MUNICIPAL STORMWATER MANAGEMENT PLAN

For the

Borough of Beachwood

Ocean County, New Jersey

March 2005

Revised November 5, 2007

Updated March 9, 2021

Prepared By

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3/9/21

Date

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RVE Project No. Job #1505-T-023

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Introduction

The Municipal Stormwater Management Plan (MSWMP) was prepared by the Borough of Beachwood's previous Municipal Engineer, Shoor De Palma Inc, dated March 2005 and revised on November 5, 2007.

NJDEP has indicated to the Borough to take immediate actions to develop and update its MSWMP and Stormwater control Ordinances in order that these documents are consistent with NJAC 7:8. Therefore Remington and Vernick Engineers has been authorized by the Borough to update the Municipal Stormwater Management Plan and the Stormwter Management Control Ordinances.

This Municipal Stormwater Management Plan (MSWMP) documents the strategy for the Borough of Beachwood to address stormwater-related impacts. The creation of this plan is required by N.J.A.C. 7:14A-25 Municipal Stormwater Regulations. This plan contains all of the required elements described in N.J.A.C. 7:8 Stormwater Management Rules. The plan addresses groundwater recharge, stormwater quantity, and stormwater quality impacts by incorporating stormwater design and performance standards for new major development, defined as projects that disturb one or more acre of land or increases impervious area by ¼ acre. These standards are intended to minimize the adverse impact of stormwater runoff on water quality and water quantity and the loss of groundwater recharge that provides baseflow in receiving water bodies. The plan describes long-term operation and maintenance measures for existing and future stormwater facilities.

A "build-out" analysis has not been included in this plan based upon the fact that there is less than one square mile of existing land available for development. The plan also addresses the review and update of existing ordinances, the Borough Master Plan, and other planning documents to allow for project designs that include low impact development techniques. The final component of this plan is a mitigation strategy for when a variance or exemption of the design and performance standards is sought. As part of the mitigation section of the stormwater plan, specific stormwater management measures are identified to lessen the impact of existing development.

The plan also addresses the review and update of existing ordinances, the Township Master Plan and other planning documents to allow for the project designs to include low impact development techniques.

The final component of this plan is a mitigation strategy for when a variance or exemption of the design and performance standards is sought. As part of the mitigation section of the stormwater plan, specific stormwater management measures are identified to lessen the impact of existing developments.

Goals

The goals of this MSWMP are to:

- reduce flood damage, including damage to life and property;
- minimize, to the extent practical, any increase in stormwater runoff from any new development;
- reduce soil erosion from any development or construction project;
- assure the adequacy of existing and proposed culverts and bridges, and other in-stream structures;
- maintain groundwater recharge;
- prevent, to the greatest extent feasible, an increase in non-point pollution;
- maintain the integrity of stream channels for their biological functions, as well as for drainage;
- minimize pollutants in stormwater runoff from new and existing development to restore, enhance, and maintain the chemical, physical, and biological integrity of the waters of the state, to protect public health, to safeguard fish and aquatic life and scenic and ecological values, and to enhance the domestic, municipal, recreational, industrial, and other uses of water; and
- protect public safety through the proper design and operation of stormwater basins.

To achieve these goals, this plan outlines specific stormwater design and performance standards for new development. Additionally, the plan proposes stormwater management controls to address impacts from existing development. Preventative and corrective maintenance strategies are included in the plan to ensure long-term effectiveness of stormwater management facilities. The plan also outlines safety standards for stormwater infrastructure to be implemented to protect public safety. ***These goals are ongoing***.

The General Reexamination of the Master Plan was adopted on June 8, 2019. The MSWMP was adopted as a stormwater element to the master plan. The following Goals and Objectives were implemented to the Master Plan that referenced the MSWMP:

7. Development Regulation Recommendations:

(i) **Landscaping and Green Stormwater Infrastructure (GSI).** Consideration should be given to the inclusion of additional landscaping standards regarding low impact design, native vegetation, and green stormwater infrastructure (GSI) concepts. The Borough should develop policies to encourage rain gardens and usage of rain barrels, stormwater planters and porous pavement as cost effective ways to reduce the effects of climate change.

During the planning stages of developmental projects, developers are encouraged to include additional landscaping standards regarding low impact design, native vegetation, and green storm water facility concepts such as rain gardens, stormwater planters, etc.

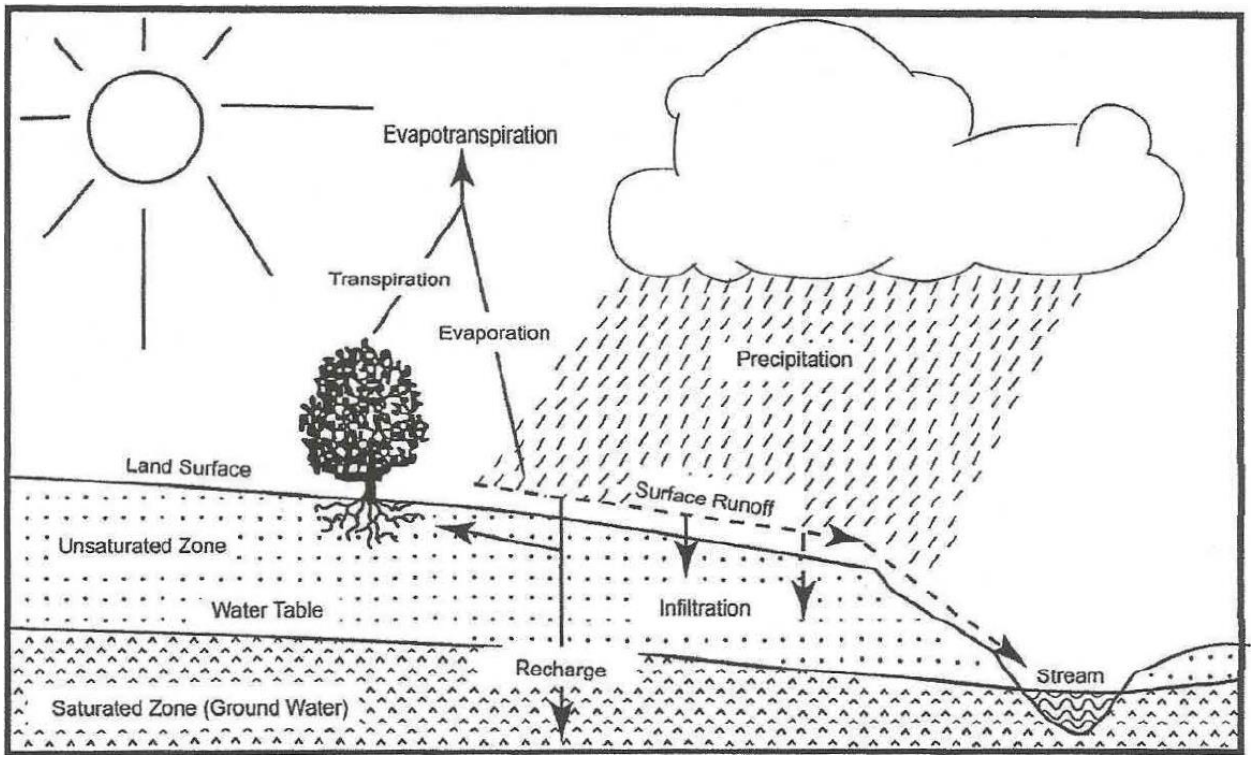
The Stormwater Management Control Ordinances are being revised to include Green Stormwater Infrastructure BMP's per NJAC 7:8 and the NJDEP BMP Manual.

Stormwater Discussion

Land development can dramatically alter the hydrologic cycle (See Figure C-1) of a site and, ultimately, an entire watershed. Prior to development, native vegetation can either directly intercept precipitation or draw that portion that has infiltrated into the ground and return it to the atmosphere through evapotranspiration. Development can remove this beneficial vegetation and replace it with lawn or impervious cover, reducing the site's evapotranspiration and infiltration rates. Clearing and grading a site can remove depressions that store rainfall. Construction activities may also compact the soil and diminish its infiltration ability, resulting in increased volumes and rates of stormwater runoff from the site. Impervious areas that are connected to each other through gutters, channels, and storm sewers can transport runoff more quickly than natural areas. This shortening of the transport or travel time quickens the rainfall-runoff response of the drainage area, causing flow in downstream waterways to peak faster and higher than natural conditions. These increases can create new and aggravate existing downstream flooding and erosion problems and increase the quantity of sediment in the channel. Filtration of runoff and removal of pollutants by surface and channel vegetation is eliminated by storm sewers that discharge runoff directly into a stream. Increases in impervious area can also decrease opportunities for infiltration, which, in turn, reduces stream base flow and groundwater recharge. Reduced base flows and increased peak flows produce greater fluctuations between normal and storm flow rates, which can increase channel erosion. Reduced base flows can also negatively impact the hydrology of adjacent wetlands and the health of biological communities that depend on base flows. Finally, erosion and sedimentation can destroy habitat from which some species cannot adapt.

In addition to increases in runoff peaks, volumes, and loss of groundwater recharge, land development often results in the accumulation of pollutants on the land surface that runoff can mobilize and transport to streams. New impervious surfaces and cleared areas created by development can accumulate a variety of pollutants from the atmosphere, fertilizers, animal wastes, and leakage and wear from vehicles. Pollutants can include metals, suspended solids, hydrocarbons, pathogens, and nutrients.

Figure C-1: Groundwater Recharge in the Hydrologic Cycle



Source: New Jersey Geological Survey Report GSR-32.

In addition to increased pollutant loading, land development can adversely affect water quality and stream biota in more subtle ways. For example, stormwater falling on impervious surfaces or stored in detention or retention basins can become heated and raise the temperature of the downstream waterway, adversely affecting cold water fish species such as trout. Development can remove trees along stream banks that normally provide shading, stabilization, and leaf litter that falls into streams and becomes food for the aquatic community.

Background

The Borough of Beachwood encompasses a 2.76 square mile area in Ocean County, New Jersey. The population of the Borough has increased from 11,045 in 2010 to 11,226 in 2019 according to the government census. This steady population level in the last 10 years has not resulted in a considerable demand in new development. Figure C-2 illustrates the waterways in the Borough and C-3 depicts the Borough boundary on the USGS quadrangle maps. Because of the low level of development in the Borough the increase in landscaping and disturbance decreases the chances of additional pollutants to these waterways.

The New Jersey Department of Environmental Protection (NJDEP) has established an Ambient Biomonitoring Network (AMNET) to document the health of the state's waterways. There are over 800 AMNET sites throughout the state of New Jersey. These sites are sampled for benthic macroinvertebrates by NJDEP on a five-year cycle. Streams are classified as non-impaired, moderately impaired, or severely impaired based on the AMNET data:

(https://njogis-newjersey.opendata.arcgis.com/datasets/d8937d8a49064467876d80e0c58a0d6a_13).

The data is used to generate a New Jersey Impairment Score (NJIS), which is based on a number of biometrics related to benthic macroinvertebrate community dynamics. One major water body is present in the Borough, the Toms River, which forms the Borough's northern border. This water body is classified a nonimpaired waterway based on AMNET but is monitored by the NJDEP Coastal Monitoring and Shellfish Monitoring.

In addition to the AMNET data, the NJDEP and other regulatory agencies collect water quality chemical data on the streams in the state. This data is located on Sublist *5* of New Jersey's Integrated List of Waterbodies:

(https://www.nj.gov/dep/wms/bears/docs/2014_final_integrated_report.pdf).

It shows that the total coliform levels of the Toms River frequently exceeds the state's criteria. This means that this is an impaired waterway and the NJDEP is required to develop a Total Maximum Daily Load (TMDL) for this pollutant for the waterway. The NJDEP adopted TMDL for total coliform to address shellfish-impaired waters in the Toms River on September 27, 2006. The TMDL established in the report is significantly lower than the existing loads on the Toms River and requires a 74% reduction in the current total coliform load. Since the NJDEP maintains a large network of monitoring stations, the Borough of Beachwood has not collected other sampling data nor does it plan to in the future.

A TMDL is the amount of a pollutant that can be accepted by a waterbody without causing an exceedance of water quality standards or interfering with the ability to use a waterbody for one or more of its designated uses. The allowable load is allocated to the various sources of the pollutant, such as stormwater and wastewater discharges, which require an NJPDES permit to discharge, and nonpoint source, which includes stormwater runoff from agricultural areas and residential areas, along with a margin of safety. Provisions may also be made for future sources in the form of reserve capacity. An implementation plan is developed to identify how the various sources will be reduced to the designated allocations. Implementation strategies may include improved stormwater treatment plants, adoption of ordinances, reforestation of stream corridors, retrofitting stormwater systems, and other BMPs.

The New Jersey Integrated Water Quality Monitoring and Assessment Report (305(b) and 303(d)) (Integrated List) is required by the federal Clean Water Act to be prepared biennially and is a valuable source of water quality information. This combined report

presents the extent to which New Jersey waters are attaining water quality standards, and identifies waters that are impaired. Sublist 5 of the Integrated List constitutes the list of waters impaired or threatened by pollutants, for which one or more TMDLs are needed.

In addition to water quality problems, flooding in the Borough of Beachwood occurs semi-frequently due to lack of storm drainage facilities in most of the Borough, slight topography of the roads, and the close proximity of the Toms River and the low-runoff character of the soil. Additionally, since the Borough is close to build out, permeable soil has been replaced by impermeable surfaces, which increases runoff volumes. In general non-point source pollution from the Borough is collected with stormwater runoff and is a potential source of the coliform impairment to the Toms River since the stormwater discharges into the waterway. In addition, the large number of water fowl in and around the Toms River contribute to the high coliform levels.

In an effort to reduce non-point source pollution, the Borough of Beachwood has taken several actions. First, a pet waste ordinance, wildlife feeding ordinance, yard waste ordinance, illicit connection ordinance, and improper disposal of waste ordinance have been adopted and are being enforced. Standard operating procedures have been developed and implemented for fueling Borough vehicles, vehicle maintenance, storage of deicing materials, and street sweeping. In addition, Beachwood has been labeling the storm drains, training employees, and distributing stormwater brochures in an effort to educate the public of the effects of non-point source pollution.

Furthermore, all future development in the Borough of Beachwood shall utilize the best available technology to minimize off-site stormwater runoff, increase onsite infiltration, simulate natural drainage systems, encourage green infrastructure, minimize off-site discharge of pollutants to ground or surface water and encourage natural filtration functions. Aside from the efforts to reduce the daily pollutant loads, Beachwood will continue to implement the adopted Stormwater Pollution Prevention Plan.

Since there is limited remaining developable land within the Borough, the potential for additional surface and groundwater degradation in the long-term will be via redevelopment and limited development. Any future major development will comply with the new NJDEP Stormwater design standards (NJAC 7:8). As such, future development/redevelopment will be controlled to the maximum extent practicable with respect to stormwater management, Total Suspended Solids (TSS) minimization, utilization of Green Infrastructure BMP's and stormwater recharge to the maximum extent practicable. A map of the groundwater recharge areas is shown in Figure C-4. Wellhead protection areas, also required as part of the Municipal Stormwater Management Plan, are shown in Figure C-5.

Design and Performance Standards

The Borough is in the process of updating their Stormwater Management Control Ordinances to reflect amendments to the stormwater management rules at NJAC 7:8 adopted March 2, 2020. These ordinances minimize the adverse impact of stormwater

runoff on water quality and water quantity, to utilize Green Infrastructure BMP's and loss of groundwater recharge in receiving water bodies. The design and performance standards include the language for maintenance of stormwater management measures consistent with the stormwater management rules at N.J.A.C. 7:8-5.8 Maintenance Requirements, and language for safety standards consistent with N.J.A.C. 7:8-6 Safety Standards for Stormwater Management Basins. The updated Stormwater Control Ordinances will be submitted to Ocean County for review and approval.

Non-structural measures to be considered first shall include site design and preventive source controls per NJAC 7:8-2. To confirm the effectiveness of such measures, applicants must verify the control of stormwater quantity impacts as detailed in the Stormwater Management rules. The tests of assuring control of the quantity impacts as detailed in these rules will be incorporated into the Borough's Stormwater Ordinance.

The general standards for structural measures will be specified in the Stormwater Management rules and will be incorporated into the Borough of Beachwood's Ordinance. These measures shall be incorporated as needed to meet the soil erosion, infiltration, Green Infrastructure BMP's and runoff quantity standards included in the Borough's Stormwater Ordinance. The design standards for the specific structural stormwater management measures are those included in the New Jersey Stormwater Best Management Practices Manual. The design and construction of such facilities must comply with the Soil Erosion and Sediment Control Standards *as* well *as* any other applicable state regulation, including the Freshwater Wetland Protection Act rules, the Flood Hazard Control rules, the Surface Water Quality Standards, the Coastal Area Facilities Review Act, Waterfront Development and Harbor Facilities Act and the Dam Safety rules. The requirement to be consistent with all other applicable rules will be included in the Borough's Stormwater Ordinance. Stormwater runoff quality controls for total suspended solids and nutrient loads shall meet the design and performance standards as specified in the Stormwater Management rules.

The minimum design and performance standards for infiltration, Green Infrastructure BMP's and groundwater recharge specified in the Stormwater Management Rules will be incorporated into the Borough's Stormwater Ordinance and must be met for all applicable development. Consistent with the Stormwater Management Rules, the Ordinance allows for an exemption from this requirement where the applicant can demonstrate that it is not practicable to meet the standards but has taken all possible steps to meet all stormwater management measures.

During construction, Borough inspectors will observe the construction of the project to ensure that the stormwater management measures are constructed and function as designed. Adequate long term operation, as well as preventative and corrective maintenance of the selected stormwater management measures, will be ensured by requiring the design engineer to prepare a maintenance plan for its stormwater management facilities incorporated into the design of the major development. The maintenance plan shall have specific preventative maintenance tasks, schedules and cost estimates, as well as the responsible party for corrective and preventative maintenance.

Where the Borough assumes maintenance responsibility, preventative maintenance shall be performed on a regular basis and will be appropriate for the particular structural management measure being implemented. These maintenance measures shall be in accordance with the stormwater ordinances and may include: periodic inspections, vegetation management, sediment, debris and trash removal and mosquito control. Corrective maintenance shall be performed on an as needed basis for structure repairs or replacements, removal of outlet and pipe blockages, erosion restoration, snow and ice removal, etc. The person or persons responsible for maintenance shall keep a detailed log of all preventative and corrective maintenance for the structural management measures incorporated into the design of the development, including a record of all inspections and work orders.

Plan Consistency

The Borough is within Watershed Management Area 13 and TMDL have been developed for the Toms River. This plan has taken into account the TMDL developed in the report "Fourteen Total Maximum Daily Loads for Total Coliform to Address Shellfish-Impaired Waters in Watershed Management Area 13 Atlantic Coastal Water Region" as prepared by the NJDEP and approved September 27, 2006 and has developed actions that will potentially reduce the total coliform load on the Toms River so that the TMDL can be achieved.

The Municipal Stormwater Management Plan is consistent with the Residential Site Improvement Standards (RSIS) at N.J.A.C. 5:21. The municipality will utilize the most current update of the RSIS in the stormwater management review of residential areas. This Municipal Stormwater Management Plan will be updated to be consistent with any future updates to the RSIS.

The Borough's Stormwater Management Ordinance requires all new development and redevelopment plans to comply with the NJDEP BMP Manual. During construction, Borough inspectors will observe on-site soil erosion and sediment control measures and report any inconsistencies to NJDEP and the local Soil Conservation District.

CAFRA and the Borough of Beachwood both comply with the phase 2 stormwater regulations. As such, individuals submitting for a CAFRA permit and requesting a waiver from the performance standards may be required to submit a mitigation plan to the NJDEP even if the Borough does not require one.

Twenty eight percent (28%) of Beachwood is in the Pinelands and as such the Pinelands Commission regulates development on these lands. Although most of the land is owned by the County of Ocean some individuals own lots in the Pinelands of Beachwood. All development within the Pinelands must comply with the alternative design standards and specific mitigation criteria as required by the Pinelands Commission and as required by Beachwood Revised General Ordinance Chapter 17 Development Regulations, Article V Pinelands Area, Subchapter 17-27 Pinelands Area Regulations and Article VIl Stormwater Management Control, Subchapter 17- 33 Pinelands Area.

Nonstructural Stormwater Management Strategies

Non-structural measures shall be considered first and shall include site design and preventive source controls per NJAC 7:8-2. The Borough has modified the land use and zoning ordinances to incorporate the nonstructural stormwater management strategies as recommended from the previous updated SWMP. No other modifications need to be incorporated at this time.

Land Use Build-Out Analysis

The Borough of Beachwood encompasses a total of 2.76 square miles of developable land. The undeveloped land area west of the Garden State Parkway (Pinelands Area) is almost entirely owned by the County of Ocean for passive recreation (384 acres ±). Therefore, the Borough of Beachwood is not required to complete a build-out analysis.

The Zoning Map, Figure C-6 and the Wetlands Map, Figure C-7 shows the constrained lands within the Borough.

Mitigation Plans

This mitigation plan is provided for a proposed development that is granted a variance or exemption from the stormwater management design and performance standards. It should be noted that the issuance of a waiver by the NJDEP under a Land Use Permit does not automatically waive the requirement for mitigation to be performed under the municipal review. In addition, all required permits must be obtained by the applicant for a mitigation project prior to municipal approval. Presented is a hierarchy of options.

Mitigation Project Criteria

1. Mitigation for stormwater management deficiencies should be addressed on the site as much as possible before offsite mitigation projects are considered. For projects within the Pinelands Area any off site mitigation measures must occur within the Pinelands Area and within the same drainage area as the parcel proposed for development. Any mitigation project must be implemented in the same drainage area as the proposed development. The project must provide additional groundwater recharge benefits, or protection from stormwater runoff quality and quantity from previously developed property that does not currently meet the design and performance standards outlined in the Municipal Stormwater Management Plan. The developer must ensure the long-term maintenance of the project, including the maintenance requirements under Chapters 8 and 9 of the NJDEP Stormwater BMP Manual.

    a. The applicant can select one of the following projects listed to compensate for the deficit from the performance standards resulting from the proposed project. More detailed information on the projects can be obtained from the Borough

Engineer. Listed below are specific projects that can be used to address the mitigation requirement.

Water Quality

- Retrofit the existing stormwater management facilities at the following facilities to provide the removal of 80 percent of total suspended solids.

    - Borough Municipal Complex at 1600 Pinewald Road
    - Community Center on Compass A venue
    - Mayo Park
    - Beachwood Elementary School at 901 Berkeley Avenue
    - Toms River Intermediate School at Pinewald Road
    - Beachwood Soccer Complex at Cherry Street

- Retrofit the existing stormwater systems that outfall into the Toms River to provide the removal of 80 percent of total suspended solids and oils.

- Retrofit the heads on catch basins as specified by the Borough Engineer to comply with NJDEP Phase II regulations.

The Borough may allow a developer to provide funding or partial funding to the Borough for an environmental enhancement project that has been identified in a Municipal Stormwater Management Plan, or towards the development of a Regional Stormwater Management Plan. The funding must be equal to or greater than the cost to implement the mitigation outlined above, including costs associated with purchasing the property or easement for mitigation, and the cost associated with the long-term maintenance requirements of the mitigation measure.

For areas within the Pinelands, monetary contributions can be made to the municipality in lieu of performing the site mitigation measures identified in the Stormwater Management Plan as long as the amount is equivalent to the cost of implementing and maintaining the stormwater management measures for which an exception is granted and the municipality must expend the contributions within 5 years.

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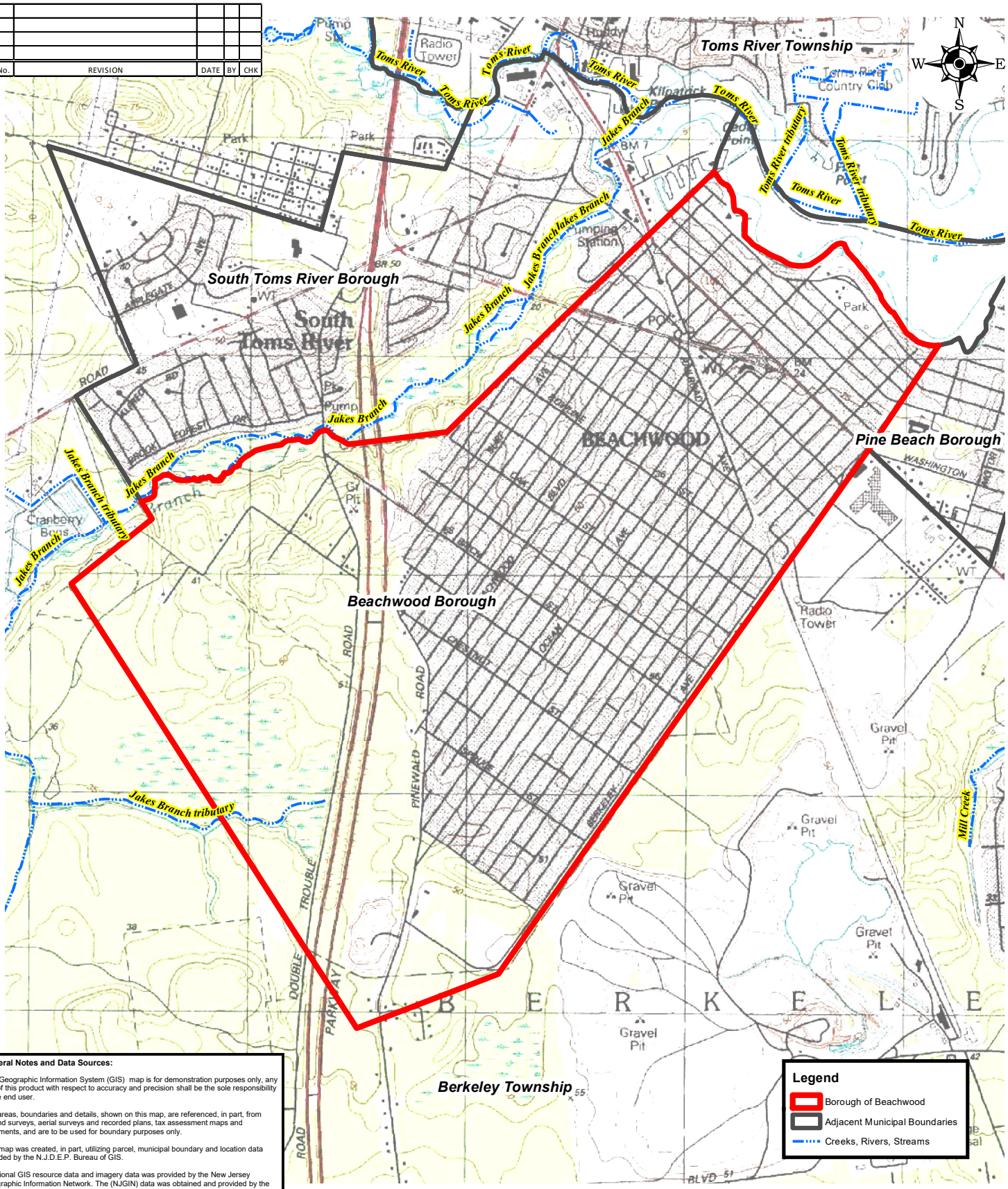

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- English units (feet)

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Figure C-2

0 500 1,000 2,000 3,000 4,000 Feet

1 inch = 2,000 feet

Map of Waterways

BOROUGH OF BEACHWOOD

OCEAN COUNTY — NEW JERSEY

February, 2021 — SCALE: 1" = 2,000'

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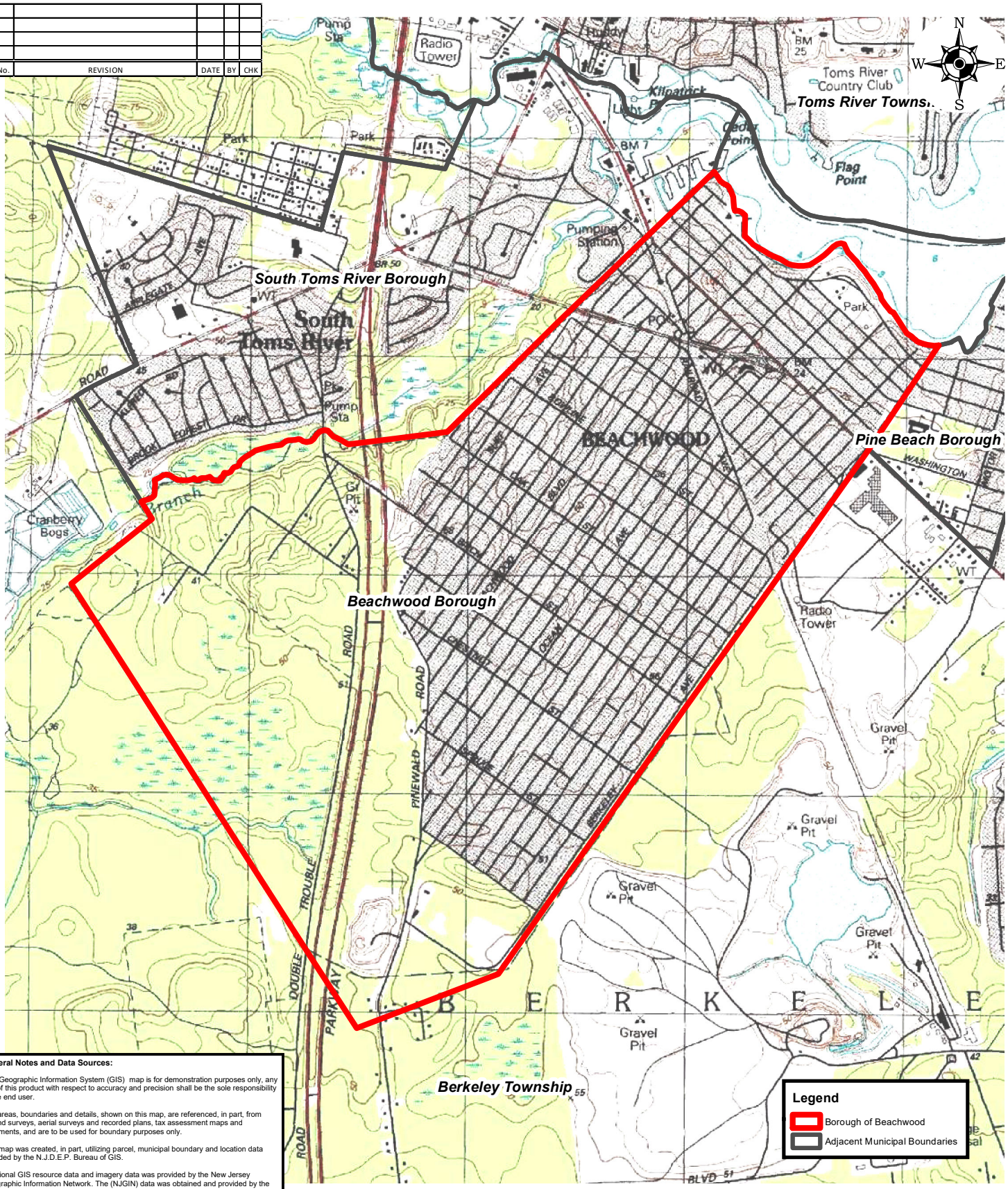

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Figure C-3

0 500 1,000 2,000 3,000 4,000 Feet

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USGS Quadrangles and Municipal Boundaries

BOROUGH OF BEACHWOOD

OCEAN COUNTY — NEW JERSEY

February, 2021 — SCALE: 1" = 2,000'

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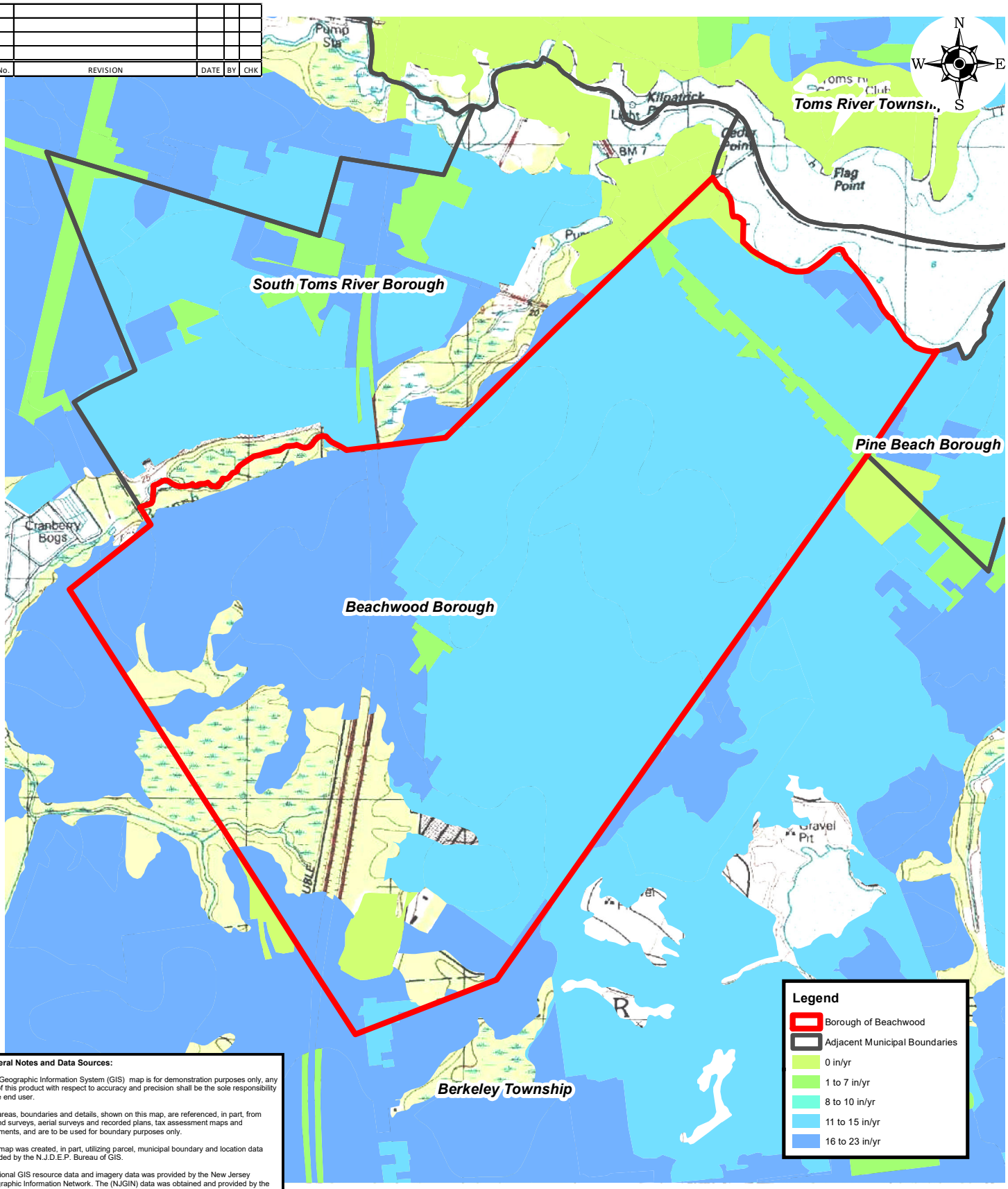

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Figure C-4

0 500 1,000 2,000 3,000 4,000 Feet

1 inch = 2,000 feet

Map of Ground Water Recharge Areas

BOROUGH OF BEACHWOOD

OCEAN COUNTY — NEW JERSEY

February, 2021 — SCALE: 1" = 2,000'

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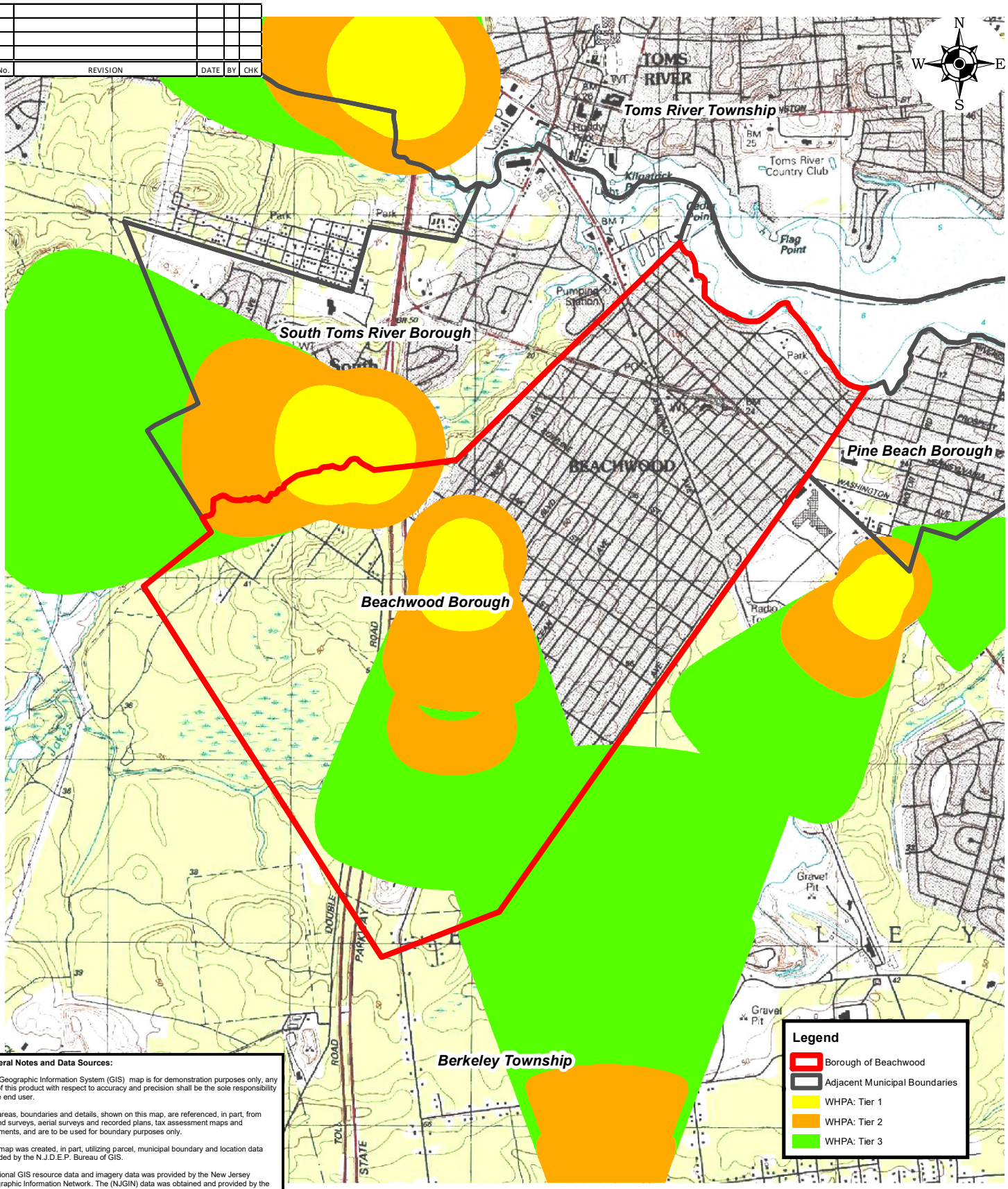

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Figure C-5

0 600 1,200 2,400 3,600 4,800 Feet

1 inch = 2,400 feet

Map of Well Head Protection Areas

BOROUGH OF BEACHWOOD

OCEAN COUNTY — NEW JERSEY

February, 2021 — SCALE: 1" = 2,400'

REMINGTON & VERNICK ENGINEERS
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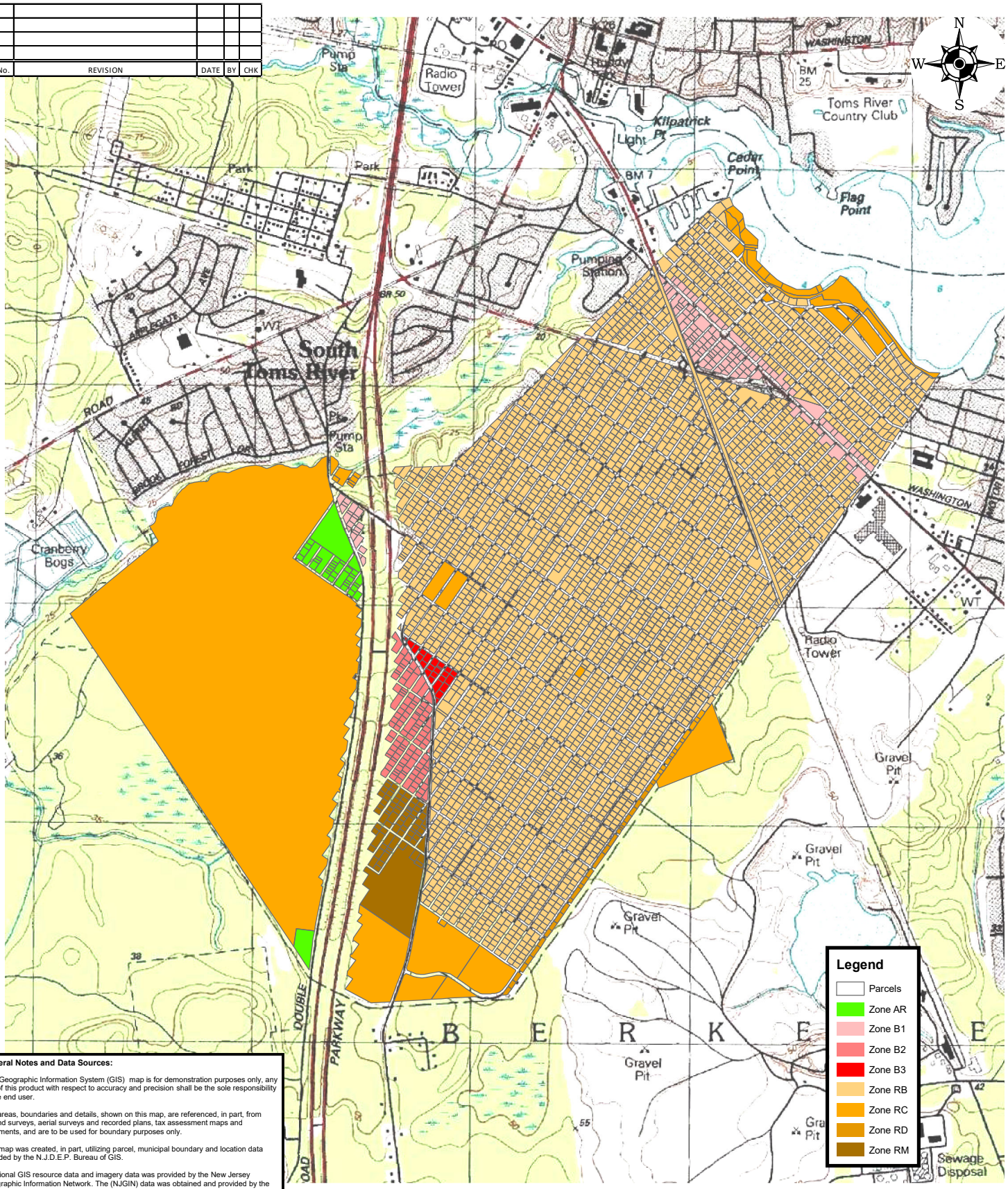
No.	REVISION	DATE	BY	CHK



General Notes and Data Sources:

This Geographic Information System (GIS) map is for demonstration purposes only, any use of this product with respect to accuracy and precision shall be the sole responsibility of the end user.

The areas, boundaries and details, shown on this map, are referenced, in part, from ground surveys, aerial surveys and recorded plans, tax assessment maps and documents, and are to be used for boundary purposes only.

This map was created, in part, utilizing parcel, municipal boundary and location data provided by the N.J.D.E.P. Bureau of GIS.

Additional GIS resource data and imagery data was provided by the New Jersey Geographic Information Network. The (NJGIN) data was obtained and provided by the New Jersey Geographic Information Network (NJGIN): https://njgin.state.nj.us/NJ_NJGINExplorer/index.jsp. This secondary product has not been verified by (NJGIN) and is not state-authorized.

Additional cadastral feature mapping data, such as, waterways, roadways, railroads, aerial orthophotography, etc. was obtained from the New Jersey Department of Environmental Protection (NJDEP). The New Jersey Department of Environmental Protection (NJDEP) data was obtained and provided by the New Jersey Department of Environmental Protection: http://www.state.nj.us/dep/gis/. This secondary product has not been verified by (NJDEP) and is not state-authorized.

All positions are based on the following:
- NAD 83 (horizontal datum)
- New Jersey State Plane Coordinate System
- English units (feet)

The geodetic accuracy and precision of the Geographic Information System (GIS) data contained in this mapping has not been developed nor verified by a professional licensed land surveyor and shall not be nor is intended to be used in matters requiring delineation and location of true ground horizontal and/or vertical controls.

Figure C-6

0 500 1,000 2,000 3,000 4,000 Feet

1 inch = 2,000 feet

Map of Zoning Areas

BOROUGH OF BEACHWOOD

OCEAN COUNTY — NEW JERSEY

February, 2021 — SCALE: 1" = 2,000'

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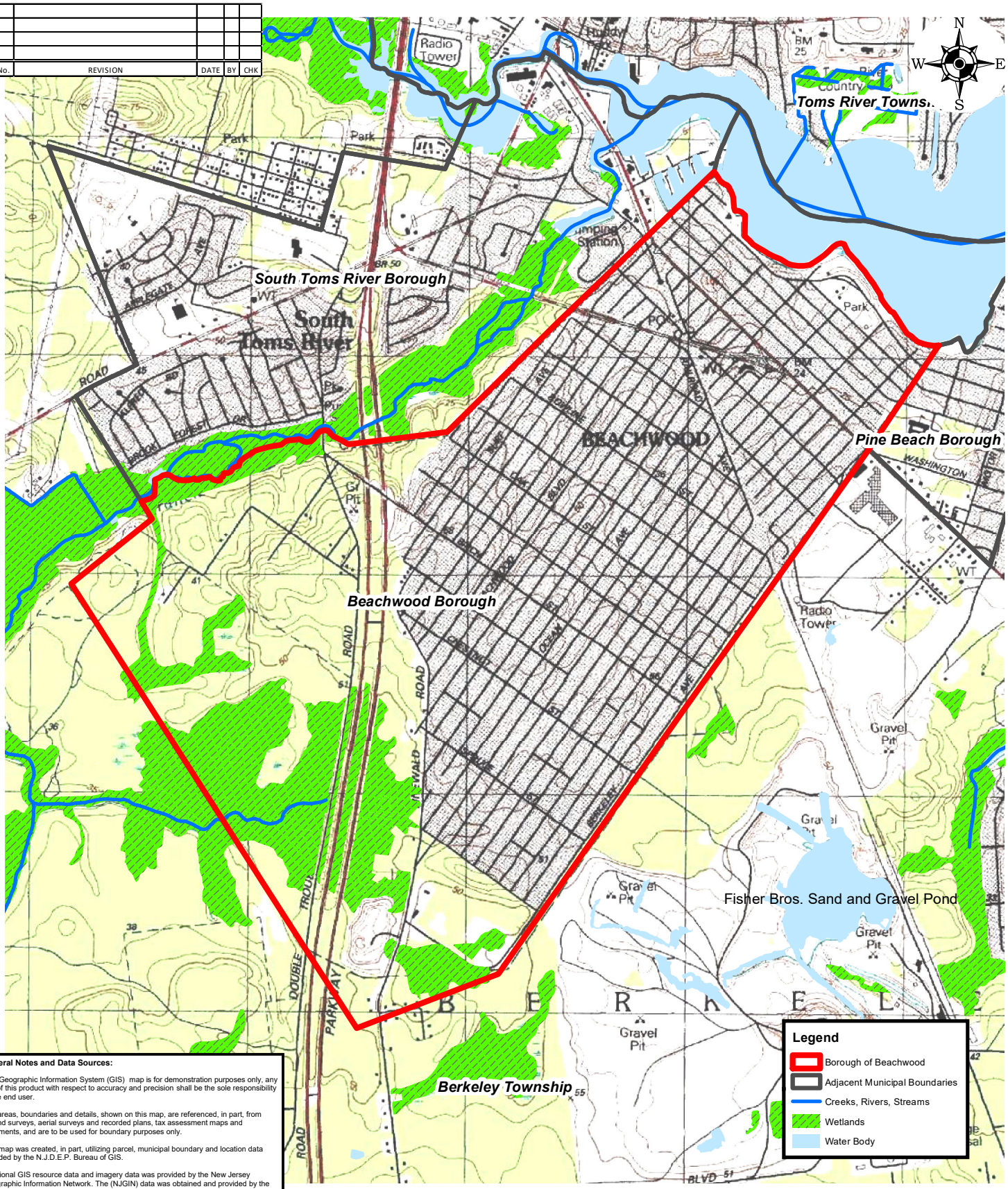

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Figure C-7

0 500 1,000 2,000 3,000 4,000 Feet

1 inch = 2,000 feet

Map of Wetlands and Water Land Uses

BOROUGH OF BEACHWOOD

OCEAN COUNTY — NEW JERSEY

February, 2021 — SCALE: 1" = 2,000'

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