

**Testimony of Jeffrey A. Nelson**  
**Strategic Advisor/Principal, VHB**  
**Regarding Proposed H.833**  
**September 16, 2020**

**Background**

- See my bio previously provided to the Committee which summarizes my professional background.
- In my position with VHB, I have worked for many years with the Agency of Natural Resources, in particular with staff and regulations in areas of water quality, stormwater management, wetlands. I have been asked to participate in numerous VT stakeholder processes through my career as new or revised regulations have been considered.
- We are involved in preparing designs, analyses, and permit applications for a broad range of projects which require various permits in Vermont, including
  - Ski areas
  - Utilities/Renewable Energy projects
  - Commercial developments
  - Transportation projects
- Specific to surface water withdrawals, I have been very actively involved in this issue in Vermont since the 1980s, working on behalf of ski areas to develop projects to enable the areas to provide sufficient water supply for snowmaking operations while ensuring environmental protection. I was a key participant in the stakeholder processes that ultimately led to (statute) and ANR Rule and guidance. I have also been involved in numerous specific cases where such water withdrawals have been proposed and considered.
- Today I am speaking on behalf of the Vermont Ski Areas Association, a non-profit trade association with 20 alpine and 30 cross country member areas. Molly Mahar, the president of VSAA is best suited to speak to the economic and demographic contributions of outdoor recreation and skiing to the State of Vermont, but in summary I will say that these industries bring in \$2.5B in consumer spending to VT annually, and directly employ 33,000 people.

**Summary of Testimony**

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- Consideration of protection of physical, biological and chemical quality of waters in Vermont absolutely includes streamflow as a criterion.

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- Certain sectors (e.g. snowmaking, hydropower) are currently more highly regulated than others.
- We believe that the establishment of a Study Group makes sense to take a look at existing conditions, regulations and opportunities, and I'll explain why.

## **Importance of Water Supplies to Ski Areas**

- As we continue to see a rapidly-changing climate and weather patterns in Vermont, the need for reliable and environmentally sound snowmaking systems for alpine and Nordic ski areas in Vermont cannot be overstated. It is absolutely critical.
- As one example, VHB has worked for many years with Mount Snow in southern Vermont to develop a new water supply system for their snowmaking operations to replace a marginal water source that resulted in inadequate downstream streamflows in the North Branch of the Deerfield River. What was ultimately permitted and built was a new intake on Cold Brook which complies with current-day flow standards, along with a 120 Mgal offstream reservoir. When Mount Snow operated under the old system, they were only able to open as little as 20% of their ski terrain before the critical Christmas-New Year's holiday period. Following completion of the new system, they have been able to reliably open 97% or more of the terrain open at the same time and have eliminated the prior withdrawal facilities that resulted in insufficient streamflows.

## **Current Regulatory Framework**

Vermont currently has mechanisms in place that are focused on the projection of streamflow from excessive or "uncontrolled" diversions of water:

- Existing Statutory framework in 10 VSA Chapter 41 expressly includes protection of streamflow from diversions. (see Exhibit JAN-1)
- Subchapter 3 provides statutory basis for regulation of water withdrawals for snowmaking
- Pursuant to this statute, ANR has implemented a Rule titled "Water Withdrawals for Snowmaking" (1996)
- More generally, the Vermont Water Quality Standards include a Hydrology policy (see Exhibit JAN-2) which clearly states the importance of protection of streamflows.
- Any project requiring a federal permit or license (which includes nearly all ski area water withdrawals) must obtain a "401 Certification" from ANR that provides documentation that the project meets these Standards
- VWQS provide authority for ANR to enforce against any activity that is violating water quality standards.

## **Snowmaking Rule**

After a very contentious period in the 1980s when ski areas in Vermont were proposing large investments in new water withdrawal facilities with increased amounts of water diverted from streams and rivers, a very robust stakeholder process was initiated by ANR resulting in:

- Issuance by ANR in 1993 of Agency Procedure for Determining Acceptable Minimum Streamflows (see Exhibit JAN-3)
- Statutory changes (noted above) and adoption of Snowmaking Rule in 1996 (see Exhibit JAN-4).

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The Snowmaking Rule has several key elements including:

- A General Standard, known as the February Median Flow
- Requirements for streamflow monitoring and reporting
- Requirement for a Needs and Alternatives analysis before a new or expanded withdrawal can be approved
- Establishment of a robust public process

What the Rule did not include was a permit, which has created some challenges.

In the years that the Rule has been in effect, a number of projects have been permitted and constructed and the monitoring data that ANR collects have shown that the FMF standard of the Rule is protective and that these waters are meeting the State's water quality standards.

### Inter-basin transfers

There has been some recent discussion regarding the subject of "inter-basin" transfers of water following the approval last year of a project (that VHB worked on for the application, Killington-Pico), to pump water for snowmaking from the Killington side to the Pico side to enable major improvements in snowmaking capabilities at Pico. While this project is technically considered "inter-basin", it represents moving a relatively small volume of water a relatively short distance from one side of the mountain to the other - from the upper reaches of the Ottauquechee River watershed (which ultimately drains to the Connecticut River) to the upper reaches of Mendon Brook (which ultimately drains to Otter Creek and Lake Champlain).

Certainly, I don't see this type of project as raising the types of concerns that would result from pumping water from the Great Lakes to the U.S. Southwest, for example. Further, I don't see this project as a precursor to others that would involve "inter-basin" transfers.

However, what that project did highlight was that there was no established protocol for such situations to avoid issues of concern, such as the inadvertent transfer of invasive organisms.

### Study Group

We believe that the proposed establishment of a Study Group, through this bill makes sense, with a few qualifiers:

- The standard, protocols and precedents established through the Snowmaking Rule must be respected, since this Rule has been successful in protecting water quality and in providing regulatory certainty.
- Consideration should be given to the establishment of a water withdrawal permit process that addresses all diversions.
- Consideration should be given to how to manage potential future proposals that involve inter-basin transfers.

I appreciate the opportunity to testify on this important topic.

# The Vermont Statutes Online

## **Title 10 : Conservation And Development**

### **Chapter 041 : Regulation Of Stream Flow**

#### **Subchapter 001 : General Provisions**

(Cite as: 10 V.S.A. § 1001)

#### **§ 1001. Purpose**

The Department of Environmental Conservation is created to administer the water conservation policy of this State. It is in the public interest that the waters of the State shall be protected, regulated, and where necessary controlled under the authority of the State. The proper administration of the water resources now and for the future require careful consideration of the interruption of the natural flow of water in our watercourses resulting from the construction of new, and the operation of existing dams, diversion, and other control structures. This subchapter is intended to identify this need, to provide a means for the investigation of the cause and effect of intermittent or diverted flow, and for the consideration of corrective actions required to assure as nearly continuous flow of waters in the natural watercourses as may be possible consistent with reasonable use of riparian rights. (1965, No. 37, § 1; amended 1981, No. 222 (Adj. Sess.), § 24; 1987, No. 76, § 18.)

# The Vermont Statutes Online

## **Title 10 : Conservation And Development**

### **Chapter 041 : Regulation Of Stream Flow**

#### **Subchapter 003 : Water Withdrawal For Snowmaking**

(Cite as: 10 V.S.A. § 1031)

#### **§ 1031. Policy on water withdrawal for snowmaking**

(a) This subchapter is intended to establish a policy for snowmaking that supports and is consistent with section 1001 of this title and with chapter 47 of this title, including the water quality standards.

(b) This policy established under this subchapter is to:

(1) assure the protection, maintenance, and restoration of the chemical, physical, and biological water quality, including water quantity, necessary to sustain aquatic communities and stream functions;

(2) help to provide for and enhance the viability of Vermont's ski industry, which uses certain of the State's waters for snowmaking;

(3) permit water withdrawals, diversions, impoundments, and the construction of appurtenant facilities for snowmaking, based on an analysis of the need for water and a consideration of alternatives, consistent with this policy and other applicable laws and rules;

(4) recognize that existing users of the State's waters for snowmaking, which may have an adverse effect on water quality, should have time and opportunity to improve water quality. (Added 1995, No. 15, § 1.)

# **The Vermont Statutes Online**

## **Title 10 : Conservation And Development**

### **Chapter 041 : Regulation Of Stream Flow**

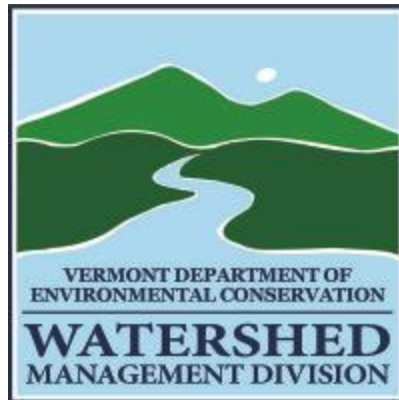
#### **Subchapter 003 : Water Withdrawal For Snowmaking**

**(Cite as: 10 V.S.A. § 1032)**

#### **§ 1032. Rulemaking on snowmaking withdrawals**

The Secretary shall adopt rules to determine conservation flow standards for snowmaking, to be used in relevant Agency of Natural Resources regulatory processes governing water withdrawals, diversions, impoundments, and the construction of appurtenant facilities, and to be used in developing positions to be asserted by the Agency in other State regulatory processes governing conservation flows for snowmaking. These rules shall not supersede water quality standards adopted by the Secretary pursuant to chapter 47 of this title. These rules shall achieve the purposes of this subchapter, and shall provide for the periodic review of any decision issued under the rules. All existing water withdrawals, diversions, and impoundments for snowmaking that are permitted at instream flows below the standards shall be reviewed by July 1, 2000. (Added 1995, No. 15, § 1; amended 2003, No. 115 (Adj. Sess.), § 21, eff. Jan. 31, 2005; 2011, No. 138 (Adj. Sess.), § 27, eff. May 14, 2012.)

**State of Vermont**  
**AGENCY OF NATURAL RESOURCES**  
**Department of Environmental Conservation**



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**Vermont Water Quality Standards**  
**Environmental Protection Rule Chapter 29A**

Effective January 15, 2017

consistent with applicable state and federal law, for how various sources of pollution within each basin will be managed in order to achieve compliance with these rules. The Secretary is required by state law to revise all 15 tactical basin plans on a five-year rotating basis.

- (2) As part of the tactical basin planning process, public participation shall be sought to identify and inventory problems, solutions, high quality waters, existing uses and the quality of such uses, and significant resources of high public interest.
- (3) In preparing tactical basin plans, the Secretary shall, to the extent required by applicable law, consider all relevant aspects of approved municipal plans and regional plans adopted under 24 V.S.A. Chapter 117 and coordinate and cooperate with the Secretary of the Agency of Agriculture, Food and Markets as provided for in 6 V.S.A. Chapter 215.
- (4) Each tactical basin plan shall identify strategies, where necessary, by which to allocate levels of pollution between various sources as well as between individual discharges. Tactical basin plans shall, to the extent appropriate, contain specific recommendations by the Secretary that include the identification of all known existing uses, any recommended changes in classification and designation of waters, including reclassifying waters' uses from Class B(2) to a higher classification level and designating waters as Outstanding Resource Waters, schedules and funding for remediation, stormwater management, riparian zone management, and other measures or strategies pertaining to the enhancement and maintenance of the quality of waters within the basin.
- (5) Upon adoption of a tactical basin plan, the Secretary shall promptly initiate rulemaking and shall give due consideration to the recommendations contained in the tactical basin plan.

**(f) Hydrology Policy.**

- (1) The proper management of water resources now and for the future requires careful consideration of the interruption of the natural flow regime and the fluctuation of water levels resulting from the construction of new, and the operation of existing, dams, diversions, and other control structures. These rules, in conjunction with other applicable law, provide a means for determining conditions which preserve, to the extent practicable, the natural flow regime of waters.
- (2) When determining necessary streamflows or conditions necessary to further the goals of this policy through application of the applicable Agency of Natural Resources procedures or regulations, the Secretary, as provided for in 10 V.S.A. § 1003, may cooperate with appropriate federal, state, municipal, and private interests in achieving voluntary agreements relating to artificial streamflow regulation that assure consistency with these rules.



## **AGENCY PROCEDURE FOR DETERMINING ACCEPTABLE MINIMUM STREAM FLOWS**

**July 14, 1993**

### **Introduction**

It is the policy of the State of Vermont to protect and enhance the quality, character and usefulness of its surface waters, prevent the degradation of high quality waters, and prevent, abate or control all activities harmful to water quality. It is further the policy to assure the maintenance of water quality necessary to sustain existing aquatic communities and seek over the long term to upgrade the quality of waters and to reduce existing risks to water quality.

At the same time, it is the policy of the State of Vermont to promote a healthy and prosperous agricultural community, to maintain the purity of drinking water and assure the public health, to decrease Vermont's dependence on non-renewable energy sources, and to allow beneficial and environmentally sound development. (10 V.S.A. §1250 and State of Vermont Executive Order regarding the State Energy Policy)

The procedures described below are applicable to Agency determinations of acceptable minimum stream flow, made pursuant to a) permits issued under 10 V.S.A. Chapter 43 (Dams); b) issuance of water quality certificates pursuant to Section 401 of the Federal Clean Water Act and FERC licensing or relicensing actions; c) stream alteration permits or stream flow regulation under 10 V.S.A. Chapter 41; d) authorization by the Commissioner of Fish and Wildlife to obstruct streams pursuant to 10 V.S.A. Section 4607, and e) positions taken before Act 250 district environmental commissions with respect to projects affecting stream flow.

The foundation of state statutes protecting the natural flow of Vermont's rivers and streams is that the natural flow should be protected and maintained in the public interest. All reasonable alternatives to altering stream flow and water conservation measures should be thoroughly considered before reduction of the natural flow rate is considered. Only when a comprehensive analysis of such measures is completed can a reasoned and rational balance be defined between legitimate but competing users of the stream.

The intent of this procedure is to assure a consistent process is used in determining acceptable minimum stream flows when there are existing or potential competing uses of the water. This does not necessarily mean that a uniform minimum stream flow number will be reached in every case. What it does mean is that the minimum stream flow numbers will be derived using a consistent procedure.

### **General Procedure**

Determination of acceptable conservation flows are made to assure the passage of adequate water to maintain fisheries interests, aesthetic qualities, recreational and potable water supply uses appropriate to the body of water in question. In general, minimum flows adequate to maintain fisheries interests are sufficient to simultaneously maintain acceptable aesthetic qualities and recreational uses. The procedures below therefore focus primarily on determining fisheries related minimum flow requirements. The Agency reserves the right to require, or to recommend to other regulatory bodies, maintenance of minimum low flows in excess of or less than fisheries requirements where specific facts of the proposed project clearly show such higher or lower flows are needed to properly balance the many competing water uses at the site consistent with applicable statutes or rules. Where the Agency needs additional information to make a determination of flow needs for non-fisheries issues the Agency may request that water users perform special studies.

This procedure may be viewed in three (3) simplified steps. First, the Agency will accept the U.S. Fish and Wildlife Service recommended minimum flows of 0.5 csm (cubic feet per second per square mile) (summer), 1.0 csm (fall and winter), and 4.0 csm (spring) as a presumption that stream values and

uses are protected with little or no further field examination of the water in question or hydrologic computations.

Secondly, applicants may conduct flow gaging of the subject stream to establish a valid statistical relationship with a long-term stream gage station, which relationship would then be used to compute applicable stream flow statistics as used in the U.S. Fish and Wildlife Service policy.

Finally, where an applicant wishes to seek Agency approval for lower conservation flows, applicant may conduct site specific studies such as the U.S. Fish and Wildlife Service's Instream Flow Incremental Methodology (IFIM) protocols, or other approved habitat assessment methods. Results of valid evaluations, while costly and time consuming, may provide specific habitat information on which to make minimum flow judgements. Where Agency approved evaluations are available, the Agency will use this information to make judgements on acceptable low flows, which judgements may be greater or lesser than the U.S. Fish and Wildlife Service presumptive flow recommendation. It should be noted that some streams are not physically conducive to IFIM analysis, other evaluation methods may be necessary, and that IFIM analysis conducted to date tend to support conservation flows at the February median flow value for the fall/winter period.

Permits and decisions issued pursuant to this procedure shall provide opportunity for the Agency to reopen permits to review and modify conservation flow requirements at anytime after the initial five years when the Agency demonstrates that conflicting uses exist which require a balancing of those uses or that existing environmental problems require a review. Where the conservation flow requirements are contained in permits or approvals issued by other governmental authorities, the Agency will recommend inclusion of similar reopening conditions. In the event Agency rules governing determination of acceptable minimum stream flow change during the term of any permit, the Agency will not reopen the permit for that reason until it has made an affirmative finding that environmental damage or harm is resulting from the permitted minimum flows.

## **Procedure**

### **A. U.S. Fish and Wildlife Threshold**

The Agency will accept minimum stream flows described in the U.S. Fish and Wildlife Service "Interim Regional Policy for New England Stream Flow Recommendations" dated February 13, 1981, subject to the exceptions and modifications described later in this procedure. That policy (attached) calls for year-round release of 0.5 csm unless superseded by spawning and incubation flow requirements, in which case a flow of 1.0 csm for fall/winter spawning and incubation and/or 4.0 csm for spring spawning and incubation shall be required.

The Agency shall assume that fall/winter and spring spawning and incubation requirements exist within a stream unless a site specific determination is made that such requirements do not exist. The Agency may at its own initiative and with available information, or with information provided by the applicant, determine that significant spawning and incubation are not indigenous to the impacted stream segment. The impacted stream segment shall be that reach which extends downstream of the project to a point where 95% of the spawning/incubation flows have been restored by other flows of the drainage basin.

Alternatively, the Agency will use a determination of the median flow for a river or stream segment based upon continuous gage data over a ten year period from a gage located on the same river as the river segment in question and where that gage station and data are acceptable to the Agency. The gage data must be unregulated with defined accuracy and precision, and be from a hydrologically similar watershed region in the river basin as the river segment. The median flow shall be taken as the median of all days of record for that period. The applicable record for hydrological analysis and the periods defining the seasons for the purposes of issuing permits are shown in the following table.

<b>Season</b>	<b>Period</b>	<b>Record for Hydrologic Analysis</b>
Summer	June 1 - Sept. 30	August
Fall/winter	October 1 - March 31	February
Spring	April 1 - May 31	April/May

## **B. Stream Hydrologic Analysis**

When the stream segment is not suited to a habitat assessment or when the applicant elects to conduct stream gaging, a hydrologic evaluation of the stream may be used to determine the appropriate stream flow statistics.

The applicant shall gage the stream for a period of not less than 3 months for the summer or fall/winter spawning and incubation seasons of interest. Applicants shall gage for not less than 2 1/2 months during the spring spawning and incubation period.

The highest 10% of the average daily flows measured at the study stream shall be eliminated and the remaining flows contained in this record shall be regressed against contemporaneous data from a suitable long-term gage to derive an equation that can reliably predict flows at the study site from gaged flows at the long-term gage. The long-term gage must be effectively unregulated, located in a similar basin and acceptable to the Agency.

The analysis shall be considered successful if a correlation coefficient of 0.9 or greater is attained. The equation can then be used to estimate monthly median flows for the study site for the long-term gage statistics. If the gaging period is doubled over a period of at least two years, then the minimum acceptable correlation coefficient shall be 0.8.

Alternatively, the regression equation can be used to estimate monthly median flows for the study site from the long-term gage statistics through the use of confidence intervals. The value used as a flow standard shall be the higher +95% confidence interval value corresponding to the median value for the long-term gage.

The gaging data set shall be furnished to the Agency on 3 1/2 or 5 1/4 inch disc, and the statistical analysis shall be provided.

Acceptable gaging periods are shown in the following table.

<b>Season</b>	<b>Period</b>
Summer	July 1 - Sept. 30
Fall/winter	December 15 - March 15
Spring	March 15 - May 31

## **C. Instream Flow Incremental Method (IFIM)**

The Instream Flow Incremental Methodology (IFIM) is a problem-solving framework and set of comprehensive procedures for making decisions regarding stream flow. The methodology provides a basis for describing the relationship between stream flow and habitat for fish and other aquatic organisms.

The method does not generate a single solution, but predicts the impacts of different alternatives. Professional judgement on the part of applicants and the Agency plays a critical role in determining an acceptable stream flow regime.

The Agency will accept use of the IFIM as a basis for establishing conservation flows. Applicants should recognize that IFIM evaluations provide a basis for conservation flow determination which is more site specific than the U.S. Fish and Wildlife Service policy approach, and that the resulting Agency judgement as to conservation flows may be greater or less than the U.S. Fish and Wildlife Service policy flows or low median monthly flows.

The Agency will accept conservation flows that provide a high level of aquatic habitat protection, except where compelled to reduce standards to properly balance against other competing water uses which apply to the stream segment.

The results of an IFIM evaluation may support a conclusion that acceptable minimum flows are less than the median monthly flow for the time period of interest. Where IFIM results support such a conclusion, the Agency will approve such lower flows provided the approved fall/winter minimum flow is not less than two-thirds of the median monthly flow for the period of interest unless a valid study approved by the Agency demonstrates that ice formation would not be exacerbated. The latter restraint is included to help assure that no undue damage to fisheries will result from exacerbated ice conditions.

The Agency recognizes that there are certain streams which by reason of their size, basin areas, channel shape or other characteristics are not susceptible to IFIM analysis. The stream hydrologic analysis described in B above or another acceptable method as described below may be accepted in such cases in lieu of an IFIM evaluation.

#### **D. Other Methods**

The Agency will consider other methods of determining required conservation flows which applicants may wish to propose. In general, the Agency will accept alternative methods of analysis where it concludes the new method is of equal or greater reliability than the methods outlined above. An applicant is encouraged to seek Agency approval of such alternative methods before commencing such investigations.

#### **E. Offstream Uses of Water - Special Policies**

##### **Domestic Water Supplies**

Many municipalities throughout Vermont draw most or all of their drinking water from surface streams or lakes, and have done so for a number of years, sometimes dating back to the last century. For new water supply systems or for existing water supply systems which are beginning the planning and engineering phase of modifying their systems, it is the policy of the Agency to encourage municipalities to institute water conservation measures and evaluate alternative sources. The Agency will request that all reasonable water conservation measures be evaluated as part of the studies and that all economically reasonable conservation measures be instituted in order to reduce water consumption demands prior to the Agency considering approval of minimum stream flows below those prescribed by the procedure. Possible conservation measures include water metering, system flushing during high stream flow periods, repairing leaks in distribution systems, requiring industrial users to recycle water or take process water from a non-potable source for which minimum flows can be maintained.

Where minimum flows cannot be achieved through conservation, additional water sources and/or storage should be explored. It is recognized that some options such as storage required to provide minimum stream flows may in some cases be extremely expensive. The economic stress to a municipality must be defined and based on engineering studies before reduced instream quality will be considered as part of a balancing process.

It is the purpose of this procedure to recognize that while all legitimate uses of the water body are to be protected to the extent possible, the bias is in favor of public water supply systems only after all water conservation and feasible alternatives have been explored.

### **Hydroelectric and Hydromechanical**

Vermont rivers have served as a source for the production of hydroelectricity for over a century and have provided water to power our mills since the early settlement period. Population increases and the demand for on-peak energy production have resulted in utilities operating some of their projects in a manner which is incompatible with environmental goals with respect to flow maintenance (*Hydropower in Vermont: An Assessment of Environmental Problems and Opportunities*, 1988).

This minimum flow procedure makes a distinction between the river reach downstream of the project tailrace and the bypassed reach between the intake and the tailrace. Flow released at the tailrace of a project can be used to produce energy while water spilled at a dam and passed through a bypass reach may not be usable to produce energy.

Hydropower facilities shall be encouraged to operate in a true run-of-the-river mode to reduce conflicts with other uses and values. For run-of-the-river projects, the General Procedure shall be used to set flows for river management during special conditions after storage depletion (i.e. flashboard replacement, maintenance drawdown, power audits). During extended periods of non-operation, all inflows shall be required to be spilled over the project dam. For projects not operating in a run-of-the-river mode the General Procedure shall be applied to flow setting for the downstream river reach.

Bypasses shall be analyzed case-by-case. Generally, the Agency shall recommend bypass flows of at least 7Q10 in order to protect aquatic habitat and maintain dissolved oxygen concentration in the bypass and below the project. Higher or lower amounts of bypass flows shall be prescribed as a function of the uses and values to be restored or protected in the bypassed reach. In assessing values, consideration shall be given to the length of the bypass; wildlife and fish habitat potential; the aesthetic and recreational values; the relative supply of the bypass resource values in the project area; the public demand for these resources; and any additional impacts of such flows upon citizens of the State of Vermont. Bypass flows shall be at least sufficient to maintain dissolved oxygen standards and wastewater assimilative capacity. Where there are exceptional resource values in need of restoration or protection, the general procedure shall be followed. In most cases, a portion or all of the bypass flows must be spilled over the crest of the dam to reoxygenate water, provide aquatic habitat at the base of the dam and assure aesthetics are maintained.

In order to fulfill Agency responsibilities to strike a balance between competing water uses in the public interest, any deviations from minimum flow requirements as defined by the General Procedure will require an assessment of water and energy conservation alternatives.

### **Snowmaking**

[This section has been removed. Snowmaking water withdrawals are now subject to a separate procedure dated March 4, 1994.]

### ***De Minimis* Withdrawals**

It is recognized that certain withdrawals are so small in relation to the stream flow even during periods of drought, that the resultant impact on the natural stream values is negligible. In such cases, it is the Agency's policy to permit such withdrawals of water regardless of the natural instantaneous stream flow. For the purposes of this procedure, a withdrawal rate equal to or less than .005 cubic feet per second times the drainage area in square miles at the proposed withdrawal site, or 5% of the 7Q10 stream flow is considered a *de minimis* impact on the stream flow.

Permittees are not entitled to extract *de minimis* withdrawal flows in addition to flows specified in a project specific permit or certificate. In the case where there may be cumulative impacts of *de minimis* withdrawals, the Agency may require a site specific review.

#### **F. Prior Permits/Approvals/Practices**

Applicants may seek permits, approvals or Agency positions to modify existing projects for which earlier permits or approvals were granted and where such permits specified acceptable conservation flows less than would be determined by this procedure. Where the conservation flows specified in earlier permits do not correspond with the conservation flows determined under this procedure, or where earlier operating practices resulted in release of substandard low flows, the Agency will generally require that the flows determined under this procedure be restored as of the earliest practical date. The Agency will negotiate a schedule of actions and mitigating measures which will restore acceptable flows at the earliest practical date. The Agency shall consider any public benefits or detriment realized by restoration of acceptable conservation flows compared to any public benefit or detriment realized by the continued release of less than acceptable conservation flows. The Agency may conclude that the greatest public benefits are realized by continued release of less than acceptable conservation flows determined under this interim procedure.

#### **G. Decision Authority**

Decision authority for permits issued under V.S.A. Chapter 43 (Dams); water quality certificates issued pursuant to Section 401 of the Federal Clean Water Act; and stream alteration permits issued under 10 V.S.A. Chapter 41 shall rest with the Commissioner of Environmental Conservation or his designee. Decision authority for approvals of fish passage obstructions issued under 10 V.S.A. Section 4607 shall rest with the Commissioner of Fish and Wildlife or his designee. Decision authority for positions taken before Act 250 district commissions or subsequent appeals shall rest with the Secretary of the Agency of Natural Resources or his designee.

**AGENCY OF NATURAL RESOURCES  
ENVIRONMENTAL PROTECTION RULES**

**CHAPTER 16**

**WATER WITHDRAWALS FOR SNOWMAKING**

**Section 16-01** Authority

These rules are adopted pursuant to the authority of Title 10 V.S.A. Chapter 41, Subchapter 3. Water Withdrawal for Snowmaking. These rules shall not supersede the water quality standards adopted by the water resources board pursuant to Title 10 V.S.A. Chapter 47.

**Section 16-02** Policy

It is the policy of the State of Vermont to:

- (1) assure the protection, maintenance, and restoration of the chemical, physical, and biological water quality, including water quantity, necessary to sustain aquatic communities and stream functions;
- (2) help to provide for and enhance the viability of Vermont's ski industry, which uses certain of the state's waters for snowmaking;
- (3) permit water withdrawals, diversions, impoundments, and the construction of appurtenant facilities for snowmaking, based on an analysis of the need for water and a consideration of alternatives, consistent with this policy and other applicable laws and rules;
- (4) recognize that existing users of the state's waters for snowmaking, which may have an adverse effect on water quality, should have time and opportunity to improve water quality.

**Section 16-03** General Standard

- (1) The following standard is applicable to agency determinations of acceptable conservation flow, including those made for:
  - (a) permits issued under 10 V.S.A. Chapter 43 (Dams);
  - (b) issuance of water quality certificates pursuant to Section 401 of the Federal Clean Water Act;
  - (c) stream alteration permits or stream flow regulation under to 10 V.S.A. Chapter 41;

- (d) authorization by the Commissioner of Fish and Wildlife;
  - (e) positions taken before Act 250 District Environmental Commissions, the Environmental Board, the Water Resources Board, and recommendations to local authorities where the Commission, Board, or authority has asserted jurisdiction over projects affecting stream flow; and
  - (f) positions taken in any enforcement action with respect to projects affecting stream flow in connection with any of the above proceedings, permits, or approvals.
- (2) The general standard for the winter flow limit (October 1 through March 31) is the February Median Flow (FMF).
  - (3) The application of the general standard to a specific outtake shall be:
    - (a) the site specific FMF if data acceptable to the Agency exists, or the applicant or other interested party determines the FMF pursuant to the protocol attached as Appendix A; or
    - (b) if site specific data is not available, the Vermont statewide average FMF of 0.8 csm.
  - (4) Approvals shall provide for periodic review of approved projects to determine whether it would be reasonable and feasible to revise the conservation flow requirements. Review intervals shall be no longer than twenty years.

**Section 16-04** Water Use Report

- (1) New and expanded systems shall measure water use and stream flow.
- (2) Each ski area shall file annually with the Agency a report which includes the daily pumping rate and volume; seasonal water withdrawal; trail coverage; compliance with existing conservation flow requirements; available data on stream flow, temperature, and snowfall; known expansion plans; and projections on future water use. This information shall be filed annually as soon as it is available but in any event no more than three years after issuance of this rule.
- (3) For purposes of developing a baseline profile of water use by ski areas in Vermont the Agency may request each ski area to provide efficiencies that are currently available and its system design.



## Section 16-05 Alternatives Analysis

- (1) After the effective date of this procedure, the Agency shall not approve any stream flow alteration if there is a feasible and reasonable alternative that would avoid or lessen the impact to the natural condition of the stream. In determining whether an alternative is reasonable and feasible, the Agency shall consider both natural resource and economic constraints. The Agency's determination as to the economic constraints shall be developed in consultation with an entity competent in analyzing economic issues. The applicant shall reimburse the agency for the actual costs to the agency of this economic analysis.
- (2) The applicant shall conduct an analysis that includes an examination of:
  - (a) the need for the water in consideration of the competitive viability of the ski area;
  - (b) other potential sources of water and the storage of water on land the applicant owns, controls, or may reasonably obtain the use of, taking into account the economic, environmental, and other relevant aspects of the applicant's use of the land it does not control;
  - (c) improvements in efficiency and conservation; and
  - (d) general management practice, provided, however, that while this analysis should include information about individual management decisions proposed or utilized by the applicant, including the timing, methods, or locations of snowmaking as determined to be appropriate by the operator, the Agency does not claim any ability beyond its regulatory authority to control those matters through this policy.
- (3) The applicant shall conduct the analysis pursuant to a study plan approved by the Agency. The Agency intends to issue a guidance document following discussions with interested persons with respect to the conduct of these analyses.
- (4) Agency decisions made based on the results of an alternatives analysis shall not result in a net loss of water relative to:
  - (a) the maximum annual snowmaking volume utilized up to and including the 1994-1995 season; and
  - (b) the volume of water that would have been used by projects permitted but not constructed as of the effective date of this rule. However, with respect to such permitted-but-not-constructed projects, if they involve a withdrawal below 0.5 csm, that volume of water below 0.5 csm may be taken into account when the Agency is considering new or expanded existing systems.

## Section 16-06 New Systems

- (1) Any new physical water outtake, other than a replacement, repair, or refurbishment of an existing outtake at the same location, is regarded as a new system.
- (2) An applicant may withdraw:
  - (a) 50% of the portion of the water between the level permitted under section 16-03(3) and the levels set in section 16-06(2)(b); plus
  - (b) any portion of the flow above 1.4 csm from October 1 to November 30 and 1.1 csm from December 1 to March 31.
- (3) If the level permitted under section 16-03(3) is not the site specific FMF, then after ten years of site specific hydrologic data collection, the applicant shall not withdraw any water that would cause the stream to be below the site specific FMF at the point of the outtake.
- (4) In a drainage area of 10 square miles or less of watershed at the outtake, the Agency shall apply the standard of section 16-06(2), except:
  - (a) if the alternatives analysis demonstrates to the satisfaction of the Agency that more water is needed than would be available under the 50% limitation, the Agency will adjust or delete the 50% limitation;
  - (b) if the alternatives analysis demonstrates to the satisfaction of the Agency that more water is needed than would be available after deletion of the 50% limitation, and the Agency does not demonstrate that withdrawal below the FMF would violate the Water Quality Standards, the Agency may approve water withdrawal below the FMF, but in no event below 0.5 csm.
- (5) An applicant may design and operate a new system to withdraw water at rates not exceeding the *de minimis* rate, which is defined as 0.005 cubic feet per second per square mile of drainage area (csm), at the withdrawal point subject to the following:
  - (a) where an applicant already has one or more permitted withdrawals for snowmaking in the same watershed and wishes to continue those uses:
    - (i) the aggregate rate of withdrawal shall not exceed the *de minimis* rate at the downstream location(s) at any time;<sup>1</sup>

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<sup>1</sup>For example, if the applicant has an existing withdrawal that diverts water at 100 gpm and proposes to add a new *de minimis* withdrawal one mile downstream, the applicant would have to either suspend operation of the existing withdrawal when the new one is being used or would have to limit the withdrawal at the new source to the *de minimis* rate less 100 gpm when water is being drawn upstream.

- (ii) if the applicant removes water at an existing outtake at rates that exceed *de minimis*, then a *de minimis* withdrawal cannot be added at any location such that there would be a use of water when the source stream is flowing at less than the present minimum conservation flow;<sup>2</sup> and
- (iii) any existing withdrawals shall become expanded existing systems subject to section 16-07;
- (b) Section 16-04, **Water Use Report** is modified to the extent that stream flow need not be measured at the *de minimis* outtake;
- (c) Section 16-05, **Alternatives Analysis** shall only apply in cases where the *de minimis* use is proposed to serve a system that includes other surface water sources for snowmaking;
- (d) in cases where there may be cumulative impacts from several withdrawals, the Agency may prohibit the addition of a *de minimis* withdrawal or reduce the allowed rate to less than 0.005 csm.

#### **Section 16-07** Expanded Existing Systems

- (1) An expanded existing system is any change in an existing system that requires an Agency determination of acceptable conservation flow under section 16-03(1). This section applies only to the extent the proposed change would actually affect stream flow, except that, an existing system shall not be considered as an expanded existing system until such time as it proposes to increase existing and permitted acreage of trail coverage by 15% (systems with a source at a minimum flow of 0.5 csm or greater) or 7.5% (systems with a source at a minimum flow of less than 0.5 csm), though in no case by more than 40 acres, or proposes to make other changes, including but not limited to an increase in withdrawal capacity or the addition of new water sources or storage reservoirs, unless the system is already being treated as an expanded existing system under a present permit requiring an alternatives analysis. The increase in trail coverage shall be measured relative to the acreage served or permitted to be served by snowmaking during the 1994-1995 season.
- (2) Notwithstanding the above, an existing system can be modified to withdraw any portion of stream flow above 1.4 csm from October through November or 1.1 csm from December through March without becoming an expanded existing system. This allowance only applies if the design is such that the flow is not being drawn below the 1.4 csm or 1.1 csm when the additional capacity is being used. For systems with volumetric caps on water use contained in existing permits, the Agency will allow applicants to withdraw the portion of flow above 1.4 csm from October through November or 1.1 csm from December through March without that flow counting towards the volumetric cap, if on those days the applicant does not draw the flow below the 1.4 csm or 1.1 csm.

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<sup>2</sup>For example, if an applicant has an existing permitted withdrawal with a minimum flow equal to the February median flow, a new withdrawal may not be constructed downstream that removes water at *de minimis* rates.

- (3) The goal of the policy is to increase existing permitted flow limits for withdrawal systems that are less than FMF to the FMF. In order to make all reasonable and feasible efforts to progress towards or attain this goal, a schedule shall be included as a condition of approving the expansion which shall provide:
  - (a) for existing systems that have permitted flow limits of 0.5 csm and above, compliance with the FMF, but no sooner than is determined to be reasonable and feasible based on the results of the alternatives analysis;
  - (b) for existing systems that have permitted flow limits below 0.5 csm, the incremental implementation of alternatives and restoration of higher conservation flows to a minimum of 0.5 csm within five years after permit approval and to the FMF within a reasonable period of time, but to neither flow level any sooner than is determined to be reasonable and feasible based on the results of the alternatives analysis.
  - (c) Projects approved under subsections (3)(a) or (b) based on schedules that do not attain the FMF will be reviewed at five year intervals to determine whether it would be reasonable and feasible to increase conservation flows towards attainment of the FMF.

**Section 16-08** Existing Systems That Do Not Expand

- (1) No change in the flow limits or allowable withdrawal rate for an existing system will be required prior to July 1, 2000 unless a new interconnected system or an expansion of the existing system is proposed and approved.
- (2) In addition to its general applicability, the Agency may, however, take action to increase conservation flows for existing systems pursuant to 10 V.S.A. §1003.
- (3) Pursuant to Title 10 V.S.A., Section 1032, existing systems with minimum stream flows less than the standard established in section 16-03(2) shall be reviewed by the secretary by no later than July 1, 2000. This review shall include an assessment of the completeness of water use reports submitted as required under section 16-04(2) of these rules and other required information submitted by the permittee and of compliance with permit conditions and limits.

**Section 16-09** Procedures For Case Management

- (1) The Agency shall make reasonable efforts to consolidate any determinations of conservation flow under section 16-03(1) in a consolidated proceeding.
- (2) The Agency shall:
  - (a) provide general public notice of any request that would require it to make a determination of conservation flow pursuant to section 16-03(1). This notice shall, at minimum, be sent to any person who is entitled to receive notice under the relevant authority requiring the determination and others who have requested notice of the determination;

- (b) hold an informal conference open to anyone who is interested in participating at which the issues raised by the application are discussed, the issues that may need to be resolved are identified, the scope of the proceeding is determined preliminarily, and a tentative schedule for action on the applications is developed; and
  - (c) if requested or on its own motion, hold a consolidated hearing on its draft determination prior to making its final determination on conservation flow.
- (3) The decision reached pursuant to this rule shall fulfill the Agency's obligation in making its conservation flow determination pursuant to section 16-03(1).

**APPENDIX A  
STREAM HYDROLOGIC ANALYSIS**

A hydrologic evaluation of the stream may be used to determine the appropriate stream flow statistics under section 16-03(3).

The applicant shall gauge stream flows in accordance with the following table:

Season	Accepted Data Collection Period	Number of Acceptable Daily Flows Required in Data Set
Fall/Winter	December 15 - March 15	76

The Agency may, in its discretion, eliminate the highest 10% of the average daily flows and appropriate outlying data points measured at the study stream. The remaining daily flows contained in this record shall be regressed against contemporaneous data from a suitable long-term gauge to derive an equation that can be used to reliably estimate flow statistics at the study site from gauged-flow statistics at the long-term gauge. The long-term gauge must be unregulated, have a minimum 10 year period of record, and otherwise be acceptable to the Agency for the purposes of the analysis. The analysis shall be considered successful if: 1) a correlation coefficient of 0.9 or greater is attained and 2) the +95% confidence interval value for the FMF is no greater than 110% of the actual estimate based on the regression equation. If the data set is doubled and the confidence interval requirement is met, then the minimum acceptable correlation coefficient will be 0.8. The equation shall then be used to estimate FMF for the study site from the long-term gauge statistics.

The full gauging data set shall be furnished to the Agency on 3.5 or 5.25 inch disk, and the statistical analysis shall be provided.

**Effective date of this rule: February 15, 1996**