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EPA Approved: TBD
Date Amended: N/A
Amendment Notes: N/A

Narragansett Bay Watershed SCP Lawton Brook (RI0007035R-04) Portsmouth, RI

Key Findings

This SCP Report is for Lawton Brook (RI0007035R-04) located within the Narragansett Bay Watershed (Figure 1-A).

Table 1-A: Subwatershed Summary

Impairment(s)	Evaluation Methodology	RIDOT Reduction Target (% / Acres)	Existing Treatment	Potential Treatment	Runoff Reduction	Remaining RIDOT Reduction Target	NonRIDOT Treatment Credit
Benthic- Macroinvertebrate Bioassessments	IC Method	62% (4.4 ac)	0	7.3 ac	4.6 ac-ft	0	65%

Site Description

Subwatershed Description

- The subwatershed is located in Portsmouth, RI.
- The subwatershed is 274 acres and 26% impervious (70 acres).
- The general land uses within the subwatershed are industrial and woodland, with a smaller amount of residential and agricultural land.

RIDOT Discharging Area

- RIDOT maintained property is 10.8 total acres and 7.1 impervious acres.
- No "Other RIDOT roadways" exist in this subwatershed.
- The subwatershed area increased from approximately 139 acres to 274 acres (97 percent) due to changes identified during desktop review and site visits.
- There are no High Priority outfalls (Appendix 6).
- There are no Priority outfalls (Paragraph 20.b.).
- There are no RIDOT MS4 discharge points for which RIDOT must provide a schedule for initiating IDDE inspections (Appendix 8).
- There are no MS4 outfalls for which RIDOT shall identify upgradient interconnections (Appendix 9).
- There are no TMDL Priority outfalls.
- There are no incoming MS4 interconnections and 2 private incoming interconnections.
- There are no outgoing interconnections.

Non-Discharge Areas

- RIDOT did not identify any non-discharge areas.

Sewered/Combined Sewer Areas

- There are no areas in the subwatershed that are sewered.
- There are no areas that discharge to a combined sewer system.

Reduction Target Development

- RIDOT's IC reduction target is 4.4 acres.
- A TMDL is planned for 2026 for the benthic-macroinvertebrates bioassessments impairment.

Existing Stormwater Controls

- No STUs currently exist within the subwatershed.

Potential Enhanced Non-Structural Stormwater Controls

- RIDOT did not identify any non-structural controls.

Potential Structural Stormwater Controls

- RIDOT has identified that structural control measures are needed to reduce its effective IC to achieve the RIDOT IC reduction target.
- RIDOT identified 4 opportunities for potential STUs within the subwatershed (Table 2-A) with a total IC reduction credit of 6.4 acres.
- This SCP includes areas that will be modified as part of a TIP project (as of November 2018) scheduled for the next 5 years within the subwatershed with an assumed 50% treatment level with a total IC reduction credit of 0.9 acres.

Table 2-A: STU Stormwater Controls Summary

STU ID	Stormwater Control Type	Catchment Area (ac)	Impervious Cover (ac)	Treatment Depth (in) (Depth of Runoff Treated)	Runoff Reduction (ac-ft)	Equivalent IC Reduction Credit (ac)	Estimated Cost	Cost per IC Reduction Acre (\$/ac)	Retrofit Priority
SCP-LBR-001	Sand Filter	76.3	26.4	0.1	0.4	5.3	\$387,700	\$73,400	1
Percent RIDOT Reduction Reached									120%
SCP-LBR-002	Bioretention Swale	1.2	0.4	0.9	0.2	0.2	\$34,100	\$179,500	2
SCP-LBR-003	Bioretention Swale	1.2	0.4	0.9	0.2	0.2	\$38,100	\$165,700	2
SCP-LBR-004	Bioretention Basin	2.1	1.4	0.8	0.5	0.7	\$55,300	\$75,800	2
SCP-LBR-005	TIP	0.2	0.2	0.0	0.3	0.1	--	--	2
SCP-LBR-006	TIP	0.3	0.3	0.0	0.6	0.2	--	--	2
SCP-LBR-007	TIP	1.9	1.3	0.0	2.4	0.7	--	--	2
Percent RIDOT Reduction Reached									166%
Total		83.3	30.5		4.6	7.3	\$515,200		

Site Description

Subwatershed Description

Lawton Brook (RI0007035R-04) is located within the Narragansett Bay Watershed (Figure 1-A). The subwatershed is located in Portsmouth, RI, in the southwest corner of the Town on the west coast of Aquidneck Island. Its headwaters are located in Saint Mary's Pond (RI0007035L-05) in Portsmouth, which flows west into Sisson Pond (RI0007035L-10) and then north into Lawton Valley Reservoir (RI0007035L-06), all three of which are impounded by earthen dams. Lawton Brook begins at the bottom of the Lawton Valley Reservoir spillway. Close to half of the RIDOT Right-of-Way (ROW) in the subwatershed drains to an outfall at the top of a ditch that discharges to Lawton Brook just below the spillway. The remaining ROW drains to several outfalls along the bridge that passes over Lawton Brook. The brook passes under the RIDOT roadway at this bridge where it flows past residential and commercial/industrial land, eventually flowing through mostly wooded area until it reaches its mouth at Weaver Cove. From observation of aerial imagery, the brook appears to receive runoff from the large parking lots of Raytheon Co. and RTN Federal Credit Union (1847 West Main Road). The Rhode Island Department of Environmental Management (RIDEM) water quality classification for Lawton Brook is Class A. Use goals associated with this classification include fish and wildlife habitat and primary and secondary contact recreation. According to RIDEM's Clean Water Act (CWA) Integrated List of Waterbodies – Appendix A 2016 Index of Waterbodies and Category Listing,¹ the impairment affecting this waterbody segment is benthic-macroinvertebrate bioassessments. RIDEM has classified Lawton Brook as a Category 5 waterbody that is not supporting fish and wildlife habitat. The waterbody is not assessed for primary and secondary contact recreation or fish consumption. A TMDL for the benthic-macroinvertebrates bioassessments impairment is scheduled for 2026.

RIDOT maintained property in the subwatershed is 10.8 acres; 7.1 acres of which is impervious. ArcGIS online Figure 1/2 shows the subwatershed with the impaired waterbody segments, the Rhode Island Department of Transportation (RIDOT) maintained roadways, the RIDOT maintained property (catchment area) that is discharging to the waterbody, and the outfalls that are discharging to the waterbody. According to 2011 land use data obtained from the Rhode Island Geographic Information System (RIGIS),² the subwatershed consists mostly of industrial and woodland land use, with a smaller amount of residential and agricultural land.

RIDOT Discharging Area Description

ArcGIS online Figure 3 shows RIDOT maintained roadways and catchment areas, outfalls, catch basins, interconnections, and RIDEM-listed impaired water bodies located within the subwatershed, as discussed below.

Subwatershed Boundary Delineation

The RIDEM-provided subwatershed boundary was reviewed through desktop analysis and site visits. As a result of the review, the subwatershed area increased from approximately 139 acres to

¹ RIDEM, March 2018, 2016 Integrated Water Quality Monitoring and Assessment List – Appendix A 2016 Index of Waterbodies and Category Listing. Available at: <http://dem.ri.gov/programs/benviron/water/quality/surfwq/pdfs/iwr16.pdf>

² Rhode Island Department of Environmental Management, Rhode Island Department of Administration, Statewide Planning Program, Photo Science, Inc. www.rigis.org

274 acres (97 percent). A subwatershed boundary modification memo was sent to RIDEM on December 31, 2018 and is under review.

A revised subwatershed was delineated using automated ArcSWAT tools and 1-meter LiDAR elevation data. The new delineation differed significantly from the HUC14 delineation. Beyond the minor variations due to topographic data, three major modifications were made to the Lawton Brook subwatershed boundary:

1. The revised delineation incorporates RIDOT drainage information. RI-114 from ~150 feet north of Locust Ave to just in front of the Newport Car Museum (1947 West Main Road) drains to an outfall discharging indirectly to Lawton Brook via a vegetated drainage channel. RI-114 from the Newport Car Museum to ~150 feet north of the Valley Inn restaurant (2221 West Main Road) drains to a series of four outfalls located along the bridge over Lawton Brook.
2. RIDOT-mapped interconnections indicate incoming interconnections from the Newport Car Museum and from Bay View Estates Apartments (2121 West Main Road). No drainage information was obtained from Raytheon Co. which is located in the central portion of the subwatershed. The delineation of this area was based on the topography of existing impervious cover and aerial imagery.
3. The portion of Burma Road (also named Defense Highway) in proximity to the outlet of Lawton Brook drains to a low point under a railroad bridge where Lawton Brook connects to Weaver Cove via a culvert under Burma Road.

Other RIDOT Roadways

Preliminary evaluation of this subwatershed determined RIDOT roads are properly identified and no "Other RIDOT roadways" exist in this subwatershed.

RIDOT Roadways

RIDOT maintained roadways in the subwatershed include: West Main Road (RI-114). RIDOT maintains 10.8 acres of property (impervious and pervious) within the subwatershed, all of which are directly or indirectly discharging to Lawton Brook with 7.1 acres of impervious cover. The RIDOT direct and indirect discharging areas include the following:

Table 3-A: Direct and Indirect Discharging Areas

RIDOT Roadway	Roadway Type	ROW Description	Adjacent Land Use	Drainage System
West Main Road (RI-114)	four lane roadway with no sidewalks	Right-of-Way (ROW) width ranging from 60- to 110- feet	industrial, forested, agricultural	closed drainage systems with indirect discharge to Lawton Brook

Outfall Catchment Delineation

RIDOT catchment areas by discharge location within the subwatershed are summarized in Appendix A-A. Catchments in the Lawton Brook subwatershed were delineated based on a desktop review of RIDOT drainage data, 1-meter resolution LiDAR data, Google Earth, and 3-inch resolution aerial imagery. The RIDOT ROW boundary was determined based on parcel boundaries retrieved from

the Town of Portsmouth website. Non-RIDOT catchments were delineated only for those RIDOT catchments containing a potential STU. Non-RIDOT areas comprise a significant portion of the total catchment area for RIDOT outfalls in Lawton Brook. Aerial imagery and topography indicated that the majority of the Raytheon parking lot and neighboring agricultural land runs on to West Main Road upstream of the mapped outfall discharging to the vegetated drainage channel. West Main Road consists of a closed drainage system draining to a total of five outfalls that discharge directly or indirectly to Lawton Brook. Field verification of four of these five outfalls was not possible due to dense vegetation and safety concerns, however these outfalls were mapped based on information from RIDOT's existing storm pipe data. In general, catchments were confirmed during the field visit, where questions regarding utilities, roadway crowns and superelevation, and drainage infrastructure were answered.

Illicit Discharge Detection and Elimination Priority Outfalls

There are 5 mapped RIDOT outfalls within the Lawton Brook subwatershed. There are no High Priority outfalls (as defined in Appendix 6) or Priority outfalls (as defined by paragraph 20.b.) located in the subwatershed. There are also no RIDOT MS4 discharge points for which RIDOT must provide a schedule for initiating IDDE inspections (per Appendix 8). There are no MS4 outfalls for which RIDOT shall identify upgradient interconnections (per Appendix 9).

TMDL Priority Outfalls

There are no TMDL Priority outfalls located in the subwatershed.

Interconnections

Interconnections are shown on ArcGIS online Figure 3. RIDOT utilized RIDOT drainage data and reviewed local topography and surface drainage patterns to identify possible interconnections.

MS4: RIDOT identified no locations where municipal separate storm sewer systems (MS4s) tie into the RIDOT drainage system (incoming interconnections) and no locations where RIDOT drainage ties into a municipal drainage system adjacent to their property (outgoing interconnections).

Private: The desktop review, drainage system mapping, and field visits identified 2 potential private interconnections. Based on observation using Google Maps, the interconnections are most likely from Newport Car Museum (1947 West Main Road) and Bay View Apartments (2121 West Main Road).

RIDOT reviewed its Physical Alterations Permit Application (PAPA) database. This database lists permits requested by adjacent properties to tie into the RIDOT storm drainage system and includes an analysis of the applicant's contribution to the RIDOT storm drainage system. The current PAPA database did not contain entries for any of the potential interconnections listed above. The interconnections are included in RIDOT's online mapping database. RIDOT will add all private interconnections for which the owner is unknown to its IDDE program to verify that only stormwater flows are being discharged and will have the owners file for a PAPA. Further, RIDOT will review future PAPA permit requests for compliance with its TAC 0071 – PAPA Guidance – Public and Private Tie-Ins to the State's Drainage System and its RIPDES permit and to ensure that only stormwater flows are being introduced to their system.

Non-Discharge Areas

RIDOT did not identify any non-discharge areas in the subwatershed.

Sewered/Combined Sewer Areas

There are no areas in the subwatershed that are sewered.

There are no areas in the subwatershed that discharge to a combined sewer system.

Flow and Water Quality Monitoring Data

As part of this SCP, RIDOT reviewed the following sources for existing flow and water quality monitoring data:

- University of Rhode Island (URI) Watershed Watch
- Groundwater Elevation Data

URI Watershed Watch³

The URI Watershed Watch does not have any monitoring sites within the Lawton Valley Reservoir subwatershed. The only monitoring site in the Town of Portsmouth is at Melville Pond – Upper.

Groundwater Elevation Data

Groundwater elevation data was obtained from the United States Department of Agricultural National Cooperative Soil Survey and includes soil classification, standard groundwater depths, and infiltration rates.

Reduction Target Development

The impairment affecting Lawton Brook (RI0007035R-04) is benthic-macroinvertebrate bioassessments. A TMDL is planned for 2026 for this impairment.

Impervious Cover Method

As shown in Table 4-A-2 the subwatershed's percent IC is greater than 10%, thereby indicating that stormwater is a likely contributor to the impairment. To meet RIDOT's apportioned responsibility for achieving the subwatershed IC reduction target, RIDOT's effective IC within the subwatershed will need to be reduced by the percentage calculated in Table 4-A-2. (Note: The TMDL Method was not performed for this water body, and as a result, there is no Table 4-A-1: TMDL Method: Pollutant Reduction Target Summary)

³ University of Rhode Island (URI) Watershed Watch. Available at: <https://web.uri.edu/watershedwatch/uri-watershed-watch-monitoring-data/>

Table 4-A-2: Impervious Cover Method: IC Reduction Target Summary

Subwatershed Total Area:	274 acres
Subwatershed Total IC Area (%):	70 acres (26%)
Subwatershed Target IC (10%):	27 acres
Subwatershed IC Reduction Target:	62%
RIDOT Contributing Total Area to Waterbody:	10.8 acres
RIDOT Contributing Total IC Area to Waterbody:	7.1 acres
RIDOT IC Reduction Target:	4.4 acres
Pollutants of Concern:	None

Non-Stormwater Related Impairments

The Lawton Brook (RI0007035R-04) subwatershed is not impaired by any non-stormwater related impairments.

Existing Stormwater Controls

No stormwater treatment units (STUs) currently exist to treat stormwater from RIDOT's property directly or indirectly discharging to Lawton Brook (RI0007035R-04). Under existing conditions, RIDOT's estimated equivalent IC exceeds the RIDOT IC reduction target.

Potential Enhanced Non-Structural Stormwater Controls

RIDOT has identified that control measures are needed to reduce its effective IC within the contributing subwatershed to achieve the required RIDOT IC reduction target. RIDOT did not identify any non-structural stormwater controls. Enhanced street-sweeping is not required by the Consent Decree because the subwatershed does not drain to a Newport Water Supply Reservoir, and other potential non-structural controls were deemed infeasible.

Potential Structural Stormwater Controls

RIDOT has identified that structural control measures are needed to reduce its effective IC within the contributing subwatershed to achieve the required RIDOT IC reduction target. Appropriate locations are potentially available for control measures, as shown in ArcGIS online Figure 4.

Specific stormwater controls have been identified that may be considered for implementation, as described in the following section. See sub-section Evaluation of Infeasible Stormwater Controls for more information regarding locations where retrofit STUs are not currently feasible.

Stormwater Controls Description

RIDOT identified specific locations and several general locations for potential structural STUs within this subwatershed. ArcGIS online Figure 4 shows potential STU locations with catchment areas, including non-RIDOT areas and Appendix C-A lists site-specific constraints.

Below are descriptions of the potential STUs including location, conceptual design, RIDOT ROW treated, hydrologic soil group based on United States Department of Agriculture National Cooperative Soil Survey, major constraints, and any partnership required.

SCP-LBR-001

SCP-LBR-001 is an end-of-pipe sand filter located in the open space on Town of Portsmouth property across West Main Road from Newport Car Museum (1947 West Main Road). This open space is adjacent to the vegetated drainage channel that conveys flow from the easternmost RIDOT outfall in the subwatershed. The majority of the STU catchment area is outside the RIDOT ROW. Stormwater will enter the STU via a diversion structure from the nearby channel and pass through a pretreatment system. An overflow system will be designed to return flows in excess of the design volume back to the adjacent channel. Poor soils in the area will prevent infiltration, so an underdrain will be installed that will run under the current construction staging site owned by Newport Water and discharge to the channel downstream. Site constraints include large trees on the property and utility poles along the road adjacent to the STU. Significant excavation will be required due to the depth of the adjacent channel. This STU is located on Town of Portsmouth property and will require partnerships with the Town and Newport Water.

SCP-LBR-002, SCP-LBR-003

SCP-LBR-002 and -003 are linear bioretention swales located along the northwest side of West Main Road adjacent to Newport Car Museum (1947 West Main Road). The majority of the STU catchments is within the RIDOT ROW. Each will utilize the open space between trees, and receive runoff via curb inlets just upstream of the closest upstream catch basin and pass through a pretreatment system. An overflow system will be designed to bypass flows in excess of the design volume back to RIDOT's storm drain system. Poor soils in the area will prevent infiltration, so an underdrain will be installed and connected to the existing drainage system in the road. Both swales are located in ROW that is subject to a TIP in 2022 (Project ID 1360), and may be implemented as part of that project.

SCP-LBR-004

SCP-LBR-004 is a bioretention basin on the Newport Water property in the open space just northeast of Lawton Brook and southeast of West Main Road (southwest of SCP-LBR-001). An outfall currently discharges to a small channel that flows close to the road down to Lawton Brook. Flow will be diverted from this small channel to the STU and pass through a pretreatment system. The majority of the catchment area for this outfall (and STU) is within the RIDOT ROW. An overflow system will be designed to bypass flows in excess of the design volume back to the channel. Poor soils in the area will prevent infiltration, so an underdrain will be installed that will daylight at the downstream channel. This STU is located on Newport Water property and will require a partnership.

TIP STUs

The RIDOT Transportation Improvement Plan (TIP) identifies RIDOT projects that are scheduled to be designed and constructed in the near future.

Appendix D-A lists the TIP projects (as of November 2018) scheduled for the next 5 years within the subwatershed. Areas that will be modified as part of a TIP project where potential STU locations were

not identified are included within this SCP with an assumed 50% treatment level. Stormwater controls will be included in TIP projects to the maximum extent practicable.

SCP-LBR-005, SCP-LBR-006, SCP-LBR-007

- TIP ID: 1360
- TIP Year: 2022
- TIP Category: Pavement Capital Program
- Project Name: Rt 114, West Main Rd (John Kesson to Mill Ln)
- Municipality: Portsmouth and Middletown
- Description: Resurfacing roadway with box widening for turn lanes, limited sidewalk replacement, limited sidewalk extension and handicapped ramp installation.

Limited ROW STUs

RIDOT did not identify any roadways as areas with limited ROW STUs.

Infeasible Stormwater Controls

Through this evaluation, RIDOT determined that certain areas of the direct and indirect discharging area are not feasible for retrofit stormwater controls. These locations are shown in ArcGIS online Figure 4 with specific constraints listed in Appendix C-A. In general, constraints included physical constraints such as steep slopes and dense vegetation, limiting the construction and/or function of a potential STU. Although some constraints are manageable via creative design and permitting, other constraints or the combination of multiple constraints make locations prohibitive for retrofit STUs. These locations may be feasible for STUs in the future if conditions change and will be evaluated as transportation designs occur.

Stormwater Controls Calculations

Calculations showing effective IC reduction credit for potential stormwater controls are attached as Appendix B-A and summarized in Table 1-A.

Implementation

Existing and potential enhanced non-structural and structural controls are summarized in Table 5-A below.

Table 5-A: Stormwater Controls Summary

STU ID	Stormwater Control Type	Catchment Area (ac)	Impervious Cover (ac)	Treatment Depth (in) (Depth of Runoff Treated)	Runoff Reduction (ac-ft)	Equivalent IC Reduction Credit (ac)	Estimated Cost	Cost per IC Reduction Acre (\$/ac)	Retrofit Priority
SCP-LBR-001	Sand Filter	76.3	26.4	0.1	0.4	5.3	\$387,700	\$73,400	1
Percent RIDOT Reduction Reached									120%
SCP-LBR-002	Bioretention Swale	1.2	0.4	0.9	0.2	0.2	\$34,100	\$179,500	2
SCP-LBR-003	Bioretention Swale	1.2	0.4	0.9	0.2	0.2	\$38,100	\$165,700	2
SCP-LBR-004	Bioretention Basin	2.1	1.4	0.8	0.5	0.7	\$55,300	\$75,800	2
SCP-LBR-005	TIP	0.2	0.2	0.0	0.3	0.1	--	--	2
SCP-LBR-006	TIP	0.3	0.3	0.0	0.6	0.2	--	--	2
SCP-LBR-007	TIP	1.9	1.3	0.0	2.4	0.7	--	--	2
Percent RIDOT Reduction Reached									166%
Total		83.3	30.5		4.6	7.3	\$515,200	--	

RIDOT will implement this SCP through:

1. Non-Constructed Measures
2. RIDOT New Construction and Re-Construction Projects
3. Retrofit Projects

RIDOT constructs STUs as part of either programmed or retrofit projects until the RIDOT IC or pollutant reduction target is met.

Non-Constructed Measures

RIDOT is not proposing any non-constructed measures for this SCP.

RIDOT New Construction and Re-Construction

New and re-construction projects whose scope and limits have been defined at the time of SCP development are included within this SCP with an assumed 50% treatment level. Funding for the resurfacing project on West Main Road from Mill Lane to John Kesson Lane (TIP ID 1360) begins in 2022. In areas where potential STUs were proposed within these limits, IC reduction credit was calculated as usual and the assumed 50% treatment level was ignored.

Retrofits

Retrofit STUs have been identified as part of this SCP. Table 5-A includes estimated costs and implementation priority for these controls. Cost estimates for STUs were obtained from guidance in EPA's memo "Methodology for developing cost estimates for Opti-Tool", RIDOT Weighted Average Unit Prices for calendar years 2017 and 2018, and experience from prior stormwater projects. Costs from EPA's memo have not been adjusted to the current year. Average unit costs were developed based on a typical STU retrofit scenario and include considerations for mobilization and demobilization, soil erosion and sediment control, contingency, engineering and design fees, and construction administration. Individual STU costs were then adjusted based on STU size, with larger systems being more cost-effective than smaller systems. Cost estimates presented in this SCP should be considered as Order of Magnitude as defined by the American Association of Cost Engineers and are expected to be accurate within a plus 50% or minus 30% range as they were developed without detailed engineering data.

STU retrofit priorities were determined based on per-acre cost of IC reduction, constructability, and necessity for achieving the RIDOT IC reduction target. STUs more difficult and/or expensive to implement were generally given lower priority, unless they are necessary for achieving the reduction target, in which case they were tagged as priority 1 or 2. STUs located in TIP areas were given retrofit priorities based on the project start date, where near-term projects are higher priority and longer-term projects are lower priority.

Table 6-A shows the implementation schedule for the major milestones for design and construction of the retrofit STUs. Although these target implementation dates have been identified at this time based on the STU prioritization, RIDOT may implement certain STUs on an alternate schedule if cost efficiencies are identified. Examples of potential cost saving opportunities include:

- Constructing STUs along a highway corridor that spans multiple SCP subwatersheds at the completion of all associated SCPs
- Modifications in planned roadway project timelines or scopes
- Identification of partnering opportunities.

Table 6-A: Structural Controls Target Implementation Schedule

STU Priority Level	Feasibility & Scope Start	Recommended Target Dates by		
		Design Start	Construction Advertise	Construction Finalized
Priority Level 1	June 2019	January 2021	June 2022	June 2023
Priority Level 2	June 2021	As Needed to Fulfill Target	As Needed to Fulfill Target	As Needed to Fulfill Target

Note: Target dates are based on an assumed EPA approval within six months of SCP submittal. The dates only apply to STU's that are determined feasible and are needed to fulfill the required RIDOT reduction target.

Municipal and Private Partnerships

There are no existing partnerships, therefore Appendix E-A is not included.

There are two potential STUs proposed on land that is not within the RIDOT ROW. SCP-LBR-001 is proposed in the open area next to the vegetated drainage channel on Town property. SCP-LBR-004 is proposed in the empty field on land owned by Newport Water. RIDOT will coordinate with the Town of Portsmouth and Newport Water to discuss the possibility of easements or other mechanisms to construct these STUs.

IDDE Activities

RIDOT has completed IDDE dry-weather screenings at its outfalls within this subwatershed.

During system mapping activities, dry-weather discharge was not observed at any outfalls in the subwatershed. Between April 1 and November 30, 2019, RIDOT will inspect the outfalls where flow was not observed during dry weather under wet-weather conditions and analyze samples for parameters listed in Paragraph 21c.

Public Outreach

During development of this SCP, RIDOT met with the Town of Portsmouth on May 2, 2018. RIDOT conveyed the Consent Decree requirements and the SCP Plan development schedule and made a request for available stormwater system mapping data. RIDOT was not able to obtain infrastructure or any other data from the Town. RIDOT will continue coordination with the Town of Portsmouth to share data, findings, and plans for improvements.

STU Operations and Maintenance Plan

Existing and newly constructed STUs will be inspected, operated and maintained to ensure functionality and longevity of the STUs. The inspection, operation and maintenance procedures for STUs are consistent with those outlined in RIDEM's Stormwater Design and Installation Standards Manual, amended in March 2015,⁴ and RIDOT's forthcoming Linear Stormwater Manual (2019), and include inspections and maintenance that is customized to the functioning components of the STU.

Next Steps

In the year following submission of this SCP, RIDOT will develop feasibility studies for all Priority 1 STUs listed in Table 2-A. These feasibility studies will further evaluate site characteristics and constraints, including soil infiltration rates, utility conflicts, and catchment areas to each potential STU. In addition, a 30% design, 90% design, PS&E and required Contract Advertising Documents and as-build plans will be developed for each of the Priority 1 STUs.

⁴ Rhode Island Stormwater Design and Installation Standards Manual, Rhode Island Department of Environmental Management and Coastal Resources Management Council, Amended March 2015. Accessed: <http://www.dem.ri.gov/pubs/regs/regs/water/swmanual15.pdf>.

APPENDIX A-A
LAWTON BROOK (RI0007035R-04)

RIDOT DISCHARGING AREA SUMMARY

Appendix A-A: RIDOT Discharging Area Summary

Structure ID	Discharge Location	Description	Total Area (ac)	Impervious Cover (ac)	Pervious Cover (ac)	Pervious Cover Types
OF-900209	Non-Wetland	Unknown	5.2	3.6	1.6	Grass/ Forest
OF-9008837	Non-Wetland	Unknown	2.2	1.6	0.6	Grass/Forest
OF-9008834	Non-Wetland	Unknown	0.2	0.2	0.0	None
OF-9008838	Stream/River	Unknown	0.3	0.3	0.0	None
OF-9008839	Non-Wetland	Unknown	1.9	1.3	0.6	Grass/Forest
Sheet flow	Various	Unknown	0.9	0.1	0.8	Grass/Forest

APPENDIX B-A
LAWTON BROOK (RI0007035R-04)

STORMWATER CONTROLS
POLLUTANT CALCULATIONS

APPENDIX B-A
Stormwater Controls
Pollutant Calculations - RIDOT_Catchment

Segment Name: Lawton Brook (RI0007035R-04), Group 1A
Date: 12/31/2018

[illegible][illegible]

APPENDIX B-A
Stormwater Controls
Pollutant Calculations - RIDOT_Catchment

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APPENDIX B-A
Stormwater Controls
Pollutant Calculations - Non-RIDOT_Catchment

Segment Name: Lawton Brook (RI0007035R-04), Group 1A
Date: 12/31/2018

[illegible][illegible]

APPENDIX B-A
Stormwater Controls
Pollutant Calculations - Potential_STU

Segment Name: Lawton Brook (RI0007035R-04), Group 1A
Date: 12/31/2018

[illegible]

Pollutant Calculations - STU Storage Volume

Date: 12/31/2018

[illegible]

APPENDIX B-A

Stormwater Controls

Pollutant Calculations - Reduction Targets

Segment Name:Lawton Brook (RI0007035R-04), Group 1A

Date:12/31/2018

Subwatershed ID:	Total Subwatershed Area (ac)	Total Subwatershed IC Area (ac)	RIDOT Total Area (ac) ¹	RIDOT Total IC Area (ac)
RI0007035R-04	274	70	10.8	7.1

¹ RIDOT contributing total area to waterbody is equal to total RIDOT area minus non-discharge areas (does not include non-discharge areas) and areas discharging to a CSO.

IC Standard

Total Subwatershed IC Area (%)	Subwatershed Target IC (10%) (ac)	Subwatershed IC Reduction Target (%):	RIDOT IC Reduction Target (ac)
26%	27	62%	4.4

TMDL Method

Pollutant of Concern ²	Required TMDL Pollutant Reduction Target (%) ³	Current RIDOT Load (lb/yr)	RIDOT Pollutant Reduction Target (lb/yr)
Aluminum			
Cadmium			
Copper			
Lead			
Zinc			
Phosphorus			
Nitrogen			

² Zinc used as a surrogate for all metals per consent decree.

³ Pollutant load reduction (%) per TMDL.

Segment Name: Lawton Brook (RI0007035R-04), Group 1A
Date: 12/31/2018

[illegible]

APPENDIX B-A
Stormwater Controls
Pollutant Calculations - STU_WaterQuality

Segment Name: Lawton Brook (RI0007035R-04), Group 1A
Date: 12/31/2018

[illegible]

APPENDIX B-A
Stormwater Controls
Pollutant Calculations - STU_WaterQuality

Segment Name: Lawton Brook (R0007035R-04), Group 1A
Date: 12/31/2018

Subwatershed ID	Total RIDOT area (acres)	RIDOT IC area (acres)	RIDOT Non- Discharge Area (acres)	RIDOT CSO Discharge Area (acres)	RIDOT Phosphorus Load (lbs/yr)	TP Reduction Target (%)	TP Reduction Target (lbs/yr)	Existing STUs TP Reduction (lbs/yr)	Potential STUs TP Reduction (lbs/yr)	Total TP Reduction (lbs/yr)	TP Reduction by NonRIDOT Area (%)	RIDOT Nitrogen Load (lbs/yr)	TN Reduction Target (%)	TN Reduction Target (lbs/yr)	Existing STUs TN Reduction (lbs/yr)	Potential STUs TN Reduction (lbs/yr)	Total TN Reduction (lbs/yr)	TN Reduction by NonRIDOT Area (%)	RIDOT Zinc Load (lbs/yr)	Zinc Reduction Target (%)	Zinc Reduction Target (lbs/yr)	Existing STUs Zinc Reduction (lbs/yr)	Potential STUs Zinc Reduction (lbs/yr)	Total Zinc Reduction (lbs/yr)	Zinc Reduction by NonRIDOT Area (%)	RIDOT TSS Load (lbs/yr)	TSS Reduction Target (%)	TSS Reduction Target (lbs/yr)	Existing STUs TSS Reduction (lbs/yr)	Potential STUs TSS Reduction (lbs/yr)	Total TSS Reduction (lbs/yr)	TSS Reduction by NonRIDOT Area (%)	Effective IC Reduction Target (%)	Effective IC Reduction Target (acres)	Existing STUs Effective IC Reduction <i>(acres)</i>	Potential STUs Effective IC Reduction <i>(acres)</i>	Total Effective IC Reduction <i>(acres)</i>	Total Effective IC Reduction Achieved <i>(acres)</i>	IC Reduction by NonRIDOT Area (%)
R0007035R-04	10.8	7.1	0	0	9.5	0		0.0	12.2	12.2	74.56	60.0	0.00		0.0	55.5	55.5	72.69	8.8	0	0.00	0.0	18.9	18.9	67.41	4377			0.0	10552	10552	74.91	62%	4.4	0.0	7.3	7.3	167	65.34

APPENDIX C-A
LAWTON BROOK (RI0007035R-04)

IDENTIFIED CONSTRAINTS
FOR STU IMPLEMENTATION

Appendix C-A: Identified Site Constraints Limiting STU Implementation

	Environmental Constraints																Physical Constraints							Access Constraints		Other		
Catchment ID	FEMA Floodplain (FIRM)	Inundation Surfaces (RIGIS)	Outstanding Resource Waters (RIGIS)	Surface Water Protection Areas (RIGIS)	Freshwater Wetlands (RIGIS)	OWTS Critical Resource Area (RIDEM)	Coastal Features (CRMC)	Endangered Species (RI Natural Heritage Program)	Environmental Justice Area (RIDEM)	Open Space / Conservation Land (RIGIS)	Cultural / Historic Resources (RIGIS)	Underground Storage Tanks (RIDEM)	Leaking Underground Storage Tanks (RIDEM)	CERCLIS/National Priority List (US EPA)	Environmental Land Use Restriction (RIDEM)	Other Resource Area	Non-RIDOT Property / Limited Right-Of-Way	Soils (Poor Infiltration Capacity) (Urban Fill)	Groundwater Resources	Ledge (Bedrock)	Existing Vegetation	Steep Slopes	Elevated Topography	Utilities	Safety	Road Closure	Other	STU Recommended
PT-LBR-001																	X	X		X	X	X	X	X				X
PT-LBR-002																		X							X			X
PT-LBR-004																		X						X	X			X
PT-LBR-005										X							X	X						X				X
TP-LBR-008																		X						X	X			X
TP-LBR-009																		X						X	X			X
TP-LBR-010																		X		X		X	X	X	X			X
NF-LBR-003										X								X			X	X		X	X			
NF-LBR-006										X								X			X	X		X	X			
NF-LBR-007										X								X			X	X		X	X			

APPENDIX D-A
LAWTON BROOK (RI0007035R-04)

TIP PROJECTS

Appendix D-A: TIP Projects Scheduled for FY 2019-2025 as of November 2018

TIP ID	TIP Project Name	Location	TIP Project Description	TIP Project Status
1360	Rt 114, West Main Rd	John Kesson to Mill Ln	Pavement Capital Program	2022-2023

FIGURE 1-A
LAWTON BROOK (RI0007035R-04)

SUBWATERSHED OVERVIEW



- SCP Watershed
- RIDOT Catchment
- NonRIDOT Catchment Area
- RIDOT Maintained Roads
- Town Boundaries
- Wetlands
- Impaired Streams, TMDL
- Impaired Streams, No TMDL
- Impaired Lakes & Estuaries, TMDL
- Impaired Lakes & Estuaries, No TMDL
- RIDOT Outfalls
- Priority Outfalls
- Existing STU
- Potential STU Location**
 - Retrofit Priority 1
 - Retrofit Priority 2
 - Retrofit Priority 3



Figure 1-A
Lawton Brook
RI0007035R-04
Impaired Subwatershed
December 2018

Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

