Coastal ENGINEERING & SURVEYING, INC.

Coinjock Meadows

Phase II

Stormwater Narrative

Coastal Engineering & Surveying

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Introduction

This narrative presents the proposed stormwater plan for Coinjock Meadows Phase II, involving the development of a 14.79-acre residual parcel located directly east of the existing Coinjock Meadows Phase I subdivision, east of Worth Guard Road (SR 1143), in Coinjock, Currituck County, North Carolina.

This above mentioned, residual parcel is identified in the recorded plat "P.C. K, SL. 182." for Coinjock Meadows Phase I (dated February 27, 2008). Presently, it includes the development of eight (8) single-family residential lots with the continuation of the 20-foot-wide Olive Branch Lane roadway, sidewalks, and associated drainage infrastructure. There is a future reserve for the development of six (6) duplex units.

This report includes the downstream capacity evaluation required for the Major Alternative Stormwater Runoff Storage Analysis for both pre-development and post-development conditions. The analysis demonstrates that the proposed stormwater improvements will not increase downstream water surface elevations by more than 0.01 feet (1/8 inch) when compared to existing conditions, thereby meeting the County's hydraulic performance requirements.

The hydrologic and hydraulic analyses for this project were performed using HEC-HMS 4.12 and HEC-RAS 6.7 (Beta 4a), which were used to model watershed response, channel and pipes conveyance, and downstream hydraulic performance.

As part of the downstream evaluation, six professionally surveyed cross sections were obtained along the Coinjock Ditch Canal at 100-foot spacing, and water surface elevations were collected to inform the HEC-RAS boundary conditions and model calibration.

For both existing and proposed conditions, the hydrologic analysis followed the NRCS Curve Number (CN) Method. Soil characteristics were obtained from the USDA NRCS Web Soil Survey (Appendix A), the site is primarily underlain by soils classified as Hydrologic Soil Groups C and D, with minor portions of Group A along the western boundary. Curve Numbers were assigned using the land cover classifications and values provided in Table 2-6 of the Currituck County Stormwater Manual, consistent with County stormwater design requirements.

Rainfall intensities and design storm values used in this analysis were obtained from NOAA Atlas 14 for the project location in Currituck County, North Carolina (Appendix B). The time of concentration (tc) for each watershed on each condition was determined using the NRCS TR-55 methodology, based on flow path characteristics, slope, and surface roughness for each watershed.

Existing Site Conditions

- Overall Information

Presently, the 14.79-acre site is currently a mix of agricultural land and undeveloped woodland. Ground slopes range between 1% and 3%, generally draining toward the east.

A system of existing agricultural ditches conveys runoff southward and then eastward toward the off-site Coinjock Ditch Canal, which becomes the Coinjock Canal and ultimately discharges to the Intracoastal Waterway. The Coinjock Canal provides hydraulic connectivity between the Currituck Sound to the east and the North River–Pasquotank River Basin to the west.

The Coinjock Ditch Canal was inspected and verified by Atlantic Environmental Consultants, LLC, as documented in the attached Blue Line Ditch Determination Letter (Appendix C). This letter certifies that the canal provides direct hydrologic connectivity to the Intracoastal Waterway. Field inspections confirmed that the existing agricultural ditches on site are functional and did not retain standing water at the time of survey.

The northeastern portion of the site consists of a low-lying wooded area that will remain undisturbed. This area is designated as Drainage Area 1 and consists of 5.08 acres, as indicated in the Existing Conditions Plan.

The southwestern corner of the site, identified as Drainage Area 4 (0.13 acres) on the Existing Conditions Plan, currently serves as a drainage conveyance area for stormwater runoff generated from Phase I, specifically from Lots 12 and 13, to the existing Phase I stormwater pond. Both this drainage area and the pond were originally designed and approved under the Phase I stormwater management plan to attenuate peak flows prior to discharge.

The proposed Phase II improvements will not modify Drainage Area 4, the existing swale system, or the pond, thereby maintaining the integrity and function of the Phase I stormwater infrastructure.

No existing erosion or sedimentation issues have been observed on-site or within the existing agricultural ditch system. All development will occur within the agricultural portion of the property, outside of the existing wooded areas, which will remain protected by erosion control measures.

- Hydrologic Evaluation

The site was evaluated under existing conditions by delineating the drainage areas and identifying their hydrologic and morphologic characteristics based on site topography and existing features. The delineated drainage areas are shown on the Existing Conditions Plan, and the following Table 1 summarizes the existing drainage areas and the hydrologic parameters used for determining runoff and peak discharge on each determined watershed.

Watershed	A(mi2)	CN w	tc (TR-55)	Lag Time (min)
PreDA1	0.0079	84	7.80	4.6776
PreDA2a	0.0032	51	8.70	5.2210
PreDA2b	0.0045	79	9.36	5.6150
PreDA2c	0.0052	84	14.05	8.4280
PreDA3	0.0021	83	6.37	3.8221

Table 1. Existing Conditions Watershed Characteristics

These drainage areas and parameters were then incorporated into a HEC-HMS model using the NRCS Curve Number methodology and SCS Type III storm distribution, in accordance with Section 2.4.3 of the Currituck County Stormwater Design Manual. The model also incorporated the rainfall data obtained from NOAA Atlas 14, as previously described.

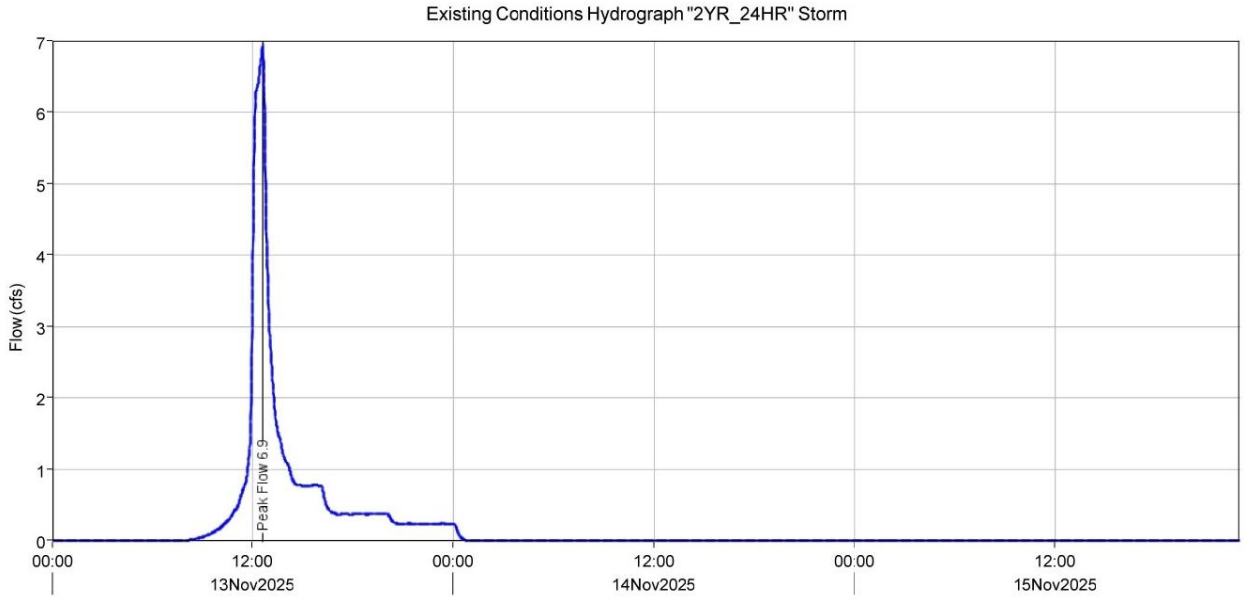


Figure 1. HEC-HMS Computed Hydrograph for the 2-Year, 24-Hour Storm – Existing Conditions

Figure 1 presents the resulting hydrograph for the 2-year, 24-hour storm event at "Out2", the discharge location where drainage areas Pre-DA2A, Pre-DA2B, and Pre-DA2C converge.

These areas are conveyed through the existing agricultural ditch system and ultimately drain toward the Coinjock Ditch Canal. The peak flow at "Out2" represents the combined runoff from the three drainage areas and corresponds to the inflow entering the Coinjock Ditch Canal under existing conditions.

"Out2" also represents the planned downstream discharge location for the proposed conditions; therefore, the peak flow value obtained at this point establishes the baseline condition for comparison against the post-development scenario. It is important to note that, this approach is consistent with the Currituck County requirements for Major Stormwater Alternative Storage and Downstream Capacity Analysis, which require evaluating downstream conveyance and water surface elevations for both existing and proposed conditions.

- Hydraulic Modeling

The hydrographs generated in HEC-HMS for each delineated watershed under existing conditions were used as inflow boundary conditions in a 2D hydraulic model developed in HEC-RAS. The objective of this model was to simulate water surface depths resulting from the peak flows at each watershed outlet.

The site geometry was imported into HEC-RAS 2D as an irregular finite-element mesh. A base computational grid with 10-ft by 10-ft cells was applied across the site, with a refined 7-ft by 7-ft mesh along the existing ditches and swale areas to improve hydraulic resolution. Surface roughness was assigned using Manning's Coefficients based on land cover, utilizing a previously developed land-use shapefile. Typical roughness values included 0.035 for grass areas, 0.070 for dense vegetation, and 0.015 for impervious surfaces.

Initial conditions were defined as a dry starting condition across the domain, consistent with field observations confirming no standing water in the existing agricultural ditches at the time of the most recent survey. The HEC-HMS hydrographs were assigned as inflow boundary conditions at the upstream ends of the ditch system, while downstream boundary conditions were specified using observed water surface elevations at the Coinjock Ditch Canal. Field survey identified a water surface elevation of 0.16 feet at the upstream point of the canal and -0.14 feet approximately 500 feet downstream. These values were used to establish the downstream hydraulic control for the 2-year and 10-year flow simulations.

This modeling approach allows the simulation to account for topographic variability, land cover differences, and channel conveyance characteristics when determining hydraulic performance and depth of flow under peak storm events.

With all required parameters defined, the hydraulic model was processed using an unsteady flow solution scheme. The results obtained from the HEC-RAS simulation are presented in the following Figure 3, showing the computed water surface elevations and channel response for existing conditions.

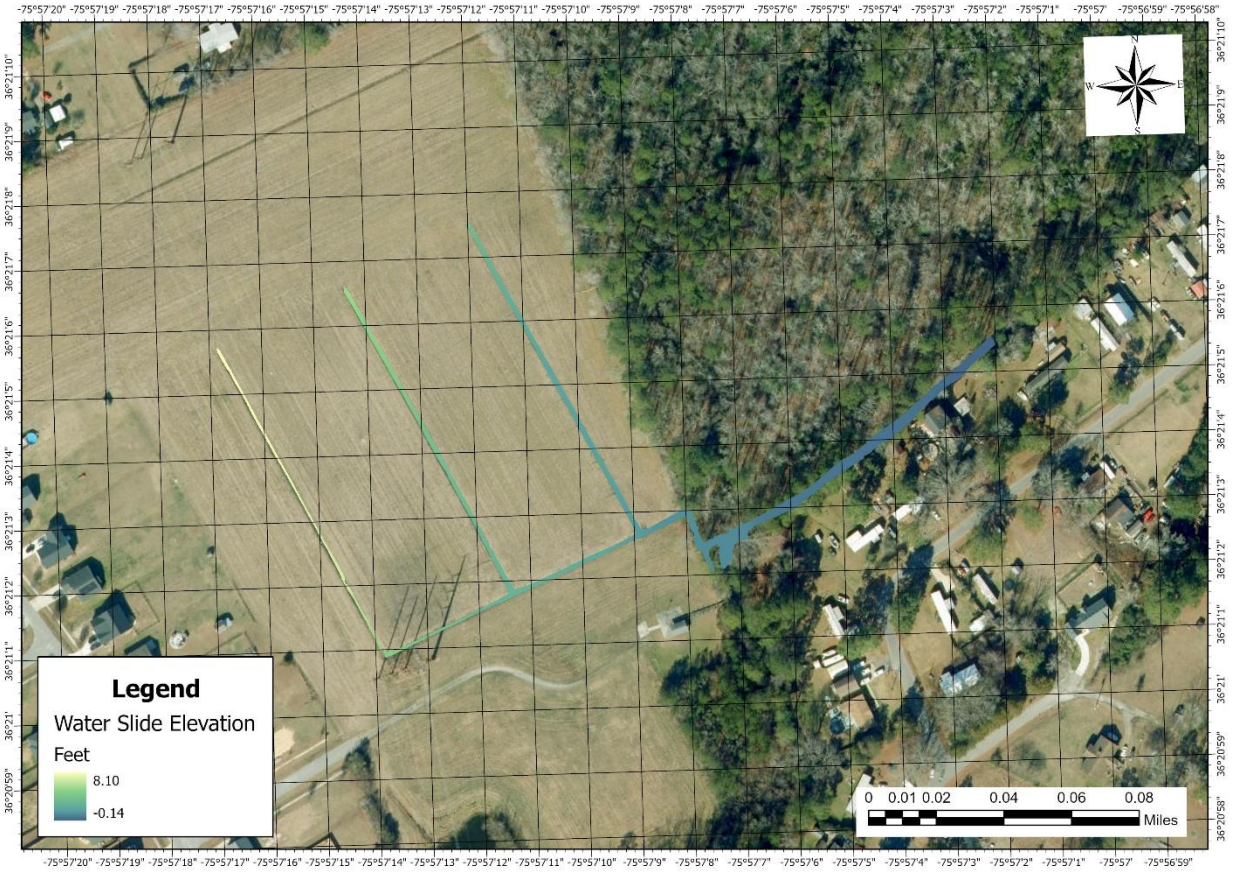


Figure 2. HEC-RAS 2D Results – Existing Conditions Water Surface Elevation.

The figure above shows that, under the current conditions of the proposed development area, the water slide elevation in the ditches range from -0.14 to 8.10 feet above the sea level for the 2-year flow simulation. This condition serves as the basis for comparison with the proposed drainage design for the area, which should not increase by more than 0.01 feet.

Proposed Stormwater Plan

- Low Density BUA Calculations:

The overall development complies with Currituck County's low-density requirement, as the total impervious/covered area for the Phase II parcel (644,440 sf) does not exceed the allowable 24% Built-Upon Area (154,666 sf). The proposed BUA for the residential lots is summarized in Table 2 below.

	Total Area (sf)	30% BUA (sf)
Lot 29	21,039	6,312
Lot 30	21,179	6,354
Lot 31	20,198	6,059
Lot 32	29,850	8,955
Lot 33	28,033	8,410
Lot 34	28,431	8,529
Lot 35	32,141	9,642
Lot 36	25,207	7,562
TOTAL	206,078	61,823

Table 2. Proposed BUA for residential lots of Phase II. Coinjock Meadows

The total proposed coverage for Phase II is further summarized as follows:

- Total coverage proposed for lots: 61,823 sf
- Asphalt Roadway (Olive Branch Lane): 23,859 sf
- Concrete Walkway: 6,530 sf
- Asphalt Access to Open Space: 2,256 sf
- Driveways (12' wide x 5' long x 8 lots) within r/w: 480 sf

TOTAL 94,948 sf or 14.73%

Total proposed impervious area for Phase II: 94,948 square feet, or 14.73% of the project area. By satisfying the County's low-density criteria, the proposed development inherently complies with the applicable State stormwater performance requirements for low-density projects.

A designated area within the project limits has been reserved for a future Phase III development, which includes a pre-approved multifamily area consisting of six (6) duplex buildings for a total of twelve (12) residential units, as identified in the recorded plat "P.C. K, Sl. 182" for Coinjock Meadows Phase I. This area, shown on the Overall Plan, encompasses 77,338.69 square feet (1.78 acres). For planning purposes, a conceptual development

intensity of 30% built-upon area was evaluated, resulting in a projected impervious coverage of 18.33%. This remains below the 24% maximum built-upon threshold for Low Density development, demonstrating compliance with the Currituck County Unified Development Ordinance.

Including this reserved area, the project provides a total of 7.74 acres of Open Space, representing 52.32% of the overall parcel, thereby exceeding Currituck County open space requirements.

- Stormwater Collection, Treatment, Storage, and Disposal

Stormwater runoff generated from the proposed development will be conveyed through a system of vegetated swales that run along both sides of the roadway and across selected near or on property lines, as shown in the Stormwater Plan.

Roadside and cul-de-sac swales consist of triangular channels with a maximum depth of 2.5 feet, side slopes of 2:1, and a maximum width of approximately 10 ft. Swales that cross or run along property boundaries consist of triangular channels with a minimum depth of 1 ft, 6:1 side slopes, and a maximum width of approximately 12 ft. This configuration maintains shallow flow and provides distributed conveyance consistent with the site's natural drainage patterns.

ADS plastic circular pipes crossings are proposed only where roadway drainage continuity is needed. Due to the low-lying nature of the site, a set of two parallel 18-inch HP pipes is proposed at Stations 3+65 and 6+15 along Olive Branch Lane. A minimum separation of 18 inches between the outer diameters of the pipes will be maintained. Final pipe lengths will be determined based on roadway width. Detailed pipe specifications, dimensions, and locations are provided in the Stormwater Plan.

All runoff will drain to the existing ditch system located along the eastern boundary of the site, consistent with the pre-development agricultural drainage network "Out2". This ditch system ultimately discharges to the Coinjock Ditch (Canal), as previously referenced, which flows to the Intracoastal Waterway.

The swale network has been designed to provide stable flow velocities and positive drainage, while rip-rap energy dissipation pads will be installed at discharge points to minimize erosion. No stormwater from Phase II will be routed through or connected to the Phase I system, and vice versa. The proposed layout preserves existing flow directions and ensures that post-development runoff is safely conveyed to the established outfall without adverse impacts to adjacent properties or downstream systems.

- Hydrologic Evaluation

For proposed conditions, the drainage areas were updated to reflect the planned site layout. As shown in the Stormwater Plan, a post-development drainage area map was prepared to delineate the contributing sub-basins within the project site. The site is divided into 12 drainage areas, each defined based on surface topography, proposed roadway layout, stormwater features, and lot configuration. The hydrologic parameters for the proposed drainage areas were determined based on the proposed grading plan and typical lot development assumptions for the subdivision.

These parameters were incorporated into a HEC-HMS model using the same methodology applied for the existing conditions analysis to ensure a consistent comparison of peak discharge rates. Table 3 summarizes the proposed drainage areas and the parameters used to determine peak discharge under post-development conditions.

Watershed	A(mi2)	CN w	Tc (TR-55) (min)	Lag Time (min)
PostDA-1	0.0064	84	6.46	3.8755
PostDA-2a	0.0044	58	8.80	5.2797
PostDA-2b-a	0.0029	83	85.38	51.2274
PostDA-2b-b	0.0020	83	206.21	123.7249
PostDA-2c-a	0.0009	63	190.50	114.3004
PostDA-2c-b	0.0003	92	217.93	130.7598
PostDA-2c-c	0.0003	90	419.67	251.8025
PostDA-2d-a	0.0012	86	6761.70	4057.0217
PostDA-2d-b	0.0011	88	225.69	135.4153
PostDA-2d-c	0.0008	88	7.04	4.2260
PostDA-3	0.0027	85	842.98	505.7859

Table 3. Proposed Watershed Characteristics

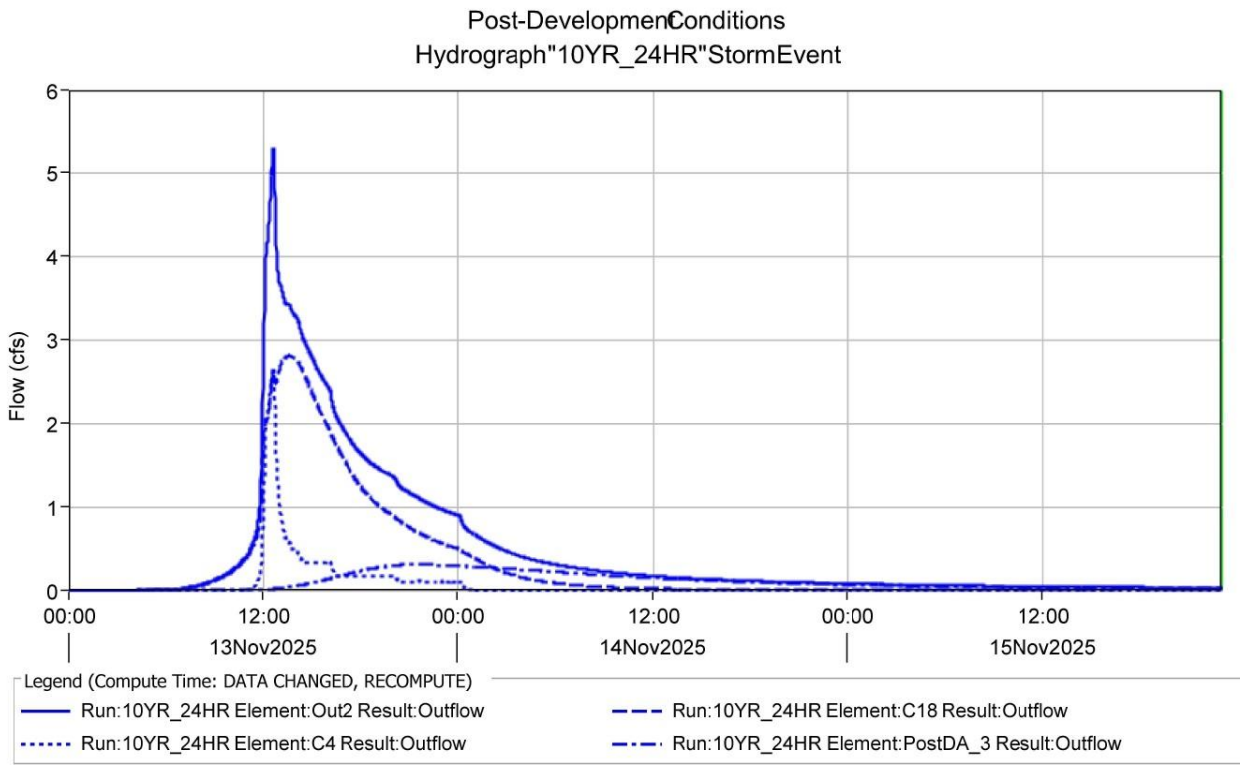


Figure 3. HEC-HMS Computed Hydrograph for the 10-Year. 24-Hour-Storm-Event: Post-Development

Figure 3 presents the resulting hydrograph for the 10-year, 24-hour storm event under post-development conditions. The hydrograph shows the peak discharge at "Out2", which represents the combined discharge location for the contributing drainage areas Post-DA2A, Post-DA2B, Post-DA2C, and Post-DA3 under proposed conditions. The peak flow at "Out2 increases relative to existing conditions due to the additional contributing drainage area (Post-DA3). However, the routing of flows through the proposed ditch and swale system results in a more attenuated response at C18, where a lower and broader peak hydrograph is observed. This attenuation reflects the additional conveyance distance and storage effects along the channel network, reducing flow velocity and peak discharge at the downstream location.

- Hydraulic Modeling

The post-development hydraulic analysis followed the same methodology applied under existing conditions. The hydrographs generated in HEC-HMS for the post-development watersheds were used as inflow boundary conditions in HEC-RAS, and the model was

updated to incorporate the proposed grading, roadway layout, stormwater swales, culverts, and revised land use. The same model domain, mesh resolution, Manning's roughness assignments, and downstream boundary conditions were maintained to ensure consistency with the existing conditions simulation.

All hydraulic elements and boundary conditions were applied using the same unsteady flow solution scheme used in the existing conditions analysis. The following figure presents the water surface elevations and channel response resulting from the post-development peak flows.

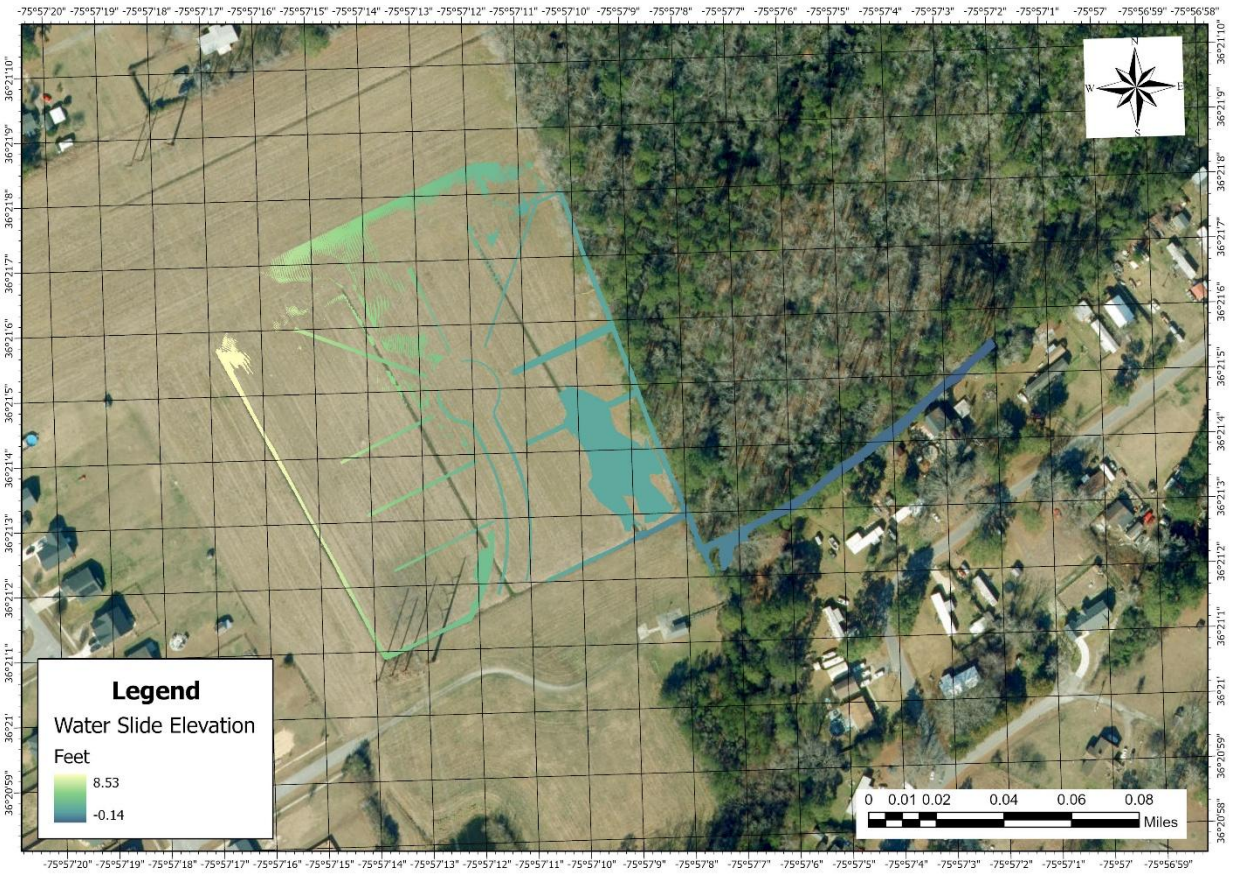


Figure 4. HEC-RAS 2D Results – Post-Development Conditions Water Surface Elevation.

The figure above shows that, under the proposed conditions of the development area, the water slide elevation in the ditches range from -0.14 to 8.53 feet above sea level for the 10-year flow simulation. Under this condition, the water slide elevation in the Coinjock Ditch (Canal) decreases by approximately 0.01 feet as shown in Figure 5, complying with the established requirement Currituck County Stormwater Manual, by not increasing the water depth by 0.01 feet.

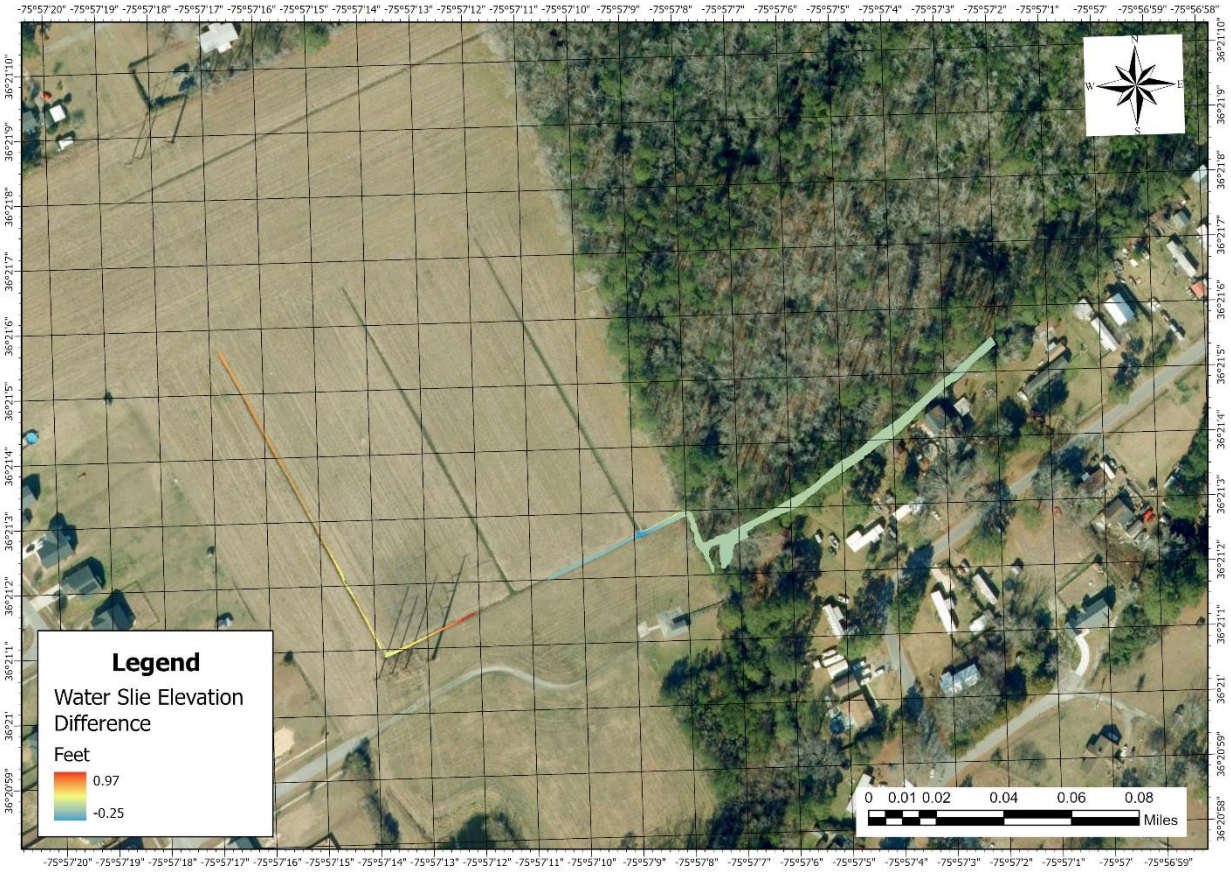


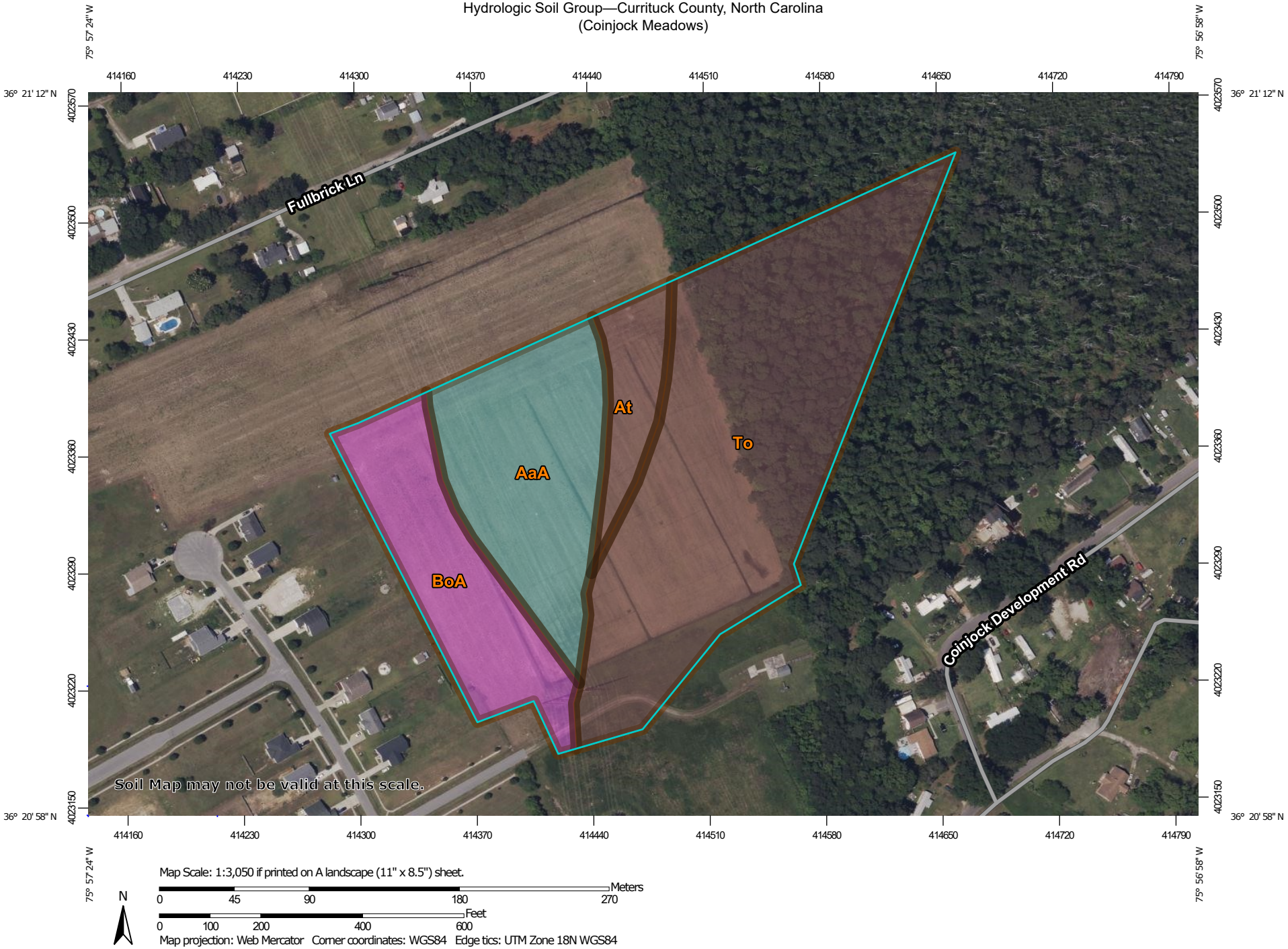
Figure 5. HEC-RAS 2D Results - Water Surface Elevation Comparison.

Conclusion

As required by the Currituck County Stormwater Manual, the downstream hydraulic performance of the site was evaluated under existing and proposed conditions using the peak flows generated for the 2-year and 10-year, 24-hour storm events. The results demonstrate that the proposed development does not increase downstream water surface elevations by more than 0.01 feet when compared to existing conditions. Therefore, the project satisfies the criteria for the Major Alternative Stormwater Runoff Storage and Downstream Capacity Analysis and meets the County's stormwater requirements for peak discharge and downstream conveyance.

Appendix A. Hydrologic_Soil_Group

Hydrologic Soil Group—Currituck County, North Carolina
(Coinjock Meadows)



MAP LEGEND

Area of Interest (AOI)
- Area of Interest (AOI)

Soils
- Soil Survey Areas
- Soil Map Unit Polygons
- Soil Map Unit Lines
- Soil Map Unit Points

Soil Rating Polygons
- A
- A/D
- B
- B/D
- C
- C/D
- D
- Not rated or not available

Soil Rating Lines
- A
- A/D
- B
- B/D
- C
- C/D
- D
- Not rated or not available

Soil Rating Points
- A
- A/D
- B
- B/D
- C
- C/D
- D
- Not rated or not available

Special Point Features
- Blowout
- Borrow Pit
- Clay Spot
- Closed Depression
- Gravel Pit
- Gravelly Spot
- Landfill
- Lava Flow
- Marsh or swamp
- Mine or Quarry
- Miscellaneous Water
- Perennial Water
- Rock Outcrop
- Saline Spot
- Sandy Spot
- Severely Eroded Spot
- Sinkhole
- Slide or Slip
- Sodic Spot
- Spoil Area
- Stony Spot
- Very Stony Spot
- Wet Spot
- Other
- Special Line Features

Water Features
- Streams and Canals

Transportation
- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background
- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:20,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Currituck County, North Carolina
Survey Area Data: Version 25, Sep 2, 2025

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: May 18, 2022—May 31, 2022

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Hydrologic Soil Group

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
AaA	Altavista fine sandy loam, 0 to 2 percent slopes	C	3.5	22.2%
At	Augusta fine sandy loam	B/D	1.1	6.8%
BoA	Bojac loamy sand, 0 to 3 percent slopes	A	2.8	17.6%
To	Tomotley fine sandy loam	B/D	8.5	53.5%
Totals for Area of Interest			**15.9**	**100.0%**

Description

Hydrologic soil groups are based on estimates of runoff potential. Soils are assigned to one of four groups according to the rate of water infiltration when the soils are not protected by vegetation, are thoroughly wet, and receive precipitation from long-duration storms.

The soils in the United States are assigned to four groups (A, B, C, and D) and three dual classes (A/D, B/D, and C/D). The groups are defined as follows:

Group A. Soils having a high infiltration rate (low runoff potential) when thoroughly wet. These consist mainly of deep, well drained to excessively drained sands or gravelly sands. These soils have a high rate of water transmission.

Group B. Soils having a moderate infiltration rate when thoroughly wet. These consist chiefly of moderately deep or deep, moderately well drained or well drained soils that have moderately fine texture to moderately coarse texture. These soils have a moderate rate of water transmission.

Group C. Soils having a slow infiltration rate when thoroughly wet. These consist chiefly of soils having a layer that impedes the downward movement of water or soils of moderately fine texture or fine texture. These soils have a slow rate of water transmission.

Group D. Soils having a very slow infiltration rate (high runoff potential) when thoroughly wet. These consist chiefly of clays that have a high shrink-swell potential, soils that have a high water table, soils that have a claypan or clay layer at or near the surface, and soils that are shallow over nearly impervious material. These soils have a very slow rate of water transmission.

If a soil is assigned to a dual hydrologic group (A/D, B/D, or C/D), the first letter is for drained areas and the second is for undrained areas. Only the soils that in their natural condition are in group D are assigned to dual classes.

Rating Options

Aggregation Method: Dominant Condition

Component Percent Cutoff: None Specified

Tie-break Rule: Higher

Appendix B. Precipitation Frequency Data Server_NOAA

NOAA Atlas 14, Volume 2, Version 3
Location name: Coinjock, North Carolina, USA*
Latitude: 36.3508°, Longitude: -75.9541°
Elevation: 8 ft**
* source: ESRI Maps
** source: USGS

POINT PRECIPITATION FREQUENCY ESTIMATES

G.M. Bonnin, D. Martin, B. Lin, T. Parzybok, M.Yekta, and D. Riley

NOAA, National Weather Service, Silver Spring, Maryland

PF_tabular | PF_graphical | Maps_&_aerials

PF tabular

PDS-based point precipitation frequency estimates with 90% confidence intervals (in inches/hour)[1]

Duration	Average recurrence interval (years)									
	1	2	5	10	25	50	100	200	500	1000
5-min	**5.26** (4.78-5.80)	**6.13** (5.56-6.78)	**6.91** (6.26-7.63)	**7.96** (7.18-8.77)	**8.95** (8.05-9.88)	**9.88** (8.84-10.9)	**10.7** (9.54-11.8)	**11.5** (10.2-12.7)	**12.5** (11.0-13.8)	**13.4** (11.7-14.9)
10-min	**4.20** (3.81-4.63)	**4.90** (4.44-5.42)	**5.54** (5.02-6.11)	**6.36** (5.74-7.01)	**7.14** (6.41-7.87)	**7.86** (7.04-8.66)	**8.50** (7.58-9.37)	**9.12** (8.08-10.0)	**9.86** (8.68-10.9)	**10.6** (9.23-11.7)
15-min	**3.50** (3.18-3.86)	**4.11** (3.72-4.54)	**4.67** (4.23-5.16)	**5.36** (4.84-5.92)	**6.03** (5.42-6.65)	**6.64** (5.95-7.31)	**7.16** (6.39-7.89)	**7.67** (6.80-8.45)	**8.28** (7.28-9.14)	**8.84** (7.72-9.79)
30-min	**2.40** (2.18-2.64)	**2.84** (2.57-3.14)	**3.32** (3.00-3.66)	**3.89** (3.50-4.29)	**4.47** (4.01-4.92)	**5.00** (4.48-5.51)	**5.49** (4.89-6.04)	**5.97** (5.29-6.58)	**6.59** (5.79-7.27)	**7.16** (6.25-7.93)
60-min	**1.50** (1.36-1.65)	**1.78** (1.61-1.97)	**2.13** (1.93-2.35)	**2.53** (2.28-2.79)	**2.97** (2.67-3.28)	**3.39** (3.03-3.73)	**3.78** (3.37-4.16)	**4.19** (3.71-4.61)	**4.72** (4.16-5.22)	**5.23** (4.56-5.78)
2-hr	**0.874** (0.787-0.971)	**1.04** (0.940-1.16)	**1.27** (1.14-1.41)	**1.54** (1.38-1.70)	**1.85** (1.65-2.04)	**2.14** (1.91-2.37)	**2.43** (2.15-2.69)	**2.74** (2.41-3.03)	**3.15** (2.75-3.49)	**3.54** (3.07-3.93)
3-hr	**0.622** (0.560-0.695)	**0.741** (0.666-0.830)	**0.907** (0.814-1.01)	**1.10** (0.990-1.23)	**1.34** (1.20-1.49)	**1.57** (1.39-1.75)	**1.80** (1.59-2.00)	**2.06** (1.79-2.28)	**2.40** (2.07-2.66)	**2.73** (2.34-3.03)
6-hr	**0.369** (0.333-0.412)	**0.440** (0.396-0.492)	**0.538** (0.484-0.602)	**0.657** (0.588-0.733)	**0.801** (0.713-0.891)	**0.942** (0.834-1.04)	**1.08** (0.953-1.20)	**1.24** (1.08-1.37)	**1.45** (1.25-1.61)	**1.66** (1.42-1.84)
12-hr	**0.216** (0.194-0.242)	**0.257** (0.230-0.289)	**0.316** (0.282-0.354)	**0.388** (0.345-0.434)	**0.476** (0.421-0.531)	**0.564** (0.496-0.627)	**0.654** (0.569-0.726)	**0.753** (0.649-0.836)	**0.892** (0.758-0.989)	**1.03** (0.862-1.14)
24-hr	**0.129** (0.118-0.141)	**0.157** (0.144-0.172)	**0.202** (0.186-0.221)	**0.241** (0.220-0.263)	**0.298** (0.270-0.324)	**0.347** (0.312-0.377)	**0.400** (0.357-0.435)	**0.459** (0.405-0.499)	**0.547** (0.475-0.597)	**0.622** (0.532-0.682)
2-day	**0.074** (0.068-0.081)	**0.090** (0.083-0.099)	**0.116** (0.106-0.126)	**0.137** (0.126-0.150)	**0.170** (0.155-0.186)	**0.199** (0.179-0.217)	**0.231** (0.205-0.251)	**0.266** (0.234-0.291)	**0.320** (0.275-0.351)	**0.365** (0.310-0.403)
3-day	**0.053** (0.048-0.057)	**0.064** (0.059-0.070)	**0.081** (0.075-0.089)	**0.096** (0.088-0.105)	**0.119** (0.108-0.129)	**0.138** (0.124-0.149)	**0.158** (0.142-0.172)	**0.181** (0.160-0.197)	**0.215** (0.187-0.236)	**0.246** (0.211-0.271)
4-day	**0.042** (0.039-0.045)	**0.051** (0.047-0.055)	**0.064** (0.060-0.070)	**0.076** (0.070-0.082)	**0.093** (0.085-0.100)	**0.107** (0.097-0.116)	**0.122** (0.110-0.132)	**0.139** (0.123-0.150)	**0.163** (0.143-0.178)	**0.187** (0.161-0.205)
7-day	**0.028** (0.026-0.030)	**0.033** (0.031-0.036)	**0.042** (0.039-0.046)	**0.049** (0.045-0.053)	**0.060** (0.055-0.064)	**0.068** (0.062-0.074)	**0.077** (0.070-0.084)	**0.087** (0.078-0.094)	**0.101** (0.089-0.110)	**0.113** (0.098-0.124)
10-day	**0.022** (0.020-0.023)	**0.026** (0.024-0.028)	**0.032** (0.030-0.035)	**0.038** (0.035-0.040)	**0.045** (0.042-0.048)	**0.051** (0.047-0.055)	**0.058** (0.053-0.062)	**0.065** (0.059-0.070)	**0.075** (0.067-0.082)	**0.084** (0.073-0.091)
20-day	**0.015** (0.014-0.016)	**0.017** (0.016-0.019)	**0.021** (0.020-0.023)	**0.025** (0.023-0.026)	**0.029** (0.027-0.031)	**0.033** (0.030-0.035)	**0.037** (0.034-0.039)	**0.041** (0.037-0.044)	**0.046** (0.042-0.050)	**0.051** (0.045-0.055)
30-day	**0.012** (0.011-0.013)	**0.014** (0.013-0.015)	**0.017** (0.016-0.018)	**0.020** (0.018-0.021)	**0.023** (0.021-0.024)	**0.025** (0.024-0.027)	**0.028** (0.026-0.030)	**0.031** (0.028-0.033)	**0.035** (0.032-0.037)	**0.038** (0.034-0.041)
45-day	**0.010** (0.009-0.010)	**0.012** (0.011-0.012)	**0.014** (0.013-0.015)	**0.016** (0.015-0.017)	**0.019** (0.017-0.020)	**0.021** (0.019-0.022)	**0.023** (0.021-0.025)	**0.026** (0.024-0.027)	**0.029** (0.026-0.031)	**0.032** (0.028-0.034)
60-day	**0.009** (0.008-0.009)	**0.010** (0.010-0.011)	**0.012** (0.012-0.013)	**0.014** (0.013-0.015)	**0.016** (0.015-0.017)	**0.018** (0.017-0.019)	**0.020** (0.018-0.021)	**0.021** (0.020-0.023)	**0.024** (0.022-0.025)	**0.026** (0.023-0.027)

[1] Precipitation frequency (PF) estimates in this table are based on frequency analysis of partial duration series (PDS).

Numbers in parenthesis are PF estimates at lower and upper bounds of the 90% confidence interval. The probability that precipitation frequency estimates (for a given duration and average recurrence interval) will be greater than the upper bound (or less than the lower bound) is 5%. Estimates at upper bounds are not checked against probable maximum precipitation (PMP) estimates and may be higher than currently valid PMP values.

Please refer to NOAA Atlas 14 document for more information.

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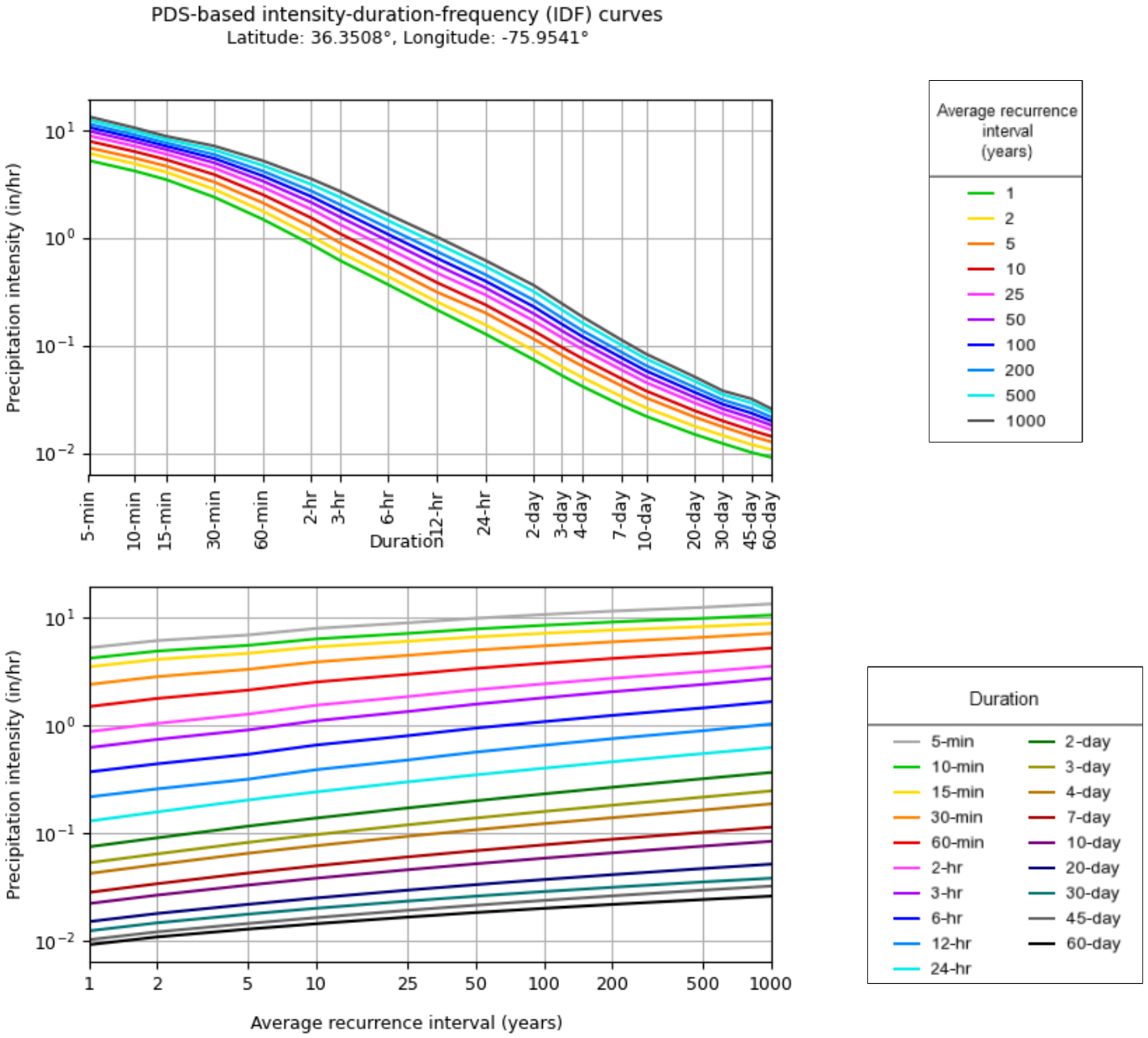
PF graphical



NOAA Atlas 14, Volume 2, Version 3

Created (GMT): Mon Jul 21 19:53:48 2025

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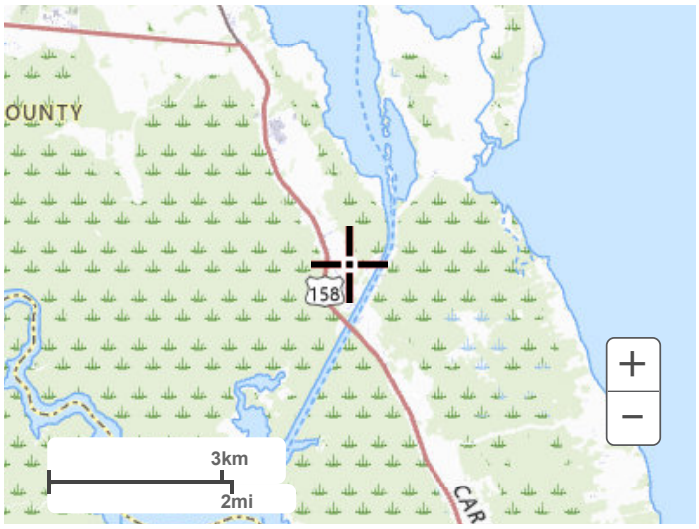
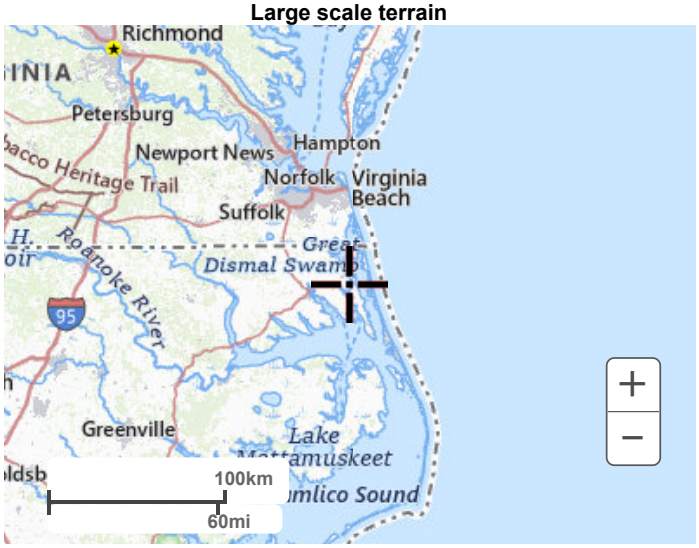
Maps & aerials

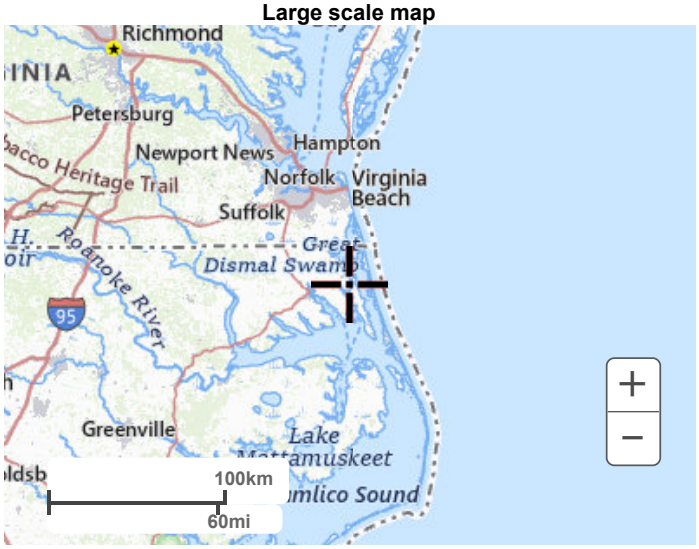
Small scale terrain



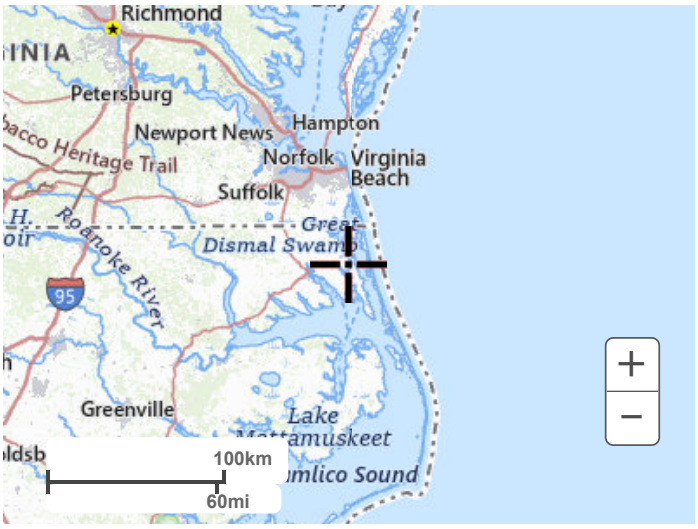
Large scale terrain



Large scale map



Large scale aerial



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US Department of Commerce
National Oceanic and Atmospheric Administration
National Weather Service
National Water Center
1325 East West Highway
Silver Spring, MD 20910
Questions?: HDSC.Questions@noaa.gov

Disclaimer

Appendix C. Blue Line Ditch Determination

ATLANTIC ENVIRONMENTAL CONSULTANTS, LLC

PO Box 3266, Kitty Hawk, NC 27949

May 13, 2025

Subject: Blue Line Ditch Determination
Project Location: Parcel ID 0070000013D0000
County: Currituck, North Carolina
Property Owner: Parker & Rose Investments, LLC

To Whom It May Concern:

On May 12, 2025, Atlantic Environmental Consultants, LLC (AEC) conducted a site assessment at the above-referenced property to evaluate the presence of surface water features, including any blue line ditches as defined by the U.S. Army Corps of Engineers (USACE) and the North Carolina Division of Water Resources (NCDWR).

Methodology

The evaluation was performed in accordance with the U.S. Army Corps of Engineers' 1987 Wetland Delineation Manual and the appropriate Regional Supplement (Atlantic and Gulf Coastal Plain or Piedmont, as applicable). The site was visually inspected for indicators of:

- Wetland hydrology
- Surface water features, including blue line ditches and other linear drainages

USGS topographic quadrangle maps, National Wetlands Inventory (NWI) maps, NRCS soil surveys, and aerial imagery were reviewed prior to the field investigation.

Based on the field investigation and supporting desktop resources:

- Blue Line Ditch: A mapped blue line feature known as Coinjock Ditch, located in the southeast corner of the property, was confirmed in the field as a perennial stream. Indicators of an Ordinary High-Water Mark (OHWM) and consistent flow were present, with surface water movement observed toward the Intracoastal Waterway.

Conclusion

The site contains a jurisdictional blue line ditch that appears hydrologically connected to the Intracoastal Waterway. A formal Jurisdictional Determination (JD) from the U.S. Army Corps of Engineers may be required to confirm federal regulatory status under Section 404 of the Clean Water Act.

Cell: (252) 599-2603 **Office:** (252) 261-7707 **Email: dougdaec@gmail.com**

Please contact our office if you have any questions or would like to coordinate the next steps regarding agency coordination or permitting.

Sincerely,

Doug Dorman
Senior Environmental Scientist
Atlantic Environmental Consultants, LLC

Parcel ID Number: 0070000013D0000

Property Address: OLIVE BRANCH LN
COINJOCK
27923

Property Owner: PARKER & ROSE INVESTMENTS LLC

Map Date: May 13, 2025

N

1:6,991

0 0.05 0.1 0.2 mi

0 0.075 0.15 0.3 km

This map should be used for general reference purposes only. Currituck County assumes no legal liability for the information shown on this map. This map is not a survey.

ALBEMARLE REGIONAL HEALTH SERVICES

416822

Applicant:
E.J. Gwin P.E Coastal Engineering & Surveying, Inc
PO Box 1129
Kitty Hawk, NC 27949

Owner:
Parker & Rose Investments LLC
144 Meadowlark Rd
Goldsboro, NC 27534

Site Location:
Lot 29 Olive Branch Ln
Coinjock, NC 27923

GPD:	360	**LTAR:**	0.400	**Classification:**	Suitable

If unsuitable, the site may be reclassified to provisionally suitable with the following modification(s):

* Fill Area 97 ft. by 52 ft. with 18 in. of Sand
* Other**:** Fill area is based on 4 lines, 75' long, 9' on-center

To obtain an Authorization to Construct:

* Submit a plat or scale drawing of the lot, showing location and dimensions of all property lines, proposed structures and driveways
* Pay permit fee of $420

Comments:

**Fill house pad higher than finished septic tank grade

**System doesn't need to be designed through existing field ditch

EHS: 

Carver, Kevin

Date: 08/07/2024

THIS APPROVAL WILL BECOME VOID AFTER 12 MONTHS AND A NEW APPLICATION WILL BE NECESSARY.

462034

ALBEMARLE REGIONAL HEALTH SERVICES
Improvement Permit

Applicant:
Coastal Engineering & Surveying Inc- Valeria A.
4425 N Croatan Hwy
Kitty Hawk, NC 27949

Owner:
Parker & Rose Investments LLC
1144 Meadowlark Rd
Goldsboro, NC 27534

Site Location:
Lot 30 Olive Branch Ln
Coinjock, NC 27923

GPD:	480	LTAR:	0.400	Classification:	Suitable

The site will require the following modification(s):

* Fill Area 126 ft. by 56 ft. with 24 in. of Sand
* Other: Fill area is based on 4 lines, 100' long, 9' on center and 3' wide trenches

To obtain an Authorization to Construct:

* Submit a plat or scale drawing of the lot, showing location and dimensions of all property lines, proposed structures and driveways
* Pay permit fee of $441

Comments:

*Fill House pad higher then finished septic tank grade
*Call for reinspection once fill is complete
*System needs to be placed as designed, not within current field ditches

EHS: _____ Date: 10/28/2025
Carver, Kevin

THIS APPROVAL WILL BECOME VOID AFTER 12 MONTHS AND A NEW APPLICATION WILL BE NECESSARY.

462035

ALBEMARLE REGIONAL HEALTH SERVICES
Improvement Permit

Applicant:
Coastal Engineering & Surveying Inc- Valeria A.
4425 N Croatan Hwy
Kitty Hawk, NC 27949

Owner:
Parker & Rose Investments LLC
1144 Meadowlark Rd
Goldsboro, 27534

Site Location:
Lot 31 Olive Branch Ln
Coinjock, NC 27923

GPD: 480	**LTAR:** 0.500	**Classification:** Suitable

The site will require the following modification(s):

* Fill Area 102 ft. by 52 ft. with 18 in. of Sand
* Other: Fill is based on 4 lines, 80' long, 9' on center, and 3' wide trenches

To obtain an Authorization to Construct:

* Submit a plat or scale drawing of the lot, showing location and dimensions of all property lines, proposed structures and driveways
* Pay permit fee of $441

Comments:

*Fill House pad higher then finished septic tank grade
*Call for reinspection once fill is complete
*System needs to be placed as designed, not within current field ditches

EHS: _____ **Date:** 10/28/2025

Carver, Kevin

THIS APPROVAL WILL BECOME VOID AFTER 12 MONTHS AND A NEW APPLICATION WILL BE NECESSARY.

ALBEMARLE REGIONAL HEALTH SERVICES

416818

Applicant:

E.J. Gwin P.E Coastal Engineering & Surveying, Inc
PO Box 1129
Kitty Hawk, NC 27949

Owner:

Parker & Rose Investments LLC
144 Meadowlark Rd
Goldsboro, NC 27534

Site Location:

Lot 32 Olive Branch Ln
Coinjock, NC 27923

GPD:	360	**LTAR:**	0.500	**Classification:**	Suitable

If unsuitable, the site may be reclassified to provisionally suitable with the following modification(s):

To obtain an Authorization to Construct:

* Submit a plat or scale drawing of the lot, showing location and dimensions of all property lines, proposed structures and driveways
* Pay permit fee of $420

Comments:

**Fill house pad higher than finished septic tank grade

**System doesn't need to be designed through existing field ditch

**Seasonal Soil Wetness 36"

EHS: 

Carver, Kevin

Date: 08/07/2024

THIS APPROVAL WILL BECOME VOID AFTER 12 MONTHS AND A NEW APPLICATION WILL BE NECESSARY.

ALBEMARLE REGIONAL HEALTH SERVICES

462036

Improvement Permit

Applicant:
Coastal Engineering & Surveying Inc- Valeria A.
4425 N Croatan Hwy
Kitty Hawk, NC 27949

Owner:
Parker & Rose Investments LLC
1144 Meadowlark Rd
Goldsboro, 27534

Site Location:
Lot 33 Olive Branch Ln
Coinjock, NC 27923

GPD: 480	LTAR: 0.500	Classification: Suitable

The site will require the following modification(s):

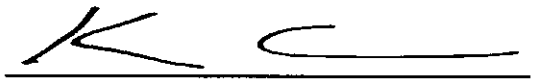
* Fill Area 100 ft. by 50 ft. with 15 in. of Sand
* Other: Fill is based on 4 lines, 80' long, 9' on center and 3' wide trenches

To obtain an Authorization to Construct:

* Submit a plat or scale drawing of the lot, showing location and dimensions of all property lines, proposed structures and driveways
* Pay permit fee of $441

Comments:

*Fill House pad higher then finished septic tank grade
*Call for reinspection once fill is complete
*System needs to be placed as designed, not within current field ditches

EHS: 

Carver, Kevin

Date: 10/28/2025

THIS APPROVAL WILL BECOME VOID AFTER 12 MONTHS AND A NEW APPLICATION WILL BE NECESSARY.

462037

ALBEMARLE REGIONAL HEALTH SERVICES
Improvement Permit

Applicant:
Coastal Engineering & Surveying Inc- Valeria A.
4425 N Croatan Hwy
Kitty Hawk, NC 27949

Owner:
Parker & Rose Investments LLC
1144 Meadowlark Rd
Goldsboro, 27534

Site Location:
Lot 34 Olive Branch Ln
Coinjock, NC 27923

GPD: 480	**LTAR:** 0.500	**Classification:** Suitable

The site will require the following modification(s):

* Fill Area 102 ft. by 52 ft. with 18 in. of Sand
* Other: Fill is based off of 4 lines, 80' long, 9' on center & 3' wide trenches

To obtain an Authorization to Construct:

* Submit a plat or scale drawing of the lot, showing location and dimensions of all property lines, proposed structures and driveways
* Pay permit fee of $441

Comments:

*Fill House pad higher then finished septic tank grade
*Call for reinspection once fill is complete
*System needs to be placed as designed, not within current field ditches

EHS: _____ **Date:** 10/28/2025

Carver, Kevin

THIS APPROVAL WILL BECOME VOID AFTER 12 MONTHS AND A NEW APPLICATION WILL BE NECESSARY.

ALBEMARLE REGIONAL HEALTH SERVICES

416821

Applicant:

E.J. Gwin P.E Coastal Engineering & Surveying, Inc
PO Box 1129
Kitty Hawk, NC 27949

Owner:

Parker & Rose Investments LLC
144 Meadowlark Rd
Goldsboro, NC 27534

Site Location:

Lot 35 Olive Branch Ln
Coinjock, NC 27923

GPD:	360	**LTAR:**	0.400	**Classification:**	Suitable

If unsuitable, the site may be reclassified to provisionally suitable with the following modification(s):

* Fill Area 101 ft. by 56 ft. with 24 in. of Sand
* Other**:** Fill area is based on 4 lines, 75' long, 9' on-center

To obtain an Authorization to Construct:

* Submit a plat or scale drawing of the lot, showing location and dimensions of all property lines, proposed structures and driveways
* Pay permit fee of $420

Comments:

**Fill house pad higher than finished septic tank grade

**System doesn't need to be designed through existing field ditch

EHS: 

Carver, Kevin

Date: 08/07/2024

THIS APPROVAL WILL BECOME VOID AFTER 12 MONTHS AND A NEW APPLICATION WILL BE NECESSARY.

462038

ALBEMARLE REGIONAL HEALTH SERVICES
Improvement Permit

Applicant:
Coastal Engineering & Surveying Inc- Valeria A.
4425 N Croatan Hwy
Kitty Hawk, NC 27949

Owner:
Parker & Rose Investments LLC
1144 Meadowlark Rd
Goldsboro, 27534

Site Location:
Lot 36 Olive Branch Ln
Coinjock, NC 27923

GPD:	480	LTAR:	0.400	Classification:	Suitable

The site will require the following modification(s):

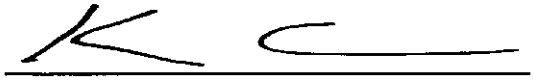
* Fill Area 126 ft. by 56 ft. with 24 in. of Sand
* Other: Fill Area is based on 4 lines, 100' long, 9' on center, and 3' wide trenches

To obtain an Authorization to Construct:

* Submit a plat or scale drawing of the lot, showing location and dimensions of all property lines, proposed structures and driveways
* Pay permit fee of $441

Comments:

*Fill House pad higher then finished septic tank grade
*Call for reinspection once fill is complete
*System needs to be placed as designed, not within current field ditches

EHS:  **Date:** 10/28/2025

Carver, Kevin

THIS APPROVAL WILL BECOME VOID AFTER 12 MONTHS AND A NEW APPLICATION WILL BE NECESSARY.

Currituck County Mainland Water
Capacity Availability Form

County Contact Information

Will Rumsey, Utilities Director
444 Maple Road
Maple, NC 27956

Phone: 252.232.2769
Fax: 252.453.3721

Website: https://co.currituck.nc.us/departments/water/

Request

This request is for:

- ☐ Single Family Residence
- ☒ Residential Development
- ☐ Non-residential

Owner Information

Name(s): Parker & Rose Investments, LLC

Mailing Address: 144 Meadowlark Rd, Goldsboro NC, 27534

E-Mail Address: parkerdw144@gmail.com

Phone Number: 919-440-9170

Applicant Information (if different from Owner)

Name(s): Valeria Gonzalez Alarcon - Coastal Engineering & Surveying Inc

Mailing Address: PO Box 1129, Kitty Hawk NC, 27949

E-Mail Address: valeria@coastales.com

Phone Number: (252)261-4151

Parcel Information

PIN(s): 8996-70-1586

Street Address: Olive Branch Ln

Project Information

Name of Project: Coinjock Meadows Ph2

Number of Units: 8 residential lots

Projected Daily Project Demand (gpd): 3,200

Anticipated Water Access Date: Q1 2026

Applicant's Signature

I declare, that to the best of my knowledge, the information provided herein is true, correct, and complete.

Valeria Gonzalez Alarcon
Property Owner/Applicant Signature

11/10/2025
Date

Note: Water connection and/or developmental fees are due at building permit application. See the Currituck County Master Fee Schedule for rates.
https://co.currituck.nc.us/master-fee-schedule/

For Office Use Only

☒ Water capacity is available for this project.

☐ Water capacity is not available for this project.

11.13.25
Utilities Director Date

11/19/2025
County Manager Date

This capacity availability is good for one year