



Memorandum



To: Michael Lavin, Public Works Director, Town of Dennis

*From: Marlee Newman
Kara Rozycki, PE, PMP*

Date: January 8, 2025

Updated: April 7, 2025

Subject: Effluent Recharge Site Screening Evaluation

Executive Summary

This memorandum outlines the comprehensive methodology utilized to identify and rank properties within the Dennis town limits for their potential as an additional site for effluent recharge. The future recharge site(s) will infiltrate clean effluent back into the ground from the Water Resource Recovery Facility (WRRF) to be constructed at 160 Theophilus Smith Road. The site screening evaluation involved a three-step approach: initial elimination of infeasible parcels, application of additional screening criteria, and manual review of parcels incorporating feedback from the Town of Dennis. The criteria reviewed for each parcel include characteristics such as physical features, ownership, land uses, and comparison with the design criteria and site requirements for a future effluent recharge system. The analysis identified 203 viable parcels, with four top-ranking parcel groups recommended as sites for further consideration based on their overall scores and alignment with suitability requirements.

The four top ranking parcel groups—A, B, C, and D—offer distinct advantages. Group A, located south of Theophilus Smith Road, is favorable due to high depth to groundwater, mostly undeveloped land, and proximity to the WRRF. Group B, north of Theophilus Smith Road, is favorable due to high average depth to groundwater, proximity to the WRRF and multiple parking lots that are suitable for subsurface recharge systems. Group C, north of Bob Crowell Road, is favorable due to high undeveloped area and Town ownership. Group C was previously submitted in December 2022 to MassDEP via a WP-83 Hydrogeologic Evaluation Report (#22-WP83-0009-APP) and is currently under review by MassDEP. Group D, near Old Chatham Road, presents advantages including high undeveloped area and partial Town ownership, but could face challenges due to proximity to Zone I areas and potential discharge to Swan Pond River Watershed.

The Town of Dennis should use this memorandum as a tool to select the next recharge site by June 2025 to maintain compliance with its MassDEP issued groundwater discharge permit. Once the next recharge site is selected, a detailed assessment must be conducted that will involve engaging with MassDEP to ensure regulatory compliance and successful implementation.

Effluent Recharge Site Screening Methodology

The town-wide parcel analysis to identify additional effluent recharge sites was performed in three steps. This process, which is outlined in detail below, resulted in the selection of the four most viable parcel groups. The evaluation included criteria such as potential drinking water impacts, minimum parcel size, favorable development status, and property ownership.

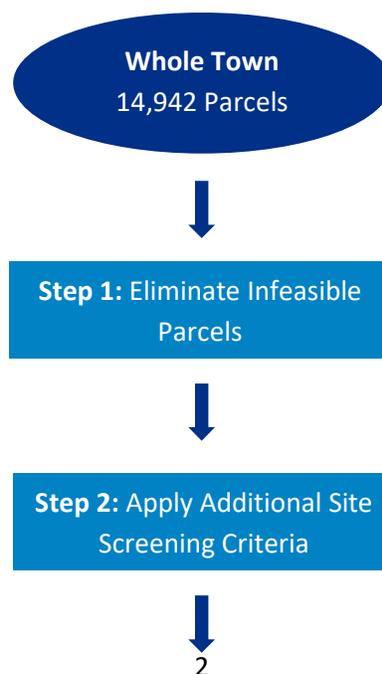
In Step 1, all infeasible parcels were eliminated from further consideration in the analysis. Also in Step 1, neighboring parcels with the same owner were grouped together to be considered as one merged site to reduce the total number of individual sites evaluated.

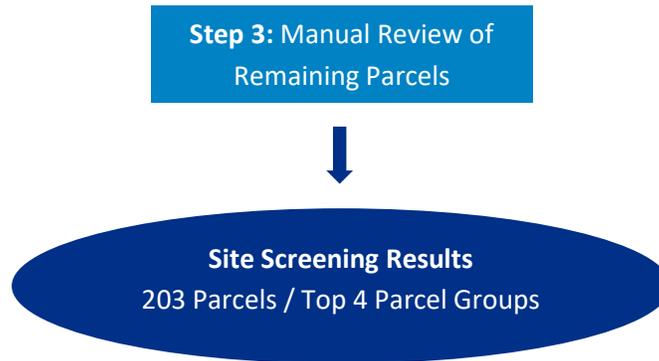
In Step 2, detailed screening criteria were applied to all remaining parcels after Step 1. Yes / No Criteria were applied to parcels as a score of 1 / 0, respectively, and considered flood hazards, Zone II impacts, Town and State parcel ownership, priority habitat areas, soil suitability, public road access, and powerline easements. Additional weighted criteria were applied to parcels as a score range of 0-3 (with a high of 3 being the best score) for each parcel based on specific ranking definitions. These additional criteria considered depth to groundwater, distance to surface waterbodies and wetlands, non-wetland area, ground topography, development status, and distance to the WRRF location.

In Step 3, a collaborative manual review of all remaining parcels was performed. As a result of comments from the Town of Dennis and the Dennis Water District (DWD), manual exclusions and additions of parcels were applied. Parcels were manually excluded due to factors including specific land uses, potential conservation restrictions in progress, current site conditions, and reduced site area due to the adjacent area with the same ownership being excluded. Parcels were manually added back into the screening analysis in cases where the potential for adjacent parcels with different ownership that fell below the area threshold to be combined into one viable site, or there was potential for a land ownership swap.

The flowchart in **Figure 1** demonstrates the order of the multi-step methodology.

Figure 1 – Methodology and Results of the Effluent Recharge Site Screening Evaluation





The sections below detail the criteria, selection process, and resulting parcel groups considered to be the most viable candidates in Dennis for siting an additional effluent recharge system.

Step 1: Eliminate Infeasible Parcels

A summary of the exclusion criteria applied during this step to eliminate infeasible parcels are shown in **Table 1**.

Table 1 – Exclusion Factors

Exclusion Factor	Description
Zone I	Parcels within a Zone I area are excluded.
Minimum Parcel Size	Parcels with total adjacent area with the same ownership < 3 acres are excluded.
Minimum Non-Wetland Area	Parcels with non-wetland area < 3 acres are excluded.
Minimum Depth to Groundwater	Parcels with an average depth to groundwater < 4 feet (ft) are excluded.
Dennis Water Department (DWD) Ownership	Parcels owned by the DWD are excluded with the exception of Parcel 228-15 and 211-25.
Dennis Conservation Land Trust Ownership	Parcels owned by the Dennis Conservation Land Trust are excluded.
Housing Authority Ownership / Land Use	Parcels owned by the Dennis Housing Authority and/or have a Housing Authority land use description are excluded.
Cemetery	All cemeteries are excluded.

Step 2: Apply Additional Site Screening Criteria

This section details the specific criteria applied during Step 2 of the site screening methodology and data sources. A summary of all Yes / No criteria is shown in **Table 2** and a summary of all Additional criteria is shown in **Table 3**.

Data Sources

The MassGIS data portal was used to obtain the parcel data for the Town of Dennis. The majority of the site screening criterion were evaluated using additional data layers from the MassGIS portal, with some supplemented from the Town of Dennis GIS database.

Yes / No Site Screening Criterion No. 1: FEMA Special Flood Hazard Areas

Effluent recharge facilities or related components, if possible, should not be sited within floodplain areas for continued operation during storm conditions and minimal impacts on existing flood hazards. Thus, many areas prone to flooding or which have limited soil permeability due to existing wet conditions were eliminated as part of this siting evaluation. Parcels that fall inside of FEMA Special Flood Hazard Areas were given a ranking of zero as 'less favorable'. Parcels that fall outside of FEMA Special Flood Hazard Areas were given a positive ranking of plus one as 'favorable'.

Yes / No Site Screening Criterion No. 2: Zone II

A Wellhead Protection Zone II, as defined by Massachusetts Department of Environmental Protection (MassDEP), is "an area of an aquifer which contributes water to a well under the most severe pumping and recharge conditions that can be realistically anticipated (180 days of pumping at safe yield, with no recharge from precipitation)". MassDEP may require a higher level of treatment before allowing effluent recharge in a Zone II area depending on time of travel to the well from the recharge site. Parcels that fall inside of Zone II areas were given a ranking of zero as 'less favorable'. Parcels that fall outside of Zone II areas were given a positive ranking of plus one as 'favorable'.

Yes / No Site Screening Criterion No. 3: Town Owned Property

Parcels owned by the Town of Dennis were preferred because town ownership provides significant scheduling, financial, logistical, and legal efficiencies for site access, development, and permitting. Town-owned parcels were therefore given one point as 'more favorable', and parcels not owned by the Town of Dennis were given a ranking of zero as 'less favorable.'

Yes / No Site Screening Criterion No. 4: State/DCR Owned Property

Parcels owned by the State of Massachusetts, or the Massachusetts Department of Conservation and Recreation (DCR) were less preferred because state ownership often adds significant scheduling, financial, logistical, and legal challenges for site access, development, and permitting. Therefore, parcels not owned by the State or DCR were given one point as 'more favorable', and parcels owned by the State or DCR were given a ranking of zero as 'less favorable.'

Yes / No Site Screening Criterion No. 5: NHESP Priority Habitat Areas

MassWildlife's Natural Heritage & Endangered Species Program (NHESP) is responsible for protecting and conserving the state's wide range of native species that are not allowed to be hunted, fished, trapped or commercially harvested within the state. The program also acts to protect natural communities that make up their habitats. These areas, including wetlands, uplands, and marine habitats, are included in the NHESP Priority Habitats of Rare Species layer from MassGIS. Permitting of facilities within a Priority Habitat area carries inherent risk, is extremely challenging, and can add months or years to the permitting process for a proposed project. If more than three acres of the parcel area is outside of a NHESP Priority Habitat Area, the parcel was given one point as 'more favorable'. If less than three acres of the parcel area is outside of a NHESP Priority Habitat Area, the parcel was given a ranking of zero as 'less favorable'.

Yes / No Site Screening Criterion No. 6: Permeable Soil

Wastewater effluent recharge requires permeable, well-draining soil to achieve consistent subsurface drainage and recharge of water. Soil areas classified by the National Resources Conservation Service (NRCS) as 'boulder', 'silty loam', or 'muck/peat' are all soils with low permeability. Parcels that intersect

one of these soil classifications were given a ranking of zero as ‘less favorable’, and parcels that do not intersect any of these soil classifications were given one point as ‘more favorable’.

Yes / No Site Screening Criterion No. 7: Access to Public Road

Typical effluent recharge system maintenance and operation tasks, such as equipment inspection, are most efficiently accomplished when a site has convenient accessibility to public roadways that allow space for large vehicles/trucks to more easily navigate. Therefore, site locations in proximity to public roads were prioritized. Parcels adjacent to a Town road were given one point as ‘more favorable’ and parcels not adjacent to a Town road were given a rank of zero as ‘less favorable.’

Yes / No Site Screening Criterion No. 8: Powerline Easement

There are two major Eversource powerline easements within the Town of Dennis. Eversource has specific permitted uses within these easements. Non-permitted uses include “underground items such as septic systems, utilities, drainage systems, wells, sprinkler or irrigation systems and invisible fencing for pets”. An effluent recharge system is likely to fall under these categories. Therefore, parcels that intersect either powerline easement were given a rank of zero as ‘less favorable’. Parcels that do not intersect either powerline easement were given one point as ‘more favorable’.

Table 2 – Summary of Yes / No Site Screening Criteria

Rank	Criteria Definitions per Ranking Factor
FEMA Special Flood Hazard Areas	
0	Parcel is inside special flood hazard area
1	Parcel is outside of special flood hazard area
Zone II	
0	Parcel is inside Zone II area
1	Parcel is outside of Zone II area
Town Owned Property	
0	Parcel is not owned by Town of Dennis
1	Parcel is owned by Town of Dennis
State/DCR Owned Property	
0	Parcel is owned by the State or DCR
1	Parcel is not owned by the State or DCR
NHESP Priority Habitat Areas	
0	Parcel area < 3 acres is outside of NHESP Priority Habitat Area
1	Parcel area ≥ 3 acres is outside of NHESP Priority Habitat Area
Permeable Soil	
0	Parcel intersects areas classified as ‘boulder’, ‘silty loam’, or ‘muck/peat’
1	Parcel does not intersect soil categories above
Access to Public Road	
0	Parcel is not adjacent to a Town road
1	Parcel is adjacent to a Town road

Rank	Criteria Definitions per Ranking Factor
Powerline Easement	
0	Parcel intersects existing powerline easement
1	Parcel does not intersect existing powerline easement

Additional Site Screening Criterion No. 1: Depth to Groundwater

A suitable site for subsurface effluent recharge ideally has approximately 10 feet of depth to the groundwater table to allow for room to place subsurface structures and allow time for the effluent to infiltrate into the ground. Parcels with an average depth to groundwater less than four feet were excluded from the analysis during Step 1 because recharge was deemed infeasible under those conditions. The remaining parcels were given a ranking from 1-3 based on different levels of average depth to groundwater across the site. Parcels with a higher depth to groundwater were given more points as ‘more favorable’ and parcels with a lower depth to groundwater were given less points as ‘less favorable.’

Additional Site Screening Criterion No. 2: Distance to Nearest Surface Water Body

A new effluent recharge system will have mounding associated with it. This mounding refers to the increase in groundwater level from the additional water from the recharge system. It is preferable to not significantly increase the groundwater levels near surface water bodies, thereby increasing the water elevation in the surface water. To minimize any potential impacts from future effluent, the distance to the nearest surface water body was measured for each parcel. A parcel with a surface water body onsite was given the lowest score as ‘less favorable’, while parcels with surface water bodies further away were given higher scores.

Additional Site Screening Criterion No. 3: Distance to Nearest Vernal Pool

Vernal pools are protected under MassWildlife’s NHESP, and the program provides guidelines for certifying a vernal pool. According to these certification guidelines, vernal pools are temporary bodies of fresh water that provide important habitat for many vertebrate and invertebrate species. Therefore, potential impacts from effluent recharge are important to consider. There is one certified vernal pool located in the Town of Dennis in the wetland area behind the Wixon Innovation School, along with several potential vernal pools noted in MassGIS data. Certified vernal pools located in the adjacent towns of Yarmouth, Brewster, and Harwich were also considered for this criterion. The distance from the nearest certified vernal pool to each parcel was measured. Parcels with a longer distance from a certified vernal pool, which reduces the potential for habitat impacts, were given more points as ‘more favorable’ and parcels with a shorter distance were given less points as ‘less favorable’ because of a higher potential for impacts on the vernal pool habitats.

Additional Site Screening Criterion No. 4: Distance to Nearest Wetland

A more favorable recharge site would be further away from a wetland area to reduce potential nitrogen, groundwater table, and habitat impacts. Therefore, parcels with a longer distance to the nearest wetland were given more points as ‘more favorable’ and parcels with a shorter distance to the nearest wetland were given less points as ‘less favorable.’

Additional Site Screening Criterion No. 5: Distance to Nearest 'Wooded swamp coniferous' Wetland

Surface water elevations on Cape Cod are directly correlated with changes in groundwater elevation. MassDEP has specific concerns regarding species impact with potential rise in groundwater in wooded swamp coniferous wetland areas. An effluent recharge site in close proximity to a wooded swamp coniferous wetland area has higher potential for groundwater impacts than one that is located at a greater distance away. Therefore, parcels with a longer distance to nearest wooded swamp coniferous wetland area were given more points as 'more favorable' and parcels with a shorter distance to the nearest wooded swamp coniferous wetland area were given less points as 'less favorable.'

Additional Site Screening Criterion No. 6: Distance to Nearest 'Wooded swamp mixed trees' Wetland

Surface water elevations on Cape Cod are directly correlated with changes in groundwater elevation. MassDEP has specific concerns regarding species impact with potential rise in groundwater in wooded swamp mixed trees wetland areas. An effluent recharge site in close proximity to a wooded swamp mixed trees wetland area has higher potential for groundwater impacts than one that is located at a greater distance away. Therefore, parcels with a longer distance to nearest wooded swamp mixed trees wetland area were given more points as 'more favorable' and parcels with a shorter distance to the nearest wooded swamp mixed trees wetland area were given less points as 'less favorable.'

Additional Site Screening Criterion No. 7: Non-Wetland Area

Massachusetts Department of Environmental Protection (MassDEP) defines inland wetlands as "areas where water is at or just below the surface of the ground. Although these wetlands can appear dry during some seasons, they contain enough water to support certain plants and soils. Inland wetlands include marshes, wet meadows, bogs, and swamps." Siting of wastewater facilities, as with recharge structures, is prohibited within wetlands. As a result, any parcel with a non-wetland area of less than the minimum parcel size of three acres was excluded from the analysis in Step 1. The remaining parcels were given a ranking from 1-3 based on different amounts of available non-wetland area. Parcels with a higher non-wetland area were given more points as 'more favorable' and parcels with a lower non-wetland area were given less points as 'less favorable.'

Additional Site Screening Criterion No. 8: Maximum Ground Surface Grade Change on Parcel

Variable ground surface can result in a variable groundwater table which is not favorable for an effluent recharge system. High ground surface grade changes can also result in additional construction impacts. Therefore, parcels with a lower maximum ground surface grade change were given more points as 'more favorable' and parcels with a higher maximum ground surface grade change were given less points as 'less favorable.'

Additional Site Screening Criterion No. 9: Favorable Development Status

It is often more cost-effective and resource efficient to construct infrastructure on a site which is not currently developed. Thus, development status was evaluated as part of this screening. Development status was calculated as a percentage of each individual parcel area based on the existing building coverage. A buffer of 2x the building area was applied to these calculations to account for the area directly adjacent to each building that would be unsuitable for recharge. Rankings were applied to each parcel based on the percentage of the parcel that was developed based on the buffered building

coverage. Parcels with a higher undeveloped area were given more points as ‘more favorable’ and parcels with a lower undeveloped area were given less points as ‘less favorable.’

Additional Site Screening Criterion No. 10: Distance to Water Resource Recovery Facility (WRRF)

The future WRRF location is 160 Theophilus Smith Road, in South Dennis. From the perspective of site ranking, an effluent recharge site in close proximity to the WRRF would be more resource efficient and cost beneficial because the pipeline between the WRRF and the effluent recharge site would be shorter and would require less pumping infrastructure to convey the effluent from the WRRF to the recharge site. A distance for each parcel was measured from the WRRF location. Parcels with a shorter distance to the WRRF were given more points as ‘more favorable’ and parcels with a longer distance to the WRRF were given less points as ‘less favorable.’

Table 3 – Summary of Additional Site Screening Criteria

Rank	Criteria Definitions per Ranking Factor
Depth to Groundwater	
0	Average Depth to Groundwater is < 4 ft
1	Average Depth to Groundwater is between 4 and 10 ft
2	Average Depth to Groundwater is between 10 and 20 ft
3	Average Depth to Groundwater is greater than 20 ft
Distance to Nearest Surface Water Body	
0	Distance to nearest surface water body is 0 ft (water body on site)
1	Distance to nearest surface water body is between 0 and 500 ft
2	Distance to nearest surface water body is between 500 and 1,000 ft
3	Distance to nearest surface water body is greater than 1,000 ft
Town Owned Distance to Nearest Vernal Pool	
0	Distance to nearest vernal pool is 0 ft (vernal pool on site)
1	Distance to nearest vernal pool is between 0 and 500 ft
2	Distance to nearest vernal pool is between 500 and 1,000 ft
3	Distance to nearest vernal pool is greater than 1,000 ft
Distance to Nearest Wetland	
0	Distance to nearest wetland is 0 ft (wetland on site)
1	Distance to nearest wetland is between 0 and 100 ft
2	Distance to nearest wetland is between 100 and 500 ft
3	Distance to nearest wetland is greater than 500 ft
Distance to Nearest ‘Wooded swamp coniferous’ Wetland	
0	Distance to nearest ‘Wooded swamp coniferous’ wetland is 0 ft (wetland on site)
1	Distance to nearest ‘Wooded swamp coniferous’ wetland is between 0 and 500 ft
2	Distance to nearest ‘Wooded swamp coniferous’ wetland is between 500 and 2,000 ft
3	Distance to nearest ‘Wooded swamp coniferous’ wetland is greater than 2,000 ft
Distance to Nearest ‘Wooded swamp mixed trees’ Wetland	
0	Distance to nearest ‘Wooded swamp mixed trees’ wetland is 0 ft (wetland on site)

Rank	Criteria Definitions per Ranking Factor
1	Distance to nearest 'Wooded swamp mixed trees' wetland is between 0 and 500 ft
2	Distance to nearest 'Wooded swamp mixed trees' wetland is between 500 and 2,000 ft
3	Distance to nearest 'Wooded swamp mixed trees' wetland is greater than 2,000 ft
Non-Wetland Area	
0	Non-wetland area is <3 acres
1	Non-wetland area is between 3 and 5 acres
2	Non-wetland area is between 5 and 10 acres
3	Non-wetland area is greater than 10 acres
Maximum Ground Surface Grade Change on Parcel	
0	Maximum ground surface change on parcel is greater than 30 ft
1	Maximum ground surface change on parcel is between 20 and 30 ft
2	Maximum ground surface change on parcel is between 10 and 20 ft
3	Maximum ground surface change on parcel is between 0 and 10 ft
Favorable Development Status	
0	Undeveloped area is less than 50% of the parcel area
1	Undeveloped area is between 50% and 75% of the parcel area
2	Undeveloped area is between 75% and 100% of the parcel area
3	100% of the parcel is undeveloped
Distance to Water Resource Recovery Facility (WRRF)	
0	Distance to WRRF is > 3 miles
1	Distance to WRRF is between 2-3 miles
2	Distance to WRRF is between 1-2 miles
3	Distance to WRRF is < 1 mile

The rankings for each criterion detailed in this section were totaled for each parcel to result in a rank sum to indicate how favorable a parcel is for use as a recharge site. A parcel with a higher rank sum is 'more favorable', and a parcel with a lower rank sum is 'less favorable'.

Step 3: Manual Review of Remaining Sites

It is important for the Town of Dennis and ultimate owner/operator of the future effluent recharge site to have an opportunity to provide critical and first-hand input for a final review of the site screening parcels. As a result, this step of the site screening evaluation was a collaborative effort between CDM Smith and the Town of Dennis. The Town holds historical knowledge about specific characteristics of each parcel that can impact the suitability of each parcel outside of the exclusion factors and criterion applied in Steps 1-2. Parcels were manually excluded and added back into the analysis during this step of the workflow.

Representatives from the Dennis Water District (DWD) attended a meeting with CDM Smith and Town of Dennis staff in January 2025 to discuss the results of the effluent recharge site screening analysis

detailed in this memorandum. Additional comments from the DWD following this meeting included excluding additional parcels that are owned by DWD or have large existing developments, and adding a parcel back into the screening that is owned by DWD but is no longer used. A detailed list of DWD comments can be found in **Appendix A**.

Parcel Manually Excluded from Analysis: Residential Land Use Restriction

Residential parcels are generally infeasible for the location of a recharge site due to private land ownership and lack of available undeveloped space. However, residential parcels could be feasible for use as a recharge site if it is able to be combined with a larger plot of undeveloped land. As a result, CDM Smith received guidance from the Town of Dennis to manually exclude all residential parcels except for those that have a large portion of remaining undeveloped area adjacent.

Parcel Manually Excluded from Analysis: Conservation Restriction in Progress

The Town of Dennis provided CDM Smith with a list of parcels with potential conservation restrictions in progress from the Dennis Director of Natural Resources. The conservation restrictions would not allow for a recharge system to be built on these parcels. CDM Smith reviewed this list and excluded any parcels that were not already excluded from the screening analysis due to other exclusion criteria.

Parcel Manually Excluded from Analysis: Adjacent Area Excluded

As discussed above during Step 1 of the workflow, neighboring parcels with the same owner were grouped together to be considered as one merged site. Although the area-based criteria were calculated using these parcel groups, all other criteria were applied to the parcels on an individual basis. If a parcel in an adjacent area grouping was excluded due to a different criterion and the total adjacent area was reduced to below the minimum site size, other parcels in the group were manually excluded as well.

Parcel Manually Excluded from Analysis: 2-Year and 5-Year Zone of Contribution from Drinking Water Wells

The Town of Dennis and CDM Smith completed a groundwater flow model update in North Dennis during 2024. The model will be used as a screening tool to assess potential recharge sites. The updated 2024 screening model was used to simulate the 180-day, 2-year, 5-year, and long-term zone of contribution for each DWD pumping well at both the average annual and maximum permitted pumping rates at each well. The pumping rates are from the 2016 USGS model. Any remaining parcels in the screening analysis that were not excluded under Step 1 and are located within the simulated average annual 2-year zone of contribution were manually removed from the screening analysis. Additionally, any parcels with a large portion located in the simulated average annual 5-year zone of contribution were manually removed from the screening analysis.

Parcel Manually Excluded from Analysis: Other Town Feedback

Other feedback from the Town of Dennis regarding general infeasibility on a parcel-specific basis was applied. Some of these characteristics that made individual parcels infeasible for recharge include heavy excavation on site, known clay layer limitations, potential space zoning restrictions, and high building density. The Site 1 parcel was also manually excluded because it is already permitted for recharge through GWDP #1016-0.

Parcel Manually Added Back into Analysis: Other Town Feedback

Other feedback from the Town of Dennis focused on opportunities for parcels originally excluded due to the criterion applied in Step 1 to be added back into the analysis. Some of these opportunities include the potential to combine smaller adjacent parcels with different ownership into the same site, DWD owned parcels with potential to be subdivided and combined with adjacent parcels (Parcels 228-15 and 211-25), and potential land swaps with conservation areas.

Parcel Manually Excluded from Analysis: DWD Feedback

Feedback from DWD following a meeting to review the site screening results in January 2025. DWD Ownership was applied as an exclusion criterion during Step 1 of the site screening analysis. Most of the comments from DWD focused on excluding parcels with DWD ownership that were not previously excluded because the MassGIS parcel database did not reflect DWD ownership. Additionally, there were two parcels that DWD requested to be removed that had large existing developments that deemed the site unsuitable for recharge.

Parcel Manually Added Back into Analysis: DWD Feedback

Feedback from DWD following a meeting to review the site screening results in January 2025 also included one parcel that was suggested to be added back into the analysis. Parcel 133-5 was previously excluded from the analysis because it is owned by DWD, however DWD noted that it is longer used by the District and can be added back into the site screening. A detailed list of DWD comments can be found in **Appendix A**.

Table 4 includes a summary of the number of parcels manually addressed during Step 3.

Table 4. Summary of Parcels Manually Addressed in Step 3

Description of Workflow Change	Count of Parcels
Manually excluded due to residential land use restriction	74
Manually excluded due to Conservation Restriction in progress per Dennis Director of Natural Resources	42
Manually excluded due to adjacent area excluded during screening process	125
Manually excluded due to 2-Year and 5-Year Zone of Contribution from Drinking Water Wells	1
Manually excluded due to town feedback regarding infeasibility for recharge	102
Manually added back into analysis due to town comments	52
Manually excluded due to DWD comments following meeting on 1/14/2025	8
Manually added back into analysis due to DWD comments following meeting on 1/14/2025	1

Selection of Top Four Parcel Groups for Further Consideration

After completing Steps 1 through 3 of the Effluent Recharge Site Screening Methodology, 203 parcels remain. The ranks were summed from the criteria in Steps 1 and 2, with a higher rank sum representing a more suitable parcel for effluent recharge. The maximum rank sum a parcel could receive was 38 points. The maximum rank sum received by a parcel in this screening was 37. The distribution of rank sum among the final remaining parcels is shown in **Figure 2**. The remaining parcels and their rank sums

are shown spatially in **Figure 3**. A complete list of the remaining 203 parcels and their rankings is attached in **Appendix B**.

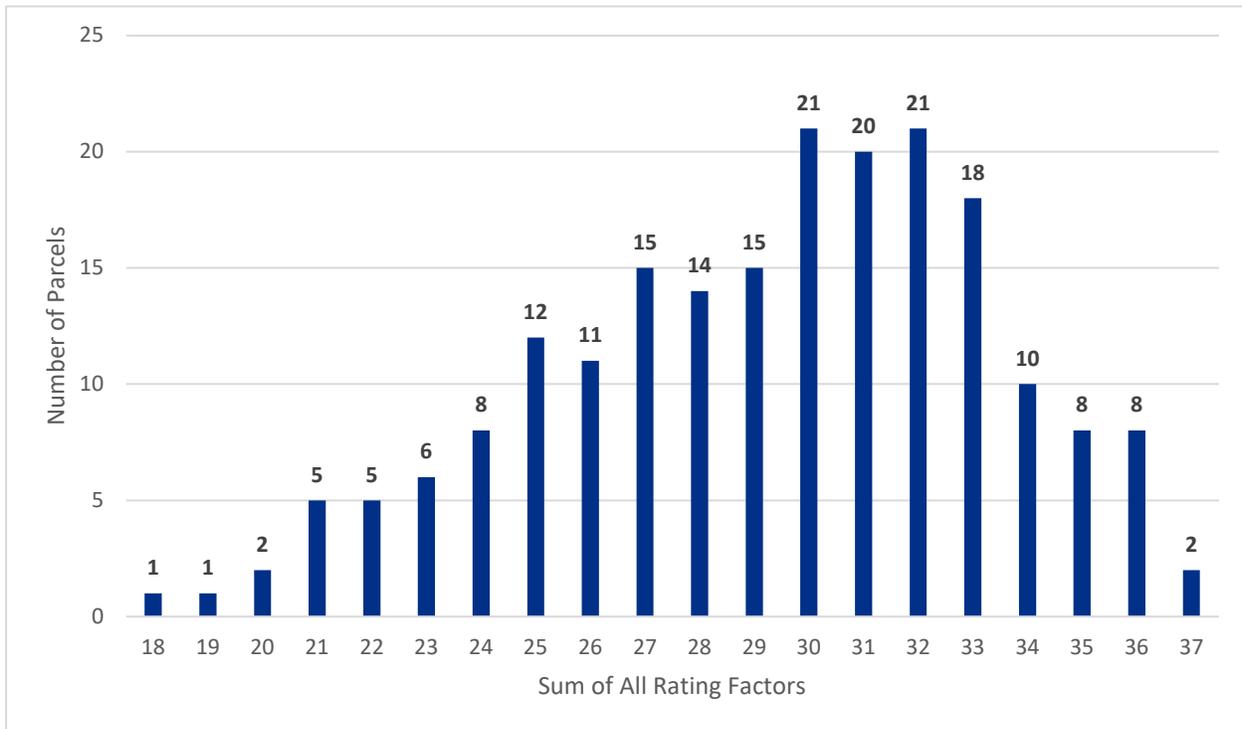


Figure 2 – Rank Sum Distribution for Remaining Parcels

The top four areas for further consideration are defined by adjacent parcel groupings with the highest average sum of all ranking factors. These parcel groupings are labeled A, B, C, and D, in **Figure 4**, and the detailed characteristics are provided below.

Group A – South of Theophilus Smith Road

Group A is a 23.5-acre parcel grouping that includes 10 adjacent parcels. This group is bordered by Theophilus Smith Road to the north, the Rail Trail to the south, Route 134 to the west, and Bertram Ave to the east. Group A is located in the Bass River Watershed, and is outside of Zone II areas, wetlands, flood zones, and priority habitats. This parcel group also has a high average depth to groundwater. The majority of the area is undeveloped and one of the parcels is owned by the Town of Dennis. Discussions with remaining private landowners will need to be held to move forward with Group A for use as an effluent recharge site. This group is considered favorable due to its proximity to the treatment plant location and the highest ranked parcels in this group have a rank sum of 37. Overall, the parcels in Parcel Grouping A have an average rank sum of 34.6.

Group B – North of Theophilus Smith Road

Group B is a 46-acre parcel grouping that includes 19 adjacent parcels. This group is bordered by Route 6 to the north, Theophilus Smith Road to the south, Route 134 to the west, and the Town of Dennis Landfill to the east. Group B is located in the Bass River Watershed, and is outside of wetlands, flood zones, and priority habitats. Although there are small areas of this group with a depth to groundwater less than 10 ft, it has a high average depth to groundwater overall. A small portion of this group is

located within a Zone II area. Most of the area is developed, however this group is a good candidate for a subsurface effluent recharge system placed below parking lots. Alternatively, there is approximately 17 acres of privately owned parcels with open space that could have potential for recharge. Discussions with the landowners of specific parcels, depending on the placement of the recharge system, will be required to move forward with Group B for use as an effluent recharge site. This group is considered favorable due to its proximity to the WRRF and the highest ranked parcels in this group have a rank sum of 36. Overall, the parcels in Parcel Grouping B have an average rank sum of 33.5.

Group C – Bob Crowell Road

Group C is a 56-acre parcel grouping that includes 6 adjacent parcels. This group is bordered by Bob Crowell Road to the south, Old Bass River Road to the west, and Route 134 to the east. Group C is located in the Bass River Watershed, and is outside of wetlands, flood zones, and priority habitats. Part of this group is located within a Zone II area. The majority of this area is undeveloped, and all of the parcels in the grouping are owned by the Town of Dennis. This site was previously submitted in December 2022 to MassDEP via a WP-83 Hydrogeologic Evaluation Report (#22-WP83-0009-APP) and is currently under review by MassDEP. The highest ranked parcels in Parcel Grouping C have a rank sum of 35, and the overall average rank sum for all parcels in this group is 33.8.

Group D – Old Chatham Road

Group D is a 57.5-acre parcel grouping that includes 9 adjacent parcels. This group is bordered by Old Chatham Road to the northeast, Route 6 to the south, and Gages Way to the west. Group D is located partially within the Bass River Watershed, and is outside of wetlands, flood zones, and priority habitats. Although there are some areas of this group with a depth to groundwater less than 10 ft, it has a high average depth to groundwater overall. Additional concerns with the suitability of Group D include that it is partially located within the Swan Pond River Watershed, is located within a Zone II area, and has close proximity to Zone I areas. The majority of the area is undeveloped and one of the parcels in the grouping is owned by the Town of Dennis. Discussions with the remaining private landowners on this site will need to be held to move forward with Group D for use as an effluent recharge site. This group is considered favorable due to its proximity to the treatment plant location and the highest ranked parcels in this group have a rank sum of 33. Overall, the parcels in Parcel Grouping D have an average rank sum of 31.4.

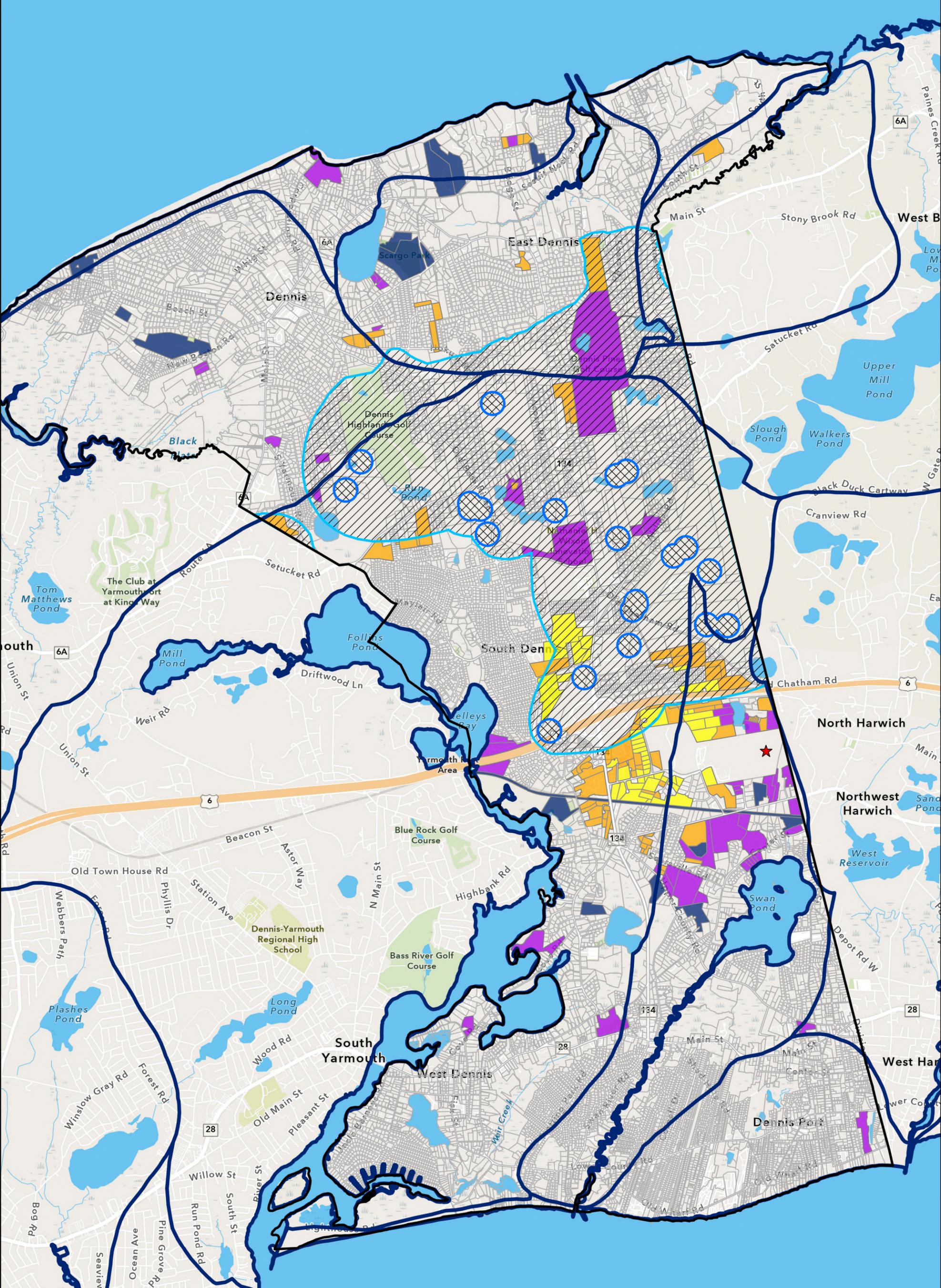
Next Steps

The Town's permitted effluent recharge site at the WRRF currently has a discharge limit of 100,000 gallons per day (gpd) maximum day. Additional recharge sites are needed to discharge the 2.07 million gallons per day (MGD) of treated wastewater based on the average day demand identified in the Comprehensive Wastewater Management Plan (CWMP) to meet mandated nitrogen removal requirements for the Town's Watershed Permit applications (Bass River, Swan Pond and Herring River). This equates to 5.36 MGD maximum day flow of effluent recharge capacity which will require multiple sites.

The Town's current groundwater discharge permit (GWDP) for the effluent recharge site at the WRRF includes conditions that require for additional sites to be approved and constructed by the 4th year of the first 5-year permit (2028), an assessment of the impacts of the approved flow of 100,000 gpd at Site 1 and an analysis of the potential for greater discharge flows at Site 1. The Town will need to determine its next recharge site by June 30, 2025 in order to meet the implementation schedule necessary to

maintain compliance with its MassDEP issued groundwater discharge permit. The following steps are recommended in order to identify the Town's next effluent recharge site:

- Develop comparisons of the top 4 parcel groups from the site screening results evaluating potential impacts such as flooding to basements, impacts to wetlands/NHESP areas, impacts to drinking water supplies, mounding impacts, nitrogen impacts, and other applicable impacts determined during the analysis. Based on these impacts, determine the planning level capacity for the top 4 sites.
- Once the top site is selected (required by June 30, 2025), perform a detailed assessment of the selected site. The assessment will include:
 - Identification of areas of concern on the site and potential solutions for concerns including time of travel and water level changes. Solutions will be assessed via scenarios which may include:
 - Changes to discharge location within the site,
 - Monthly, seasonal or annual variations in recharge rates,
 - Monthly, seasonal or annual limitations to water supply pumping.
 - Calculate the time of travel to DWD wells, kettle ponds and Waters of the United States (WOTUS).
 - Develop a map of particle pathways from recharge area to discharge locations.
 - Develop a map of mounding impacts (90-day period at 80% peak flow) including potentially impacted receptors such as public water supply wells and mapped vernal pools, potential vernal pools and wetlands.
 - Develop a map of water table contours with recharge.
 - Develop a map of depth to water (Mounding impacts from 90-day period plus simulated high-water conditions).
 - Identify recommended discharge technology (subsurface, well injection, or wick wells).
- For the top site, perform a site walk with MassDEP in advance of developing a Hydrogeologic Scope of Work for the selected site for MassDEP review and approval.
- Following hydrogeologic approval from MassDEP, submit a Groundwater Discharge Permit Application for the selected site.



Legend

- Dennis Town Boundary
- WWRF Location
- Watersheds
- Zone 1
- Zone 2

Remaining Dennis Site Screening Parcels

Sum of all Ranking Factors

- 33 - 37
- 28 - 32
- 23 - 27
- 18 - 22
- Excluded Dennis Site Screening Parcels

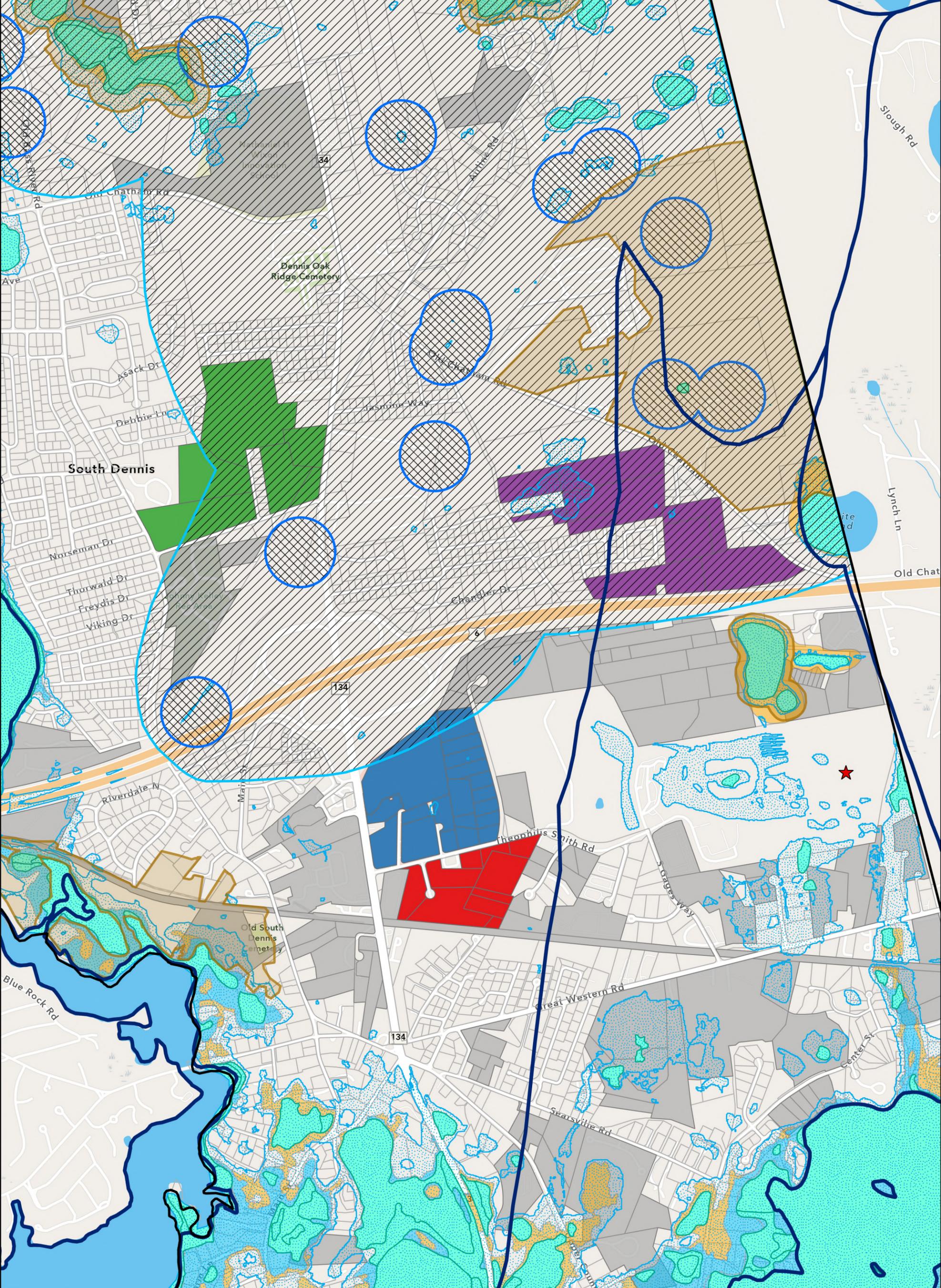
Dennis Effluent Recharge Site Screening
Figure 3 - Remaining Parcel Rankings

CDM Smith

N

0 1,500 3,000
 Feet

1 inch equals 3,000 feet



Legend

Dennis Town Boundary	Watersheds	FEMA Flood Zone
Group	NHEP Priority Habitat	AE
A	Zone 1	VE
B	Zone 2	X
C	Depth to Groundwater less than 10 ft	
D	DEP Wetlands	
Excluded Dennis Site Screening Parcels		
Remaining Dennis Site Screening Parcels		
WWRF Location		

Dennis Effluent Recharge Site Screening
Figure 4 - Top 4 Parcel Groups

**CDM
Smith**

N

0 500 1,000
 Feet

1 inch equals 1,000 feet



Memorandum

Appendix A – Summary of DWD Comments

Representatives from the Dennis Water District (DWD) attended a meeting with the Town of Dennis staff and their engineers to discuss the effluent recharge site screening analysis detailed in this memorandum. Additional comments from the DWD following this meeting to review the site screening results are detailed in **Table A** below and have been incorporated into this site screening document.

Effluent Recharge Site Screening Meeting

Date: January 14, 2025
 Time: 9:00 AM
 Location: Town of Dennis Hall, Prue Room
 Attendees: Tom Andrade, Michael Lavin, Val Peter, Elizabeth Sullivan (Town of Dennis)
 Maura Callahan, David Larkowski, Bob Perry (Dennis Water District)
 Tim Dupuis, Karilyn Heisen, Kara Rozycki, Dave Young (CDM Smith)
 Marc Drainville (GHD)

The meeting focused on a discussion of parcel site screening changes following presentation by Tim Dupuis and Marc Drainville.

Table A – Summary of DWD Comments on Site Screening Parcels

Parcel	DWD Comment	Site Screening Update
MAP_PAR_ID 191-4	Parcel is owned by DWD and will be excluded from the Site Screening.	DWD ownership was not reflected in MassGIS Parcel database. Excluded from Site Screening.
MAP_PAR_ID 191-? (adjacent to Parcel 191-4)		DWD ownership was not reflected in MassGIS Parcel database. Excluded from Site Screening.
MAP_PAR_ID 236-11		Parcel was already excluded from Site Screening due to DWD ownership.
MAP_PAR_ID 207-3		DWD ownership was not reflected in MassGIS Parcel database. Excluded from Site Screening.
LOC_ID F_1026424_2724693		DWD ownership was not reflected in MassGIS Parcel database. Excluded from Site Screening.
MAP_PAR_ID 225-93		DWD ownership was not reflected in MassGIS Parcel database. Excluded from Site Screening.
MAP_PAR_ID 205-1		Excluded from Site Screening.

Town of Dennis Effluent Recharge Site Screening Evaluation

April 7, 2025

Page 2

Parcel	DWD Comment	Site Screening Update
MAP_PAR_ID 205-2	Parcel should be excluded due to existing development on the parcel.	Excluded from Site Screening.
MAP_PAR_ID 290-10		Excluded from Site Screening.
MAP_PAR_ID 133-5	Parcel can be added back into Site Screening. It is owned by DWD but is no longer in use.	Added back into Site Screening.



Memorandum



Appendix B – Remaining Parcel List

MAP_PAR_ID	LOC_ID	Owner	Lot Size (ac)	Adjacent Area with Same Owner (ac)	Watershed	Land Use Description	FEMA SFHA Rank	Zone II Rank	Town Property Rank	State / DCR Rank	Powerline Easement Rank	Development Status Rank	Permeable Soil Rank	Public Road Rank	Groundwater Rank	Priority Habitat Rank	Nearest Water Body Rank	Nearest Vernal Pool Rank	Nearest Wetland Rank	Nearest "Wooded swamp coniferous" Wetland Rank	Nearest "Wooded swamp mixed trees" Wetland Rank	Non-Wetland Area Rank	Elevation Change Rank	Distance Rank	Rank Sum
141-38	F_1025060_2715162	CHAMBERLAIN ROBERT C TRUSTEE	6.1	12.2	MEP - Bass River	Developable Industrial Land	1	1	0	1	1	3	1	1	3	1	3	3	3	3	3	3	3	3	37
141-39	F_1024638_2715354	CHAMBERLAIN ROBERT C TRUSTEE	2.9	12.2	MEP - Bass River	Developable Industrial Land	1	1	0	1	1	3	1	1	3	1	3	3	3	3	3	3	3	3	37
141-37	F_1025079_2715539	CHAMBERLAIN ROBERT C TRUSTEE	3.2	12.2	MEP - Bass River	Developable Industrial Land	1	1	0	1	1	3	1	1	3	1	3	3	3	3	3	3	2	3	36
152-25	F_1025505_2716024	CHAMBERLAIN CHARLES JR ET ALI	1.0	13.0	MEP - Bass River	Developable Industrial Land	1	1	0	1	1	3	1	1	3	1	3	3	3	3	3	3	2	3	36
152-26	F_1025499_2716188	CHAMBERLAIN CHARLES JR ET ALI	0.9	13.0	MEP - Bass River	Developable Industrial Land	1	1	0	1	1	3	1	0	3	1	3	3	3	3	3	3	3	3	36
152-10	F_1025585_2715858	SOUTHPOINTS DENNIS REALTY TR	0.9	5.4	MEP - Bass River	Developable Industrial Land	1	1	0	1	1	3	1	1	3	1	3	3	3	3	3	2	3	3	36
152-27	F_1025481_2716337	CHAMBERLAIN CHARLES JR ET ALI	1.0	13.0	MEP - Bass River	Developable Industrial Land	1	1	0	1	1	3	1	0	3	1	3	3	3	3	3	3	3	3	36
152-28	F_1025454_2716486	CHAMBERLAIN CHARLES JR ET ALI	0.9	13.0	MEP - Bass River	Developable Industrial Land	1	1	0	1	1	3	1	0	3	1	3	3	3	3	3	3	3	3	36
153-8	F_1026427_2715737	DAVENPORT REALTY TRUST	1.0	5.8	MEP - Swan Pond River	Developable Industrial Land	1	1	0	1	1	3	1	1	3	1	3	3	3	3	3	2	3	3	36
153-7	F_1026615_2715699	DAVENPORT REALTY TRUST	1.4	5.8	MEP - Swan Pond River	Developable Industrial Land	1	1	0	1	1	3	1	1	3	1	3	3	3	3	3	2	3	3	36
161-81	F_1022132_2718693	TOWN OF DENNIS	19.5	22.3	MEP - Bass River	Improved, Selectmen or City Council (Municipal)	1	0	1	1	1	2	1	1	3	1	3	3	3	3	3	3	2	2	34
167-13	F_1027489_2717310	TOWN OF DENNIS	7.2	161.3	MEP - Swan Pond River	Vacant, Tax Title/Treasurer	1	1	1	1	1	3	1	0	3	1	2	3	3	3	3	3	2	3	35
142-20	F_1025655_2715575	SOUTHPOINTS DENNIS REALTY TR	4.5	5.4	MEP - Bass River	Radio, Television Transmission Facilities	1	1	0	1	1	3	1	1	3	1	3	3	3	3	3	2	2	3	35
152-16	F_1024714_2715957	DENNIS EXIT 9 REALTY TRUST	4.3	5.4	MEP - Bass River	Shopping Centers/Malls	1	1	0	1	1	1	1	1	3	1	3	3	3	3	3	2	2	3	33
174-13	F_1023137_2720133	TOWN OF DENNIS	6.6	56.1	MEP - Bass River	Improved, Municipal Public Safety	1	0	1	1	1	2	1	1	3	1	3	3	3	3	3	3	2	2	34
151-25	F_1024331_2716304	PATRIOT SQUARE REALTY TRUST	1.7	17.3	MEP - Bass River	Medical Office Buildings	1	1	0	1	1	2	1	1	3	1	3	3	3	3	3	3	2	2	34
189-3	F_1023424_2720487	TOWN OF DENNIS	4.3	56.1	MEP - Bass River	Vacant, Selectmen or City Council (Municipal)	1	0	1	1	1	3	1	1	3	1	3	3	3	3	3	3	2	2	35
166-14	F_1027073_2717625	TOWN OF DENNIS	4.6	161.3	MEP - Swan Pond River	Vacant, Tax Title/Treasurer	1	1	1	1	1	3	1	0	3	1	2	3	3	3	3	3	2	3	35
175-30	F_1023450_2719995	TOWN OF DENNIS	1.9	56.1	MEP - Bass River	Improved, Selectmen or City Council (Municipal)	1	0	1	1	1	2	1	1	3	1	3	3	3	3	3	3	2	2	34
152-32	F_1025198_2717059	CHAMBERLAIN CHARLES JR ET ALI	1.7	13.0	MEP - Bass River	Developable Industrial Land	1	1	0	1	1	3	1	0	2	1	3	3	3	3	3	3	3	3	35
152-29	F_1025413_2716643	CHAMBERLAIN CHARLES JR ET ALI	1.0	13.0	MEP - Bass River	Developable Industrial Land	1	1	0	1	1	3	1	0	2	1	3	3	3	3	3	3	3	3	35
152-30	F_1025270_2716766	CHAMBERLAIN CHARLES JR ET ALI	1.6	13.0	MEP - Bass River	Developable Industrial Land	1	1	0	1	1	3	1	0	2	1	3	3	3	3	3	3	3	3	35
174-9	F_1022660_2719262	TOWN OF DENNIS	2.9	22.3	MEP - Bass River	Vacant, Selectmen or City Council (Municipal)	1	0	1	1	1	3	1	0	3	1	3	3	3	3	3	3	3	2	35
165-8	F_1025751_2717893	CHAMBERLAIN CHARLES E JR	12.3	12.3	MEP - Bass River	Developable Industrial Land	1	0	0	1	1	3	1	1	3	1	3	3	3	3	3	3	1	3	34
188-42	F_1022697_2720895	TOWN OF DENNIS	22.0	56.1	MEP - Bass River	Vacant, Selectmen or City Council (Municipal)	1	0	1	1	1	3	1	1	3	1	3	3	3	3	3	3	1	2	34
142-52	F_1026410_2715020	CAPE COD REGIONAL TRANSIT	9.8	9.8	MEP - Swan Pond River	Transportation Authority	1	1	0	1	1	2	1	1	3	1	3	3	3	3	3	2	1	3	33
187-51	F_1022304_2720142	TOWN OF DENNIS	9.4	56.1	MEP - Bass River	Vacant, Selectmen or City Council (Municipal)	1	0	1	1	1	3	1	1	3	1	3	3	3	3	3	3	1	2	34
152-31	F_1025230_2716908	CHAMBERLAIN CHARLES JR ET ALI	1.7	13.0	MEP - Bass River	Developable Industrial Land	1	1	0	1	1	3	1	0	2	1	3	3	3	3	3	3	2	3	34
154-1	F_1027647_2715837	MID-CAPE ICE ARENA INC	5.3	5.3	MEP - Swan Pond River	Recreation, Active Use (Charitable Org.)	1	1	0	1	1	2	1	1	2	1	2	3	3	3	3	2	3	3	33
152-18	F_1025256_2715984	CHAMBERLAIN CHARLES E JR	1.3	2.2	MEP - Bass River	Developable Commercial Land	1	1	0	1	1	3	1	1	3	1	3	3	3	3	3	0	3	3	34
140-18	F_1024412_2715346	A B K NOMINEE TRUST	3.1	3.1	MEP - Bass River	Commercial Condo	1	1	0	1	1	2	1	1	3	1	3	3	3	3	3	1	3	2	33
142-62	F_1025573_2715002	SMALLEY JAMES EST OF	0.4	0.4	MEP - Bass River	Undevelopable Residential Land	1	1	0	1	1	3	1	1	3	1	3	3	3	3	3	0	3	3	34
151-4	F_1024593_2716756	PATRIOT SQUARE REALTY TRUST	15.6	17.3	MEP - Bass River	Shopping Centers/Malls	1	0	0	1	1	1	1	1	2	1	3	3	3	3	3	3	1	3	31
140-1	F_1023665_2715520	NICKERSON REAL ESTATE	14.7	14.7	MEP - Bass River	Lumber Yards	1	1	0	1	1	1	1	1	2	1	3	3	3	3	3	3	1	2	31
142-61	F_1026424_2715527	DAVENPORT REALTY TRUST	1.7	5.8	MEP - Swan Pond River	Developable Industrial Land	1	1	0	1	1	3	1	0	3	1	3	3	3	3	3	2	1	3	33
173-36	F_1022156_2719640	TOWN OF DENNIS	12.0	56.1	MEP - Bass River	Improved, Selectmen or City Council (Municipal)	1	0	1	1	1	2	1	1	3	1	3	3	3	3	2	3	1	2	32
153-9	F_1025912_2715880	NICKERSON BENJAMIN R	1.4	1.4	MEP - Bass River	Developable Industrial Land	1	1	0	1	1	3	1	1	3	1	3	3	3	3	3	0	2	3	33
164-10	F_1025137_2717292	CHAMBERLAIN CHARLES JR ET ALI	3.2	13.0	MEP - Bass River	Developable Industrial Land	1	0	0	1	1	3	1	0	2	1	3	3	3	3	3	3	2	3	33
178-50	F_1027361_2718933	KELLEY OLIVE	9.4	9.4	MEP - Swan Pond River	Developable Residential Land	1	0	0	1	1	3	1	1	3	1	2	3	3	3	3	2	2	3	33
153-1	F_1025825_2716443	COMMONWEALTH OF MASS	4.1	4.1	MEP - Bass River	Mass. Highway Dept. (MHD) (non-reimbursable)	1	1	0	0	1	2	1	1	3	1	3	3	3	3	3	1	2	3	32
177-44	F_1026686_2719587	LAMMERS DAVID W	1.9	3.2	MEP - Bass River	Undevelopable Residential Land	1	0	0	1	1	3	1	1	3	1	3	3	3	3	3	1	2	3	33
166-10	F_1027267_2717941	LEBEL LAURIE SNOWDEN TRUSTEE	5.7	5.7	MEP - Swan Pond River	Undevelopable Industrial Land	1	1	0	1	1	3	1	0	3	1	2	3	3	3	3	2	2	3	33
151-23	F_1024324_2715901	CFI PROPCO 2 LLC	3.3	3.3	MEP - Bass River	Small Retail and Services stores (under 10,000 sq. ft.)	1	1	0	1	1	2	1	1	3	1	3	3	3	3	3	1	2	2	32
141-3	F_1025485_2715192	TOWN OF DENNIS	1.9	1.9	MEP - Bass River	Vacant, Conservation (Municipal or County)	1	1	1	1	1	3	1	0	3	1	3	3	3	3	3	0	2	3	33
152-12	F_1024674_2716256	DENNIS EXIT 9 REALTY TRUST	1.1	5.4	MEP - Bass River	Eating and Drinking Establishments - restaurants, diners, fast food establishments, bars, nightclubs	1	1	0	1	1	2	1	0	2	1	3	3	3	3	3	2	2	3	32
152-17	F_1025312_2715724	CHAMBERLAIN CHARLES E JR	1.1	1.1	MEP - Bass River	Developable Residential Land	1	1	0	1	1	3	1	1	3	1	3	3	3	3	3	0	2	3	33
129-65	F_1025516_2713314	DAVENPORT REALTY TRUST	1.0	7.2	MEP - Bass River	Single Family Residential	1	1	0	1	1	2	1	1	3	1	3	3	3	3	2	2	3	2	32
142-54	F_1026108_2715763	DAVENPORT DEWITT P TRUSTEE	0.9	0.9	MEP - Bass River	Developable Industrial Land	1	1	0	1	1	3	1	0	3	1	3	3	3	3	3	0	3	3	33

MAP_PAR_ID	LOC_ID	Owner	Lot Size (ac)	Adjacent Area with Same Owner (ac)	Watershed	Land Use Description	FEMA SFHA Rank	Zone II Rank	Town Property Rank	State / DCR Rank	Powerline Easement Rank	Development Status Rank	Permeable Soil Rank	Public Road Rank	Groundwater Rank	Priority Habitat Rank	Nearest Water Body Rank	Nearest Vernal Pool Rank	Nearest Wetland Rank	Nearest "Wooded swamp coniferous" Wetland Rank	Nearest "Wooded swamp mixed trees" Wetland Rank	Non-Wetland Area Rank	Elevation Change Rank	Distance Rank	Rank Sum
167-4	F_1027606_2717701	MACGREGOR J BRUCE TRUSTEE	4.2	10.8	MEP - Swan Pond River	Undevelopable Industrial Land	1	1	0	1	1	3	1	0	3	1	1	3	2	3	3	3	3	3	33
165-7	F_1026255_2718339	TOWN OF DENNIS	0.6	0.6	MEP - Bass River	Vacant, Conservation (Municipal or County)	1	0	1	1	1	3	1	0	3	1	3	3	3	3	3	0	3	3	33
166-12	F_1026731_2718052	BAKER FREEMAN	0.3	0.3	MEP - Swan Pond River	Undevelopable Industrial Land	1	1	0	1	1	3	1	0	3	1	3	3	3	3	3	0	3	3	33
166-16	F_1027020_2718096	NICKERSON SAMUEL	0.8	0.8	MEP - Swan Pond River	Undevelopable Industrial Land	1	1	0	1	1	3	1	0	3	1	3	3	3	3	3	0	3	3	33
166-18	F_1026845_2718067	BAKER OBED	0.5	0.5	MEP - Swan Pond River	Undevelopable Industrial Land	1	1	0	1	1	3	1	0	3	1	3	3	3	3	3	0	3	3	33
178-51	F_1027002_2719858	WATSON BAKER	11.0	11.0	MEP - Swan Pond River	Undevelopable Residential Land	1	0	0	1	1	3	1	0	2	1	3	3	3	3	3	3	1	3	32
150-51	F_1023584_2716010	SOUTH DENNIS AQUISITION CORP	5.2	5.2	MEP - Bass River	Shopping Centers/Malls	1	1	0	1	1	1	1	1	2	1	3	3	3	3	3	2	1	2	30
290-15	F_1022710_2728917	QUAGAN DAVID F	13.5	13.5	MEP - Bass River	Residential Condominium	1	0	0	1	1	2	1	1	3	1	3	3	3	3	3	3	1	1	31
179-5	F_1027785_2719403	TOWN OF DENNIS	5.5	5.5	MEP - Swan Pond River	Vacant, Conservation (Municipal or County)	1	0	1	1	1	3	1	0	3	1	2	3	3	3	3	2	1	3	32
150-53	F_1023355_2716367	CAPE EXIT 9 REALTY TRUST	2.1	3.8	MEP - Bass River	Developable Commercial Land	1	1	0	1	1	3	1	1	2	1	3	3	3	3	3	1	2	2	32
177-52	F_1026160_2719676	LAMMERS DAVID W	1.3	3.2	MEP - Bass River	Developable Residential Land	1	0	0	1	1	3	1	1	2	1	3	3	3	3	3	1	2	3	32
142-57	F_1025867_2715215	DAVENPORT REALTY TRUST	1.0	1.0	MEP - Bass River	Developable Industrial Land	1	1	0	1	1	3	1	0	3	1	3	3	3	3	3	0	2	3	32
141-30	F_1025553_2715315	CHAMBERLAIN CHARLES JR ET ALI	1.0	1.0	MEP - Bass River	Developable Residential Land	1	1	0	1	1	3	1	0	3	1	3	3	3	3	3	0	2	3	32
165-4	F_1026438_2717954	FISHER ROBERT M	6.6	6.6	MEP - Bass River	Undevelopable Industrial Land	1	0	0	1	1	3	1	0	2	1	3	3	3	3	3	2	2	3	32
142-55	F_1026026_2715604	DAVENPORT REALTY TRUST	0.9	0.9	MEP - Bass River	Developable Industrial Land	1	1	0	1	1	3	1	0	3	1	3	3	3	3	3	0	2	3	32
152-20	F_1025249_2716170	CHAMBERLAIN CHARLES E JR	0.9	2.2	MEP - Bass River	Developable Commercial Land	1	1	0	1	1	3	1	0	3	1	3	3	3	3	3	0	2	3	32
151-18	F_1023418_2716220	CAPE EXIT 9 REALTY TRUST	1.7	3.8	MEP - Bass River	Property Used for Postal Services	1	1	0	1	1	2	1	1	2	1	3	3	3	3	3	1	2	2	31
129-72	F_1025332_2713471	BAKER OTIS	2.2	2.2	MEP - Bass River	Single Family Residential	1	1	0	1	1	3	1	1	3	1	3	3	3	3	2	0	3	3	32
164-12	F_1025186_2717826	CHAMBERLAIN CHARLES ET UX	1.5	2.9	MEP - Bass River	Developable Industrial Land	1	0	0	1	1	3	1	0	3	1	3	3	3	3	3	0	3	3	32
166-13	F_1027482_2718173	MACGREGOR BRUCE TRUSTEE	2.5	2.5	MEP - Swan Pond River	Undevelopable Industrial Land	1	1	0	1	1	3	1	0	3	1	2	3	3	3	3	0	3	3	32
129-63	F_1025514_2713609	DENNISPORT PARTNERS LLC	1.7	1.7	MEP - Bass River	Developable Residential Land	1	1	0	1	1	3	1	1	3	1	3	3	3	3	2	0	3	3	32
165-10	F_1026384_2718260	FISHER ROBERT	0.7	0.7	MEP - Bass River	Undevelopable Industrial Land	1	0	0	1	1	3	1	0	3	1	3	3	3	3	3	0	3	3	32
140-5	F_1024126_2714763	SOVEREIGN BANK	0.8	0.8	MEP - Bass River	Bank Buildings	1	1	0	1	1	2	1	1	3	1	3	3	3	3	2	0	3	2	31
212-9	F_1016939_2723875	MACGREGOR CATHERINE TRUSTEE	0.2	4.5	MEP - Bass River	Single Family Residential	1	1	0	1	1	1	1	1	3	1	3	3	3	3	2	1	3	1	30
165-11	F_1026663_2718338	BROWN CLARA P	0.9	0.9	MEP - Bass River	Undevelopable Industrial Land	1	0	0	1	1	3	1	0	3	1	3	3	3	3	3	0	3	3	32
166-11	F_1027666_2718464	STUDLEY ANTHONY	0.1	0.1	MEP - Swan Pond River	Undevelopable Industrial Land	1	1	0	1	1	3	1	0	3	1	2	3	3	3	3	0	3	3	32
192-6	F_1026915_2720221	LAMMERS DAVID W	9.0	9.0	MEP - Bass River	Developable Residential Land	1	0	0	1	1	3	1	1	2	1	3	3	3	3	3	2	0	3	31
177-65	F_1025971_2720036	OHAIRE J KEVIN TRUSTEE	4.7	4.7	MEP - Bass River	Developable Residential Land	1	0	0	1	1	3	1	1	2	1	3	3	3	3	3	1	1	3	31
179-4	F_1027870_2719746	OLOUGHLIN JOSEPH V TRUSTEE	4.7	4.7	MEP - Swan Pond River	Apartments with Four to Eight Units	1	0	1	1	1	2	1	1	2	1	2	3	3	3	3	1	1	3	30
128-20	F_1024173_2714180	ROSENBACH DANIEL J TRUSTEE	2.7	2.7	MEP - Bass River	Single Family Residential	1	1	0	1	1	2	1	1	3	1	3	3	3	3	3	0	2	2	30
150-22	F_1023005_2715966	CHAMBERLAIN ROBERT C TRUSTEE	1.1	1.1	MEP - Bass River	Developable Residential Land	1	1	0	1	1	3	1	1	2	1	3	3	3	3	3	0	2	2	31
152-33	F_1025191_2716452	NICKERSON HORACE L	2.5	2.5	MEP - Bass River	Undevelopable Residential Land	1	1	0	1	1	3	1	0	2	1	3	3	3	3	3	0	2	3	31
165-9	F_1025780_2718255	NICKERSON HORACE L	1.4	1.4	MEP - Bass River	Undevelopable Industrial Land	1	0	0	1	1	3	1	1	2	1	3	3	3	3	3	0	2	3	31
166-17	F_1027021_2718382	OLIVE KELLY	1.4	1.4	MEP - Swan Pond River	Undevelopable Industrial Land	1	0	0	1	1	3	1	0	3	1	3	3	3	3	3	0	2	3	31
128-37	F_1024286_2714135	TOWN OF DENNIS	0.5	0.5	MEP - Bass River	Vacant, Selectmen or City Council (Municipal)	1	1	1	1	1	3	1	1	2	1	3	3	3	3	2	0	2	2	31
164-11	F_1025116_2717551	CHAMBERLAIN CHARLES ET UX	1.4	2.9	MEP - Bass River	Developable Industrial Land	1	0	0	1	1	3	1	0	3	1	3	3	3	3	3	0	2	3	31
129-32	F_1025353_2713282	TOWN OF DENNIS	0.4	0.4	MEP - Bass River	Vacant, Conservation (Municipal or County)	1	1	1	1	1	3	1	1	3	1	3	3	2	2	2	0	3	2	31
225-108	F_1013976_2725653	TOWN OF DENNIS	0.4	3.1	Chase Garden Creek	Vacant, Conservation (Municipal or County)	1	0	1	1	1	3	1	1	3	1	2	3	3	3	3	1	3	0	31
140-3	F_1023956_2714931	KENNETH H FOSTER REALTY TRUST	1.4	1.4	MEP - Bass River	Developable Commercial Land	1	1	0	1	0	3	1	1	3	1	3	3	3	3	2	0	3	2	31
309-48	F_1015899_2730647	P J NYBERG FAMILY LTD PARTNSHP	0.1	0.1	Chase Garden Creek	Undevelopable Residential Land	1	1	0	1	1	3	1	1	3	1	3	3	3	3	3	0	3	0	31
168-7	F_1029100_2717825		0.2	9.2	MEP - Swan Pond River	Use code not known or nor provided.	1	1	0	1	1	3	1	0	3	1	1	3	1	3	3	2	3	3	31
166-15	F_1027338_2718423	STUDLEY ANTHONY	0.2	0.2	MEP - Swan Pond River	Undevelopable Industrial Land	1	0	0	1	1	3	1	0	3	1	2	3	3	3	3	0	3	3	31
335-106	F_1018298_2731873	TOWN OF DENNIS	3.6	3.6	MEP - Sesuit Harbor	Vacant, Tax Title/Treasurer	1	1	1	1	1	3	1	1	3	1	3	3	3	3	3	1	0	0	30
144-10	F_1028131_2715228	GREAT WESTERN LLC	9.9	11.5	MEP - Swan Pond River	Facilities providing building materials, hardware and farm equip, heating, hardware, plumbing, lumber supplies and equip	1	1	0	1	1	2	1	1	2	1	2	3	3	2	2	3	0	3	29
335-107	F_1018193_2731092	TOWN OF DENNIS	4.6	4.3	MEP - Sesuit Harbor	Vacant, Selectmen or City Council (Municipal)	1	1	1	1	1	3	1	1	3	1	3	3	3	3	3	1	0	0	30
152-8	F_1024994_2716266	SOUTH DENNIS EXIT 9 REALTY TR	1.8	1.8	MEP - Bass River	Developable Commercial Land	1	1	0	1	1	3	1	0	2	1	3	3	3	3	3	0	1	3	30

MAP_PAR_ID	LOC_ID	Owner	Lot Size (ac)	Adjacent Area with Same Owner (ac)	Watershed	Land Use Description	FEMA SFHA Rank	Zone II Rank	Town Property Rank	State / DCR Rank	Powerline Easement Rank	Development Status Rank	Permeable Soil Rank	Public Road Rank	Groundwater Rank	Priority Habitat Rank	Nearest Water Body Rank	Nearest Vernal Pool Rank	Nearest Wetland Rank	Nearest "Wooded swamp coniferous" Wetland Rank	Nearest "Wooded swamp mixed trees" Wetland Rank	Non-Wetland Area Rank	Elevation Change Rank	Distance Rank	Rank Sum
332-30	F_1015280_2730883	COMMONWEALTH OF MASS	2.2	6.3	Chase Garden Creek	Dept. of Conservation and Recreation (DCR), Division of State Parks and Recreation	1	1	0	0	1	3	1	1	3	1	3	3	3	3	3	2	1	0	30
168-9	F_1029582_2718339	HAC LOVE LANE, LLC	5.3	5.3	MEP - Swan Pond River	Nursing Homes - includes property designed for minimal care with or without medical facilities	1	1	0	1	1	2	1	1	3	1	1	3	1	2	3	2	2	3	29
212-69	F_1017323_2723859	MACGREGOR CATHERINE TRUSTEE	4.3	4.5	MEP - Bass River	Undevelopable Residential Land	1	1	0	1	1	3	1	0	3	1	3	3	3	3	2	1	2	1	30
140-4	F_1023747_2714612	NICKERSON EDMOND R	4.1	4.1	MEP - Bass River	Undevelopable Residential Land	1	1	0	1	1	3	1	0	3	1	2	3	3	3	2	1	2	2	30
167-15	F_1027353_2718303	RACHEL PEIRCE	5.0	5.0	MEP - Swan Pond River	Undevelopable Industrial Land	1	1	0	1	1	3	1	0	3	1	1	3	2	3	3	1	2	3	30
140-19	F_1024088_2714531	DENNIS CONSERVATION TRUST	1.0	2.1	MEP - Bass River	Vacant, Conservation Organizations (Charitable Org.)	1	1	0	1	1	3	1	0	3	1	3	3	3	3	3	0	2	2	30
140-21	F_1024038_2714276	DENNIS CONSERVATION TRUST	1.1	2.1	MEP - Bass River	Vacant, Conservation Organizations (Charitable Org.)	1	1	0	1	1	3	1	0	3	1	3	3	3	3	2	0	2	2	30
139-23	F_1023502_2714756	COLON-DIAZ INARA ET AL	1.6	1.6	MEP - Bass River	Two-Family Residential	1	1	0	1	1	2	1	1	3	1	2	3	3	3	2	0	2	2	29
168-7	F_1029263_2717818		0.3	9.2	MEP - Swan Pond River	Use code not known or nor provided.	1	1	0	1	1	3	1	0	3	1	1	3	1	2	3	2	3	3	30
168-7	F_1029045_2717837		0.2	9.2	MEP - Swan Pond River	Use code not known or nor provided.	1	1	0	1	1	3	1	0	3	0	1	3	1	3	3	2	3	3	30
168-7	F_1029156_2717823		0.2	9.2	MEP - Swan Pond River	Use code not known or nor provided.	1	1	0	1	1	3	1	0	3	1	1	3	1	2	3	2	3	3	30
212-80	F_1017624_2724049	WINTERS TOBEY ET ALI	1.0	1.0	MEP - Bass River	Undevelopable Residential Land	1	0	0	1	1	3	1	0	3	1	3	3	3	3	3	0	3	1	30
408-52	F_1020623_2737687	FENNEL SHIRLEY A TRUSTEE	1.8	41.4	Direct Discharge	Developable Residential Land	1	1	0	1	1	3	0	1	3	1	2	3	2	2	3	3	3	0	30
168-7	F_1029309_2717792		0.2	9.2	MEP - Swan Pond River	Use code not known or nor provided.	1	1	0	1	1	3	1	0	3	1	1	3	1	2	3	2	3	3	30
167-18	F_1027861_2718487	J LOIRE LEAVITT	0.3	0.3	MEP - Swan Pond River	Undevelopable Industrial Land	1	1	0	1	1	3	1	0	3	1	1	3	2	3	3	0	3	3	30
167-19	F_1028115_2718518	FRIEDLANE MARY B	0.0	0.0	MEP - Swan Pond River	Undevelopable Industrial Land	1	1	0	1	1	3	1	0	3	1	1	3	2	3	3	0	3	3	30
332-29	F_1015634_2730866	COMMONWEALTH OF MASS	4.1	6.3	Chase Garden Creek	Dept. of Conservation and Recreation (DCR), Division of State Parks and Recreation	1	1	0	0	1	3	1	1	3	1	3	3	3	3	3	2	0	0	29
359-59	F_1021273_2733483	SANJAGHI KAREEM J TRUSTEE	3.2	5.1	MEP - Sesuit Harbor	Developable Residential Land	1	1	0	1	1	3	1	1	2	1	3	3	3	3	3	2	0	0	29
333-37	F_1015991_2730822	FERRO STANLEY C	1.9	1.9	Chase Garden Creek	Undevelopable Residential Land	1	1	0	1	1	3	1	1	3	1	3	3	3	3	3	0	1	0	29
208-6	F_1012893_2724559	MATHEWS SAM ET AL	10.0	10.0	MEP - Bass River	Developable Residential Land	1	0	0	1	1	3	1	1	3	1	2	3	3	3	2	3	1	0	29
179-8	F_1028459_2719079	NICKERSON EDMOND R	10.0	10.0	MEP - Swan Pond River	Developable Residential Land	1	0	0	1	1	3	1	1	3	1	1	3	2	2	3	2	1	3	29
146-12	F_1030572_2714798	DAVENPORT REALTY TRUST	4.3	4.6	MEP - Swan Pond River	Warehouses for storage of manufactured products	1	1	0	1	1	0	1	1	2	1	3	3	2	1	1	1	2	3	25
140-14	F_1023680_2714288	KAPINOS ELLEN JOY TRUSTEE	3.2	3.2	MEP - Bass River	Single Family Residential	1	1	0	1	1	2	1	1	3	1	1	3	2	3	2	1	2	2	28
139-24	F_1023459_2714894	SABO SHELLEY WAGAR TRUSTEE	2.2	2.2	MEP - Bass River	Single Family Residential	1	1	0	1	0	2	1	1	3	1	2	3	3	3	2	0	2	2	28
168-7	F_1029510_2717644		2.5	9.2	MEP - Swan Pond River	Use code not known or nor provided.	1	1	0	1	1	3	1	0	3	1	1	3	1	2	3	2	2	3	29
231-3	F_1020956_2725869	TOWN OF DENNIS	1.1	11.3	MEP - Bass River	Vacant, Selectmen or City Council (Municipal)	1	0	1	1	1	3	1	0	3	0	1	3	2	3	3	3	2	1	29
378-20	F_1021209_2733856	SANJAGHI KAREEM J TRUSTEE	0.8	5.1	MEP - Sesuit Harbor	Developable Residential Land	1	1	0	1	1	3	1	0	2	1	2	3	3	3	3	2	2	0	29
167-3	F_1027975_2718255	SOUTHPOINTS DENNIS REALTY TR	0.9	0.9	MEP - Swan Pond River	Developable Industrial Land	1	1	0	1	1	3	1	0	3	1	1	3	2	3	3	0	2	3	29
168-7	F_1029214_2717832		0.3	9.2	MEP - Swan Pond River	Use code not known or nor provided.	1	1	0	1	1	3	1	0	3	1	1	3	1	2	3	2	2	3	29
130-92	F_1026040_2712714	DERICK ELBERT ORION JR	1.0	1.0	MEP - Swan Pond River	Developable Residential Land	1	1	0	1	1	3	1	1	3	1	2	3	2	2	2	0	3	2	29
120-21	F_1025981_2712537	WODEN REALTY TRUST	1.0	1.0	MEP - Swan Pond River	Other Storage, Warehouse, and Distribution facilities (see also usecode 401)	1	1	0	1	1	3	1	1	3	1	2	3	2	2	2	0	3	2	29
361-27	F_1023681_2733500	TOWN OF DENNIS	26.2	183.9	MEP - Sesuit Harbor	Vacant, Conservation (Municipal or County)	1	0	1	1	1	3	1	1	3	1	1	3	2	3	3	3	0	0	28
414-18	F_1027706_2737427	TOWN OF DENNIS	9.7	170.7	Quivett Creek	Vacant, Conservation (Municipal or County)	0	1	1	1	1	3	1	1	3	1	3	3	0	3	3	3	0	0	28
132-2	F_1028197_2713862	CHILDS ROBERT	26.2	26.2	MEP - Swan Pond River	Undevelopable Industrial Land	1	1	0	1	0	2	1	1	2	1	2	3	2	2	2	3	0	3	27
333-72	F_1016139_2731085	VINCENT PHILLIP	3.3	3.3	MEP - Sesuit Harbor	Undevelopable Residential Land	1	1	0	1	1	3	1	0	3	1	3	3	3	3	3	1	0	0	28
228-15	F_1017835_2724429	DENNIS WATER DISTRICT	12.4	12.4	MEP - Bass River	Vacant, District (County)	1	0	0	1	0	3	1	1	3	1	1	3	2	3	3	3	1	1	28
131-5	F_1027149_2713866	VS GREAT WESTERN DENNIS	13.9	13.9	MEP - Swan Pond River	Sand and Gravel Mining/Quarry	1	1	0	1	1	3	1	1	1	1	1	3	0	3	3	3	1	3	28
167-2	F_1028185_2717384	MACGREGOR J BRUCE TRUSTEE	6.5	10.8	MEP - Swan Pond River	Undevelopable Industrial Land	1	1	0	1	1	3	1	0	3	1	0	3	0	3	3	3	1	3	28
219-1	F_1025172_2724326	ULRICH FAMILY NOMINEE TRUST	3.3	3.3	MEP - Bass River	Single Family Residential	1	0	0	1	1	2	1	0	3	1	2	3	3	3	2	1	1	2	27
334-97	F_1017800_2732137	DORLEY GEORGE	1.8	1.8	MEP - Sesuit Harbor	Developable Commercial Land	1	1	0	1	1	3	1	0	3	1	3	3	3	3	3	0	1	0	28
211-25	F_1016329_2723593	DENNIS WATER DISTRICT	10.8	10.8	MEP - Bass River	Vacant, District (County)	1	0	0	1	1	3	1	1	3	1	2	3	2	3	1	3	1	1	28
120-10	F_1026379_2712467	OLOUGHLIN JOSEPH V TRUSTEE	5.2	8.9	MEP - Swan Pond River	Three-Family Residential	1	1	0	1	1	2	1	1	2	1	2	3	2	2	2	2	1	2	27
290-16	F_1022971_2728274	HENRY KELLEY II LIV TR AGMT	2.7	2.7	MEP - Bass River	Undevelopable Residential Land	1	0	0	1	1	3	1	0	3	1	3	3	3	3	3	0	1	1	28

MAP_PAR_ID	LOC_ID	Owner	Lot Size (ac)	Adjacent Area with Same Owner (ac)	Watershed	Land Use Description	FEMA SFHA Rank	Zone II Rank	Town Property Rank	State / DCR Rank	Powerline Easement Rank	Development Status Rank	Permeable Soil Rank	Public Road Rank	Groundwater Rank	Priority Habitat Rank	Nearest Water Body Rank	Nearest Vernal Pool Rank	Nearest Wetland Rank	Nearest "Wooded swamp coniferous" Wetland Rank	Nearest "Wooded swamp mixed trees" Wetland Rank	Non-Wetland Area Rank	Elevation Change Rank	Distance Rank	Rank Sum	
409-50	F_1021377_2737821	FENNEL SHIRLEY A TRUSTEE	1.7	41.4	Direct Discharge	Developable Residential Land	1	1	0	1	1	3	1	1	2	1	3	3	1	1	3	3	2	0	28	
408-54	F_1021161_2737787	FENNEL SHIRLEY A TRUSTEE	1.7	41.4	Direct Discharge	Developable Residential Land	1	1	0	1	1	3	0	1	3	1	3	3	1	1	3	3	2	0	28	
131-2	F_1027091_2712920	TOWN OF DENNIS	1.8	4.3	MEP - Swan Pond River	Vacant, Conservation (Municipal or County)	1	1	1	1	1	3	1	0	3	1	1	3	1	2	2	1	2	3	28	
133-26	F_1029125_2712915	TOWN OF DENNIS	0.9	6.2	MEP - Swan Pond River	Vacant, Conservation (Municipal or County)	0	1	1	1	1	3	1	1	3	1	1	3	1	2	2	2	2	0	3	27
133-27	F_1029033_2712849	TOWN OF DENNIS	1.0	6.2	MEP - Swan Pond River	Vacant, Conservation (Municipal or County)	0	1	1	1	1	3	1	1	3	1	1	3	1	2	2	2	2	0	3	27
354-8	F_1016410_2732791	TOWN OF DENNIS	2.0	5.3	MEP - Sesuit Harbor	Improved, Selectmen or City Council (Municipal)	1	1	1	1	1	3	1	1	3	1	1	3	2	2	3	2	0	0	27	
145-22	F_1029718_2715490	BARDON TRIMONT INC	5.5	5.5	MEP - Swan Pond River	Warehouses for storage of manufactured products	1	1	0	1	1	2	1	1	3	1	1	3	2	2	1	2	0	3	26	
333-57	F_1016231_2731297	SCHOFIELD JOHN H TRUSTEE	1.0	1.0	MEP - Sesuit Harbor	Developable Residential Land	1	1	0	1	1	3	1	0	3	1	3	3	3	3	3	0	0	0	27	
256-67	F_1014354_2726810	PILGRIM LAND TRUST	3.2	3.2	Chase Garden Creek	Undevelopable Industrial Land	1	0	0	1	1	3	1	0	3	1	2	3	3	3	3	1	1	0	27	
79-33	F_1019368_2707283	STEIN RICHARD ET UX	4.5	7.2	MEP - Bass River	Developable Residential Land	0	1	0	1	1	3	1	1	2	1	1	3	2	3	3	2	1	1	27	
168-1	F_1029811_2717745	TOWN LINE LLC	4.9	4.9	MEP - Swan Pond River	Undevelopable Residential Land	1	1	0	1	1	3	1	0	3	1	1	3	1	2	3	1	1	3	27	
145-24	F_1029936_2715505	DENNIS GREAT WESTERN ROAD LLC	3.6	3.6	MEP - Swan Pond River	Liquid Natural Gas Tanks	1	1	0	1	1	3	1	1	2	1	2	3	2	2	1	1	1	3	27	
120-6	F_1026238_2712084	OLOUGHLIN JOSEPH V TRUSTEE	3.6	8.9	MEP - Swan Pond River	Developable Commercial Land	1	1	0	1	1	3	1	1	2	1	2	3	2	1	2	2	1	2	27	
41-42	F_1032971_2703654	TOWN OF DENNIS	8.7	13.8	Direct Discharge	Vacant, Selectmen or City Council (Municipal)	0	1	1	1	1	3	1	1	1	1	1	3	1	3	3	2	2	1	27	
408-53	F_1020889_2737738	FENNEL SHIRLEY A TRUSTEE	2.8	41.4	Direct Discharge	Developable Residential Land	1	1	0	1	1	3	0	1	3	1	2	3	0	2	3	3	2	0	27	
120-20	F_1025854_2712677	ELDREDGE JEFFREY S TRUSTEE	0.9	0.9	MEP - Bass River	Developable Residential Land	1	1	0	1	1	3	1	1	2	1	2	3	2	2	2	0	2	2	27	
133-5	F_1029185_2713590	DENNIS WATER DISTRICT	11.8	12.0	MEP - Swan Pond River	Vacant, District (County)	1	1	0	1	1	3	1	1	2	1	1	3	0	2	2	3	0	3	26	
304-9	F_1010229_2729865	SOUTHdene REALTY LLC	2.1	3.6	Chase Garden Creek	Multiple Houses on one parcel	1	1	0	1	1	2	1	1	2	1	2	3	2	2	2	1	3	0	26	
354-6	F_1016136_2733010	TOWN OF DENNIS	1.0	5.3	MEP - Sesuit Harbor	Vacant, Conservation (Municipal or County)	1	1	1	1	1	3	1	1	3	0	1	3	1	3	3	2	0	0	26	
315-1	F_1023813_2730019	TOWN OF DENNIS	157.7	183.9	MEP - Sesuit Harbor	Improved, Selectmen or City Council (Municipal)	1	0	1	1	1	3	1	1	3	1	0	3	0	3	3	3	0	1	26	
217-1	F_1022776_2723796	TOWN OF DENNIS	44.3	44.3	MEP - Bass River	Improved, Education (Municipal or County)	1	0	1	1	1	2	1	1	3	1	1	1	0	3	3	3	0	2	25	
133-25	F_1029218_2712980	TOWN OF DENNIS	0.9	6.2	MEP - Swan Pond River	Vacant, Conservation (Municipal or County)	0	1	1	1	1	3	1	1	2	1	1	3	1	2	2	2	0	3	26	
133-28	F_1028908_2712751	TOWN OF DENNIS	1.7	6.2	MEP - Swan Pond River	Vacant, Conservation (Municipal or County)	0	1	1	1	1	3	1	1	2	1	1	3	1	2	2	2	0	3	26	
144-2	F_1028842_2714326	JOBENS LLC	4.1	4.1	MEP - Swan Pond River	Sand and Gravel Mining/Quarry	1	1	0	1	0	3	1	1	1	1	2	3	3	2	2	1	0	3	26	
167-10	F_1028128_2718083	FISHER ROBERT M	3.8	3.8	MEP - Swan Pond River	Undevelopable Residential Land	1	1	0	1	1	3	1	0	3	1	0	3	0	3	3	1	1	3	26	
225-94	F_1014179_2725569	TOWN OF DENNIS	2.8	3.1	MEP - Bass River	Vacant, Conservation (Municipal or County)	1	0	1	1	1	3	1	1	3	1	1	3	2	3	2	1	1	0	26	
219-35	F_1025625_2724538	ULRICH RICHARD G TRUSTEE	7.7	7.7	MEP - Bass River	Mixed Use (Primarily Residential, some Agriculture)	1	0	0	1	1	2	1	1	3	1	1	3	1	2	2	2	1	2	25	
168-7	F_1028937_2717897		0.8	9.2	MEP - Swan Pond River	Use code not known or nor provided.	1	1	0	1	1	3	1	0	2	0	0	3	0	3	3	2	2	3	26	
354-7	F_1016267_2733019	TOWN OF DENNIS	1.1	5.3	MEP - Sesuit Harbor	Vacant, Conservation (Municipal or County)	1	1	1	1	1	2	1	1	3	0	1	3	1	2	3	2	0	0	24	
231-55	F_1020974_2725641	TOWN OF DENNIS	10.2	11.3	MEP - Bass River	Vacant, Selectmen or City Council (Municipal)	1	0	1	1	0	3	1	1	3	1	0	3	0	3	3	3	0	1	25	
131-6	F_1027553_2712984	GREAT WESTERN SAND & GRAVEL	13.7	13.7	MEP - Swan Pond River	Sand and Gravel Mining/Quarry	1	1	0	1	1	3	1	1	2	1	0	3	0	2	2	3	0	3	25	
255-2	F_1012676_2727401	3 P PROPERTIES LLC	3.5	3.5	Chase Garden Creek	Small Retail and Services stores (under 10,000 sq. ft.)	1	1	0	1	1	2	1	1	3	1	3	3	2	2	1	1	0	0	24	
144-12	F_1028568_2715615	S B C C LAND TRUST	1.8	3.7	MEP - Swan Pond River	Other Storage, Warehouse, and Distribution facilities (see also usecode 401)	1	1	0	1	1	3	1	0	2	1	1	3	2	2	2	1	0	3	25	
121-7	F_1026870_2712009	DAVENPORT REALTY TRUST	19.4	19.4	MEP - Swan Pond River	Apartments with More than Eight Units	1	1	0	1	1	2	1	1	2	1	2	3	1	1	1	3	0	2	24	
144-13	F_1028603_2715453	S B C C LAND TRUST	0.9	3.7	MEP - Swan Pond River	Developable Industrial Land	1	1	0	1	1	3	1	0	1	1	1	3	2	2	2	1	1	3	25	
167-1	F_1028231_2717805	GORHAM JUDITH M ET AL	3.7	3.7	MEP - Swan Pond River	Undevelopable Residential Land	1	1	0	1	1	3	1	0	3	0	0	3	0	3	3	1	1	3	25	
168-7	F_1029103_2717556		4.5	9.2	MEP - Swan Pond River	Use code not known or nor provided.	1	1	0	1	1	3	1	0	2	0	0	3	0	3	3	2	1	3	25	
146-10	F_1030334_2715859	TOWN LINE LLC	4.0	4.0	MEP - Swan Pond River	Developable Industrial Land	1	1	0	1	1	3	1	0	1	1	2	3	1	2	2	1	1	3	25	
121-5	F_1027345_2711641	POWERS TRUST	3.4	4.1	MEP - Swan Pond River	Undevelopable Residential Land	1	1	0	1	1	3	1	0	3	1	2	3	1	2	1	1	1	2	25	
304-10	F_1010158_2730002	SOUTHdene REALTY LLC	1.5	3.6	Chase Garden Creek	Developable Residential Land	1	1	0	1	1	3	1	1	2	1	2	3	1	2	2	1	2	0	25	
148-10	F_1020280_2716144	COMMONWEALTH OF MASS	8.1	28.9	MEP - Bass River	Mass. Highway Dept. (MHD) (non-reimbursable)	0	1	0	0	1	3	1	1	2	1	0	3	0	3	3	3	0	2	24	
148-8	F_1020479_2716838	KEMPF BARBARA A ET UX	10.5	10.5	MEP - Bass River	Residential Condominium	0	1	0	1	1	2	1	1	2	1	0	3	0	3	3	2	0	2	23	
133-23	F_1029353_2713066	TOWN OF DENNIS	1.7	6.2	MEP - Swan Pond River	Vacant, Conservation (Municipal or County)	0	1	1	1	1	3	1	1	2	1	0	3	0	2	2	2	0	3	24	
148-6	F_1020390_2717133	NELSON MARK G	4.3	4.6	MEP - Bass River	Multiple Houses on one parcel	0	1	0	1	1	2	1	1	2	1	1	3	0	3	3	1	0	2	23	
144-14	F_1028661_2715312	S B C C LAND TRUST	1.0	3.7	MEP - Swan Pond River	Developable Industrial Land	1	1	0	1	1	3	1	0	1	1	1	3	2	2	2	1	0	3	24	
106-14	F_1021761_2710070	TOWN OF DENNIS	15.8	15.8	MEP - Bass River	Vacant, Conservation (Municipal or County)	0	1	1	1	1	3	1	1	1	1	0	3	0	2	2	3	1	2	24	
167-7	F_1028244_2718296	YOUNG-KROEGER DEBORAH L TRUSTEE	0.9	0.9	MEP - Swan Pond River	Undevelopable Residential Land	1	1	0	1	1	3	1	0	3	0	0	3	0	3	3	0	1	3	24	

MAP_PAR_ID	LOC_ID	Owner	Lot Size (ac)	Adjacent Area with Same Owner (ac)	Watershed	Land Use Description	FEMA SFHA Rank	Zone II Rank	Town Property Rank	State / DCR Rank	Powerline Easement Rank	Development Status Rank	Permeable Soil Rank	Public Road Rank	Groundwater Rank	Priority Habitat Rank	Nearest Water Body Rank	Nearest Vernal Pool Rank	Nearest Wetland Rank	Nearest "Wooded swamp coniferous" Wetland Rank	Nearest "Wooded swamp mixed trees" Wetland Rank	Non-Wetland Area Rank	Elevation Change Rank	Distance Rank	Rank Sum
134-56	F_1030556_2713992	C S A S LLC	3.1	3.1	MEP - Swan Pond River	Automotive Supplies Sales and Service	0	1	0	1	1	2	1	1	2	1	2	3	1	1	1	1	3	23	
83-30	F_1024276_2707315	TOWN OF DENNIS	14.1	14.1	MEP - Bass River	Improved, Education (Municipal or County)	0	1	1	1	1	2	1	1	1	1	2	3	0	2	1	3	1	1	23
89-28	F_1030940_2707198	ROMAN CATHOLIC BISHOP OF FR	4.3	4.3	MEP - Herring River (Harwich)	Church, Mosque, Synagogue, Temple, etc...	0	1	0	1	1	2	1	1	1	1	3	3	0	2	1	1	2	2	23
402-1	F_1014345_2736698	TOWN OF DENNIS	18.5	18.5	Direct Discharge	Improved, Selectmen or City Council (Municipal)	0	1	1	1	1	3	0	1	2	1	0	3	0	3	3	3	0	0	23
145-7	F_1029375_2715306	TRIMOUNT BITUMINOUS PRODUCTS C	6.2	6.2	MEP - Swan Pond River	Sand and Gravel Mining/Quarry	1	1	0	1	1	2	1	1	2	1	0	3	0	2	1	2	0	3	22
345-156	F_1006128_2733467	TOWN OF DENNIS	11.5	14.3	Direct Discharge	Vacant, Selectmen or City Council (Municipal)	0	1	1	1	1	2	1	1	1	1	2	3	0	2	3	2	0	0	22
120-1	F_1025820_2711966	DENNIS CHURCH OF THE NAZARENE	7.4	7.4	MEP - Bass River	Church, Mosque, Synagogue, Temple, etc...	1	1	0	1	1	2	1	1	2	1	2	3	0	0	1	2	1	2	22
325-23	F_1007511_2731776	CICCHETTI ROBERT	3.8	7.7	Chase Garden Creek	Undevelopable Residential Land	0	1	0	1	1	2	1	0	2	1	1	3	1	2	3	2	1	0	22
139-14	F_1022450_2714757	TOWN OF DENNIS	13.3	63.2	MEP - Bass River	Improved, Selectmen or City Council (Municipal)	0	1	1	1	0	3	1	1	1	0	0	3	0	3	2	3	0	2	22
374-43	F_1017165_2733674	TOWN OF DENNIS	36.7	44.9	MEP - Sesuit Harbor	Vacant, Conservation (Municipal or County)	1	1	1	1	1	3	1	1	2	1	0	3	0	1	1	3	0	0	21
304-14	F_1009225_2730718	SUSAN E MAKOWSKI REV TR ET AL	32.9	32.9	Chase Garden Creek	Multiple Houses on one parcel	0	1	0	1	1	2	1	1	3	1	0	3	0	1	2	3	0	0	20
131-7	F_1027312_2713322	131A GREAT WESTERN ROAD LLC	4.7	4.7	MEP - Swan Pond River	Sand and Gravel Mining/Quarry	1	1	0	1	1	3	1	0	1	1	0	3	0	2	2	1	0	3	21
111-42	F_1027181_2711111	DAVENPORT DEWITT TRUSTEE	9.9	9.9	MEP - Swan Pond River	Apartments with More than Eight Units	0	1	0	1	1	2	1	1	2	1	2	3	0	1	0	2	0	2	20
409-47	F_1021726_2737138	CROWELL BETH K	7.5	7.5	Direct Discharge	Developable Residential Land	1	1	0	1	1	3	1	1	2	1	2	3	0	0	3	1	0	0	21
146-31	F_1030472_2714278	C S A W LLC	5.4	5.4	MEP - Swan Pond River	Automotive Supplies Sales and Service	0	1	0	1	0	3	1	0	2	1	2	3	0	0	1	2	1	3	21
373-11	F_1016898_2734290	TOWN OF DENNIS	8.2	44.9	MEP - Sesuit Harbor	Vacant, Conservation (Municipal or County)	1	1	1	1	1	3	1	0	1	1	0	3	0	1	2	3	1	0	21
141-35	F_1021173_2715560	COMMONWEALTH OF MASS	20.7	28.9	MEP - Bass River	Dept. of Conservation and Recreation (DCR) - Division of Urban Parks and Recreation (non-reimbursable)	0	0	0	0	1	3	1	1	2	1	0	3	0	1	1	2	0	3	19
118-15	F_1023621_2711269	MASSACHUSETTS AUDUBON SOCIETY	6.8	7.8	MEP - Bass River	Vacant, Conservation Organizations (Charitable Org.)	0	1	0	0	1	3	1	0	1	1	1	3	0	2	0	2	0	2	18