

Responses to Public Comments on the Draft Centennial, Bartlett, Englesby, and Morehouse Brook TMDLs

Comments received

Identification	Submitted by:	Signed by:
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City of South Burlington	City of South Burlington (prepared by Pioneer Environmental Associates, LLC)	Jeffrey A. Nelson Principal/Hydrogeologist
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Following each numbered comment below, the [] identifies the commenter's identification.

Part 1: Comments pertaining to legal interpretations of CWA

1. Notwithstanding EPA's approval of the Potash Brook "TMDL," which remains subject to appeal in federal court for six years, CLF maintains its position that these Drafts are also contrary to law for the reasons set forth in our previous comment letter on the Draft Potash Brook TMDL. Accordingly, CLF's comments on the Potash Brook Draft TMDL at Section I.A-C(2) are incorporated by reference. Similarly, CLF's comments in Section II are also incorporated by reference.[CLF]

Response

For the responses to the abovementioned comments incorporated by reference from CLF, please see the Response to Public Comments on the Draft Potash Brook TMDL, October 2006, attached hereto.

2. CLF does not understand why DEC (with EPA's apparent blessing) is so intent on stretching the legal concept of a "Total Maximum Daily Load" beyond recognition so that it encompasses these Drafts notwithstanding their lack of a maximum load calculated for a pollutant or suite of pollutants on a daily basis. This persistence in trying to jam the square-pegs represented by these Drafts into the round hole created by 33 U.S.C. § 1313(d)(1)(C) is all the more confounding in light of the United States Court of Appeals for the District of Columbia's recent ruling that EPA does not enjoy the discretion to approve TMDL's that fail to give effect to the clear intent of Congress as expressed in the plain terms of the Clean Water Act. Friends of the Earth v. E.P.A., U.S. Court of Appeals for the District of Columbia Docket No. 05-5015 (April 25, 2006). It is all the

more confusing because these Drafts, with additional elements added (see CLF Comments on Potash Brook Draft TMDL at Section II 7-8), could easily meet the requirements of a Category 4(b) Water Quality Remediation Plan. Utilizing this approach will allow DEC to maintain the targets that are at the heart of these Drafts and would provide greater up-front clarity and accountability to the adaptive management process that the Drafts sketch out in minimal detail. As importantly, the Category 4(b) approach avoids creating the legal liabilities that result from the inconsistency between the required elements of a “TMDL” as defined in federal statute and regulations and the Drafts that lack a true “T”, “M”, “D”, or “L”. [CLF]

Response

With respect to the commentor’s statement that a water quality remediation plan is a more appropriate approach than a TMDL, please see VTDEC’s response to comment # 2 in the attached “Responses to Public Comments on the Draft Potash Brook TMDL.” With respect to the commentor’s reference to the Friends of the Earth case, VTDEC directs the commentor to the controlling Second Circuit decision in Natural Resources Defense Council, Inc. v. Muszynski, 268 F.3d 91 C.A. 2 (N.Y.), 2001. In the NRDC case, the Second Circuit found that the word “daily” in “total maximum daily load” was ambiguous, and could lead to absurd results if taken literally. The Second Circuit found that the NRDC’s overly narrow reading of the term total daily maximum load “loses sight of the overall structure and purpose of the CWA,” NRDC, 268 F.3d at 98, and that the term is “susceptible to a broader range of meanings.” Id. The Second Circuit held that the Clean Water Act does not require that all TMDLs be expressed strictly in terms of daily loads and that EPA has discretion to approve TMDLs expressed in other periodic measurements. Although there is currently a split in the federal Circuit Courts on this issue, the controlling case for Vermont is the NRDC case, which allows for flexibility in “T”, “M”, “D”, “L.”

In this second circuit decision, the Court did require a reasoned explanation for the choice of any particular non-daily load. Some discussion of this issue is provided in the TMDL documents in the sections titled “Target Setting Approach”, but a further explanation of why the TMDLs do not express the loading capacity in terms of specific daily loadings (or runoff volume amounts) is provided here:

- 1) The biological impairment in these streams resulted from the cumulative effects of a range of stormwater runoff events throughout the year over a multiple year period. It is not the magnitude of loadings on any particular day that drives attainment of the biological criteria; instead, attainment will result from a long-term overall reduction in the amount of stormwater runoff. The flow duration curve approach provides for identification of this overall reduction target.
- 2) Stormwater runoff will vary dramatically from one day to the next depending on rainfall amounts. There will be no runoff on some days, while storms may generate large runoff events on others. Because of this variability, it is neither feasible nor logical to establish specific daily limits linked to attainment of the biological criteria. In the face of such variability, the approach taken in these TMDLs, based on percent reductions tied to

the flow duration curves, is both a practical and effective way to establish reduction targets. Rather than imposing particular daily limits, this approach establishes percent reduction targets for stormwater runoff volume that effectively apply to all storm events whenever they occur (e.g., on any given day) throughout the year.

3. In several places, the Drafts evince an utter disregard for the clear mandate of the Vermont Supreme Court and the federal Clean Water Act by clinging to the notion that state stormwater programs can supplant Clean Water Act authority over stormwater discharges that contribute to the violation of Vermont Water Quality Standards in these watersheds. In re NPDES Stormwater Petition, 2006 VT 91, ¶ 20. For example, the Drafts refer to “stormwater discharges that are not subject to NPDES permitting (e.g. stormwater discharges from impervious surfaces regulated under Vermont’s stormwater program).” E.g., Bartlett Brook Draft TMDL at 19. The Vermont Supreme Court has squarely rejected DEC’s contention that a discharger who contributes to a violation of Vermont Water Quality Standards such as is occurring in these watersheds can escape Clean Water Act permitting solely because that discharger may also be regulated under Vermont’s state stormwater program. [CLF]

Response

VTDEC is currently engaged in litigation with the commentor regarding the use of residual designation authority and does not agree with the commentor’s summary of the Vermont Supreme Court’s opinion. The Secretary’s final decision as to whether the general and/or individual permits used to implement these TMDLs will be issued pursuant to Vermont’s state stormwater law or pursuant to Vermont’s federally-delegated NPDES program is still to be made.

4. DEC has already acknowledged as a scientific matter that all existing discharges in these watersheds contribute to violation of Vermont Water Quality Standards. See Hearing Transcripts in Re: Morehouse Brook, Englesby Brook, Centennial Brook, and Bartlett Brook, Nos. WQ-02-04, WQ-02-05, WQ-02-06, and WQ-02-07 (consolidated). The Draft’s “Allocations” section provides further indication that a broad category of these unregulated discharges could and should be regulated pursuant to the NPDES program because they “typically convey stormwater via discrete means such as pipes or swales”, (Drafts at 16) and are thus point sources. See 33 U.S.C. § 1362(14) (defining “point source”). When viewed in context of the WLA’s for high-flow reductions needed as a result of existing conditions (Centennial 49.9%, Morehouse 54%, Englesby 25.5%, and Bartlett 9%), it is clear that all existing discharges are contributing to the violations and must also contribute to the solution that includes appropriately aggressive flow reduction targets. [CLF]

Response:

VTDEC will issue general and/or individual permits to require implementation of those measures necessary to meet the TMDL targets. If the Secretary decides to issue the permits pursuant to Vermont’s federally-delegated NPDES program, then they will only be issued to “point sources” as defined by federal law. If the Secretary issues these permits pursuant to Vermont’s state stormwater program, they may be issued to a

discharge from any size of impervious surface if the Secretary determines that a permit is necessary to meet the requirements of a TMDL. (Vermont Environmental Protection Rules, Chapter 22, Section 22-302(a)(5). The issuance of permits pursuant to Vermont’s state stormwater law is not limited by the concept of “point source.”

VTDEC has not yet determined which existing discharges will need to participate in the overall remediation effort in each watershed. In order to implement appropriate restoration efforts, it is important to identify and size the appropriate best management practices (BMP) to achieve the watershed target. Because there are a plethora of BMP type, size, and location combinations, this type of analysis is typically extremely time-consuming. To increase the efficiency in evaluating these watersheds and determining what measures must be implemented to meet the TMDL targets, VTDEC is developing a BMP modeling tool that considers type, sizing, and placement and produces results that can be compared to the TMDL targets. This modeling tool is the Vermont BMP Decision Support System (VT BMP DSS). The VT BMP DSS will help to evaluate where the implementation of stormwater treatment and control will result in the greatest improvements on the flow regime, and ultimately the water quality in the watershed. The Agency anticipates that it will utilize an iterative, adaptive management approach to implementing this TMDL. The first prong of implementation will involve the issuance of a watershed-wide general permit. Stormwater treatment and control measures will be required in the first-round watershed-wide general permit, including the construction and/or upgrade of stormwater treatment and control systems by specifically identified dischargers of stormwater runoff. The first-round general permit will include a coordinated and cost-effective monitoring program to gather necessary information to determine the extent to which the general permit provides for the attainment of the VTWQS and to determine the appropriate conditions or limitations for subsequent permits. Such a monitoring program may include ambient monitoring, receiving water assessment, discharge monitoring (as needed), or a combination of monitoring procedures designed to gather the necessary information. Based on this information, the permit will be amended, as needed, through the implementation of more widespread and/or more stringent treatment and controls or other best management practices as necessary to meet the water quality targets in the TMDL.

5. The Clean Water Act and its implementing regulations anticipated situations like this and in response have built flexibility into NPDES jurisdiction. As the Vermont Supreme Court has held, extension of this jurisdiction to contributing dischargers is “not optional.” In re NPDES Stormwater Petition, 2006 VT 91, ¶ 21. The Drafts stand as evidence that all existing dischargers contribute to the biological impairments in these watersheds notwithstanding the fact that some of them are regulated under Vermont’s state stormwater law. Accordingly, they must be designated for NPDES permitting. [CLF]

Response

VTDEC is currently engaged in litigation with the commentor regarding the use of residual designation authority and does not agree with the commentor’s summary of the Vermont Supreme Court’s opinion. The final decision as to whether the general and/or individual permits issued to implement these TMDLs will be issued pursuant to

Vermont's state stormwater law or pursuant to Vermont's federally-delegated NPDES program is still to be determined.

Part 2: Comments pertaining to TMDL components

Impairment/Listing

6. At page 4, it is reported that "the source of the impairment is multiple impacts associated with excess stormwater runoff" and at page 5, Englesby is subject to many stressors that include "stormwater runoff volumes and increased watershed pollutant load (e.g. sediment)." While I agree with the conclusion that excessive runoff and increased sediment load are problematic stressors on Englesby, so too are thermal impacts of the "heated" runoff that reaches Englesby and as such this TMDL does not address thermal impacts at all.[Mr. Mapes]

Response

TMDLs are only be prepared for documented impairments. VTDEC has no data indicating that temperature is a source of impairment of the biological community in this stream.

7. At page 8, WATER QUALITY STANDARDS, the TMDL provides that "Englesby Brook is listed as impaired due to "the impact of excessive stormwater flows into Englesby Brook [and] has resulted in a violation of the VTWQS." While I do not dispute the impairment of the Englesby, I question why the Southern Oakledge Beach Tributary is not included in this TMDL to address the entire watershed discharging at this location on the Lake.[Mr. Mapes]

Response

The Englesby Brook TMDL has been developed for the restoration of the VTWQS in Englesby Brook itself, not for the portion of Lake Champlain it empties into; therefore, it addresses the cumulative impacts of stormwater runoff to the brook. Regarding the southern tributary at Oakledge Beach, it has not been identified as impaired. The majority of streams on the 303d List impaired due to a lack of biological integrity are streams that are considered perennial and that have year round biological communities. The Oakledge tributary is not believed to be perennial or to support a year round community. ANR has limited resources and the biological standard is what is typically applied statewide to gauge water quality.

Target Setting

8. It is difficult to evaluate the TMDLs without understanding the actual volume of stormwater loads DEC will require to be regulated based on percentages. VNRC recommends that DEC take the calculations one step further and depict the targets as the amount of water surplus or deficit that must be achieved when applying the percent differences. [VNRC]

Response

VTDEC does not believe that such a calculation, though easily computed, is a useful item to include in the TMDL. First, the TMDL included the percentage allocations rather than modeled runoff volumes because this approach was specifically suggested in the Docket report at page 2 of Appendix A:

“The same models would be run in the impaired watershed and the attainment watersheds, and the relative difference between the two conditions would be used to establish the flows needed to restore the stream’s hydrology. Hydrologic targets could be expressed as percentage reductions in distribution of runoff volumes over time within the impaired watershed.”

VTDEC believes that this is the proper approach based on the TMDL development framework applied for target development.

Second, the TMDLs explain in the “Target Setting” section that due to possible discrepancies between model outputs and actual stream flows, percentage differences between modeled attainment and impaired flows best represent the amount of flow change necessary. Presenting the targets as flow volumes based on modeled outputs could confuse readers as to what is really necessary to fulfill the TMDL allocations. It’s the relative differences between the impaired and attainment stream flows that is the premise of this TMDL approach, not the attainment of the modeled flow differences as an absolute volume. Basing the TMDL on the volumes produced by the model could leave the false impression that simply implementing controls to produce those volumes would be sufficient to bring the impaired water into compliance with the WQS. For example, given that modeled flows rarely equate exactly to actual flows, it could turn out (hypothetically) that measured flows obtained prior to BMP implementation are found to be already at the target volume levels identified through the modeling work. In this scenario, if the TMDL target was expressed as an absolute flow (cubic feet/second), one could conclude that the target was met and no more work was needed. However, if the target was expressed as a percentage reduction, it would be clear that significant work would still be needed. Clearly, attainment of WQS will be the ultimate gauge of whether more work is needed, but the expression of the flow target as a percentage reduction ensures that the goal of the TMDL (bringing the hydrologic regime of the impaired stream into line with the hydrologic regimes of the matched attainment streams) is preserved.

Allocations/Future Growth

9. VNRC is concerned about the lack of an allocation for stormwater loads for future growth in the TMDLs. If the amount of stormwater loads contributed by future growth is not adequately accounted for, then there is no assurance the load reductions achieved by implementing the TMDLs will not be offset by new discharges. VNRC does not want to see the water bodies in question remain impaired despite aggressive efforts to reduce existing discharges because future growth is not properly limited. [VNRC]

Response

VTDEC also desires to see these waters come into compliance with the VTWQS and that is precisely why the allocation for future growth was included in the TMDLs as described in the “Future Growth” section of the TMDLs and as quantified in Table 7.

10. DEC states new future growth that creates at least one acre of impervious surface does not conflict with efforts to restore the water bodies in question because these discharges will require a state stormwater permit, and the channel protection criterion in the stormwater manual will protect against future degradation. There is no scientific justification for this assumption in the draft TMDLs.[VNRC]

Response

The following response repeats the response provided in the Potash Brook Response to Comments to a similar comment. The following information was included in the final version of the Potash Brook TMDL submitted to and subsequently approved by EPA and was also included in the draft versions of the four TMDLs being addressed here.

To address the impacts of development larger than 1 acre, the TMDL notes that this category of growth will need to comply with the current stormwater manual. The manual requires sites to meet channel protection (CPv) as well as groundwater recharge treatment standards. The premise of the channel protection standard is that runoff would be stored and released in such a gradual manner that critical erosive velocities would seldom be exceeded in downstream channels. MacRae (1991)¹ found that the traditionally used 2-year control approach failed to protect channels worn into more sensitive boundary materials and actually aggravated erosion hazard in very sensitive channels. Therefore, MacRae (1991) developed the DRC (Distributed Runoff Control) as a method to vary the degree of control from the 2-year control to the 80% over control based on the strength of boundary material. A study done in Maryland (Cappuccitti, 2000)² showed that “the CPv and DRC methods provide a comparable level of management.” Additionally, the Center for Watershed Protection (CWP) recommends the use of the channel protection criteria stating that “the criterion balances the need to use a scientifically valid approach with a methodology that is relatively easy to implement in the context of a statewide program.” (CWP, 2000)³. VTDEC believes that if future growth complies with the channel protection standard as well as the groundwater treatment standard, the waters in question will still be able to meet both the high and low flow targets of the TMDLs.

11. VNRC believes that to satisfy the requirements of federal law, TMDLs must include an actual allocation of loads for new growth, not just broad assumptions that best management practices can address any amount of new pollutant loading in an impaired water. *See* 40 CFR §130.7. [VNRC]

¹ MacRae, C.R., 1991. “A Procedure for Planning of Storage Facilities for Control of Erosion Potential in Urban Creeks”, Ph.D. Thesis, Dept. of Civil Eng., University of Ottawa, 1991.

² Cappuccitti, D.J., 2000. Stream Response to Stormwater Management Best Management Practices in Maryland. Maryland Department of the Environment, Nonpoint Source Program. Baltimore, MD

³ Center for Watershed Protection (CWP), 2000. “Memo No. 2: Recommendation and Justification for Stream Channel Protection Criteria”. Memo to Larry Becker, State Geologist, Vermont Agency of Natural Resources. Dated: September 8, 2000

Response

See response to Comment #10. VTDEC believes that these TMDLs have been prepared in accordance with federal law and adequately address future growth.

12. Under DEC’s proposal, there is no limit on the number of new discharges that can be allowed to add loads of stormwater. The idea that stormwater permitting can offset the impacts of an unlimited number of new discharges simply does not make sense.[VNRC]

Response

See response to Comment #10.

13. DEC states that future growth that creates less than 1 acre of impervious surface that does not trigger state permitting requirements is addressed because the municipalities in which the waterbodies in question are located estimate that there are limits on this “non-jurisdictional” future growth, and these limits have been factored into the TMDL. The draft TMDLs provide no basis for this limitation on future growth. ANR must do more than reference limitations on future growth projected by municipal officials to prove that there are limits on future growth.[VNRC]

Response

The goal of the future growth estimates for individual impervious surfaces less than one acre is to create the necessary buffer to initially allow some amount of future development to occur by setting stricter runoff limits from the current landscape. The targets developed in the TMDL, including those portions attributed to future growth, establish the framework upon which limitations of stormwater runoff and ultimately stream flow are based. It’s the role of the forthcoming watershed general permit to implement those limitations, establish retrofit priorities and provide the permitting mechanism through which future potential runoff from impervious surfaces will be managed. Through use of an adaptive management approach, sufficient remedial measures will be implemented to reach the targets of the TMDL, which includes a “buffer” for inputs from new growth.

14. The public should have access to these future growth estimates and be able to analyze and comment on them as part of the TMDL process.[VNRC]

Response

The future growth estimates for non-jurisdictional impervious acreage were included in the draft TMDLs in the “Future Growth” section of the documents.

15. VNRC does not understand the basis for assuming that all WLA’s or point sources are in urban areas and all LA’s or non-point sources are in agricultural areas. Isn’t it true that farms that are discharging in agricultural areas would be considered point source CAFO’s? Why does DEC assume that no MS4, multi-sector or NPDES construction discharges do occur in agricultural areas? Federal law requires that WLA’s and LA’s be allocated according to actual point and non-point sources. DEC’s proposal to lump point

and non-point discharges based on land use does not satisfy this requirement. 40 CFR §130.7. [VNRC]

Response

This comment is identical to a comment received on the Potash Brook TMDL. Below is essentially the same response provided in the Potash Brook response to comments. Language was added to the final Potash Brook TMDL and to these four TMDLs in response to the previously submitted comment. That language further explained the allocation process utilized.

The Wasteload/Load allocation process applied in these TMDLs allocates stormwater control responsibilities based on the sources and magnitude of stormwater runoff generated. As indicated in the TMDL, USEPA TMDL guidance suggests that oftentimes when dealing with the allocation of stormwater it is only possible to allocate by gross allotments due to a lack of specific data. This is the case in these four TMDLs. EPA guidance states (USEPA, 2002⁴, p.2) :

“Waste load allocations among point source dischargers are usually based on the relative contribution of pollutant load to the waterbody. We realize that estimating an aggregated load contribution to a particular waterbody from the stormwater phase I and II sources is imprecise, given the variability in sources, runoff volumes, and pollutant loads over time. We therefore anticipate that any stormwater WLA portion of the TMDL may be based on a rough estimate.

The simplest way to estimate a gross regulated-stormwater WLA could probably be done on a watershed basis using land use analysis and export coefficients to estimate loading. One option might be to assess land area involved in urban and industrial uses and assign loading from that area to a WLA. If only part of a given community is regulated under phase II, the WLA estimate could be limited to the regulated land area (see “urbanized areas” delineated on stormwater maps). We’re interested in working with you to develop reasonable approaches that work for your TMDLs.”

Following this guidance, the runoff coefficient approach was applied to determine in a broad sense the sources and magnitude of stormwater runoff. The weighted proportion of runoff from the more developed areas, where the vast majority of the “regulated” stormwater was generated, established the limit of the WLA. In other words, the “regulated” areas, including all the NPDES permitted sources required to be in the WLA, are responsible for reducing and maintaining their respective decreases in the high flow targets. The same is true for the LA whereby the “nonregulated” areas are responsible for reducing and maintaining their respective decrease in the high flow target.

⁴ USEPA, 2002(a). EPA New England Guidelines to States for Characterizing TMDL Allocations for NPS/Stormwater. April 2002. USEPA Region 1, Boston, MA.

16. 40 acres of impervious surfaces was used to model and allocate additional stream flow reductions for “non-jurisdictional” future growth in the cities of Burlington and South Burlington. Based on our experience, this seems high. For example, we reviewed the *Centennial Brook Watershed* map prepared by Pioneer Environmental Associates. 10 acres of impervious surface was estimated for “non-jurisdictional” future growth for the City of Burlington. Based only on a review of the orthophotograph, there are very few areas in the City of Burlington, within the Centennial Brook watershed, that would qualify as “non-jurisdictional”. The majority of the land is either UVM land, which is “jurisdictional”, or the Centennial Woods conservation land. If the projected new impervious surface in Burlington is over estimated it seems the modeled attainment stream flow reductions would also be over estimated. Although not as readily apparent it seems the same argument would pertain to the portion of the watershed in South Burlington. It already appears achieving the high flow reductions for Centennial Brook will be a difficult task. [K & L]

Response

See response to #17

17. The focus of Pioneer’s review is on VTDEC’s allocation estimates for non-jurisdictional new growth (i.e., new impervious surfaces less than one acre) provided in both of the draft TMDLs. We believe that the current estimates, though provided by the City of South Burlington, are unrealistic, and have conducted additional analyses to provide more refined estimates of the anticipated area of non-jurisdictional impervious area anticipated to be constructed within the Bartlett Brook and Centennial Brook watersheds over the next 10 years. (see Attachment 1 for complete analysis). [City of South Burlington]

Response

VTDEC admits that future growth estimates are difficult to determine, especially estimating the cumulative impervious cover to occur over 10 years based on projects of 1 acre or less. While the additional analysis provided does attempt to add clarity to the future growth estimates, it is still lacking certainty in particular areas. First, there is no explanation provided as to why 2007 data was selected to be representative for the basis of the future growth projections. Also, at the time of the analysis preparation, 2007 was essentially only half over. It is not clear how data from half of a year, without extrapolation, can be representative for entire years in the future. Second, the analysis assumes that development will take place at an even rate city-wide. This assumption appears overly simplistic without taking into consideration the watershed specific characteristics that may or may not allow for future growth potential.

VTDEC has a responsibility to provide conservative estimates in setting TMDL targets to ensure ultimate compliance with the water quality standards. This concern is also echoed by other parties providing comments noting the need for assurance of properly conservative TMDL targets.

Based on the above discussion, VTDEC intends to maintain the original non-jurisdictional future growth estimates provided in the draft TMDLs.

Margin of Safety

18. The Margin of Safety should incorporate additional allocations to guard against this climactic trend (global climate change). At the very minimum, the monitoring plan should flag this as an issue for study and should recognize the potential need to adjust the allocations if monitoring confirms this trend. This heightens the need to expressly notify the public of another eventuality that may necessitate reopening.[CLF]

Response

VTDEC will take this into consideration during the development of the forthcoming watershed permit and monitoring plan.

Reasonable Assurance

19. DEC has not provided reasonable assurance that non-point source reductions will be achieved. The TMDLs discuss the actions that it may take to address non-point stormwater runoff, however, no estimate of how the actions will translate into load reductions has been provided.[VNRC]

Response

It should be noted that the Load Allocations for Morehouse Brook and Englesby Brook are zero, thereby eliminating the need for Reasonable Assurance that the nonpoint source controls will be sufficient to meet the TMDL.

The remaining Load Allocations for Bartlett and Centennial Brooks are an exceedingly small -0.7 % and -0.4% respectively. VTDEC believes that the Reasonable Assurances outlined in the TMDLs for these streams are more than sufficient to meet the TMDL. Additionally, there is no indication in USEPA TMDL guidance that nonpoint source controls identified in a TMDL providing Reasonable Assurance need to include actual loading estimates or in this case estimates of hydrologic impact.

Part 3: Comments pertaining to forthcoming implementation strategy/permit issuance

20. VNRC urges DEC to issue the draft general permit that will implement the TMDL and allow public comment on both the TMDL and the general permit simultaneously. This would give the public the opportunity to understand how these percent differences translate into actual load allocations, and how the load reductions will be achieved. Unless this is done, it is very difficult to understand and comment on the TMDL. [VNRC]

Response

There is nothing in federal or state law that requires DEC to issue a draft general permit simultaneously with the TMDL. DEC believes that it is more appropriate to follow a two-step process. First, to issue the TMDL which establishes scientifically based

hydrologic targets. Second, is to issue a watershed wide general permit to require actions to reach those targets. In this way, the scientifically based TMDL targets will not be influenced by the pressures, both political and otherwise, that will inevitably surface when the general permit is issued and dischargers are required to spend potentially significant sums of money to construct and/or upgrade their stormwater systems.

21. CLF applauds DEC's efforts to anticipate and explicitly allocate flow reductions to account for future growth. Given that achievement of these allocated reductions depends on the retrofit of existing sites and that the timetable for that process has not been established, CLF wonders how DEC plans to coordinate future growth that may occur prior to the completion of these retrofits.

CLF suggests that a process be developed in coordination with the DEC construction stormwater program (which may have jurisdiction as to construction sites disturbing more than one acre, but that will result in less than one acre of impervious surface when built out), the DEC TMDL implementation program, and the host municipalities that may also have permitting authority over future growth. This process should create a mechanism for coordinating development over time to ensure that these waters and their aquatic communities are restored to health without undue delay. [CLF]

Response

VTDEC appreciates such constructive comments and will take this into consideration during the development of watershed permit.

22. In light of DEC's recognition that future monitoring data may necessitate adjustment of the targets, the Drafts should be revised to expressly recognize DEC's inherent authority to reopen the TMDL under appropriate circumstances. [CLF]

Response

EPA's "Guidance for Water-Quality based Decisions: The TMDL Process," US EPA, 1991, EPA440-4-91-001, states that if water quality standards are not met after implementation of a TMDL, the TMDL and allocations of load and wasteloads must be modified. See EPA Guidance, p. 25. The modification should be based on the additional data and information gathering required as part of the TMDL implementation process. Vermont will use the monitoring plan described in the TMDL, and the specific monitoring requirements set out in the general permit to implement the TMDL, to determine if the stormwater control measures required by the general permit are meeting the TMDL targets. If controls are meeting the TMDL targets, but water quality standards are not met, then Vermont will reevaluate the TMDL targets.

23. At page 5, this TMDL uses "the surrogate of stormwater runoff volume in place of the traditional "pollutants of concern" approach." This summarily dismisses the other "pollutants of concern" and focuses the TMDL entirely on the physical impacts to the stream channel due to stormwater runoff volume, "SRV". At page 5, it is noted that "reductions in SRV will help diminished base flow (increased groundwater recharge)."

At page 5, the TMDL claims support for the surrogate approach as "appropriate because the amount of sediment and other pollutants discharged from out of channel sources is a function of the amount of SR generated from a watershed." At page 8, the TMDL states the singular "goal of this TMDL is to address the controlling factor of instream sediment production by determining the departure of the existing discharge characteristics in Englesby Brook from attainment stream discharge characteristics and to set flow reductions targets to allow for reestablishment of good habitat conditions throughout the stream on or to meet VTWQS." The foregoing rationale seems to be that IF there is a reduction of SRV there will be a resulting reduction in sediment load. While I would agree that reducing SRV would help reduce in channel stream bank erosion, reducing SRV will not necessarily reduce sediment load IF erosion control measures and best management practices are not equally implemented throughout the watershed. [Mr. Mapes]

Response

In justifying the use of the hydrologic targets, which fundamentally means treatment of stormwater runoff, as a surrogate for pollutant loading, the TMDL identifies several mechanisms by which stressors on the streams' biological communities will be addressed. These include, reducing the instream channel sediment loading, habitat degradation, direct effects of high flows on biota, and out of channel pollutant loading associated primarily with sediment. This final stressor will be substantially reduced as runoff from existing impervious surfaces is treated to accomplish the TMDL hydrologic targets. To what degree existing impervious surfaces are treated with best management practices will be spelled out in the forthcoming watershed permit implementing the TMDL targets.

24. At page 8, REDUCED BASE FLOW, the TMDL recognizes that groundwater recharge is the predominant source of stream base flow and that impervious cover increases surface runoff and thus reduces recharge. Yet there is no discussion or strategy offered on how to increase perviousness (permeable pavers, stormwater infiltrators) in the watershed to effectively increase groundwater recharge by the target percentage and how such recharge can be effectively achieved and at the same time complying with the Vermont Stormwater Management Manual. I often hear how the VSMM is not easy to use (fully comply) in more urbanized environments.[Mr. Mapes]

Response

The implementation strategy necessary to achieve the TMDL flow targets, both high and low flows, will be the focus of the forthcoming watershed general permit.

25. At page 10, NUMERIC WATER QUALITY TARGET, the TMDL provides that "the challenge is to determine the maximum stormwater runoff target volume for the stormwater-impaired stream." At page 15-16, Target Setting Approach, figure 2, bases this TMDL on streams in communities and landscapes not like Burlington and that concerns me as to how realistic the targets are when the compared streams/watersheds are not at all like Englesby. The TMDL provides "While VTDEC affirms the attainment stream approach outlined in the Docket report and has taken steps to reduce a significant

level of target setting uncertainty by incorporating a solid statistical approach and while the stormwater runoff volume target approach has not routinely been utilized in the development of TMDL's should not detract from its firm basis in sound science and logical experimental design" and further rests on the concept that "post-implementation adaptive management provides yet another layer of safety that the VTWQS will be met". I am concerned not as much with target setting approach to reducing SRV, but with the "post-implementation adaptive management" and how that management strategy will ultimately play out if the "trial & error " approach requires further measures to reduce flow over that what is predicted today by this TMDL. Once development occurs and sites get paved and infrastructure is in place then what? [Mr. Mapes]

Response

Vermont's state stormwater law provides that the Secretary may require a state permit for a discharge from any size of impervious surface if the Secretary determines that a permit is necessary to meet the requirements of a TMDL. (Vermont Environmental Protection Rules, Chapter 22, Section 22-302(a)(5). This level of regulation is unprecedented and allows the Secretary to reach down and require BMP implementation on even the smallest of sites if necessary to meet the TMDL targets. Additionally, if future monitoring reveals that after sufficient time the TMDL targets are not being achieved, the above authority can be used to require additional stormwater treatments on existing sites.

26. At page 16-19, ALLOCATIONS, the TMDL must "provide for an allocation of the target (flows) between point sources and nonpoint sources "and in establishing the limits of the WLA with the TMDL concluding that the "regulated areas (those stormwater discharges subject to NPDES program, e.g., construction activity and multi-sector industries), including all the NPDES permitted sources required to be in the WLA, are responsible for reducing and maintaining a 100% decrease in the high flow target. Essentially what this means to me is that only those properties or projects that invoke a need for a Construction General Permit or MSGP permit will be responsible for reducing and maintaining a 100% decrease in the high flow target. If so, how is this realistically going to work, when many if not most projects at least as far as CGP is concerned occur often on less than an acre of earth disturbance and the State has yet to implement or fully implement the MSGP program for VT. So to state my point: by aggregating NPDES-regulated and non NPDES-regulated stormwater discharges in the WLA, the public is provided a (very un)clear understanding of how VT proposes to achieve WQS and meet the cleanup target established in the TMDL and as such the allocation upon which this TMDL rests is very misleading and not realistically achievable. What happens IF no property/project within the watershed ever invokes a CGP or MSGP? Why not assure implementation/compliance of the TMDL is tied to Burlington's MS4 permit, and/or MS4 permit required stormwater/erosion ordinance? [Mr. Mapes]

Response

As discussed in the TMDL, Vermont is authorized to implement both a federally-authorized NPDES permit program for stormwater discharges from construction activities, industrial activities and municipal discharges under the MS4 program and a state-authorized permitting program for stormwater discharges from impervious surfaces

equal to or greater than one acre. This dual permitting authority provides Vermont with powerful tools for requiring the implementation of stormwater treatment and control practices necessary to meet the cleanup targets in this TMDL.

Vermont's state stormwater law provides that the Secretary may require a state permit for a discharge from any size of impervious surface if the Secretary determines that a permit is necessary to meet the requirements of a TMDL. (Vermont Environmental Protection Rules, Chapter 22, Section 22-302(a)(5). This level of regulation is unprecedented and allows the Secretary to reach down and require BMP implementation on even the smallest of sites if necessary to meet the TMDL targets. This authority is not limited in any way to whether the site does or does not require a NPDES permit for construction activities, industrial activities or otherwise.

27. I am assured in the TMDL that the responsibility for achieving 100% decrease rest on a group of unknown and too few to account for groups of properties but then the TMDL proceeds to advise me how the TMDL is to be allocated (accomplished) as a result of future growth. And future growth is divided between "jurisdictional" and "non-jurisdictional" new growth based upon what development triggers new impervious surfaces of more than 1 acre. While the allocations from 20 acres of "assumed "non-jurisdictional" growth is apparently added to the platter of the "jurisdictional" folks the TMDL makes no mention of redevelopment of existing impervious properties where such flow control opportunities may lie OR how to employ or engage "non-jurisdictional" new growth via the City's MS4 mandated stormwater ordinances (of which none currently exist but are required of GP 3-9014) OR what happens IF no new growth triggers "jurisdiction" to begin with? Also, while it may be fair to assume there would be 20 new acres of "non-jurisdictional" development, this TMDL seems to create two classes of projects/developments, those that MUST do something to improve Englesby and those who not do a thing, thus creating and sending the writing message to all owners, developers alike. I do not like the mixed message and the fact that while the allocation may have been incorporated and burdened on the backs of the "jurisdictional" folks, if any ever exist, that there are and will be some folks/properties who can easily through no minimum requirements NEGATE all the positive and hopeful anticipated results because they do not need to do a thing. This strategy in my humble opinion is flawed.[Mr. Mapes]

Response

See Response to Comment 26 above.

28. At page 19, FUTURE GROWTH, the TMDL distinguishes between new "jurisdictional" growth, those projects subject to VSMM 2002, and assumes adherence to the channel protection requirements of VSMM 2002 are sufficient to protect against future stream degradation. While I believe the stream channel requirements of the VSMM are sound and perhaps very effective, what is not effective is resting an entire TMDL on a program where there is no certainty or predictability that projects/properties are necessarily going to invoke requiring to comply with VSMM 2002 AND stream Channel Protection is yet one part of the sediment load equations what about the contributions of erosion in the

watershed from many projects/properties/impacts/activities that will remain unaddressed and unabated because CGP will not apply or even if it does there is little enforcement dealing with ongoing erosion.[Mr. Mapes]

Response

See Response to Comment #26.

Attachment 1

Responses to Public Comments on the Draft Potash Brook TMDL – October 2006

Responses to Public Comments on the Draft Potash Brook TMDL

Comments received on the Draft Potash Brook TMDL

Identification	Submitted by:	Signed by:
VNRC	Vermont Natural Resources Council	Jon Groveman, Esq. VNRC Water Program Director
City of South Burlington	City of South Burlington (prepared by Pioneer Environmental Associates, LLC)	Jeffrey A. Nelson Principal/Hydrogeologist
LCC	Lake Champlain Committee	Michael Winslow Staff Scientist
CLF	Conservation Law Foundation	Anthony Iarrapino Staff Attorney
WRP	Vermont Natural Resources Board, Water Resources Panel (staff comments)	D. Dutcher Associate General Council
VTrans	VTrans	Jon Armstrong Stormwater Management Engineer
USEPA-R1	US Environmental Protection Agency, Region 1	via email from Eric Perkins

Following each numbered comment below, the [] identifies the commentor's identification.

Part 1: Comments pertaining to legal interpretations of CWA and various implementing regulations

1. Section 303(d) of the Clean Water Act specifically requires that DEC establish TMDLs for “pollutants.” The draft TMDL contains no maximum pollutant load calculation for sediment or any other “pollutant” as that term is defined in 33 U.S.C. Section 1362(6). The pollutant-surrogate approach cannot legally be labeled a TMDL consistent with 33 U.S.C. Section 1313(d)(1)(C) and thus EPA has no authority to approve it as such. Sediment is the appropriate “pollutant” for which a TMDL should be issued. [CLF]

Response to 1:

Section 303(d)(1)(C) of the Clean Water Act (33 U.S.C. Section 1313(d)(1)(C)) provides that each State shall establish, for waters listed pursuant to Section 303(d)(1)(A), the total maximum daily load (“TMDL”) for those pollutants which EPA has identified as suitable for such calculation. The term “total maximum daily load” is not specifically defined in the Clean Water Act. While TMDLs are intended to address impairments resulting from pollutants, there is nothing in EPA’s regulations that forbid expression of a TMDL in terms of a surrogate for pollutant-related impairments.

EPA's regulations state that TMDLs can be expressed in several ways, including in terms of toxicity, which is a characteristic of one or more pollutants, or by some "other appropriate measure." 40 C.F.R. § 130.2(i). They also state that TMDLs may be established using a biomonitoring approach as an alternative to the pollutant-by-pollutant approach. 40 C.F.R. § 130.7(c)(1). This flexibility in the expression of TMDLs supports reliance on a surrogate where, as in this case, there is a reasonable rationale and the TMDL is designed to ensure attainment with water quality standards.

As discussed in the TMDL documentation, a combination of pollutants found in stormwater, including sediment (from wash-off and instream sources) and associated pollutants such as metals, is contributing to the aquatic life impairment in Potash Brook. However, there is no information that indicates that any pollutant is causing or contributing to an exceedence of any pollutant specific water quality criterion. Nor is there sufficient information available to identify specific pollutant loadings which, in combination, are contributing to the aquatic life impairment, particularly given the variability in types and amounts of pollutants depending on a range of storm events.

On the other hand, there is a strong correlation between pollutant loads and stormwater flows, for the reasons explained in the TMDL and supporting documentation. Therefore it is reasonable to rely on the surrogate measure of stormwater runoff volume to represent the combination of pollutants that contribute to the impairment of Potash Brook.

2. TMDL development is premature since DEC has not exhausted all of its options for bringing Potash Brook into compliance with WQS. TMDLs are only for those waters for which effluent limitations are not stringent enough to implement WQS and since DEC has failed to impose effluent limitations on eligible discharges, there is no basis yet to conclude that a TMDL is required. [CLF]

Response to 2:

Pollutants associated with stormwater flows causing impairments of Potash Brook come from NPDES-regulated point sources, such as discharges from municipal separate storm sewer systems (MS4s); non-NPDES regulated point sources, such as commercial parking lot runoff; and nonpoint sources, such as overland runoff and instream sediment erosion. EPA's regulations require the listing of an impaired segment on the CWA Section 303(d) list -- and the preparation of a TMDL -- if technology-based effluent limitations required under the CWA, more stringent effluent limitations required by federal, state, or local authority, or other pollution control requirements required by local, state, or federal authority are not sufficient to meet state water quality standards. See 40 CFR §130.7(b)(1). Conversely, as set forth in EPA's July 29, 2005 Guidance for 2006 Assessment, Listing and Reporting Requirements Pursuant to Sections 303(d), 305(b) and 314 of the Clean Water Act, EPA interprets §130.7(b)(1) to allow the removal of a water from the § 303(d) list, and its placement into the integrated list's § 4(b) category of waters that are impaired but no TMDL is needed, if effluent limitations and/or other pollution control requirements are stringent enough to implement water quality standards within a reasonable period of time. See EPA 2005 Guidance, p. 54.

Neither the statute nor the regulations obligate states to implement all possible actions to control the full suite of point and nonpoint sources before establishing a TMDL. This is particularly true where, as here, there are many varied sources within the watershed that cumulatively result in the adverse effects on the brook. In this case, the TMDL is a valuable tool for establishing reasonable targets on which future implementation actions can be based.

Finally, the commenter argues that DEC should exercise its residual designation authority under 40 C.F.R. § 122.26(a)(9)(i)(d) so that NPDES permits are required for all stormwater discharges to Potash Brook. This would enable DEC to remove Potash Brook from the § 303(d) list, and to place it in the § 4(b) listing category. Forty C.F.R. § 122.26(a)(9)(i)(d) provides the permitting agency with residual designation authority to require a NPDES permit for stormwater discharges that are determined to be causing or contributing to a water quality standards violations or are a significant contributor of pollutants. As a result of a recent Vermont Supreme Court decision, *In Re Stormwater NPDES Petition*, ___A.2d ___, 2006 WL 2457167, 2006 Vt 91 (August 25, 2006), DEC will be evaluating the petition for residual designation of stormwater discharges to Potash Brook. However, there is no statutory or regulatory reason to halt completion of the TMDL pending any final residual designation determinations. Even if additional point source stormwater discharges are required to obtain an NPDES permit, there will still be nonpoint sources of stormwater, including overland runoff and, in the case of sediment, instream erosion.

3. Clean Water Act regulations define a wasteload allocation as “the portion of a receiving water’s loading capacity that is allocated to one of its existing or future point sources.” 40 C.F.R. § 130.2(h) (Emphasis added). The regulatory definition does not contemplate the type of aggregate WLA contained in the Draft. To be consistent with the regulatory definition, the Draft must give some indication of the per capita responsibility for the overall flow reduction/increase assigned to each point source. [CLF]

Response to 3:

Forty C.F.R. Section 130.2(h) provides that point source discharges (interpreted by EPA to mean discharges subject to the NPDES permit program) must be addressed by the wasteload allocation component of a TMDL. Discharges involving process wastewater, non-contact cooling water, and other non-stormwater discharges are assigned individual waste load allocations pursuant to this regulation. Stormwater discharges, however, are less amenable to individual wasteload allocations. In recognition of this fact, EPA’s November 22, 2002 guidance entitled “Establishing Total Maximum Daily Load (TMDL) Wasteload Allocations (WLAs) for Stormwater Sources and NPDES Permit Requirements Based on Those WLAs,” provides that it is reasonable to express allocations for NPDES-regulated stormwater discharges from multiple point sources as a single categorical or aggregate wasteload allocation when data and information are insufficient to assign each source or outfall individual WLAs. EPA’s guidance recognizes that the available data and information usually are not detailed enough to determine waste load allocations for NPDES-regulated stormwater discharges on an outfall-specific basis.

In the case of Potash Brook, VTDEC has determined that because the stormwater discharges are highly variable in frequency and duration, it is not feasible to establish specific wasteload allocations for each stormwater outfall. It is impossible to determine with any precision or certainty the actual and projected loadings for individual discharges or groups of discharges. During the implementation of the Potash Brook TMDL, through a watershed wide general permit, DEC will assign responsibilities to stormwater dischargers as necessary to meet the remediation targets.

4. A water quality remediation plan should be developed for Potash Brook so that it can be “delisted” from the 303(d) list via Category 4(b), thereby negating the need for a TMDL. [CLF]

Response to 4:

DEC has addressed the commenter’s comment in the response to Comment #2. DEC, in full cooperation with EPA and in keeping with the spirit and recommendation of the Docket, has decided to prepare a TMDL for Potash Brook and the other Vermont urban stormwater-impaired watersheds.

5. The Draft TMDL determines that stormwater controls on point source discharges into Potash Brook are needed based on the Draft TMDL’s wasteload allocations. Once the Draft TMDL is issued, all operators of point source stormwater discharges subject to state stormwater permitting in the Potash Brook watershed may need to obtain NPDES permits pursuant to Section 122.26(a)(9)(i)(C) of EPA’s Phase II stormwater regulations. In addition, the state stormwater permitting system presumes that all stormwater discharges to which it applies are significant contributors of stormwater pollutants. Consequently, pursuant to section 122.26(a)(9)(i)(D) of EPA’s Phase II stormwater regulations, ANR may need to issue NPDES permits for all point source stormwater discharges subject to state stormwater permitting in the Potash Brook watershed. [WRP]

Response to 5:

As stated in Response #2, 40 C.F.R. Section 122.26(a)(9)(i)(D) provides the permitting agency with residual designation authority to require a NPDES permit for stormwater discharges that are determined to be causing or contributing to a water quality standards violation or are a significant contributor of pollutants. In *In Re Stormwater NPDES Petition*, __A.2d __, 2006 WL 2457167, 2006 Vt 91 (August 25, 2006), the Vermont Supreme Court held that any designation decision under Section 122.26(a)(9)(i)(D) involves a particularized, fact-specific determination on a case-by-case basis as to whether certain discharges or categories of discharges should be designated as requiring a NPDES permit. Contrary to the comment submitted, the Court did not find that the state permitting system “presumes that all stormwater discharges to which it applies are significant contributors of stormwater pollutants” under federal law. Although the Vermont Supreme Court case did not deal with designation pursuant to 40 C.F.R. 122.26(a)(9)(i)(C), it is anticipated that a court would find that a similar fact-specific determination on a case-by-case basis would be applicable in that case also. As a result of the recent Vermont Supreme Court case, DEC will be evaluating the petition for the residual designation of stormwater discharges to Potash Brook.

6. The Draft TMDL inaccurately refers to areas of growth not currently subject to ANR’s stormwater permitting program as non-jurisdictional. ANR has the duty and authority to manage and control all point source and nonpoint source discharges into Potash Brook as may be necessary to ensure that the receiving waters comply with the Vermont Water Quality Standards. [WRP]

Response to 6:

The draft TMDL’s reference to “non-jurisdictional” discharges is a general reference to stormwater discharges from impervious surfaces less than one acre. Generally, a state stormwater permit is only required for stormwater discharges from impervious surfaces greater than one acre. Despite this, DEC clearly has the authority to require state stormwater discharge permits for any discharge from impervious surfaces less than one acre as necessary to meet the TMDL targets. See Section 22-302(a)(5) of DEC’s Stormwater Management Rule for Stormwater-Impaired Waters.

7. Given the highly innovative and experimental nature of the approach taken by the Draft, it is important that the Draft include some mechanism to revisit the model’s artificial targets in the event that the synthetic targets are met, but predicted in-stream responses do not occur. The commenter urges DEC to include a reopener clause that would allow DEC to “recalculate the TMDL” if new data demonstrates that recalculation is necessary. [CLF]

Response to 7:

EPA’s “Guidance for Water-Quality based Decisions: The TMDL Process,” US EPA, 1991, EPA440-4-91-001, states that if water quality standards are not met after implementation of a TMDL, the TMDL and allocations of load and wasteloads must be modified. See EPA Guidance, p. 25. The modification should be based on the additional data and information gathering required as part of the TMDL implementation process. Vermont will use the monitoring plan described in the TMDL, and the specific monitoring requirements set out in the general permit to implement the TMDL, to determine if the stormwater control measures required by the general permit are meeting the TMDL targets. If controls are meeting the TMDL targets, but water quality standards are not met, then Vermont will reevaluate the TMDL targets.

Part 2: Comments pertaining to technical or policy decisions

Use of Hydrology as Surrogate

8. The Draft states that it is based on the Water Resources Board’s “Stormwater Cleanup Plan Framework” (Framework), but it discards a key aspect of the Framework by failing to establish “loading targets” for wash-off sediment. [CLF]
9. The Water Resources Board’s Stormwater Investigation Docket outlined a plan for using both hydrology and sediment as surrogates for the full panoply of stormwater pollutants addressed by stormwater TMDLs. The Draft Potash Brook TMDL uses hydrology as a surrogate but not sediment. [WRP]

Response to 8 & 9:

The hydrologic targets selected for the Potash Brook TMDL are consistent with the recommended approach in the Docket report, which advocates the establishment of surrogate hydrologic targets as being the most useful and predictable way to attain water quality standards. The Docket also suggested including wash-off sediment as an additional surrogate for the pollutants that may be found in stormwater. However, VTDEC’s subsequent detailed evaluation of Potash Brook has led VTDEC to conclude that wash-off sediment loading targets would not be a useful addition to the TMDL, as explained below.

Wash-off sediment is a subset of the sediment loads that are contributing to impairments in the urbanized streams. The 2005 geomorphic assessment for Potash Brook revealed that the brook is in a less than stable condition (undergoing active erosion) and 11 out of 15 assessed reaches were found to be highly sensitive to further channel instability. The assessment confirmed that the endogenous (i.e., instream) sediment load plays a much greater role than wash-off sediment in this system. Setting wash-off sediment targets would not address the endogenous sediment loads. In contrast, the selected approach of using hydrologic targets, focusing on the volume of stormwater runoff, acts to address both the wash-off sediment and the instream sediment dynamics associated with high flow runoff events. As explained in the TMDL documentation⁵, there is a high correlation between sediment loads and stormwater flows. Stormwater targets are therefore a reasonable surrogate for sediment loads. Stormwater flow reductions will result in reductions of sediment inputs, as well as improvement in other stressors that contribute to impairment, such as channel instability and habitat destruction.

Given that stormwater flow is a reasonable surrogate for sediment loads, the question is whether there is any value in adding wash-off sediment load targets either as a surrogate for other pollutants that may be in stormwater, or as an additional basis for controlling sediment. In this case, there is nothing in the record that suggests that pollutants other

⁵ *Expanded Technical Analysis: Utilizing Hydrologic Targets as Surrogates for TMDL Development in Vermont’s Stormwater Impaired Streams*. Prepared by the U.S. Environmental Protection Agency and the Vermont Department of Environmental Conservation, September, 2006.

than sediment are significantly contributing to the impairments in the brook, so there is no apparent need to establish wash-off sediment load targets for the specific purpose of controlling such other pollutants. Moreover, to the extent that such pollutants exist and are associated with wash-off sediment, their loads will be reduced along with sediment reductions through the implementation of measures to meet the hydrologic targets.

VTDEC also sees little value in adding wash-off sediment targets to the TMDL in order to address sediment loads. Such targets would not be useful for purposes of TMDL implementation. The Docket report itself plainly states that hydrologic targets are more predictable in their connection to attainment of WQS than sediment loading. The Docket states on page 5 of Appendix A:

“Although both the water flow and sediment targets could be used to guide the development of the specific management measures, currently there is a better understanding of the hydrologic responses in streams than there is of the sediment dynamics in streams. Therefore, in most cases the hydrologic targets will be the primary ones driving the development of specific management strategies.”

Implementation efforts to achieve specific wash-off sediment loading targets would be incomplete, because they would ignore the larger problem of instream sediment production, as well as other stressors such as channel instability and habitat destruction. Management actions primarily focused on achieving the wash-off sediment targets could potentially conflict with more beneficial actions to address the hydrologic targets. For example, in a retrofit situation with limited space for a stormwater treatment practice, design decisions may need to be made to either maximize control of sediment (water quality) or runoff volumes. Even if sediment loading targets that include both wash-off and instream sediment could be established, the only reasonable way to achieve such targets would be to control stormwater flow. Therefore, the addition to the TMDL of sediment loading targets would not improve the VTDEC’s or the public’s understanding of what control measures would be needed to attain water quality standards.

In summary, the bottom line as to why hydrologic targets were used exclusively is that VTDEC believes these targets provide the best and most comprehensive measure to predict when an impaired stream will attain WQS. As stated above, it’s believed that application of the hydrologic targets provides a reasonable expectation that watershed sediment loading from surface and gully erosion will be sufficiently controlled since a reduction in stormwater runoff will result in reduced wash-off and endogenous sediment loading. Since the publication of the Docket report, VTDEC has worked closely with and received financial support from EPA to develop the modeling framework upon which this TMDL is based. The sole purpose of the P8 modeling effort was to develop flow based targets for the impaired watersheds. EPA has supported the stormwater runoff approach as a surrogate for the “pollutant of concern” for TMDL development in this case.

10. Please remove the word “stormwater” from the title of the TMDL. We suggest the following title: Total Maximum Daily Load to Address Biological Impairment in Potash Brook. This may seem like a subtle distinction, but the TMDL is really being developed

for pollutant loads and other stressors to aquatic life, and stormwater is a surrogate for those loads and stressors. [USEPA-R1]

Response to 10:

VTDEC will re-title the TMDL as suggested.

11. The TMDL should include a short description or table of the most likely stressors (e.g., increased sedimentation, other pollutant stressors, impaired habitat, and low base flow) contributing to the biological impairment with citations to the various studies that have been done of the Potash watershed. Each stressor should then be linked to the surrogate selected for this TMDL: stormwater runoff volume. [USEPA-R1]

Response to 11:

VTDEC has made a determination that stormwater flows and the resultant instability and degradation of aquatic habitat in the stream channel is the primary cause of impairment in Potash Brook and therefore, hydrologic targets have been established to address that problem. While other stressors may be at play in Potash Brook, VTDEC doesn't believe, at this time, that they are contributing the same level of disturbance as the stormwater flows. Stormwater treatment and reduction of flows will lead to improved water quality in Potash Brook.

12. We also recommend that the section on fluvial geomorphic considerations be made more specific to Potash Brook. [USEPA-R1]

Response to 12:

The TMDL will be edited to reflect fluvial geomorphic considerations specific to Potash Brook.

13. We suggest the following formatting/organizational changes to the “Pollutant of Concern” section to help accommodate the additions referred to above: We suggest the title “Pollutant of Concern” be changed to “Description of Impairment” and that the subsection “Surrogate Measure for Biological Impairment” be changed to “Pollutants of Concern and Other Stressors”. The additional site-specific information on stressors, including a revised section on reduced base flow tailored to Potash, would all fit under the Pollutants of Concern and Other Stressors heading. The bottom paragraph on page 4 (describing the surrogate approach) and the section on fluvial geomorphic considerations could be included in a section titled “Surrogate Measure for Multiple Stressors”. [USEPA-R1]

Response to 13:

VTDEC will reorganize as suggested.

14. To further document the relationship between stormwater runoff and sedimentation, we recommend including an analysis of substrate composition and related data for Potash Brook and the attainment watersheds to the extent these data are available. This could be included as a technical addendum to the TMDL. [USEPA-R1]

Response to 14:

While substrate composition is a very good measure of aquatic life habitat in streams, VTDEC believes that a better overall measure of the instream habitat condition is the departure that exists between Potash Brook and an appropriate reference condition as related in the Stream Geomorphic Assessment data. This departure data will be added to the TMDL to further illustrate the link between stormwater runoff and habitat degradation.

Target Setting Approach

15. Please include a statement in the first paragraph under “Target Setting Approach” on page 8 that clarifies that all attainment watersheds meet or exceed Vermont’s water quality standards criteria for aquatic life. Also, we suggest revising the first sentence under the Numeric Water Quality Target section to read “In a pollutant-specific TMDL, a stream’s water quality target, or loading capacity, is the greatest amount of pollutant loading the water can receive without violating water quality standards.” [USEPA-R1]

Response to 15:

VTDEC will edit as suggested.

16. We recommend that the target setting process be explained a little more clearly. In particular, the final paragraph starting at the bottom of page 11 may leave readers with the impression that the target is based on the mean of all 15 attainment FDCs rather than just the two matched with Potash. [USEPA-R1]

Response to 16:

VTDEC will edit as suggested.

Margin of Safety

17. TMDL lacks a sufficiently conservative Margin of Safety due to significant uncertainty, limited attainment stream data and untested nontraditional approach. [CLF, VNRC]
18. TMDL does not include a reasonably derived margin of safety and it is not clear as to how the selection of the mean flow value of the attainment streams is conservative. [WRP]
19. Please explain more clearly why the use of the mean of the attainment flow duration curves for target setting provides a margin of safety. [USEPA-R1]

Response to 17, 18, & 19:The mean flow of the two attainment streams was selected as the target flow condition in the Potash Brook TMDL to provide an intrinsic margin of safety that the selected targets would provide for the attainment of the Vermont Water Quality Standards. Due to the rigorous application of the attainment stream approach in

the Potash Brook TMDL, the targets are believed to be particularly accurate thus reducing the need for an overly conservative or arbitrary margin of safety.

The use of the attainment stream approach is a particularly good approach to identify flow targets because it relates appropriate flow conditions in streams that comply with the VTWQS (attainment streams) back to Potash Brook. However, haphazard matching of attainment streams, and thus flow targets, to Potash Brook could lead to targets with a high degree of uncertainty as to whether standards would be met. To provide a more rigorous target setting approach, attainment streams for Potash Brook were selected using an analysis described in “Statistical Analysis of Watershed Variables” (Foley, J. and Bowden, 2005). VTDEC believes that by utilizing this approach, Potash Brook was paired with the “most similar” attainment streams available in the Lake Champlain Valley. By identifying the “most similar” attainment streams through standard statistical approaches, a significant amount of uncertainty is eliminated regarding what are the best target values.

According to the attainment stream approach, by definition, the flows for the attainment streams (LaPlatte and Little Otter Creek) represent flows under which the biologic criteria are currently being met. This can be thought of as a range of flows in streams most similar to Potash Brook that are capable of sustaining appropriate aquatic life standards as defined by the VTWQS. At the high flow target interval, this represents a range of flows from 9.02 to 11.52 cfs/sq mi. It is reasonable to assume that attainment of flows at the high end of this range (11.52 cfs/sq mi) would allow Potash Brook to comply with the VTWQS. However, rather than basing the Potash Brook target on the high end of the range for the attainment streams, VTDEC took a more conservative approach by selecting the mean of the range (10.27 cfs/sq mi). This had the effect of providing a 10% margin of safety.

Additionally, it is likely that the flows represented by the attainment stream are not at the “threshold” of attainment. That is, the modeled flows in the streams currently meeting standards likely represent flows somewhat below that which impairment would occur, thus adding an additional level of safety.

VTDEC affirms the attainment stream approach outlined in the Docket report and has taken steps to reduce a significant level of target setting uncertainty by incorporating a solid statistical approach. The fact that the stormwater runoff volume target approach has not routinely been utilized in the development of TMDLs should not detract from its firm basis in sound science and logical experimental design.

Further, the Docket strongly urges the concept of adaptive management when implementing controls in the stormwater-impaired streams and VTDEC is firmly committed to this idea. Various types of watershed monitoring, many of which have already been initiated, will provide the necessary data to either adjust the targets or implementation measures to ensure ultimate compliance in Potash Brook. While VTDEC believes there is an adequately conservative margin of safety associated with these

targets, post-implementation adaptive management provides yet another layer of “safety” that the WQS will be met.

Additional language will be added to the TMDL to provide more clarity regarding the conservative nature of the mean attainment flow target and how it provides an adequate margin of safety.

Allocation of Loads

20. VNRC recommends that DEC take the calculations one step further and depict the targets as the amount of water surplus or deficit that must be achieved when applying the percent differences. [VNRC]

Response to 20:

VTDEC does not believe that such a calculation, though easily computed, is a useful item to include in the TMDL. First, the TMDL included the percentage allocations rather than modeled runoff volumes because this approach was specifically suggested in the Docket report at page 2 of Appendix A:

“The same models would be run in the impaired watershed and the attainment watersheds, and the relative difference between the two conditions would be used to establish the flows needed to restore the stream’s hydrology. Hydrologic targets could be expressed as percentage reductions in distribution of runoff volumes over time within the impaired watershed.”

VTDEC believes that this is the proper approach based on the TMDL development framework applied for target development.

Second, the TMDL explains on page 13 that due to possible discrepancies between model outputs and actual stream flows, percentage differences between modeled attainment and impaired flows best represent the amount of flow change necessary. Presenting the targets as flow volumes based on modeled outputs could confuse readers as to what is really necessary to fulfill the TMDL allocations. It’s the relative differences between the impaired and attainment stream flows that is the premise of this TMDL approach, not the attainment of the modeled flow differences as an absolute volume. Basing the TMDL on the volumes produced by the model could leave the false impression that simply implementing controls to produce those volumes would be sufficient to bring the impaired water into compliance with the WQS. For example, given that modeled flows rarely equate exactly to actual flows, it could turn out (hypothetically) that measured flows obtained prior to BMP implementation are found to be already at the target volume levels identified through the modeling work. In this scenario, if the TMDL target was expressed as an absolute flow (cubic feet/second), one could conclude that the target was met and no more work was needed. However, if the target was expressed as a percentage reduction, it would be clear that significant work would still be needed (a 16% reduction in the case of Potash). Clearly, attainment of WQS will be the ultimate gauge of whether more work is needed, but the expression of the flow target as a percentage reduction

ensures that the goal of the TMDL (bringing the hydrologic regime of the impaired stream into line with the hydrologic regimes of the matched attainment streams) is preserved.

21. VNRC urges DEC to issue the draft general permit that will implement the TMDL and allow public comment on both the TMDL and the general permit simultaneously. This would give the public the opportunity to understand how these percent differences translate into actual load allocations, and how the load reductions will be achieved. Unless this is done, it is very difficult to understand and comment on the TMDL. [VNRC]

Response to 21:

There is nothing in federal or state law that requires DEC to issue a draft general permit simultaneously with the TMDL. DEC believes that it is more appropriate to follow a two-step process. First, to issue the TMDL which establishes scientifically based hydrologic targets. Second, to issue a watershed wide general permit to require actions to reach those targets. In this way, the scientifically based TMDL targets will not be influenced by the pressures, both political and otherwise, that will inevitably surface when the general permit is issued and dischargers are required to spend potentially significant sums of money to construct and/or upgrade their stormwater systems.

22. VNRC does not understand the basis for assuming that all WLA's or point sources are in urban areas and all LA's or non-point sources are in agricultural areas. Isn't it true that farms that are discharging in agricultural areas would be considered point source CAFO's? Why does DEC assume that no MS4, multi-sector or NPDES construction discharges do occur in agricultural areas? Federal law requires that WLA's and LA's be allocated according to actual point and non-point sources. DEC's proposal to lump point and non-point discharges based on land use does not satisfy this requirement. 40 CFR §130.7. [VNRC]

Response to 22:

The Wasteload/Load allocation process applied in this TMDL allocates stormwater control responsibilities based on the sources and magnitude of stormwater runoff generated. As indicated in the TMDL, USEPA TMDL guidance suggests that oftentimes when dealing with the allocation of stormwater it is only possible to allocate by gross allotments due to a lack of specific data. This is the case in the Potash Brook TMDL. EPA guidance states (USEPA, 2002⁶, p.2) :

“Waste load allocations among point source dischargers are usually based on the relative contribution of pollutant load to the waterbody. We realize that estimating an aggregated load contribution to a particular waterbody from the stormwater phase I and II sources is imprecise, given the variability in sources,

⁶ USEPA, 2002(a). EPA New England Guidelines to States for Characterizing TMDL Allocations for NPS/Stormwater. April 2002. USEPA Region 1, Boston, MA.

runoff volumes, and pollutant loads over time. We therefore anticipate that any stormwater WLA portion of the TMDL may be based on a rough estimate.

The simplest way to estimate a gross regulated-stormwater WLA could probably be done on a watershed basis using land use analysis and export coefficients to estimate loading. One option might be to assess land area involved in urban and industrial uses and assign loading from that area to a WLA. If only part of a given community is regulated under phase II, the WLA estimate could be limited to the regulated land area (see “urbanized areas” delineated on stormwater maps). We’re interested in working with you to develop reasonable approaches that work for your TMDLs.”

Following this guidance, the runoff coefficient approach was applied to determine in a broad sense the sources and magnitude of stormwater runoff. The weighted proportion of runoff from the more developed areas, where the vast majority of the “regulated” stormwater was generated, established the limit of the WLA. In other words, the “regulated” areas, including all the NPDES permitted sources required to be in the WLA, are responsible for reducing and maintaining a 91% decrease in the high flow target. The same is true for the LA whereby the “nonregulated” areas are responsible for reducing and maintaining a 9% decrease in the high flow target.

Language will be added to the TMDL to clarify this procedure.

23. There is an error in the formula on page 14 for calculating R_v . A decimal place has been left off in the second constant. The correct formula according to the VT Stormwater Manual should read: $R_v = 0.05 + 0.009(I)$. However, calculations in Table 6 appear to be based on the correct formula. [LCC]

Response to 23:

The formula provided in the TMDL for calculating R_v at page 16 will be corrected. The formula given in the TMDL is presented in a slightly different form than the Vermont Stormwater Manual. The Vermont Stormwater Manual requires that “I” (impervious cover) be given as a whole number percentage while the formula in the TMDL asks that “I” be given as an “impervious fraction” as stated. Both forms of the equation will provide the same result.

24. The narrative explaining development of an R_v for each land use does not make clear what level of percent impervious cover was used in the calculation. The narrative states that the R_v for each land use group was weighted, however it is not clear whether this was done only between urban/developed land and agricultural land, or for each of the sub-categories within urban/developed as well. To the extent possible, weighting should be done by sub-category. The final TMDL should clarify the approach used. [LCC]

Response to 24:

The percent impervious cover value was applied to each sub-category of land use (e.g Residential, Row Crop, etc.) based on Table 5 of the TMDL. The total area of

impervious cover for each land use sub-category was then calculated based on the acreage of that specific land use found in the Potash Brook watershed. The impervious area was then summed for all sub-categories according to Table 4 and divided by the total area of the major land use categories. It was from this impervious cover number the Rv was calculated for each major land use category. The relative influence of each major land use category on runoff generation was then determined by calculating the ratio of that specific major land use category to the sum of the Rv's for both Urban/Developed and Agriculture/Open. The final step involved multiplying this relative influence value by the actual amount of area in each major land use category to determine the weighted influence of each major land use category on runoff generated.

25. Allocations p. 13-15: Not all transportation within Potash watershed should be characterized as urban/ developed broad land use class. The interstate and some other roads in the watershed do not have substantial collection systems representative of other urban curb and gutter closed systems. In these areas, sheet flow through vegetation and shallow concentrated flow in vegetated swales (with infiltration) is more dominant. Suggest that transportation be split into 2 categories to better represent actual conditions. A 41% percent impervious cover is quite high and not representative of the interstate. Have railroads been considered? [VTrans]

Response to 25:

The degree to which VTDEC was able to differentiate between existing land use categories for the determination of the Wasteload and Load Allocation was based solely on the quality of the land use data available. The LU/LC data available at the time of TMDL development does not distinguish between various types and locations of roads and highways but rather lumps all into a "Transportation" category (including railroads). VTDEC believes that while the 41% percent impervious value may not be absolutely accurate when looking at one specific section of road, when compiled across entire watersheds it reflects a reasonable value for the Transportation land use category.

26. Agriculture may have low impervious percent cover, but can have substantial hydrologic impacts associated with ditching, stream straightening, filling in of depressions, removal of trees and other large vegetative cover. Using % impervious cover, while convenient is not fully representative of actual hydrologic impacts. [VTrans]

Response to 26:

It is true that a more detailed hydrologic analysis could consider more site specific conditions that affect runoff. However, neither the data nor the resources to develop the data are currently available for inclusion in the TMDL. VTDEC believes that the 91%/9% allocation breakdown provides a reasonably realistic picture of the landscape conditions in the Potash Brook watershed as they relate to stormwater runoff generation.

27. While EPA appreciates the value of including a base flow target for informational purposes (as presented in the target setting section) we have concluded that it is not appropriate to include low flow targets as an actual allocation in the TMDL. The TMDL's loading capacity is presented in terms of a maximum volume of stormwater

runoff, and available information cited in the TMDL and its supporting documents indicates that the majority of the stressors, including pollutant loads, are associated with the high flows. We believe the low flow target should be included only for informational purposes to help promote awareness of the fact that infiltration practices should be an important part of selected stormwater controls. [USEPA-R1]

Response to 27:

VTDEC believes that restoring the low flow dynamics in Potash Brook are a vital component in the recovery of the stream and these targets will remain a management objective of the implementation. However, VTDEC will decouple the low flow targets from the TMDL allocation process as currently presented in the TMDL. VTDEC agrees that the current high flow regime is the primary stressor in Potash Brook.

28. In the allocation section, please specify regulated and non-regulated stormwater sources covered by the TMDL, e.g., MS4 stormwater discharges, other NPDES stormwater discharges (construction, industrial), state regulated (non-NPDES) stormwater discharges, and non-regulated nonpoint source discharges. [USEPA-R1]

Response to 28:

As stated in the TMDL:

“Because of data limitations and the wide variability of stormwater discharges, it is not possible to separate the stormwater discharges subject to the NPDES program (e.g. stormwater discharges from construction activity and multi-sector industries) from stormwater discharges that are not subject to NPDES permitting (e.g. stormwater discharges from impervious surfaces regulated under Vermont’s stormwater program). Therefore, all stormwater discharges from the urban/developed land category are included in the wasteload allocation portion of this TMDL. This category includes the NPDES-regulated stormwater discharges as well as other sources of stormwater runoff not regulated as NPDES discharges.”

29. Please explain why use of the runoff coefficient (primarily influenced by watershed imperviousness) is appropriate for establishing the load allocation for agricultural land. [USEPA-R1]

Response to 29:

VTDEC believes that this is a reasonable approach considering the types and condition of the Agriculture/Open spaces that are present in the Potash Brook watershed. The vast majority of Ag/Open spaces currently present are open fields with minimal manmade ditching drainage. Very little row crop production remains in the Potash Brook watershed where one would expect enhanced drainage infrastructure and significant sediment export.

Future Growth Allocation

30. The Draft’s “Future Growth” section appears to be based on the unrealistic assumption that Potash Brook’s pollution budget will never be exceeded as long as compliance with

the Vermont Stormwater Manual's Channel Protection Volume (CPv) criterion is achieved. CLF cannot agree that this is a scientifically sound concept. [CLF, VNRC]

Response to 30:

It's important to remember that there are two components to the future growth section of the TMDL. First, to address the impacts of new single family residential or other small development under 1 acre, the TMDL builds in an allocation for runoff expected to result from the maximum projected growth in this category over the next 10 years. Second, to address the impacts of development larger than 1 acre, the TMDL notes that this category of growth will need to comply with the current stormwater manual. The manual requires sites to meet channel protection (CPv) as well as groundwater recharge treatment standards. The premise of the channel protection standard is that runoff would be stored and released in such a gradual manner that critical erosive velocities would seldom be exceeded in downstream channels. MacRae (1991) found that the traditionally used 2-year control approach failed to protect channels worn into more sensitive boundary materials and actually aggravated erosion hazard in very sensitive channels. Therefore, MacRae (1991) developed the DRC (Distributed Runoff Control) as a method to vary the degree of control from the 2-year control to the 80% over control based on the strength of boundary material. A study done in Maryland (Cappuccitti, 2000) showed that "the CPv and DRC methods provide a comparable level of management." Additionally, the Center for Watershed Protection (CWP) recommends the use of the channel protection criteria stating that "the criterion balances the need to use a scientifically valid approach with a methodology that is relatively easy to implement in the context of a statewide program." (CWP, 2000) VTDEC believes that if future growth complies with the channel protection standard as well as the groundwater treatment standard, Potash Brook will still be able to meet both the high and low flow targets of the TMDL. Language will be added to the TMDL to further clarify this approach.

31. VNRC believes that to satisfy the requirements of federal law, TMDLs must include an actual allocation of loads for new growth, not just broad assumptions that best management practices can address any amount of new pollutant loading in an impaired water. *See* 40 CFR §130.7. [VNRC]

Response to 31:

See Response to Comment #30. DEC believes that the Potash Brook TMDL has been prepared in conformance with federal law and adequately addresses future growth.

32. Even with rigorous implementation and enforcement of the Manual's CPv requirements, there will come a point at which the amount of new impervious being added to the watershed will make it impossible to meet the flow reduction targets set by the Draft. Moreover, unchecked increases in the percentage impervious cover in the watershed will make it increasingly difficult, if not impossible, to achieve low-flow targets. Natural processes, like groundwater recharge that safeguard low flows, depend on large nonimpervious areas into which stormwater can infiltrate. Accordingly, the Draft's WLA's and LA's must expressly quantify the amount of additional impervious that the watershed can accommodate and still meet both the high and low flow targets. [CLF]

Response to 32:

See response to 30.

33. TMDL provides unrealistic allocation for future growth since it is based on unproven assumptions in the SWMM. Additional in situ effectiveness studies should be conducted to quantify and verify the actual load reductions. [VNRC]

Response to 33:

See response to 30.

34. What is the methodology employed to estimate thirty acres of “nonjurisdictional” impervious surfaces, at a maximum, will be created over the next ten years? Estimates should include full build out, not just what is expected in the next ten years. Additionally, the TMDL does not indicate that future growth in this category will be limited to 30 acres. [VNRC]

Response to 34:

VTDEC consulted with the City of South Burlington Planning Department to obtain an estimate of the non-jurisdictional impervious surfaces expected to be created over the next ten years. This estimate provides a basis from which to develop the future growth allocation incorporated in the TMDL. The overall TMDL is not intended to establish some “development limit” but rather to establish a stormwater runoff volume target that must be met and maintained through stormwater control measures. Implementation of the TMDL and future monitoring and adaptive management will inform the process as to whether future non-jurisdictional development (beyond that projected for the next 10 years) can be accommodated without further stormwater runoff controls. It should also be noted that there are a variety of projects currently underway in the Potash watershed which are promoting and funding the voluntary use of such stormwater controls as rain gardens and rain barrels at new and existing residential sites. The benefits provided by these measures are not factored into the TMDL allocations, and will help to further offset and minimize the impacts associated with new non-jurisdictional development. Considering all of the above, VTDEC believes future growth is adequately addressed in the TMDL.

35. The allocation for future growth is incomplete. Depending upon the Channel Protection Volume to mitigate impacts from future growth addresses peak flows, but does not necessarily address the need to maintain base flows, the importance of which was stressed in the TMDL. This weakness should be addressed in the final TMDL. [LCC]

Response to 35:

The VTDEC at the request of EPA Region 1 (see response to 27 above) is decoupling the low flow allocation from the TMDL allocation process. Therefore, there is no formal future growth allocation as it relates to the low flow target. However, the VTDEC believes that retaining the low flow target is instrumental in restoring Potash Brook. For the “jurisdictional” new growth, the Vermont Stormwater Management Manual requires

that the recharge volume be maintained from predevelopment conditions. For the “non-jurisdictional” new growth, a separate allocation was incorporated into the low flow target to account for any impact new impervious surfaces might have on groundwater recharge and base flow. VTDEC will add language to the TMDL to address new growth in relation to the low flow targets.

36. In the future growth section, please explain whether new development regulated through the NPDES program would also be required to meet the channel protection requirements in the Vermont Stormwater Management Manual. [USEPA-R1]

Response to 36:

New development is subject to Vermont’s approved NPDES program, including the stormwater construction permit, multi-sector permit and MS4 permit. New development regulated through these NPDES programs only needs to meet the channel protection requirements in the Vermont Stormwater Management Manual if such development also requires a state stormwater permit. In general, the development of one or more acres of impervious surfaces requires a state stormwater permit, which includes channel protection requirements. However, DEC’s Stormwater Rule for Stormwater-Impaired Waters also provides that a state stormwater permit, with channel protection requirements, may also be required for impervious surfaces of any size if necessary to implement a TMDL. This broad authority allows DEC to “reach down” to any size of impervious surfaces and require a state stormwater permit to ensure that the TMDL targets will be met.

Reasonable Assurance

37. The Clean and Clear plan is a statewide plan not specifically targeted at Potash Brook. The Draft fails to provide any indication of whether and to what extent the Clean and Clear action steps upon which it relies for reasonable assurances of nonpoint source reduction will actually occur in the Potash Brook watershed. Therefore, the Draft fails to provide a reasonable assurance that Clean and Clear will deliver nonpoint source reductions in Potash Brook sufficient to achieve the flow targets in the Draft’s LA. Also, funding is not guaranteed. [CLF, VNRC, WRP]

Response to 37:

VTDEC strongly believes that the Clean and Clear initiative provides a robust framework by which to identify and ultimately remediate non-point source problems that are contributing to the stormwater impairment in Potash Brook. Rarely does a nonpoint source pollution abatement program exist that takes such a multidisciplinary approach (wetlands, agriculture, stream geomorphology, transportation, planning, etc.) to the improvement of water quality. Not only does the multidisciplinary approach benefit a holistic assessment of the watershed, including stormwater impacts, but funding sources for implementing fixes have been high and consistent since Clean and Clear’s inception. According to the Clean and Clear Action Plan 2005 Annual Report:

“Clean and Clear remains on track to reach its TMDL funding goal of \$103 million from state and federal sources by 2009 (SFY 2010). Appropriate funding is critical in order to maintain the positive momentum of these programs which are so important to the task of removing phosphorus from Vermont waterways. State and federal government sources have contributed more than \$33 million to Clean and Clear. Full funding of the FY2007 request will bring the program close to the half-way point of the overall funding goal.” See also the response to comment #38, below.

38. Given that a (modestly) less stringent wasteload allocation is included in the TMDL based on the assumption that nonpoint source reductions will occur, EPA regulations require that there be reasonable assurance that these nonpoint source reductions will be achieved. The activities planned under the Clean and Clear initiative are broad actions that will have varying application throughout the Lake Champlain basin. Please indicate which actions will likely apply directly to the Potash Brook watershed (e.g., expansion of the Conservation Reserve Enhancement Program?) and make a significant impact on loadings, and the amount of funding provided and projected to be available for these particular actions. [USEPA-R1]

Response to 38:

The eight (8) bulleted items included in the Reasonable Assurance section of the TMDL are the Clean and Clear efforts that VTDEC believes are the most beneficial and relevant to the Potash Brook watershed. The Clean and Clear initiative includes many other types of work through many programs that would have lesser benefit to the Potash Brook stormwater impairment if applied in the watershed.

Since the TMDL was first drafted, work has progressed on a number of these efforts that will directly address the stormwater impacts to Potash Brook. This work includes the following: 1) the State-led basin planning process that includes the Potash watershed is now well underway, and is developing a number of strategies for the conservation of open space and restoration of riparian buffers, etc.; 2) an agricultural basin planner has been hired by the Otter Creek Natural Resources Conservation District, and this planner is facilitating input on agricultural components of the basin plan; 3) both phase 1 and 2 geomorphic assessments of Potash Brook have now been completed, and specific recommendations for next steps are laid out; 4) an Agricultural Resource Specialist has been assigned to the region including Potash Brook, and will be conducting a needs survey to determine opportunities for technical assistance on riparian buffer conservation, the Accepted Agricultural Practices, and other technical assistance needs; 5) the State Department of Forests, Parks and Recreation recently established a Wetland Restoration and Protection Program that provides funding for the protection or restoration of wetland areas in the Lake Champlain Basin, and basin planners have noted a number of wetland areas in the upper portion of the Potash watershed that might be good candidates for this program; and 6) The Vermont League of Cities and Towns recently hired a staff person under the Clean and Clear Initiative to assist municipalities with improvements to conservation oriented ordinances, and this person will be offering assistance to South Burlington. Taken together, these Potash Brook components of the Clean and Clear

Initiative (many of which are already underway) provide reasonable assurance that the modest nonpoint source reductions in the TMDL will be achieved.

Regarding the funding concern, see response to comment #37.

Monitoring Plan

39. In addition to the parameters discussed in the monitoring section of the TMDL report, EPA recommends that VT DEC also include monitoring for sediment and other pollutant stressors such as chloride. [USEPA-R1]

Response to 39:

A finalized monitoring plan has yet to be fully developed for Potash Brook; although, VTDEC will give thorough consideration to all potential parameters to be monitored and what methodologies will be applied for data collection.

Permit Related Comments

40. TMDL fails to provide interim targets to gauge effectiveness of implementation plan or a schedule as to when these targets would be met. [VNRC]

Response to 40:

Pursuant to federal regulation and guidance, the TMDL is not required to provide either of these things. The general permit that is issued to implement the TMDL will include a monitoring program to determine the effectiveness of the implementation plan in the permit and the permit will be amended as needed using the concept of adaptive management.

41. No timeline provided for adaptive management approach including Permit issuance and aquatic biota at a minimum. Fear that modifications to the permit could be put off for decades. [VNRC]

Response to 41:

The general permit that is issued to implement the TMDL will include timeframes for monitoring and amending the permit as necessary to ensure that water quality standards are met in Potash Brook.

42. The TMDL should be based on a five year time period and contain a provision that requires DEC to review the assumptions and calculations in the TMDL after data is collected over this period of time. Without a reasonable time frame and firm commitment to revisit the TMDL, there is no assurance that DEC will adapt and alter the TMDL as we learn more about its effectiveness. [VNRC]

Response to 42:

DEC is committed to taking whatever action is required to ensure that water quality standards are met in Potash Brook. This may include amending the TMDL as necessary.

43. Permit actions should be “front-loaded” so that dischargers with the greatest impact be required to take action first. [VNRC]

Response to 43:

The TMDL implementation plan will be reflected in the general permit that is issued to implement the TMDL. That permit will require actions that DEC determines are necessary to meet water quality standards in Potash Brook and that permit will be amended over time to include additional actions as necessary.

44. No guarantee that the permit will meet specific requirements of the TMDL. DEC should wait until implementation plan (permit) is further defined before moving forward with TMDL adoption. [VNRC]

Response to 44:

There is nothing in state or federal law that requires that DEC must wait until the implementation plan is further defined before moving forward with the TMDL for Potash Brook.

45. NPDES Construction permit should require stricter controls in Potash Brook. [VNRC]

Response to 45:

NPDES construction permits are issued by DEC in conformance with federal and state law. These permits will serve as one more tool to ensure that water quality standards are met in Potash Brook.

46. A detailed enforcement program must be included in the TMDL if it relies on other stormwater NPDES programs to restore Potash Brook. [VNRC]

Response to 46:

DEC is committed to taking whatever action is necessary to ensure that water quality standards are met in Potash Brook, including the use of enforcement tools, as necessary. There is no requirement in federal or state law that requires that an enforcement program be included in a TMDL.

47. The Potash Brook TMDL should contain a fully developed monitoring plan even without a detailed implementation plan in place. [VNRC]

Response to 47:

While not required by EPA to be included, the Potash TMDL does describe several monitoring plan items that have already been initiated such as the stream geomorphic assessments, flow and precipitation monitoring, impervious surface mapping and aquatic biological monitoring. The watershed specific monitoring plan, including parameters, methodologies, and sampling frequencies will likely not be fully compiled until an implementation plan and time line is developed.

48. The allocation process in the Draft Potash Brook TMDL does not demonstrate how management measures proposed for existing and new discharges will bring the receiving waters into compliance with the Vermont Water Quality Standards. [WRP]

Response to 48:

The purpose of the Potash Brook TMDL, and TMDLs in general, is to establish the targets necessary to implement the applicable Water Quality Standards, and to allocate portions of that target among point sources (WLA) and nonpoint sources (LA). VTDEC has accomplished this in the Potash Brook TMDL. Specific management measures to implement this target and the WLA are to be specified in the forthcoming general permit. A description of the LA management measures has been provided in the TMDL in the “Reasonable Assurances” section.

Miscellaneous

49. Table 1. Biomonitoring frequency in Potash Brook from 1987 – 2004. The table body says # of samples. Question - is this an annual frequency of yearly samples, or the total number of samples taken in that 17 year timespan? This seems to be insufficient data on which to establish targets that will likely result in substantial costs. [VTrans]

Response to 49:

At the time of the TMDL writing, the values in Table 1 represent the total number of biological sampling events conducted from 1987 through 2004. This totals 28 macroinvertebrate sampling events and 16 fish sampling events. VTDEC believes that this frequency of sampling is more than adequate to categorize Potash Brook as impaired and is fully consistent with the Vermont Surface Water Assessment and Listing Methodology. One should note that biological monitoring varies significantly from other pollutant-based sampling schemes that may normally require a high sampling frequency. The primary utility of biological monitoring is that it is a direct measure of the aquatic life supporting conditions in a waterbody and that it integrates and relates the long-term impacts (usually annually) of multiple stressors on aquatic life.

50. The last few devastating storms experienced in VT have been small cell, localized downpours that devastated small areas while barely causing a ripple in rivers with larger drainage areas. Streams like the White River (10 -25 yr) when Granville (>100 yr) washed out. The same was true for the Rupert /Pawlet area. It should be recognized up front that if such an event occurs in Potash Bk. causing biological washout and geomorphologic changes, the monitoring may appear to reflect that the TMDL is not achieving it's attainment goals. [VTrans]

Response to 50:

VTDEC pays thorough attention to past hydrologic conditions (i.e. extreme high flows and drought conditions) when interpreting biomonitoring data as it can have a significant impact on instream habitat and therefore biological community structure. Current and ongoing precipitation and flow monitoring will provide a useful reference to better consider extreme hydrologic impacts on the aquatic communities in Potash Brook.

51. Some stream base flow is partly maintained through highway subsurface drainage such as curtain drains, roadway underdrains and other features that intercept groundwater flow. Ironically, this clean cool water likely helps stream biological integrity. Drinking water in this watershed is taken mostly from the lake rather than wells, so Aquifer recharge is not as much a concern as other locations. There are areas of substantial ground water flowing out into the streams during much of the year. It doesn't seem that this is adequately accounted for in the P8 model (includes only a small constant GW contribution) or discussed in the TMDL. [VTrans]

Response to 51:

In the P8 model, percolated stormwater is collected and stored in an aquifer device and discharged to the river with a time of concentration. Using this single time of concentration limits the accuracy of developing flow duration curves. To improve the groundwater simulation using P8, a tool was developed by TetraTech which uses simulated percolation from the P8 output and estimates base flow reaching the river using the "Linear Reservoir Groundwater Model" following Haan (1972). For a complete discussion of the model setup, calibration, adjustments and results can be found in the report entitled "*Stormwater Modeling for Flow Duration Curve development in Vermont*" (Tetra Tech, 2005).

52. Please delete the first sentence in the water quality standards section, as the focus of this section should be on the aquatic life criteria. For clarification, please add the words "for aquatic life" to the second sentence of this section. [USEPA-R1]

Response to 52:

VTDEC will edit as suggested.

53. For clarity purposes, we recommend that the TMDL include a discussion of the basis for equating the numeric biological indices to levels of aquatic health or impairment. [USEPA-R1]

Response to 53:

In Vermont, numeric biological indices are used to determine the condition of fish and aquatic life uses. Vermont's Water Quality Standards at 3-01(D)(1) and (2) provide the following regulatory basis for these numeric biological indices:

"(1) In addition to other applicable provisions of these rules and other appropriate methods of evaluation, the Secretary may establish and apply numeric biological indices to determine whether there is full support of aquatic biota and aquatic habitat uses. These numeric biological indices shall be derived from measures of the biological integrity of the reference condition for different water body types. In establishing numeric biological indices, the Secretary shall establish procedures that employ standard sampling and analytical methods to characterize the biological integrity of the appropriate reference condition. Characteristic measures of biological integrity include but are not limited to

community level measurements such as: species richness, diversity, relative abundance of tolerant and intolerant species, density, and functional composition.

(2) In addition, the Secretary may determine whether there is full support of aquatic biota and aquatic habitat uses through other appropriate methods of evaluation, including habitat assessments.” [VWQS 3-01(D)(1) & (2)].

Additional language will be added to the TMDL to clarify this relationship between numeric biological indices and aquatic life conditions.

54. The City of South Burlington, through Pioneer Environmental Associates, submitted a technical review memo in response to the call for public comments regarding the Potash brook TMDL. These comments addressed two general areas. First, the comments were in support of the approach used in developing the Potash Brook TMDL. Second, an alternative approach was offered for consideration for the development of the Potash Brook implementation plan. This approach utilizes a calibrated SWMM model rather than the current P8 model.

VTDEC subsequently contacted Pioneer to confirm that the technical comments submitted were directed at the future implementation plan rather than the TMDL methodology. Pioneer then submitted a clarification memo stating that indeed the previous comments were directed at the future, yet undeveloped, implementation plan.

Response to 54:

VTDEC will take into consideration the City of South Burlington’s suggestions for developing the Potash Brook implementation plan when that plan comes under development. These comments have no bearing on the development of the TMDL.