal water table levels. Water table recharge occurs during the late fall and winter months until a rapid water table draw down occurs as PET rates increase in the spring. During the summer, the water budget model shows the existing site is unsaturated within the upper 36 inches of soil. The proposed conditions water budget shows the annual hydrographs for the same three climatic years, reflecting dry, average, and wet conditions. Without the estimated groundwater loss from the ditch/drainage network, the water table recharges earlier in the fall, maintains a shallower soil depth for a greater duration, and remains within 12 inches of the soil surface for a greater proportion of the growing season.

The clearing, draining, and conversion of the site to agriculture has altered its natural wetland ecological function and diminished its capacity for natural biological productivity, biogeochemical cycling, nutrient cycling, and water quality enhancement. Under the current conditions, lateral drains, grassed waterways and the ditching have effectively altered the hydrology of the site, decreasing the amount of water available for soil saturation and extended periods of inundation. In its present state, the site is only fulfilling a small proportion of its potential and historical wetland functional role within the landscape.

Restoration of the site will focus on the removal of hydrologic alterations and reforestation of the site with species common to Low Elevation Seeps and Nonriverine Wet Hardwood Forests. The proposed wetland mitigation activities will result in substantial enhancement of the existing water quality and habitat functions onsite. Elimination of channelized flow from agricultural ditches that drain in two different directions to the Tar River will drastically reduce nutrient, pesticide and sediment runoff from the site and improve downstream water quality in the Tar River. The proposed ditch plugging and filling will result in increased short-term surface and subsurface water storage, and a subsequent increase in the duration and elevation of the seasonally high water table.

Specific actions proposed to achieve the goals and objectives of the project include:

- Filling the primary drainage ditch along the western site boundary
- Filling the farm drainage ditch along the western site boundary
- Plugging the lateral ditch with a ditch plug
- Filling the grassed waterways
- Removing ditch spoil from wooded areas to restore natural seepage patterns
- Placing water diversion features, where appropriate, to redistribute the surface hydrology
- Placing restrictive berms, where appropriate, to reduce runoff and enhance infiltration
- Recreating microtopography across the site to enhance surface water retention and storage, and to provide amphibian breeding habitat where possible
- Disking the ground surface to reduce compaction from pastured cattle
- Re-vegetating the site with Low Elevation Seep and Nonriverine Wet Hardwood Forest species

DANIELS FARM MITIGATION PLAN

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1.0 INTRODUCTION

The following section presents background information pertaining to the Daniels Farm Site. Assessments of both historical and existing site conditions were developed from data gathered during field investigations, desktop review of relevant documents, and landowner interviews conducted between November 2002 and February 2003.

1.1 Goals and Objectives

The goal of the project is to re-establish a nonriverine wetland that will restore ecosystem processes, structure, and composition to mitigate for wetland functions and values that have been lost as a result of anthropogenic disturbances in this region of the Tar-Pamlico River Basin.

Functions that will be restored as a result of the restoration include:

- Aquatic/Terrestrial Wildlife Habitat
- Water Quality
- Ground water Recharge
- Nutrient Cycling
- Low Elevation Seep and Nonriverine Wet Hardwood Communities

1.2 Site Description

The site is located approximately 1260 feet north of Egypt Church Road (SR 1604) along the western property line of the Clyde Daniels Farm, approximately 3.5 miles south-southeast of Louisburg in Franklin County, North Carolina **(Figure 1)**. The site is located on the Louisburg, North Carolina USGS 7.5 minute topographic quadrangle, near the headwaters of two unnamed first-order tributaries to the Tar River **(Figure 2)**. The ground elevation at the Daniels Farm Site is approximately 185 to 200 feet above mean sea level, as determined from the USGS topographic quadrangle. Topography at the site is generally flat, and slopes gently in a northeasterly direction toward a tributary of the Tar River. The 33.93 acres that comprise the site are situated on portions of Farm Tract T3792, Field 13 (25.4 acres) and Farm Tract T3791, Field 1 (20.6 acres).

1.3 Watershed Characteristics

The site is located in USGS Hydrologic Unit 03020101 and North Carolina Division of Water Quality (NCDWQ) sub-basin 04-00-70 of the Tar-Pamlico River Basin. The site is generally flat and depressional with slopes ranging from 0 to 2%. The watershed is located in the Raleigh Belt of the Piedmont physiographic region. The site is underlain by foliated to massive granite, and is located west of a prominent northeast-southwest trending anticline. Much of the site is located on a historic terrace feature associated with the Tar River, which is located approximately 825 feet north of the northernmost extent of the site.

The local watershed drains approximately 101 acres consisting of 56 acres of agriculture, 39 acres of forest and 6 acres of urban land uses **(Figure 3)**. Current land use/land cover is agriculture with mixed deciduous and evergreen forest around the perimeter to the west and east.

1.4 Historical Site Conditions

Historical aerial photographs were reviewed in order to help determine the chronology of land use at the site, and to assist in the development of an appropriate restoration strategy. Aerial photographs of the site were obtained from the U.S. Department of Agriculture, Natural Resources Conservation Service District Office in Franklin County for the following years: 1938, 1955, 1973, 1982, and 2000 **(Appendix B)**.

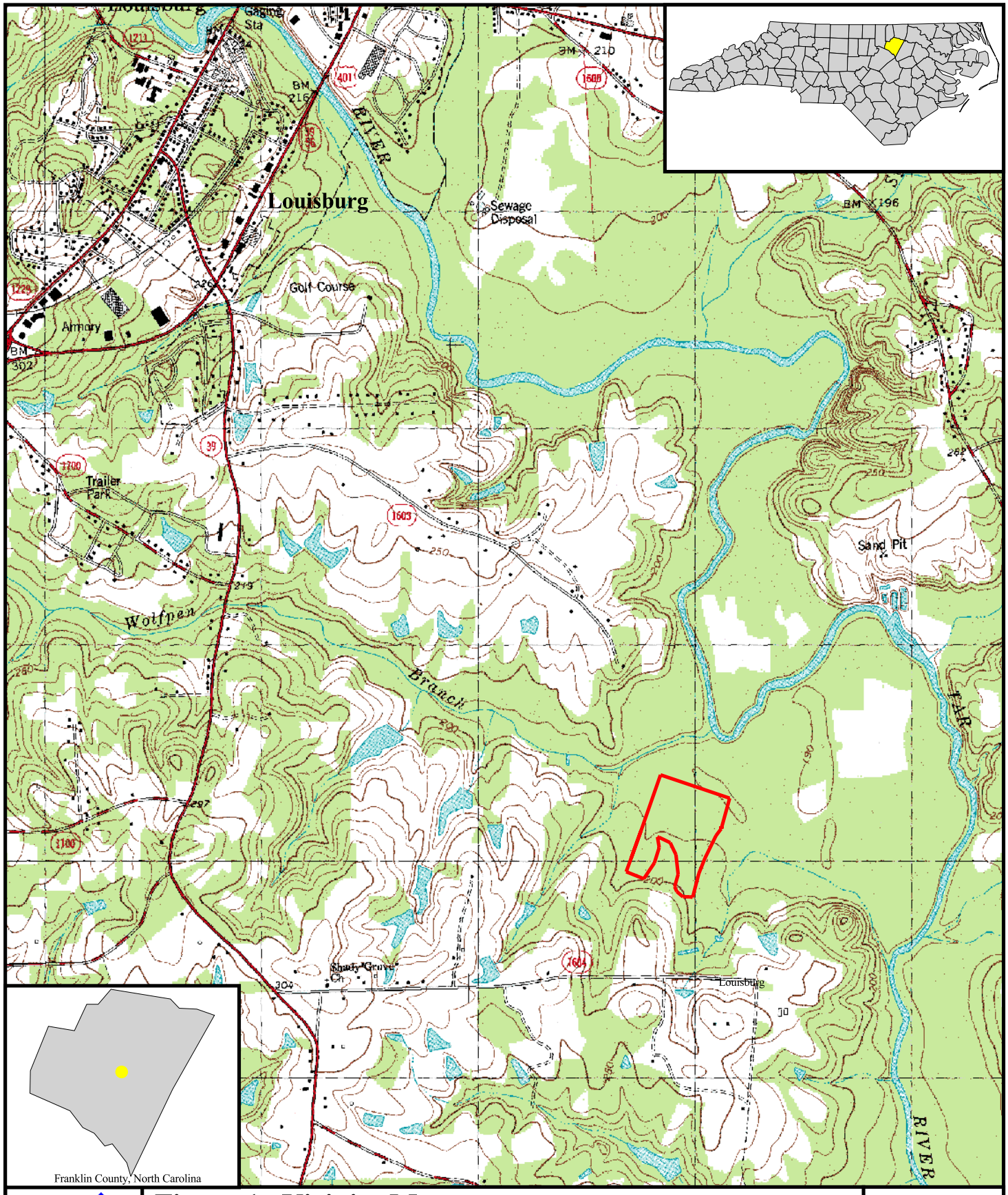

Figure 1. Vicinity Map

Site Boundary

N

1000 0 1000 Feet

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Source: 7.5' USGS Topographic Quadrangle - Lousiburg

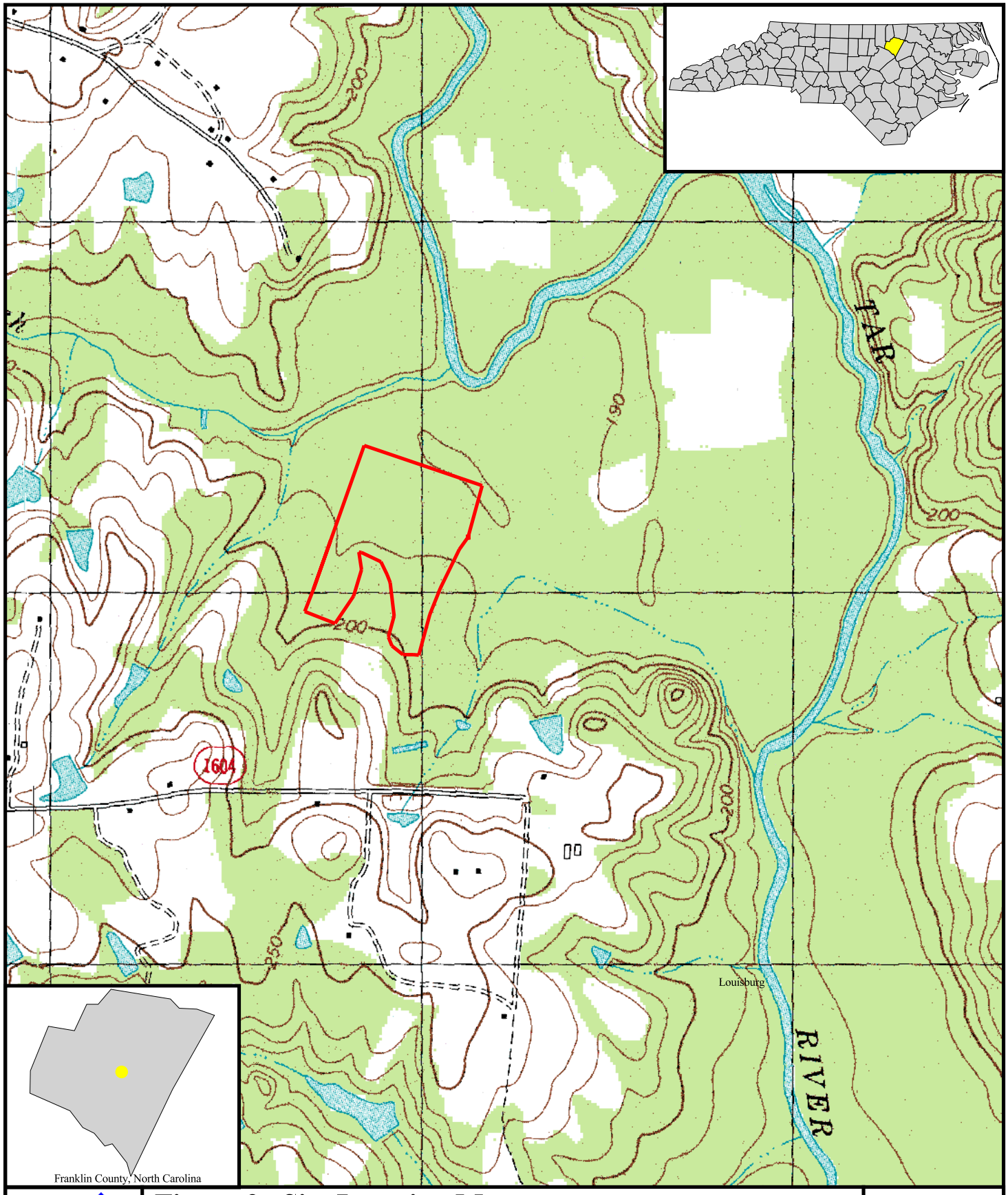

Figure 2. Site Location Map

Site Boundary

N

800 0 800 Feet

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Source: 7.5' USGS Topographic Quadrangle - Louisburg

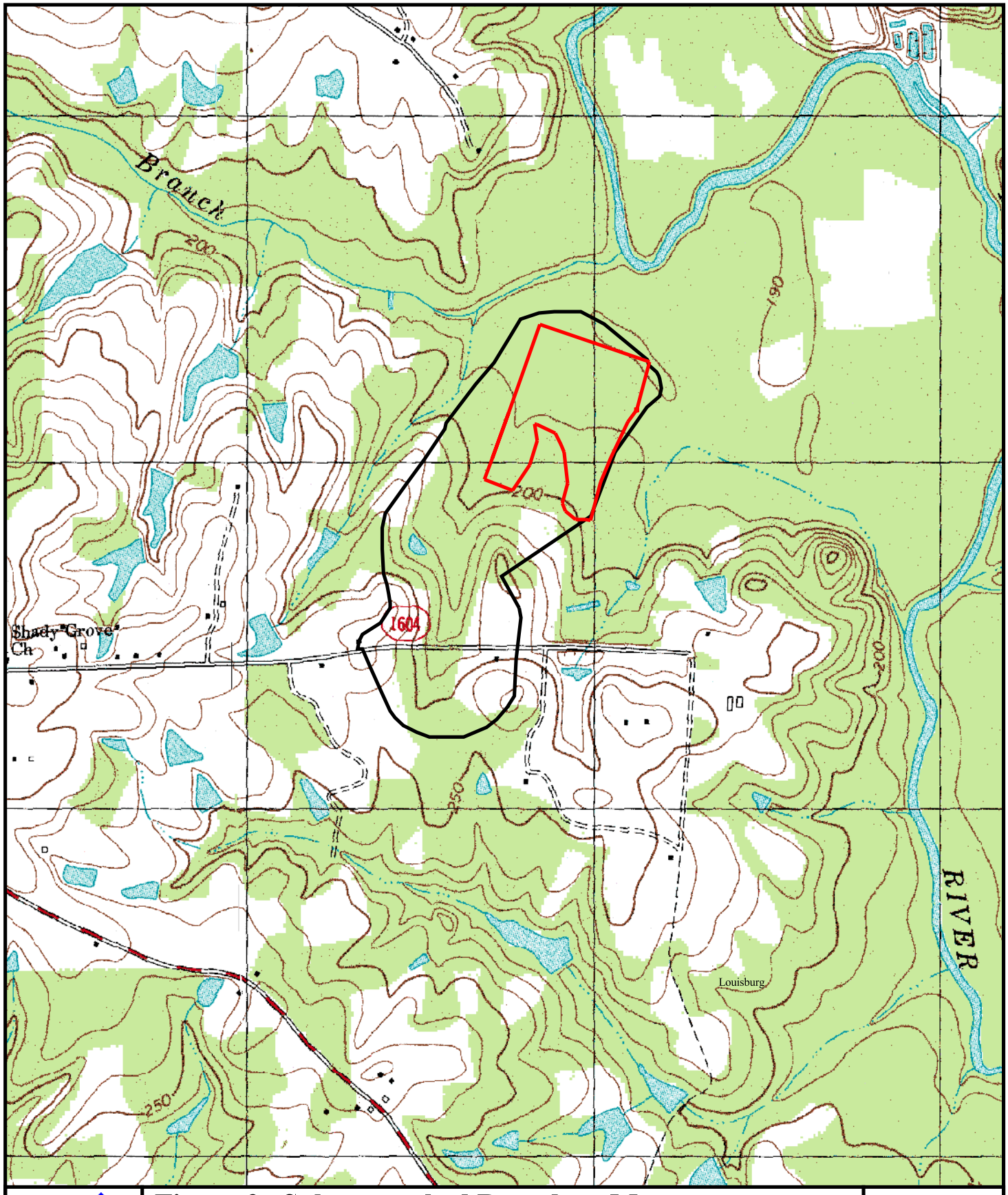

Figure 3. Sub-watershed Boundary Map

Site Boundary

Drainage Area

N

800 0 800 Feet

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Source: 7.5' USGS Topographic Quadrangle - Louisburg

- The 1938 aerial photograph shows the subject property covered with forest. The land to the south of the site is cleared, and presumably in agricultural use. To the east of the site, the land appears to be forested, interspersed with some open areas. While most of the land immediately adjacent to the site was forested in 1938, much of the land in the general vicinity had been cleared at this time, likely for agricultural production.
- The subject site remains forested in the 1955 aerial photograph. The section of the field south of the site that had been cleared in the 1938 photograph, appeared to have been reforested by 1955. There were very few other observable changes to the area immediately around the site from the 1938 photograph, though additional land further from the site appeared to have been cleared for agricultural use.
- The subject site remains forested in the 1973 aerial photograph. The only observable alteration to the site is a dirt road that runs to the property, which could have been used for logging operations, though no significant land clearing is apparent. Land southeast of the site that had been cleared in 1938 and showed signs of reforestation in the 1955 photograph, appears to have returned to forested cover in the 1973 photograph. Across the landscape, there were isolated areas, primarily along the Tar River, that were cleared for agriculture between 1955 and 1973.
- In the 1982 aerial photograph, the subject property had been cleared and appeared to be in agricultural use. To a limited degree, additional land in the general vicinity of the site was cleared and ditched for agriculture between 1973 and 1982.
- No apparent changes took place to the site between 1982 and 2000. The site remained cleared and open, as visible in the 2000 aerial photograph. Adjacent land to the west and east of the site was cleared between 1982 and 2000, either for agriculture or logging activities.

Based on the historical aerial photographs reviewed, it appears that the Daniels Farm Site was forested until 1982, when it was cleared and utilized for agriculture. There is no visible evidence of mass disturbance such as filling or mining on the subject site in any of the reviewed photographs.

1.5 Constraints

1.5.1 Rare, Threatened, and Endangered (RTE) Species Documentation

Available records were reviewed at the North Carolina Department of Parks and Recreation, Natural Heritage Program (NCNHP) to determine the presence of any rare, threatened, or endangered (RTE) species or critical habitats on or near the site. Additionally, during the field investigation, the existing site conditions were evaluated in order to determine if habitat suitable for supporting Franklin County RTE species existed on the site. No occurrences of RTE species or critical habitats were identified on the mitigation site. However, a pair of Bald Eagles was observed on a nest located 1535 feet northeast of the site. The nest falls outside of the primary zone designated as the critical habitat that encompasses an area extending 750 to 1500 feet outward from the nest tree. The eagles appear to be using an area that has been farmed since before 1938. Additionally, Bald Eagles have been nominated for de-listing by the U.S. Fish and Wildlife Service.

1.5.2 Cultural Resources

Inspection of records from the Office of State Archeologists indicated that no archeological sites have been recorded within the project area, or within a one-mile radius of the site. Given the large breadth of the project and its relatively close proximity to the Tar River, a cursory field inspection of the project area for archeological resources was considered to be prudent. Portions of the project area that possessed the highest potential for archeological resources were identified and inspected, either through surface collection or limited shovel testing. In addition to a limited archeological reconnaissance, basic landform chronology and geomorphologic theory pertaining

to soil drainage and erosion were applied to interpret the potential for certain landforms within the project area to possess intact archeological resources.

The majority of the project area consists of a series of older alluvial features, including terraces, filled-in oxbows, and meander cutoffs. The distant location of these features in relation to the current channel indicates that these landforms probably formed during the Pleistocene. Limited testing verified this probable chronology with the exposure of very dense and old Bt horizons along the elevated alluvial terraces. Based on this basic age assessment of the various alluvial landforms within the project area, archeological material would be isolated to the upper A-horizon stratum, or Ap in the case of the project area. Thus, the only potential for intact resources would be truncated basal portions of features lying along elevated portions of the alluvial floodplain landforms.

Field inspection of the current conditions indicated that the great majority of the project area, approximately 85%, is saturated with standing water. Limited shovel testing along the only elevated, and currently dry, portion of the alluvial terraces within the project area revealed redoximorphic depletions. This finding indicates that even the elevated portions of the alluvial landforms are saturated for some portion of the year. This high saturation level of the alluvial landforms in the project would severely limit their utilization for occupation throughout the past. Inspection and limited shovel testing of the upland colluvial deposits, approximately 15% of the project area, indicated that these areas remain well-drained throughout the year. Although dry, and therefore more attractive for permanent occupation throughout the past, the colluvial foot slope of the surrounding uplands has no potential to retain buried archeological components given the fact that it is an erosional surface and receives no accumulation of slope wash. The utilization of these basic geomorphological theories and landform chronology indicates that the project area possess no potential for intact buried archeological resources. Limited archeological reconnaissance produced no intact archeological material, corroborating the basic geomorphologic assessment of the project area.

The North Carolina Department of Cultural Resources, State Historic Preservation Office (SHPO) conducted a review of the proposed mitigation project to determine the presence of historic preservation sites on the proposed mitigation site. The review found no known or documented historic sites within a one-mile radius of the site.

1.5.3 Environmental Hazards

Deed records, aerial photographs, USGS maps, and county planning maps were reviewed to assess the presence and potential impact of any utilities and easements on wetland restoration. A Phase I Environmental Site Assessment is located in **Appendix C**. In summary, through the scope of this investigation, no environmentally hazardous conditions were identified on the Daniels Farm Site.

2.0 EXISTING CONDITIONS

2.1 Hydrology/Hydraulics

The hydrologic source for the site is based on high groundwater, overland surface flow, and groundwater seeps and springs; no natural streams are found in the proposed restoration area. **Figure 4** illustrates the existing surface water flow patterns. Several seeps or springs are found upslope of the project area, indicating groundwater discharge is prominent in the local vicinity seasonally, particularly during the wet period from November to March. This seep/spring area collects water from upgradient areas to the south, and from areas to the west. Water flow from the seep/spring area is then directed toward several manmade drainage features that have been installed to prevent water from reaching the site and to

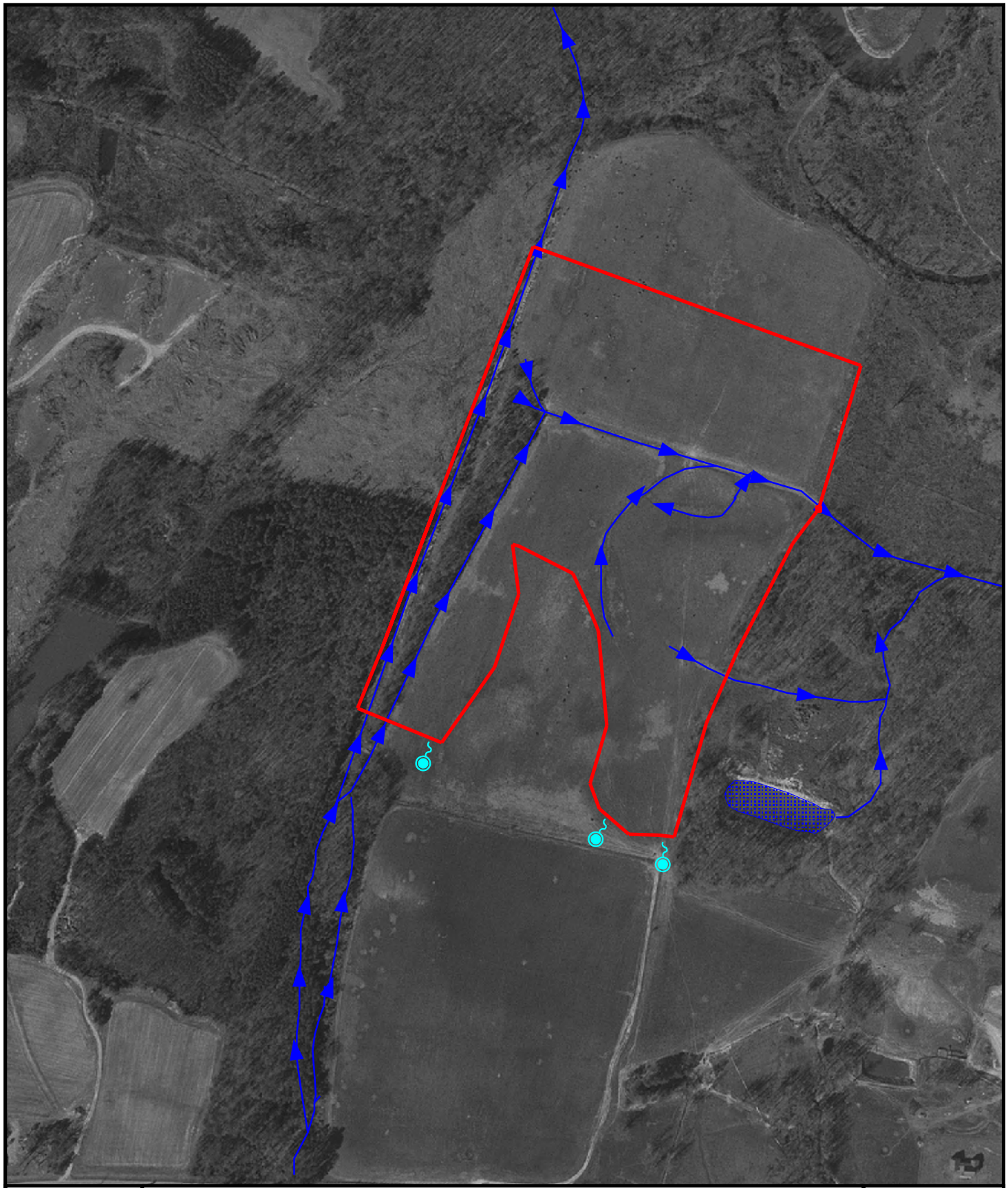

Figure 4. Site Hydrology

Site Boundary
Pond
Direction of Flow
Seep

N

300 0 300 Feet

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Source: March 2000 Aerial Photographs, Franklin County GIS

efficiently remove water from the site. Two drainage ditches were observed on the site. The ditches run parallel to one another along the field edge of the site's western border. The ditch closest to the field, and the shallower of the two ditches, flows north approximately three-quarters the length of the site, then turns east and flows offsite to a tributary of the Tar River. The deeper ditch flows along the western boundary to the north, until it eventually drains off site and into the Tar River. Three grassed waterways that vary from 1-2 feet deep and 5-25 feet wide traverse the central and eastern parts of the site, removing ground and surface water from the site.

2.1.1 Surface Water

The site is located at the toe of a slope, and the topographic layout of the watershed is such that water appears to be directed toward the site from upgradient areas. An apparent topographic divide near the southern end of the site directs water to the western and northern areas and to existing drainage ditches that flow east. Water directed to the other side of the topographic divide flows toward the eastern and northern areas of the site, where a grassed waterway directs water downslope to the north and offsite toward constructed ponds to the east. A significant portion of the surface water draining onto the site is diverted around and away from the site via two drainage ditches, which run north parallel to each other along the western edge of the site. Grassed waterways were also constructed to channel water away from groundwater seeps, draining the central and eastern parts of the site. One of the north flowing ditches along the western edge of the site turns east, bisecting the site, and accepts discharge from a grassed waterway before flowing offsite at the eastern boundary.

2.1.2 Groundwater

High ground water has historically been reported for the site and occurs seasonally at or near the surface in the surrounding natural areas. This high water condition is attributed to a relatively high water table and numerous groundwater seeps. The site groundwater is being evaluated by monitoring the water level with eight on-site Solinst Levelogger gages and a barometric control gage. Data will be compared to that received by a Levelogger gage installed at a reference wetland **(Figure 5)**. The Leveloggers were installed across the site on February 5 and 6, 2003 and programmed to measure water levels twice a day, at 12-hour intervals starting on February 6, 2003. The data was downloaded periodically and evaluated to determine the depth and duration of the groundwater levels on the site. Data has been collected and evaluated through February 5, 2003.

Data from each monitoring gauge was plotted to determine the hydroperiod (duration of saturation within 12 inches of the ground surface) for the site **(Appendix D)**.

Hydrology Monitoring: On February 5, 2003 eight groundwater wells and one rain gauge were installed on the project site to better determine site hydrology. Above average rainfall of 14.41 inches was recorded from February 5 to June 13, 2003, with 10.91 inches of this recorded since the beginning of the growing season on March 20.

Well 1 is located north of the proposed restoration boundary near a sharp drop in slope away from the site. This drop appears to help drain the area quickly after rain events, even though well 1 is situated in Wahee soils which are classified as being somewhat poorly drained and slowly permeable. This results in many days of inundation within a foot of the surface, but few for periods of prolonged time **(Table 1)**.

Well 2 is located within the site boundary north of the large lateral drainage ditch that flows west to east across the site. The area slopes slightly from north to south, toward the drainage ditch. Well 2 was placed in the Roanoke soil series, which is classified as being poorly drained and

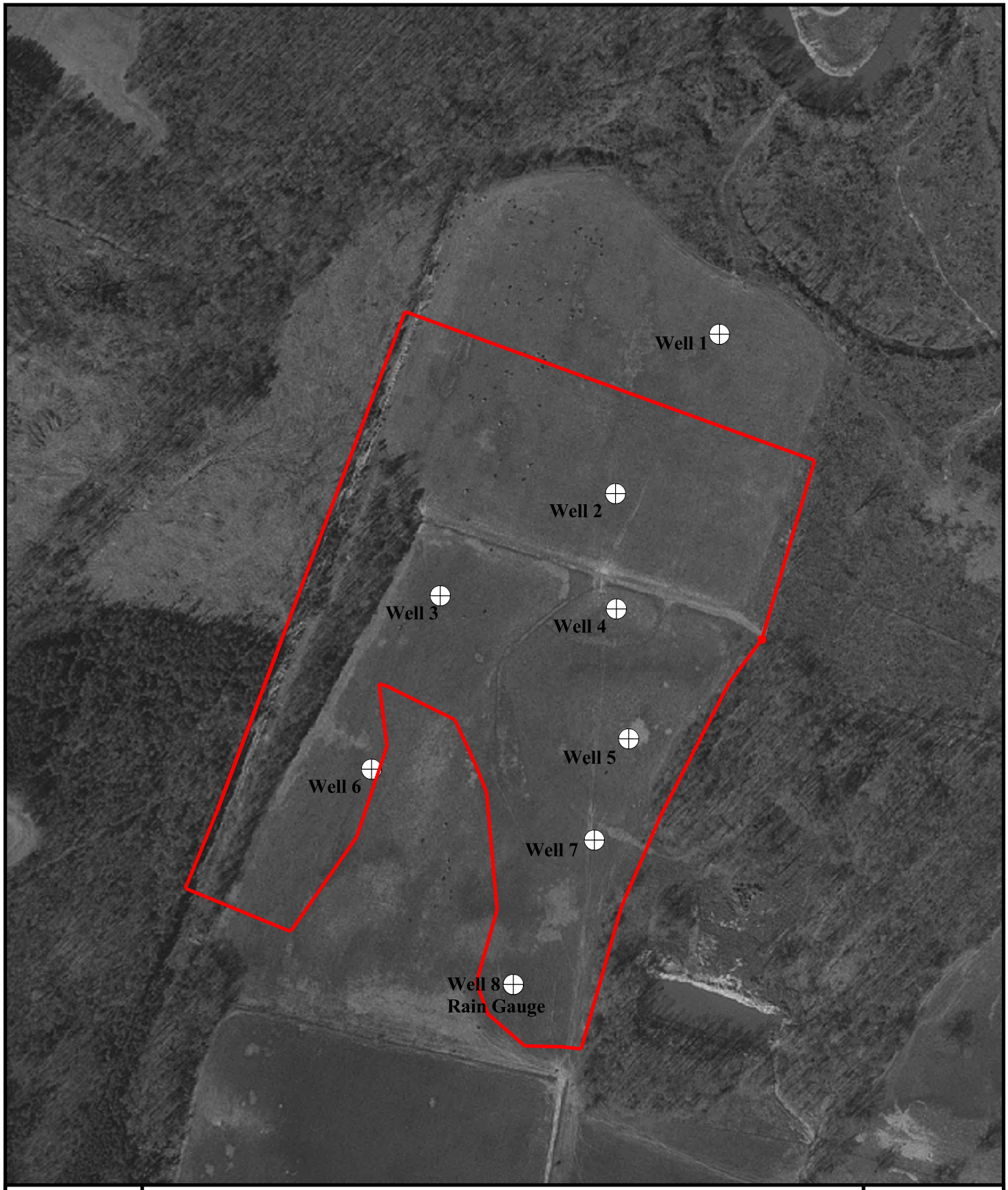

Figure 5. GW Monitoring Gauges

Site Boundary

Groundwater Monitoring Gauge I.D. Number

N

200 0 200 Feet

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Source: March 2000 Aerial Photographs, Franklin County GIS

slowly permeable or very slowly permeable. Lower landscape elevation contributes to groundwater recharge from surrounding upland areas creating long periods of inundation following precipitation events.

Well 3 is just south of the lateral drainage ditch near the seep that creates the western border of the project site. The seep drains the western portion of the project site toward the lateral drainage ditch. Similar to well 2, this point is located at a low elevation within Roanoke soils, and likewise retains water at or near the surface for long periods following precipitation events.

Well 4 is located just south of the lateral drainage ditch just east of a south to north grassed waterway/ drainage ditch in the southern portion of the project site. Although positioned at relatively low elevation and within the poorly drained Roanoke soil series, the water table is slightly lower here compared with the other low elevation wells, likely due to the close proximity to the two drainage ditches.

Well 5 is located near the eastern border of the project site in an outcropping of the moderately well-drained Altavista soil series. The water table is much lower here than at the other monitoring points, and sharp spikes in water level are followed by quick declines after precipitation events.

Well 6 is further south and just upgradient of well 3 near the seep that creates the western border of the project site. Due to high elevation and close proximity to the seep, well 6 exhibits quick drainage compared with monitoring points found within the Roanoke series.

Well 7 is located in the south east corner of the project site, just south of well 5. Like wells 2 and 3, well 7 is situated in Roanoke soil series. Like those monitoring points, water is retained after precipitation events, but due to the high elevation and deeper water table, there is less groundwater recharge, resulting in sharp declines in groundwater levels during dry periods.

Well 8 is located inside the south east corner of the project site boundary in an area distinguished by a conglomeration of soils found on the project site, including Altavista, Augusta and Toisnot. Toisnot is a poorly drained, slowly permeable soil that causes this area to pond during rain events and keeps groundwater level consistently at or near the surface for extended periods following precipitation events.

Table 1 – Days groundwater level was within 12 inches of surface since 03/20/03

Well	Total days	Max consecutive days	Surface Elevation (ft)	Soil Series
1	25	7.5	188.45	Wahee
2	50	15.5	187.31	Roanoke
3	50	18	188.07	Roanoke
4	35	10	186.73	Roanoke
5	10	6.5	191.47	Altavista
6	36	14.5	192.81	Roanoke
7	31	11	190.07	Roanoke
8	72	26	197.50	Toisnot

2.1.3 Water Budget

Existing site hydrology was modeled by developing an annual water budget that calculates water inputs and outputs, and the change in storage on a monthly time step **(Appendix F)**. Under existing conditions, precipitation (P) is considered to be the only water input to the site. Historic

precipitation data from the National Climatic Data Center (NCDC) Summary of the Day Data Set was obtained from Earth Info, Inc. The data was obtained for the City of Louisburg, Franklin County, NC, located approximately 3.5 miles north-northeast of the Daniels Farm site. Total precipitation for the years of the period of record, from 1948-1997, was reviewed. Three years were selected that represent precipitation conditions for an average year (1973), dry year (1963) and wet year (1979).

Groundwater input to the site is likely, due to the landscape position of the site and observation of several groundwater seep discharge zones on the site. However, groundwater input was not calculated for the water budget since it is difficult to quantify and its exclusion provides for a conservative estimate of water availability.

Water outputs from the site include potential evapotranspiration (PET) and groundwater infiltration. PET was calculated by the Thornthwaite method using mean monthly temperatures determined from 1971-2000 data from Louisburg, NC, and daytime hours. Groundwater infiltration represents groundwater losses from the site due to downward seepage through the soil profile. Soil permeability was assumed to be $2x10^{-6}$ ft/min, which is typical of low permeability soils associated with wetlands.

Net water inputs and outputs were calculated in inches, and normalized across the site on a monthly time step. Net water inputs and outputs were then added or subtracted from a running wetland water volume, expressed as a depth in inches, and normalized across the total area of the site. A maximum wetland water volume of 2.52 inches was calculated, based on 36 inches of soil with a specific yield of 0.12. All of the calculated water volume came from water in the soil, there was no surface water storage factored into the calculation.

The hydrographs for the average, dry, and wet years show a similar pattern of seasonal water table levels. Water table recharge occurs during the late fall and winter months, until a rapid water table drawdown occurs as PET rates increase in the summer. During the summer, the water budget model shows the existing site is unsaturated within the upper 36 inches of soil.

2.2 Soils

A detailed soils investigation was conducted to determine the extent and distribution of the hydric soils on the site and to classify the predominate soils identified to the soil series level **(Figure 6, Appendix E)**. The investigation consisted of delineating the hydric soil boundaries with pink flagging in accordance with the 1987 US Army Corps of Engineers (ACOE) Wetland Delineation Manual, NRCS Field Indicators of Hydric Soils in the United States and Soil Taxonomic Practices. Areas that have been identified as possible hydric soil mapping units were surveyed at a higher intensity until the edge of the mapping unit was identified. The boundary of the hydric and non-hydric soil mapping units were then followed by continual sampling and observations as the boundary line was identified and delineated. In those areas where the boundary was found to be a broad band gradient rather than a distinct break, microtopography, landscape position, soil textural changes, redoximorphic features, depleted matrix, etc. were additionally considered to identify the extent of the hydric soils.

To develop a detailed soils map, several soil borings were advanced on the site in the general hydric soil areas identified by landscape position, vegetation and slope. Once the hydric soil borings were identified, the soil scientist marked the point and established a visual line to the next auger boring where again hydric soil conditions were predicted then confirmed by additional borings. The soil scientist moved along the edges of the mapping unit and marked each point along the line. To confirm the hydric soil mapping unit, nine soil borings were advanced to a depth of 50 inches. The soil profile descriptions identified the individual horizons in the topsoil and upper subsoil as well as the depth, color, texture,

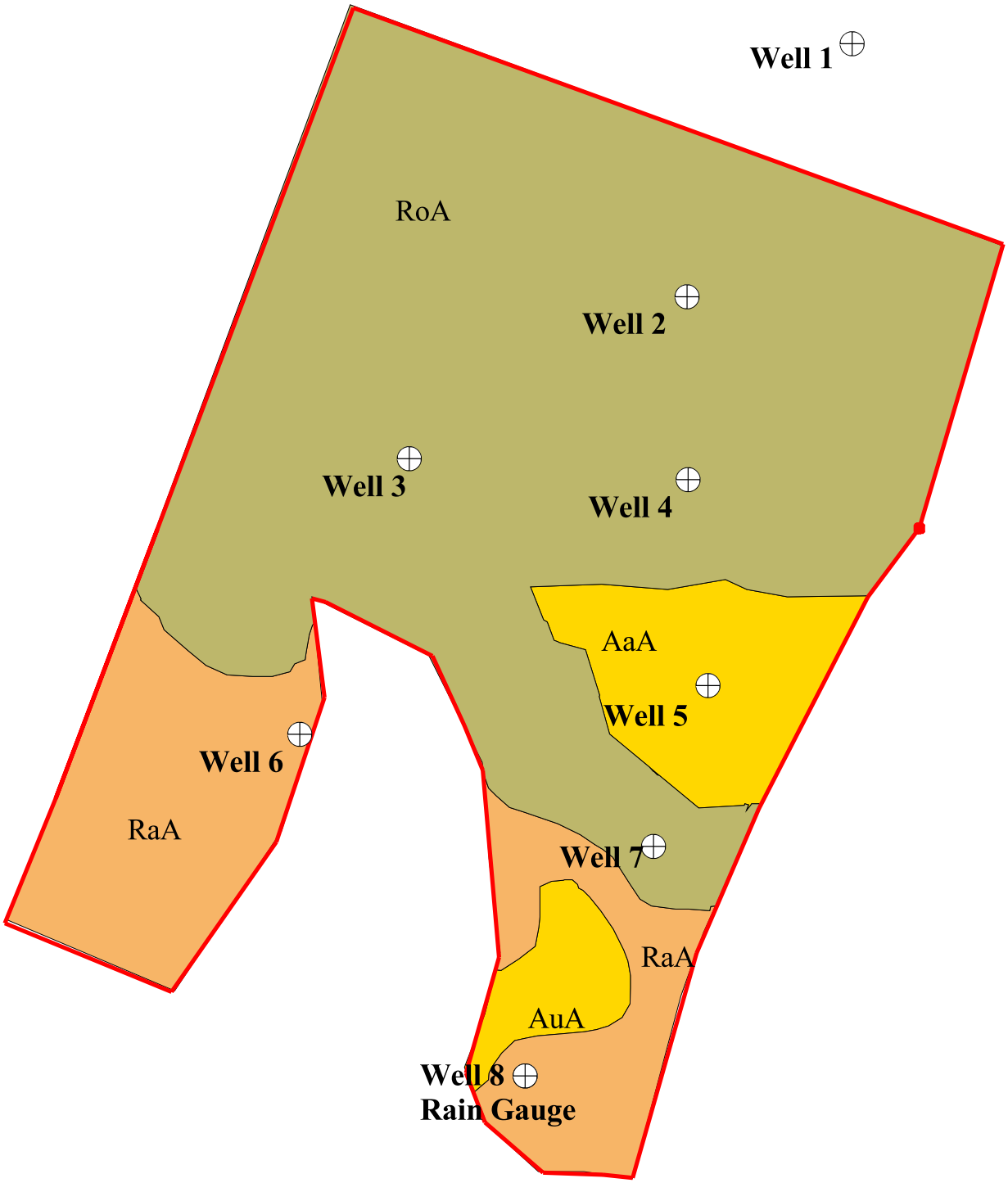

Figure 6. Soil Map

AaA - Altavista
AuA - Augusta
RoA - Roanoke
RaA - Toisnet

Groundwater Monitoring Gauge I.D. Number
Site Boundary

N

200 0 200 Feet

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structure, boundary, and evidence of restrictive horizons and redoximorphic features. Eight of the soil descriptions were located at each of the eight monitoring well locations. The ninth soil description was located about 30 feet west of monitoring well #6.

Soils mapped on the property were found to be typical of low Piedmont, Coastal Plain uplands and terraces that have formed in loamy and clayey marine and fluvial sediments. Specific soil series identified on the property include: Altavista (Fine-loamy, mixed, semiactive, thermic Aquic Hapludults), Augusta (Fine-loamy, mixed, semiactive, thermic Aeric Endoaquults), Roanoke (Fine, mixed, semiactive, thermic Typic Endoaquults), and Toisnot (Coarse-loamy, siliceous, semiactive, thermic Typic Fragiaquults). Additionally, State (Fine-loamy, mixed, semiactive, thermic Typic Hapludults) and Wahee (Fine, mixed, semiactive, thermic Aeric Endoaquults) were identified in the transitional areas between the poorly drained Roanoke and Toisnot soils and the somewhat poorly drained Augusta and moderately well drained Altavista soils. The Roanoke and Toisnot soil series are listed as hydric soils in Franklin County because of saturation for a significant period during the growing season. Altavista and the Augusta soils are not considered hydric but have inclusions of hydric soils within the soil mapping unit. Per the Franklin County Hydric Soils List, important notes state that hydric soils in this county cannot be farmed under natural conditions without removing woody vegetation or hydrology manipulation. Some map units and included soils listed, as hydric soils in this county may not meet the definition of hydric soils and wetlands because the hydrology has been altered through drainage or other manipulation.

The Franklin County Soil Survey has classified the soils underlying the site as Altavista sandy loam, (59A). However, our findings **(Appendix E)** indicate that the Roanoke and Toisnot hydric soils comprise approximately 89 percent of the site, while Altavista, Augusta and other non-hydric inclusions cover approximately 11 percent of the site **(Figure 7)**. All of these soil series are formed in alluvial sediments and are commonly found on terraces adjacent to better-drained soils. The following sections describe each soil series, in detail. The basic soil properties of each series are summarized in **Table 2**.

Altavista sandy loam (AaA, 59A, 544A) comprises the dominant non-hydric upland soil on the site. The Altavista series consists of moderately well drained, moderately permeable soils that formed in fluvial material on stream terraces. The soils have a low shrink-swell potential. The seasonally high water table is at a depth of 1.5 to 2.5 feet during wet periods. This soil is mapped as rarely flooded by NRCS in Franklin County. Slopes are 0 to 3 percent. Individual areas commonly are long and narrow and generally range from 5 to 50 acres in size. Typically, the surface layer is dark brown fine sandy loam eight inches thick. The subsoil extends to a depth of 33 inches. The upper part is yellowish brown sandy clay loam with strong brown and very pale brown mottles. The next part is yellowish brown sandy clay loam with light gray mottles. The lower part is yellowish brown sandy loam with gray mottles. Included with this soil in mapping are a few small areas of well-drained State soils in slightly higher landscape positions, and the slightly wetter somewhat poorly drained Wahee soils.

Augusta (AuA) is a minor soil component of the site. It is formed in loamy alluvial sediments of the Piedmont and upper Coastal Plain stream terraces. The Augusta series consist of very deep, somewhat poorly drained, moderately permeable soils with slow runoff and have a low shrink-swell potential. The seasonally high water table is at a depth of 1.0 to 2.0 feet during wet periods. The soil appears to be rarely flooded in Franklin County. Slopes are from 0 to 2 percent. Individual units occur as transitional areas adjacent to the Altavista and Roanoke soils. Typically the surface layer is pale brown loam 0 to 9 inches thick. The solum extends to a depth of 40 to 80 inches. The subsoil ranges from pale brown to light brownish gray and gray with a texture of clay loam, sandy clay loam or loam. Included with this soil in mapping are areas of poorly drained Toisnot soils.

Figure 7. Limits of Hydric Soils

Depleted Soils
Site Boundary

N

200 0 200 Feet

KCI ASSOCIATES OF NORTH CAROLINA, PA

N.C. Wetlands Restoration Program

Source: March 2000 Aerial Photographs, Franklin County GIS

Roanoke (RoA, 80, 80A, 88, and 88A) is the dominant soil on the site. It is formed in clayey alluvial sediments on low Piedmont and coastal plain floodplains and terraces, and in clayey marine and alluvial sediments on broad flats in the Coastal Plain. The Roanoke series consist of very deep, poorly drained, slowly permeable or very slowly permeable soils that have a moderate shrink-swell potential. The seasonally high water table is at a depth of one foot during wet periods. The soil is occasionally flooded in low areas for brief periods. Slopes are 0 to 2 percent. Individual areas are irregular in shape and generally range from 10 to 50 acres in size. Typically, the surface layer is five inches thick with a Munsell color of light brownish gray, and ranges from fine sandy loam and loam to silt loam. The subsoil is usually 48 inches thick. The upper part of the subsoil is light gray sandy clay loam that has brownish yellow mottles. The lower part is gray silty clay or clay that has yellowish brown or brownish yellow mottles.

The Toisnot Series (RaA, 827, 827A, 830, 830A, 837 and 847, and 847A) is mapped in a complex with the Rains soil series in Franklin County; however, during the investigation, the Rains soils were not identified on site. The Toisnot soils occur in shallow depressions, around the heads of drainageways, and on the outer fringe of stream terraces next to the better-drained uplands in the upper Coastal Plain. The soil formed in moderately coarse textured fluvial or marine sediments. The Toisnot soils consist of poorly drained, slowly permeable soils that have a low shrink-swell potential. The seasonally high water table is at a depth of one foot during wet periods. Slopes range from 0 to 2 percent. Typically, the surface layer is six inches thick with a Munsell color of very dark gray and ranges from loam, sandy loam to silt loam. The subsoil is usually 45 to 61 inches thick. A fragipan commonly occurs in the upper boundary of the subsoil and commonly ranges from 20 to 40 inches but may range from 10 to 45 inches. The upper part of the subsoil is light gray or dark gray sandy clay loam that has grayish brown and light gray mottles. The lower part is gray and the texture is commonly sandy clay loam, but it may range to fine sandy loam, sandy loam or sandy clay.

Table 2: Summary of Soil Series Mapping

Map Symbol	Soil Series	Soil Subgroup	Hydric Status [1]	Depth & Duration of High Water Table [2]	Estimated Extent
AaA	Altavista	Aquic Hapludults	Non-Hydric	1.5’ to 2.5’ (Nov. - April)	7.62%
AuA	Augusta	Aeric Endoaquults	Non-Hydric	1.0’ to 2.0’ (Dec. – May)	3.44%
RoA	Roanoke	Typic Endoaquults	Hydric	0’ to 1.0’ (Nov. - April)	70.12%
RaA	Rains-Toisnot, Complex	Typic Fragiaquults	Hydric	0’-1. 0’ (Nov. - April)	18.82%

[1] Hydric soil lists for Franklin County and North Carolina
[2] Based on soil taxonomy for undrained condition

2.2.1 Historic Hydric Soils

The current and historic hydric status of the soil was evaluated to determine the extent to which wetland restoration can be achieved on the site. This determination was complicated because the upper 6 to 12 inches of the site have been severely altered from prior land use including: agricultural practices, cattle traffic, ditching and drainage of the primary water source, and reshaping the land surface to promote

drainage offsite. The cumulative impact of these land uses has significantly affected the hydrology of the site. Resolution of these issues was achieved through conducting detailed field evaluations.

General guidance is provided by the ACOE for establishing the hydric status of the soils mapped for a site. The guidance specifies that "depleted (reduced) soils must occur in the upper 12 inches" of the soil profile to be considered hydric for the purposes of determining wetland restoration areas. The depleted soils criteria were mapped in conjunction with the detailed hydric soil delineation. The soils exhibiting a depleted matrix include the Roanoke and Toisnot series as well as the wetter inclusions in the somewhat poorly drained Augusta and Wahee soils.

Detailed field investigations were also conducted with the detailed soil mapping of the site to identify redoximorphic features in the upper 12 inches of the soil. Nine soil borings were described to a depth of 60 inches. The soil description process was complicated due to the disturbed nature of the agricultural fields, where plowing has homogenized the horizons in the upper 6 to 12 inches of the soil. Repetitive plowing and mixing of crop residues into the soil, along with the artificial drainage, has affected and altered the hydric features (soil color and mottling) normally found in the upper soil horizons in an undisturbed, natural site. Of the seven detailed soil descriptions within the hydric soil areas each contained redoximorphic features in the upper 12 inches **(Appendix E/ Figure 6).**

2.3 Ecological Communities

A field survey was conducted in the fall/winter of 2002 to identify the dominant vegetative communities on the site. This review documented that, though Nonriverine Wet Hardwood Forest historically dominated the site, agricultural fields, planted in silage consisting of Brown Top Millet and Sudan grass, are now the predominate cover. The site has also been used to graze cattle. Only small remnants of the Low Elevation Seep community still remain within the area of proposed restoration. This community currently occupies a thin strip adjacent to the western site boundary. A schematic of the existing vegetative communities at the time of the investigation is included **(Figure 8)**.

Low Elevation Seep

Low Elevation Seep communities are found at seepages and springs along bases of slopes or edges of floodplains. These areas are generally saturated, even if no standing water is present. The canopy includes *Acer rubrum*, *Quercus phellos*, and possibly other wetland trees. Herbs found in this association include *Saururus cernuus*, *Impatiens capensis*, *Osmunda cinnamomea*, *Osmunda regalis* var. *spectabilis*, *Boehmeria cylindrica*, *Chelone glabra*, *Rudbeckia laciniata*, *Ranunculus recurvatus*, *Juncus spp*., and *Saxifraga micranthidifolia*. These communities can serve as important breeding and foraging areas for amphibians. Low Elevation Seep communities are relatively common in the Piedmont, lower Mountains, and upper Coastal Plain. These communities tend to be small, and are often shaded by the canopy of the adjacent communities. The vegetation and soils associated with well-developed Low Elevation Seeps varies from the vegetation and soils found in the adjacent floodplain or upland communities.

Agriculture occupies the majority of the site, with pasture being the primary land use. Ditches are found around the perimeter of the agricultural fields to enhance drainage of water from the site and make the land more suitable for farming. Utilization of the site for agriculture has had significant impacts on the site. Ditches and grassed waterways have been created or enhanced to promote drainage through, around and off of the site to allow crop production on prior converted wetland areas. Clearing of the site has removed virtually all of the natural vegetative communities. All existing agricultural land, or 89% of the site, has been classified as prior converted wetland. The remaining 11% of the land should also qualify for restoration due to drainage and filling activities.

Figure 8. Existing Communities

Site Boundary

Agriculture

Low Elevation Seep

N

200 0 200 Feet

KCI ASSOCIATES OF NORTH CAROLINA, PA

N.C. Wetlands Restoration Program

Source: March 2000 Aerial Photographs, Franklin County GIS

2.4 Assessment of Site Conditions

The Daniels Wetland mitigation site has an extensive history of disturbance, undergoing dramatic land cover alterations in 1982 for the purposes of agricultural production. The site consisted of Low Elevation Seeps and Nonriverine Wet Hardwood Forest communities before these modifications. One small remnant of a Low Elevation Seeps natural community remains; however, the understory vegetation has been removed, and the hydrology and the landscape has been modified by subsequent ditching and drainage efforts. The Nonriverine Wet Hardwood Forest communities historically dominate the lower elevations of the site. These communities are found on poorly drained interstream flats with fine textured mineral soils, not associated with rivers. These areas are seasonally saturated or flooded water tables, poor drainage and perhaps by sheet flow from adjacent landscapes and pocosins. The soils are poorly drained loamy or clayey mineral soils. The series in the Franklin County area consists of the Roanoke (Typic Endoaquults) soils. The canopy is dominated by various hardwood trees typical of bottomlands and includes *Quercus michauxii*, *Quercus laurifolia*, *Quercus pagoda*, *Liriodendron tulipifera*, *Liquidambar styraciflua*, *Ulmus Americana*, *Acer rubrum*, and *Nyssa biflora*. The understory includes species such as *Carpinus caroliniana*, *Acer rubrum*, *Ilex opaca*, and *Asimina triloba*. The shrub layer includes *Lindera benzoin*, *Persea palustris*, *Leucothoe axillaries*, *Clethra alnifolia*, *Vaccinium corymbosum*, *Myrica cerifera*, and *Arundinaria gigantean*. The herb layer may include *Carex spp*., *Saururus cernus*, *Boehmeria cylindrica*, and *Woodwardia areolata*.

Nonriverine Wet Forest Hardwood communities are among the most threatened of North Carolina's natural communities, and in some ways are the least known. Also called oak flats, they were once widespread in the outer Coastal Plain of northeastern North Carolina, but were long ago reduced to a small fraction of their pre-settlement abundance. This community appears to exist on the extreme western edge of its range. Although this unit does not exist along the margins of peatlands, it does meet several wetland criteria, including landscape position, Roanoke soils, and some of the typical vegetation communities.

The 33.93 acres that comprise the site are situated on portions of Farm Tract T3792, Field 13 (25.4 acres) and Farm Tract T3791, Field 1 (20.6 acres). Field 13 holds Prior Converted status with NRCS. Field 1 has not been evaluated for Prior Converted Status but meets hydric soil criteria and shares the same hydrologic drains as Field 13 **(See NRCS letter – Appendix A)**. Agricultural farm fields are adjacent to the site to the north and south.

The soils on the site have been disturbed, manipulated and ditched to promote drainage. The horizons in the upper 6 to 12 inches of soil have been homogenized and mixed from plowing and grading activities on the land. A network of ditches has effectively drained the site for agricultural use. Repetitive plowing and mixing of crop residues into the soil, along with artificial drainage, has affected and altered the hydric features (soil color and mottling) normally found in the upper soil horizons of an undisturbed site. The extensive land alterations described have complicated the identification and determination of historic hydric soil conditions. Despite drainage and regular plowing, field investigations indicate that much of the relict hydric features of the soils on the site, i.e. redoximorphic features such as mottling, manganese masses, and oxidized root channels within 6 to 12 inches of the surface, have been significantly reduced.

The site hydrology and hydraulics reflect those characteristically found in the lower Piedmont seeps and nonriverine interstream flats in the upper Coastal Plain areas. The primary surface water input is from **seeps** or springs that capture drainage from approximately 100 acres south and upgradient of the site. It is believed that originally, discharge from the spring flowed by sheet flow (then perhaps a shallow channel) from its source onto the southeastern corner of the site. The flow then likely continued northeast and collected in a depressional area before flowing east off the site. After clearing the property, the landowner realized that he needed to remove the surface water and groundwater from the site for crop production or pasture. The shallow erosional drainageway that had formed along the western side of the

site was converted into a drainage ditch that extended from Egypt Church Road north along the site to a depressional area where the ditch turned east and continued offsite to the Tar River. Later, since the water was not being effectively drained offsite due to the amount of surface and groundwater input from the west, the landowner dug another ditch along the western property line from Egypt Church Road extending to the north end of the site. The ditch was cut through high ground to a stream that flowed into the Tar River. These ditches along the eastern and western sides of the site are thought to have effectively drained the majority of the site.

The secondary source of hydrology is from seeps along the southern end of the property and from high ground water along the northern end of the property. Several grassed waterways were cut to intercept seepage from the toeslopes along the southern boundary and direct the water eastward to the ditch dug through the depressional collection area before flowing east and offsite. Additionally, in the field to the north, shallow ditches were cut to allow gravity flow to the ditch flowing east through the depressional area and offsite. Under the current conditions, the ditches and grassed waterways have effectively altered the hydrology of the site, decreasing the amount of water available for soil saturation and extended periods of flooding.

A water budget was developed for existing conditions, in order to calculate water inputs and outputs, and the change in storage on a monthly time step. Under existing conditions, water input to the site comes from precipitation, seasonally wet seepage zones, and surface runoff. Water outputs from the site include potential evapotranspiration, surface water output, groundwater flow via the ditch network, and groundwater infiltration. All of the calculated water volume for the site came from water in the soil; there was no surface water storage factored into the calculation. The results of the existing water budget show the expected pattern of rapidly declining water table levels in the spring and water table recharge during the fall and winter. The model indicates that the upper 36 inches of soil will remain dry through the summer and early fall.

In summary, the clearing, draining, and conversion of the site to agriculture has altered its natural wetland ecological function and diminished its capacity for natural biological productivity, biogeochemical cycling, nutrient cycling, and water quality enhancement. In its present state, the site is only fulfilling a small proportion of its potential and historical wetland functional role within the landscape.

3.0 WETLAND RESTORATION ACTIVITIES

Restoration of the site will focus on the removal of hydrologic alterations and reforestation of the site with species common to Low Elevation Seeps and Nonriverine Wet Hardwood Forests **(Figure 9)**. This effort will be initiated by removal of the perimeter ditches and grassed waterways. Hydrologic reconnection will be made to allow water currently bypassing the site to the west to enter the site. Reforestation of the site with Low Elevation Seep and Nonriverine Wet Hardwood Forest species consistent with the surrounding natural wetlands will be initiated with 436 stems per acre, with a target density of 320 stems per acre after five years. The proposed restoration types and extents are presented in **Table 3** and **Figure 9**.

Table 3: Restoration Type and Extent

	Restoration	**Enhancement**	**Creation**
Community Type			
Low Elevation Seep	8.62 acres	0 acres	0 acres
Nonriverine Wet Hardwood Forest	21.43 acres	0 acres	0 acres
Upland	0 acres	3.88 acres	0 acres

Figure 9. Restoration Activities

Water Diversion Feature
Berm
Fill Ditch
Low Elevation Seep
Ditch Plug
Hydric Soil Boundary
Water Flow
Fill Grass Waterway

N

200 0 200 Feet

KCI ASSOCIATES OF NORTH CAROLINA, PA

N.C. Wetlands Restoration Program

Source: March 2000 Aerial Photographs, Franklin County GIS

3.1 Wetland Restoration

The proposed wetland restoration area within the site currently consists of 21.43 acres of agricultural fields and 8.62 acres of Low Elevation Seep forested land, which does not currently qualify as wetland due to artificial drainage on the site. Based on existing relict hydric soils and forested vegetation on the site, it is presumed that 30.05 acres were jurisdictional wetlands prior to conversion for agriculture. The proposed restoration actions will be directed at restoring the character and function of the Low Elevation Seep and the Nonriverine Wet Hardwood Forest wetland types that historically occupied these fields and woodlands. It is anticipated that the proposed restoration actions will result in 30 acres of restored and created wetland area on the site.

The proposed wetland mitigation activities will result in substantial enhancement of the existing water quality and habitat functions onsite. Elimination of channelized flow from agricultural ditches that drain in two different directions to the Tar River will drastically reduce nutrient, pesticide and sediment runoff from the site and improve water quality downstream. The proposed ditch plugging and filling will result in increased short-term surface and subsurface water storage, and a subsequent increase in the duration and elevation of the seasonally high water table. The increased retention time of surface and subsurface water will result in reduced peak flows to drainages that feed into the Tar River. Increased retention time will also facilitate a variety of biogeochemical transformations such as denitrification and dissolved organic carbon export. Reduced nitrogen export and increased carbon export will benefit downstream aquatic habitat areas in the Tar River.

Converting the agricultural fields back to a natural vegetative species composition will improve the feeding, shelter and breeding habitat for many indigenous and migrant faunal species. The seepage and nonriverine nature of the restored wetlands will also augment wildlife corridors between existing habitats.

Specific actions proposed to achieve the goals and objectives of the project include:

- Filling the primary drainage ditch along the western site boundary
- Filling the farm drainage ditch along the western site boundary
- Plugging the lateral ditch with a ditch plug
- Filling the grassed waterways
- Removing ditch spoil from wooded areas to restore natural seepage patterns
- Placing water diversion features, where appropriate, to redistribute the surface hydrology
- Placing restrictive berms, where appropriate, to reduce runoff and enhance infiltration
- Recreating microtopography across the site to enhance surface water retention and storage, and to provide amphibian breeding habitat where possible
- Disking the ground surface to reduce compaction from pastured cattle
- Re-vegetating the site with Low Elevation Seep and Nonriverine Wet Hardwood Forest species

3.1.1 Hydrologic Alterations

In order to enhance the site functionality and increase habitat diversity, modifications that will influence the hydroperiod of the site are being proposed. These actions are described in more detail below:

Ditch Removal: Approximately two drainage ditches and three grassed waterways found on the site currently enhance the removal of seepage waters and precipitation. This drainage network will be filled or plugged as appropriate as part of restoration activities.

Fill Removal and Micro-topography Enhancement: Dredge spoils from ditching will be removed and replaced on the site to expose buried hydric soils and establish micro-topographic variations to enhance the retention of water from seepage and precipitation.

Redistribution of Surface Water: Water Diversion Features will be placed at planned contour intervals to enhance the retention of water from seepage and precipitation and to counteract the damage due to farm practices that promote soil disturbance, manipulation and ditching. The water diversion features will simulate a mature forest condition by diffusing surface water rather than concentrating sheet flow into erosive channels.

3.1.2 Vegetative Community Establishment Vegetation on the site will be restored in order to be consistent with Low Elevation Seeps and Nonriverine Wet Hardwood Forest communities **(Figure 9)**. The following actions will be taken to re-vegetate the site:

Site Preparation: The soils on the site have undergone significant disturbance for at least 21 years. Agricultural operations have compacted the soil, thus decreasing infiltration. Upon the completion of the earth-moving activities, the site will be ripped as necessary to create conditions conducive for the re-establishment of Low Elevation Seep and Nonriverine Wet Hardwood Forest communities on the site.

Planting: The community-planting plan described below provides a guide for the vegetative re-establishment of the targeted communities. If available, the following species will be planted:

Low Elevation Seeps

Species:	**Scientific Name**	**Common Name**
	Quercus phellos	willow oak
	Quercus michauxxii	swamp chest nut oak
	Quercus falcate var. pagodaefolia	cherry bark oak
	Quercus laurifolia	laurel oak
	Ulmus Americana	american elm
	Liriodendron tulipifera	yellow poplar

Planting Density: 436 Stems per acre
Comments: All trees will be 12"-18" bare root material.

Nonriverine Wet Hardwood Forest

Species:	**Scientific Name**	**Common Name**
	Liriodendron tulipifera	yellow poplar
	Quercus falcata var. pagodaefolia	cherry bark oak
	Ulmus americana	American elm
	Quercus laurifolia	laurel oak
	Quercus michauxii	swamp chestnut oak
	Nyssa sylvatica var. biflora	swamp blackgum
	Nyssa biflora	water tupelo
	Taxodium distichum	bald cypress

Planting Density: 436 Stems per acre
Comments: All trees will be 12”-18” bare root material.

4.0 WETLAND MANAGEMENT ACTIVITIES

4.1 Post Implementation Documentation

An "as built" report will be submitted to the WRP within 90 days of the completion of planting and gauge installation and will include: elevations, photographs, gauge locations, and a description of initial species composition by community and sampling plot locations. Included within the report will be a list of species planted, planting densities, and a total number of stems in the mitigation area. This information will form the base for further monitoring and evaluation.

4.2 Monitoring and Success Criteria

The monitoring program will be implemented to document system development and progress towards achieving mitigation goals and objectives. The site will be determined to be successful once wetland hydrology is established and vegetation success criteria are met. Monitoring data will be collected yearly for a period of five years or until success criteria are achieved. Annual reports will be submitted to the WRP, documenting the monitored components of the restoration plan i.e. hydrology and vegetation, and will include all collected data, analysis and photographs.

4.2.1 Hydrology

Groundwater elevations will be monitored to demonstrate the attainment of jurisdictional hydrology. The reference wetland monitored during the design phase will also be monitored with the same procedures for comparative analysis.

Monitoring Procedure: Verification of wetland hydrology will be determined by automatic recording well data, collected within the project area and approved reference wetland. Automatic recording wells will be established within restoration areas at a density of one automatic well per four acres (8 wells total). Daily data will be collected from automatic wells over the 5-year monitoring period following implementation. This data will be utilized to aid in determination of the local growing season based on soil temperature and NRCS data.

Success Criteria: Wetland hydrology will be considered established if well data from the site indicates that the water table is within 12 inches of the soil surface for 5% of the growing season (NRCS published or locally calculated) during normal weather conditions. A "normal" year was based on NRCS climatological data for Franklin County, and using the 30^{th} to 70^{th} percentile thresholds as the range of normal, as documented in the USACOE Technical Report "Accessing and Using Meterological Data to Evaluate Wetland Hydrology, April 2000." According to the USDA, NRCS Franklin County Soil Survey, the growing season is considered to be the period with a 50% probability that the daily minimum temperature is higher than 28°F. Using this criterion and data from the adjacent counties of Nash and Granville, the growing season in Franklin County is considered to extend from March 20 to November 11, yielding 235 days. Therefore, success will be achieved if the water table is within 12 inches of the soil surface for 12 days during the growing season.

4.2.2 Vegetation

The success criteria for the planted species in the restoration areas will be based on survival and growth. Beginning at the end of the first growing season, the project team will monitor site vegetation for five years following the planting.

Monitoring Procedure: Permanent monitoring plots will be established in wetland restoration areas at a density of one plot per four acres (eight plots total) and systematically located to ensure even coverage. Data will be collected at each plot for: total number of stems, species, percent survival, height, estimated percent cover of all species, and evidence of insects, disease and browsing.

Success Criteria: Survival of planted species must be 260 stems/acre at the end of five years of monitoring. Non-target species must not constitute more than 20 percent of the woody vegetation based on permanent monitoring plots.

4.3 Management Plan/Remedial Activities

Restoration of wetlands involves interpretation of collected information to devise a strategy that will ultimately lead to a functional ecosystem. In such, minor variations in expected responses can be anticipated due to unknown site conditions, inputs from outside the restoration site, regional climatic variations, acts of God, etc. Correspondingly, nurturing of the site through regular management activities is considered necessary to assure that the goals and objectives of the project are met. These activities will be conducted throughout the year and may include: invasive control, debris or trash removal, etc. If the monitoring of the site thereafter identifies a failure to attain specific success criteria, a remedial action plan will be developed which investigates the cause of the failure and proposes actions to rectify the problem.

APPENDIX A

NRCS Letter Regarding Prior Converted Status

APPENDIX B

Historical Aerial Photographs

NOT TO SCALE

KCI ASSOCIATES OF NORTH CAROLINA, P.A.

PHASE I ESA
DANIELS FARM SITE
1938 AERIAL PHOTOGRAPH

Approximate Subject Property Area Highlighted

N.C. Wetlands Restoration Program
NCDENR

NOT TO SCALE

KCI ASSOCIATES OF NORTH CAROLINA, P.A.

PHASE I ESA
DANIELS FARM SITE
1955 AERIAL PHOTOGRAPH

Approximate Subject Property Area Highlighted

N.C. Wetlands Restoration Program
NCDENR

KCI ASSOCIATES OF NORTH CAROLINA, P.A.

PHASE I ESA
DANIELS FARM SITE
1973 AERIAL PHOTOGRAPH

Approximate Subject Property Area Highlighted

N.C. Wetlands Restoration Program
NCDENR

KCI ASSOCIATES OF NORTH CAROLINA, P.A.

PHASE I ESA
DANIELS FARM SITE
1982 AERIAL PHOTOGRAPH

Approximate Subject Property Area Highlighted

N.C. Wetlands Restoration Program
NCDENR

APPENDIX C

Phase I Environmental Site Assessment Report

EDR NEPACheck®

Daniels
North of Egypt Church Road
Louisburg, NC 27549

Inquiry Number: 912282.3s

January 16, 2003

Environmental Data Resources, Inc.

The Source For Environmental Risk Management Data

3530 Post Road
Southport, Connecticut 06890

Nationwide Customer Service

Telephone: 1-800-352-0050
Fax: 1-800-231-6802
Internet: www.edrnet.com

FORM-HOW

TABLE OF CONTENTS

Thank you for your business.
Please contact EDR at 1-800-352-0050
with any questions or comments.

EDR NEPACheck® DESCRIPTION

The National Environmental Policy Act of 1969 (NEPA) requires that Federal agencies include in their decision-making processes appropriate and careful consideration of all environmental effects and actions, analyze potential environmental effects of proposed actions and their alternatives for public understanding and scrutiny, avoid or minimize adverse effects of proposed actions, and restore and enhance environmental quality as much as possible.

The EDR NEPACheck provides information which may be used, in conjunction with additional research, to determine whether a proposed site or action will have significant environmental effect.

The report provides maps and data for the following items (where available). Search results are provided in the Map Findings Summary on page 2 of this report.

Section	Regulation
Natural Areas Map	
• Federal Lands Data:	
- Officially designated wilderness areas	47 CFR 1.1307(1)
- Officially designated wildlife preserves, sanctuaries and refuges	47 CFR 1.1307(2)
- Wild and scenic rivers	40 CFR 6.302(e)
- Fish and Wildlife	40 CFR 6.302
• Threatened or Endangered Species, Fish and Wildlife, Critical Habitat Data (where available)	47 CFR 1.1307(3); 40 CFR 6.302
Historic Sites Map	
• National Register of Historic Places	47 CFR 1.1307(4); 40 CFR 6.302
• State Historic Places (where available)	
Flood Plain Map	
• National Flood Plain Data (where available)	47 CFR 1.1307(6); 40 CFR 6.302
Wetlands Map	
• National Wetlands Inventory Data (where available)	47 CFR 1.1307(7); 40 CFR 6.302
FCC & FAA Map	
• FCC antenna/tower sites, AM Radio Towers, FAA Markings and Obstructions, AM Radio Interference Zones, Airports, Topographic gradient	47 CFR 1.1307(8)
Key Contacts and Government Records Searched	

MAP FINDINGS SUMMARY

The databases searched in this report are listed below. Database descriptions and other agency contact information is contained in the Key Contacts and Government Records Searched section on page 25 of this report.

TARGET PROPERTY ADDRESS

DANIELS
NORTH OF EGYPT CHURCH ROAD
LOUISBURG, NC 27549

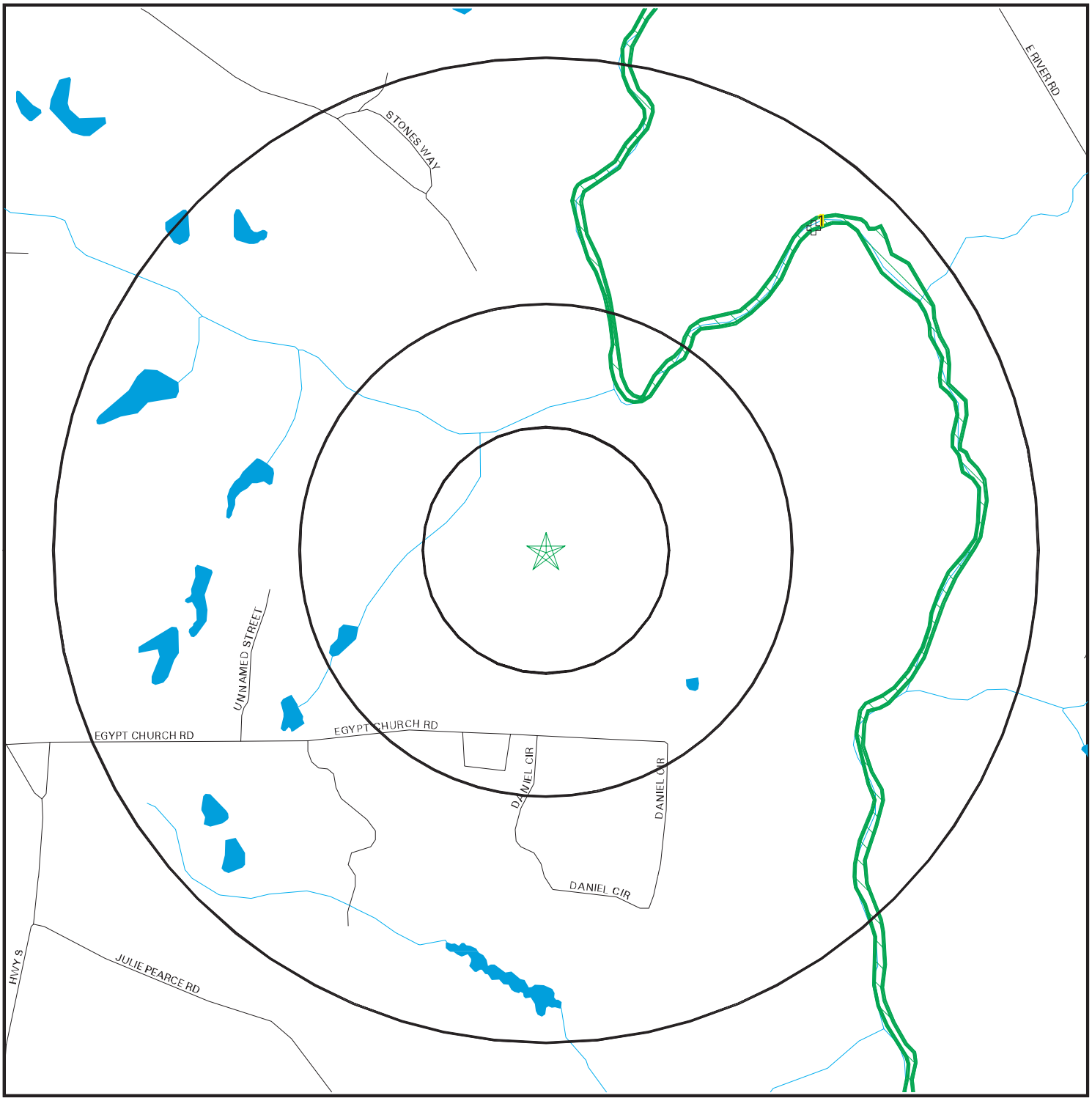
Inquiry #: 912282.3s
Date: 1/16/3

TARGET PROPERTY COORDINATES

Latitude (North):	36.062302 - 36° 3' 44.3''
Longitude (West):	78.281097 - 78° 16' 52.0''
Universal Tranverse Mercator:	Zone 17
UTM X (Meters):	744889.4
UTM Y (Meters):	3994079.8

Applicable Regulation from 47 CFR/FCC Checklist	Database	Search Distance (Miles)	Within Search	Within 1/8 Mile
NATURAL AREAS MAP				
1.1307a (1) Officially Designated Wilderness Area	US Federal Lands	1.00	NO	NO
1.1307a (2) Officially Designated Wildlife Preserve	US Federal Lands	1.00	NO	NO
1.1307a (2) Officially Designated Wildlife Preserve	NC Game Lands	1.00	NO	NO
1.1307a (3) Threatened or Endangered Species or Critical Habitat	NC Natural Heritage Sites	1.00	NO	NO
1.1307a (2) Officially Designated Wildlife Preserve	NC Natural Areas	1.00	YES	NO
1.1307a (3) Threatened or Endangered Species or Critical Habitat	NC Endangered Species/Natural	1.00	NO	NO
HISTORIC SITES MAP				
1.1307a (4) Listed or eligible for National Register	National Register Hist. Places	1.00	NO	NO
1.1307a (4) Listed or eligible for National Register	NC Historic Sites	1.00	NO	NO
	APPAL_TRAIL	1.00	NO	NO
FLOODPLAIN MAP				
1.1307 (6) Located in a Flood Plain	FLOODPLAIN	1.00	YES	YES
WETLANDS MAP				
1.1307 (7) Change in surface features (wetland fill)	NWI	1.00	YES	YES
NC COASTAL ZONE	20.00	NO	NO	
FCC & FAA SITES MAP				
	FCC Cellular	1.00	NO	NO
	FCC Antenna	1.00	NO	NO
	FCC Tower	1.00	NO	NO
	FCC AM Tower	1.00	NO	NO
	FAA DOF	1.00	NO	NO

Natural Areas Map



Target Property
Roads
County Boundary
Waterways
Water
Locations
Federal Areas
Federal Linear Features
State Areas
State Linear Features

0 1/4 1/2 1 Miles

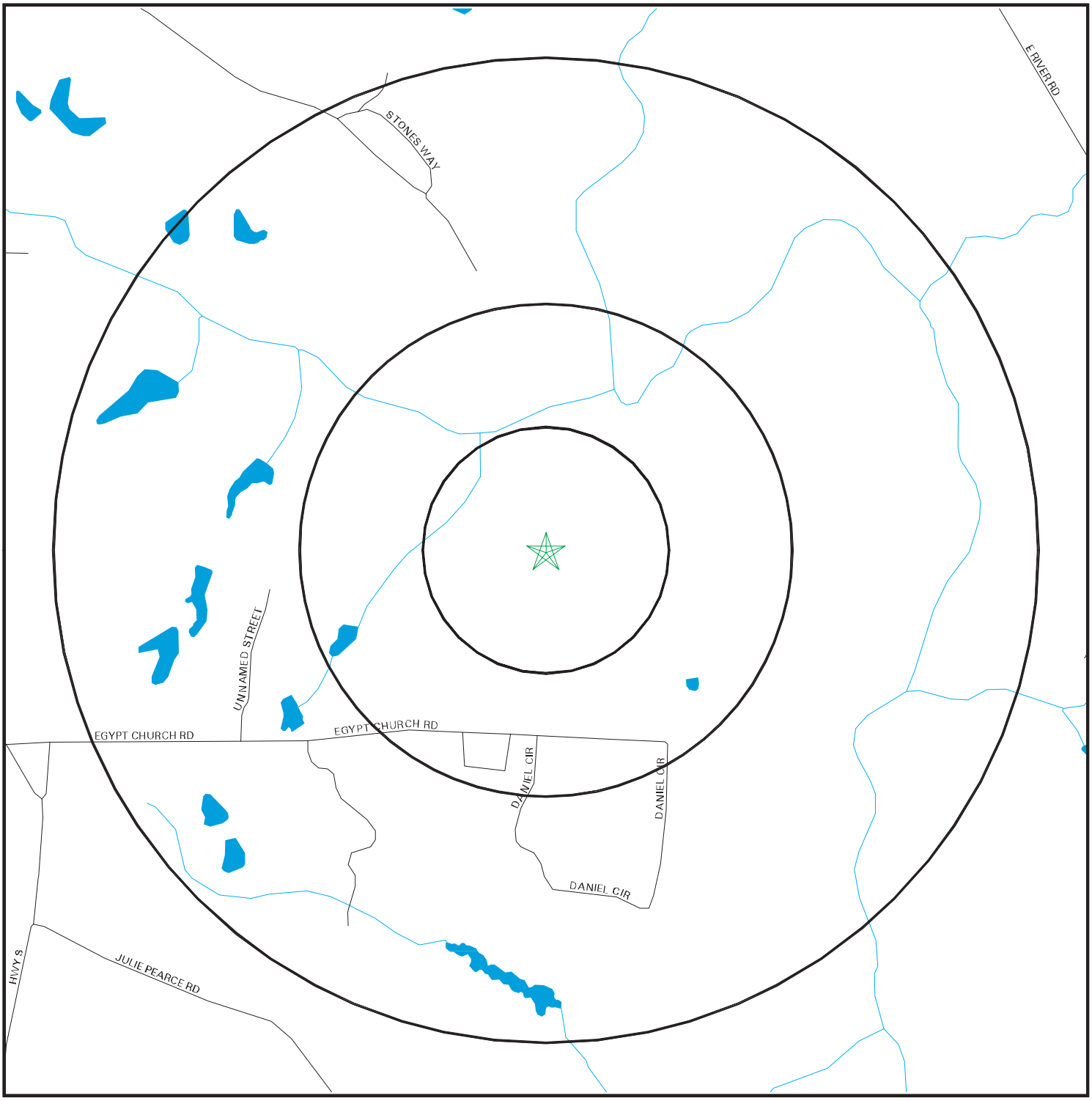
N

TARGET PROPERTY:	Daniels	CUSTOMER:	KCI Technologies, Inc.
ADDRESS:	North of Egypt Church Road	CONTACT:	Kim Burton
CITY/STATE/ZIP:	Louisburg NC 27549	INQUIRY #:	912282.3s
LAT/LONG:	36.0623 / 78.2811	DATE:	January 16, 2003

NATURAL AREAS MAP FINDINGS

Map ID Direction Distance Distance (ft.)			EDR ID Database
1 NNE 1/4-1/2 mi 1831	Site Name: Acreage per Polygon: NHP Site Number: Cartographic Specification:	Middle Tar River Aquatic Habitat 754.302 S.USNCHP*1203 Natural Area	NC20000104 NC Natural Areas

Historic Sites Map



Target Property
Streets
County Boundary
Waterways
Water

Historic Sites
Federal Historic Areas
State Historic Areas
Scenic Trail

0 1/4 1/2 1 Miles

N

TARGET PROPERTY:	Daniels	CUSTOMER:	KCI Technologies, Inc.
ADDRESS:	North of Egypt Church Road	CONTACT:	Kim Burton
CITY/STATE/ZIP:	Louisburg NC 27549	INQUIRY #:	912282.3s
LAT/LONG:	36.0623 / 78.2811	DATE:	January 16, 2003

HISTORIC SITES MAP FINDINGS

Map ID Direction Distance Distance (ft.)	EDR ID Database

No mapped sites were found in EDR's search of available government records within the search radius around the target property.

UNMAPPABLE HISTORIC SITES

Due to poor or inadequate address information, the following sites were not mapped:

Status
EDR ID
Database

Name: Archibald H. Davis Plantation (Cypress Hall)
City: Louisburg vicinity
County: FRANKLIN
Date Listed: 7/24/1975
NR Number: 397 - Unknown code

Unmappable
NC50000838
NC Historic Sites

Name: Cascine
City: Louisburg vicinity
County: FRANKLIN
Date Listed: 4/26/1973
NR Number: 254 - Unknown code

Unmappable
NC50000835
NC Historic Sites

Name: Cooke House
City: Louisburg vicinity
County: FRANKLIN
Date Listed: 10/14/1975
NR Number: 423 - Unknown code

Unmappable
NC50000837
NC Historic Sites

Name: Dean Farm
City: Louisburg vicinity
County: FRANKLIN
Date Listed: 5/2/1975
NR Number: 381 - Unknown code

Unmappable
NC50000839
NC Historic Sites

Name: Edwin Wiley Fuller House
City: Louisburg
County: FRANKLIN
Date Listed: 11/17/1978
NR Number: 568 - Unknown code

Unmappable
NC50000841
NC Historic Sites

Name: Green Hill House
City: Louisburg vicinity
County: FRANKLIN
Date Listed: 6/10/1975
NR Number: 395 - Unknown code

Unmappable
NC50000842
NC Historic Sites

Name: Laurel Mill and Colonel Jordan Jones House
City: Louisburg vicinity
County: FRANKLIN
Date Listed: 5/30/1975
NR Number: 383 - Unknown code

Unmappable
NC50000847
NC Historic Sites

Name: Louisburg Historic District
City: Louisburg
County: FRANKLIN
Date Listed: 2/18/1987
NR Number: 1251 - Unknown code

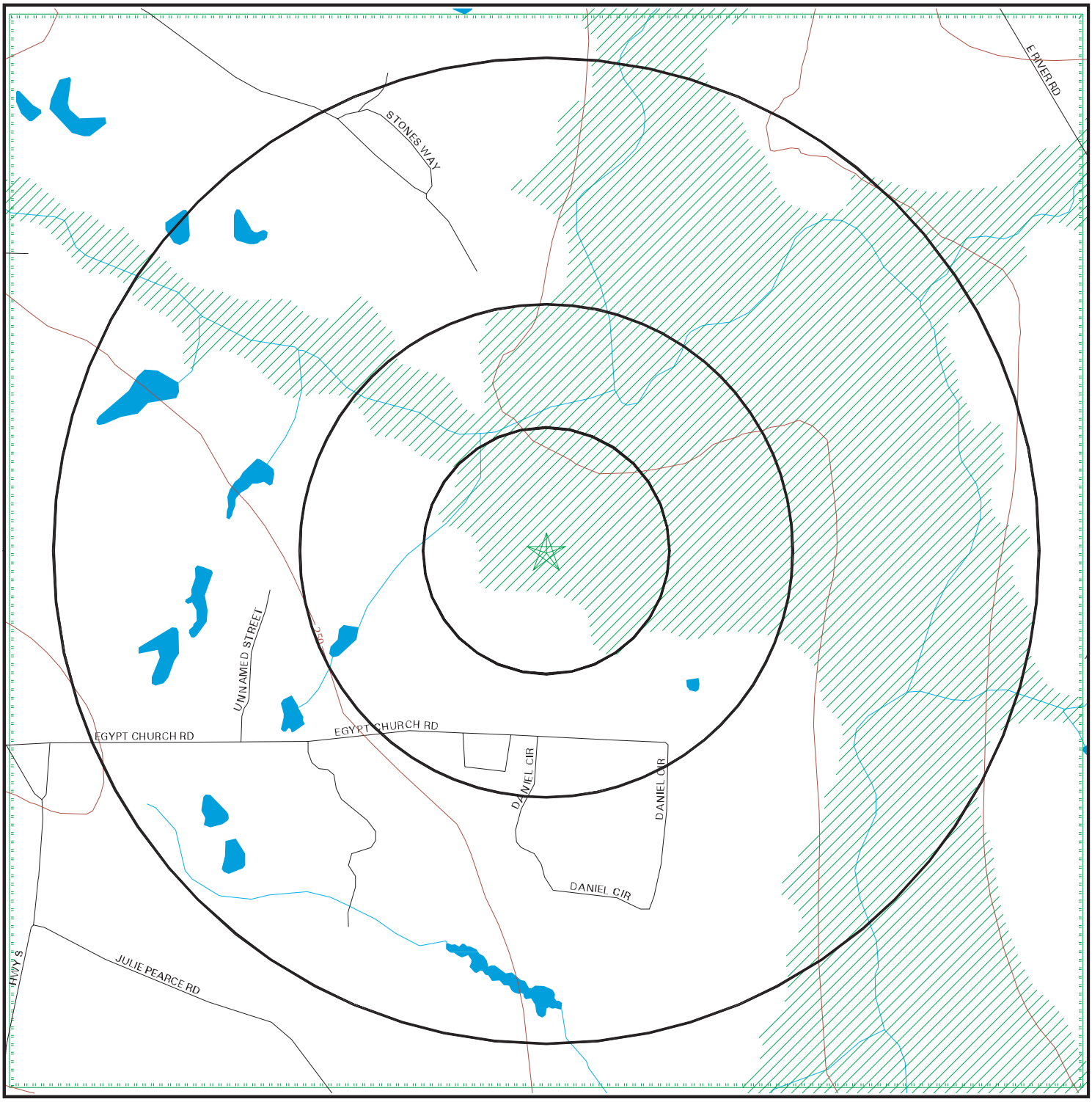
Unmappable
NC50000849
NC Historic Sites

UNMAPPABLE HISTORIC SITES

Due to poor or inadequate address information, the following sites were not mapped:

		Status EDR ID Database
Name:	Main Building, Louisburg College	Unmappable
City:	Louisburg	NC50000850
County:	FRANKLIN	NC Historic Sites
Date Listed:	12/8/1978	
NR Number:	583 - Unknown code	
Name:	Massenburg Plantation (Boundary Expansion)	Unmappable
City:	Louisburg vicinity	NC50000852
County:	FRANKLIN	NC Historic Sites
Date Listed:	3/15/2000	
NR Number:	2026 - Unknown code	
Name:	Massenburg Plantation (Woodleaf Plantation)	Unmappable
City:	Louisburg vicinity	NC50000851
County:	FRANKLIN	NC Historic Sites
Date Listed:	7/30/1975	
NR Number:	399 - Unknown code	
Name:	Patty Person Taylor House	Unmappable
City:	Louisburg vicinity	NC50000862
County:	FRANKLIN	NC Historic Sites
Date Listed:	2/13/1975	
NR Number:	374 - Unknown code	
Name:	Person Place	Unmappable
City:	Louisburg vicinity	NC50000855
County:	FRANKLIN	NC Historic Sites
Date Listed:	6/19/1972	
NR Number:	189 - Unknown code	
Name:	Portridge Plantation	Unmappable
City:	Louisburg vicinity	NC50000857
County:	FRANKLIN	NC Historic Sites
Date Listed:	3/1/1990	
NR Number:	1524 - Unknown code	
Name:	Williamson House	Unmappable
City:	Louisburg	NC50000864
County:	FRANKLIN	NC Historic Sites
Date Listed:	6/20/1975	
NR Number:	398 - Unknown code	

Flood Plain Map



Major Roads
Contour Lines
Waterways
County Boundary

Power Lines
Pipe Lines
Fault Lines

Water
100-year flood zone
500-year flood zone
Electronic FEMA data available
Electronic FEMA data not available

0 1/4 1/2 1 Miles

N

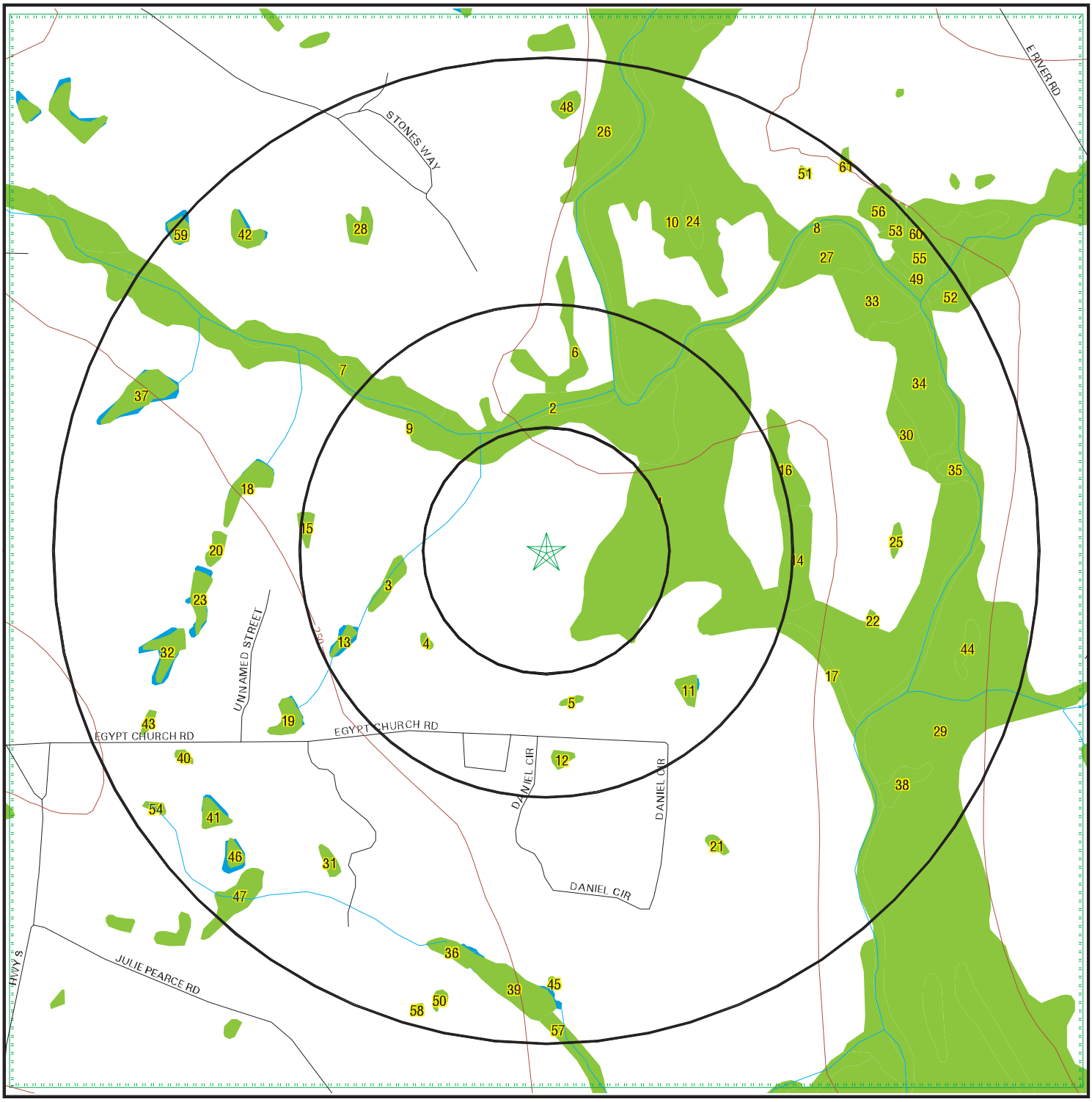
TARGET PROPERTY:	Daniels	CUSTOMER:	KCI Technologies, Inc.
ADDRESS:	North of Egypt Church Road	CONTACT:	Kim Burton
CITY/STATE/ZIP:	Louisburg NC 27549	INQUIRY #:	912282.3s
LAT/LONG:	36.0623 / 78.2811	DATE:	January 16, 2003

FLOOD PLAIN MAP FINDINGS

Source: FEMA Q3 Flood Data

County	FEMA flood data electronic coverage
FRANKLIN, NC	YES
Flood Plain panel at target property:	3703770006A
Additional Flood Plain panel(s) in search area:	
3700980002C	
3703770009A	

National Wetlands Inventory Map



Major Roads
Contour Lines
Waterways
County Boundary

Power Lines
Pipe Lines
Fault Lines

Water
Wetlands
Electronic NWI data available
Electronic NWI data not available

0 1/4 1/2 1 Miles

N

TARGET PROPERTY:	Daniels	CUSTOMER:	KCI Technologies, Inc.
ADDRESS:	North of Egypt Church Road	CONTACT:	Kim Burton
CITY/STATE/ZIP:	Louisburg NC 27549	INQUIRY #:	912282.3s
LAT/LONG:	36.0623 / 78.2811	DATE:	January 16, 2003

WETLANDS MAP FINDINGS

Source: Fish and Wildlife Service NWI data

NWI hardcopy map at target property: Louisburg
Additional NWI hardcopy map(s) in search area:
Not reported in source data

Map ID Direction Distance Distance (ft.)	Code and Description*	Database
1 ESE 0-1/8 mi 476	PFO1A [P] Palustrine, [FO] Forested, [1] Broad-Leaved Deciduous, [A] Temporarily Flooded	NWI
2 NNW 1/8-1/4 mi 1303	PFO1C [P] Palustrine, [FO] Forested, [1] Broad-Leaved Deciduous, [C] Seasonally Flooded	NWI
3 West 1/4-1/2 mi 1499	PUBHh [P] Palustrine, [UB] Unconsolidated Bottom, [H] Permanently Flooded, [h] Diked/Impounded	NWI
4 SW 1/4-1/2 mi 1555	PUBHh [P] Palustrine, [UB] Unconsolidated Bottom, [H] Permanently Flooded, [h] Diked/Impounded	NWI
5 SSE 1/4-1/2 mi 1582	PUBHx [P] Palustrine, [UB] Unconsolidated Bottom, [H] Permanently Flooded, [x] Excavated	NWI
6 North 1/4-1/2 mi 1690	PFO1A [P] Palustrine, [FO] Forested, [1] Broad-Leaved Deciduous, [A] Temporarily Flooded	NWI
7 NW 1/4-1/2 mi 1810	PSS1A [P] Palustrine, [SS] Scrub-Shrub, [1] Broad-Leaved Deciduous, [A] Temporarily Flooded	NWI
8 NNE 1/4-1/2 mi 1833	R2UBH [R] Riverine, [2] Lower Perennial, [UB] Unconsolidated Bottom, [H] Permanently Flooded	NWI
9 NW 1/4-1/2 mi 1913	PUBHx [P] Palustrine, [UB] Unconsolidated Bottom, [H] Permanently Flooded, [x] Excavated	NWI

*See Wetland Classification System for additional information.

WETLANDS MAP FINDINGS

Map ID Direction Distance Distance (ft.)	Code and Description*	Database
10 NNE 1/4-1/2 mi 1918	PFO1A [P] Palustrine, [FO] Forested, [1] Broad-Leaved Deciduous, [A] Temporarily Flooded	NWI
11 SE 1/4-1/2 mi 1954	PUBHh [P] Palustrine, [UB] Unconsolidated Bottom, [H] Permanently Flooded, [h] Diked/Impounded	NWI
12 South 1/4-1/2 mi 2136	PUBHh [P] Palustrine, [UB] Unconsolidated Bottom, [H] Permanently Flooded, [h] Diked/Impounded	NWI
13 WSW 1/4-1/2 mi 2194	PUBHh [P] Palustrine, [UB] Unconsolidated Bottom, [H] Permanently Flooded, [h] Diked/Impounded	NWI
14 East 1/4-1/2 mi 2504	PEM1Ad [P] Palustrine, [EM] Emergent, [1] Persistent, [A] Temporarily Flooded, [d] Partially Drained/Ditched	NWI
15 West 1/4-1/2 mi 2509	PUBHh [P] Palustrine, [UB] Unconsolidated Bottom, [H] Permanently Flooded, [h] Diked/Impounded	NWI
16 ENE 1/4-1/2 mi 2518	PEM1Cd [P] Palustrine, [EM] Emergent, [1] Persistent, [C] Seasonally Flooded, [d] Partially Drained/Ditched	NWI
17 ESE 1/4-1/2 mi 2589	PFO1C [P] Palustrine, [FO] Forested, [1] Broad-Leaved Deciduous, [C] Seasonally Flooded	NWI
18 WNW 1/2-1 mi 3018	PUBHh [P] Palustrine, [UB] Unconsolidated Bottom, [H] Permanently Flooded, [h] Diked/Impounded	NWI
19 WSW 1/2-1 mi 3144	PUBHh [P] Palustrine, [UB] Unconsolidated Bottom, [H] Permanently Flooded, [h] Diked/Impounded	NWI

*See Wetland Classification System for additional information.

WETLANDS MAP FINDINGS

Map ID Direction Distance Distance (ft.)	Code and Description*	Database
20 West 1/2-1 mi 3420	PUBHh [P] Palustrine, [UB] Unconsolidated Bottom, [H] Permanently Flooded, [h] Diked/Impounded	NWI
21 SSE 1/2-1 mi 3504	PEM1Fh [P] Palustrine, [EM] Emergent, [1] Persistent, [F] Semipermanently Flooded, [h] Diked/Impounded	NWI
22 East 1/2-1 mi 3509	PEM1Cd [P] Palustrine, [EM] Emergent, [1] Persistent, [C] Seasonally Flooded, [d] Partially Drained/Ditched	NWI
23 West 1/2-1 mi 3586	PUBHh [P] Palustrine, [UB] Unconsolidated Bottom, [H] Permanently Flooded, [h] Diked/Impounded	NWI
24 NNE 1/2-1 mi 3612	PFO1C [P] Palustrine, [FO] Forested, [1] Broad-Leaved Deciduous, [C] Seasonally Flooded	NWI
25 East 1/2-1 mi 3686	PEM1Cd [P] Palustrine, [EM] Emergent, [1] Persistent, [C] Seasonally Flooded, [d] Partially Drained/Ditched	NWI
26 North 1/2-1 mi 3721	PFO1A [P] Palustrine, [FO] Forested, [1] Broad-Leaved Deciduous, [A] Temporarily Flooded	NWI
27 NE 1/2-1 mi 3755	PFO1A [P] Palustrine, [FO] Forested, [1] Broad-Leaved Deciduous, [A] Temporarily Flooded	NWI
28 NNW 1/2-1 mi 3792	PUBHh [P] Palustrine, [UB] Unconsolidated Bottom, [H] Permanently Flooded, [h] Diked/Impounded	NWI
29 ESE 1/2-1 mi 3899	PFO1A [P] Palustrine, [FO] Forested, [1] Broad-Leaved Deciduous, [A] Temporarily Flooded	NWI

*See Wetland Classification System for additional information.

WETLANDS MAP FINDINGS

Map ID Direction Distance Distance (ft.)	Code and Description*	Database
30 ENE 1/2-1 mi 3917	PFO1C [P] Palustrine, [FO] Forested, [1] Broad-Leaved Deciduous, [C] Seasonally Flooded	NWI
31 SW 1/2-1 mi 3950	PUBHh [P] Palustrine, [UB] Unconsolidated Bottom, [H] Permanently Flooded, [h] Diked/Impounded	NWI
32 WSW 1/2-1 mi 3967	PUBHh [P] Palustrine, [UB] Unconsolidated Bottom, [H] Permanently Flooded, [h] Diked/Impounded	NWI
33 NE 1/2-1 mi 4058	PEM1Ad [P] Palustrine, [EM] Emergent, [1] Persistent, [A] Temporarily Flooded, [d] Partially Drained/Ditched	NWI
34 ENE 1/2-1 mi 4090	PFO1A [P] Palustrine, [FO] Forested, [1] Broad-Leaved Deciduous, [A] Temporarily Flooded	NWI
35 ENE 1/2-1 mi 4276	PFO1A [P] Palustrine, [FO] Forested, [1] Broad-Leaved Deciduous, [A] Temporarily Flooded	NWI
36 SSW 1/2-1 mi 4290	PFO1Fh [P] Palustrine, [FO] Forested, [1] Broad-Leaved Deciduous, [F] Semipermanently Flooded, [h] Diked/Impounded	NWI
37 WNW 1/2-1 mi 4314	PUBHh [P] Palustrine, [UB] Unconsolidated Bottom, [H] Permanently Flooded, [h] Diked/Impounded	NWI
38 SE 1/2-1 mi 4349	PFO1C [P] Palustrine, [FO] Forested, [1] Broad-Leaved Deciduous, [C] Seasonally Flooded	NWI
39 South 1/2-1 mi 4383	PUBHh [P] Palustrine, [UB] Unconsolidated Bottom, [H] Permanently Flooded, [h] Diked/Impounded	NWI

*See Wetland Classification System for additional information.

WETLANDS MAP FINDINGS

Map ID Direction Distance Distance (ft.)	Code and Description*	Database
40 WSW 1/2-1 mi 4390	PEM1Ch [P] Palustrine, [EM] Emergent, [1] Persistent, [C] Seasonally Flooded, [h] Diked/Impounded	NWI
41 SW 1/2-1 mi 4426	PUBHh [P] Palustrine, [UB] Unconsolidated Bottom, [H] Permanently Flooded, [h] Diked/Impounded	NWI
42 NW 1/2-1 mi 4482	PUBHh [P] Palustrine, [UB] Unconsolidated Bottom, [H] Permanently Flooded, [h] Diked/Impounded	NWI
43 WSW 1/2-1 mi 4512	PUBHh [P] Palustrine, [UB] Unconsolidated Bottom, [H] Permanently Flooded, [h] Diked/Impounded	NWI
44 ESE 1/2-1 mi 4523	PFO4A [P] Palustrine, [FO] Forested, [4] Needle-Leaved Evergreen, [A] Temporarily Flooded	NWI
45 South 1/2-1 mi 4555	PUBHh [P] Palustrine, [UB] Unconsolidated Bottom, [H] Permanently Flooded, [h] Diked/Impounded	NWI
46 SW 1/2-1 mi 4560	PUBHh [P] Palustrine, [UB] Unconsolidated Bottom, [H] Permanently Flooded, [h] Diked/Impounded	NWI
47 SW 1/2-1 mi 4572	PUBHh [P] Palustrine, [UB] Unconsolidated Bottom, [H] Permanently Flooded, [h] Diked/Impounded	NWI
48 North 1/2-1 mi 4624	PUBHh [P] Palustrine, [UB] Unconsolidated Bottom, [H] Permanently Flooded, [h] Diked/Impounded	NWI
49 NE 1/2-1 mi 4762	PFO1A [P] Palustrine, [FO] Forested, [1] Broad-Leaved Deciduous, [A] Temporarily Flooded	NWI

*See Wetland Classification System for additional information.

WETLANDS MAP FINDINGS

Map ID Direction Distance Distance (ft.)	Code and Description*	Database
50 SSW 1/2-1 mi 4826	PUBHh [P] Palustrine, [UB] Unconsolidated Bottom, [H] Permanently Flooded, [h] Diked/Impounded	NWI
51 NE 1/2-1 mi 4857	PUBHh [P] Palustrine, [UB] Unconsolidated Bottom, [H] Permanently Flooded, [h] Diked/Impounded	NWI
52 ENE 1/2-1 mi 4869	PFO1C [P] Palustrine, [FO] Forested, [1] Broad-Leaved Deciduous, [C] Seasonally Flooded	NWI
53 NE 1/2-1 mi 4893	PUBHh [P] Palustrine, [UB] Unconsolidated Bottom, [H] Permanently Flooded, [h] Diked/Impounded	NWI
54 WSW 1/2-1 mi 4910	PUBHh [P] Palustrine, [UB] Unconsolidated Bottom, [H] Permanently Flooded, [h] Diked/Impounded	NWI
55 NE 1/2-1 mi 4911	PSS1F [P] Palustrine, [SS] Scrub-Shrub, [1] Broad-Leaved Deciduous, [F] Semipermanently Flooded	NWI
56 NE 1/2-1 mi 4917	PEM1Cx [P] Palustrine, [EM] Emergent, [1] Persistent, [C] Seasonally Flooded, [x] Excavated	NWI
57 South 1/2-1 mi 4938	PFO1A [P] Palustrine, [FO] Forested, [1] Broad-Leaved Deciduous, [A] Temporarily Flooded	NWI
58 SSW 1/2-1 mi 5022	PUBHh [P] Palustrine, [UB] Unconsolidated Bottom, [H] Permanently Flooded, [h] Diked/Impounded	NWI
59 NW 1/2-1 mi 5063	PUBHh [P] Palustrine, [UB] Unconsolidated Bottom, [H] Permanently Flooded, [h] Diked/Impounded	NWI

*See Wetland Classification System for additional information.

WETLANDS MAP FINDINGS

Map ID Direction Distance Distance (ft.)	Code and Description*	Database
60 NE 1/2-1 mi 5145	PFO1A [P] Palustrine, [FO] Forested, [1] Broad-Leaved Deciduous, [A] Temporarily Flooded	NWI
61 NE 1/2-1 mi 5188	PUBHh [P] Palustrine, [UB] Unconsolidated Bottom, [H] Permanently Flooded, [h] Diked/Impounded	NWI

*See Wetland Classification System for additional information.

WETLANDS CLASSIFICATION SYSTEM

National Wetland Inventory Maps are produced by the U.S. Fish and Wildlife Service, a sub-department of the U.S. Department of the Interior. In 1974, the U.S. Fish and Wildlife Service developed a criteria for wetland classification with four long range objectives:

- to describe ecological units that have certain homogeneous natural attributes,
- to arrange these units in a system that will aid decisions about resource management,
- to furnish units for inventory and mapping, and
- to provide uniformity in concepts and terminology throughout the U.S.

High altitude infrared photographs, soil maps, topographic maps and site visits are the methods used to gather data for the productions of these maps. In the infrared photos, wetlands appear as different colors and these wetlands are then classified by type. Using a hierarchical classification, the maps identify wetland and deepwater habitats according to:

- system
- subsystem
- class
- subclass
- modifiers

(as defined by Cowardin, et al. U.S. Fish and Wildlife Service FWS/OBS 79/31. 1979.)

The classification system consists of five systems:

1. marine
2. estuarine
3. riverine
4. lacustrine
5. palustrine

The marine system consists of deep water tidal habitats and adjacent tidal wetlands. The riverine system consists of all wetlands contained within a channel. The lacustrine systems includes all nontidal wetlands related to swamps, bogs & marshes. The estuarine system consists of deepwater tidal habitats and where ocean water is diluted by fresh water. The palustrine system includes nontidal wetlands dominated by trees and shrubs and where salinity is below .5% in tidal areas. All of these systems are divided in subsystems and then further divided into class.

National Wetland Inventory Maps are produced by transferring gathered data on a standard 7.5 minute U.S.G.S. topographic map. Approximately 52 square miles are covered on a National Wetland Inventory map at a scale of 1:24,000. Electronic data is compiled by digitizing these National Wetland Inventory Maps.

SYSTEM **MARINE**

SUBSYSTEM **1 - SUBTIDAL** **2 - INTERTIDAL**

CLASS	RB-ROCK BOTTOM	UB-UNCONSOLIDATED BOTTOM	AB-AQUATIC BED	RF-REEF	OW-OPEN WATER / Unknown Bottom	AB-AQUATIC BED	RF-REEF	RS-ROCKY SHORE	US-UNCONSOLIDATED SHORE
Subclass	1 Bedrock 2 Rubble	1 Cobble-Gravel 2 Sand 3 Mud 4 Organic	1 Algal 3 Rooted Vascular 5 Unknown Submergent	1 Coral 3 Worm		1 Algal 3 Rooted Vascular 5 Unknown Submergent	1 Coral 3 Worm	1 Bedrock 2 Rubble	1 Cobble-Gravel 2 Sand 3 Mud 4 Organic

SYSTEM **E - ESTUARINE**

SUBSYSTEM **1 - SUBTIDAL**

CLASS	RB-ROCK BOTTOM	UB-UNCONSOLIDATED BOTTOM	AB-AQUATIC BED	RF-REEF	OW-OPEN WATER / Unknown Bottom
Subclass	1 Bedrock 2 Rubble	1 Cobble-Gravel 2 Sand 3 Mud 4 Organic	1 Algal 3 Rooted Vascular 4 Floating Vascular 5 Unknown Submergent 6 Unknown Surface	2 Mollusk 3 Worm	

SUBSYSTEM **2 - INTERTIDAL**

CLASS	AB-AQUATIC BED	RF-REEF	SB - STREAMBED	RS-ROCKY SHORE	US-UNCONSOLIDATED SHORE	EM-EMERGENT	SS-SCRUB SHRUB	FO-FORESTED
Subclass	1 Algal 3 Rooted Vascular 4 Floating Vascular 5 Unknown Submergent 6 Unknown Surface	2 Mollusk 3 Worm	1 Cobble- Gravel 2 Sand 3 Mud 4 Organic	1 Bedrock 2 Rubble	1 Cobble- Gravel 2 Sand 3 Mud 4 Organic	1 Persistent 2 Nonpersistent	1 Broad-Leaved Deciduous 2 Needle-Leaved Deciduous 3 Broad-Leaved Evergreen 4 Needle-Leaved Evergreen 5 Dead 6 Deciduous 7 Evergreen	1 Broad-Leaved Deciduous 2 Needle-Leaved Deciduous 3 Broad-Leaved Evergreen 4 Needle-Leaved Evergreen 5 Dead 6 Deciduous 7 Evergreen

SYSTEM — **R - RIVERINE**

SUBSYSTEM	**1 - TIDAL**	**2 - LOWER PERENNIAL**	**3 - UPPER PERENNIAL**	**4 - INTERMITTENT**	**5 - UNKNOWN PERENNIAL**
CLASS	RB-ROCK BOTTOM UB-UNCONSOLIDATED BOTTOM *SB-STREAMBED AB-AQUATIC BED RS-ROCKY SHORE US-UNCONSOLIDATED SHORE **EM-EMERGENT OW-OPEN WATER/ Unknown Bottom				
Subclass	1 Bedrock 2 Rubble	1 Cobble-Gravel 2 Sand 3 Mud 4 Organic	1 Bedrock 2 Rubble 3 Cobble-Gravel 4 Sand 5 Mud 6 Organic 7 Vegetated	1 Algal 2 Aquatic Moss 3 Rooted Vascular 4 Floating Vascular 5 Unknown Submergent 6 Unknown Surface	1 Bedrock 2 Rubble	1 Cobble-Gravel 2 Sand 3 Mud 4 Organic 5 Vegetated	2 Nonpersistent

* STREAMBED is limited to TIDAL and INTERMITTENT SUBSYSTEMS, and comprises the only CLASS in the INTERMITTENT SUBSYSTEM.
**EMERGENT is limited to TIDAL and LOWER PERENNIAL SUBSYSTEMS.

SYSTEM — **L - LACUSTRINE**

SUBSYSTEM — **1 - LIMNETIC**

CLASS	RB-ROCK BOTTOM	UB-UNCONSOLIDATED BOTTOM	AB-AQUATIC BED	OW-OPEN WATER/ Unknown Bottom
Subclass	1 Bedrock 2 Rubble	1 Cobble-Gravel 2 Sand 3 Mud 4 Organic	1 Algal 2 Aquatic Moss 3 Rooted Vascular 4 Floating Vascular 5 Unknown Submergent 6 Unknown Surface	

SUBSYSTEM — **2 - LITTORAL**

CLASS	RB-ROCK BOTTOM	UB-UNCONSOLIDATED BOTTOM	AB-AQUATIC BED	RS-ROCKY SHORE	US-UNCONSOLIDATED SHORE	EM-EMERGENT	OW-OPEN WATER/ Unknown Bottom
Subclass	1 Bedrock 2 Rubble	1 Cobble-Gravel 2 Sand 3 Mud 4 Organic	1 Algal 2 Aquatic Moss 3 Rooted Vascular 4 Floating Vascular 5 Unknown Submergent 6 Unknown Surface	1 Bedrock 2 Rubble	1 Cobble-Gravel 2 Sand 3 Mud 4 Organic 5 Vegetated	2 Nonpersistent	

SUBSYSTEM — **P - PALUSTRINE**

CLASS	RB--ROCK BOTTOM	UB--UNCONSOLIDATED BOTTOM	AB-AQUATIC BED	US--UNCONSOLIDATED SHORE	ML--MOSS-LICHEN	EM--EMERGENT	SS--SCRUB-SHRUB	FO--FORESTED	OW-OPEN WATER/ Unknown
Bottom									
Subclass	1 Bedrock 2 Rubble 3 Mud 4 Organic	1 Cobble-Gravel 2 Sand	1 Algal 2 Aquatic Moss 3 Rooted Vascular 4 Floating Vascular 5 Unknown Submergent 6 Unknown Surface	1 Cobble-Gravel 2 Sand 3 Mud 4 Organic 5 Vegetated	1 Moss 2 Lichen	1 Persistent 2 Nonpersistent	1 Broad-Leaved Deciduous 2 Needle-Leaved Deciduous 3 Broad-Leaved Evergreen 4 Needle-Leaved Evergreen 5 Dead 6 Deciduous 7 Evergreen	1 Broad-Leaved Deciduous 2 Needle-Leaved Deciduous 3 Broad-Leaved Evergreen 4 Needle-Leaved Evergreen 5 Dead 6Deciduous 7 Evergreen	

MODIFIERS

In order to more adequately describe wetland and deepwater habitats one or more of the water regime, water chemistry, soil, or special modifiers may be applied at the class or lower level in the hierarchy. The farmed modifier may also be applied to the ecological system.

WATER REGIME

Non-Tidal

A Temporarily Flooded
B Saturated
C Seasonally Flooded
D Seasonally Flooded/ Well Drained
E Seasonally Flooded/ Saturated
F Semipermanently Flooded
G Intermittently Exposed

Tidal

H Permanently Flooded
J Intermittently Flooded
K Artificially Flooded
W Intermittently Flooded/Temporary
Y Saturated/Semipermanent/ Seasonal
Z Intermittently Exposed/Permanent
U Unknown

Coastal Halinity Inland Salinity pH Modifiers for

K Artificially Flooded
L Subtidal
M Irregularly Exposed
N Regularly Flooded
P Irregularly Flooded

*S Temporary-Tidal
*R Seasonal-Tidal
*T Semipermanent -Tidal
V Permanent -Tidal
U Unknown

*These water regimes are only used in tidally influenced, freshwater systems.

WATER CHEMISTRY

1 Hyperhaline
2 Euhaline
3 Mixohaline (Brackish)
4 Polyhaline
5 Mesohaline
6 Oligohaline
0 Fresh

7 Hypersaline
8 Eusaline
9 Mixosaline
0 Fresh

all Fresh Water

a Acid
t Circumneutral
i Alkaline

SOIL

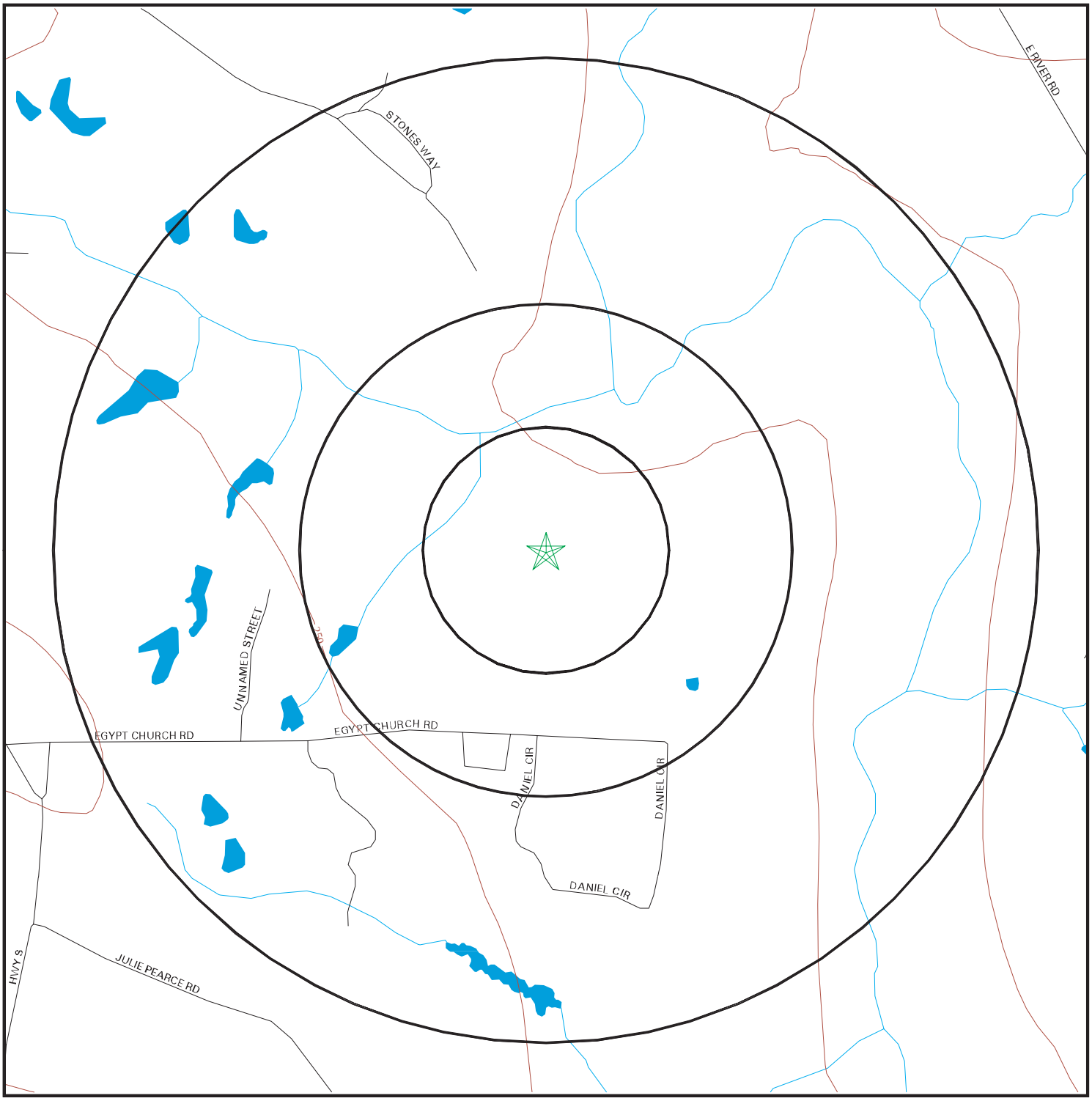
g Organic
n Mineral

SPECIAL MODIFIERS

b Beaver
d Partially Drained/Ditched
f Farmed
h Diked/Impounded
r Artificial Substrate
s Spoil
x Excavated

Source: U.S. Department of the Interior
Fish and Wildlife Service
National Wetlands Inventory

FCC & FAA Sites Map



Streets
Contour Lines
County Boundary
Waterways
Water

Sites
Omni Directional AM Interference
Directional AM Interference

0 1/4 1/2 1 Miles

N

TARGET PROPERTY:	Daniels	CUSTOMER:	KCI Technologies, Inc.
ADDRESS:	North of Egypt Church Road	CONTACT:	Kim Burton
CITY/STATE/ZIP:	Louisburg NC 27549	INQUIRY #:	912282.3s
LAT/LONG:	36.0623 / 78.2811	DATE:	January 16, 2003

FCC & FAA SITES MAP FINDINGS

Map ID
Direction
Distance
Distance (ft.)

EDR ID
Database

No Sites Reported.

KEY CONTACTS & GOVERNMENT RECORDS SEARCHED

Various Federal laws and executive orders address specific environmental concerns. NEPA requires the responsible offices to integrate to the greatest practical extent the applicable procedures required by these laws and executive orders. EDR provides key contacts at agencies charged with implementing these laws and executive orders to supplement the information contained in this report.

NATURAL AREAS
Officially designated wilderness areas
Government Records Searched in This Report

FED_LAND: Federal Lands
Source: USGS
Telephone: 703-648-5094
Federal data from Bureau of Land Management, National Park Service, Forest Service, Fish and Wildlife Service, and Bureau of Indian Affairs.
- National Parks
- Forests
- Monuments
- Wildlife Sanctuaries, Preserves, Refuges
- Federal Wilderness Areas.
- Indian Reservations
Date of Government Version: 09/01/1997

Federal Contacts for Additional Information

National Park Service, Southeast Region
100 Alabama Street SW, 1924 Building
Atlanta, GA 30303
404-562-3100

USDA Forest Service, Southern
1720 Peachtree Road, N.W.
Atlanta, GA 30367
404-347-2384

BLM - Eastern States Office
7450 Boston Blvd.
Springfield, VA 22153
703-440-1713

Fish & Wildlife Service, Region 4
Budget and Finance 1875 Century Boulevard
Atlanta, GA 30345
404-679-4096

Officially designated wildlife preserves, sanctuaries and refuges
Government Records Searched in This Report

FED_LAND: Federal Lands
Source: USGS
Telephone: 703-648-5094
Federal data from Bureau of Land Management, National Park Service, Forest Service, Fish and Wildlife Service, and Bureau of Indian Affairs.
- National Parks
- Forests
- Monuments
- Wildlife Sanctuaries, Preserves, Refuges
- Federal Wilderness Areas.
- Indian Reservations
Date of Government Version: 09/01/1997

NC Natural Areas: Natural Areas
Areas containing ecologically significant natural communities of rare species
Source: Center for Geographic Information and Analysis.
Telephone: 919-733-2090

NC Game Lands: North Carolina Wildlife Resources Commission Game Lands
All publicly owned game lands managed by the North Carolina Wildlife Resources Commission and as listed in Hunting and Fishing Maps for North Carolina Game Lands, 1989-90.
Source: Center for Geographic Information and Analysis.
Telephone: 919-733-2090

Federal Contacts for Additional Information

Fish & Wildlife Service, Region 4
Budget and Finance 1875 Century Boulevard
Atlanta, GA 30345
404-679-4096

State Contacts for Additional Information

Wildlife Resources Commission 919-733-3391

Wild and scenic rivers

Government Records Searched in This Report

FED_LAND: Federal Lands
Source: USGS
Telephone: 703-648-5094
Federal data from Bureau of Land Management, National Park Service, Forest Service, Fish and Wildlife Service, and Bureau of Indian Affairs.
- National Parks
- Forests
- Monuments
- Wildlife Sanctuaries, Preserves, Refuges
- Federal Wilderness Areas.
- Indian Reservations

Date of Government Version: 09/01/1997

Federal Contacts for Additional Information

Fish & Wildlife Service, Region 4
Budget and Finance 1875 Century Boulevard
Atlanta, GA 30345
404-679-4096

Endangered Species

Government Records Searched in This Report

NC Endangered Species/Natural Areas: North Carolina Rare/Endangered Species and Natural Areas
Source: Natural Heritage Occurrence Sites Center for Geographic Information and Analysis.
Telephone: 919-733-2090

NC Natural Heritage Sites: Natural Heritage Element Occurrence Sites
Locations of rare and endangered species populations and occurrences of exemplary or unique natural ecosystems (terrestrial and palustrine) and special wildlife habitats
Source: Center for Geographic Information and Analysis.
Telephone: 919-733-2090

KEY CONTACTS & GOVERNMENT RECORDS SEARCHED

Federal Contacts for Additional Information

Fish & Wildlife Service, Region 4
Budget and Finance 1875 Century Boulevard
Atlanta, GA 30345
404-679-4096

State Contacts for Additional Information

Natural Heritage Program, Dept. of Env. & Natural Resources 919-733-4181

LANDMARKS, HISTORICAL, AND ARCHEOLOGICAL SITES
Historic Places

Government Records Searched in This Report

National Register of Historic Places:
The National Register of Historic Places is the official federal list of districts, sites, buildings, structures, and objects significant in American history, architecture, archeology, engineering, and culture. These contribute to an understanding of the historical and cultural foundations of the nation.
The National Register includes:
- All prehistoric and historic units of the National Park System;
- National Historic Landmarks, which are properties recognized by the Secretary of the Interior as possessing national significance; and
- Properties significant in American, state, or local prehistory and history that have been nominated by State Historic Preservation Officers, federal agencies, and others, and have been approved for listing by the National Park Service.

Date of Government Version: 03/15/2000

NC Historic Sites: Historic Places; Archeologic Sites
Historic sites and districts that are listed in the National Register of Historic Places as determined by the Department of Cultural Resources Division of Archives and History. Historic sites and districts that have Study List Locally Designated and Determined Eligible status. Archaeological Sites Districts and Shipwrecks - National Register Sites.
Source: NCGIA. Office of State Budget Planning and Management
Telephone: 919-733-2090

NC Historic Sites: National Register Properties of North Carolina
Listing of historic sites included on the National Register for North Carolina.
Source: Department of Cultural Resources. Historic Preservation Section
Telephone: 919-733-6545

Federal Contacts for Additional Information

Park Service; Advisory Council on Historic Preservation
1849 C Street NW
Washington, DC 20240
Phone: (202) 208-6843

State Contacts for Additional Information

Div. Of Archives & History 919-733-4673

KEY CONTACTS & GOVERNMENT RECORDS SEARCHED

Indian Religious Sites

Federal Contacts for Additional Information

Department of the Interior- Bureau of Indian Affairs
Office of Public Affairs
1849 C Street, NW
Washington, DC 20240-0001
Office: 202-208-3711
Fax: 202-501-1516

National Association of Tribal Historic Preservation Officers
1411 K Street NW, Suite 700
Washington, DC 20005
Phone: 202-628-8476
Fax: 202-628-2241

State Contacts for Additional Information

A listing of local Tribal Leaders and Bureau of Indian Affairs Representatives can be found at:
http://www.doi.gov/bia/areas/agency.html

Eastern Area Office, Bureau of Indian Affairs
3701 N. Fairfax Drive Mail Stop 260-VASQ
Arlington, VA 22203
703-235-2571

Scenic Trails

Government Records Searched in This Report

APPAL_TRAIL: Appalachian Trail
Source: Appalachian Trail Conference
Telephone: (304) 535-6331
Appalachian Trail centerline.

State Contacts for Additional Information

Appalachian Trail Conference
799 Washington Street P.O. Box 807
Harpers Ferry, WV 25425-0807
(304) 535-6331

FLOOD PLAIN, WETLANDS AND COASTAL ZONE

Flood Plain Management

Government Records Searched in This Report

Flood Zone Data: This data, available in select counties across the country, was obtained by EDR in 1999 from the Federal Emergency Management Agency (FEMA). Data depicts 100-year and 500-year flood zones as defined by FEMA.

Federal Contacts for Additional Information

Federal Emergency Management Agency 877-3362-627

State Contacts for Additional Information

Dept. of Crime Control & Public Safety, Div. Of Emergency Mgmt. 919-733-3867

KEY CONTACTS & GOVERNMENT RECORDS SEARCHED

Wetlands Protection

Government Records Searched in This Report

NWI: National Wetlands Inventory. This data, available in select counties across the country, was obtained by EDR in 2002 from the U.S. Fish and Wildlife Service.

Federal Contacts for Additional Information

Fish & Wildlife Service 813-570-5412

State Contacts for Additional Information

Wildlife Conservation Commission 919-733-3391

Coastal Zone Management

Government Records Searched in This Report

CAMA Management Areas
Dept. of Env., Health & Natural Resources
919-733-2293

Federal Contacts for Additional Information

Office of Ocean and Coastal Resource Management
N/ORM, SSMC4
1305 East-West Highway
Silver Spring, Maryland 20910
301-713-3102

State Contacts for Additional Information

DEHNR, Div. Of Coastal Management 919-733-2293

Government Records Searched in This Report

CAMA Management Areas
Dept. of Env., Health & Natural Resources
919-733-2293

FCC & FAA SITES MAP

For NEPA actions that come under the authority of the FCC, the FCC requires evaluation of Antenna towers and/or supporting structures that are to be equipped with high intensity white lights which are to be located in residential neighborhoods, as defined by the applicable zoning law.

Government Records Searched in This Report

Cellular

Federal Communications Commission
Mass Media Bureau
2nd Floor - 445 12th Street SW
Washington DC 20554 USA
Telephone (202) 418-2700

Tower

Federal Communications Commission
Mass Media Bureau
2nd Floor - 445 12th Street SW
Washington DC 20554 USA
Telephone (202) 418-2700

KEY CONTACTS & GOVERNMENT RECORDS SEARCHED

Antenna Registration
Federal Communications Commission
Mass Media Bureau
2nd Floor - 445 12th Street SW
Washington DC 20554 USA
Telephone (202) 418-2700

AM Tower
Federal Communications Commission
Mass Media Bureau
2nd Floor - 445 12th Street SW
Washington DC 20554 USA
Telephone (202) 418-2700

FAA Digital Obstacle File
National Oceanic and Atmospheric Administration
Telephone: 301-436-8301
Describes known obstacles of interest to aviation users in the US. Used by the Federal Aviation Administration (FAA) and the National Oceanic and Atmospheric Administration to manage the National Airspace System.

Excessive Radio Frequency Emission
For NEPA actions that come under the authority of the FCC, Commission actions granting construction permits, licenses to transmit or renewals thereof, equipment authorizations or modifications in existing facilities, require the determination of whether the particular facility, operation or transmitter would cause human exposure to levels of radio frequency in excess of certain limits.

Federal Contacts for Additional Information
Office of Engineering and Technology
Federal Communications Commission
445 12th Street SW
Washington, DC 20554
Phone: 202-418-2470

OTHER CONTACT SOURCES

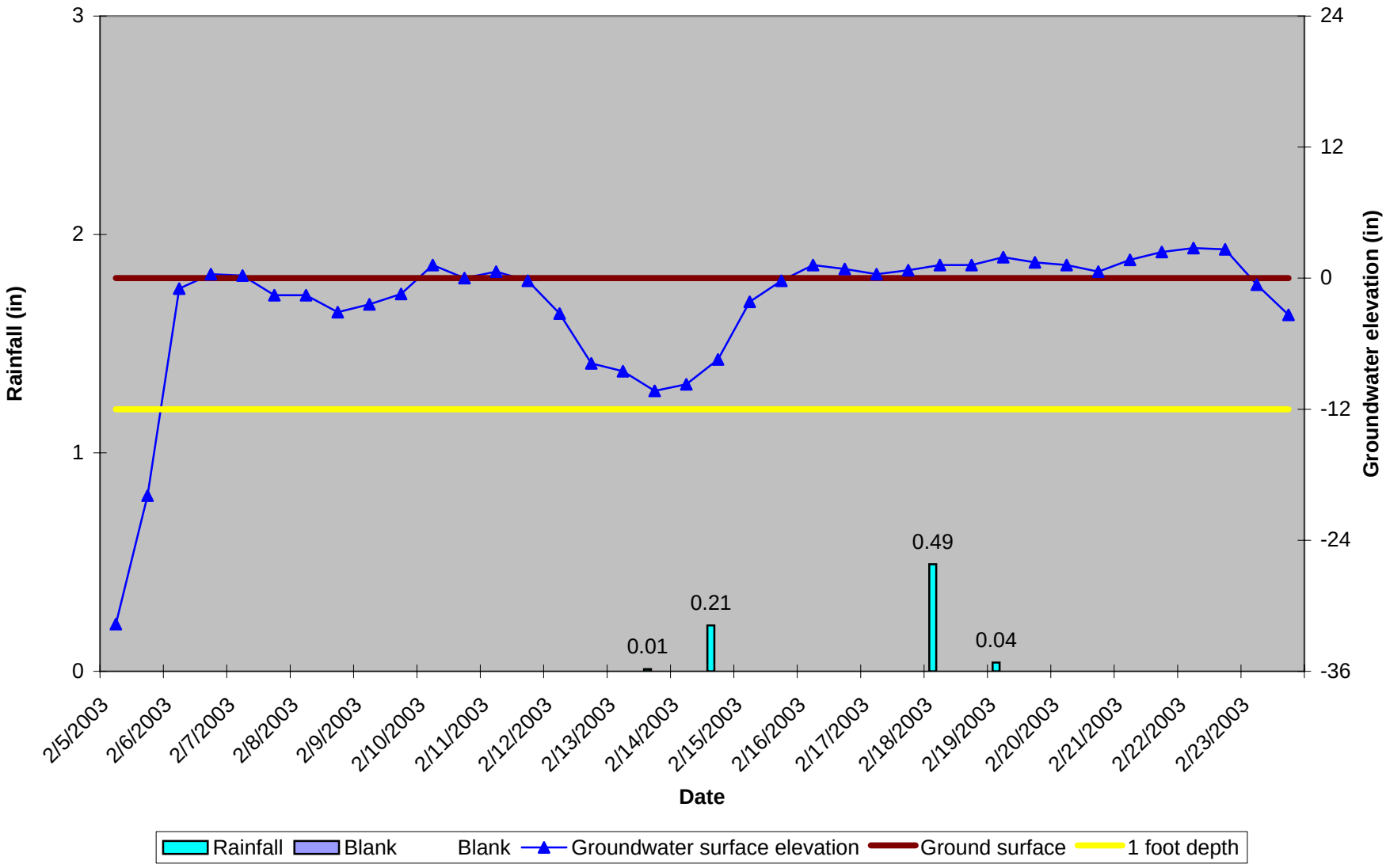
NEPA Single Point of Contact
State Contacts for Additional Information
Department of Administration
1302 Mail Service Center
Raleigh, NC 27699-1302
919-807-2323

KEY CONTACTS & GOVERNMENT RECORDS SEARCHED

STREET AND ADDRESS INFORMATION

APPENDIX D

Groundwater Hydrographs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Groundwater elevation (in)
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0.49
0.04
2/5/2003
2/6/2003
2/7/2003
2/8/2003
2/9/2003
2/10/2003
2/11/2003
2/12/2003
2/13/2003
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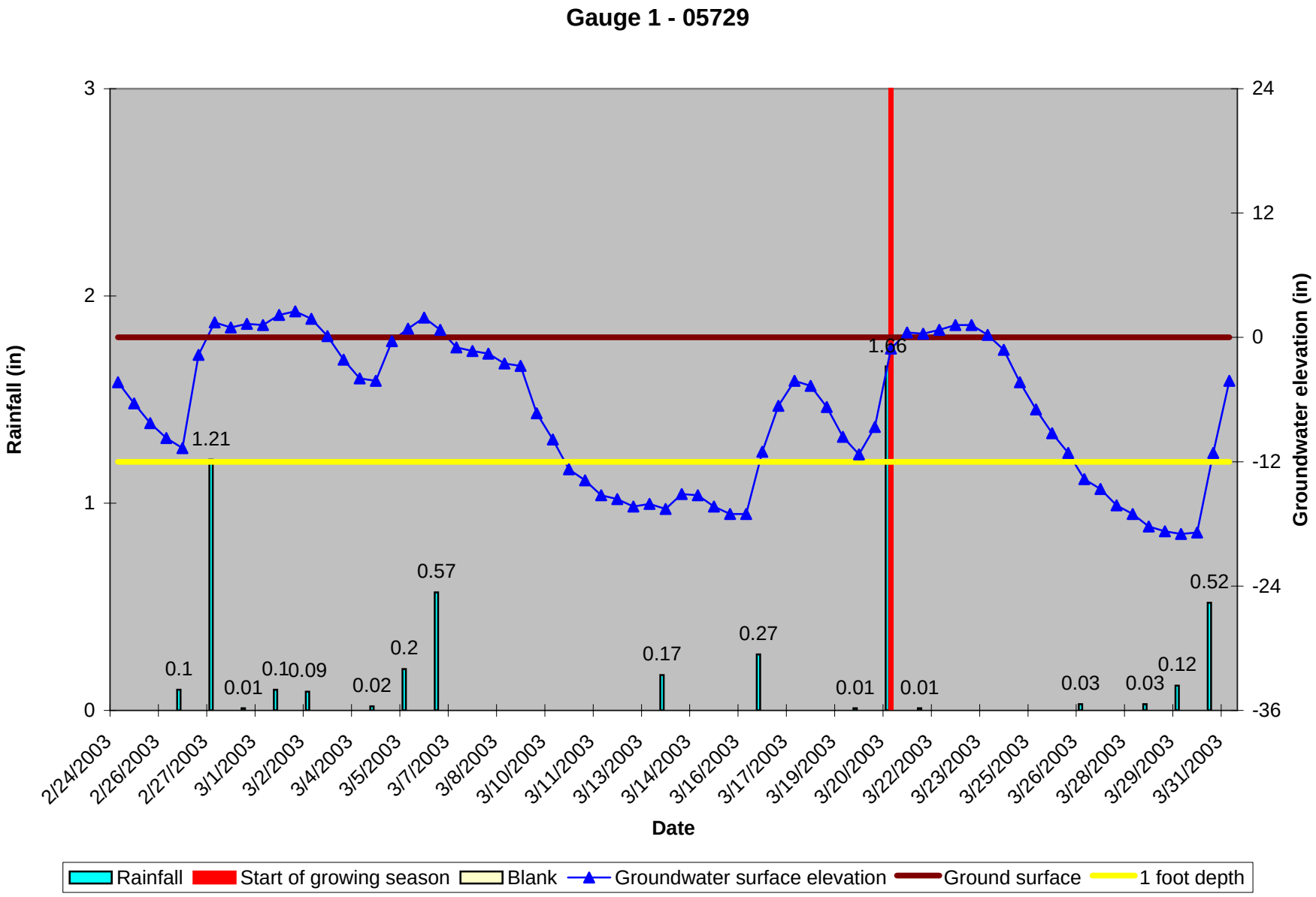
2/15/2003
2/16/2003
2/17/2003
2/18/2003
2/19/2003
2/20/2003
2/21/2003
2/22/2003
2/23/2003
Date
Rainfall
Blank
Blank
Groundwater surface elevation
Ground surface
1 foot depth


Gauge 1 - 05729
Rainfall (in)
Groundwater elevation (in)
Date
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12
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1.21
1.66
0.1
0.01
0.1
0.09
0.02
0.2
0.57
0.17
0.27
0.01
0.01
0.03
0.03
0.12
0.52
2/24/2003
2/26/2003
2/27/2003
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3/2/2003
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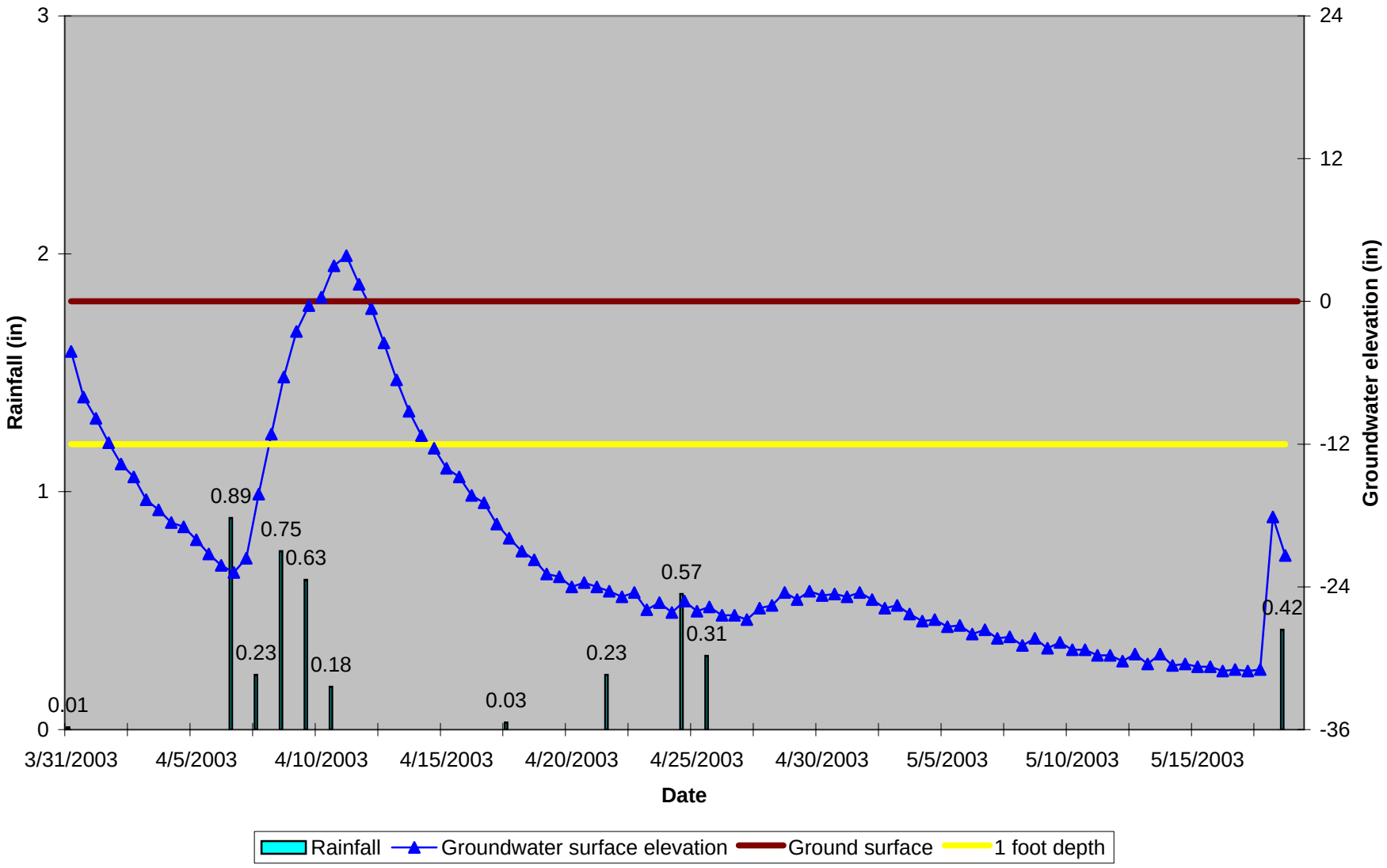
3/19/2003
3/20/2003
3/22/2003
3/23/2003
3/25/2003
3/26/2003
3/28/2003
3/29/2003
3/31/2003
Rainfall
Start of growing season
Blank
Groundwater surface elevation
Ground surface
1 foot depth


Gauge 1 - 05729
Rainfall (in)
Groundwater elevation (in)
Date
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24
12
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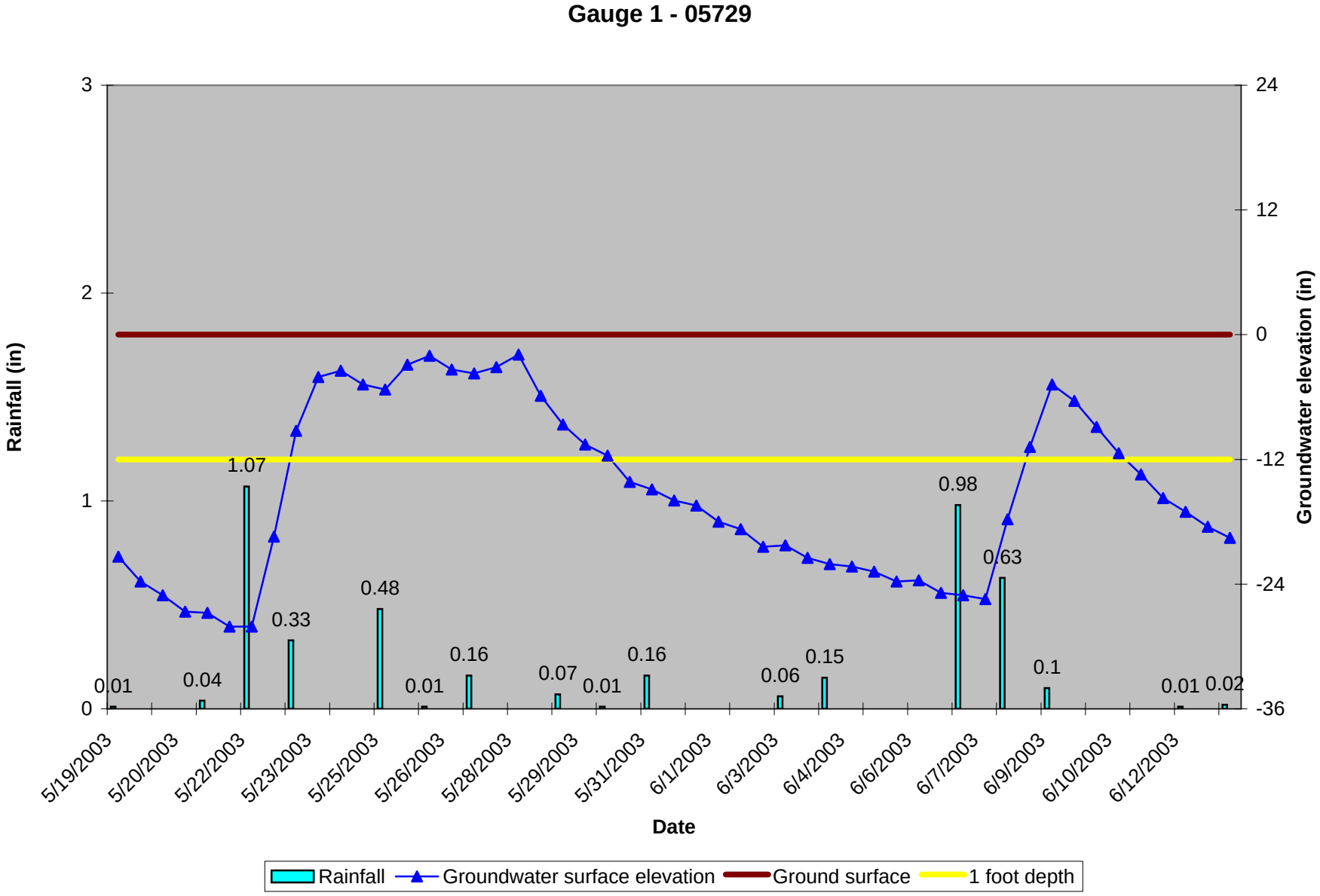
-36
0.89
0.75
0.63
0.57
0.42
0.23
0.18
0.23
0.31
0.03
0.01
3/31/2003
4/5/2003
4/10/2003
4/15/2003
4/20/2003
4/25/2003
4/30/2003
5/5/2003
5/10/2003
5/15/2003
Rainfall
Groundwater surface elevation
Ground surface
1 foot depth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Rainfall (in)
Groundwater elevation (in)
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2
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0.01
0.04
1.07
0.33
0.48
0.01
0.16
0.07
0.01
0.16
0.06
0.15
0.98
0.63
0.1
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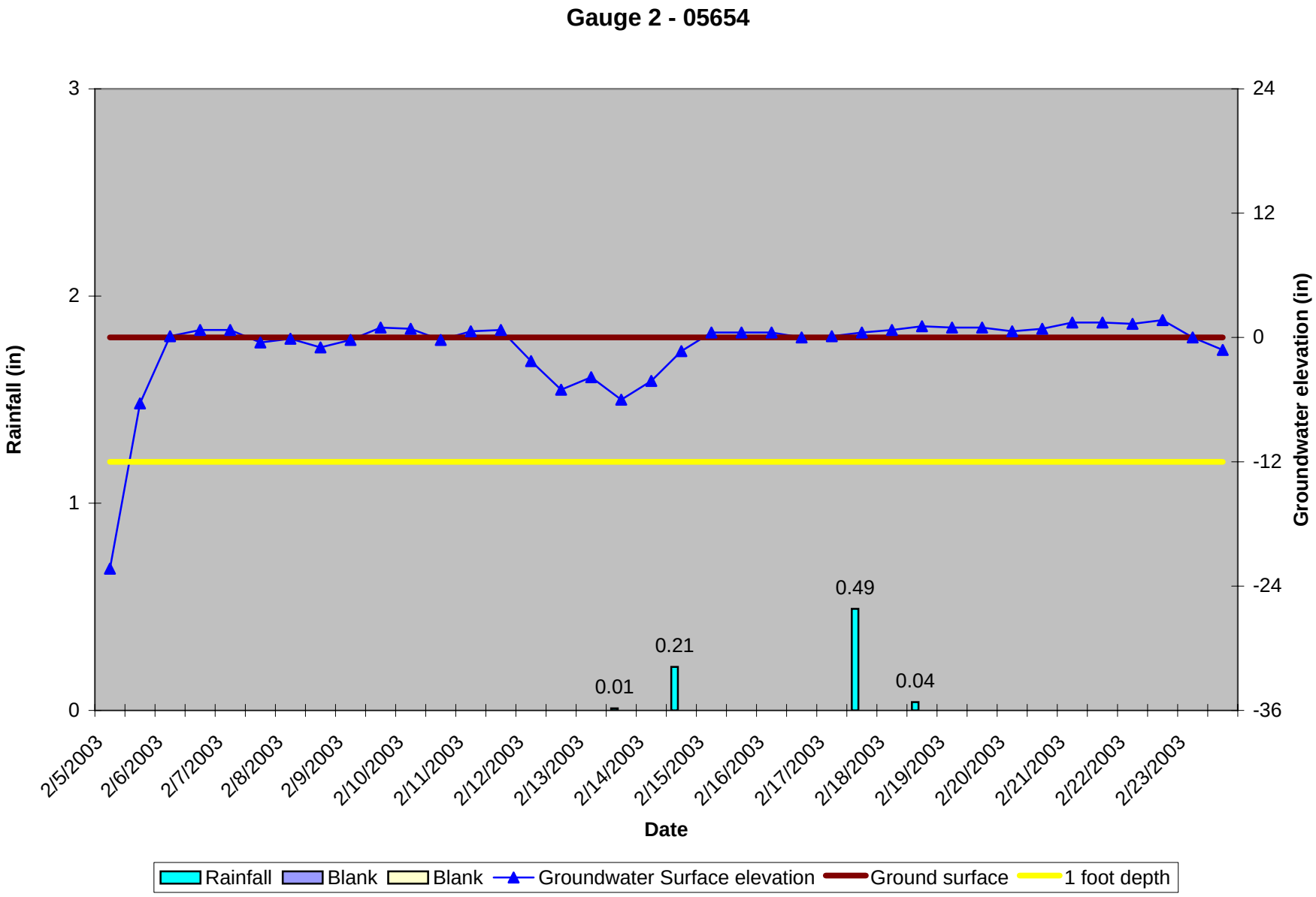
6/3/2003
6/4/2003
6/6/2003
6/7/2003
6/9/2003
6/10/2003
6/12/2003
Rainfall
Groundwater surface elevation
Ground surface
1 foot depth


Gauge 2 - 05654
Rainfall (in)
Groundwater elevation (in)
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2/13/2003
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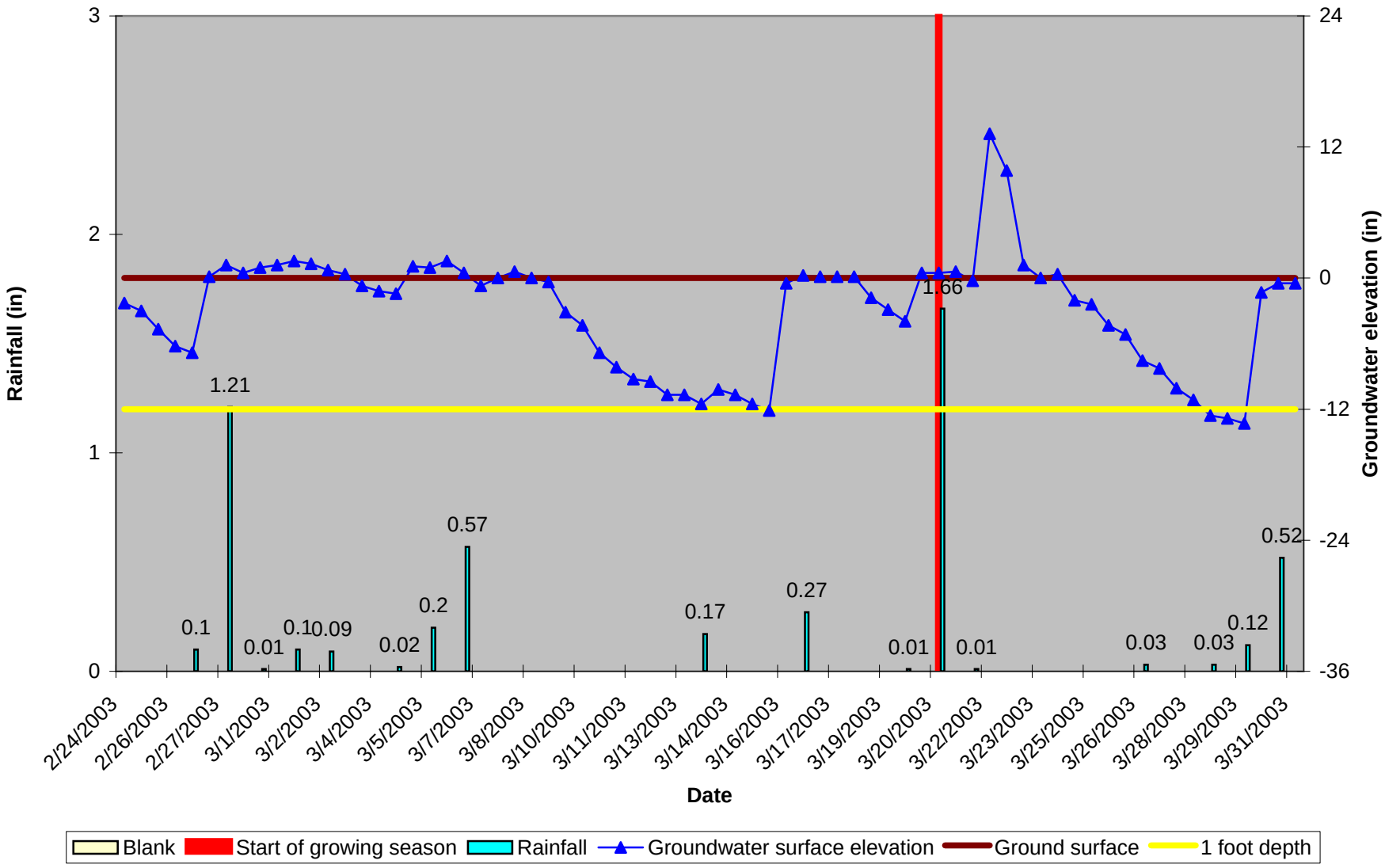
2/15/2003
2/16/2003
2/17/2003
2/18/2003
2/19/2003
2/20/2003
2/21/2003
2/22/2003
2/23/2003
Rainfall
Blank
Blank
Groundwater Surface elevation
Ground surface
1 foot depth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Rainfall (in)
Groundwater elevation (in)
Date
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-36
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0.57
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0.27
1.66
0.01
0.01
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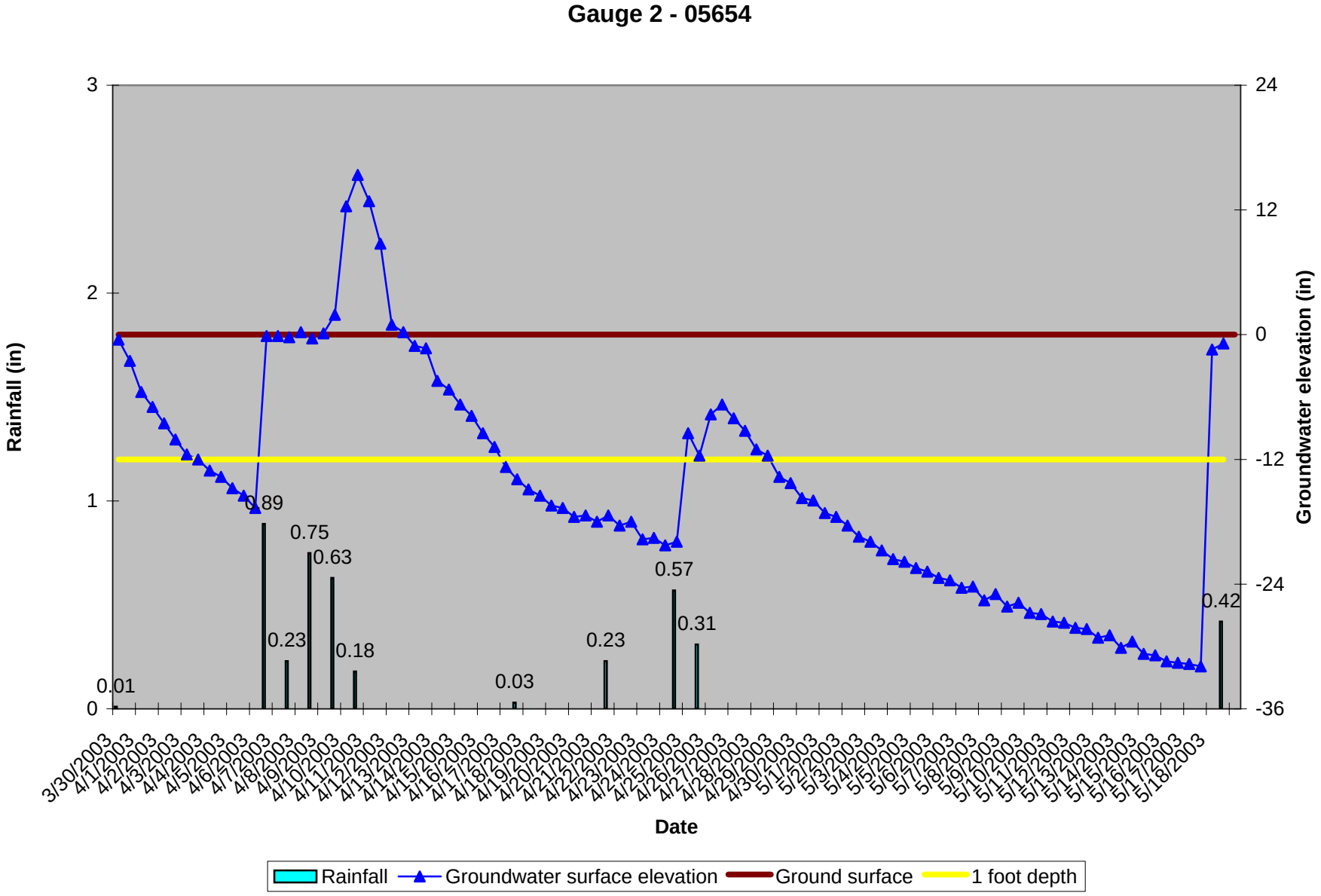
3/22/2003
3/23/2003
3/25/2003
3/26/2003
3/28/2003
3/29/2003
3/31/2003
Blank
Start of growing season
Rainfall
Groundwater surface elevation
Ground surface
1 foot depth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Rainfall (in)
Groundwater elevation (in)
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0.23
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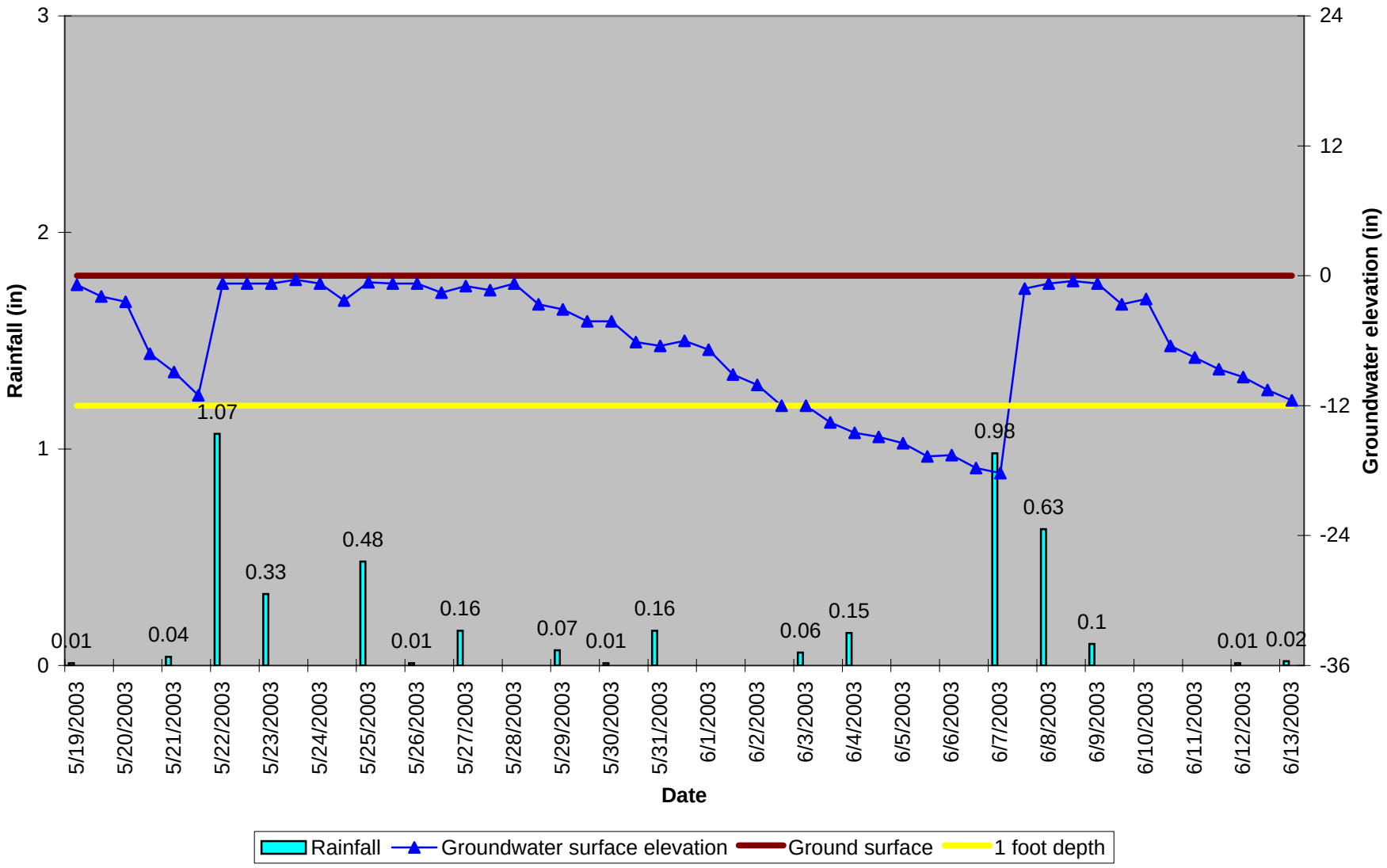
Rainfall
Groundwater surface elevation
Ground surface
1 foot depth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Rainfall (in)
Groundwater elevation (in)
Date
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-24
-36
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0.04
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0.01
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0.02
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6/6/2003
6/7/2003
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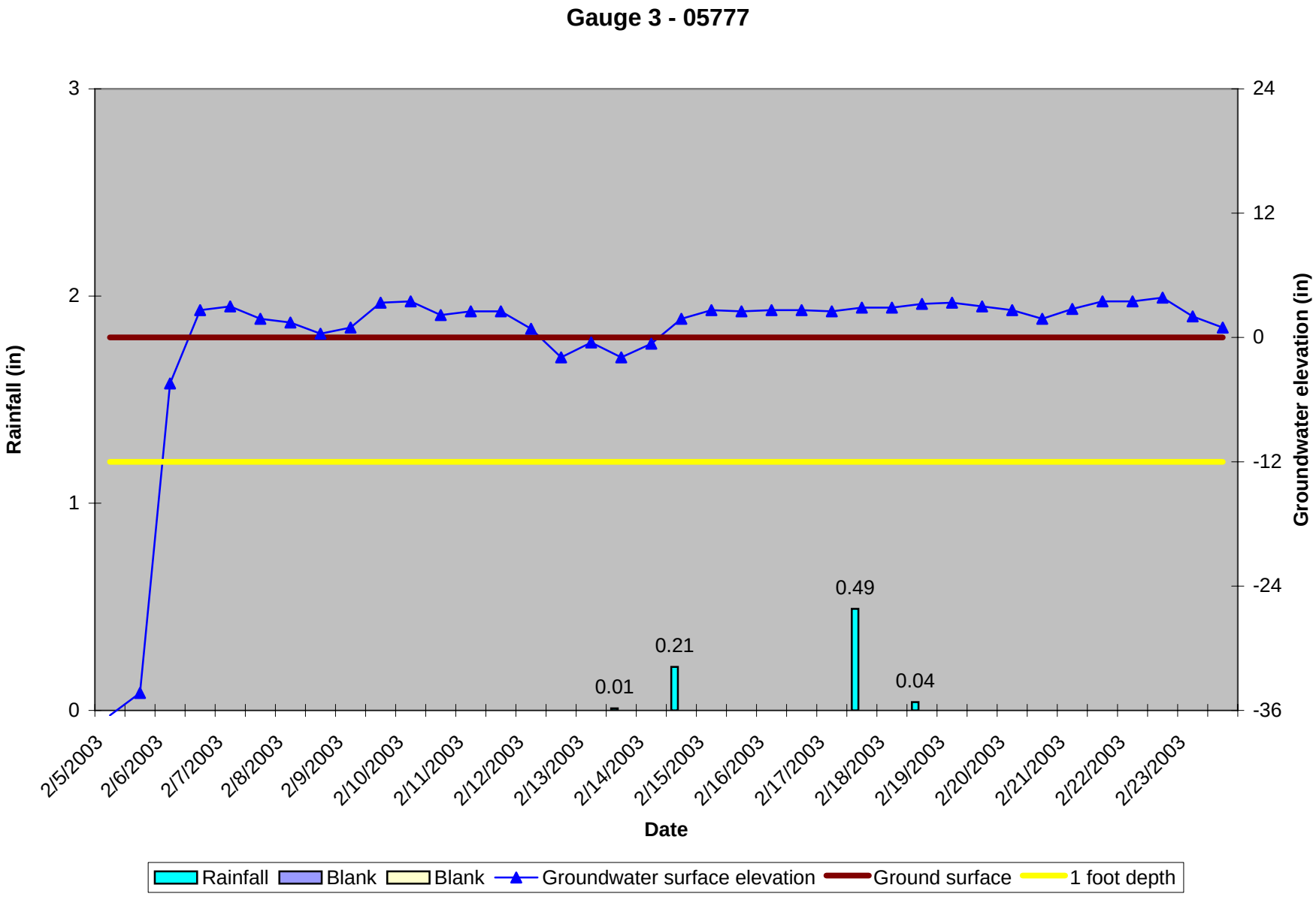
6/13/2003
Rainfall
Groundwater surface elevation
Ground surface
1 foot depth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Groundwater elevation (in)
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2/12/2003
2/13/2003
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2/16/2003
2/17/2003
2/18/2003
2/19/2003
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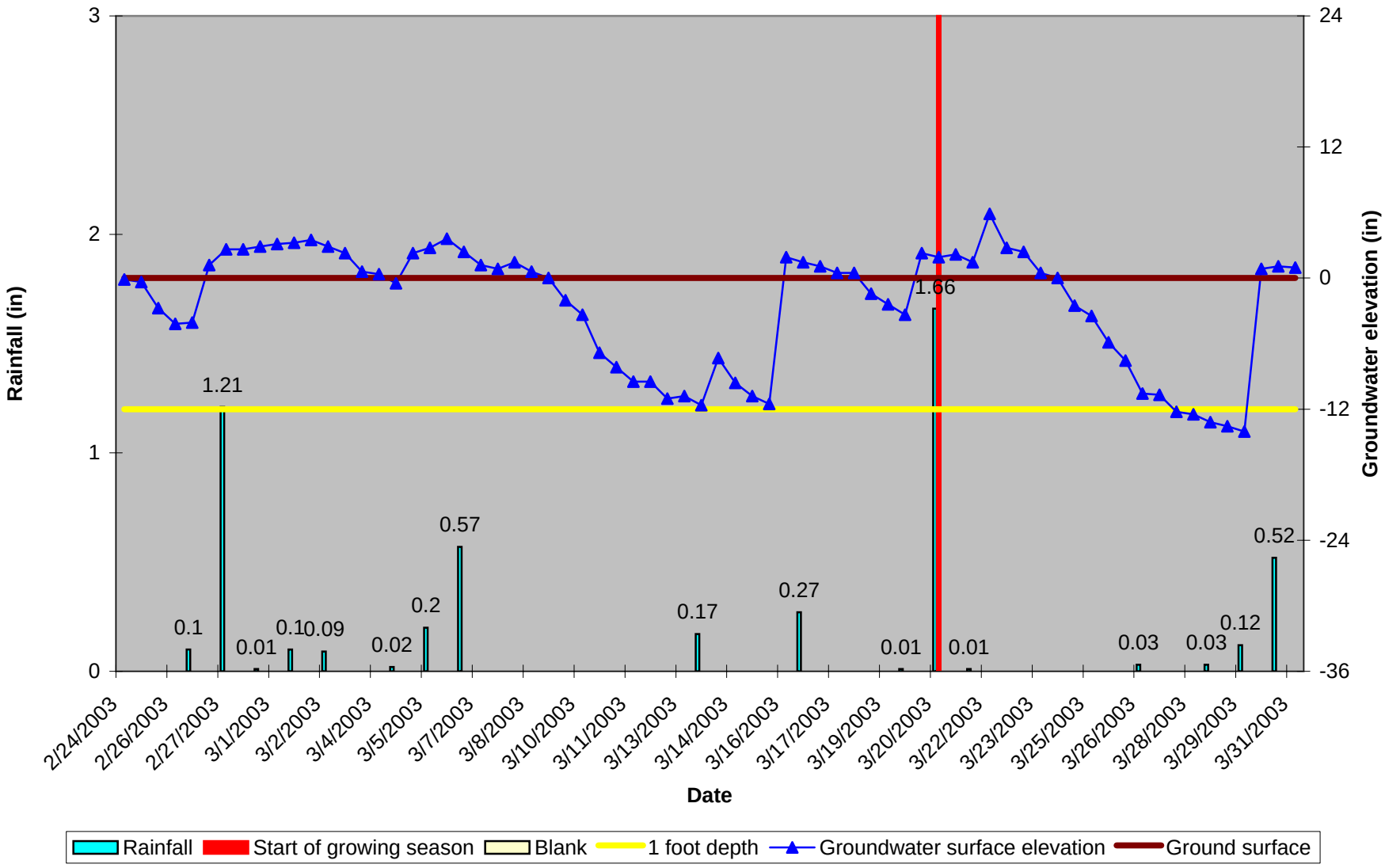
2/22/2003
2/23/2003
Rainfall
Blank
Blank
Groundwater surface elevation
Ground surface
1 foot depth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Rainfall (in)
Groundwater elevation (in)
Date
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3/1/2003
3/2/2003
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3/20/2003
3/22/2003
3/23/2003
3/25/2003
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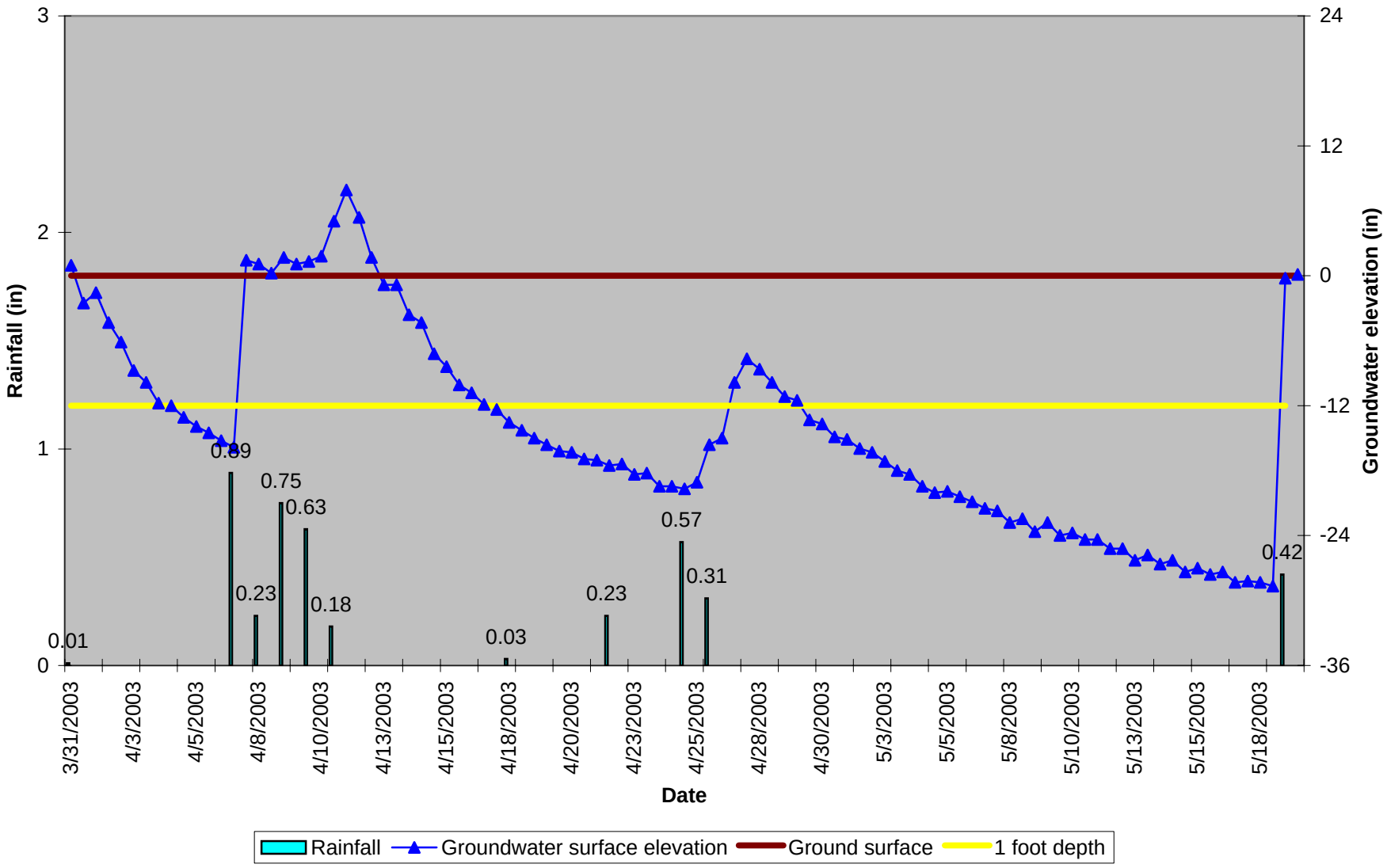
3/29/2003
3/31/2003
Rainfall
Start of growing season
Blank
1 foot depth
Groundwater surface elevation
Ground surface


Gauge 3 - 05777
Rainfall (in)
Groundwater elevation (in)
Date
3
2
1
0
24
12
0
-12
-24
-36
0.01
0.89
0.75
0.63
0.23
0.18
0.03
0.23
0.57
0.31
0.42
3/31/2003
4/3/2003
4/5/2003
4/8/2003
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4/15/2003
4/18/2003
4/20/2003
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4/30/2003
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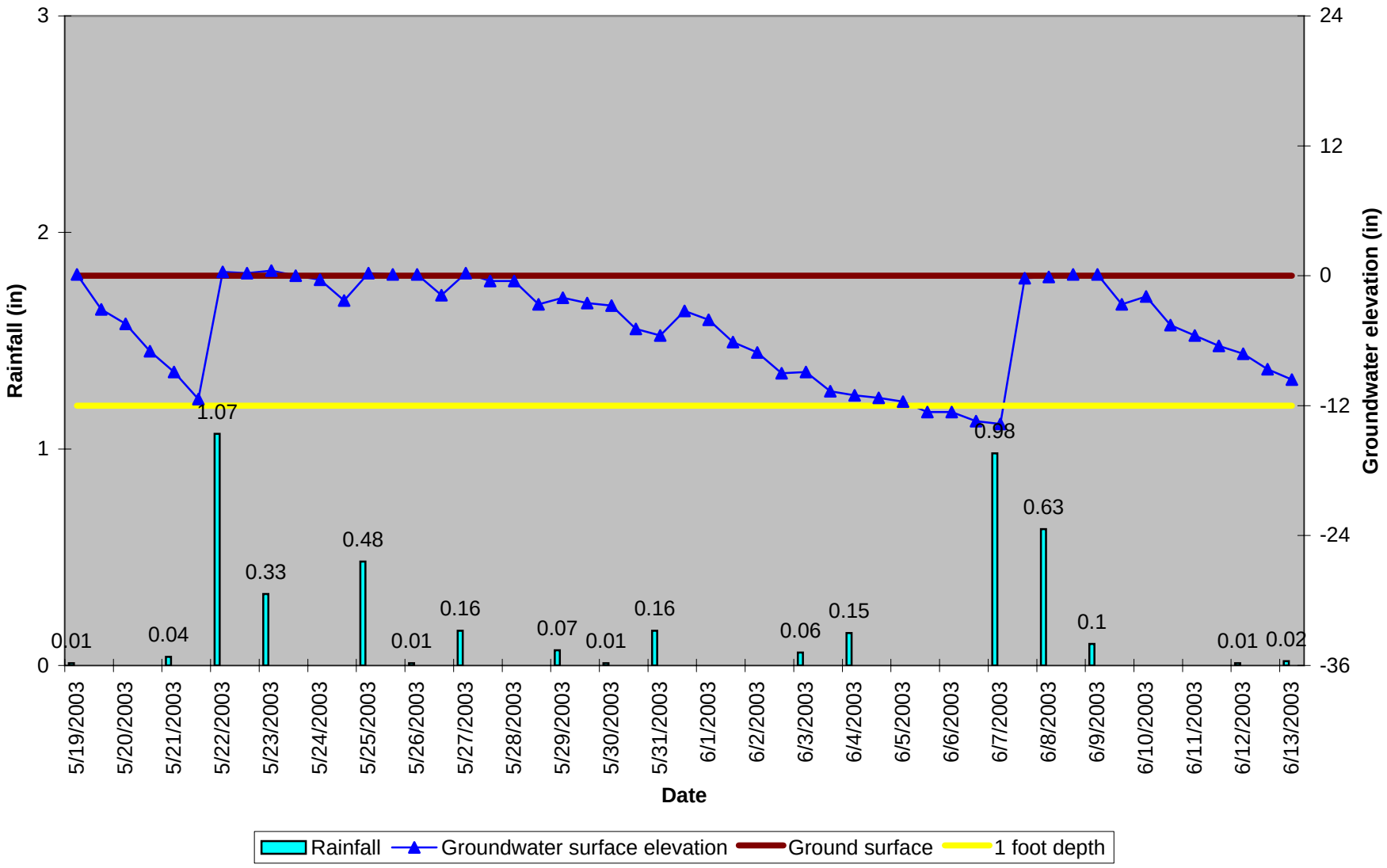
5/15/2003
5/18/2003
Rainfall
Groundwater surface elevation
Ground surface
1 foot depth


Gauge 3 - 05777
Rainfall (in)
Groundwater elevation (in)
Date
3
2
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0
24
12
0
-12
-24
-36
0.01
0.04
1.07
0.33
0.48
0.01
0.16
0.07
0.01
0.16
0.06
0.15
0.98
0.63
0.1
0.01
0.02
5/19/2003
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6/5/2003
6/6/2003
6/7/2003
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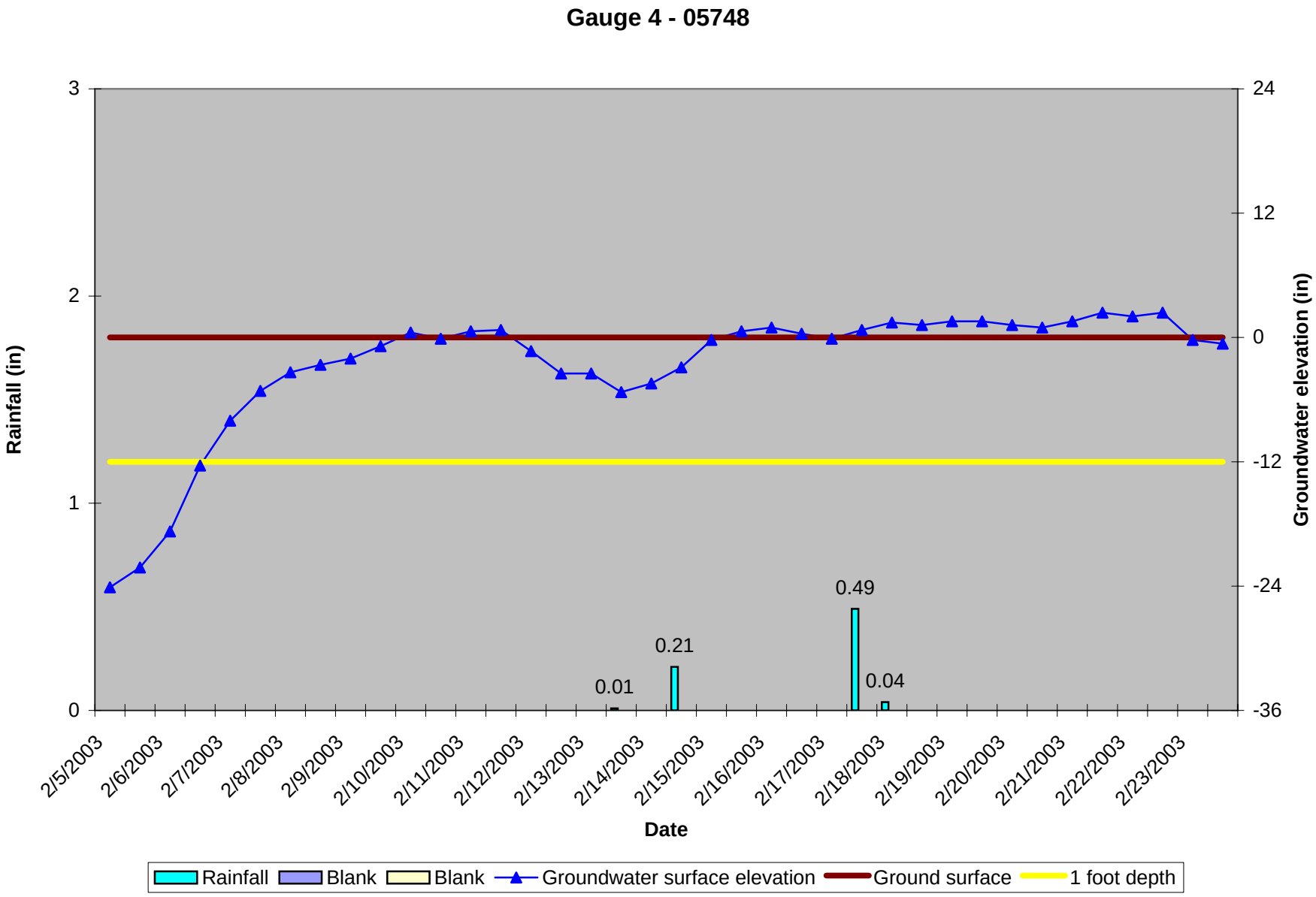
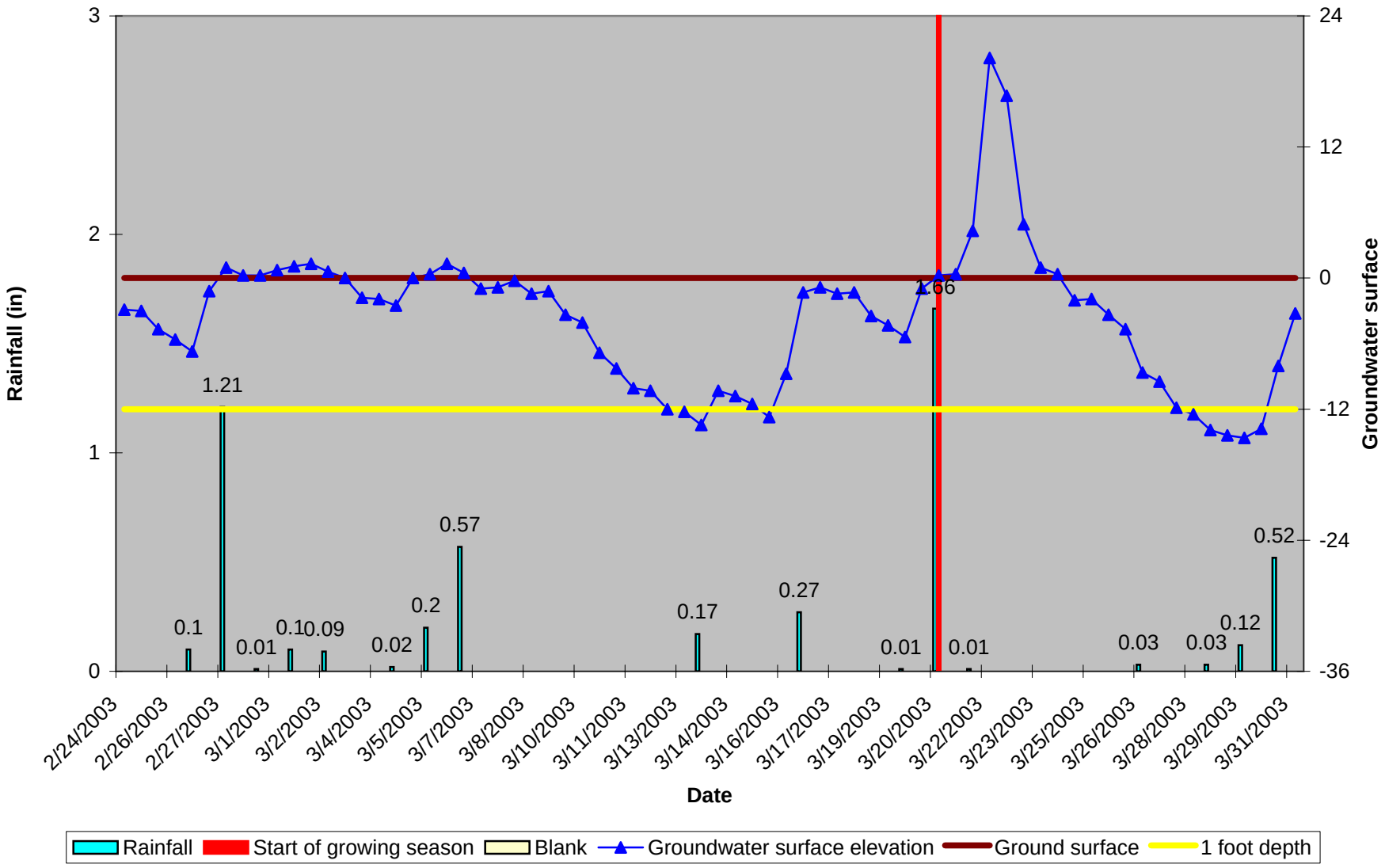
6/10/2003
6/11/2003
6/12/2003
6/13/2003
Rainfall
Groundwater surface elevation
Ground surface
1 foot depth


Gauge 4 - 05748
Rainfall (in)
Groundwater elevation (in)
Date
3
2
1
0
24
12
0
-12
-24
-36
0.01
0.21
0.49
0.04
2/5/2003
2/6/2003
2/7/2003
2/8/2003
2/9/2003
2/10/2003
2/11/2003
2/12/2003
2/13/2003
2/14/2003
2/15/2003
2/16/2003
2/17/2003
2/18/2003
2/19/2003
2/20/2003
2/21/2003
2/22/2003
2/23/2003
Rainfall
Blank
Blank
Groundwater surface elevation
Ground surface
1 foot depth


Gauge 4 - 05748
Rainfall (in)
Groundwater surface
Date
3
2
1
0
24
12
0
-12
-24
-36
1.21
1.66
0.1
0.01
0.1
0.09
0.02
0.2
0.57
0.17
0.27
0.01
0.01
0.03
0.03
0.12
0.52
2/24/2003
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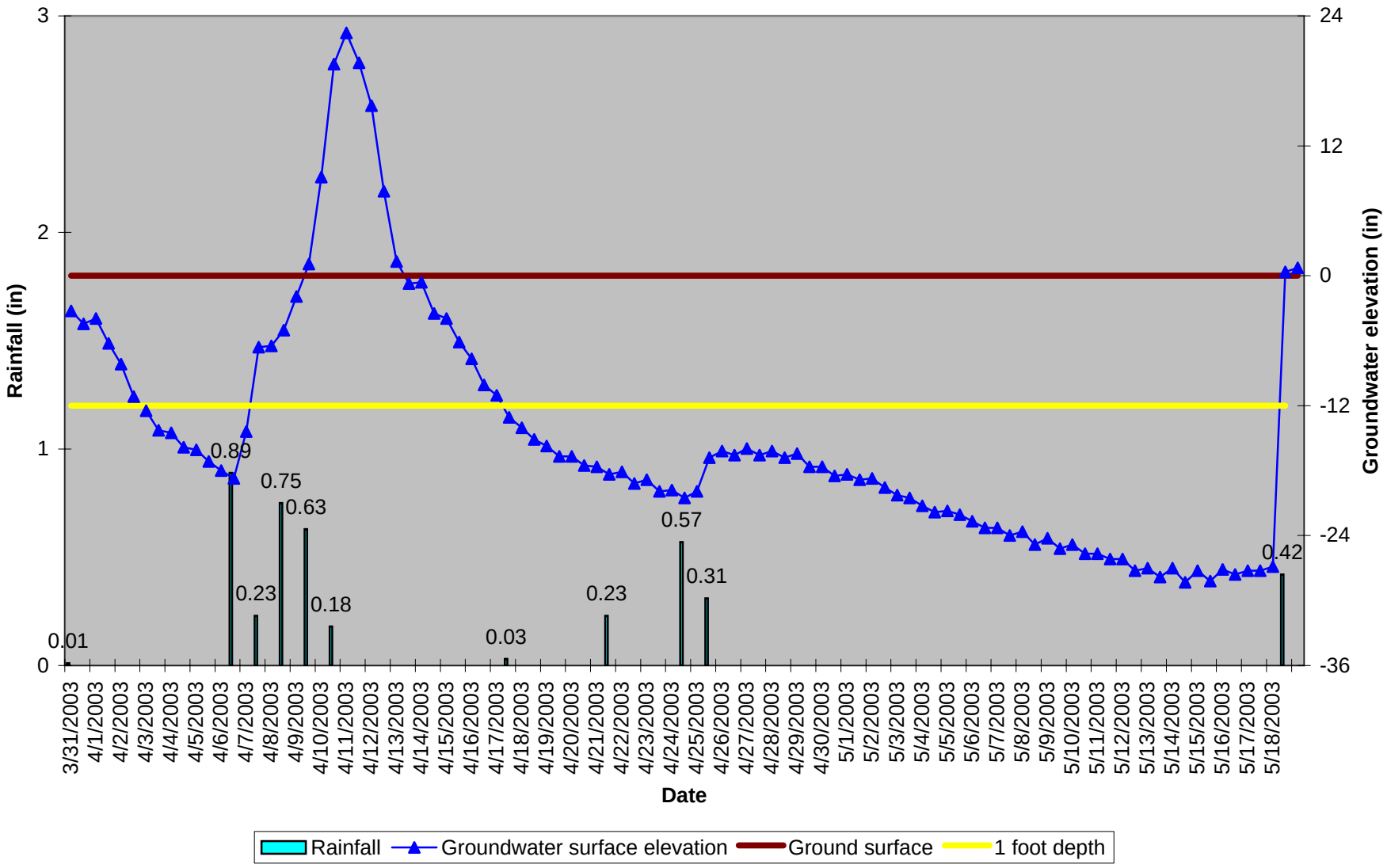
3/14/2003
3/16/2003
3/17/2003
3/19/2003
3/20/2003
3/22/2003
3/23/2003
3/25/2003
3/26/2003
3/28/2003
3/29/2003
3/31/2003
Rainfall
Start of growing season
Blank
Groundwater surface elevation
Ground surface
1 foot depth


Gauge 4 - 05748
Rainfall (in)
Groundwater elevation (in)
Date
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12
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-24
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0.01
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0.75
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0.23
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0.31
0.42
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5/11/2003
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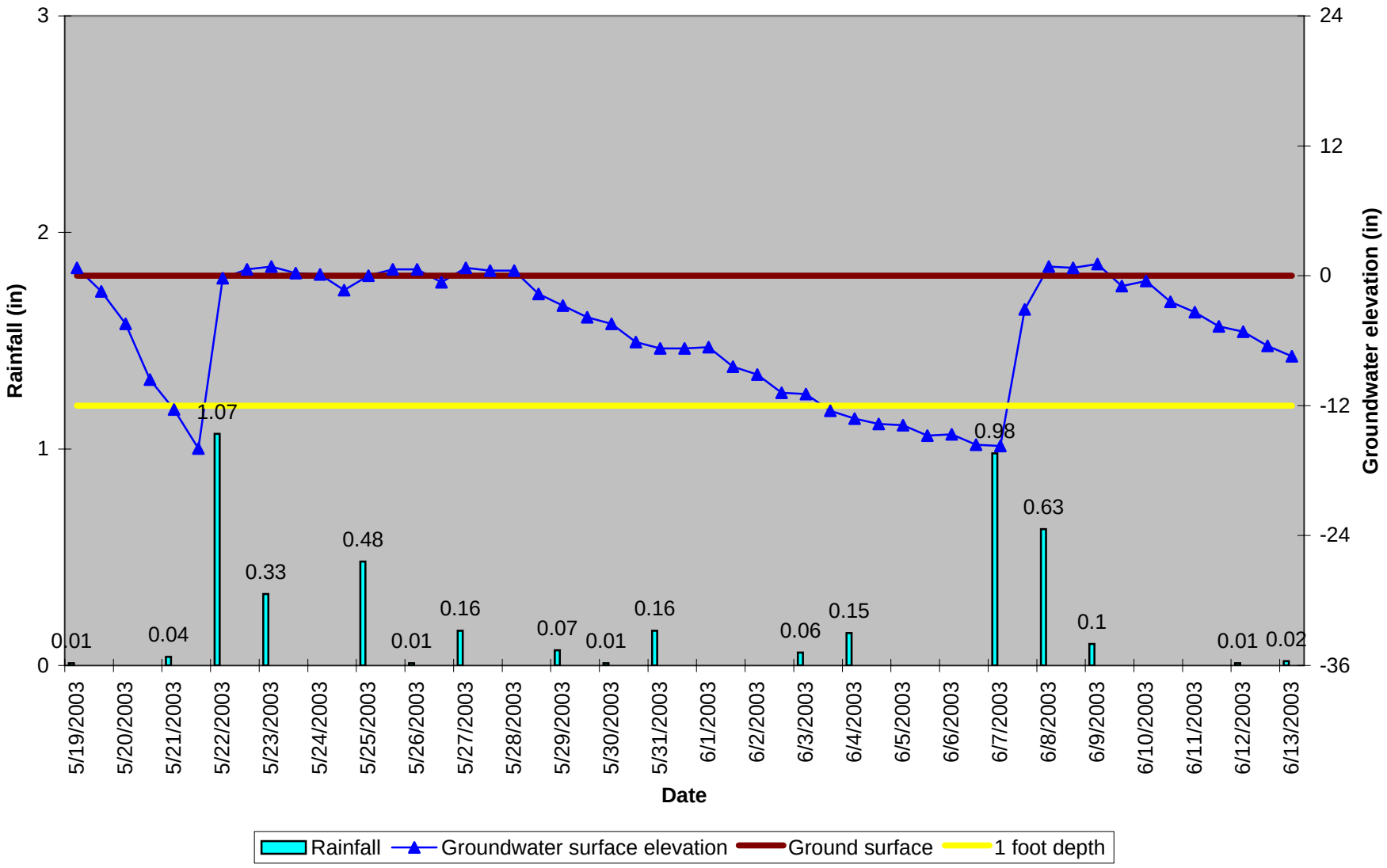
5/17/2003
5/18/2003
Rainfall
Groundwater surface elevation
Ground surface
1 foot depth


Gauge 4 - 05748
Rainfall (in)
Groundwater elevation (in)
Date
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1
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12
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-12
-24
-36
0.01
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1.07
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0.98
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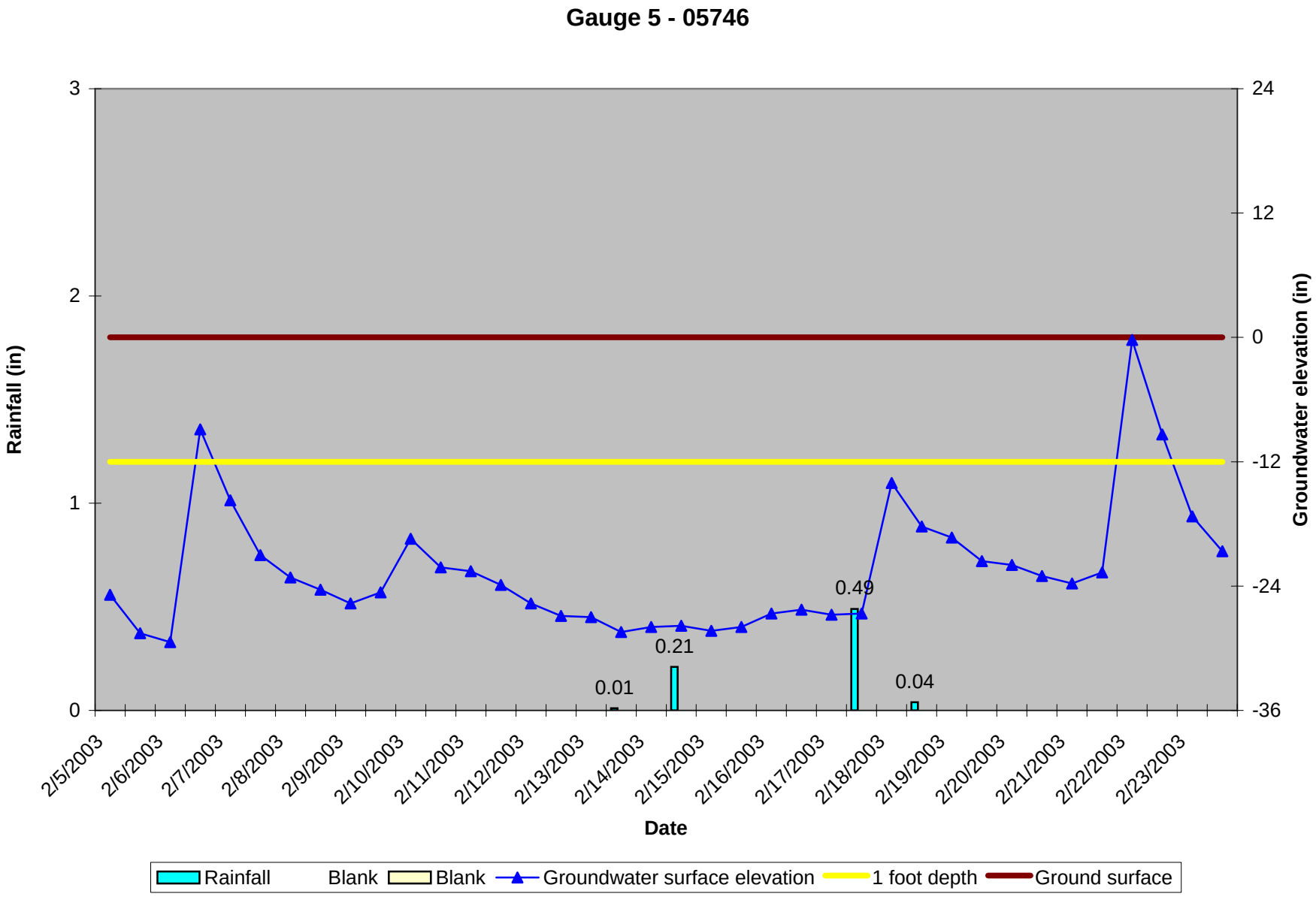
6/12/2003
6/13/2003
Rainfall
Groundwater surface elevation
Ground surface
1 foot depth


Gauge 5 - 05746
Rainfall (in)
Groundwater elevation (in)
Date
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0
24
12
0
-12
-24
-36
0.01
0.21
0.49
0.04
2/5/2003
2/6/2003
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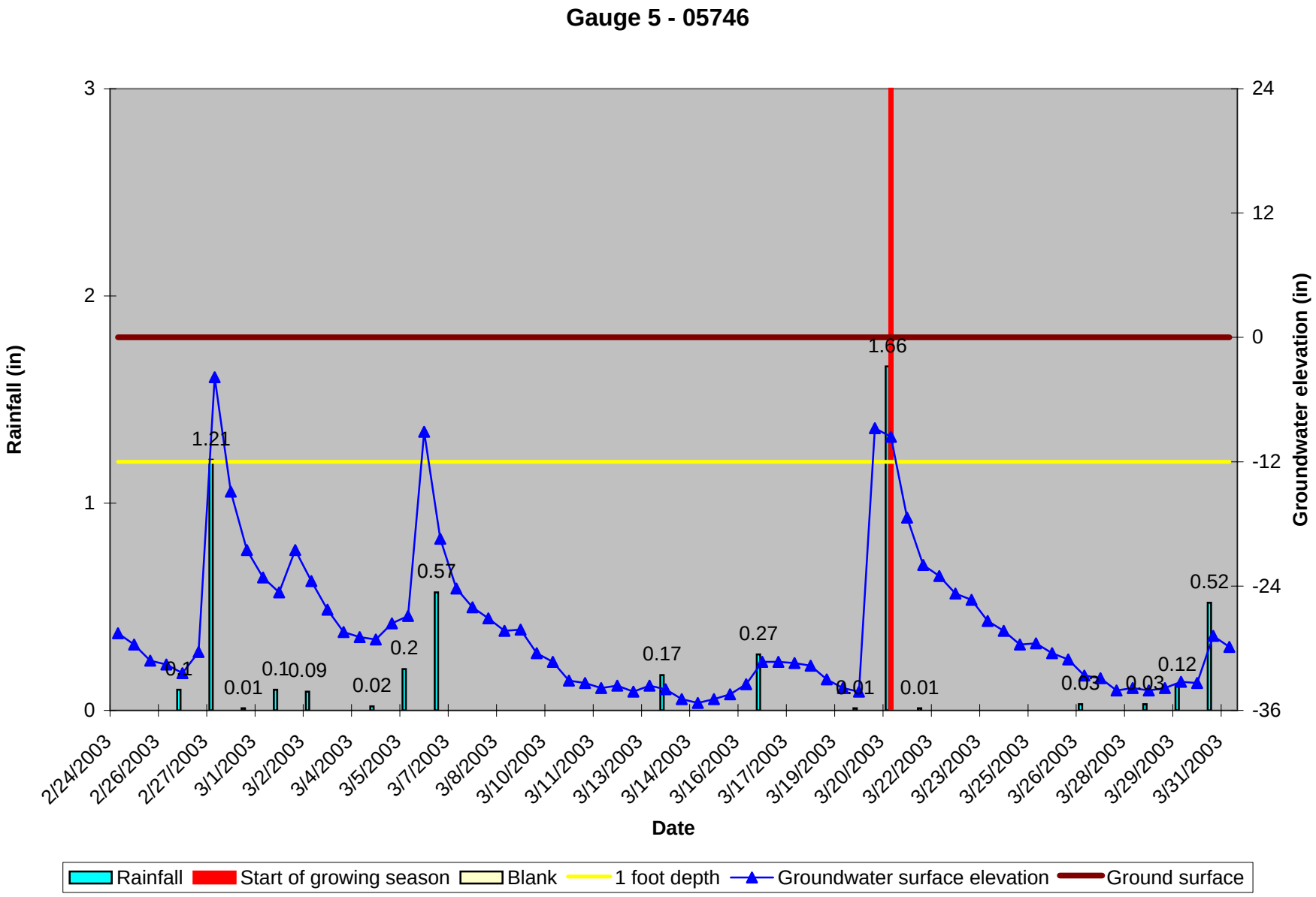
2/13/2003
2/14/2003
2/15/2003
2/16/2003
2/17/2003
2/18/2003
2/19/2003
2/20/2003
2/21/2003
2/22/2003
2/23/2003
Rainfall
Blank
Blank
Groundwater surface elevation
1 foot depth
Ground surface


Gauge 5 - 05746
Rainfall (in)
Groundwater elevation (in)
Date
3
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0
24
12
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-12
-24
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0.52
0.27
0.2
0.17
0.12
0.1
0.01
0.1
0.09
0.02
0.01
0.01
0.03
0.03
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3/17/2003
3/19/2003
3/20/2003
3/22/2003
3/23/2003
3/25/2003
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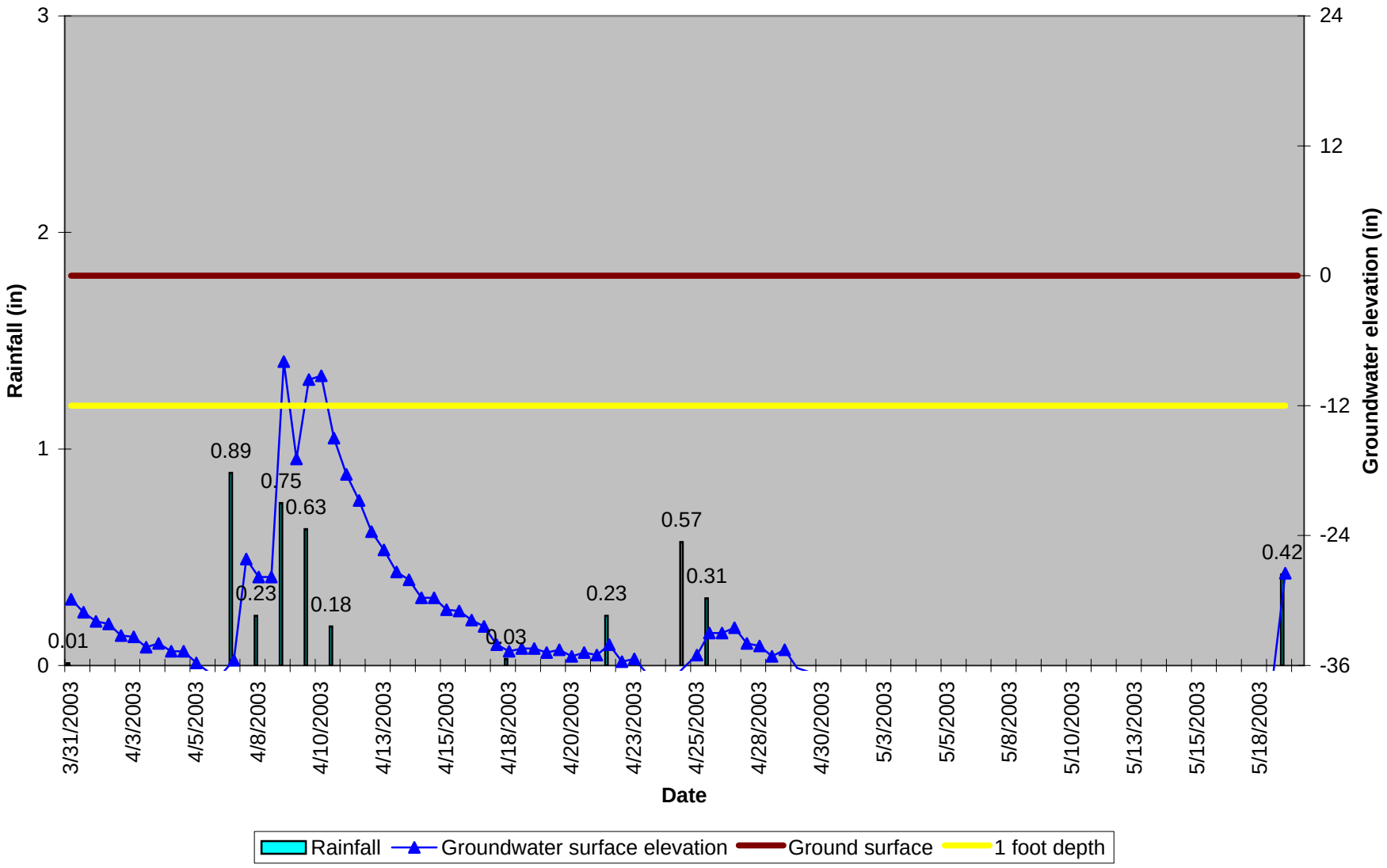
3/28/2003
3/29/2003
3/31/2003
Rainfall
Start of growing season
Blank
1 foot depth
Groundwater surface elevation
Ground surface


Gauge 5 - 05746
Rainfall (in)
Groundwater elevation (in)
Date
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24
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0
-12
-24
-36
0.01
0.89
0.75
0.63
0.23
0.18
0.03
0.23
0.57
0.31
0.42
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4/5/2003
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4/10/2003
4/13/2003
4/15/2003
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4/30/2003
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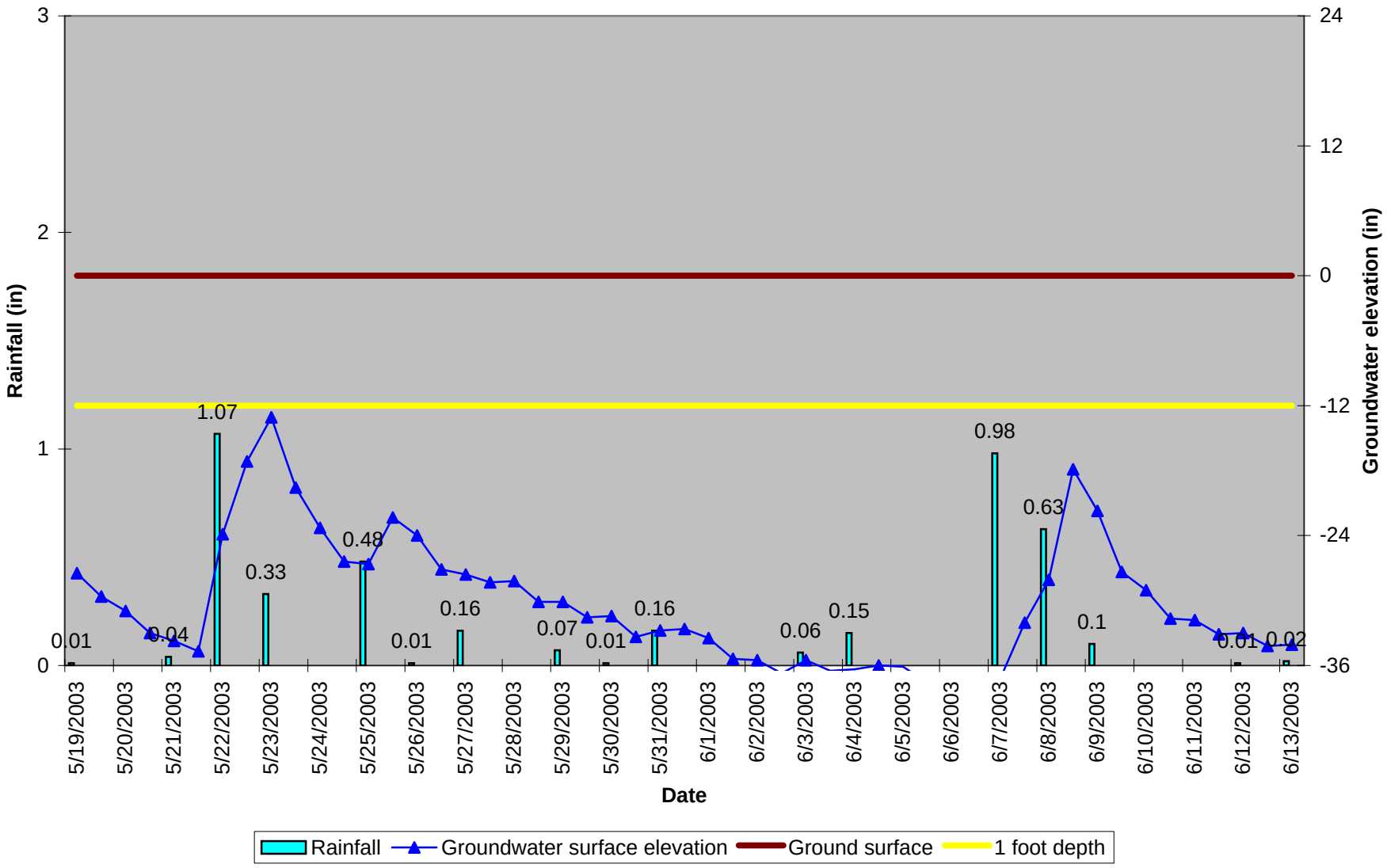
5/8/2003
5/10/2003
5/13/2003
5/15/2003
5/18/2003
Rainfall
Groundwater surface elevation
Ground surface
1 foot depth


Gauge 5 - 05746
Rainfall (in)
Groundwater elevation (in)
Date
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12
0
-12
-24
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0.01
0.04
1.07
0.33
0.48
0.01
0.16
0.07
0.01
0.16
0.06
0.15
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0.1
0.01
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6/5/2003
6/6/2003
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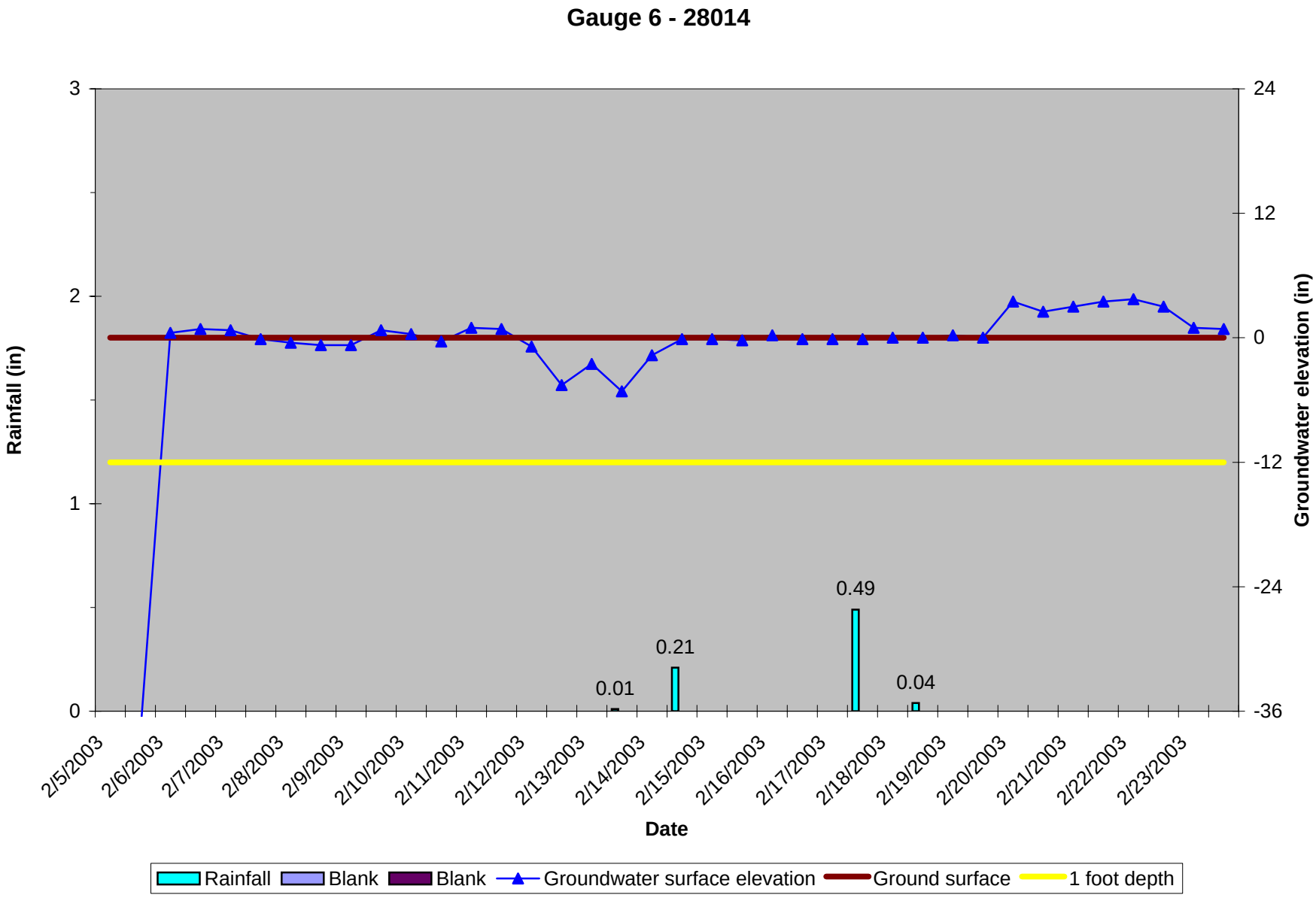
6/9/2003
6/10/2003
6/11/2003
6/12/2003
6/13/2003
Rainfall
Groundwater surface elevation
Ground surface
1 foot depth


Gauge 6 - 28014
Rainfall (in)
Groundwater elevation (in)
Date
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12
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-12
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0.49
0.04
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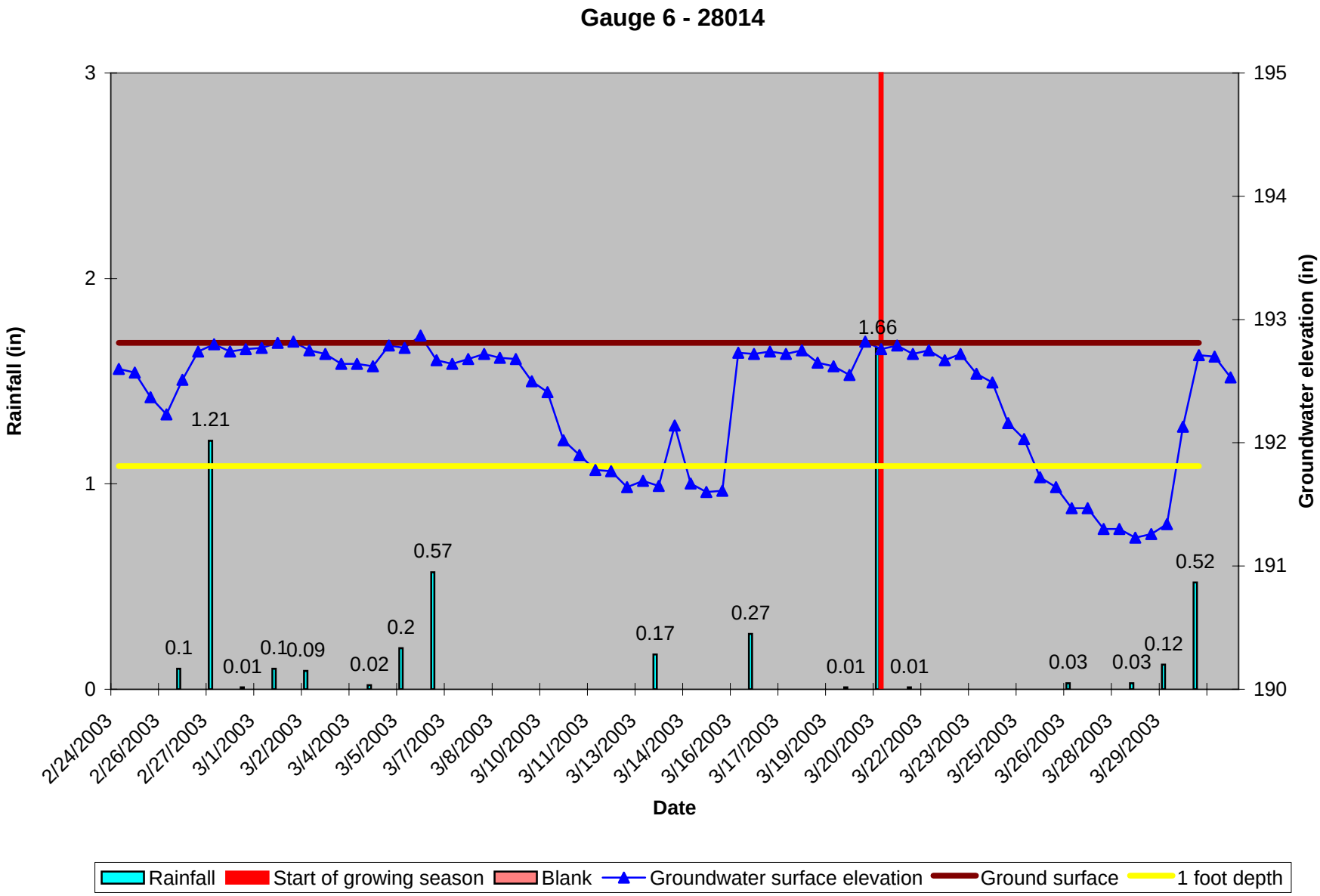
2/15/2003
2/16/2003
2/17/2003
2/18/2003
2/19/2003
2/20/2003
2/21/2003
2/22/2003
2/23/2003
Rainfall
Blank
Blank
Groundwater surface elevation
Ground surface
1 foot depth


Gauge 6 - 28014
Rainfall (in)
Groundwater elevation (in)
Date
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194
193
192
191
190
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1.21
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0.2
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0.17
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0.12
0.1
0.01
0.1
0.09
0.02
0.01
0.01
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2/24/2003
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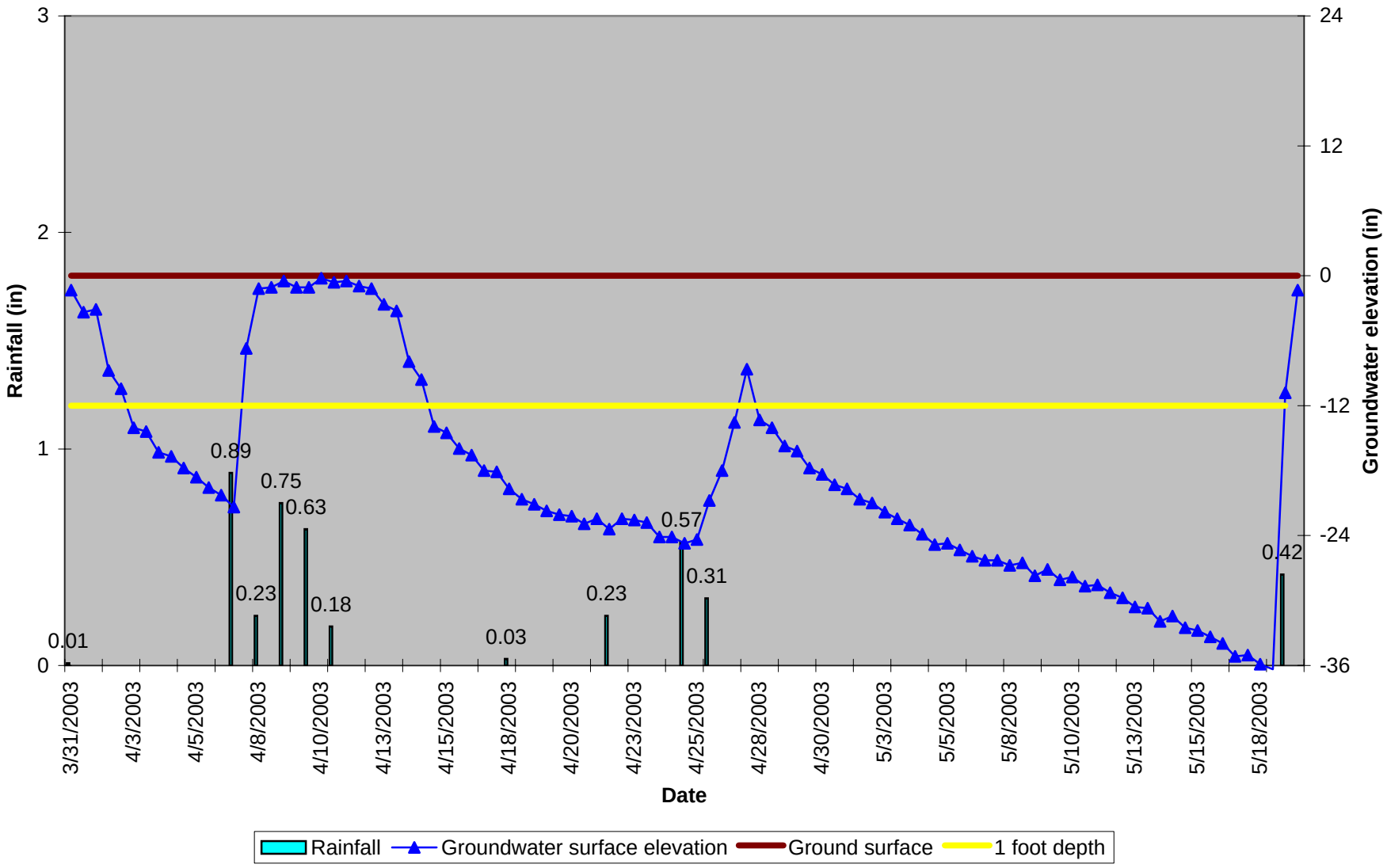
3/17/2003
3/19/2003
3/20/2003
3/22/2003
3/23/2003
3/25/2003
3/26/2003
3/28/2003
3/29/2003
Rainfall
Start of growing season
Blank
Groundwater surface elevation
Ground surface
1 foot depth


Gauge 6 - 28014
Rainfall (in)
Groundwater elevation (in)
Date
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0
24
12
0
-12
-24
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0.01
0.89
0.23
0.75
0.63
0.18
0.03
0.23
0.57
0.31
0.42
3/31/2003
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4/5/2003
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4/18/2003
4/20/2003
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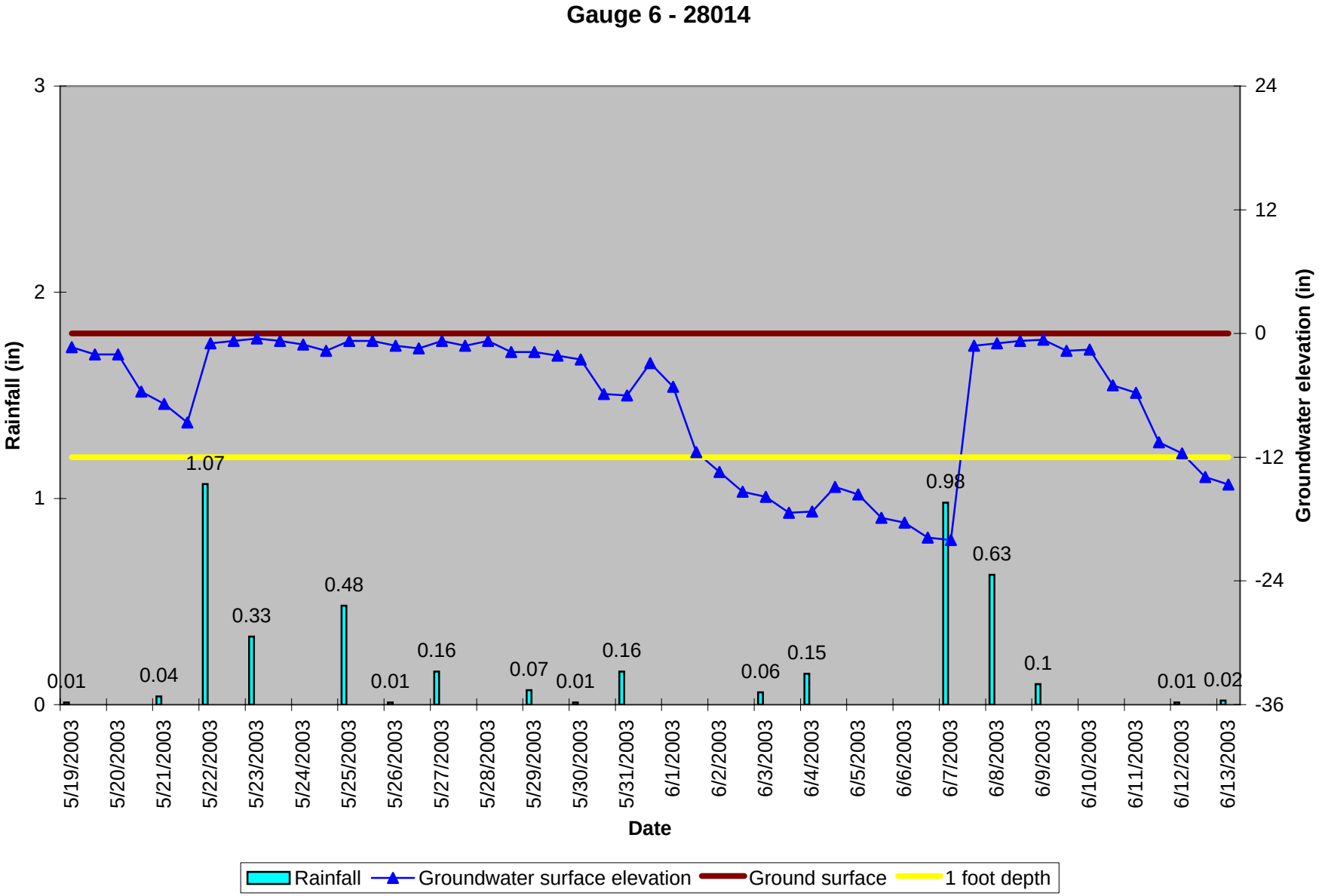
4/28/2003
4/30/2003
5/3/2003
5/5/2003
5/8/2003
5/10/2003
5/13/2003
5/15/2003
5/18/2003
Rainfall
Groundwater surface elevation
Ground surface
1 foot depth


Gauge 6 - 28014
Rainfall (in)
Groundwater elevation (in)
Date
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0
24
12
0
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0.07
0.01
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0.06
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0.01
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5/19/2003
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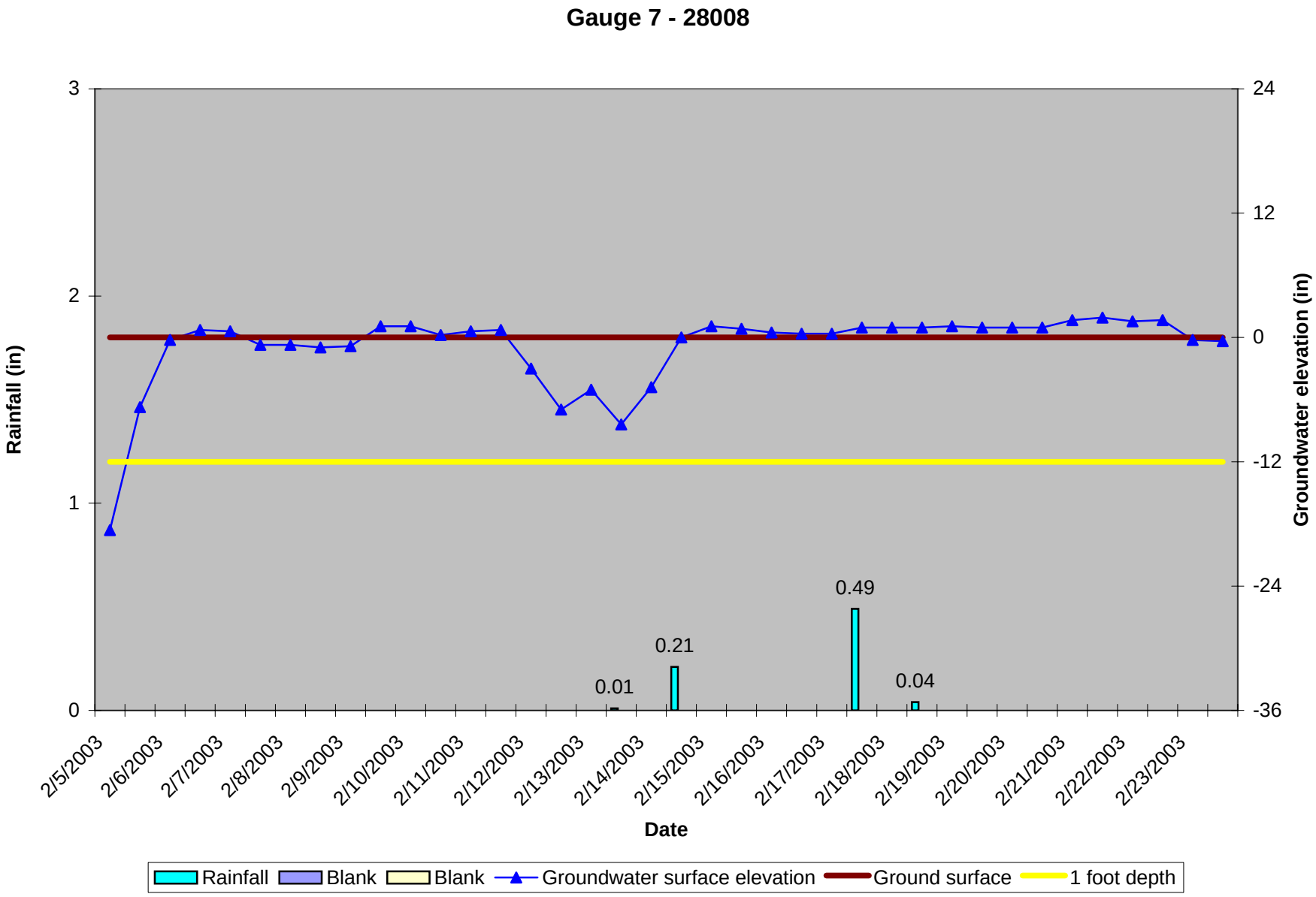
6/13/2003
Rainfall
Groundwater surface elevation
Ground surface
1 foot depth


Gauge 7 - 28008
Rainfall (in)
Groundwater elevation (in)
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12
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-12
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-36
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0.49
0.04
2/5/2003
2/6/2003
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2/16/2003
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2/19/2003
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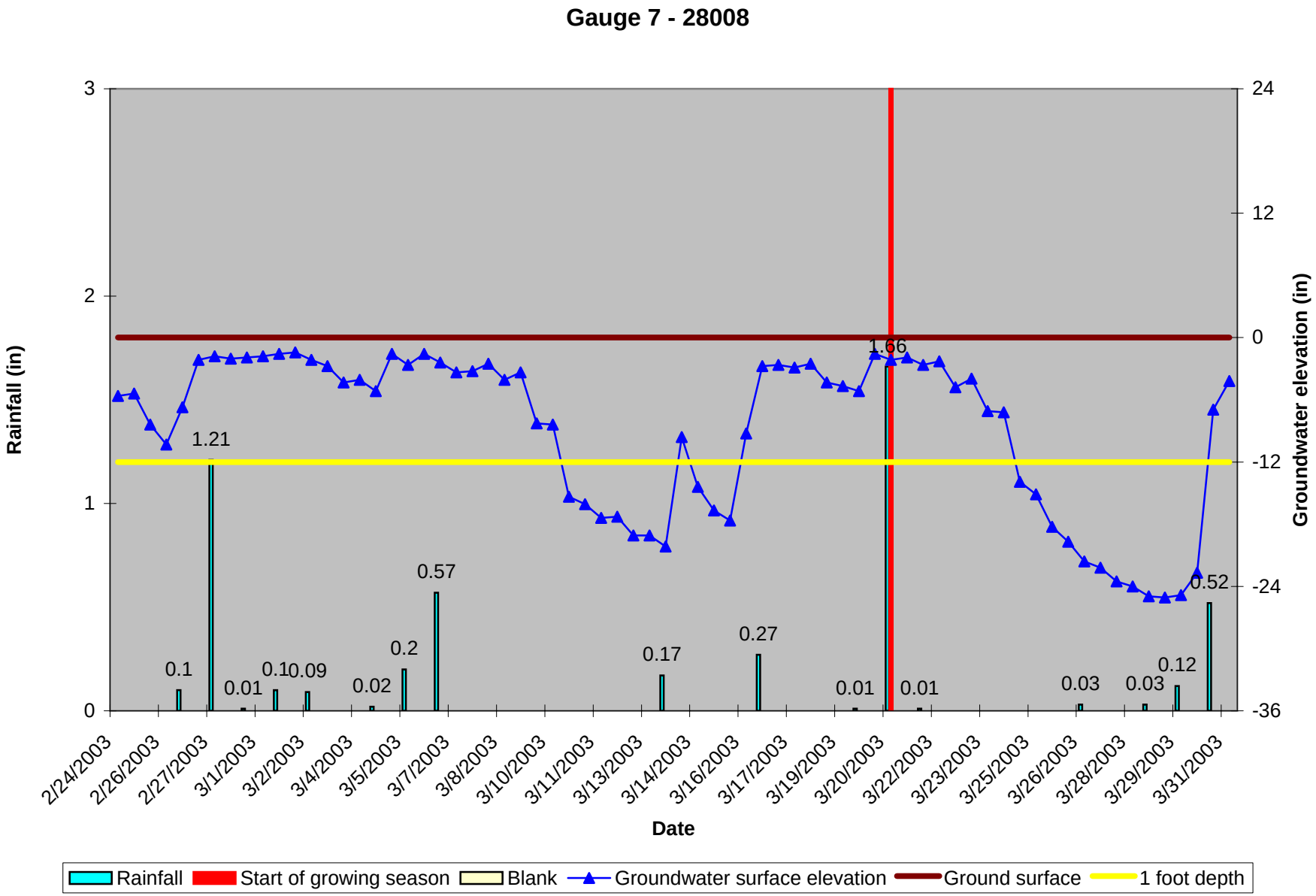
2/22/2003
2/23/2003
Date
Rainfall
Blank
Blank
Groundwater surface elevation
Ground surface
1 foot depth


Gauge 7 - 28008
Rainfall (in)
Groundwater elevation (in)
Date
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0
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12
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-12
-24
-36
1.21
1.66
0.1
0.01
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3/19/2003
3/20/2003
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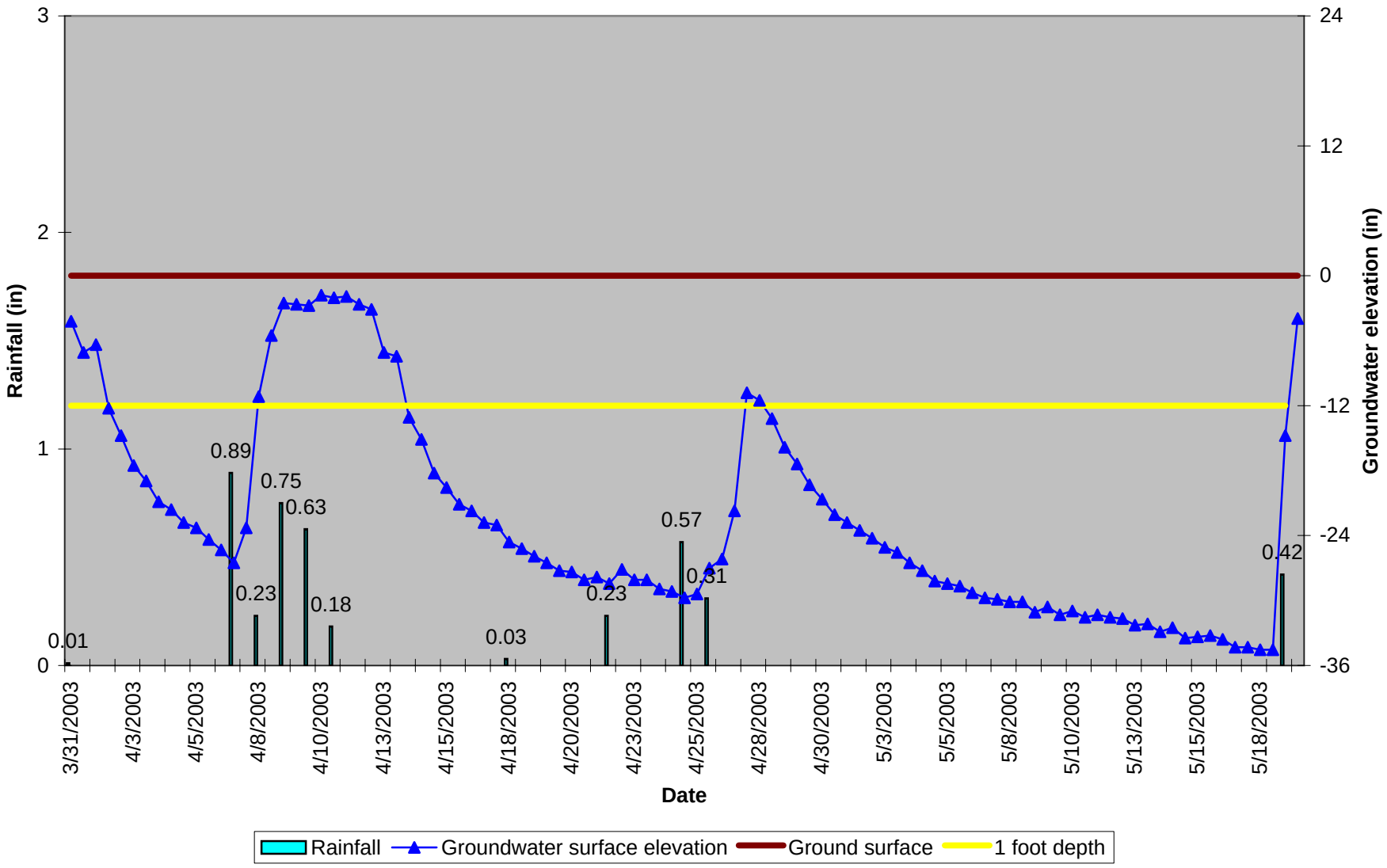
3/29/2003
3/31/2003
Rainfall
Start of growing season
Blank
Groundwater surface elevation
Ground surface
1 foot depth


Gauge 7 - 28008
Rainfall (in)
Groundwater elevation (in)
Date
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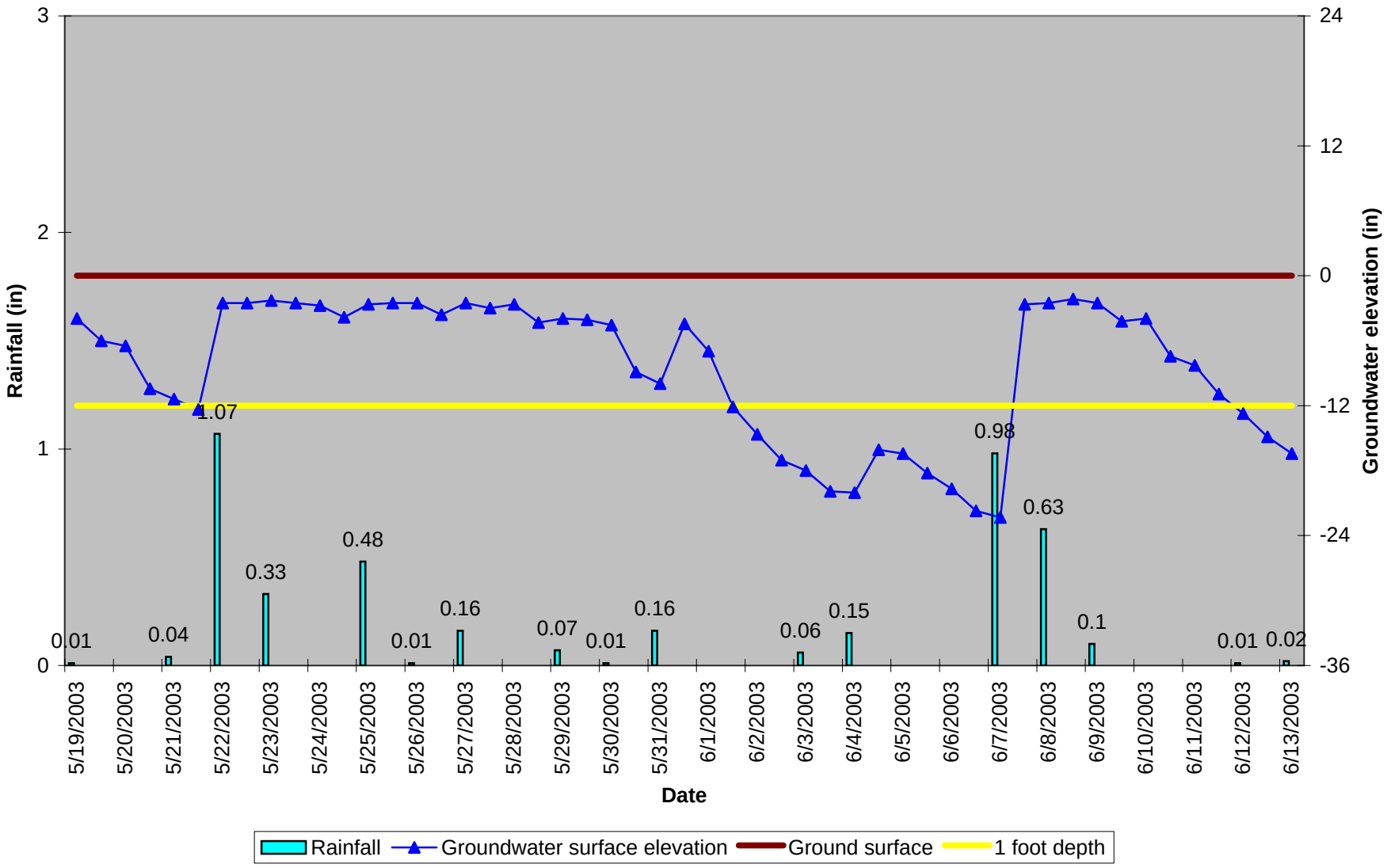
5/15/2003
5/18/2003
Rainfall
Groundwater surface elevation
Ground surface
1 foot depth


Gauge 7 - 28008
Rainfall (in)
Groundwater elevation (in)
Date
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0.04
1.07
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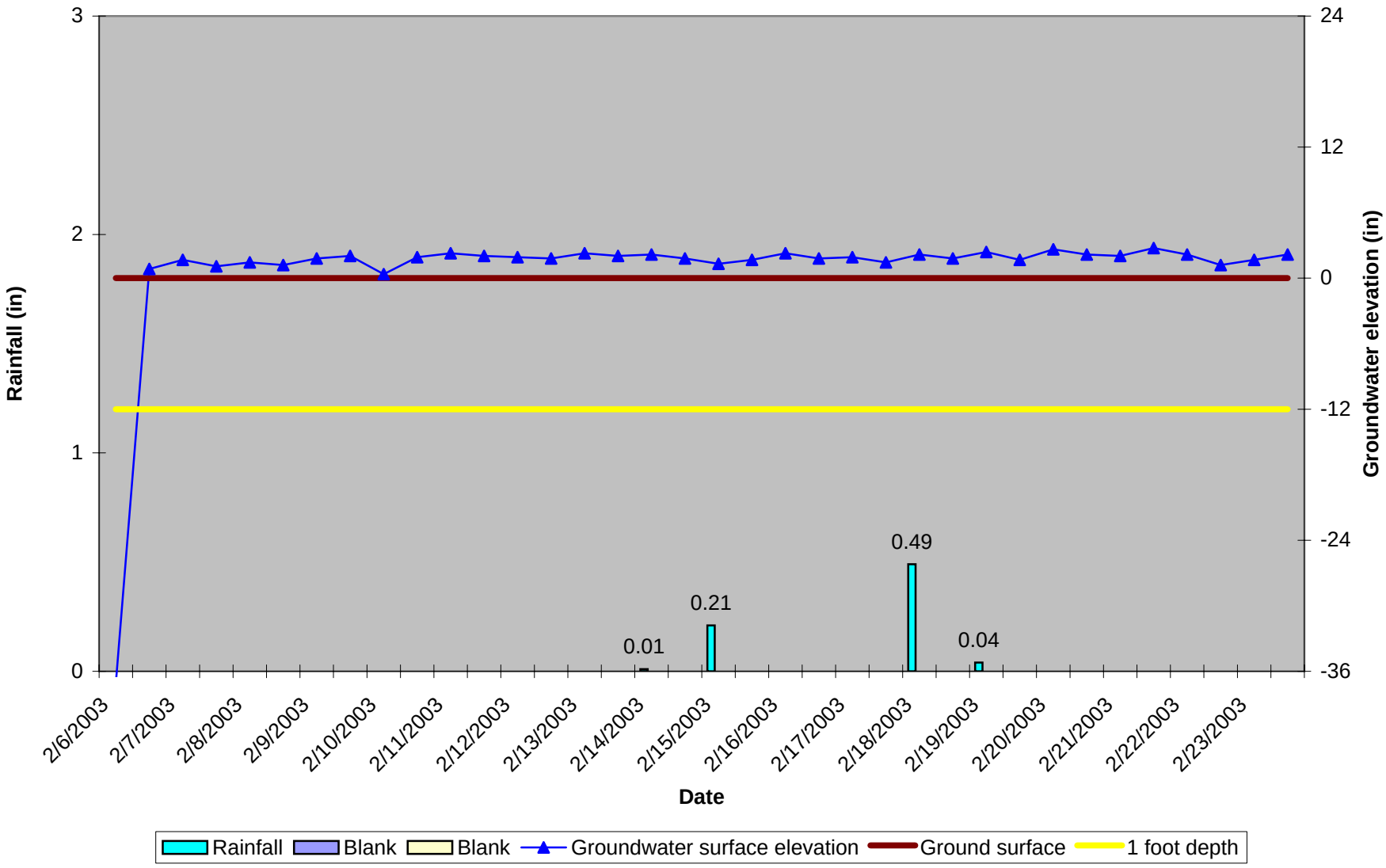
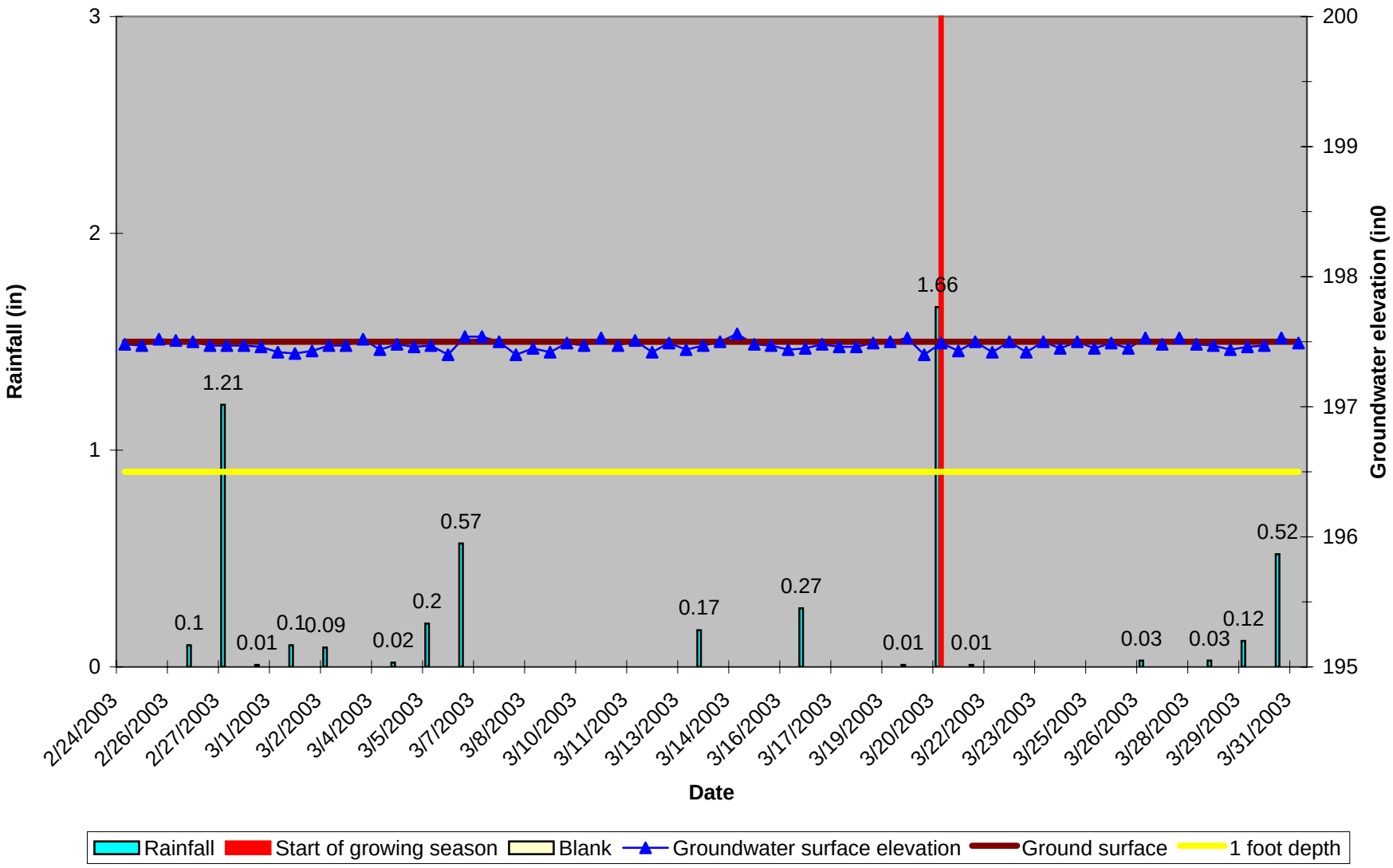
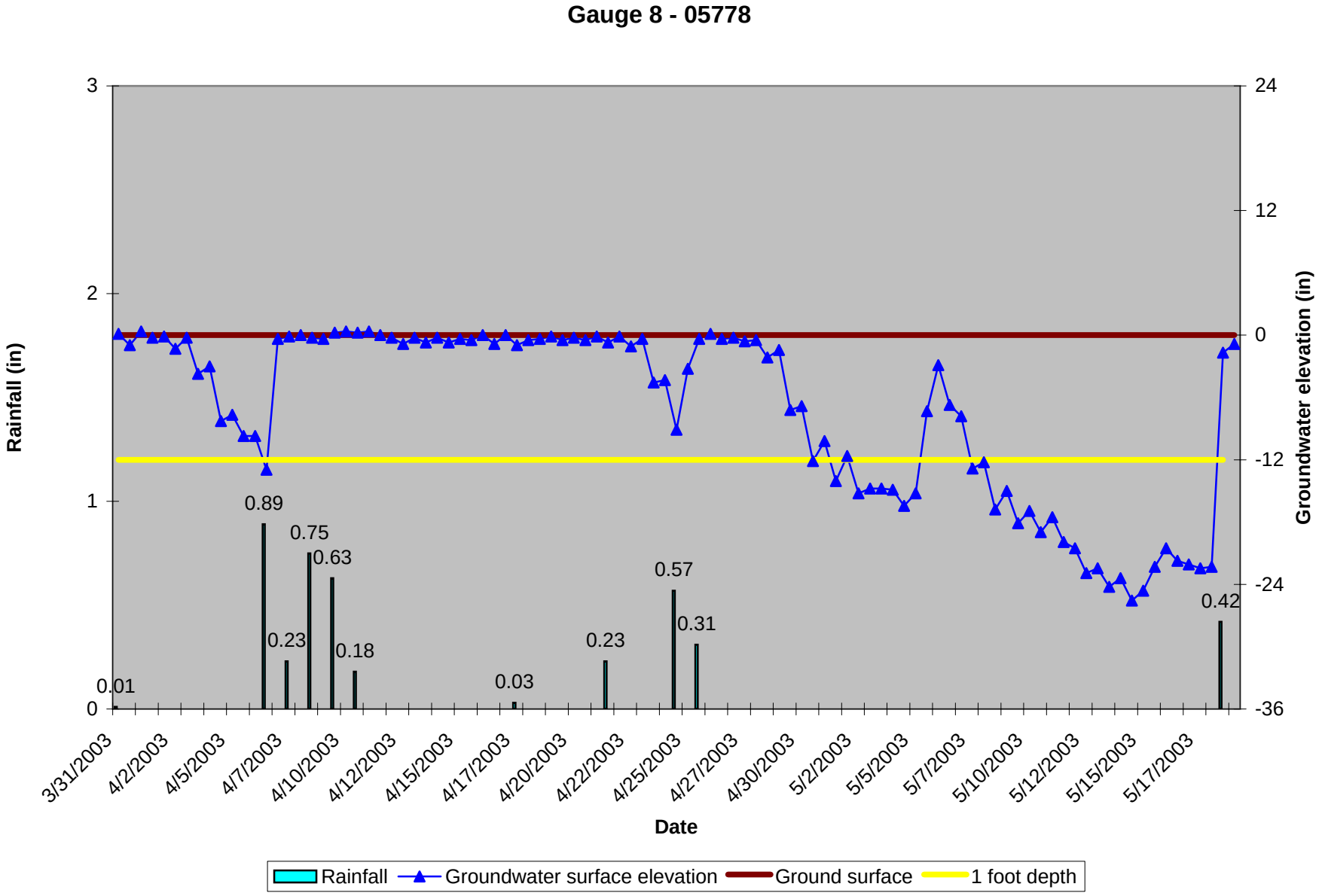
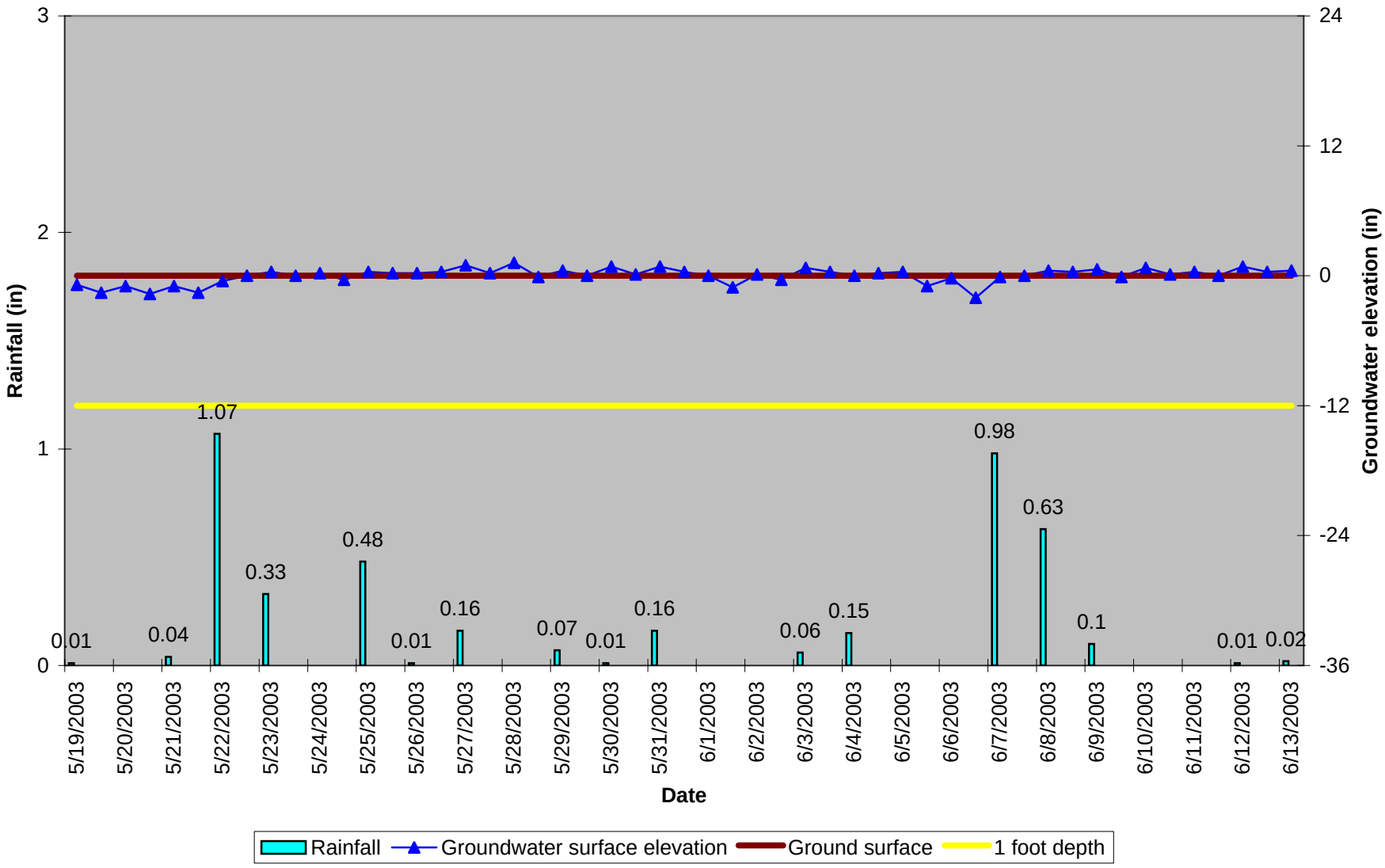
6/11/2003
6/12/2003
6/13/2003
Rainfall
Groundwater surface elevation
Ground surface
1 foot depth


Gauge 8 - 05778
Rainfall (in)
Groundwater elevation (in)
3
2
1
0
24
12
0
-12
-24
-36
0.01
0.21
0.49
0.04
2/6/2003
2/7/2003
2/8/2003
2/9/2003
2/10/2003
2/11/2003
2/12/2003
2/13/2003
2/14/2003
2/15/2003
2/16/2003
2/17/2003
2/18/2003
2/19/2003
2/20/2003
2/21/2003
2/22/2003
2/23/2003
Date
Rainfall
Blank
Blank
Groundwater surface elevation
Ground surface
1 foot depth


Gauge 8 - 05778
Rainfall (in)
Groundwater elevation (in0
Date
3
2
1
0
200
199
198
197
196
195
1.66
1.21
0.57
0.2
0.1
0.1
0.09
0.01
0.02
0.17
0.27
0.01
0.01
0.03
0.03
0.12
0.52
2/24/2003
2/26/2003
2/27/2003
3/1/2003
3/2/2003
3/4/2003
3/5/2003
3/7/2003
3/8/2003
3/10/2003
3/11/2003
3/13/2003
3/14/2003
3/16/2003
3/17/2003
3/19/2003
3/20/2003
3/22/2003
3/23/2003
3/25/2003
3/26/2003
3/28/2003
3/29/2003
3/31/2003
Rainfall
Start of growing season
Blank
Groundwater surface elevation
Ground surface
1 foot depth


Gauge 8 - 05778
Rainfall (in)
Groundwater elevation (in)
Date
3
2
1
0
24
12
0
-12
-24
-36
0.01
0.89
0.23
0.75
0.63
0.18
0.03
0.23
0.57
0.31
0.42
3/31/2003
4/2/2003
4/5/2003
4/7/2003
4/10/2003
4/12/2003
4/15/2003
4/17/2003
4/20/2003
4/22/2003
4/25/2003
4/27/2003
4/30/2003
5/2/2003
5/5/2003
5/7/2003
5/10/2003
5/12/2003
5/15/2003
5/17/2003
Rainfall
Groundwater surface elevation
Ground surface
1 foot depth


Gauge 8 - 05778
Rainfall (in)
Groundwater elevation (in)
Date
3
2
1
0
24
12
0
-12
-24
-36
0.01
0.04
1.07
0.33
0.48
0.01
0.16
0.07
0.01
0.16
0.06
0.15
0.98
0.63
0.1
0.01
0.02
5/19/2003
5/20/2003
5/21/2003
5/22/2003
5/23/2003
5/24/2003
5/25/2003
5/26/2003
5/27/2003
5/28/2003
5/29/2003
5/30/2003
5/31/2003
6/1/2003
6/2/2003
6/3/2003
6/4/2003
6/5/2003
6/6/2003
6/7/2003
6/8/2003
6/9/2003
6/10/2003
6/11/2003
6/12/2003
6/13/2003
Rainfall
Groundwater surface elevation
Ground surface
1 foot depth

APPENDIX E

Hydric Soil Certification Letter
Soil Boring Descriptions

KCI ASSOCIATES OF NORTH CAROLINA, PA

SOIL PROFILE DESCRIPTION

Client: NCWRP **Date:** February 5, 2003
Project: Daniels Farm Mitigation Site **Project #:** 1203012
County: Franklin **State:** NC
Location: Egypt Church Road, South of Louisburg, off Highway 39 **Site/Lot:** MW #1
Soil Series: Wahee
Soil Classification: Fine, mixed, semiactive, thermic, Aeric Endoaquults
AWT: >40" **SHWT:** 12-18" **Slope:** 0-1% **Aspect:**
Elevation: **Drainage:** Somewhat Poorly **Permeability:** slow to very slow
Vegetation: Silage-Brown top millet and sudex
Borings terminated at 62 **Inches**

HORIZON	DEPTH (IN)	MATRIX	MOTTLES	TEXTURE	STRUCTURE	CONSISTENCE	BOUNDARY	NOTES
Ap	0-5	2.5Y 6/4		sl	1fgr	mfr	as	
E	5-7	10YR 5/4	10YR 6/6	sl	1msbk	mfr	cs	
Bt1	7-10	10YR 6/6	10YR 6/3	scl	2msbk	mfr	gw	detect vfs, almost silt
Bt2	10-18	10YR 6/6	10YR 7/1 c2f	scl-cl	2msbk	mfr	gw	
Bt3	18-40	10YR 6/6	10YR 7/1 c2f	c	2msbk	mfi	gw	
Btg	44-48	2.5Y7/2	10YR5/6 c2d	c	2msbk	mfi	gw	many prominent clay skins
			2.5Y6/6 c2f					
BCg	48-54	10YR5/6	10YR4/6 c2d	sl-scl	1fsbk	mfr	gw	
			2.5Y7/2 c2d					
Cg	54-62	10YR7/2	10YR5/6 c2d	scl	massive	mfr		

COMMENTS:

DESCRIBED BY: S.F.S. & K.A.N. DATE: 02/05/03

KCI ASSOCIATES OF NORTH CAROLINA, PA

SOIL PROFILE DESCRIPTION

Client: NCWRP **Date:** February 5, 2003
Project: Daniels Farm Mitigation Site **Project #:** 1203012
County: Franklin **State:** NC
Location: Egypt Church Road, South of Louisburg, off Highway 39 **Site/Lot:** MW #2
Soil Series: Roanoke
Soil Classification: Fine, mixed, semiactive, thermic, Typic Endoaquults
AWT: 5" **SHWT:** 0-12" **Slope:** 0-1% **Aspect:**
Elevation: **Drainage:** Poorly **Permeability:** slow to very slow
Vegetation: Silage-Brown top millet and sudex
Borings terminated at 62 **Inches**

HORIZON	DEPTH (IN)	MATRIX	MOTTLES	TEXTURE	STRUCTURE	CONSISTENCE	BOUNDARY	NOTES
A	0-5	10YR 4/2	5YR4/6 c1p	loam	1fr	mfr	as	redox
Btg1	5-9	10YR 5/2	5YR4/6 c1p	scl	1fsbk	mfr	cs	common medium rounded -
								concretions
			5YR3/4c2p					Mn masses
Btg2	9-12	10YR 6/1	10YR 5/6 c2d	scl	1fsbk	mfr	gs	many black Mn mass~3mm
Btg3	12-33	10YR 6/1	10YR 5/8 m2d	c	1msbk	mfi	gs	few 3mm concretions &
								masses below 18"
Cg1	33-50	10YR6/1	10YR5/8m2d	c	massive	mfi	gs	see note below
			10YR2/1m2d					
Cg2	50-62	2.5Y6/2	7.5YR5/8 c1p	c	massive			see note below

COMMENTS:
33-50" lenses of black 10YR2/1 stained clay soil 1/4 to 1/2" wide repeating every 1/2 to 1" in horizon
50-62" lenses of black 10YR 2/1 stained clay soil 1/4" wide repeating every 1/2 to 1" in horizon

DESCRIBED BY: S.F.S. & K.A.N. DATE: 02/05/03

KCI ASSOCIATES OF NORTH CAROLINA, PA

SOIL PROFILE DESCRIPTION

Client: NCWRP **Date:** February 5, 2003
Project: Daniels Farm Mitigation Site **Project #:** 1203012
County: Franklin **State:** NC
Location: Egypt Church Road, South of Louisburg, off Highway 39 **Site/Lot:** MW #3
Soil Series: Roanoke
Soil Classification: Fine, mixed, semiactive, thermic, Typic Endoaquults
AWT: 4" **SHWT:** 0-12" **Slope:** 0-1% **Aspect:**
Elevation: **Drainage:** Poorly **Permeability:** slow to very slow
Vegetation: Silage-Brown top millet and sudex
Borings terminated at 60 **Inches**

HORIZON	DEPTH (IN)	MATRIX	MOTTLES	TEXTURE	STRUCTURE	CONSISTENCE	BOUNDARY	NOTES
Ap	0-4	10YR 3/1		sl-l	1fgr	mfr	as	
Btg1	4-8	10YR 5/2	10YR 5/6 f1f	sl	1fsbk	mfr	cs	
			5YR4/6 c1p					
Btg2	8-12	10YR4/2	10YR5/6 f1f	fsl	1fsbk	mfr	cs	
			5YR4/6 c1p					
Btg3	12-18	10YR 5/1	5YR 5/8 f1p	scl	1fsbk	mfr	gs	
			10YR 5/8 c2d					
Btg4	18-44	10YR 6/1	10YR 8/6 c2d	c	2msbk	mfi	gs	few medium concretions -
								between 40 to 44 "
Btg5	44-52	2.5Y7/2	7.5YR5/6 f1p	sc	1msbk	mfi	gs	
BCg	52-60	2.5Y6/2	2.5Y6/4f1f	scl	1msbk	mfr	gw	
			7.5YR5/6 f1p					

COMMENTS:

DESCRIBED BY: S.F.S. & K.A.N. DATE: 02/05/03

KCI ASSOCIATES OF NORTH CAROLINA, PA

SOIL PROFILE DESCRIPTION

Client: NCWRP **Date:** February 5, 2003
Project: Daniels Farm Mitigation Site **Project #:** 1203012
County: Franklin **State:** NC
Location: Egypt Church Road, South of Louisburg, off Highway 39 **Site/Lot:** MW #4
Soil Series: Roanoke
Soil Classification: Fine, mixed, semiactive, thermic, Typic Endoaquults
AWT: 5" **SHWT:** 0-12" **Slope:** 0-1% **Aspect:**
Elevation: **Drainage:** Poorly drained **Permeability:** slow to very slow
Vegetation: Silage-Brown top millet and sudex
Borings terminated at 60 **Inches**

HORIZON	DEPTH (IN)	MATRIX	MOTTLES	TEXTURE	STRUCTURE	CONSISTENCE	BOUNDARY	NOTES
A1	0-3	10YR4/2		l	1fgr	mfr	cs	redox
A2	3-6	10YR5/1	5YR4/4 f1p	l	1fgr	mfr	cs	
			5YR4/6f1p					
Btg1	6-14	10YR 5/2	10YR 5/6 f1d	scl	2fsbk	mfr	cs	common medium black-
								Mn masses
Btg2	14-34	10YR 5/2	10YR 5/6 f1d	c	2msbk	mfi	gs	common medium black-
								Mn masses
Btg3	34-42	2.5Y 6/2	10YR 5/8 c2d	scl	1fsbk	mfr	gs	
2Cg1	42-54	2.5Y 6/2		ls	mass	mfr	gs	
2Cg2	54-60	2.5Y 6/2	5YR 5/8 f1p	sl	mass	mfr		
			10YR 6/6 f1d					

COMMENTS:
placed well bottom 30" and transducer 28"

DESCRIBED BY: S.F.S. & K.A.N. DATE: 02/05/03

KCI ASSOCIATES OF NORTH CAROLINA, PA

SOIL PROFILE DESCRIPTION

Client: NCWRP **Date:** February 5, 2003
Project: Daniels Farm Mitigation Site **Project #:** 1203012
County: Franklin **State:** NC
Location: Egypt Church Road, South of Louisburg, off Highway 39 **Site/Lot:** MW #5
Soil Series: State
Soil Classification: Fine, loamy, mixed, semiactive, thermic, Typic Hapludults
AWT: 44" **SHWT:** 38-72" **Slope:** 0-2% **Aspect:**
Elevation: **Drainage:** Well **Permeability:** Moderate
Vegetation: Silage-Brown top millet and sudex
Borings terminated at 60 **Inches**

HORIZON	DEPTH (IN)	MATRIX	MOTTLES	TEXTURE	STRUCTURE	CONSISTENCE	BOUNDARY	NOTES
Ap	0-6	10YR 4/3		fsl-sl	1fgr	mfr	as	
E	6-13	10YR 5/4		sl	1fgr	mfr	cw	
Bt1	13-20	10YR 5/6		scl	1fsbk	mfr	gw	
Bt2	20-26	7.5YR 5/6		scl	1fsbk	mfr	gw	
Bt3	26-38	10YR 6/6	2.5YR4/8c2p	scl-cl	1fsbk	mfr		
Bt4	38-43	10YR 6/8	10YR 7/1 f1f	scl-cl	1fsbk	mfr	gw	
			2.5YR4/8 c2p					
Bt5	43-53	10YR 5/8	10YR 7/2 c2f	scl	1fsbk	mfr	gw	
			2.5YR4/8 c2d					
Bt6	53-58	10YR 5/8	10YR 7/2 c2d	scl	1fsbk	mfr	gw	
BCg	58-60	2.5Y 7/2	10YR 5/8 c2f	scl	1fsbk	mfr		
			2.5YR4/8 c2p					

COMMENTS:
Placed well bottom 60" and transducer 58"

DESCRIBED BY: S.F.S. & K.A.N. DATE: 02/05/03

KCI ASSOCIATES OF NORTH CAROLINA, PA

SOIL PROFILE DESCRIPTION

Client: NCWRP **Date:** February 5, 2003
Project: Daniels Farm Mitigation Site **Project #:** 1203012
County: Franklin **State:** NC
Location: Egypt Church Road, South of Louisburg, off Highway 39 **Site/Lot:** MW #6
Soil Series: Toisnot
Soil Classification: Coarse-loamy, siliceous, semiactive, thermic Typic Fragiaquults
AWT: 6" **SHWT:** 0-12" **Slope:** 0-2% **Aspect:**
Elevation: **Drainage:** Poorly **Permeability:** Slow
Vegetation: Silage-Brown top millet and sudex
Borings terminated at 60 **Inches**

HORIZON	DEPTH (IN)	MATRIX	MOTTLES	TEXTURE	STRUCTURE	CONSISTENCE	BOUNDARY	NOTES
A1	0-3	10YR 4/2		l	1fgr	mfr	cs	
A2	3-5	10YR5/1	5YR4/6 f1p	sl	1fgr	mfr	cs	
			10YR4/4f1f					
Eg	5-9	10YR 5/1	5YR4/6f1p	sl	1fsbk	mfr	cw	
Btg1/Eg	9-15	10YR 5/1	2.5YR 4/8	scl	1fsbk	mfr	gw	
			5YR3/4 c1p					
Ex1	15-21	10YR 5/1	2.5Y 3/1 c2d	sl	massive	cw	gw	black Mn masses,
			2.5Y 4/8 f1d					redox
Ex2	21-36	2.5Y6/1	2.5YR 4/8 f1d	1s	massive	cw	cs	heavy clay films
Ex3	36-42	10YR 5/1		s1	massive	cw	cs	coarse sand
Ex4	42-48	10YR5/2		sl	massive	cw	cs	
Ex5	48-60	2.5Y6/2		sl	massive	cw		

COMMENTS:
placed transducer @ 36"

DESCRIBED BY: S.F.S. & K.A.N. DATE: 02/05/03

KCI ASSOCIATES OF NORTH CAROLINA, PA

SOIL PROFILE DESCRIPTION

Client: NCWRP **Date:** February 6, 2003
Project: Daniels Farm Mitigation Site **Project #:** 1203012
County: Franklin **State:** NC
Location: Egypt Church Road, South of Louisburg, off Highway 39 **Site/Lot:** 30 ft West of MW #6
Soil Series: Toisnot
Soil Classification: Coarse-loamy, siliceous,semiactive,thermic Typic Fragiaquults
AWT: >62" **SHWT:** 0-12" **Slope:** 0-2% **Aspect:**
Elevation: **Drainage:** Poorly **Permeability:** Slow
Vegetation: Silage-Brown top millet and sudex
Borings terminated at 62 **Inches**

HORIZON	DEPTH (IN)	MATRIX	MOTTLES	TEXTURE	STRUCTURE	CONSISTENCE	BOUNDARY	NOTES
Ap	0-3	10YR 3/2		l	1fgr	mfr	as	
Eg	3-6	2.5Y 5/2		sl	1fgr	mfr	cw	
Btg1	6-9	2.5Y 6/2	2.5Y 6/4 f1d	scl	1fsbk	mfr	cw	
			10YR 6/6 f1f					
Btg2	9-16	10YR 6/1	10YR 5/8 c2d	scl-sc	2fsbk	mfr	gw	
Btg3	16-20	10YR 6/1	10YR 4/6 c2d	sc	2msbk	mfi	gw	common distinct clay skins
Btg4	20-25	10YR 6/1	10YR 4/6 c2d	sl	1fmsbk	mfr	gw	scl lenses
Ex1	25-35	10YR 6/1		sl	mass	cw	gi	brittle fragipan
Ex2	35-56	10YR 5/1		sl	mass	cw	cs	brittle fragipan
Ex3	56-62	2.5Y 7/2		ls-s	mass	dvh	cs	brittle fragipan

COMMENTS:

DESCRIBED BY: SFS & KAN DATE: 02/06/03

KCI ASSOCIATES OF NORTH CAROLINA, PA

SOIL PROFILE DESCRIPTION

Client: NCWRP **Date:** February 5, 2003
Project: Daniels Farm Mitigation Site **Project #:** 1203012
County: Franklin **State:** NC
Location: Egypt Church Road, South of Louisburg, off Highway 39 **Site/Lot:** MW #7
Soil Series: Roanoke
Soil Classification: Fine, mixed, semiactive, thermic Typic Endoaquults
AWT: 5" **SHWT:** 0-12" **Slope:** 0-1% **Aspect:**
Elevation: **Drainage:** Poorly **Permeability:** slow-very slow
Vegetation: Silage-Brown top millet and sudex
Borings terminated at 60 **Inches**

HORIZON	DEPTH (IN)	MATRIX	MOTTLES	TEXTURE	STRUCTURE	CONSISTENCE	BOUNDARY	NOTES
Ap	0-5	10YR 3/2	7.5YR4/8 f1p	fsl-l	1fgr	mfr	as	
Eg	5-7	10YR 5/2	7.5YR5/6 f1d	sl	1fsbk	mfr	cs	
			5YR4/6 f1p					
Btg1	7-13	10YR 6/2	10YR 5/6 c2d	scl	1fsbk	mfr	cs	
Btg2	13-20	10YR 5/2	10YR 5/6 c2f	c	1msbk	mfi	gs	
Btg3	20-24	10YR 6/1	2.5YR 5/8 c2p	c	2msbk	mfi	gs	
			10YR 5/6 c2f					
Btg4	24-40	10YR 6/1	10YR 5/6 c2f	sc	2cpr	mfi	gs	
BCg	40-48	10YR6/1	2.5Y6/4 c2p	sc	1fsbk	mfi	gs	
2Cg	48-60	2.5Y7/2	6/10Y c2p	sl	massive	mfr		
			2.5Y6/4 c2p					

COMMENTS:
Transducer placed @ 36"

DESCRIBED BY: S.F.S. & K.A.N. DATE: 02/05/03

KCI ASSOCIATES OF NORTH CAROLINA, PA

SOIL PROFILE DESCRIPTION

Client: NCWRP **Date:** February 5, 2003
Project: Daniels Farm Mitigation Site **Project #:** 1203012
County: Franklin **State:** NC
Location: Egypt Church Road, South of Louisburg, off Highway 39 **Site/Lot:** MW #8
Soil Series: Augusta
Soil Classification: Fine-loamy, mixed, semiactive, thermic Aeric Endoaquults
AWT: surface **SHWT:** 12-18" **Slope:** 0-2% **Aspect:**
Elevation: **Drainage:** Somewhat Poorly **Permeability:** moderate
Vegetation: Silage-Brown top millet and sudex
Borings terminated at 60 **Inches**

HORIZON	DEPTH (IN)	MATRIX	MOTTLES	TEXTURE	STRUCTURE	CONSISTENCE	BOUNDARY	NOTES
A1	0-4	10YR 3/2		fsl	1fgr	mfr	cs	
A2	4-9	10YR4/1	7.5YR4/4 f1d	fsl				
			5YR4/4 c1p					
E1	9-12	10YR 5/2	10YR 5/6 f1f	sl	1fgr	mfr	cs	redox
			10YR 5/3 f1f					
E2	12-14	10YR5/3	10YR5/2 m2p	sl	1fgr	mfr	cs	
Bt1	14-22	10YR 5/4	10YR 5/2 c2d	sc1	1fsbk	mfr	gs	
			7.5YR5/6 c2d					
Bt2	22-27	10YR 5/6	10 YR 5/1 c2f	scl	1msbk	mfr	gs	
			10 YR 5/4 c2f					
Bt3	27-36	10YR 5/6	2.5YR 4/8 c2p	scl	1msbk	mfr	gs	
			10YR5/1c2d					
Btg1	36-42	10YR 5/1	10YR 5/6 c2f	scl	1msbk	mfr	gs	
C	42-50		2.5Y6/1					
			10YR5/8					
			10YR5/4					
Cg	50-60	5Y6/1	10YR5/4	scl	massive	mfr		

COMMENTS:
Sulfidic odor, surface ponding, soil saturated from 0 to 14 inches.

DESCRIBED BY: S.F.S. & K.A.N. DATE: 02/05/03

APPENDIX F

Existing and Post-Restoration Water Budgets

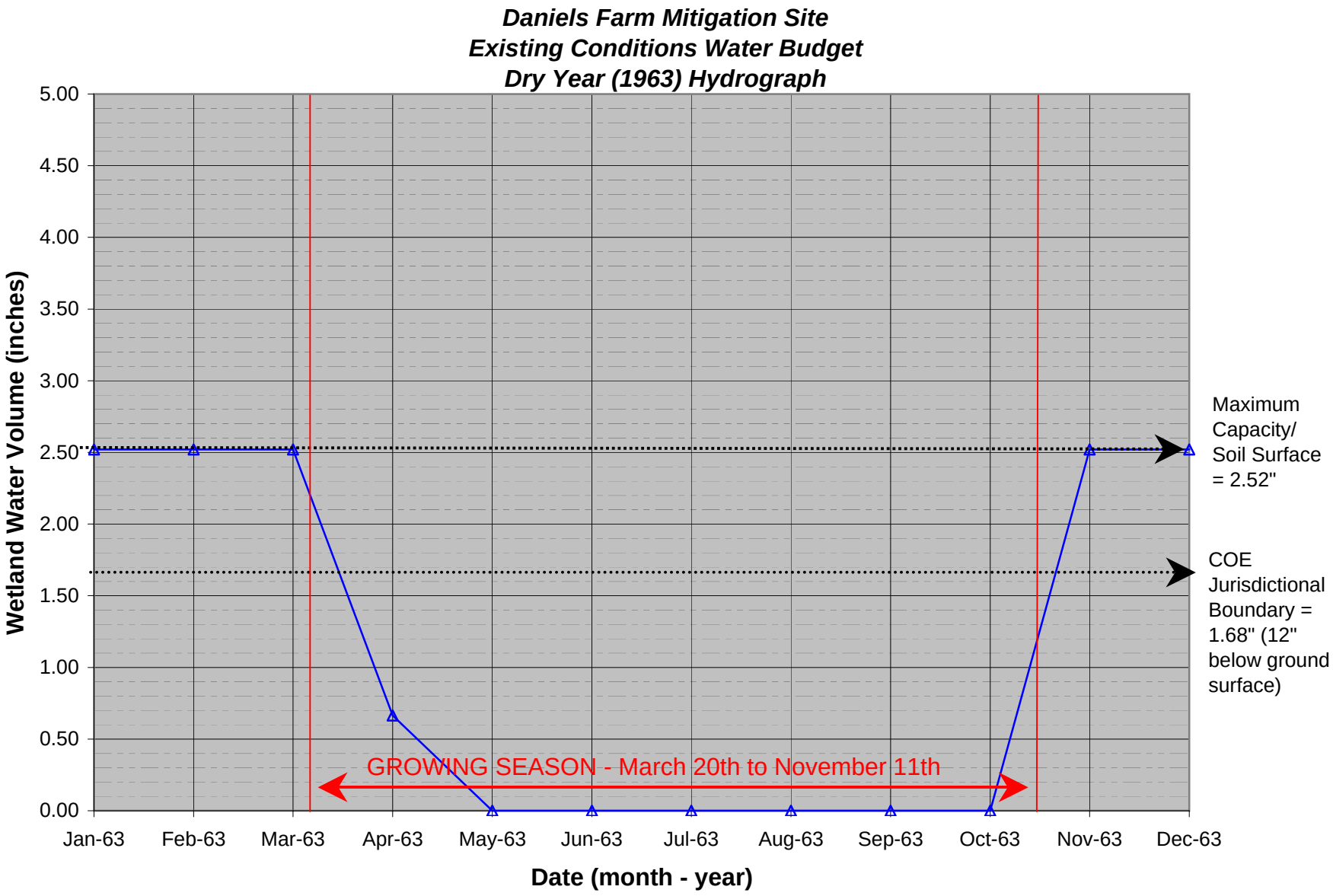
Daniels Farm Mitigation Site Water Budget - Existing Conditions

Dry Year	*Water Inputs*			*Water Outputs*				Change in Storage	Excess Water	Wetland Volume
1963	**P**	**Si ***	**Gi**	**PET**	**So**	**Go**	**Infiltration**			
Jan-63	3.22	0.00	0.00	0.17	0.00	0.00	1.04	2.01	2.01	2.52
Feb-63	3.75	0.00	0.00	0.34	0.00	0.00	1.04	2.37	2.37	2.52
Mar-63	3.7	0.00	0.00	1.05	0.00	0.00	1.04	1.61	1.61	2.52
Apr-63	1.38	0.00	0.00	2.20	0.00	0.00	1.04	-1.86	0.00	0.66
May-63	3.24	0.00	0.00	3.62	0.00	0.00	1.04	-1.42	0.00	0.00
Jun-63	2.28	0.00	0.00	5.34	0.00	0.00	1.04	-4.10	0.00	0.00
Jul-63	2.56	0.00	0.00	6.10	0.00	0.00	1.04	-4.58	0.00	0.00
Aug-63	1.32	0.00	0.00	5.40	0.00	0.00	1.04	-5.12	0.00	0.00
Sep-63	4.35	0.00	0.00	3.89	0.00	0.00	1.04	-0.58	0.00	0.00
Oct-63	0.46	0.00	0.00	1.99	0.00	0.00	1.04	-2.57	0.00	0.00
Nov-63	7.85	0.00	0.00	0.92	0.00	0.00	1.04	5.89	3.37	2.52
Dec-63	3.85	0.00	0.00	0.31	0.00	0.00	1.04	2.50	2.50	2.52
Annual Totals	**37.96**	0.00	0.00	31.32	0.00	0.00	12.48	-5.84	11.86	

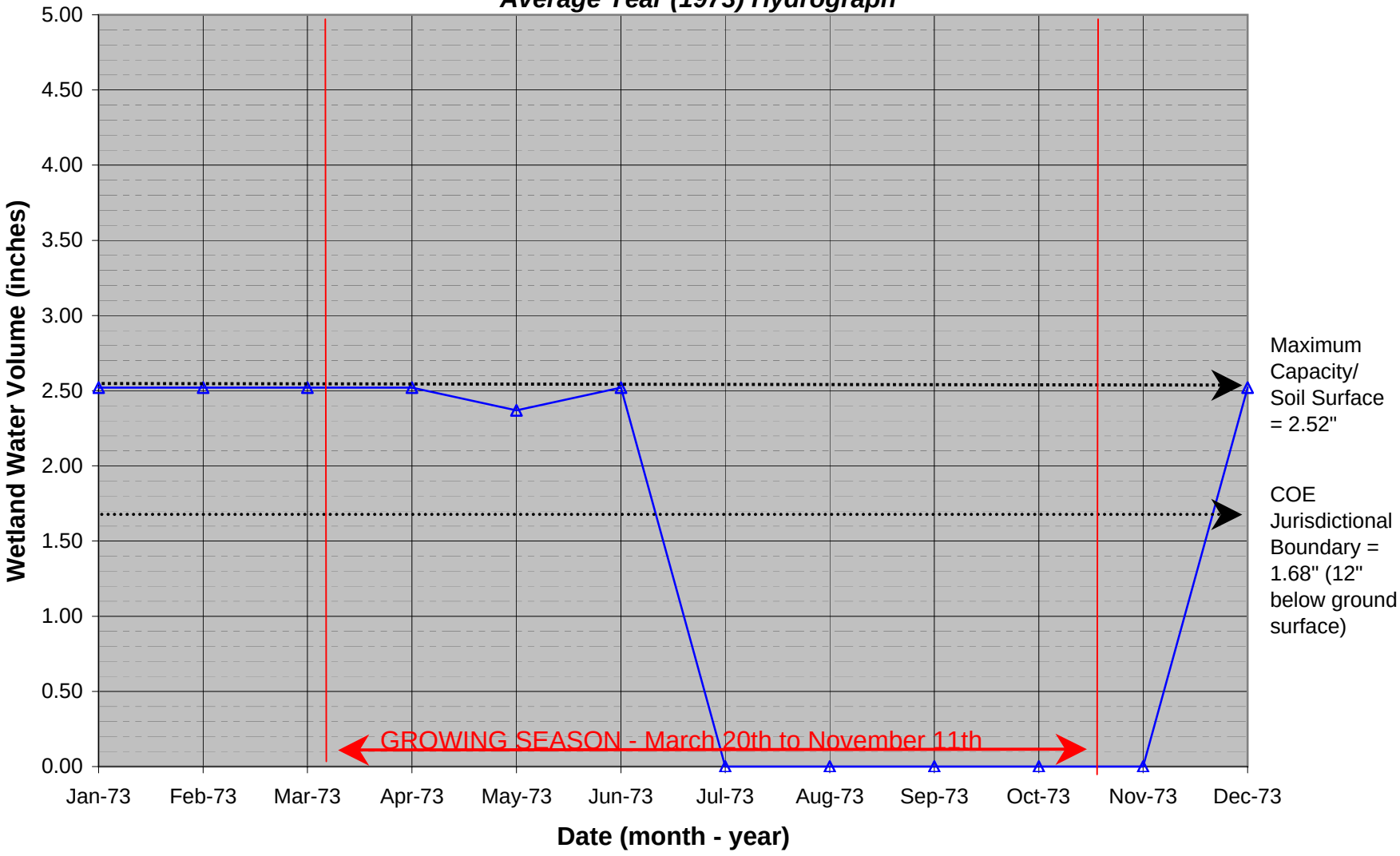
Avg. Year	*Water Inputs*			*Water Outputs*				Change in Storage	Excess Water	Wetland Volume
1973	**P**	**Si ***	**Gi**	**PET**	**So**	**Go**	**Infiltration**			
Jan-73	2.38	0.00	0.00	0.17	0.00	0.00	1.04	1.17	1.17	2.52
Feb-73	5.36	0.00	0.00	0.34	0.00	0.00	1.04	3.98	3.98	2.52
Mar-73	3.56	0.00	0.00	1.05	0.00	0.00	1.04	1.47	1.47	2.52
Apr-73	4.86	0.00	0.00	2.20	0.00	0.00	1.04	1.62	1.62	2.52
May-73	4.51	0.00	0.00	3.62	0.00	0.00	1.04	-0.15	0.00	2.37
Jun-73	8.57	0.00	0.00	5.34	0.00	0.00	1.04	2.19	2.04	2.52
Jul-73	3.06	0.00	0.00	6.10	0.00	0.00	1.04	-4.08	0.00	0.00
Aug-73	5.35	0.00	0.00	5.40	0.00	0.00	1.04	-1.09	0.00	0.00
Sep-73	2.47	0.00	0.00	3.89	0.00	0.00	1.04	-2.46	0.00	0.00
Oct-73	0.59	0.00	0.00	1.99	0.00	0.00	1.04	-2.44	0.00	0.00
Nov-73	0.74	0.00	0.00	0.92	0.00	0.00	1.04	-1.22	0.00	0.00
Dec-73	6.27	0.00	0.00	0.31	0.00	0.00	1.04	4.92	2.40	2.52
Annual Totals	**47.72**	0.00	0.00	31.32	0.00	0.00	12.48	3.92	12.69	

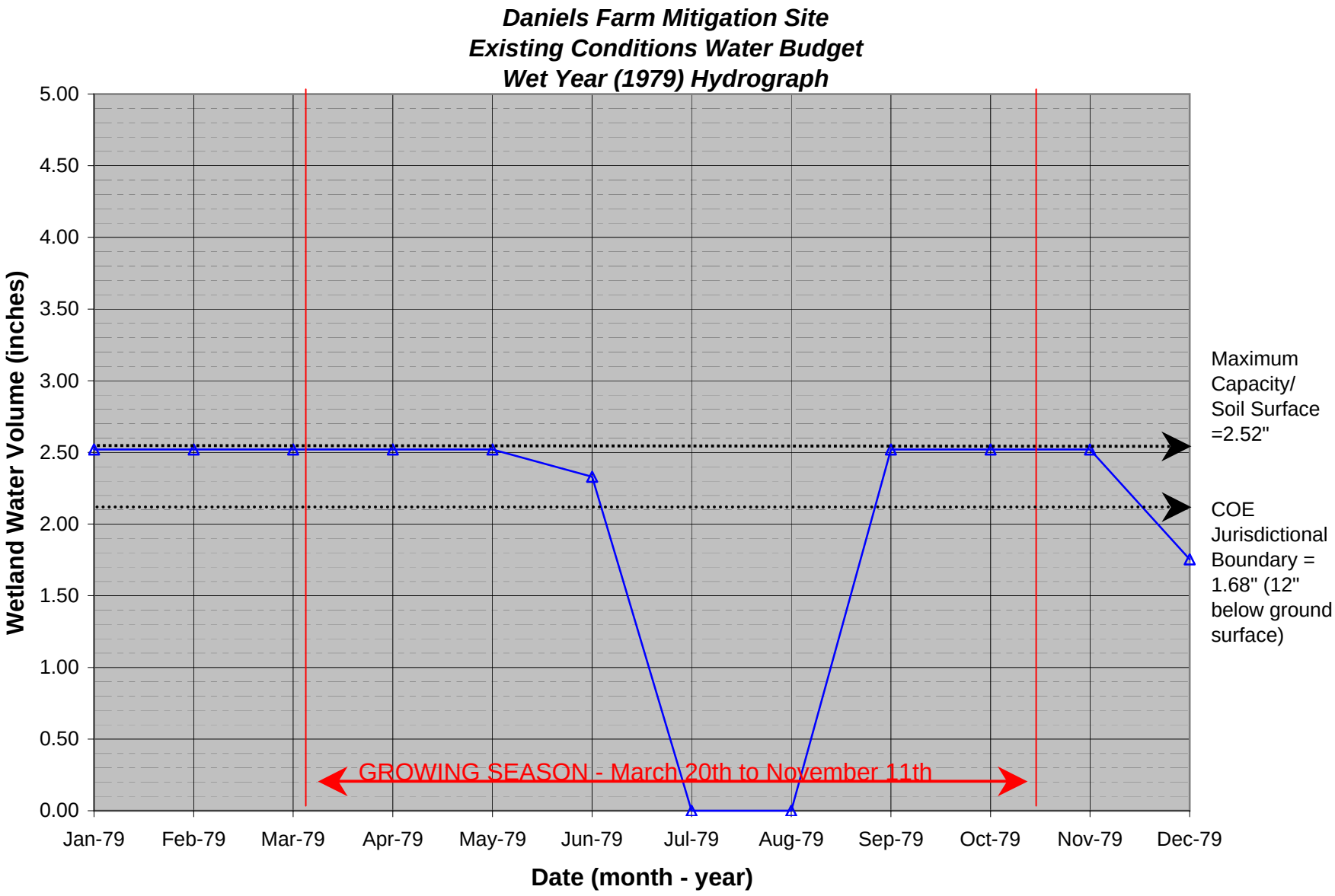
Wet Year	*Water Inputs*			*Water Outputs*				Change in Storage	Excess Water	Wetland Volume
1979	**P**	**Si ***	**Gi**	**PET**	**So**	**Go**	**Infiltration**			
Jan-79	6.35	0.00	0.00	0.17	0.00	0.00	1.04	5.14	4.37	2.52
Feb-79	4.31	0.00	0.00	0.34	0.00	0.00	1.04	2.93	2.93	2.52
Mar-79	3.47	0.00	0.00	1.05	0.00	0.00	1.04	1.38	1.38	2.52
Apr-79	5.33	0.00	0.00	2.20	0.00	0.00	1.04	2.09	2.09	2.52
May-79	5.42	0.00	0.00	3.62	0.00	0.00	1.04	0.76	0.76	2.52
Jun-79	6.19	0.00	0.00	5.34	0.00	0.00	1.04	-0.19	0.00	2.33
Jul-79	3.45	0.00	0.00	6.10	0.00	0.00	1.04	-3.69	0.00	0.00
Aug-79	3.68	0.00	0.00	5.40	0.00	0.00	1.04	-2.76	0.00	0.00
Sep-79	7.48	0.00	0.00	3.89	0.00	0.00	1.04	2.55	0.03	2.52
Oct-79	3.72	0.00	0.00	1.99	0.00	0.00	1.04	0.69	0.69	2.52
Nov-79	6.76	0.00	0.00	0.92	0.00	0.00	1.04	4.80	4.80	2.52
Dec-79	0.58	0.00	0.00	0.31	0.00	0.00	1.04	-0.77	0.00	1.75
Annual Totals	**56.74**	0.00	0.00	31.32	0.00	0.00	12.48	12.94	17.06	

* Note: S_i is inches of runoff calculated for a 100.7-acre watershed contributing to a 35-acre site.


Daniels Farm Mitigation Site
Existing Conditions Water Budget
Dry Year (1963) Hydrograph
Wetland Water Volume (inches)
5.00
4.50
4.00
3.50
3.00
2.50
2.00
1.50
1.00
0.50
0.00
Jan-63
Feb-63
Mar-63
Apr-63
May-63
Jun-63
Jul-63
Aug-63
Sep-63
Oct-63
Nov-63
Dec-63
Date (month - year)
GROWING SEASON - March 20th to November 11th
Maximum Capacity/ Soil Surface = 2.52"
COE Jurisdictional Boundary = 1.68" (12" below ground surface)

Daniels Farm Mitigation Site
Existing Conditions Water Budget
Average Year (1973) Hydrograph




Daniels Farm Mitigation Site
Existing Conditions Water Budget
Wet Year (1979) Hydrograph
Wetland Water Volume (inches)
5.00
4.50
4.00
3.50
3.00
2.50
2.00
1.50
1.00
0.50
0.00
Jan-79
Feb-79
Mar-79
Apr-79
May-79
Jun-79
Jul-79
Aug-79
Sep-79
Oct-79
Nov-79
Dec-79
Date (month - year)
GROWING SEASON - March 20th to November 11th
Maximum Capacity/ Soil Surface =2.52"
COE Jurisdictional Boundary = 1.68" (12" below ground surface)

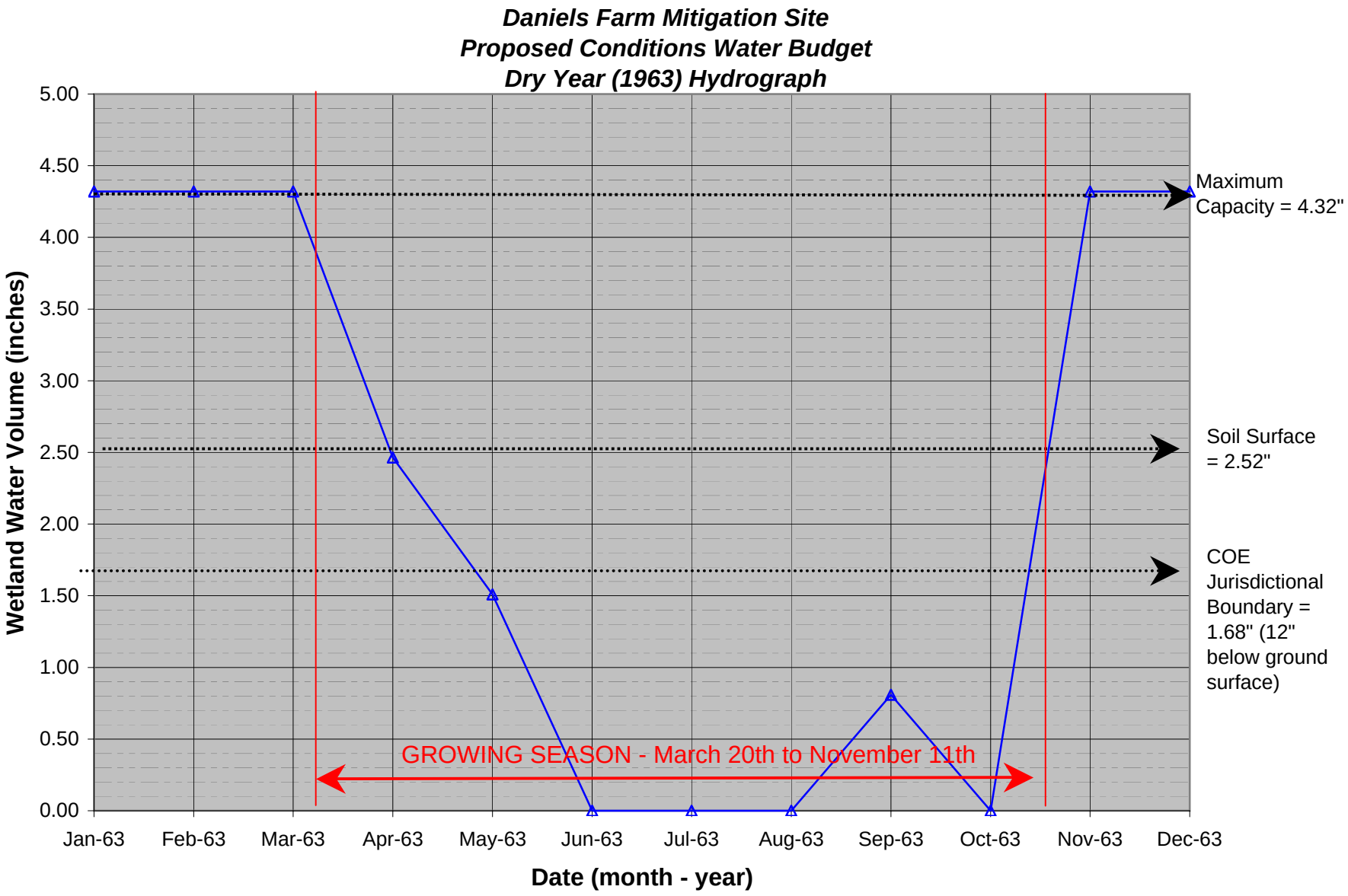
Daniels Farm Mitigation Site Water Budget - Proposed Conditions

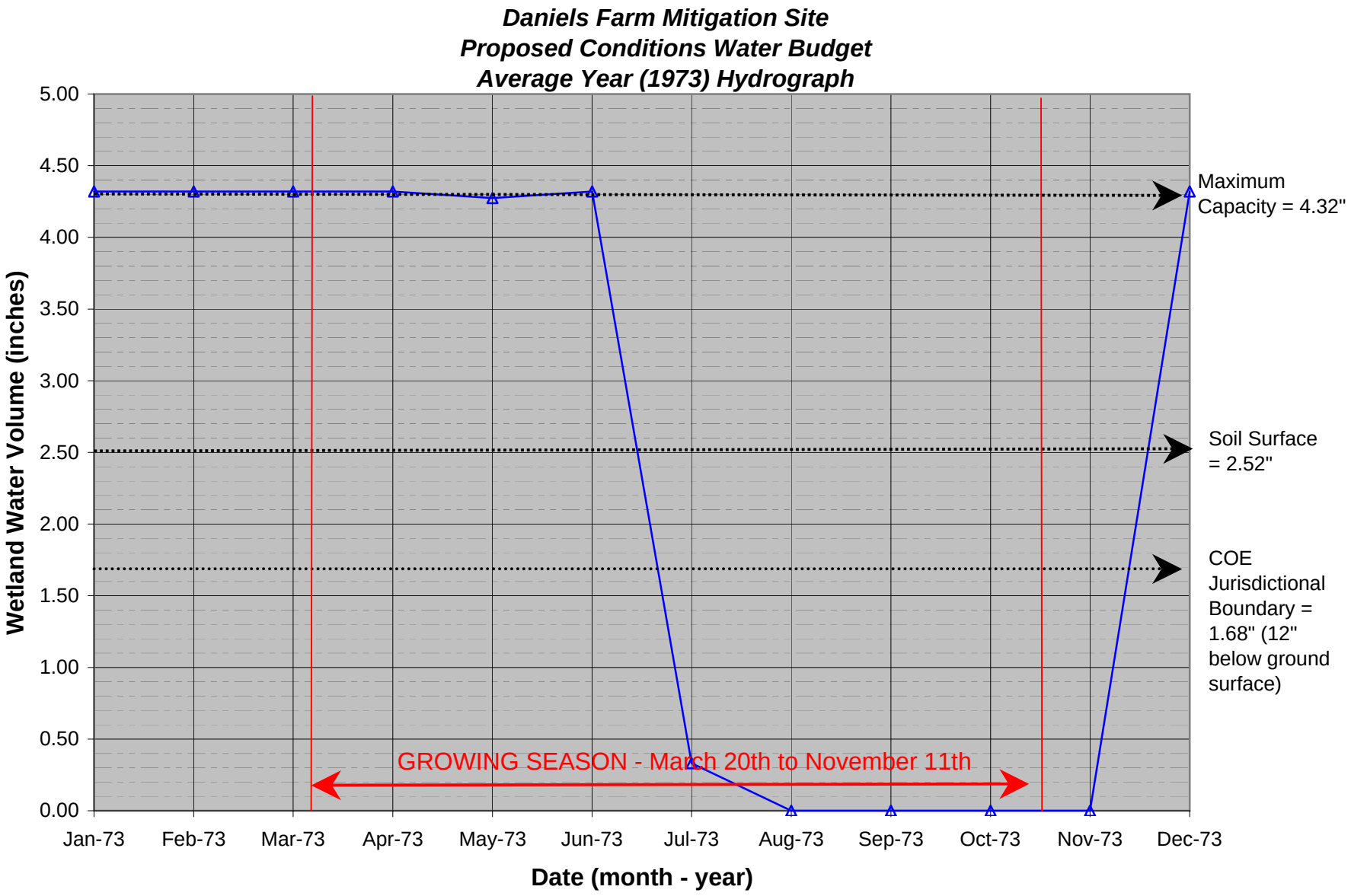
Dry Year	*Water Inputs*			*Water Outputs*				Change in Storage	Excess Water	Wetland Volume
1963	**P**	**Si ***	**Gi**	**PET**	**So**	**Go**	**Infiltration**			
Jan-63	3.22	0.04	0.00	0.17	0.00	0.00	1.04	2.04	2.04	4.32
Feb-63	3.75	0.14	0.00	0.34	0.00	0.00	1.04	2.51	2.51	4.32
Mar-63	3.7	0.08	0.00	1.05	0.00	0.00	1.04	1.69	1.69	4.32
Apr-63	1.38	0.00	0.00	2.20	0.00	0.00	1.04	-1.86	0.00	2.46
May-63	3.24	0.47	0.00	3.62	0.00	0.00	1.04	-0.96	0.00	1.51
Jun-63	2.28	0.00	0.00	5.34	0.00	0.00	1.04	-4.10	0.00	0.00
Jul-63	2.56	0.08	0.00	6.10	0.00	0.00	1.04	-4.50	0.00	0.00
Aug-63	1.32	0.00	0.00	5.40	0.00	0.00	1.04	-5.12	0.00	0.00
Sep-63	4.35	1.39	0.00	3.89	0.00	0.00	1.04	0.81	0.00	0.81
Oct-63	0.46	0.00	0.00	1.99	0.00	0.00	1.04	-2.57	0.00	0.00
Nov-63	7.85	3.73	0.00	0.92	0.00	0.00	1.04	9.62	5.30	4.32
Dec-63	3.85	0.20	0.00	0.31	0.00	0.00	1.04	2.71	2.71	4.32
Annual Totals	**37.96**	6.12	0.00	31.32	0.00	0.00	12.48	0.28	14.25	

Avg. Year	*Water Inputs*			*Water Outputs*				Change in Storage	Excess Water	Wetland Volume
1973	**P**	**Si ***	**Gi**	**PET**	**So**	**Go**	**Infiltration**			
Jan-73	2.38	0.00	0.00	0.17	0.00	0.00	1.04	1.17	1.17	4.32
Feb-73	5.36	1.14	0.00	0.34	0.00	0.00	1.04	5.12	5.12	4.32
Mar-73	3.56	0.00	0.00	1.05	0.00	0.00	1.04	1.47	1.47	4.32
Apr-73	4.86	1.12	0.00	2.20	0.00	0.00	1.04	2.74	2.74	4.32
May-73	4.51	0.10	0.00	3.62	0.00	0.00	1.04	-0.05	0.00	4.27
Jun-73	8.57	5.10	0.00	5.34	0.00	0.00	1.04	7.29	7.25	4.32
Jul-73	3.06	0.09	0.00	6.10	0.00	0.00	1.04	-3.99	0.00	0.33
Aug-73	5.35	0.72	0.00	5.40	0.00	0.00	1.04	-0.37	0.00	0.00
Sep-73	2.47	0.09	0.00	3.89	0.00	0.00	1.04	-2.37	0.00	0.00
Oct-73	0.59	0.00	0.00	1.99	0.00	0.00	1.04	-2.44	0.00	0.00
Nov-73	0.74	0.00	0.00	0.92	0.00	0.00	1.04	-1.22	0.00	0.00
Dec-73	6.27	1.04	0.00	0.31	0.00	0.00	1.04	5.96	1.64	4.32
Annual Totals	**47.72**	9.40	0.00	31.32	0.00	0.00	12.48	13.32	19.39	

Wet Year	*Water Inputs*			*Water Outputs*				Change in Storage	Excess Water	Wetland Volume
1979	**P**	**Si ***	**Gi**	**PET**	**So**	**Go**	**Infiltration**			
Jan-79	6.35	1.73	0.00	0.17	0.00	0.00	1.04	6.87	6.11	4.32
Feb-79	4.31	0.53	0.00	0.34	0.00	0.00	1.04	3.46	3.46	4.32
Mar-79	3.47	0.13	0.00	1.05	0.00	0.00	1.04	1.52	1.52	4.32
Apr-79	5.33	1.19	0.00	2.20	0.00	0.00	1.04	3.29	3.29	4.32
May-79	5.42	0.26	0.00	3.62	0.00	0.00	1.04	1.02	1.02	4.32
Jun-79	6.19	3.61	0.00	5.34	0.00	0.00	1.04	3.42	3.42	4.32
Jul-79	3.45	0.08	0.00	6.10	0.00	0.00	1.04	-3.61	0.00	0.71
Aug-79	3.68	1.55	0.00	5.40	0.00	0.00	1.04	-1.21	0.00	0.00
Sep-79	7.48	1.96	0.00	3.89	0.00	0.00	1.04	4.51	0.19	4.32
Oct-79	3.72	0.16	0.00	1.99	0.00	0.00	1.04	0.85	0.85	4.32
Nov-79	6.76	2.03	0.00	0.92	0.00	0.00	1.04	6.84	6.84	4.32
Dec-79	0.58	0.00	0.00	0.31	0.00	0.00	1.04	-0.77	0.00	3.55
Annual Totals	**56.74**	13.24	0.00	31.32	0.00	0.00	12.48	26.18	26.68	

* Note: S_i is inches of runoff calculated for a 100.7-acre watershed contributing to a 35-acre site.


Daniels Farm Mitigation Site
Proposed Conditions Water Budget
Dry Year (1963) Hydrograph
Wetland Water Volume (inches)
5.00
4.50
4.00
3.50
3.00
2.50
2.00
1.50
1.00
0.50
0.00
Jan-63
Feb-63
Mar-63
Apr-63
May-63
Jun-63
Jul-63
Aug-63
Sep-63
Oct-63
Nov-63
Dec-63
Date (month - year)
Maximum Capacity = 4.32"
Soil Surface = 2.52"
COE Jurisdictional Boundary = 1.68" (12" below ground surface)
GROWING SEASON - March 20th to November 11th


Daniels Farm Mitigation Site
Proposed Conditions Water Budget
Average Year (1973) Hydrograph
Wetland Water Volume (inches)
5.00
4.50
4.00
3.50
3.00
2.50
2.00
1.50
1.00
0.50
0.00
Jan-73
Feb-73
Mar-73
Apr-73
May-73
Jun-73
Jul-73
Aug-73
Sep-73
Oct-73
Nov-73
Dec-73
Date (month - year)
Maximum Capacity = 4.32"
Soil Surface = 2.52"
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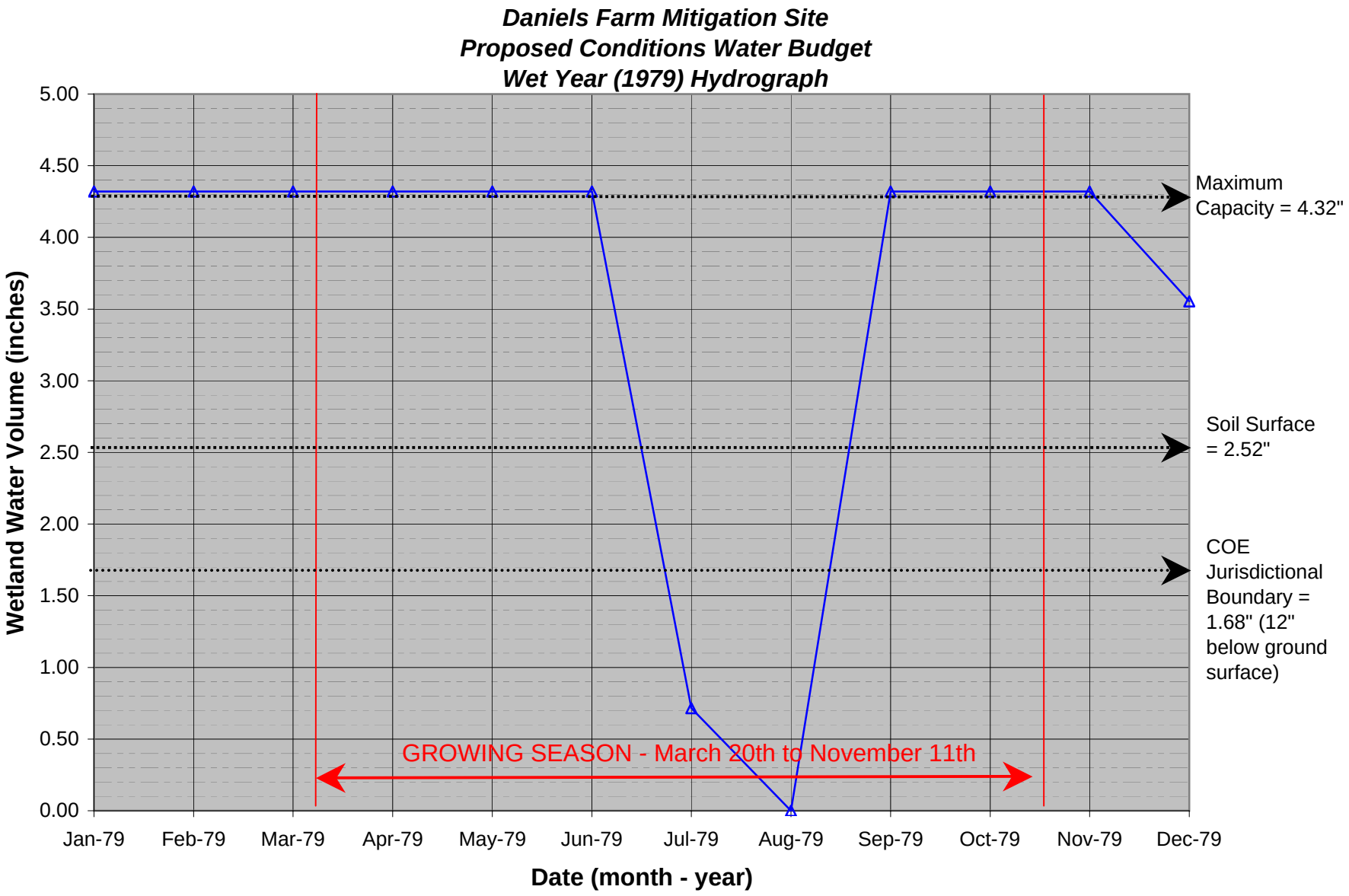
GROWING SEASON - March 20th to November 11th


Daniels Farm Mitigation Site
Proposed Conditions Water Budget
Wet Year (1979) Hydrograph
Wetland Water Volume (inches)
5.00
4.50
4.00
3.50
3.00
2.50
2.00
1.50
1.00
0.50
0.00
Jan-79
Feb-79
Mar-79
Apr-79
May-79
Jun-79
Jul-79
Aug-79
Sep-79
Oct-79
Nov-79
Dec-79
Date (month - year)
Maximum Capacity = 4.32"
Soil Surface = 2.52"
COE Jurisdictional Boundary = 1.68" (12" below ground surface)
GROWING SEASON - March 20th to November 11th

APPENDIX G

Permits

APPENDIX H

Plans

STATE	STATE CONSTRUCTION PROJECT NO.	SHEET NO.	TOTAL SHEETS
N.C.		1	5

SYM.	DESCRIPTION	DATE	APPROVED
A	ISSUED FOR PERMITS ONLY	08-06-03	

REVISIONS

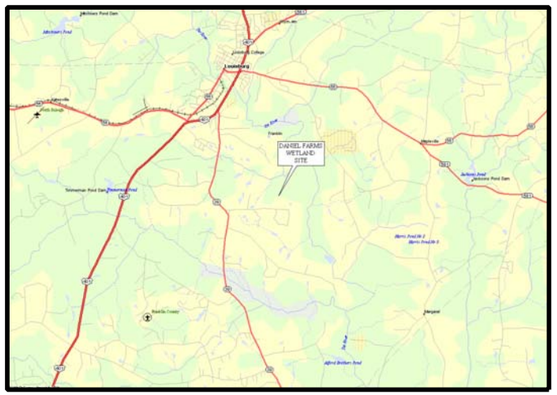
STATE OF NORTH CAROLINA

WETLANDS RESTORATION PROGRAM

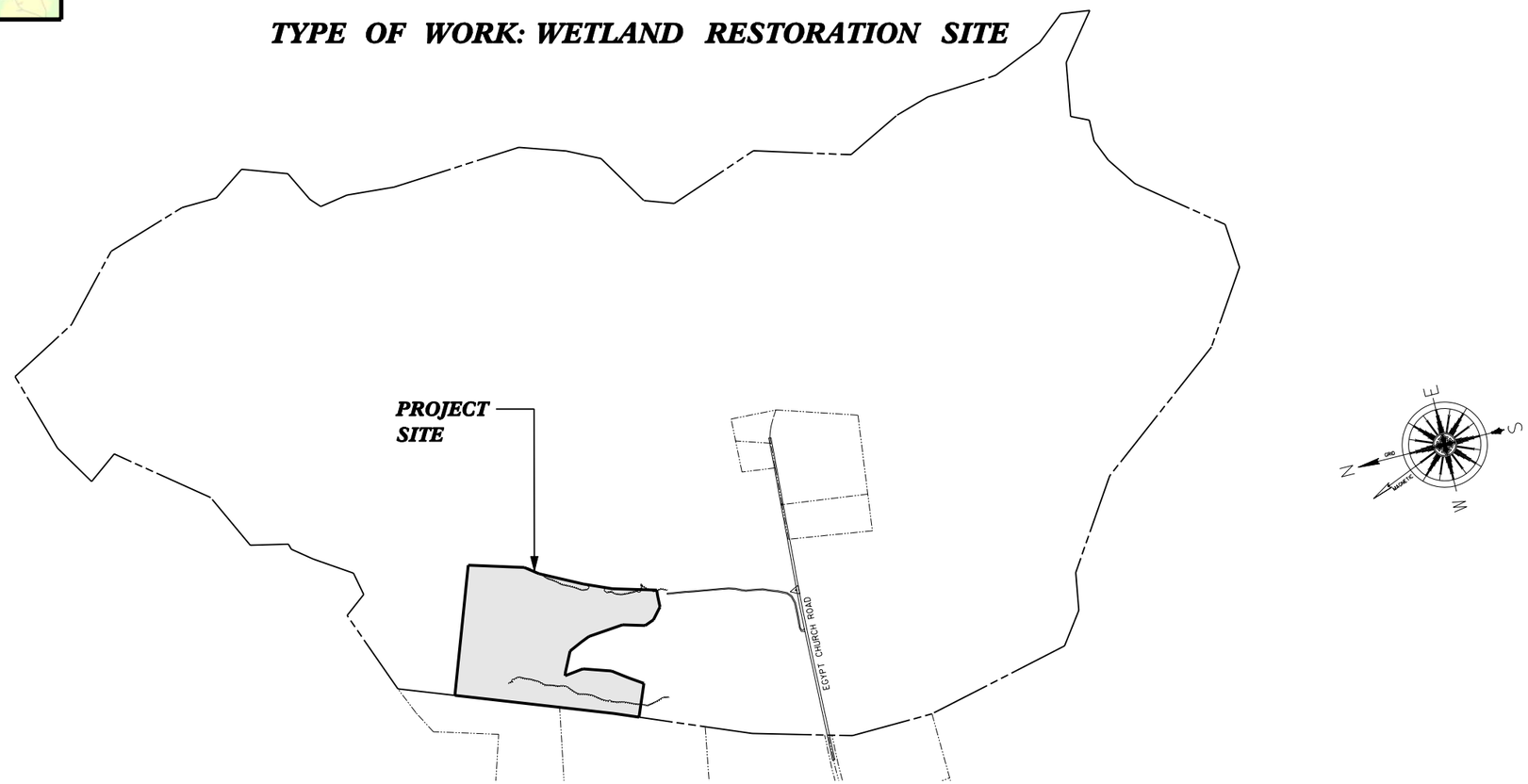
FRANKLIN COUNTY

LOCATION: DANIELS FARM
691 EGYPT CHURCH ROAD
LOUISBURG, NC 27549

TYPE OF WORK: WETLAND RESTORATION SITE



VICINITY MAP
NOT TO SCALE



INDEX OF SHEETS

CONTRACT #: AW03005

GRAPHIC SCALES

–30 –15 0 30 60

PLANS

Prepared In the Office of:

KCI Associates
of North Carolina, P.A.
SUITE 220 LANDMARK CENTER II, 4601 SIX FORKS RD., RALEIGH NC
ENGINEERS • PLANNERS • ECOLOGISTS

JAMES W. BLAKE, PE
PROJECT ENGINEER

JOSEPH J. PFEIFFER, PWS
PROFESSIONAL WETLAND SCIENTIST

STEVEN F. STOKES, LSS
SOIL SCIENTIST

PROJECT ENGINEER:

P.E.
SIGNATURE:

PROFESSIONAL WETLAND SCIENTIST:

P.W.S.
SIGNATURE:

SOIL SCIENTIST:

L.S.S.
SIGNATURE:

GENERAL PLAN LEGEND

- EXISTING PROPERTY LINE
- EXISTING 5' CONTOUR LINES
- EXISTING 1' CONTOUR LINES
- EXISTING DRAINAGE DITCH
- FENCE LINE
- TREE LINE
- WDT WATER DIVERSION TERRACE
- DITCH PLUG
- EXISTING DITCH TO BE FILLED
- PROPOSED CONTOUR LINES
- ROCK STABILIZED DITCH PLUG
- WATER DIVERSION BERM
- SURVEY CONTROL POINT

CONTRACT NO.	SHEET NO.
AW03005	2 OF 5

PROJECT ENGINEER:

WETLAND SCIENTIST:

SOIL SCIENTIST:

FENCE

108-00-020
N/F DANIELS & DANIELS FARMS INC
DEED BOOK 799, PAGE 163

WATER DIVERSION BERM
SEE SHEET 2 FOR DETAIL

ROCK STABILIZED DITCH PLUG
SEE SHEET 2 FOR DETAIL

WATER DIVERSION BERM
SEE SHEET 2 FOR DETAIL

TEMPORARY
STAGING
AREA

TBM#2
N=841506.73
E=2212560.96
ELEV.=201.26

PROPERTY LINE - CONSERVATION EASEMENT

DITCH PLUG,
SEE SHT. 2
FOR DETAIL

TBM#1
N=842929.80
E=2212446.31
ELEV.=187.94

DITCH
PLUG

TYP. WATER
DIVERSION
TERRACE
SEE SHT. 2
FOR DETAIL

DITCH PLUG

DITCH
PLUG

TYP. WATER
DIVERSION
TERRACE
SEE SHT. 2
FOR DETAIL

DITCH
PLUG

DITCH
PLUG

DITCH PLUG

FENCE

FENCE

I07-00-106
N/F LUCILLE ROMERO
DEED BOOK 781, PAGE 222

I07-00-107C
N/F IRENE W LUCAS
DEED BOOK 1090, PAGE 420

0 60 120

SCALE IN FEET
(FULL SIZE SHEET)

KCI Associates of North Carolina, P.A.
SUITE 220, LANDMARK CENTER II, 4601 SIX FORKS RD.
RALEIGH, NC 27609-5210
•ENGINEERS • PLANNERS • ECOLOGISTS

DANIELS FARM
WETLAND RESTORATION SITE

GRADING PLAN

631 EGYPT CHURCH ROAD
LOUISBURG, FRANKLIN COUNTY, NC 27549

DATE: AUG. 15, 2003
SCALE: AS SHOWN
KCI JOB#: 120301 2

GENERAL PLAN LEGEND

- EXISTING PROPERTY LINE
- EXISTING 5' CONTOUR LINES
- EXISTING 1' CONTOUR LINES
- EXISTING DRAINAGE DITCH
- FENCE LINE
- TREE LINE
- WDT — WATER DIVERSION TERRACE
- DITCH PLUG
- EXISTING DITCH TO BE FILLED
- PROPOSED CONTOUR LINES
- ROCK STABILIZED DITCH PLUG
- WATER DIVERSION BERM

SEDIMENT AND EROSION LEGEND

- UNPAVED ACCESS/HAUL ROAD
- SURVEY CONTROL POINT
- UNDISTURBED AREA
- TEMPORARY SILT FENCE (STD#:1633.01)
- TEMP. ROCK SILT CHECK TYPE-A (STD#:1605.01)
- LOD — LIMITS OF DISTURBANCE

CONTRACT NO.	SHEET NO.
AW03005	3 OF 5

PROJECT ENGINEER:

WETLAND SCIENTIST:

SOIL SCIENTIST:

FENCE

WATER DIVERSION BERM
SEE SHEET 2 FOR DETAIL

ROCK STABILIZED DITCH PLUG
SEE SHEET 2 FOR DETAIL

I08-00-020
N/F DANIELS & DANIELS FARMS INC
DEED BOOK 799, PAGE 163

TEMPORARY ROCK SILT
CHECK TYPE-A

WATER DIVERSION BERM
SEE SHEET 2 FOR DETAIL

TEMPORARY
STAGING
AREA

ACCESS/HAUL ROAD

TBM#2
N=841506.73
E=2212580.98
ELEV.=201.26

SITE DRAINAGE

PROPERTY LINE - CONSERVATION EASEMENT

DITCH PLUG,
SEE SHT. 2
FOR DETAIL

SITE DRAINAGE

PROPERTY LINE - CONSERVATION EASEMENT

FENCE

AREA TABLE

	SQ. FT.	ACRES
ENTIRE PROPERTY	1,477,823	33.93
LIMITS OF DISTURBANCE	581,522	13.35

CONSTRUCTION SEQUENCE

1. WATER DIVERSION BERMS AND ROCK STABILIZED DITCH PLUG.
2. WATER DIVERSION BERM AT ROCK SILT CHECK TYPE-A.
3. WATER DIVERSION TERRACES, GRADE TIE-INS AND FILL IN AGRICULTURAL AREAS.
4. WATER DIVERSION TERRACES, GRADE TIE-INS IN WOODED AREAS.
5. INSTALL DITCH PLUGS AND FILL DITCH.

UNDISTURBED

SITE DRAINAGE

TBM#1
N=842929.80
E=2212446.31
ELEV.=187.94

DITCH
PLUG

SITE DRAINAGE

SITE DRAINAGE

DITCH PLUG

DITCH
PLUG

SITE DRAINAGE

DITCH
PLUG

DITCH PLUG

DITCH
PLUG

I07-00-106
N/F LUCILLE ROMERO
DEED BOOK 781, PAGE 222

FENCE

I07-00-107C
N/F IRENE W LUCAS
DEED BOOK 1090, PAGE 420

0 60 120

SCALE IN FEET
(FULL SIZE SHEET)

KCI Associates of North Carolina, P.A.
SUITE 220, LANDMARK CENTER II, 4601 SIX FORKS RD.
RALEIGH, NC 27609-5210
•ENGINEERS • PLANNERS • ECOLOGISTS

DANIELS FARM
WETLAND RESTORATION SITE

SEDIMENTATION AND EROSION PLAN

691 EGYPT CHURCH ROAD
LOUISBURG, FRANKLIN COUNTY, NC 27549

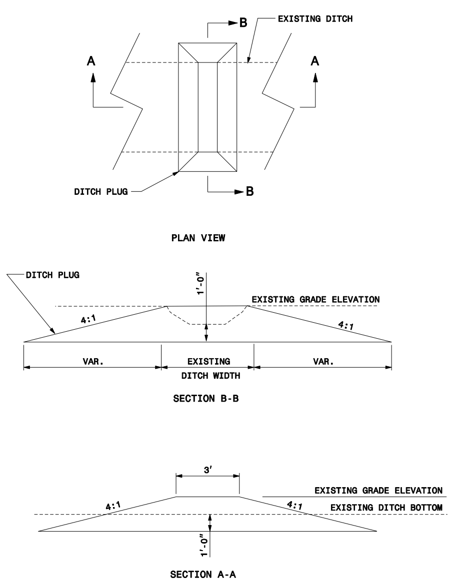
DATE: AUG. 15, 2003
SCALE: AS SHOWN
KCI JOB#: 12030.12

CONTRACT NO.	SHEET NO.
AW03005	4 OF 5

PROJECT ENGINEER:

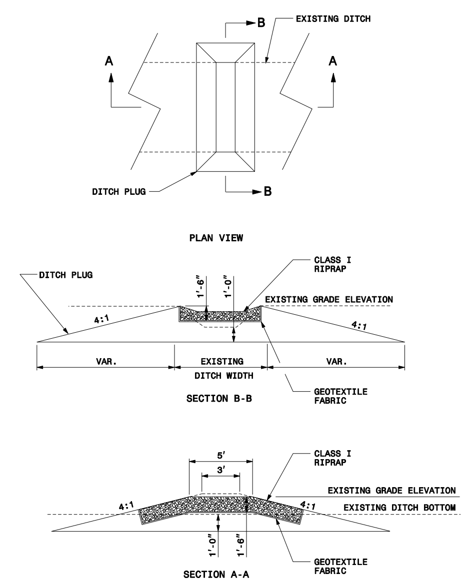
WETLAND SCIENTIST:

SOIL SCIENTIST:



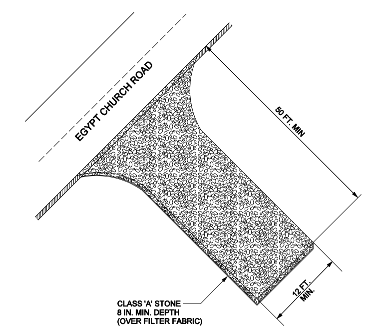
DITCH PLUG DETAIL

NOTES:
SEE PLAN SHEETS FOR LOCATIONS OF DITCH PLUGS.
SEE PROJECT SPECIAL PROVISONS FOR MATERIAL SPECIFICATIONS.



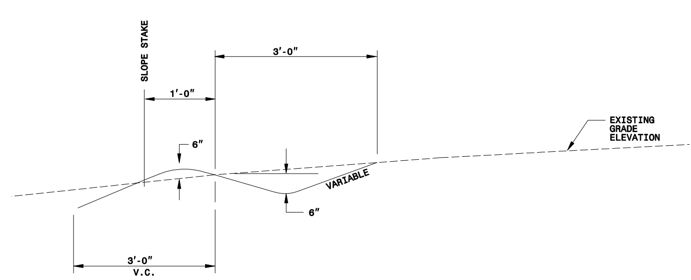
ROCK STABILIZED DITCH PLUG DETAIL

NOTES:
SEE PLAN SHEETS FOR LOCATIONS OF DITCH PLUGS.
SEE PROJECT SPECIAL PROVISONS FOR MATERIAL SPECIFICATIONS.

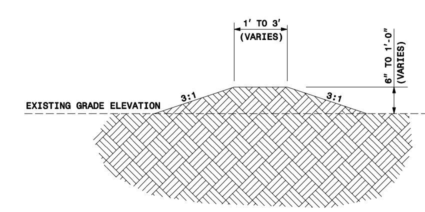


STABILIZED CONSTRUCTION ENTRANCE (SCE)
SCALE: NTS

NOTES:
1. TURNING RADIUS SUFFICIENT TO ACCOMODATE LARGE TRUCKS SHALL BE PROVIDED.
2. ENTRANCE(S) SHOULD BE LOCATED TO PROVIDE FOR UTILIZATION BY ALL CONSTRUCTION VEHICLES.
3. MUST BE MAINTAINED IN A CONDITION WHICH WILL PREVENT TRACKING OR DIRECT FLOW OF MUD ONTO STREETS. PERIODIC TOPDRESSING WITH STONE WILL BE NECESSARY.
4. ANY MATERIAL TRACKED ONTO THE ROADWAY MUST BE CLEANED UP IMMEDIATELY.
5. GRAVEL CONSTRUCTION ENTRANCE SHALL BE LOCATED AT ALL POINTS OF INGRESS AND EGRESS UNTIL SITE IS STABILIZED. FREQUENT CHECKS OF THE DEVICE AND TIMELY MAINTENANCE MUST BE PROVIDED.



WATER DIVERSION DETAIL



WATER DIVERSION BERM DETAIL

DANIELS FARM
WETLAND RESTORATION SITE

DETAILS

691 EGYPT CHURCH ROAD
LOUISBURG, FRANKLIN COUNTY, NC 27549

DATE:	SCALE:	KCI JOB#:
AUG. 15, 2003	AS SHOWN	12030 12

KCI Associates of North Carolina, P.A.
SUITE 220, LANDMARK CENTER II, 4601 SIX FORKS RD.
RALEIGH, NC 27609-5210
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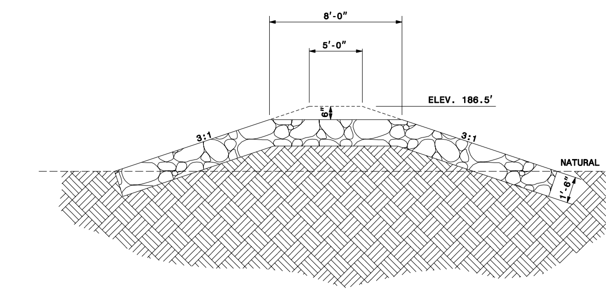
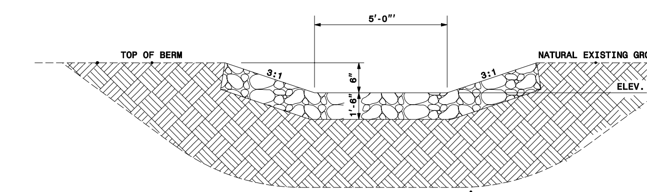
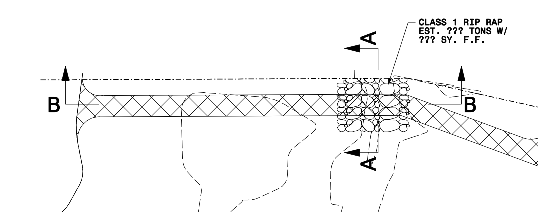


WATER BLOCK DETAIL SECTION A-A



WATER BLOCK DETAIL SECTION B-B



BERM WEIR PLAN VIEW

CONTRACT NO.	SHEET NO.
AW03005	5 OF 5
PROJECT ENGINEER:	WETLAND SCIENTIST:
	SOIL SCIENTIST:

SEQUENCE OF CONSTRUCTION:

CONSTRUCTION SEQUENCE
The Contractor is responsible for following the sequence of construction in accordance with the plans and the following provisions, as directed by the Site Supervisor. In general, site construction involves establishing appropriate ground surface elevations
to restore wetlands on the property. The Contractor should take note that the proposed grading as shown on the plans may result in saturated ground conditions depending on weather patterns preceding and during construction. These ground conditionS may make vehicular access and earthwork difficult. Construction shall proceed in the above mentioned manner unless otherwise directed or approved by the Site Supervisor.

It is the intent of this contract that -
1. All project operations will comply with the provided Erosion and Sedimentation Control Plan.

The following provisions, along with the instructions contained in the plans, constitute the sequence of construction:

I. Initial Site Preparation
1. Install 3 - 4' wooden stakes at various intervals and high visibility safety tape as deemed necessary by KCI, to isolate project site and identify project boundary, construction/grading limits, temporary staging areas, stabilized entrances, and access roads.
2. Construct stabilized construction entrance and temporary staging area.
3. Install silt fence for stabilized construction entrances and temporary staging area as indicated in the plans.
4. Install all sediment/erosion control devices in accordance with the plans and as directed by the Site Supervisor.

II. Construct Sequence 1 - Water Diversion Berm and Rock Stabilized Ditch Plug Construction
1. Conduct grading for water diversion berm construction as needed in those areas in which surface preparation and/or grade tie-ins will be accomplished.
2. Install water diversion berm starting from opposite ends and work toward the rock stabilized ditch plug section. Stabilize the water diversion berm with seed and mulch and install silt fencing around the newly constructed area.
3. Within a 24- hour period the water diversion berm and rock stabilized ditch plug construction shall be completed, seeded, mulched and stabilized.

III. Construct Sequence 2 - Water Diversion Berm and Temporary Rock Silt Check Type-A
1. Construct grading for water diversion berm construction as needed in those areas in which surface preparation and/or grade tie-ins will be accomplished.
2. Install water diversion berm starting from the north end and work to the south. Stabilize the berm and install silt fencing around the newly constructed area.
3. Install the Rock Silt Check Type-A at the lowest point along the berm.
4. Within a 24- hour period the water diversion berm and Rock Silt Check Type-A construction shall be completed, seeded, mulched and stabilized.

IV. Construct Sequence 3 - Water Diversion Terraces, Grade Tie-Ins and Fill Ditches in the Agricultural Areas
1. Conduct grading as needed in those areas in which surface preparation and/or grade tie-ins will be accomplished.
2. Fill farm ditches as indicated within this area from the existing spoil piles just inside the woods and from spoil spread in the field along the ditch edges.
3. Install ditch plugs as indicated in ditch bisecting site from west to east and in farm ditch adjacent to the woods that is oriented from south to north.
4. Construct water diversion terraces.
5. Grade site in accordance with proposed elevations. During this sequence, grading operations shall not disturb the ditch along the west property line. Grade site in such a manner so as to direct site runoff to the Water Diversion Berm and associated Rock Stabilized Ditch Plug constructed along the drainage to the east.

V. Construct Sequence 4 - Water Diversion Terraces and Grade Tie-Ins in the Wooded Area
1. Conduct grading as needed in those areas in which surface preparation and/or grade tie-ins will be accomplished.
2. Construct water diversion terraces
3. Grade site in accordance with proposed elevations.

VI. Construct Sequence 5 - Install Ditch Plugs and Fill Ditch
1. Install first ditch plug in ditch along western property line near the south end of the site to direct ditch flow into the agricultural areas.
2. Fill ditch along western property line starting at the first ditch plug and working downgradient with existing spoil along ditch. Construct remaining ditch plugs as you work filling the ditch.
3. Fine tune the grading of all water Diversion Terraces, Grade Tie-Ins and Ditches within this area in accordance with proposed elevations.

NOTES:

1. THE CONTRACTOR SHALL EXERCISE EVERY REASONABLE PRECAUTION THROUGHOUT THE CONSTRUCTION OF THE PROJECT TO PREVENT EROSION AND SILTATION. EROSION CONTROL MEASURES SHALL BE INSTALLED AND MAINTAINED IN ACCORDANCE WITH THE PROJECT PLANS AND SPECIAL PROVISIONS, NORTH CAROLINA SEDIMENT AND EROSION CONTROL GUIDE-LINES AND AS DIRECTED BY THE SITE SUPERVISOR.

2. ALL EXCAVATED MATERIAL SHALL BE STOCKPILED WITHIN THE LIMITS OF DISTURBANCE, THE CONTRACTOR SHALL STOCKPILE THE MATERIALS IN NEARBY LOCATIONS WHERE SUFFICIENT AREA DOES EXIST. THE CONTRACTOR IS RESPONSIBLE FOR INSTALLING APPROPRIATE STABILIZATION MEASURES AROUND THE STOCKPILE AREA(S) TO PREVENT EROSION AND SEDIMENTATION. ANY ADDITIONAL MEASURES NECESSARY TO CONTROL EROSION/SEDIMENTATION IN THESE AREAS WILL BE INCORPORATED AS DIRECTED BY THE SITE SUPERVISOR. ANY EXCESS MATERIAL REMAINING FOLLOWING THE BACKFILL OF THE EXISTING CHANNEL SHALL BE DISPOSED OF AT AN APPROVED LOCATION.

3. EACH SEDIMENT CONTROL DEVICE WILL BE REMOVED AFTER ALL WORK HAS BEEN COMPLETED AND THE AREAS HAVE BEEN STABILIZED.

4. THE CONSTRUCTION ENTRANCES AND STAGING AREAS IDENTIFIED ON THE PLANS PROVIDE THE ONLY ACCESS POINTS INTO THE LIMITS OF DISTURBANCE. NO ADDITIONAL ACCESS POINTS SHALL BE USED WITHOUT APPROVAL OF THE SITE SUPERVISOR.

SEEDING:

1. THE CONTRACTOR SHALL UTILIZE ATEMPORARY SEED MIX BROWN-TOP MILLET (40 LBS./AC) AND ANNUAL RYE (10 LBS./AC) IN SEEDING ALL DISTURBED AREAS.

2. THE CONTRACTOR SHALL UTILIZE THE SEED AND FERTILIZER MIX SPECIFIED IN THE PLANTING PLAN AND THE PROJECT SPECIAL PROVISIONS IN SEEDING ALL AREAS OF THE SITE.

3. FERTILIZER AND LIMESTONE SHALL BE APPLIED AT THE RATE OF 500 LBS./ACRE AND 0.0 LBS./ACRE, RESPECTIVELY (BASED ON SOIL TEST REPORT). FERTILIZER SHALL BE 10-10-10 ANALYSIS. UPON WRITTEN APPROVAL OF THE SITE SUPERVISOR, A DIFFERENT ANALYSIS OF FERTILIZER MAY BE USED PROVIDED THE 1-1-1 RATIO IS MAINTAINED AND THE RATE OF APPLICATION ADJUSTED TO PROVIDE THE SAME AMOUNT OF PLANT FOOD AS A 10-10-10 ANALYSIS.

4. SEED IS TO BE SOWN BY MECHANICAL MEANS AND IS TO BE EVENLY DISTRIBUTED AND SHOULD NOT BE BROADCAST WHEN WIND VELOCITY EXCEEDS 5 MPH.

5. SEEDED AREAS ARE TO BE PROTECTED BY SPREADING STRAW MULCH UNIFORMLY TO FORM A CONTINUOUS BLANKET OVER THE SEEDED AREA.

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DANIELS FARM
WETLAND RESTORATION SITE

GENERAL NOTES

691 EGYPT CHURCH ROAD
LOUISBURG, FRANKLIN COUNTY, NC 27549

DATE: AUG. 15, 2003
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KCI JOB#: 120302