TECHNICAL EXPLANATION OF THE 2016 TMDL ISSUED BY EPA

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INTRODUCTION

The U.S. Environmental Protection Agency ("EPA") defines "total maximum daily load" ("TMDL") as "the calculation of the maximum amount of a pollutant allowed to enter a waterbody so that the waterbody will meet and continue to meet water quality standards for that particular pollutant."[2] In the case of phosphorus in Lake Champlain, the applicable state water quality standards in Vermont are expressed as in-lake total phosphorus concentration criteria (in milligrams per liter) in each of twelve Vermont segments of the lake.[3] In order to determine the maximum amount

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2. U.S. ENVTL. PROT. AGENCY, PROGRAM OVERVIEW: TOTAL MAXIMUM DAILY LOADS (TMDL), http://www.epa.gov/tmdl/program-overview-total-maximum-daily-loads-tmdl [https://perma.cc/E25F-S6EB] (last updated Dec. 11, 2015).

3. VT. AGENCY NAT. RES., WATER QUALITY STANDARDS ENVIRONMENTAL PROTECTION RULE CHAPTER 29(A) 36 (2014) [hereinafter ENVIRONMENTAL PROTECTION RULE CHAPTER 29(A)].

of phosphorus that could be allowed to enter Lake Champlain from its tributary rivers and wastewater discharges, it was necessary to develop a mathematical model for the lake that accurately predicted changes in the phosphorus concentrations in each lake segment in response to changes in phosphorus loading to the lake. The states of Vermont and New York based the 2002 Lake Champlain Phosphorus TMDL[4] on a lake model program called "BATHTUB," which took into account the phosphorus loading rates from all sources and the manner in which phosphorus is transported by water currents within the lake and lost from the water column by sedimentation process.[5] The states used the BATHTUB model to determine the total loading capacities for phosphorus in each lake segment consistent with achieving the in-lake phosphorus concentration criteria.[6]

When EPA reconsidered its approval of the 2002 Lake Champlain TMDL, the agency reviewed the technical modeling aspects of the TMDL as part of its reevaluation. EPA's review determined that the calculation of the loading capacities for the 2002 TMDL and the selection of the hydrologic base year for modeling were done in a scientifically rigorous manner consistent with EPA requirements.[7] Inadequacies in the modeling analyses supporting the 2002 Lake Champlain TMDL were not a basis for EPA's TMDL disapproval decision in 2011. However, EPA indicated that the development of a new TMDL for Lake Champlain would make use of all available current information.[8] This new information included twenty years of additional lake and tributary monitoring data obtained since the lake model supporting the 2002 TMDL was developed. New watershed modeling methods for the evaluation of phosphorus sources and new climate-prediction models were also available.

I. LAKE MODELING APPROACH

EPA began the process of developing a new Lake Champlain TMDL by convening a technical advisory group composed of local scientists and agency staff and hiring a consulting firm, Tetra Tech, Inc., to evaluate the range of lake modeling options. This group compared the relatively simple

4. VT. AGENCY NAT. RES. & N.Y. STATE DEP'T ENVTL. CONSERVATION, LAKE CHAMPLAIN PHOSPHORUS TMDL 12 (2002).

5. WILLIAM W. WALKER, JR., EMPIRICAL METHODS FOR PREDICTING EUTROPHICATION IN IMPOUNDMENTS. REPORT 4. PHASE III. APPLICATIONS MANUAL I-18 (1987); Eric Smeltzer & Scott Quinn, *A Phosphorus Budget, Model, and Load Reduction Strategy for Lake Champlain*, J. LAKE & RESERVOIR MGMT. 386 (1996).

6. LAKE CHAMPLAIN PHOSPHORUS TMDL, *supra* note 4.

7. Letter from H. Curtis Spalding, Reg'l Admin'r Region 1, U.S. Envtl. Prot. Agency, to Deborah Markowitz, Secretary, Vt. Agency Nat. Res. (2011) (on file with Vt. J. Envtl. L.).

8. *Id.*

BATHTUB model used for the 2002 TMDL[9] with alternative, multi-dimensional modeling frameworks that simulated hydrodynamic (water movement), chemical, and biological processes at high levels of spatial and temporal resolution. The group concluded that the BATHTUB model was best suited for use in the Lake Champlain TMDL revision.[10] Proper development and calibration of multi-dimensional process models would have required data at spatial and temporal scales beyond what was currently available for Lake Champlain and would have been expensive and technically difficult to implement within the necessary time frame. The BATHTUB model met the key management and regulatory requirements for a model to simulate annual average lake phosphorus concentrations in response to changes in annual loads.

The BATHTUB model application to Lake Champlain represented the lake as a linear branching network of thirteen lake segments (Figure 1) corresponding to the same lake segments for which in-lake total phosphorus concentration criteria had been established by Vermont, New York, and Quebec.[11] Each lake segment was modeled as a completely mixed reactor under steady-state conditions, meaning that the model simulated phosphorus concentrations averaged over space and time within each lake segment. The analysis accounted for water flow and transport of phosphorus in the water by modeling two general hydrodynamic processes. The first process was the net south-to-north flow of the lake from segment to segment as water entering the lake from its tributaries drained toward the outlet at the Richelieu River. The second process was the mixing of water back and forth between adjacent lake segments driven by wind-generated currents and other complex hydrodynamic mechanisms, the effects of which were lumped into a single model term representing two-way exchange flows at the interfaces between segments. Finally, the BATHTUB model simulated phosphorus loss from the water column as a net sedimentation rate that was a function of the phosphorus concentration in each lake segment.[12]

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9. *Id.*; WALKER, *supra* note 5.

10. TETRA TECH, INC. & WILLIAM W WALKER, JR., LAKE CHAMPLAIN TMDL SUPPORT: LAKE MODELING APPROACH RECOMMENDATION 23 (2011).

11. ENVIRONMENTAL PROTECTION RULE CHAPTER 29(A), *supra* note 3; LAKE CHAMPLAIN PHOSPHORUS MGMT. TASK FORCE, REPORT OF THE LAKE CHAMPLAIN PHOSPHORUS MGMT. TASK FORCE 14 (1993); U.S. ENVTL. PROT. AGENCY, PHOSPHORUS TMDLS FOR VERMONT SEGMENTS OF LAKE CHAMPLAIN 20–21 (2015).

12. Smeltzer, *supra* note 5 at 386–88; TETRA TECH, INC., LAKE CHAMPLAIN BATHTUB MODEL CALIBRATION REPORT 18 (2015).

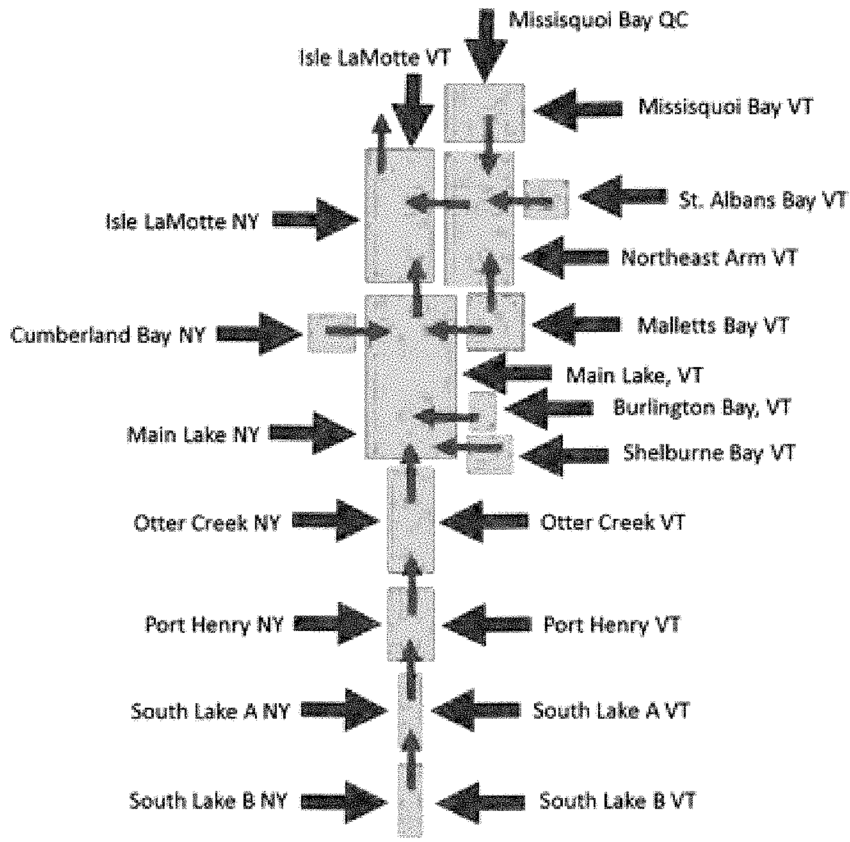

Figure 1: Schematic of the thirteen segments of Lake Champlain used for modeling and development of the TMDL. Large arrows represent the inflow of water and phosphorus from each lake-segment watershed in Vermont, New York, and Quebec. Small arrows represent the net flow of water from south to north toward the lake's outlet.

The Lake Champlain BATHTUB model predicted the phosphorus concentration in each lake segment from the balance of all phosphorus mass input loads and output losses.[13] Input loads included tributary inflows, wastewater discharges, and inflows from adjacent lake segments. Output losses included outflow to other lake segments and net sedimentation. Tetra Tech, Inc. calibrated model parameters for the exchange flows at each lake segment boundary and the net phosphorus sedimentation rate in each lake segment for the 2016 TMDL using lake and tributary monitoring data from a ten-year period (2001–2010) such that the calibrated model simulated the

13. LAKE CHAMPLAIN BATHTUB MODEL CALIBRATION REPORT, *supra* note 12.

actual phosphorus concentrations in each lake segment within statistically acceptable limits of error.[14]

II. MODELING ENHANCEMENTS FOR THE 2016 LAKE CHAMPLAIN TMDL

The lake and watershed models used to develop the 2016 Lake Champlain TMDL included several enhancements over the modeling conducted for the 2002 TMDL. The availability of a twenty-year monitoring record of lake phosphorus concentrations and tributary loads allowed for separate model calibration and validation periods of ten years each, representing the most current hydrologic conditions in the Lake Champlain Basin. Tetra Tech, Inc. used the model parameters calibrated to the 2001-2010 monitoring data to simulate phosphorus concentrations during the 1991-2000 validation period to ensure that the model performed adequately under conditions different from those under which it was calibrated.[15]

Tetra Tech, Inc. configured an established watershed process model known as "SWAT" (Soil and Water Assessment Tool) for the entire Lake Champlain Basin and used the SWAT model for three major purposes to support the 2016 TMDL.[16] First, the SWAT model provided estimates of phosphorus loading from specific source categories within each lake segment watershed, including loading from agricultural fields and farmsteads, runoff from developed land and roads, runoff from forest land, and loads contributed by river channel instability. Estimates of phosphorus loads from each source category were essential to the modeling and evaluation of alternative load allocation policies during the development of the TMDL. Second, Tetra Tech, Inc. used the SWAT model to estimate phosphorus loads from the small, unmonitored drainages near the lake that were not captured by the long-term tributary sampling program. The SWAT-derived loading estimates for these unmonitored areas were included in the BATHTUB lake model. Finally, the SWAT model provided a method for estimating phosphorus load reductions obtainable from certain agricultural and stormwater best management practices ("BMPs").

Tetra Tech used phosphorus load reduction estimates derived from the SWAT model and from the scientific literature on BMP treatment efficiencies to develop a spreadsheet-based Lake Champlain BMP Scenario

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14. *Id.* at 8.
15. *Id.* at 16.
16. TETRA TECH, INC., LAKE CHAMPLAIN BASIN SWAT MODEL CONFIGURATION, CALIBRATION AND VALIDATION 5 (2015).

Tool.[17] The Scenario Tool considered specific site conditions of land use, soil type, slope, and hydrologic setting in calculating the load reductions obtainable from various combinations of BMPs. EPA used the Scenario Tool to analyze alternative phosphorus reduction practices and policies to achieve the TMDL loading targets in each lake segment watershed.

A final enhancement to the modeling used to support the 2016 Lake Champlain TMDL was the use of an alternative phosphorus mass balance model for Missisquoi Bay in place of the BATHTUB model for that lake segment. A phosphorus model for Missisquoi Bay developed by LimnoTech, Inc., for the Lake Champlain Basin Program provided a more explicit simulation of the mechanisms of internal phosphorus loading from the bay's sediments and the influence of these mechanisms on the bay's long-term response to reductions in external phosphorus loads.[18]

III. ASSUMPTIONS ABOUT TOTAL LOADING CAPACITIES FOR NEW YORK AND QUEBEC

EPA conducted the lake modeling analysis for the 2016 Lake Champlain TMDL on a basin-wide basis and the analysis included water and phosphorus loads from tributaries and other sources in Vermont, New York, and Quebec. However, EPA disapproved only the Vermont portion of the 2002 Lake Champlain TMDL. New York chose not to reopen the TMDL for the New York watersheds during the process of developing a new TMDL for Vermont so EPA conducted the lake modeling analysis with the assumption that the total loading capacities for the New York lake segment watersheds would remain as specified in the 2002 Lake Champlain TMDL.[19] EPA derived new total loading capacities for the Vermont lake segments in a manner predicted by the updated lake modeling analysis to achieve the in-lake phosphorus concentration criteria with loads from the New York watersheds reduced to their 2002 TMDL target levels.[20]

The 2002 Quebec-Vermont Water Quality Agreement for Missisquoi Bay and the 2002 Lake Champlain TMDL incorporated a 60/40 division of the bay's total loading capacity between Vermont and Quebec,

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17. TETRA TECH, INC., LAKE CHAMPLAIN BMP SCENARIO TOOL: REQUIREMENTS AND DESIGN 1 (2015).

18. LIMNOTECH, INC., DEVELOPMENT OF A PHOSPHORUS MASS BALANCE MODEL FOR MISSISQUOI BAY (2012).

19. PHOSPHORUS TMDLS FOR VERMONT SEGMENTS OF LAKE CHAMPLAIN, *supra* note 11, at 23–24.

20. *Id.*

respectively.[21] EPA assumed that the same division would apply to the new total loading capacity for Missisquoi Bay derived from the LimnoTech model[22] for the 2016 TMDL, with Quebec assigned 40% of the total.

IV. PROCESS FOR DETERMINING VERMONT TOTAL LOADING CAPACITIES AND ALLOCATIONS

The hydrodynamic connectivity between the thirteen segments of Lake Champlain and the interdependence of phosphorus loading and in-lake phosphorus concentrations among the lake segments meant that there was no single, unique set of total loading capacities that would achieve the in-lake phosphorus criteria in each lake segment. Loading capacities for individual lake segments were dependent on the extent of load reductions applied in other lake segment watersheds. EPA's determination of total loading capacities for the Vermont lake segments was therefore an iterative process involving the modeling analysis of multiple management scenarios in order to arrive at an optimum balance of phosphorus reduction efforts across the different lake segment watersheds and source categories.

EPA derived individual wasteload allocations for the fifty-nine Vermont wastewater treatment facilities in the Lake Champlain Basin by considering the relative magnitude of the phosphorus loads from these facilities and the degree of load reductions required from non-wastewater sources in each watershed.[23] The facilities in lake segment watersheds where the aggregate wastewater allocation under the 2002 TMDL exceeded ten percent of the total load to the lake segment from all sources during the 2001-2010 base period were targeted by EPA for further phosphorus reductions in the 2016 TMDL. This affected facilities in four lake segment watersheds, including the Main Lake, Shelburne Bay, Burlington Bay, and St. Albans Bay. In addition, EPA targeted facilities in the Missisquoi Bay watershed for further phosphorus reductions because of the large amount of overall load reduction required there.[24] Facilities in all other lake-segment watersheds retained the same wasteload allocations as specified in the 2002 TMDL.

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21. *Id.*; AGENCY OF NAT. RES. & MINISTRY OF ENV'T & WATER RES., AGENCY OF NAT. RES. & ENV'T & CLIMATE CHANGE CAN., AGREEMENT BETWEEN THE GOUVERNMENT DU QUÉBEC AND THE GOVERNMENT OF THE STATE OF VERMONT CONCERNING PHOSPHORUS REDUCTION IN MISSISQUOI BAY (2002), http://www.mddelcc.gouv.qc.ca/communiques_en/2002/Vermont-Quebec_Agreement_Missisquoi.pdf [https://perma.cc/ZCE2-J7GR].

22. PHOSPHORUS TMDLS FOR VERMONT SEGMENTS OF LAKE CHAMPLAIN, *supra* note 11, at 23–24.

23. *Id.* at 28.

24. *Id.* at 31.

EPA determined the wasteload allocations for the wastewater treatment facilities in the five watersheds targeted for further reductions based on the size of the facility.[25] Facilities larger than 0.2 million gallons per day (mg/d) in permitted wastewater flow rate received annual mass loading limits calculated assuming a 0.2 milligrams per liter (mg/L) effluent phosphorus concentration at their permitted flow rate.[26] Facilities between 0.1 and 0.2 mg/d in permitted flow received annual mass loading limits calculated assuming a 0.8 mg/L effluent phosphorus concentration at their permitted flow rate.[27] Smaller facilities retained the same wasteload allocations as specified in the 2002 TMDL.

With the wasteload allocations for the wastewater discharges determined as described above, EPA evaluated the load reductions needed from non-wastewater sources. To assist EPA in this process, the State of Vermont issued a Vermont Lake Champlain TMDL Phase 1 Implementation Plan that described the set of programmatic and policy commitments that the state would make to accomplish the Lake Champlain TMDL.[28] These commitments included new regulations and program enhancements in the areas of agriculture, stormwater, river management, wetlands, and forestry.

EPA applied the Lake Champlain BMP Scenario Tool to estimate the phosphorus load reductions that would result from full implementation of the Vermont plan.[29] EPA simulated management practices included in the Vermont TMDL implementation plan, or other practices judged by EPA to produce equivalent benefits, using the Scenario Tool to estimate the load reductions achievable from each source sector in each lake segment watershed.

EPA evaluated the effects of the load reductions expected from implementation of the Vermont plan on the in-lake phosphorus concentrations in each lake segment with the assistance of a spreadsheet-based lake modeling tool developed by the Vermont Department of Environmental Conservation.[30] The spreadsheet-based lake model incorporated the same input data and mass balance equations used in the

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25. *Id.* at 28–29.
26. *Id.*
27. *Id.*
28. Letter from Peter Shumlin, Governor of Vt., to Gina McCarthy, Adm'r, U.S. Envtl. Prot. Agency and H. Curtis Spalding, Reg'l Adm'r Region. 1, U.S. Envtl. Prot. Agency (May 29, 2014) (on file with Vt. J. of Envtl. L.); AGENCY OF NAT. RES., VERMONT LAKE CHAMPLAIN TMDL PHASE I IMPLEMENTATION PLAN (2014).
29. PHOSPHORUS TMDLS FOR VERMONT SEGMENTS OF LAKE CHAMPLAIN, *supra* note 11, at 22.
30. *Id.*

calibrated Lake Champlain BATHTUB model, but allowed for greater flexibility and convenience when simulating multiple management alternatives.

The general approach used by EPA to assign TMDL allocations to each source sector was to first apply the load reductions estimated from the Scenario Tool for developed lands, back roads, forest lands, agricultural production areas, and stream channel sources. Load reduction amounts estimated by the Scenario Tool were subtracted from the 2001-2010 base loads to calculate the TMDL allocations for these sources. Load reductions applied to agricultural nonpoint sources were then increased as necessary in each lake segment watershed until the lake model predicted compliance with the in-lake phosphorus criteria in all lake segments, allowing for a five percent margin of safety in each lake segment.[31]

EPA applied some constraints and modifications in this process.[32] The EPA constrained the agricultural nonpoint source reductions applied in the TMDL in all watersheds within the maximum feasible reductions estimated from the Scenario Tool. A minimum agricultural nonpoint-source-load reduction of twenty percent was specified for all watersheds reflecting Vermont's intent to require some agricultural practices uniformly across the basin, except that no agricultural reductions were applied in the Burlington Bay watershed where agricultural-sources were minimal.[33] EPA applied equal percent agricultural nonpoint-source reductions in some adjacent watersheds that affected the same critical lake segment; for example, the South Lake A and B watersheds affected the South Lake A segment and the Otter Creek and Main Lake watersheds affected the Main Lake segment.[34] Reduction amounts required from forest and stream-channel sources were reduced in a few watersheds below the Scenario Tool estimates where agricultural reductions were sufficiently achievable, but more stringent reduction requirements for these source categories were applied in the South Lake B and Missisquoi Bay watersheds where the feasible agricultural reductions were not likely to be sufficient without additional forestry and river management actions.

V. FINAL TMDL RESULTS

EPA calculated the total loading capacities for each Vermont lake-segment watershed by subtracting the load reductions applied to source

31. *Id.* at 24.
32. *Id.*
33. *Id.* at 38.
34. *Id.*

sectors in each lake-segment watershed from the 2001-2010 base period loading rates, with allowance for a 5% margin of safety in each lake segment.[35] The total loading capacity in the 2016 TMDL for all Vermont watersheds was 418 metric tons per year (mt/yr), representing a 34% reduction from the total Vermont base load of 631 mt/yr.

EPA partitioned the total loading capacities into wasteload allocations, load allocations, and margins of safety for each Vermont lake-segment watershed as summarized in Table 1. The source categories within the wasteload allocations included wastewater discharges, the combined sewer overflow from the Burlington Main facility, stormwater runoff from developed land and roads, and discharges from agricultural production areas (barnyards and buildings). The source categories within the load allocations included nonpoint-source loads from agricultural land, forest land, and stream channel instability.

Vermont Lake Segment	**2001-2010 Base Load**	**Total Loading Capacity**	**Wasteload Allocation**	**Load Allocation**	**Margin of Safety**
South Lake B	51.1	29.9	9.0	19.4	1.5
South Lake A	26.5	11.8	2.2	8.9	0.6
Port Henry	7.0	3.1	0.6	2.3	0.2
Otter Creek	140.5	107.3	30.0	72.0	5.4
Main Lake	162.2	129.0	39.7	82.8	6.4
Shelburne Bay	10.2	9.0	3.8	4.8	0.5
Burlington Bay	4.5	3.1	2.9	0.0	0.2
Malletts Bay	56.4	46.4	17.9	26.2	2.3
Northeast Arm	17.8	15.6	3.8	11.1	0.8
St. Albans Bay	13.9	10.5	3.6	6.4	0.5
Missisquoi Bay	136.3	48.6	14.2	32.0	2.4
Isle LaMotte	4.1	3.6	0.9	2.5	0.2
TOTAL	**630.6**	**418.1**	**128.6**	**268.6**	**20.9**

Table 1: Summary of the 2016 Lake Champlain Phosphorus TMDL for Vermont lake segments.36 Phosphorus load amounts are in metric tons per year.

While the 2016 TMDL requires an overall Vermont load reduction of thirty-four percent, much greater percent reductions are required from some source categories in some lake segments (Table 2). For example, a total

35. *Id.* at 24.
36. *Id.* at 43.

load reduction of sixty-four percent is required for Missisquoi Bay.[37] Agricultural-nonpoint-source reductions of over sixty percent are required in the South Lake watersheds and an eighty-three percent agricultural reduction is required in Missisquoi Bay. Forest-load reductions of forty to fifty percent are required in the South Lake B and Missisquoi Bay watersheds.

Lake Segment	Total Overall	Wastewater[1]	Combined Sewer Overflow	Developed Land[2]	Agricultural Production Areas	Forest	Streams	Agricultural Nonpoint
South Lake B	41.4%	0.0%		21.1%	80.0%	40.0%	46.7%	62.9%
South Lake A	55.5%	0.0%		18.1%	80.0%	5.0%		62.9%
Port Henry	55.4%			7.6%	80.0%	5.0%		62.9%
Otter Creek	23.6%	0.0%		15.0%	80.0%	5.0%	40.1%	46.9%
Main Lake	20.5%	61.1%		20.2%	80.0%	5.0%	28.9%	46.9%
Shelburne Bay	11.6%	64.1%		20.2%	80.0%	5.0%	55.0%	20.0%
Burlington Bay	31.2%	66.7%	11.8%	24.2%	0.0%	0.0%		0.0%
Malletts Bay	17.6%	0.2%		20.5%	80.0%	5.0%	44.9%	28.6%
Northeast Arm	12.5%			7.2%	80.0%	5.0%		20.0%
St. Albans Bay	24.5%	59.4%		21.7%	80.0%	5.0%	55.0%	34.5%
Missisquoi Bay	64.3%	51.9%		34.2%	80.0%	50.0%	68.5%	82.8%
Isle LaMotte	11.7%	0.0%		8.9%	80.0%	5.0%		20.0%
TOTAL	**33.7%**	**42.1%**	**11.8%**	**20. 9%**	**80.0%**	**18.7%**	**45.4%**	**53.6%**

[1]Percent change from current permitted loads.

[2]Includes reductions needed to offset future growth.

Table 2. Percent load reductions relative to the 2001-2010 base loads required to achieve the total loading capacities in the 2016 Lake Champlain Phosphorus TMDL for Vermont lake segments.38

The new Vermont total loading capacity of 418 mt/yr is considerably higher than the total Vermont loading capacity of 268 mt/yr defined in the 2002 Lake Champlain TMDL.[39] This was a predicted consequence of using a new hydrologic base period representing wetter weather conditions

37. *Id.* at 44.
38. PHOSPHORUS TMDLS FOR VERMONT SEGMENTS OF LAKE CHAMPLAIN, *supra* note 11.
39. LAKE CHAMPLAIN PHOSPHORUS TMDL, *supra* note 4, at 35.

relative to the 1991 base year used in the modeling for the 2002 TMDL.[40] Estimates of the total Vermont base load increased from 414 mt/yr in the 2002 TMDL to 631 mt/yr in the 2016 TMDL due to the different base periods used. The total load reduction required by Vermont to achieve the loading capacities also increased from 146 mt/yr in the 2002 TMDL to 212 mt/yr in the 2016 TMDL. However, on a percentage basis, the overall Vermont load reduction requirement of 34% in the 2016 TMDL is nearly identical to the reduction requirement of 35% indicated in the 2002 TMDL.

The Lake Champlain TMDL is important because it defines the loading targets and reduction amounts necessary for each phosphorus source to achieve water quality standards in the lake. The 2016 Lake Champlain TMDL included many years of additional data and several modeling refinements beyond those available for the 2002 TMDL. The loading targets defined in the 2016 TMDL can therefore be assumed to be more accurate and current than the loading capacities stated in the 2002 TMDL. However, both TMDLs produced essentially the same result as to the overall level of effort required by Vermont. Vermont's phosphorus load to Lake Champlain must be reduced by about one-third. Having scientifically-sound targets is important, but success will depend much more on the depth of the commitment by Vermont and by other federal, state, local, and private partner organizations working for a clean Lake Champlain to fund and implement all the actions necessary to achieve the TMDL as laid out in the Vermont Lake Champlain TMDL Implementation Plan[41] and in the Vermont Clean Water Act of 2015.[42]

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40. VT. AGENCY NAT. RES. & VT. AGENCY AGRIC., FOOD & MARKETS, PROGRESS IN ESTABLISHING AND IMPLEMENTING THE TOTAL MAXIMUM DAILY LOAD (TMDL) PLAN FOR LAKE CHAMPLAIN 9 (2008).

41. VERMONT LAKE CHAMPLAIN TMDL PHASE I IMPLEMENTATION PLAN, *supra* note 28.

42. H.35, 2015-2016 Leg. Sess. (Vt. 2015) (Act 64).