



Burlington International Airport

STORMWATER MANAGEMENT PROGRAM

June, 2013

VOLUME 3: STORMWATER MANAGEMENT STUDY, FINAL REPORT



Final Report



Burlington International Airport

STORMWATER MANAGEMENT STUDY AIP No. 3-0005-50-44

Presented to:
Burlington International Airport
South Burlington, VT 05403
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Prepared by:



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SECTION 1

EXECUTIVE SUMMARY: STUDY BACKGROUND AND APPROACH

1.1 INTRODUCTION

This study evaluates Burlington International Airport's (BTV) stormwater quality at selected outfall locations, evaluates existing stormwater discharge permits and establishes a course of action for meeting State and Federal stormwater regulations. The study also updates BTV's stormwater system mapping to include recent improvement projects and the Vermont Air National Guard Base's stormwater collection system. This report presents the study's approach and findings in five principal sections:

- Status report on Federal and State stormwater permitting programs.
- Review and summary of existing BTV stormwater discharge permits and identification of measures required for complying with permit conditions.
- Update of existing BTV's drainage system mapping for use in evaluating current conditions and as a future-planning tool.
- Stormwater sampling and testing program: analysis of stormwater discharge from existing drainage outlets to assess water quality and identify problem discharges.
- Development of a stormwater management action plan consistent with State and Federal stormwater rules.

1.2 BACKGROUND

The need for this study was identified in 2002 when Federal Phase 2 stormwater rules were being implemented and Vermont Watershed Improvement Permits (WIP) were being developed. The study's scope was originally tailored to address requirements contained in

these regulations. Most importantly, the study was initiated as a proactive program on the Burlington Airports behalf to identify and correct problems that might contribute to pollution of State waters.

Although implementation of Federal Phase 2 rules has been on-track, evolution of the Vermont stormwater regulation process has been long and difficult. Section 2 of this report discusses status of State and Federal stormwater rules; it also explains why the WIP program has not been enacted. A document entitled *Summary of House Bill 785, An Act Relating to Stormwater Discharge*, dated May 27, 2004 (Appendix SP-1) is also provided. This summarizes recent Vermont legislation affecting stormwater permitting.

1.3 STUDY APPROACH

The structure of this study is based on addressing the State and Federal stormwater rules affecting the Burlington International Airport. Following is a description of the study's components:

1.3.1 Review Existing Stormwater Discharge Permits

This task identifies all existing stormwater discharge permits applying to the Burlington International Airport property, reviewing the permit conditions and identifying inspection or maintenance required to bring these into compliance.

State records were researched to locate applicable stormwater permits. Copies of these are included in Section 3. The synopsis of individual permit information is presented in narrative and is also summarized in a table format for quick reference.

1.3.2 Update Existing Airport Drainage System Mapping

Donald L. Hamlin Consulting Engineering, Inc. completed a drainage study for the Burlington International Airport in 1997 under AIP 3-0005-50-25. This study included evaluation reports for some drainage structures; mapping for most of the drainage structures;

identification of drainage areas; and calculations of the theoretical capacity of pipes. Hydraulic cleaning for approximately 20,000 linear feet (lf) of the total 70,000+ lf of drainage pipe on the Airport was also completed. The Hamlin study did not include the majority of the drainage system on the Air National Guard Base.

Work under this task for the current study focuses primarily on updating the Airport's mapping to include the Air Guard's drainage system. This is based on information provided by the Air Guard and field verified by Dufresne-Henry. The Airport drainage system mapping is also updated to include projects completed since the 1997 Hamlin report was published. Drainage structures on the landside and airfield were field checked to generally confirm locations. Updated mapping is presented in Section 4.

1.3.3 Evaluate Existing Stormwater Discharge Outlets

A principal objective of this study is identifying discharges that flow into State waters. Based on concerns expressed by Airport management that more information is needed to determine the quality and quantity of stormwater discharge from the system, Pioneer Environmental Associates conducted a sampling/testing program for ten outfalls under this study. Their yearlong program identified pollution locations and provided base line of information about stormwater quality and flows. An extensive report describing procedures and presenting findings from the sampling program comprises Section 5.

1.3.4 Development a Stormwater Management Action Plan

This task includes summarizing the results of this study and developing an action plan intended to assist the Airport in complying with the stormwater rules. The action plan presented in Section 6 addresses the following key issues raised in Federal Phase 2 rule, and lays out a course for complying with these:

- Public education and outreach
- Public participation/involvement
- Illicit discharge detection and elimination

- Construction site runoff control
- Post-construction runoff control
- Pollution prevention/good housekeeping

The plan also discusses status of the Airport's on-going actions to address collection and treatment of glycol runoff from aircraft deicing operations, as well as actions to terminate using urea for surface deicing and switching to an alternative product that result in lesser environmental impacts.

SECTION 2

STATUS OF STATE AND FEDERAL STORMWATER RULES

In Vermont, two stormwater permitting programs are currently implemented. The first program is based on the federal National Pollutant Discharge Elimination System (NPDES), and the second is based on the requirements of state statute. Both of these programs are administered in Vermont by the Vermont Agency of Natural Resources (VANR)¹. The federally-delegated NPDES programs regulate construction runoff, industrial activities, and municipal separate storm sewer systems (MS4s). On a national basis, US EPA developed Phase I NPDES rules in 1990, and Phase II rules were issued in 1999. The Phase I NPDES Construction Stormwater Permit regulates discharges of stormwater runoff from construction sites disturbing 5 acres or more of land, including “common plans of development” which will disturb this amount of land area over time. In Vermont, this program is currently implemented through the issuance by ANR of General Permit 3-9001(2003), which requires a qualifying construction to file a Notice of Intent (NOI) to seek coverage under the General Permit. For non-qualifying projects (e.g. construction projects located in Class A watersheds), individual NPDES permits are issued by ANR. In the past, Burlington International Airport has sought and received coverage under the General Permit for various construction projects at the airport.

Phase II NPDES requirements include small municipalities (MS4s), certain categories of industrial activities (the multi-sector permit), and “small” construction sites (disturbing 1 to 5 acres). In Vermont, a general NPDES permit (#3-9014) for stormwater discharges from small municipal separate storm sewer systems (MS4s) was enacted in March 2003. This permit required designated entities to file an NOI and to develop a stormwater management

¹ Please refer to Table SP-1 for a listing of State and Federal stormwater permits and their applicability to the Burlington International Airport.

program (SWMP) outlining how the entity would implement six minimum control measures required by the permit. The designated MS4 entities which were required to obtain coverage include several municipalities in Chittenden County, the University of Vermont, the Burlington International Airport, and the Vermont Agency of Transportation (VTrans). Despite the fact that the general permit was appealed by CLF to the Vermont Water Resources Board in April 2003, the required NOI filing was made by BIA on June 20, 2003 outlining the plan for implementation of the six minimum controls by the airport.

The other two delegated Phase II NPDES permit programs, which are the small construction site permit and the multi-sector permit, have yet to be implemented in Vermont. The timetable for implementation of these programs has been revised a number of times by ANR, and no date currently exists for their implementation. It is unlikely that BIA would be required to seek coverage under the small construction site permit, when issued, as ANR considers any earth disturbance on the airport to be part of a larger common plan of development, and therefore requiring coverage under the large construction permit. As a result, no new requirements are anticipated due to this permit.

On the other hand, the NPDES multi-sector general permit, when effective, is likely to result in additional requirements which will be applicable to BIA. These requirements could include implementation of additional controls, monitoring, inspections, and reporting. A draft general permit issued by ANR in September 2002 identifies air transportation facilities as Sector S, requiring coverage under the permit. These requirements would regulate runoff resulting from airport deicing activities

In addition to the federally delegated NPDES stormwater programs that are or will be administered in Vermont, there is a separate state statute, 10 V.S.A. 1264, which regulates discharges of stormwater runoff from impervious surfaces. Permit coverage is required for new, expanded, or redeveloped areas of impervious cover which exceed specified thresholds of 1 to 2 acres. These “state stormwater permits” have been issued in various forms and following various requirements by ANR since 1978. Discharges from impervious surfaces constructed prior to 1978 or falling below the jurisdictional threshold are considered

grandfathered and therefore exempt from this permit program. Currently, state stormwater permit applications for new, expanded or redeveloped impervious areas are reviewed pursuant to the 2002 Vermont Stormwater Management Manual, which specifies five treatment criteria which must be met for a discharge subject to the requirements of the Manual. While the Manual remains the design approach for discharges to water bodies that are not listed on the most recent 303(d) list (i.e. designated as not meeting state water quality standards) due to pollutants contained in stormwater runoff, for those discharges to such impaired waters, a different situation exists. Litigation during 2000-2001 successfully challenged the sufficiency of standard design practices for discharges occurring to water bodies impaired due to pollutants contained in stormwater runoff. A subsequent effort by ANR to develop and implement Watershed Improvement Permits (WIPs) for these watersheds was also successfully challenged. During 2003, the Vermont Water Resources Board convened an Investigative Docket to evaluate means by which long term plans could be developed and implemented to return these waters to attainment with the Standards. An outgrowth of this effort, significant effort occurred at the Vermont General Assembly to develop an interim plan for permitting and water quality improvement within these watersheds until the long term plans can be developed. The state of Vermont has recently enacted Act 140, which makes a series of modifications to 10 V.S.A. 1264. These changes primarily address state stormwater permitting requirements to waters impaired due to stormwater runoff. However, other changes are applicable on a statewide basis. The primary regulatory standard applicable to the impaired watersheds is a “zero net discharge” requirement that no increase in sediment load above a theoretical baseline level would be allowed from a project seeking permit coverage. The changes enacted through Act 140 would affect new, expanded or redeveloped impervious surfaces on the airport located within the Potash Brook watershed and possibly the Muddy Brook watershed. Thus, the proposed South End Development (SED) would be subject to these requirements.

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BURLINGTON INTERNATIONAL AIRPORT (BTV)

Comprehensive List of Applicable or Potentially Applicable State and Federal Stormwater Permits

State Permits # Number	Description	Date Permit Will Become Effective	Duration or Expiration Date	When / Why Coverage is Required	Fees		
					Administrative	Application	
3-9010	General Permit for Previously Permitted Stormwater Discharges to Waters to non-WIP waters	Presently in Effect	August 5, 2010	The Burlington International Airport has an existing permitted stormwater discharge to the Winooski River, which is not on the list of impaired waters	\$100	\$300 / acre	\$50 / acre
3-9015	General Permit for Stormwater Discharges to non-WIP Waters from New Development or Redevelopment	Presently in Effect	March 24, 2013	Any new stormwater discharge to a receiving water which is not on the list of impaired waters must seek coverage. It is unlikely that BTV will encounter this scenario since most future development will utilize an existing or previously permitted discharge point.	\$100	\$300 / acre x acres of new impervious area	\$50 / acre / year x acres of new impervious area
---	Watershed Improvement Permits (WIPs)	None established at this time	None established at this time	The Burlington International Airport has discharges to two receiving waters that are listed as impaired: Polish Brook and Muddy Brook. When the WIPs are issued for those two waters, BTV will need to seek coverage	\$100	\$300 / acre	\$50 / acre
Federal NPDES Permits (State Administered) # Number	Description	Date Permit Will Become Effective	Duration or Expiration Date	When / Why Coverage is Required	Administrative	Application	Annual
3-9001	General Permit for Stormwater Runoff from Large Construction Sites (Construction General Permit)	Presently in Effect	March 31, 2007	Any construction activity in the State of Vermont disturbing 5 or more acres, including clearing, grading and excavation, must seek coverage (exceptions noted in the permit)	\$100	\$250 per application	None
3-9003	Multi Sector General Permit for Stormwater Discharges Associated with Industrial Activity (MSGP)	Unknown	5 Years From Date of Issuance	Existing stormwater discharges for Sector S (Air Transportation Facilities) need to seek coverage under this General Permit.	\$100	\$250 every 5 years	\$30
3-9013	General Permit for Stormwater Runoff from Small Construction Sites	Fall 2004 (Tentative)	5 Years From Date of Issuance	Any construction activity in the State of Vermont disturbing 1-5 acres	\$100	\$250	None
3-9014	General Permit for Stormwater Discharges from Small Municipal Separate Storm Sewer Systems (MS4)	March 9, 2003	5 Years From Date of Issuance	The Burlington International Airport has been designated a "non-traditional" MS4 by the Vermont Agency of Natural Resources	\$100	\$250	\$30



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Summary of House Bill 785, An Act Relating to Stormwater Discharge
May 27, 2004

Summary of the Substance of the Bill:

- ***Improves the existing stormwater permit program.*** The bill amends and strengthens the existing state permit program for discharges of "regulated stormwater runoff" from impervious surfaces that discharge into surface water or infiltrate into groundwater. The bill clarifies jurisdictional requirements for permitting and enhances predictability and simplifies administration. Currently impervious surfaces of one to two acres in size are subject to regulation depending on a complicated engineering calculation and proximity to sensitive resources. The bill sets a jurisdictional trigger of one acre of impervious surface in stormwater-impaired watersheds and allows ANR to regulate smaller developments if environmentally justified. The bill also requires ANR to adopt a rule later this year imposing a uniform one acre regulatory threshold for stormwater permits in unimpaired waters across the state.
- ***Requires comprehensive clean-up plans for impaired waters as recommended by the WRB Storm water Docket.*** The bill implements the recommendations of the Water Resources Board's stormwater docket report by requiring development of comprehensive clean-up plans in no more than three years to guide future permitting in the seventeen stormwater-impaired watersheds. The bill allows ANR to issue the existing watershed improvement general permit (WIP) without a detailed planning process where the agency is confident that actions required by the general permit will result in attainment of water quality standards within five years. Additionally, the bill authorizes ANR to issue a watershed specific general permit after a comprehensive, hydrology-based, planning process leading to development of either a TMDL waste load allocation plan or a similarly detailed Water Quality Remediation Plan. There is no requirement that permits based on a TMDL or Water Quality Remediation Plan result in attainment of water quality standards in five years or any other fixed period of time.

- ***Establishes a "transitional" program to allow for permitting in impaired waters during the three year planning process.*** The bill creates a transitional permitting program of up to three years in stormwater-impaired waters while TMDL or Water Quality Remediation Plans are in development. The transitional program requires issuance of individual permits implementing a strict "net zero" pollution standard (i.e., no more sediment is caused by the discharge than would occur if the site of the discharge were in its pre-existing or "natural" condition). The net zero standard applies to construction of new impervious surfaces, redevelopment of old impervious surfaces and re-permitting of old impervious surfaces with expired permits. Most permit applicants will not be able to achieve the "net zero" standard at their own site even if they use the most advanced stormwater management practices. To compensate, most permit applicants will have to construct an off-site, offset sediment reduction project or seek association with a sediment reduction offset project built by someone else.

A new discharge must meet ANR's 2002 stormwater treatment standards and the offset project with which it is associated must be completed prior to the initiation of the new discharge. An existing discharge from a redevelopment projects or from the site of a renewal of an expired permit must come as close as possible to meeting the 2002 standards, as determined by an engineering feasibility analysis specified by ANR, and the offset project with which it is associated must be completed within two years. In all cases, a discharge and the offset project with which it is associated must be located in the same watershed.

Because finding and constructing offset projects is difficult the bill also offers dischargers the option of paying a stormwater impact fee to a newly established Stormwater-Impaired Waters Restoration Fund administered by DEC. The fund has a separate account for each of the seventeen impaired waters. The fund will be used to reimburse the costs of constructing publicly and privately sponsored offset projects. To be eligible for funding an offset project must obtain a new "offset permit". ANR will assign a discharge to an available offset project on a "first come, first served"

basis. Dischargers may not begin construction of a discharge until the stormwater impact fee is paid and ANR makes an assignment to an offset project. If no offset project is available, dischargers will have to wait to begin construction until one is available.

An offset project that will be completed before or contemporaneously with all of the discharges with which it is associated will be issued a state offset permit. An offset project that will not be completed prior to initiation of one or more of its associated discharges from a redevelopment project or renewal of expired permit will be issued a federal NPDES permit and must be completed within two years. Issuing the offset permit as an NPDES permits allows citizen suit enforcement of the two year construction limit.

The stormwater impact fee is \$30,000 per untreated acre of impervious surface but is reduced based on the amount of treatment that a discharger can accomplish on its own. For example, the fee for new discharges will be less than \$6,000 dollars per acre because new discharges must fully comply with ANR's 2002 stormwater treatment standards. The bill references a May 5,2004 DEC procedure which guides the engineering feasibility analysis, calculation of permit fees, determination of offset loads, calculation of the "offset charge capacity" of an offset project, and disbursement of money from the Stormwater-Impaired Waters Restoration Fund.

- ***Provides time-limited relief for transfers of property with expired permits.*** The bill allows a 'Bianchi' waiver for property transfers and refinancing during the transition period for property owners with expired permits for discharge of stormwater to impaired waters who meet the requirements for 'deferral of permit' notice.
- ***Provides funding for offsets, consultant planning services, local planning support, and DEC staff.*** The bill appropriates \$1.2 million for capitalization of the remediation fund; \$450,000 for contracted engineering services; \$200,700 for three DEC FTEs and \$120,000 to capitalize a 'Local Community Implementation Fund' for grants to communities with stormwater-impaired waters.

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SECTION 3

REVIEW OF EXISTING STORMWATER DISCHARGE PERMITS

3.1 DATA COLLECTION AND REVIEW PROCESS

Airport and State files were researched to identify existing stormwater discharge permits applying to Burlington International Airport property. The permit review included meetings with Burlington Airport representatives and James Pease (Vermont Agency of Natural Resources, Department of Environmental Conservation, Water Quality Division). Mr. Pease was very helpful locating permits, discussing applicability and conditions, and providing copies of permits. Research for the study also identified applicable stormwater discharge permits issued to the Vermont Air National Guard Base. Joel Clark, Adam Wright and John Ferraro (all representing the Air Guard) were very cooperative sharing their knowledge of the Base's stormwater system and permit status.

Following collection of information, the existing permits were reviewed and construction projects associated with each permit each were identified. Stormwater Drainage System Mapping located in Section 4 of this report includes labeling of permit numbers for the corresponding permitted outlet locations, (e.g. Storm Drainage System Sheet 1 of 3 identifies Permit 1-1391 with the Vortechincs Treatment Unit located south of the Main Terminal). Once permits were associated with projects and their geographic locations identified, permit conditions and expiration dates were reviewed. In some instances (such as the Vortechincs Unit), maintenance and periodic reports are required. In many cases, permit expiration dates have passed.

3.2 PRESENTATION OF FINDINGS

Copies of the stormwater discharge permits are included at the end of this section. Because it is difficult to quickly extract pertinent information from the permits, a reference table has been prepared including “*must know*” information. This includes:

- Permit Number
- Permit / Project Name
- Project Design Information
- Effective Date
- Expiration Date
- Reapplication Date
- Receiving Waters
- Manner of Discharge
- Action Dates
- Requirement to be satisfied
- Action required to fulfill specific conditions

It is recommended the action items be carefully reviewed to ensure permit compliance is maintained.

3.3 PERMIT SYNOPSIS

Following is a synopsis of stormwater discharge permits applicable to Burlington Airport and Vermont Air National Guard Base.

3-9014, MS4 Notice of Intent (NOI): This serves as the basis for a general stormwater discharge permit that was issued March 10, 2003; it commits the Airport’s to comply with measures and actions presented in their NOI application. The MS4 is much broader in coverage than other stormwater permits. The NOI references 25 discharge points: 14 of these to Muddy Brook; 4 to Potash Brook (both listed as impaired State waters); and 7 to the

Winooski River (not impaired). The NOI includes multiple action items including public education and outreach; public participation and involvement; illicit discharge detection and elimination; and several additional items. Action items listed in the NOI satisfying these requirements include developing a website for public education; stenciling paint markings at catch basins to inform the public where runoff entering storm drains discharges; installing display racks in the Terminal for distributing literature relating to stormwater; and several additional requirements. The complete list of items is provided in the summary table. Effective permit dates will be part of the general permit when it is issued.

3-9010, Authorization to Discharge, General Permit: This permit was issued in conjunction with rehabilitation of a non-functional oil / water separator (located north of the Terminal and east of the Rental Car Wash facility) to a Vortechics sediment removal system. It also includes improvement of the so-called North Outfall which discharges to the Winooski River. This permit supersedes expired permit 1-0839 and also applies to one outlet (the same North Outfall) permitted by 1-1580. Action items related to this permit include semi annual inspection and maintenance of the systems. The permit also requires filing an annual report and designer's written statement attesting the system is operating properly. The first three year certifications will be due in June 2006. The permit is in effect through August 2010; filing a renewal application will be required for this permit.

1-1580, Terminal Roadway and Parking Project (TRAP): This permit applies to two outfall locations: one to the Winooski River (the so-called North Outfall) and a second to a sand filter infiltration system (located north of the long term parking lot) that discharges to groundwater. The permit applies to treatment of stormwater from the parking garage expansion upper deck, rental car parking lot and the long term public parking lots. This permit is effective through April 2008; filing a renewal application for this permit will be required.

1-1391, South Apron Expansion: This permit applies to the Vortechics unit and the groundwater infiltration system located between Runway 1-19 and Taxiway A. Permit

requirements include quarterly inspection of the Vortechics unit as well as measurement and removal of accumulated sediment from the chamber. The Airport filed an application for renewal of this permit that was due to expire September 30, 2004. The airport received a letter confirming receipt of the application and notice the application is being reviewed.

1-1270, Pratt & Whitney Facility: This permit was due to expire in September 2001, and with reapplication required in March 2001. This permit was subsequently renewed May 16, 2001. The permit covers stormwater discharge from the Pratt & Whitney building and parking area, with discharges to Potash Brook (impaired waters) at two locations. Permit requirements include semi annual inspection and maintenance of all stormwater conveyance and treatment structures, and filing an annual report.

1-0839 Burlington International Airport: This permit expired in March 1995 and application for renewal was due in September 1994. The permit covered one discharge to the Winooski River (non-impaired waters) to redirect Airfield runoff to the North Outfall and two discharges to an unnamed tributary to Potash Brook (impaired waters) related to Taxiway A reconstruction. Permit requirements included quarterly maintenance and inspection of all stormwater conveyance and treatment structures and an annual report. The discharge from the north outfall is now permitted under 3-9010. The procedure for permitting the discharges to Potash Brook is yet to be determined by the VANR.

1-0820, Vermont Air National Guard Alert Shelter and Munitions Complex: This permit expired in March 1994; renewal application was required in September 1993. It appears a renewal application was not filed. The permit covers two discharges to Muddy Brook (an impaired water). Permit requirements include quarterly maintenance and inspection of all stormwater conveyance and treatment structures and an annual report.

2-0930, Vermont Air National Guard Fire Station and Gate House: This permit expired in July 1985; no requirements for reapplication are listed in the permit. The permit covers one discharge to an unnamed tributary to the Winooski River. Permit requirements include

quarterly maintenance and inspection of all stormwater conveyance and treatment structures and an annual report.

2-0805, Burlington International Airport: This is the earliest listed permit with an effective date of December 1979; the permit expired in July 1980 and no requirements for renewal are indicated. The permit covers two discharges from the snow removal equipment building to an unnamed tributary of Potash Brook: one discharge is for stormwater from roof drains, and the other for the discharge of stormwater from vehicle maintenance operations and fueling operations through floor/pit/yard drains. Permit requirements include quarterly maintenance and inspection of all stormwater conveyance and treatment structures and an annual report.

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Burlington International Airport
Stormwater Permit Summary

Permit Number	Permit / Project Name	Project Design Information	Effective Date	Expiration Date	Respiration Date	Receiving Water	Member of Discharge	Action Dates	Requirement	Action
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1-1270	Pratt & Whitney Facility	Webster-Martin, Inc plans and details Sheets SP-1 and 2 dated July 1996	December 19, 1996	September 30, 2001	March 31, 2001	Unnamed tributary to Polish Brook	SN 001: Stormwater from the building and parking area via grass swales to collection system SN 002: Stormwater from the access road conveyed via overland flow to a wetland	After Snowmelt	All stormwater conveyance and treatment devices including stormwater ponds, grass and stone lined swales, and vegetated buffer strips shall be properly maintained. Any instances of erosion shall be corrected promptly.	
								Prior to Snowfall		
								Immediately	Submit written report summarizing the condition of stormwater management devices at the site and the nature and dates of all cleaning and maintenance operations carried out in the past year.	Provide written notification to the Department of Environmental Conservation that construction has been performed in accordance with the approved plans, and that all disturbed areas of the site have been properly stabilized.
								30 days following construction completion	Inspect all stormwater conveyance and treatment devices including stormwater ponds, grass and stone lined swales, and vegetated buffer strips shall be properly installed and any erosion has been corrected.	

1-0839	Burlington International Airport Redirect Airfield Drains to North Outfall and Taxiway A Improvements	Hoyle Tanner and Associates 1983, August 1986, February 1990, January and March 1990, Wiemann-Lampshire, Architects (Sept. 1985)	June 11, 1990	September 30, 1994	March 31, 1995	Unnamed tributary to Winooksi River SN002 & SN003	SN001: Unnamed leaching catch basins and oil water separator and drains and rip rapped outlet. network includes grass swales, trench drain on terminal apron, SN002: via network of catch basins and storm drains and rip rapped outlet. network includes other treatment and conveyance devices shall be maintained in good operating order at all times and shall be inspected at least quarterly and cleaned at such other times as necessary to maintain design performance levels.	Quarterly	All catch basins, grass lined swales, sedimentation ponds and other treatment devices shall be maintained in good operating order at all times and shall be inspected at least quarterly and cleaned at such other times as necessary to maintain design performance levels.	
								Quarterly		
								Quarterly		
								Quarterly		

1-0820	Alert Shelter Complex and Munitions Building	Webster-Martin, Inc (Alert Shelter Complex) Site Work (C-2) dated 9/1/88 and Freeman-French-Freeman Architects (Munitions Complex) Storm Drainage plan Sheet SP3, undated.	April 9, 1989	September 30, 1993	March 31, 1994	Muddy Brook	SN001: (Munitions Complex) Via grass lined drainage swales and if paved parking lot is added, lot, then via overland flow across vegetated terrain. SN002 (Alert Shelter Complex) Via overland flow across vegetated terrain, then via a stormwater drainage system consisting of catch basins and concrete pipe that outlet via a stone lined stilling basin then via overland flow across vegetated terrain.	Quarterly	All catch basins, settling ponds, recharge basins, or other treatment devices or facilities shall be maintained in good operating order at all times and shall be cleaned quarterly and at such other times as necessary to maintain design treatment levels.	
								Quarterly		
								Quarterly		
								Quarterly		

1-2-0930	Fire Station and Gate House, Civil En gineering Maintenance	None Specified	March 6, 1981	None Specified	July 1, 1985	Unnamed tributary of the Winooksi River	Via drainage ditches, underground culvert and natural drainage channels	Quarterly	All catch basins, settling ponds, recharge basins or other treatment devices or facilities shall be maintained in good operating order at all times and shall be cleaned quarterly and at such other times as necessary to maintain design treatment levels.	
								Quarterly		
								Quarterly		
								Quarterly		

2-0805	Burlington International Airport Snow Removal Equipment Bldg.	None Specified	December 20, 1979	None Specified	July 1, 1980	Unnamed tributary to Polish Brook	SN001: untreated discharge from roof drains. SN002: discharge from vehicle maintenance activity and fueling operations through floor/drainage drains after treatment in an oil separator, and passage through a drywell.	Quarterly	All catch basins, settling ponds, recharge basins or other treatment devices or facilities shall be maintained in good operating order at all times and shall be cleaned at such other times as necessary to maintain design treatment levels.	
								Quarterly		
								Quarterly		
								Quarterly		

A written report shall be submitted to the Department of Water Resources, NPDES permit section, providing the dates and nature of cleaning operation carried out in the preceding year.

3-9014

STATE OF VERMONT
AGENCY OF NATURAL RESOURCES
DEPARTMENT OF ENVIRONMENTAL CONSERVATION

NOTICE OF INTENT

General Permit 3-9014

National Pollutant Discharge Elimination System (NPDES) Number: VTR040000
For Stormwater Discharges From Small Municipal Separate Storm Sewer Systems

Please provide the following information in support of your application for coverage under the General Permit.

1. Name of MS4 applying for coverage under General Permit 3-9014, NPDES Number VTR040000: **Burlington International Airport**

Mailing Address: **1200 Airport Drive
South Burlington, Vermont 05403**

Phone Number: **(802) 863-2874**

Fax Number: **(802) 863-1526**

E-Mail Address: **hkendrew@burlingtonintlairport.com**
2. Name and Title of person responsible for overall coordination of the storm water management program: **Heather Kendrew**

Mailing address: **Burlington International Airport
1200 Airport Drive
South Burlington, Vermont 05403**

Phone number: **(802) 863-2874**

Fax number: **(802) 863-1526**

E-mail Address: **hkendrew@burlingtonintlairport.com**
3. An estimate of the square mileage served by your small MS4: **0.9 square miles**
4. Identify the names of all known waters that receive a discharge from the MS4. If known, indicate the number of outfalls to each water: **Muddy Brook (14 outfalls), Potash Brook (4 outfalls), Winooski River (7 outfalls)**
5. You may partner with other MS4s to develop and implement your storm water management program. Each MS4 must fill out an NOI form. (You may also jointly submit the same NOI with one or more MS4s.) If you elect to partner with another MS4, the description of your storm water management program must clearly describe which permittees are responsible for implementing each of the control measures. **Not applicable.**

6. If you are relying on another governmental entity regulated under the storm water regulations (40 CFR 122.26 & 122.32) to satisfy one or more of your permit obligations (see Part 4.4), identify the entity(ies) and the element(s) they will be implementing. You do not need to identify the Agency of Natural Resources with respect to minimum measures 4 and 5. If you are participating in the regional MOU to implement minimum measure 1 check here .
7. For each of your chosen best management practices (BMPs) and the measurable goals related to the storm water minimum control measures in Part 4.2 of the General Permit provide the following information:
- Your timeframe for implementing the BMP (you must develop and fully implement your program by the expiration date of this permit): **See attached NOI narrative.**
 - The person or persons responsible for implementing or coordinating the BMPs for your storm water management program: **See attached NOI narrative.**
 - A description of the best management practices (BMPs) that you or another entity will implement: **See attached NOI narrative.**
 - The measurable goals for each of the BMPs including, as appropriate, the months and years in which you will undertake required actions, including interim milestones and the frequency of the action. When possible, your measurable goal should include outcome measures related to the BMPs impact on water quality, stream channel stability, ground water recharge, and flood protection (EPA has provided guidance on developing measurable goals at: www.epa.gov/npdes/stormwater/measurablegoals/index.htm). **See attached NOI narrative.**
 - When requested in 4.2 of the General Permit, provide a rationale for how and why you selected the BMPs and measurable goals for your storm water management program. **See attached NOI narrative.**
8. Submit your NOI together with the correct fees at the following address:
- Vermont Agency of Natural Resources
 Department of Environmental Conservation
 Water Quality Division, Stormwater Management Program
 103 South Main Street, Building 10 North
 Waterbury, Vermont 05671-0408
9. This NOI must be signed by a principal executive officer, ranking elected official or other duly authorized employee and certified as follows:

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

 Signature

 Date

BURLINGTON INTERNATIONAL AIRPORT (BTV) NOTICE OF INTENT NARRATIVE

For General Permit 3-9014

National Pollutant Discharge Elimination System (NPDES) Number: VTR040000
For Stormwater Discharges from Small Municipal Separate Storm Sewer Systems

I. Background

The 1987 Amendment to the Federal Clean Water Act (CWA) of 1972 (CWA 402(p)(5)) directed the Environmental Protection Agency (EPA) to address the problems of flooding, water pollution and public health threats caused as a result of stormwater runoff from developed lands or as commonly termed, urban stormwater runoff. This runoff from roads, rooftops and other impervious surfaces associated with developed lands causes erosion/property damage; endangers or destroys aquatic wildlife and wildlife habitats; causes unhealthy algal blooms; and endangers public health via contact during recreation sports by contaminating source water used for public water supplies.

The CWA required that the EPA address urban stormwater runoff in a phased approach starting with the largest urban areas in the United States based on population census data. In November 1999, the EPA issued new federal stormwater regulations known as the Phase II Stormwater Rule for metropolitan areas of less than 100,000 people.

Under the Phase II Rule, eight municipalities in Vermont with municipal separate storm sewer systems (MS4) are required to seek coverage under the MS4 General Permit or apply for an individual permit. These are Burlington, South Burlington, Colchester, Winooski, Essex, Essex Junction, Williston and Shelburne. In addition to these municipalities, three publicly owned, non-traditional separate storm sewer systems have also been designated and are required to seek coverage. These systems are owned or operated by the University of Vermont, Burlington International Airport (BTV) and the Vermont Agency of Transportation.

The MS4 General Permit is a National Pollutant Discharge Elimination System (NPDES) permit and has a five-year permit term. The requirements of this MS4 General Permit apply to areas served by each MS4 that are located within either the U.S. Census Bureau designated urban area (UA) or watersheds that are principally impaired by stormwater and so classified by the Vermont Agency of Natural Resources, Department of Environmental Conservation (DEC).

As a permit condition, each MS4 must develop, implement and enforce a Stormwater Management Program (SWMP) designed to reduce the discharge of pollutants from the MS4 to the maximum extent practicable (MEP), to protect water quality, and to satisfy the appropriate water quality requirements of the Clean Water Act. Implementation of best management practices consistent with the provisions of the SWMP required pursuant to this permit constitutes compliance with the standard of reducing pollutants to the "maximum extent practicable".

The SWMP must be developed and implemented by the expiration date of the MS4 permit, and must include information for the minimum control measures as described in the permit.

There are six minimum control measures required of each designated permittee under the MS4 General Permit: (1) *Public Education and Outreach*, (2) *Public Participation/Involvement*, (3) *Illicit Discharge Detection and Elimination*, (4) *Construction Site Runoff Control*, (5) *Post-Construction Runoff Control*, and (6) *Pollution Prevention/Good Housekeeping*.

Each MS4 must also comply with certain special conditions, including: *Water Quality Controls for Discharges to Impaired Water bodies*, *Consistency with Total Maximum Daily Load (TMDL) Requirements and Source Water Protection requirements*.

II. Six Minimum Measures

Following are descriptions of how BTV intends to satisfy each of the six minimum measures. Included are descriptions of each best management practice (BMP) chosen, timeframes for implementing each BMP, measurable goals of each BMP, name(s) of the person or persons responsible for implementing each BMP, and a rationale for how and why each BMP was selected.

A. Public Education and Outreach

As indicated in the NOI, this measure is met by BTV agreeing to and complying with the Regional Memo of Understanding (MOU). Please find attached a signed copy of the MOU.

1) **BMP # 1:** BTV will work with the regional group to develop a website dedicated to public education as it relates to water quality issues. In the event that the regional group is not able to develop a website, BTV will make modifications to their existing site to accommodate a water quality section for the purpose of public education.

Timeframe: A functional water quality oriented website will be developed and implemented for public education purposes by February 1, 2008.

Measurable Goals: Not applicable.

Person(s) Responsible for BMP: The Burlington International Airport's public education and outreach program and, if required, web site development, will be implemented and overseen by Heather Kendrew, who is responsible for the overall coordination of the storm water management program at the airport.

Rationale for Selection: With an ever increasing number of people utilizing the internet, a website is a cost effective way to reach the public and educate them about water quality related issues.

B. Public Participation/Involvement

This measure will be met by BTV implementing a program which will involve coordinating or participating in three (3) separate activities (BMPs) that encourage public participation and involvement. Following are descriptions, timeframes and measurable goals of the three BMPs:

1) BMP # 1: BTV will establish designated Advertisement Space in the Airport Terminal. One of the existing paid advertising signs will be cleared or moved to allow for the use of a lighted panel(s) for public participation and involvement purposes. The Airport intends to work with the City of Burlington Arts Department to design and develop, with approval from the Agency of Natural Resources, an appropriate display and message regarding storm water pollution prevention and water quality. The lighted panel(s) can display photographs and text, as well as contact information including the BTV storm water management program coordinator, applicable ANR phone numbers, and any applicable web site addresses.

Timeframe: The conceptual design will be completed by June 2004. The display will be installed by December 2004.

Measurable Goals: 1) BTV will review, re-evaluate, and update the display once per year.

Person(s) Responsible for BMP: The Burlington International Airport's public participation and involvement program and each of the three BMPs will be implemented and coordinated by the Airport Operations Division, and overseen by Heather Kendrew, who is responsible for the overall coordination of the storm water management program at the airport.

Rationale for Selection: With over 1,000,000 people passing through the terminal area annually, this will prove to be a valuable tool to reach the public.

2) BMP # 2: BTV will institute a storm drain stenciling program, which will help to inform and remind the public that storm water runoff will reach waters of the state. Stencils will be placed on all publicly viewed storm drains. This will not include storm drains located on the air carrier ramp or the airfield, due to marking restrictions. Content of the stencils will be approved by ANR, but may include wording such as "Discharges to Winooski River".

Timeframe: The storm drain stenciling program will be initiated by June 2004 and the first round of stenciling will be completed by September 2004.

Measurable Goals: 1) BTV will re-stencil each applicable storm drain once every two years.

Person(s) Responsible for BMP: The Burlington International Airport's public participation and involvement program and each of the three BMPs will be implemented and coordinated by the Airport Operations Division, and overseen by Heather Kendrew, who is responsible for the overall coordination of the storm water management program at the airport.

Rationale for Selection: With over 1,000,000 people passing through the terminal area annually, this will prove to be a valuable tool to reach the public.

3) **BMP # 3:** BTV will provide designated display rack. Located in the terminal concourse area and readily visible to the public, the display rack will provide a location for entities other than BTV to display literature and information on storm water pollution prevention and water quality. Entities that could use the space include other traditional and non-traditional MS4s, the State of Vermont, the Lake Champlain Committee, Friends of the Winooski River, etc. The actual shape and size of the rack will be determined in conjunction with the Airport's architect and the City of Burlington.

Timeframe: The conceptual design will be completed by June 2004. The rack will be constructed and installed by December 2004.

Measurable Goals: 1) BTV will have two different entities post displays in the rack each year.

Person(s) Responsible for BMP: The Burlington International Airport's public participation and involvement program and each of the three BMPs will be implemented and coordinated by the Airport Operations Division, and overseen by Heather Kendrew, who is responsible for the overall coordination of the storm water management program at the airport.

Rationale for Selection: With over 1,000,000 people passing through the terminal area annually, this will prove to be a valuable tool to reach the public. Because of the size of the terminal concourse area, this BMP provides the potential to reach many more people than allowed by other methods of public participation and involvement.

Each of the three BMPs mentioned above will be re-evaluated annually to monitor their effectiveness and ensure they are concurrent with the goals of ANR and BTV. If an activity becomes ineffective or undesirable, as agreed upon by ANR and BTV, then a replacement activity will be discussed, agreed upon, and initiated.

Because the airport is a department of the City of Burlington, the airport may additionally participate in City sponsored programs for clean up/green up days or other activities supported by the Mayor of the City of Burlington and Director of Aviation at the Burlington International Airport.

C. Illicit Discharge Detection and Elimination

As a permit condition, each MS4 must develop, implement and enforce a Stormwater Management Program (SWMP) designed to reduce the discharge of pollutants from the MS4. The SWMP will include developing, implementing and enforcing a plan to detect and eliminate all illicit discharges.

The airport is currently conducting a stormwater study which includes an analytical monitoring program. The current monitoring program has the following objectives:

- Identify stormwater outfalls with high concentrations of pollutants. Pollutants identified under current monitoring include volatile organic compounds, glycols, TPH, surfactants, metals, e. coli, BOD5, COD, chloride, conductivity, DO, nitrogen, TKN, pH, phosphorous, turbidity and TSS.
- Quantify flow from selected outfalls
- Determine if BTV is a "significant contributor" to existing water quality impacts to impaired waters
- Identify illicit discharges
- Collect data to aid in the development of an action plan to address and remediate areas where existing water quality impacts or illicit discharges are identified

As part of the study, a comprehensive base map of the entire BTV property is also being developed. The map was originally developed in 1997 by Donald L. Hamlin Consulting Engineers, and is being updated to reflect BTV development over the last five (5) years. The 1997 study included field investigation evaluation reports, identification of drainage areas, and pipe capacity calculations, as well as cleaning of some systems. The newly updated base map will serve as a master plan of all structures, pipes, outfalls and receiving waters. In addition, this map will be the basis for the plan included as part of the SWMP.

1) **BMP # 1:** A plan to detect and eliminate all illicit discharges will be developed, implemented and enforced as part of the SWMP. This plan will include the following:

- A comprehensive storm sewer system Geographic Information Systems (GIS) map of the airport, showing locations of all outfalls and names and locations of receiving waters.
- A policy which effectively prohibits non-storm water discharges into the BTV storm sewer system and implementing appropriate enforcement procedures and actions. This policy will be directed towards BTV employees and tenants, and will include disciplinary actions and repercussions as well as rewards and incentives.
- A plan to detect and address non-storm water discharges (including illegal dumping) to the BTV storm system. Outfall monitoring priorities have been established, and monitoring activities based on handling of certain materials (deicing material, cleaning fluids, fuel, etc.) are currently underway as part of the ongoing BTV stormwater study project. Monitoring results will be incorporated into the plan and problem discharges will be eliminated or corrected. Upon completion of priority monitoring and correction of problem discharges, if no opportunities exist for future illicit connections, then detailed monitoring will no longer be required.
- An annual monitoring schedule will be established with monitoring efforts consisting of annual visual and smell tests at all outfalls and discharge points.
- A way to inform employees and tenants of hazards associated with illegal discharges and improper disposal of waste. The airport will begin working with John Daly of the ANR Compliance Assistance Division. John will help educate airport staff and tenants to look at their maintenance and business practices and determine if they need to make changes to ensure environmental compliance. Individual tenant meetings will then be conducted as necessary to address all areas of concern.

Stantec to update SW mapping

Heather Kishin

Impaired together Stantec another local company (Martin ECS)

Timeframe: A draft of the plan will be developed as part of the SWMP, and will be provided for ANR review by June 2005. The final plan will be implemented by June 2007. By February 1, 2008, BTV will provide the Secretary of ANR with a summary of monitoring activities conducted and corrective actions taken.

- Measurable Goals:*
- 1) BTV will continue ongoing monitoring efforts and will complete the ongoing stormwater study, including monitoring and base map development by June 2004.
 - 2) BTV will develop a draft of the SWMP and submit to ANR for review by June 2005.
 - 3) Most or all illicit discharges detected by the stormwater study will be eliminated by June 2006.
 - 4) BTV will implement the SWMP by June 2007.
 - 5) BTV will provide the Secretary of ANR with a summary of monitoring activities conducted and corrective actions taken by February 1, 2008.

Person(s) Responsible for BMP: The Burlington International Airport's illicit discharge detection and elimination plan and each of the associated activities will be implemented and overseen by Heather Kendrew, who is responsible for the overall coordination of the storm water management program at the airport

Rationale for Selection: Development and implementation of a plan to detect and eliminate illicit discharges, as well as continuation of the ongoing BTV stormwater study program, are paramount to meeting and achieving the goals outlined in the MS4 General Permit.

2) **BMP # 2:** An employee questionnaire will be developed in conjunction with ANR and circulated which will help evaluate the success of the program. Questions asked will help determine the level of awareness of storm water pollution and water quality issues and allow for suggestions to be made. The questionnaires may also provide BTV with additional information regarding discharges from tenants.

Timeframe: A draft of the questionnaire will be developed and provided for ANR review by June 2005. The questionnaire will be completed and distributed to employees and tenants by June 2006.

- Measurable Goals:*
- 1) BTV will distribute 500 questionnaires to employees and tenants by June 2006.

Person(s) Responsible for BMP: The Burlington International Airport's illicit discharge detection and elimination program and each of the associated activities will be implemented and overseen by Heather Kendrew, who is responsible for the overall coordination of the storm water management program at the airport

Contact ANR
regarding sample

Rationale for Selection: Soliciting input from employees and tenants not only helps to educate them, but allows us to gage relative successes or failures of efforts to date.

D. Construction Site Runoff Control

As a permit condition, each MS4 must develop, implement and enforce a Stormwater Management Program (SWMP) designed to reduce the discharge of pollutants from the MS4. The SWMP will include developing, implementing and enforcing a plan to prevent or reduce pollutants in construction site runoff.

1) **BMP # 1:** A plan to prevent or reduce pollutants in construction site runoff will be developed, implemented and enforced as part of the SWMP. This plan will include the following:

- Measures for the adoption of an erosion control policy for storm water runoff from all construction sites
- Procedures to identify construction activities meeting the one (1) acre and five (5) acre thresholds and report such activities to the Secretary to assure that all such projects are properly permitted in accordance with the ANR General Permit for Stormwater Runoff from Construction Sites (CGP)
- Procedures to assure that construction activities are properly permitted and erosion and sediment control measures during construction are implemented in accordance with the terms of the permit
- Procedures to assure that permitted projects are properly constructed and operated and maintained in accordance with the terms of the permit
- Procedures to assist the Secretary of ANR in inspecting permitted projects for obvious signs of non-compliance with the conditions of the permit
- Procedures for proper disposal of removed waste
- For a listing of additional items to be included in the SWMP, refer to Section VI of this narrative

Timeframe: A draft of the plan will be developed as part of the SWMP, and will be provided for ANR review by June 2005. The final plan will be implemented by June 2007.

Measurable Goals: 1) BTV will develop a draft of the SWMP and submit to ANR for review by June 2005.

2) BTV will implement the SWMP by June 2007.

Person(s) Responsible for BMP: The Burlington International Airport's construction site runoff control plan and each of the associated policies will be implemented and overseen by Heather Kendrew, who is responsible for the overall coordination of the storm water management program at the airport.

Rationale for Selection: Development and implementation of a plan to prevent or reduce pollutants in construction site runoff, including compliance with the ANR CGP, is the most effective way to ensure appropriate protection of waters of the state during construction activities.

E. Post-Construction Runoff Control

As a permit condition, each MS4 must develop, implement and enforce a Stormwater Management Program (SWMP) designed to reduce the discharge of pollutants from the MS4. The SWMP will include developing, implementing and enforcing a plan to prevent or reduce pollutants in runoff from post-construction sites.

- 1) **BMP # 1:** A plan to prevent or reduce pollutants in post-construction site runoff will be developed, implemented and enforced as part of the SWMP. This plan will include the following:
 - An operation and maintenance program for preventing or reducing pollutant runoff from operations including the maintenance of buildings, open spaces and storm water systems
 - Procedures to ensure compliance with the ANR Stormwater Rule and to identify projects that disturb greater than one (1) acre and report to the Secretary of ANR such activities that have one (1) or more acres of impervious surface to assure that all such projects are properly permitted
 - Procedures to prevent or minimize water quality impacts from storm water runoff from projects that disturb greater than one (1) acre and have less than one (1) acre of impervious surface by utilizing a combination of structural and non-structural BMPs consistent with the Agency's 2002 Vermont State Stormwater Management Manual
 - Procedures to assure that permitted projects are properly constructed and operated and maintained in accordance with the terms of the permit
 - Procedures to assist the Secretary of ANR in inspecting permitted projects for obvious signs of non-compliance with the conditions of the permit
 - Maintenance schedules and inspection procedures for long term structural BMPs
 - Procedures for proper disposal of removed waste
 - A comprehensive storm sewer system Geographic Information Systems (GIS) map of the airport showing locations of all outfalls and names and locations of receiving waters
 - For a listing of additional items to be included in the SWMP, refer to Section VI of this narrative

Timeframe: The comprehensive storm sewer system base map is being developed as part of an ongoing BTV project, and will be completed by June 2004. A draft of the plan will be developed as part of the SWMP, and will be provided for ANR review by June 2005. The final plan will be implemented by June 2007.

- Measurable Goals:*
- 1) BTV will develop a draft of the SWMP and submit to ANR for review by June 2005.
 - 2) BTV will implement the SWMP by June 2007.

Person(s) Responsible for BMP: The Burlington International Airport's post construction runoff control plan and each of the associated policies will be implemented and overseen by Heather Kendrew, who is responsible for the overall coordination of the storm water management program at the airport.

Rationale for Selection: Development and implementation of a plan to prevent or reduce pollutants in post-construction site runoff, including compliance with the ANR Stormwater Rule, is the most effective way to ensure appropriate protection of waters of the state following the completion of construction activities.

F. Pollution Prevention/Good Housekeeping

As a permit condition, each MS4 must develop, implement and enforce a Stormwater Management Program (SWMP) designed to reduce the discharge of pollutants from the MS4. The SWMP will include developing, implementing and enforcing a plan to ensure pollution prevention and good housekeeping.

The Burlington International Airport is a non-traditional MS4. Since they are an airport, coverage must also be sought under the NPDES Phase II Multi Sector General Permit (MSGP) in addition to the MS4 General Permit. One condition under the MSGP is development of a Storm Water Pollution Prevention Plan (SWPPP) that includes measures for pollution prevention and good housekeeping. BTV will develop and implement the SWMP such that it meets the requirements of the SWPPP as outlined in the MSGP.

The airport has not historically had a comprehensive operations and maintenance program for existing stormwater structures and storm drain systems. However, several activities have been undertaken in the past to ensure that problem areas were discovered and addressed effectively. These included conducting a comprehensive drainage study, installing oil water separators, installing a glycol collection system, and installing a Vortechnic stormwater treatment system. Although no set "program" currently exists, these systems have monthly and/or annual inspections and maintenance conducted on them as required.

The airport is currently conducting a stormwater study which includes structure mapping updates and an analytical testing program. Once this study is complete, the airport will utilize the information to identify areas which may require system upgrades to meet compliance standards for stormwater discharge. The Airport has also purchased a vacuum sweeper in the last year, which will be used to perform annual cleanout of storm drain structures. Finally, the airport is in the process of developing O&M policies and procedures specifically to address airport activities. These procedures will be included with the SWPPP and SWMP, and they will effectively address airport employee and tenant activities and serve to improve the overall water quality being discharged from the site.

1) **BMP # 1:** A plan to ensure good housekeeping practices and pollution prevention will be developed, implemented and enforced as part of the SWMP. The plan will be developed and implemented such that it also meets the requirements of the SWPPP as outlined in the MSGP. The SWMP will include the following:

- An operation and maintenance program for preventing or reducing pollutant runoff from operations including the maintenance of buildings, open spaces and storm water systems
- Maintenance schedules and inspection procedures for long term structural BMPs
- Controls for reducing or eliminating the discharge of pollutants from roads, runways, buildings, parking lots, storage areas and maintenance shops
- Procedures for proper disposal of removed waste
- A training component
- A comprehensive storm sewer system Geographic Information Systems (GIS) map of the airport showing locations of all outfalls and names and locations of receiving waters
- For a listing of additional items to be included in the SWMP, refer to Section VI of this narrative

Timeframe: The comprehensive storm sewer system base map is being developed as part of an ongoing BTV project, and will be completed by June 2004. A draft of the plan will be developed as part of the SWMP, and will be provided for ANR review by June 2005. The final plan will be implemented by June 2007. The SWPPP will comply with the appropriate schedule and monitoring requirements outlined in the MSGP.

- Measurable Goals:*
- 1) BTV will develop a draft of the SWMP and submit to ANR for review by June 2005.
 - 2) BTV will implement the SWMP by June 2007.
 - 3) The SWPPP will comply with the appropriate schedule and monitoring requirements outlined in the MSGP.

Person(s) Responsible for BMP: The Burlington International Airport's pollution prevention and good housekeeping plan and each of the associated policies will be implemented and overseen by Heather Kendrew, who is responsible for the overall coordination of the storm water management program at the airport.

Rationale for Selection: Development and implementation of a plan to prevent or reduce pollutants in site runoff and encourage good housekeeping and pollution prevention practices is the most effective way to ensure appropriate protection of waters of the state.

III. Water Quality Controls for Discharges to Impaired Water Bodies

Under Section 3.1.2 of the MS4 General Permit, each MS4 discharging to a 303(d) listed (impaired) water body must control to the maximum extent practicable the discharge of the pollutants of concern to those waters, and be in compliance with all requirements of any applicable Watershed Improvement Permits (WIPs) issued for those waters. BTV has discharges to two such water bodies: Potash Brook (4 outfalls) and Muddy Brook (14 outfalls).

Potash Brook is principally impaired due to collected stormwater runoff. Pollutants of concern include sediment, pathogens, toxics, organic enrichment and temperature. As of the date of submittal of this MS4 NOI, no Watershed Improvement Permit has been issued by ANR for Potash Brook. However, this WIP is forthcoming. Upon its issuance, BTV will comply with all applicable requirements.

Muddy Brook is impaired due to sediment. ANR has stated that BTV will not be named a selected contributor to Muddy Brook. However, BTV activities are, and will continue to be, consistent with minimizing the pollutant of concern (sediment) to the maximum extent practicable. Utilization of BMPs, conformance with applicable State and Federal permits, and development and implementation of the proper stormwater plans will ensure that stormwater discharges to Muddy Brook are controlled. Sediment collection, entrapment and removal will continue to be a primary goal.

IV. Consistency with Total Maximum Daily Load (TMDL) Requirements

Under Section 3.1.3 of the MS4 General Permit, each MS4 must be consistent with applicable recommendations in the implementation section of the Lake Champlain TMDL and any future TMDLs for impaired waters affected by the MS4 established or approved by EPA pursuant to section 303(d) of the federal Clean Water Act. The Lake Champlain Phosphorous TMDL recommendations include: Erosion and Sediment Control at Construction Sites; Better Back Roads; and, Local Municipal Actions (including promotion of riparian buffers and impervious surface minimization.)

A. Erosion and Sediment Control at Construction Sites:

This recommendation in the TMDL is designed to minimize the amount of soil erosion during construction such that minimal amounts of soil move offsite or into waters of the state. BTV activities are consistent with following this recommendation. BTV will comply with conditions of the MS4 General Permit, the Multi Sector General Permit, and the ANR General Permit for Stormwater Runoff from Construction Sites, all of which require substantial consideration for erosion prevention and sediment control.

Goals of all future BTV development will include: fitting the development plan to the site; preserving existing natural drainage ways and vegetation to the maximum extent practicable; minimizing areas of disturbed soils; minimizing the duration of soil disturbance; prevent erosion by managing stormwater runoff; and, installing sediment control measures to prevent sedimentation of receiving waters.

B. Better Back Roads:

This recommendation in the TMDL is designed to prevent sediment and phosphorous due to road erosion from polluting waters of the state. It includes planning that considers the potential and adequacy of infrastructure, upgrade of infrastructure to reduce flash flood susceptibility, and employing good driveway access standards and methods to reduce road length in developments.

Because of the nature of the BTV site, and the fact that it is composed of paved roads, parking areas, runways, buildings and hangars, the "Better Back Roads" TMDL recommendation is not applicable.

C. Local Municipal Actions:

This recommendation in the TMDL is designed to encourage municipalities to develop additional policies and actions to protect riparian buffer zones and reduce the creation of impervious surfaces by new development.

1) **Riparian Buffers:** The TMDL recommends adoption in the zoning bylaws of a minimum setback and buffer requirement on all rivers, streams, lakes and ponds. These buffers are controlled by the municipal zoning committee, and thus the development of new restrictions is not applicable to BTV. However, BTV will comply with any such duly adopted municipal zoning requirements.

2) **Impervious Surface Minimization:** The TMDL recommends alteration or development of zoning codes and development standards which encourage minimization of impervious surfaces and use of open vegetated channels for stormwater runoff. These regulations are controlled by the municipality, and thus the development of new regulations or alteration of existing regulations is not applicable to BTV. However, BTV will comply with any such duly adopted municipal regulations. In addition, it should be noted that a majority of the BTV site is currently conveyed via overland flow and grassed channels, and is infiltrated. Any future development will be concurrent with the goals of maximizing overland flow, maximizing open space and minimizing impervious area to the maximum extent practicable.

V. Source Water Protection requirements

Under Section 4.1.4 of the MS4 General Permit, if applicable, each MS4 must describe the process for consultation with and involvement of public water suppliers with source water protection zones within the MS4.

BTV has four such outfalls discharging to Potash Brook, which is in the headwaters of Shelburne Bay, which is the drinking water watershed for the Champlain Water District (CWD). To meet the requirements of Section 4.1.4, BTV has included and copied CWD on this MS4 NOI. In addition, BTV will notify CWD of future projects that discharge to Potash Brook and any future problems with existing outfalls that discharge to Potash Brook.

VI. Stormwater Management Program (SWMP)

As a permit condition, each MS4 must develop, implement and enforce a Stormwater Management Program (SWMP) designed to reduce the discharge of pollutants from the MS4. The SWMP will promote construction site runoff control, post construction runoff control and pollution prevention and good house keeping. Also included in the SWMP will be the following:

- An operation and maintenance program for preventing or reducing pollutant runoff from operations including the maintenance of buildings, open spaces and storm water systems
- Procedures to identify projects that disturb greater than one (1) acre and report to the Secretary such activities that have one (1) or more acres of impervious surface to assure that all such projects are properly permitted
- Procedures to prevent or minimize water quality impacts from storm water runoff from projects that disturb greater than one (1) acre and have less than one (1) acre of impervious surface by utilizing a combination of structural and non-structural BMPs consistent with the Agency's 2002 Vermont State Stormwater Management Manual
- Procedures to assure that permitted projects are properly constructed and operated and maintained in accordance with the terms of the permit
- Measures for the adoption of an erosion control policy for storm water runoff from construction sites
- Procedures to identify construction activities meeting the one (1) acre and five (5) acre thresholds and report such activities to the Secretary to assure that all such projects are properly permitted in accordance with the ANR General Permit for Stormwater Runoff from Construction Sites (CGP)
- Procedures to assure that construction activities are properly permitted and erosion and sediment control measures during construction are implemented in accordance with the terms of the permit
- Procedures to assist the Secretary of ANR in inspecting permitted projects for obvious signs of non-compliance with the conditions of the permit
- Maintenance schedules and inspection procedures for long term structural BMPs
- Controls for reducing or eliminating the discharge of pollutants from roads, runways, buildings, parking lots, storage areas and maintenance shops
- Procedures for proper disposal of removed waste
- A training component
- A comprehensive storm sewer system Geographic Information Systems (GIS) map of the airport showing locations of all outfalls and names and locations of receiving waters

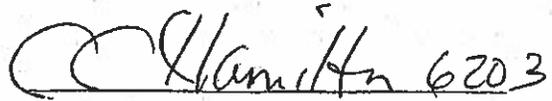
VII. Statement of Intent

It is the objective of the Burlington International Airport as a designated MS4 to comply with the conditions specified under ANR General Permit 3-9014 (NPDES Number VTR040000). It is the intent of the Airport to develop, design, implement and enforce the plans, procedures, programs and measures outlined in this narrative.



6-20-03

Heather Kendrew
Stormwater Management Program Manager
Burlington International Airport



6-20-03

JJ Hamilton
Director of Aviation
Burlington International Airport

Date

CITY OF SOUTH BURLINGTON
APPLICATION FOR CERTIFICATE OF OCCUPANCY/COMPLIANCE

The undersigned herewith requests an inspection of the premises indicated below and issuance of a "Certificate of Occupancy/Compliance", pursuant to Section 27.20 of the South Burlington Zoning Regulations.

Property Owner: CITY OF BURLINGTON

Mailing Address: 1200 AIRPORT DRIVE
SO BURLINGTON, VT

Property Address: VALLEY RD

- The work for which a Certificate of Occupancy/Compliance is being requested was completed on 6/17/03 as authorized under Zoning Permit # LD-02-06 dated 10/28/02.
- Home Occupation Request

[Signature]
Property Owner Signature

6-20-3
Date

Application received on: _____ Application #CO - _____

- Temporary Certificate of Occupancy/Compliance will expire on _____ to provide the applicant time to complete the following improvements:

- Permanent Certificate of Occupancy/Compliance
- Application denied for the following reasons:

Administrative Officer's Signature

Date

3-9010



State of Vermont

6330002
JSC
JTM
BR

Department of Fish and Wildlife
Department of Forests, Parks and Recreation
Department of Environmental Conservation
State Geologist
RELAY SERVICE FOR THE HEARING IMPAIRED
1-800-253-0181 TDD-Voice
1-800-253-0195 Voice-TDD

AGENCY OF NATURAL RESOURCES
Department of Environmental Conservation

WATER QUALITY DIVISION
103 South Main Street
Building 10 North
Waterbury, VT 05671-0408

FAX 802-241-3287
TEL 802-241-3770

June 2, 2003

City of Burlington
Burlington International Airport
J.J. Hamilton
1200 Airport Drive #1
South Burlington, VT 05403

NORTH OUTFALL
AND TANK

Re: Authorization to Discharge Permit No. 3028

Dear Mr. Hamilton,

Enclosed is your copy of an Authorization to Discharge pursuant to General Permit 3-9010 which has been signed by the Director of the Water Quality Division on behalf of the Commissioner of the Department of Environmental Conservation.

This authorizes the discharge of treated stormwater runoff from the Burlington International Airport site located on Airport Drive in South Burlington, Vermont to an Unnamed Tributary to the Winooski River.

Please read this authorization to discharge carefully and note the inspection and reporting requirements, and other operating conditions including payment of annual operating fees.

If you have any questions, please call me at (802) 241-3776.

Sincerely,

Stephanie Lanphear
Stephanie Lanphear
Environmental Technician

Enclosures

CC Peter Keibel, Act 250 District Coordinator
Brent Rakowski, P.E., Dufresne-Henry

VERMONT DEPARTMENT OF ENVIRONMENTAL CONSERVATION
AUTHORIZATION TO DISCHARGE UNDER
GENERAL PERMIT 3-9010

A determination has been made that the applicant, City of Burlington, Burlington International Airport, meets the criteria necessary for inclusion under General Permit 3-9010. Here after the named applicant shall be referred to as the permittee. Subject to the conditions of General Permit No. 3-9010, City of Burlington, Burlington International Airport is authorized to discharge stormwater as described in Notice of Intent No. 3028.

Compliance with General Permit 3-9010 and this Authorization

The permittee shall comply with this authorization and all the terms and conditions of General Permit 3-9010, including the payment of annual operating fees to the Department. A billing statement for such fees will be sent to the permittee each year. The first year's statement is enclosed. Any permit non-compliance, including a failure to pay the annual operating fee, constitutes a violation of 10 V.S.A. Chapter 47 and may be grounds for an enforcement action or revocation of this authorization to discharge.

Transferability

This authorization to discharge is not transferable to any person except in compliance with Part VI.D. of General Permit 3-9010. A copy of General Permit 3-9010 is available from the Department via the internet at <http://www.vtwaterquality.org/Stormwater/GenPermitUnimpairedWaters.pdf>.

Changes to Permitted Development

In accordance with Part V.G. of General Permit 3-9010, the permittee shall notify the Department of any planned development or facility expansions or changes that may result in new or increased stormwater discharges. The Department shall determine the appropriateness of continued inclusion under General Permit 3-9010 by the modified development or facility.

Semi-Annual Inspection and Report

The stormwater collection, treatment and control system authorized herein shall be properly operated and maintained and shall be inspected at least twice per year, once in the spring after snowmelt and one in the fall prior to snow fall. The inspection shall evaluate the operation and maintenance and condition of the stormwater collection, treatment and control system. The permittee shall prepare a semiannual inspection report on a form available from the Department. The permittee shall, by November 1st and June 1st of each year, submit an inspection report to the Department.

Restatement of Compliance

Every 3 years, the permittee shall submit to the Department a written statement signed by a designer that the stormwater collection, treatment and control system authorized herein is properly operating and maintained. The first re-statement of compliance is due in June 2006. Failure to submit a designer's restatement of compliance shall constitute a violation of General Permit 3-9010 and may result in the revocation of this authorization to discharge.

1-1580

Filing of this Authorization with Local Land Records

In accordance with Part V.I.M. of General Permit 3-9010, the permittee shall file a copy of this authorization to discharge in the land records within seven (7) days of its issuance and a copy of the recording shall be provided to the Department within fourteen (14) days of the permittee's receipt of a copy of the recording from the local land records.

Effective Date and Expiration Date of this Authorization

This authorization to discharge shall become effective on June 2, 2003 and shall continue until August 5, 2010. The permittee shall reapply for coverage at least sixty (60) days prior to August 5, 2010.

Dated at Waterbury, VT this 2nd day of June, 2003.

Jeffrey Wennberg, Commissioner
Department of Environmental Conservation

By Wallace McLean
Wallace McLean, Director
Water Quality Division

RECEIVED



State of Vermont

APR 28 2003

DUFRESNE - HENRY
SOUTH BURLINGTON, VT AGENCY OF NATURAL RESOURCES
Department of Environmental Conservation

Department of Fish and Wildlife
Department of Forests, Parks and Recreation
Department of Environmental Conservation
State Geologist
RELAY SERVICE FOR THE HEARING IMPAIRED
1-800-253-0191 TDD>Voice
1-800-253-0195 Voice>TDD

WATER QUALITY DIVISION
103 South Main Street
Building 10 North
Waterbury, VT 05671-0408

FAX 802-241-3287
TEL 802-241-3770

April 23, 2003

Heather Kendrew
Burlington International Airport
1200 Airport Drive, #1
South Burlington, VT 05403

TRAP

Re: Discharge Permit #1-1580.0302

Dear Ms. Kendrew:

Enclosed is your copy of Discharge Permit No. 1-1580.0302 which has been signed by the Director of Water Quality Division on behalf of the Commissioner of the Department of Environmental Conservation.

The permit authorizes the discharge of treated and controlled stormwater runoff from expanded parking facilities at the Burlington International Airport to an unnamed tributary to the Winooski River, and groundwater.

Please read this permit carefully and note the inspection, maintenance, and reporting requirements, and other operating conditions including operating fees.

Since we did not receive any public comments during the notice period, the final permit is unchanged from the draft that was placed on public notice.

If you have any questions, please call me at (802) 241-1453.

Sincerely,

Padraic Monks
Environmental Analyst
Stormwater Section

Enclosures

✓ CC John. T. Myers, III P.E., Dufresne-Henry

STATE OF VERMONT
AGENCY OF NATURAL RESOURCES
DEPARTMENT OF ENVIRONMENTAL CONSERVATION

DISCHARGE PERMIT

STORMWATER RUNOFF INTO DRAINAGE WELLS
and
STORMWATER RUNOFF TO WATERS OF THE STATE

In compliance with provisions of 10 V.S.A. §1263 and §1264 and in accordance with "Terms and Conditions" hereinafter specified,

Burlington International Airport
1200 Airport Drive, #1
South Burlington, VT 05403

the permittee, is hereby granted permission to discharge stormwater runoff from parking lots, roads, and roofs associated with expanded parking facilities at the Burlington International Airport to an unnamed tributary to the Winooski River, and groundwater.

1. Expiration Date: Five years from issuance date of final permit. Note: This permit, unless revoked, modified or suspended, shall be valid until the designated expiration date notwithstanding any intervening change in water quality, effluent, or treatment standards, or classification of the receiving waters including groundwater. However, any such changed standard or classification shall be applied in determining whether or not to renew the permit pursuant to 10 V.S.A. §1263 and §1264.

The permittee shall reapply for a renewed discharge permit ninety days prior to the expiration date.

2. Revocation: 10 V.S.A. §1267 provides as follows:

The Secretary may revoke, modify or suspend this permit if it is found that the permittee submitted false or inaccurate information in its application or has violated any requirement, restrictions, or condition of this permit, or if there is any change in any condition that requires either a temporary or permanent reduction or elimination of the permitted discharge. The Secretary shall impose conditions as the Secretary deems necessary for regulating the discharges of a permittee whose permit has been revoked, modified or suspended. Revocation shall be effective upon actual notice thereof to the permittee.

3. Operating Fees: This discharge is subject to operating fees under 3 V.S.A. §2822. The permittee shall submit the operating fees to the Agency in accordance with procedures provided by the Secretary.
4. Transfer of Permit: This permit is not transferable without prior written approval of the Secretary. Provided all applicable fees under 3 V.S.A. §2822 have been paid, a permittee may transfer this permit by submitting a notice of transfer to the Secretary. The notice shall be submitted at least thirty (30) days prior to the proposed date of transfer. The notice shall state that the prospective permittee has adequate funding to comply with this permit. The permittee shall provide a copy of this permit to the new owner or tenant and inform them of the responsibility to make application for a permit which shall be issued in their name. Any failure to do so shall be considered a violation of this permit.
5. Right of Entry: The permittee shall allow the Secretary, or his or her authorized representatives, at reasonable times, upon presentation of credentials, to enter upon and inspect the permitted premises and the stormwater collection, treatment and control system and to sample any discharge to determine compliance with this permit and to have access to and inspect and copy any records required to be kept pursuant to this permit.
6. Receiving Waters: Unnamed tributary to the Winooski River, and groundwater.
7. Manner of Discharge:
S/N 001: Stormwater runoff from impervious surfaces associated with the deck of the new garage, rental car lot, long-term lot, loop road extension, garage exit ramps, and rental lot, via area drains, catch basins, grass swale and closed system to an unnamed tributary to the Winooski River.

S/N 002: Stormwater runoff from impervious surfaces associated with the employee and long-term parking lots (Catchment #2) via catch basins to a closed system to an exfiltrating sand filter to groundwater.
8. Wastes Permitted: Stormwater runoff from S/N 001 and S/N 002 after treatment from a grass swale and sand filter.
9. Volumes Permitted and Frequency of Discharge: Such volumes and frequency as required by the discharge specified in #7 above.
10. Approved Project Design: This project shall be constructed and operated in accordance with the following site plans and details prepared by Dufresne-Henry, Inc.:
Sheets SG.1 through SG.5, dated 10/25/02; Sheets UP.1 through UP.5, dated 10/23/02;
SWM.1 through SWM.3, dated 1/2/03.

By reference, the above noted plans are made a part of this permit.
11. ~~Maintenance and Maintenance Reporting Requirements~~
 - a. The basins, swales, and related stormwater collection, treatment and control system shall be maintained in good operating condition at all times and shall be inspected

semi-annually and cleaned as necessary to maintain design specifications. The inspections shall include one in the spring after snowmelt, and one in the fall prior to snow fall.

- b. Any sediment removed from the swales or basins shall be disposed of properly in accordance with state and federal statutes and regulations.
- c. ~~By September 30 of each year the permittee shall submit a written report to the~~ Department of Environmental Conservation, Water Quality Division, Building 10 North, 103 South Main Street, Waterbury, Vermont 05671-0408. This report shall include, at a minimum:
- i. the dates and details of any cleaning and maintenance operations carried out in the preceding year;
 - ii. a narrative summarizing the results of any inspections conducted in the preceding year and highlighting any stormwater related problems encountered, and all remedial steps taken in response;
- d. Should any erosional problems occur, the permittee is required to immediately correct any such problems.
- e. Any basins, swales, or related stormwater devices used during construction for erosion control shall be inspected and cleaned to design specifications immediately after construction has been completed.
12. Personnel and Training Requirements: Such personnel and training as necessary to fulfill the requirements of #11 above.
13. Monitoring and Reporting Requirement: No monitoring required; reporting requirement as specified in #11 above.
14. Other Requirements:
- a. Treated stormwater runoff is the only waste authorized for disposal under the terms and conditions of this permit. The discharge of any hazardous materials or hazardous waste into the stormwater management system is prohibited.
 - b. The issuance of this permit does not relieve the permittee from obtaining authorization to discharge stormwater runoff from the construction site pursuant to 40 CFR 122.26, if applicable.
 - c. **By September 15, 2003, the permittee shall submit to the Water Quality Division of DEC for approval, a plan which ensures that any use of a chemical deicing agent or agents, including but not limited to any urea and glycol based products, shall not result in any violation of the Vermont Water Quality Standards.**

15. Adverse Impact: These discharges shall not cause or contribute to conditions that would have an undue adverse effect on the composition of the aquatic biota, the physical or chemical nature of the substrate, species composition, or the propagation of fishes. If information is obtained during the term of this permit which indicates that the discharges authorized by this permit cause or contribute to violations of the Water Quality Standards, then this permit may be amended to require implementation of additional stormwater treatment and control measures.

16. Dated at Waterbury, VT this 23rd day of April, 2003

Jeffrey Wennberg, Commissioner
Department of Environmental Conservation

By Wallace McLean
Wallace McLean, Director
Water Quality Division

TRANSFER APPLICATION

I, _____, hereby apply for permission to discharge waste into the waters of the State of Vermont under the provisions of Discharge Permit No. 1-1580.0302 previously issued to Burlington International Airport

Signed: _____

Address: _____

Telephone: _____

1-1391

STATE OF VERMONT
AGENCY OF NATURAL RESOURCES
DEPARTMENT OF ENVIRONMENTAL CONSERVATION

DISCHARGE PERMIT
STORMWATER RUNOFF INTO DRAINAGE WELLS

In compliance with provisions of 10 V.S.A. 1263

Burlington International Airport
1200 Airport Drive #1
South Burlington, VT 05403

and in accordance with "Terms and Conditions" hereinafter specified, the above named permittee is hereby granted permission to discharge stormwater runoff from the taxiways and ramp from the Burlington International Airport 'South Apron Expansion', South Burlington, VT to groundwater via a stormwater drainage well.

1. Expiration Date: September 30, 2004. Note: This permit, unless revoked, shall be valid until the designated expiration date despite any intervening change in water quality, effluent, or treatment standards of the classification of the receiving waters, including groundwater. However, any such changed standard or classification shall be applied in determining whether or not to renew the permit pursuant to 10 V.S.A. 1263.

Re-apply for a discharge permit by March 31, 2004.

2. Revocation: 10 V.S.A. 1267 provides as follows:

"The Secretary may revoke any permit issued by him pursuant to this subchapter if he finds that the permit holder submitted false or inaccurate information in his application or has violated any requirement, restriction, or condition of the permit issued. Revocation shall be effective upon actual notice thereof to the permit holder."

3. Transfer of Permit: This permit is not transferable without prior written approval of the Secretary. The permittee shall notify the Secretary immediately, in writing, of any sale, lease, or other transfer of ownership of the property from which the discharge originates. The permittee shall provide a copy of this permit to the new owner or tenant and shall inform the new owner or tenant of his responsibility to make application for a permit which shall be issued in his name. Any failure to do so shall be considered a violation of this permit.
4. Right of Entry : The permittee shall allow the Secretary or their authorized representative, upon presentation of credentials, to enter the permittee's premises where the effluent sources authorized by this permit are located and at reasonable times to have access to copy any records required to be kept under the terms and conditions of this permit, and to inspect any treatment device, monitoring equipment, or monitoring method required in this permit, and to sample any discharge of pollutants.

5. Receiving Waters: Groundwater.
 6. Manner of Discharge:
S/N 001 (infiltration basin trench): Stormwater from the South Apron expansion (ramp and taxiways) collected in catch basins and piped to a 'Vortechs' treatment unit, then discharging to an infiltration trench system which in turn infiltrates into the groundwater.
 7. Wastes Permitted:
Stormwater runoff from the taxiways and ramp after treatment via 'Vortechs' treatment unit.
 8. Volumes Permitted and Frequency of Discharge: Such volumes and frequency as required by the discharges specified in No. 6 above
 9. Approved Project Design: Treatment as specified in No.7 above. The project shall be constructed and operated in accordance with the Edwards and Kelcey, Inc plans specified below, and supporting information:

Sheet 13, 18, and 19 of 34, dated 8/18/99

By reference the above noted plans are made a part of this permit.
 10. Maintenance and Maintenance Reporting Requirements:
 - a. The permittee shall inspect the Vortechs unit and measure the accumulated sediment volume in the aluminum grit chamber quarterly.
 - b. The permittee shall remove the accumulated sediment and clean the Vortechs unit when the sediment depth has accumulated to within 6 inches of the dry-weather water level.
 - i. The permittee shall strictly follow the maintenance procedures prescribed by the manufacturer when removing sediment.
 - c. Any sediment removed from the swales, or sedimentation basin shall be disposed of properly and not within 100 feet of Waters of the State.
 - d. By **SEPTEMBER 30 OF EACH YEAR** a written report shall be submitted to the Department of Environmental Conservation, 103 South Main Street, Waterbury, VT 05671-0405. This report shall include, as a minimum:
 - i. the dates of inspection and sediment depth measurements for the year.
 - ii. the dates of sediment removal and an estimate of the volume removed.
 - f. Any stormwater devices used during construction for erosion control shall be inspected and cleaned to design specifications immediately after construction has been completed.
 11. Personnel and Training Requirements: Such personnel and training as necessary to fulfill the requirements of #10 above.
-

12. Monitoring and Reporting Requirement:

a. *By no later than September 30, 2001*, the permittee shall submit a study to the Department documenting the efficiency of the 'Vortechs' unit. This study shall investigate the removal efficiency of the 'Vortechs' unit for total suspended solids (TSS) and total petroleum hydrocarbons (TPH) and shall include the following:

i. a minimum of six storm events shall be sampled.

ii. the study shall follow the same protocol as used in the Delorme Publishing Company, Yarmouth, ME. field study.

iii. sediment depth, system maintenance activities, etc. shall also be noted in the report and considered.

iv. the study shall be conducted by an independent entity other than the manufacturer of the treatment unit.

b. Other reporting required as specified in #10 above.

13. Other Requirements:

a. Treated stormwater runoff is the only waste authorized for disposal under the terms and conditions of this permit. The discharge for any hazardous materials or hazardous waste into the stormwater management system is prohibited.

b. The permittee shall contact the Agency of Natural Resources, Wastewater Management Division, within 24 hours or the next business day if a spill occurs and materials enter the stormwater collection system.

14. Issue Date of Permit:

December 9, 1999

AGENCY OF NATURAL RESOURCES
Canute E. Dalmasse, Commissioner
Department of Environmental Conservation

By

Marilyn J. Davis
Marilyn J. Davis, Director
Wastewater Management Division

1-1270

STATE OF VERMONT
AGENCY OF NATURAL RESOURCES
DEPARTMENT OF ENVIRONMENTAL CONSERVATION

DISCHARGE PERMIT

In compliance with provisions of 10 V.S.A. 1263 and 10 V.S.A. 1264 and in accordance with "Terms and Conditions" hereinafter specified.

City of Burlington
Burlington International Airport
1200 Airport Drive #1
South Burlington, VT 05403

The above named permittee is hereby granted permission to discharge stormwater runoff from the Pratt and Whitney building on Army Guard Road at the Burlington International Airport, South Burlington, Vermont to an unnamed tributary of Potash Brook.

1. Expiration Date: September 30, 2001. Note: This permit, unless revoked, shall be valid until the designated expiration date despite any intervening change in water quality, effluent, or treatment standards or the classification of the receiving waters. However, any such changed standard or classification shall be applied in determining whether or not to renew the permit pursuant to 10 V.S.A. 1263.

Reapply for a discharge permit by March 31, 2001.

2. Revocation: 10 V.S.A. 1267 provides as follows:

"The Secretary may revoke any permit issued by him pursuant to this subchapter if he finds that the permit holder submitted false or inaccurate information in his application or has violated any requirement, restriction, or condition of the permit issued. Revocation shall be effective upon actual notice thereof to the permit holder."

3. Transfer of Permit: This permit is not transferable without prior written approval of the Secretary. The permittee shall notify the Secretary immediately, in writing, of any sale, lease, or other transfer of ownership of the property from which the discharge originates. The permittee shall provide a copy of this permit to the new owner or tenant and inform him of the responsibility to make application for a permit which shall be issued in his name. Any failure to do so shall be considered a violation of this permit.

4. Right of Entry: The permittee shall allow the Secretary, and other Agency personnel, upon presentation of proper credentials, to enter the permittee's premises where the effluent sources authorized by this permit are located, and at reasonable times to have access to and copy any records required to be kept under the terms and conditions of this permit, to inspect any collection or treatment device, and to sample any discharge of pollutants.
5. Receiving Waters: Unnamed tributary to Potash Brook
6. Manner of Discharge:
 - S/N 001: Stormwater from the building and parking area is conveyed via grassed swales to a collection system where it discharges to a wetland and unnamed tributary of Potash Brook.
 - S/N 002: Stormwater from the access road is conveyed via overland flow to a wetland and unnamed tributary of Potash Brook.
7. Wastes Permitted: S/N 001 and S/N 002: Stormwater runoff from the building, parking area and access road after treatment by grassed swales and overland flow that discharges to a wetland and unnamed tributary of Potash Brook.
8. Volumes Permitted: Such volumes as required by the discharge specified in #6 above.
9. Frequency of Discharge: As necessary
10. Approved Project Design: This project shall be constructed and operated in accordance with the Webster-Martin, Inc., site plans and details (Sheets SP-1 and 2, dated July 1996 and supporting information).

By reference, the above noted plans are made a part of this permit.

11. Maintenance and Maintenance Reporting Requirements:

All stormwater conveyance and treatment devices including stormwater ponds, grass and stone lined swales, and vegetated buffer strips shall be properly maintained. Stormwater management devices shall be inspected at least semiannually and shall be cleaned and maintained as necessary. Any instances of erosion shall be corrected promptly.

No later than September 30 of each year the permittee shall submit a written report to the Department of Environmental Conservation, Wastewater Management Division, 103 South Main Street, Waterbury, Vermont 05671-0405, summarizing the condition of stormwater management devices at the site and the nature and dates of all cleaning and maintenance operations carried out in the past year.

12. Miscellaneous Requirements:

Within 30 days following completion of project construction, the permittee shall provide written notification to the Department of Environmental Conservation verifying that construction has been performed in accordance with the approved plans, and that all disturbed areas of the site have been properly stabilized.

13. Issue Date of Permit:

December 19, 1996

William C. Brierley, Commissioner
Department of Environmental Conservation

By Roger Thompson for
Marilyn J. Davis, Director
Wastewater Management Division

Prepared and Reviewed by: Carol Carpenter
Carol S. Carpenter

TRANSFER APPLICATION

I, _____, hereby apply for permission to discharge waste into the waters of the State of Vermont under the provisions of Discharge Permit No. 1-1270 previously issued to the City of Burlington.

Signed: _____

Address: _____

Telephone: _____

1-0839

STATE OF VERMONT
AGENCY OF NATURAL RESOURCES
DEPARTMENT OF ENVIRONMENTAL CONSERVATION

Page 1 of 3

DISCHARGE PERMIT

File No. 04-14-052

Permit No. 1-0839

In compliance with provisions of 10 V.S.A. 1263

Burlington International Airport
Box 1 - Airport Drive
Burlington, Vermont 05401

and in accordance with "Terms and Conditions" hereinafter specified, the above named permittee is hereby granted permission to discharge stormwater runoff from the Burlington International Airport to an unnamed tributary of the Winooski River and an unnamed tributary of Potash Brook.

1. Expiration Date: March 31, 1995. Note: This permit, unless revoked, shall be valid until the designated expiration date despite any intervening change in water quality, effluent, or treatment standards or the classification of the receiving waters. However, any such changed standard or classification shall be applied in determining whether or not to renew the permit pursuant to 10 V.S.A. 1263.

Reapply for a discharge permit by September 30, 1994.

2. Revocation: 10 V.S.A. 1267 provides as follows:

"The Secretary may revoke any permit issued by him pursuant to this subchapter if he finds that the permit holder submitted false or inaccurate information in his application or has violated any requirement, restriction, or condition of the permit issued. Revocation shall be effective upon actual notice thereof to the permit holder."

3. Transfer of Permit: This permit is not transferable without prior written approval of the Secretary. The permittee shall notify the Secretary immediately, in writing, of any sale, lease, or other transfer of ownership of the property from which the discharge originates. The permittee shall also inform the new owner or tenant of his responsibility to make application for a permit which shall be issued in his name. Any failure to do so shall be considered a violation of this permit.

4. Receiving Waters:

- S/N 001 - Unnamed tributary of the Winooski River.
- S/N 002 - Unnamed tributary of Potash Brook.
- S/N 003 - Unnamed tributary of Potash Brook.

5. Manner of Discharge:

S/N 001 - Via a network of catch basins and storm drains, through a rip-rapped outlet, prior to discharge to an unnamed tributary of the Winooski River. The drainage network includes grass-lined swales, a trench drain on the terminal apron, some leaching catch basins, an oil/water separator, and a section of perforated storm drain pipe.

S/N 002 - Via overland flow across vegetated terrain to a network of catch basins, through perforated storm drains, including a series of lateral exfiltrating underdrains, to a rip-rapped outlet, prior to discharge to an unnamed wetland, which discharges to a tributary of Potash Brook.

S/N 003 - Via overland flow across vegetated terrain to a network of catch basins, through perforated storm drains to a rip-rapped outlet, prior to discharge to an unnamed tributary of Potash Brook.

6. Wastes Permitted:

S/N 001 - Stormwater runoff from roofs, the airport terminal apron, paved runways, taxiways, roads and parking areas, following treatment by overland flow across vegetated terrain, in grass-lined drainage swales, and in an oil/water separator.

S/N 002 - Stormwater runoff from the southern section of taxiway A, following treatment by overland flow across vegetated terrain.

S/N 003 - Stormwater runoff from taxiway G3, following treatment by overland flow across vegetated terrain.

Note: Discharge point S/N 001 incorporates stormwater discharges from areas previously permitted by Amended Temporary Pollution Permit #2-0188.

7. Volumes Permitted: Such volumes as required by the discharge specified in #5 above.

8. Frequency of Discharge: Daily

9. Operation and Treatment: Treatment as specified in #6 above. For details on the treatment and conveyance of stormwater runoff for this project see the following plans and details:
- Hoyle, Tanner and Associates (1983)
 - Wiemann-Lamphere, Architects (September 1985)
 - Hoyle, Tanner and Associates (August 1986)
 - Hoyle, Tanner and Associates (February 1989)
 - Hoyle, Tanner and Associates (January and March 1990)
10. Maintenance and Maintenance Reporting Requirements: All catch basins, grass-lined swales, sedimentation ponds, and other treatment and conveyance devices shall be maintained in good operating order at all times and shall be inspected at least quarterly and cleaned at such times as necessary to maintain design performance levels. NO LATER THAN JANUARY 31 OF EACH YEAR A WRITTEN REPORT SHALL BE SUBMITTED TO THE DEPARTMENT OF ENVIRONMENTAL CONSERVATION, NPDES PERMIT SECTION, 103 SOUTH MAIN STREET, WATERBURY, VERMONT 05676, PROVIDING THE DATES AND NATURE OF CLEANING OPERATIONS CARRIED OUT IN THE PRECEDING YEAR.
11. Personnel and Training Requirements: Such personnel and training as necessary to fulfill the requirements of #10 above.
12. Monitoring and Reporting Requirements: No monitoring required; reporting requirement as specified in #10 above.
13. Miscellaneous Requirements: Not applicable
14. Issue Date of Permit: 11 JUN 1990

Timothy J. Burke, Commissioner
Department of Environmental Conservation

By Gary Schultz
Gary Schultz, Director
Permits, Compliance & Protection

Todd Steinhilber
Prepared and Reviewed by

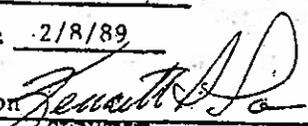
STATE OF VERMONT
AGENCY OF ENVIRONMENTAL CONSERVATION
DEPARTMENT OF WATER RESOURCES
PERMITS AND COMPLIANCE DIVISION

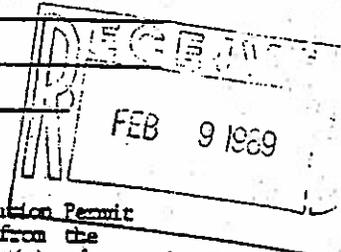
1-0839

S/n 1

APPLICATION FOR PERMIT TO DISCHARGE WASTES

Chapter 47 of Title 10 V.S.A.

1. Applicant Burlington Int'l Airport Legal Entity Airport
2. Mailing Address Box 1 - Airport Drive
Burlington, Vermont 04501
3. Contact Gerald W. D'Amico Telephone 802-863-2874
4. Name of Activity Burlington Int'l A/P Location So. Burlington, Vermont
5. Type of Activity Airport
6. Nature of Wastes: Sanitary Industrial Commercial Drainage Other
(Describe) _____
7. Receiving Water Winooski River
8. Status of Discharge Proposed Existing (Permit No. _____)
9. The applicant hereby applies for a
 Discharge Permit Indirect Discharge Permit
 Temporary Pollution Permit Emergency Pollution Permit
 Pretreatment Discharge Permit Pretreatment Temporary Pollution Permit
to discharge wastes, directly or indirectly, into water of the State from the
above named activity as described in this application, its attached schedule(s), plans and
specifications.
10. Application is for Original Permit Permit Renewal If this is for a permit
renewal, is original application still valid in all respects _____? If not, attached
schedule(s) for major changes. Minor changes may be documented by letter.
11. Enter below, using a separate serial number (S/N), to identify each independent discharge
which will result from the activity described in Item 4. Attached separate schedule for
each discharge identified below.
S/N 001 Winooski River 004 _____
002 _____ 005 _____
003 _____ 006 _____
12. Application Fee Enclosed \$ 35.00 Date of application 2/8/89
13. Kenneth Potts Director of Aviation 
AUTHORIZED REPRESENTATIVE (PRINT) TITLE SIGNATURE



INSTRUCTIONS

1. Applicant (name) and legal entity (individual, corporation, partnership, firm, state agency, municipality, etc.)
3. Contact Person to contact regarding this application.
4. Name of activity (John Doe residence, XYZ Corp., Clear Lake State Park, Green Motel, etc.)
5. Type of Activity (single family residence, paper mill, state park, motel, etc.)
6. Nature of Wastes: Sanitary (Domestic sewage only), Industrial/Commercial/Industrial (process wastes, cooling water rinse water, laboratory wastes, etc.) Drainage (stormwater, roof drains pond overflows, foundation drains, return flows, etc.)
7. Receiving waters For unnamed streams, so state and give named tributary. For discharges to "wells" (Vermont Water Pollution Control Permit Regulation 13.1(j)), enter "groundwater" and give name and distance to nearest surface water.
8. Complete as appropriate; provide permit number, if any, for existing discharge.
11. Identify and describe each separate discharge point to waters of the State.
12. Submit application fee in accord with fee schedule.

STATE OF VERMONT
AGENCY OF ENVIRONMENTAL CONSERVATION
DEPARTMENT OF WATER RESOURCES

D

APPLICATION FOR PERMIT TO DISCHARGE WASTES

SCHEDULE D - DRAINAGE DISCHARGES

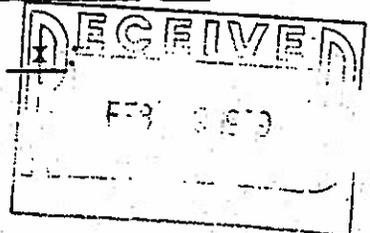
Date 2/8/89

- D-1 Applicant Burlington Int'l Airport Activity Airport
D-2 Discharge S/N 001 Designation _____
D-3 Exact location on receiving water (describe and locate on map) _____
Winooski River
D-4 How are wastes conveyed to receiving water? Via pipe and catch
basin
D-5 Type of Discharge:

STORMWATER RUNOFF

Sources (in acres): Paved Roads 43 A. Unpaved Roads _____ A.
Paved Parking Lots _____ A. Unpaved Parking Lots _____ A. Roofs _____ A.
Natural Terrain 127 A. Other (specify) _____ A. Total 170 A.
Pre-Development Peak Flow 23 CFS Post-Development Peak Flow 35 CFS
Receiving Stream Watershed Area (sq. miles) above discharge point 0.3 sq. mi.
Ratio of Stream Watershed Area (sq. miles) to Area of Road and Parking Lots (acres): 0.3 to 43

Proposed Treatment (check all that apply): Grass or Stone-lined Swales _____
Overland Flow Across Vegetated Terrain _____ Catch Basins X
Retention Pond (attach design details) _____
Sedimentation Basin (attach design details) _____
Other (specify and attach design details) _____



GROUNDWATER AND RETURN FLOWS

Source (check which applies): Foundation Drain _____ Curtain Drain _____ Spring _____
Well _____ Mine _____ Quarry _____ Pond _____ Water Wheel or Turbine _____
Filter Backwash _____ Other (specify) _____
Discharge: Estimated Discharge _____ CFS Frequency _____
Duration _____ Pumping required? _____
Contaminants present (specify) _____
Proposed Treatment: _____

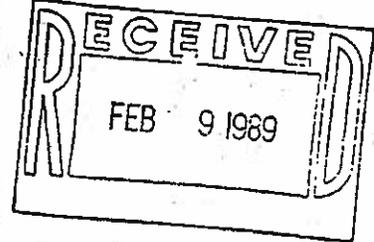
D-6 Additional Information: _____



BURLINGTON INTERNATIONAL AIRPORT

HTA Koren Fink 603-669-5555

February 9, 1989



Mr. Todd Sternbach
Agency of Environmental Conservation
Department of Water Resources
Permits and Compliance Section
West Office Building
103 South Main Street
Waterbury, Vermont 05676

Regarding: Stormwater Discharge Permit
Drainage Improvements and Oil-Water Separator
Burlington International Airport

Dear Mr. Sternbach:

Enclosed is the application package for a stormwater discharge permit for Burlington International Airport. This project will consist of improvements to the existing stormwater drainage system at the airport. We are proposing to reroute a portion of the airfield drainage that currently outlets to an unnamed tributary of the Winooski River. An additional drainage line will be installed prior to the existing outlet to connect the existing line to another existing drainage line south of Airport Parkway and north of Runway 15. This entire system will then outlet to a swale north of Airport Parkway. The swale extends to the Winooski River, as shown on the attached copy of a USGS quadrangle map.

In addition, we are proposing to install an oil-water separator on the existing drainage line near the aircraft parking apron. The system is housed in an underground concrete structure. Stormwater runoff influent enters the structure and passes through the separator plates, where oil droplets coalesce and rise to the surface of the liquid in the structure. At the surface, the oil is trapped by an oil dam and is removed from the separator compartment by a continuously operating oil skimmer/decanter unit. The oil then flows by gravity from the decanter to the product recovery tank. A copy of the plans and specifications for the oil-water separator are also enclosed for your review.

If you have any questions, or require further information, please contact me.

Sincerely,

[Handwritten signature of Kenneth Potts]

Kenneth Potts, A.A.E.
Director of Aviation



STATE OF VERMONT
AGENCY OF ENVIRONMENTAL CONSERVATION
DEPARTMENT OF WATER RESOURCES
PERMITS AND COMPLIANCE DIVISION

1-0837
S/N 2,3

APPLICATION FOR PERMIT TO DISCHARGE WASTES -2

Chapter 47 of Title 10 V.S.A.

1. Applicant Burlington Intl Airport Legal Entity Airport
2. Mailing Address 1200 Airport Drive Box 1
South Burlington, VT 05401
3. Contact John J. Hamilton Telephone (802) 863-2874
4. Name of Activity Airport Location South Burlington
5. Type of Activity Airport
6. Nature of Wastes: Sanitary Industrial Commercial Drainage Other
(Describe) Stormwater Discharge
7. Receiving Water Unnamed Tributary to Potash Brook
8. Status of Discharge Proposed Existing (Permit No. None)
9. The applicant hereby applies for a
 Discharge Permit Indirect Discharge Permit
 Temporary Pollution Permit Emergency Pollution Permit
 Pretreatment Discharge Permit Pretreatment Temporary Pollution Permit
to discharge wastes, directly or indirectly, into water of the State from the
above named activity as described in this application, its attached schedule(s), plans and
specifications.
10. Application is for Original Permit Permit Renewal If this is for a permit
renewal, is original application still valid in all respects ? If not, attached
schedule(s) for major changes. Minor changes may be documented by letter.
11. Enter below, using a separate serial number (S/N), to identify each independent discharge
which will result from the activity described in Item 4. Attached separate schedule for
each discharge identified below.
S/N 001 Taxiway 'A' South 004
002 Taxiway 'G3' 005
003 _____ 006
12. Application Fee Enclosed \$ 35.00 . Date of application: 1/17/90
13. John J. Hamilton, Director of Aviation John J. Hamilton
AUTHORIZED REPRESENTATIVE (PRINT) TITLE SIGNATURE

INSTRUCTIONS

1. Applicant (name) and legal entity (individual, corporation, partnership, firm, state agency, municipality, etc.)
3. Contact Person to contact regarding this application.
4. Name of activity (John Doe residence, XYZ Corp., Clear Lake State Park, Green Motel, etc.)
5. Type of Activity (single family residence, paper mill, state park, motel, etc.)
6. Nature of Wastes: Sanitary (Domestic sewage only), Industrial/Commercial/Industrial (process wastes, cooling water rinse water, laboratory wastes, etc.) Drainage (stormwater, roof drains pond overflows, foundation drains, return flows, etc.)
7. Receiving waters For unnamed streams, so state and give named tributary. For discharges to "wells" (Vermont Water Pollution Control Permit Regulation 13.1(j)), enter "groundwater" and give name and distance to nearest surface water.
8. Complete as appropriate; provide permit number, if any, for existing discharge.
11. Identify and describe each separate discharge point to waters of the State.
12. Submit application fee in accord with fee schedule.

FEE SCHEDULE

Note: No application fee necessary for Emergency Pollution Permits.

Nature of Discharge	Discharge Permit	Indirect Discharge Permit	Temporary Pollution Permit	Pretreatment Permit	Temporary Pretreatment Permit
Drainage <u>only</u>	\$10	--	\$20	--	--
Sanitary <u>only</u> less than 1000 GPD	\$10	--	\$20	--	--
Sanitary <u>only</u> greater than 6,500 gpd	--	\$50	--	--	--
All others	\$50	--	\$100	\$50	\$100

13. Signature Application must be signed by the applicant or an officer in applicant's business, a municipal official, etc. Application can not be signed by applicant's attorney, engineer, contractor, etc.

ATTACH APPROPRIATE SCHEDULE(S), APPLICATION FEE, PLANS, SPECIFICATIONS AND OTHER MATERIAL AS APPROPRIATE. APPLICANT FOR TEMPORARY POLLUTION PERMITS OR TEMPORARY PRETREATMENT PERMITS MUST COMPLETE SCHEDULE T (WR-82T) IN ADDITION TO OTHER NECESSARY SCHEDULE(S).

Send application to and for further information call or write:

Agency of Environmental Conservation
 Department of Water Resources
 Permits and Compliance Section
 West Office Building
 103 South Main Street
 Waterbury, Vermont 05676
 244-5674

The following application forms and material will be supplied to applicants for the following permit applications.

- (1) Discharge Permits and Pretreatment Discharge Permits
 - (a) Application (WR-82)
 - (b) Appropriate Schedule (A, B, C or D)
- (2) Indirect Discharge Permits
 - (a) Application (WR-82)
 - (b) Schedule I (WR-82I)
- (3) Temporary Pollution Permits and Pretreatment Temporary Pollution Permits
 - (a) Application (WR-82)
 - (b) Schedule T (WR-82T)
 - (c) Other appropriate schedule (A, B, C or D)
- (4) Emergency Pollution Permit
 - (a) Application (WR-82)
 - (b) Schedule E
- (5) Permit Renewals
 All include Application Form WR-82 and may need other schedules.

NOTES: (1) At this time all applications for stormwater discharge are for Temporary Pollution Permits.

(2) Applications for Industrial/Commercial/Institutional discharges (Schedule B) will be provided a copy of E.P.A.'s list of priority pollutants.

* * * * *

Application Form	Number	Type of Discharge
Application	WR-82	All Discharges
Schedule A	WR-82A	Municipal Treatment Plants
Schedule B	WR-82B	Industrial/Commercial/Institutional
Schedule C	WR-82C	Individual & Commercial (Sanitary only)
Schedule D	WR-82D	Drainage (Including stormwater)
Schedule E	WR-82E	Emergency Pollution Permit
Schedule I	WR-82I	Indirect Discharge
Schedule T	WR-82T	All Temporary Pollution Permits & Pretreatment Temporary Pollution Permits

STATE OF VERMONT
AGENCY OF ENVIRONMENTAL CONSERVATION
DEPARTMENT OF WATER RESOURCES

D APPLICATION FOR PERMIT TO DISCHARGE WASTES

SCHEDULE D - DRAINAGE DISCHARGES Date 1/17/90

- D-1 Applicant Burlington Int'l Airport Activity Airport
- D-2 Discharge S/N 001 Designation Taxiway 'A' South
- D-3 Exact location on receiving water (describe and locate on map) North of Williston Rd (Rt. 2) adjacent to Airport.
- D-4 How are wastes conveyed to receiving water? Via exfiltrating catch basins and pipes plus grassed swales
- D-5 Type of Discharge:

STORMWATER RUNOFF

Sources (in acres): Paved Roads 28.80 A. Unpaved Roads _____ A.
Paved Parking Lots _____ A. Unpaved Parking Lots _____ A. Roofs _____ A.
Natural Terrain 44.70 A. Other (specify) _____ A. Total 73.5 A.
Pre-Development Peak Flow 40.20 CFS Post-Development Peak Flow 53.07 CFS
Receiving Stream Watershed Area (sq. miles) above discharge point 0.11 sq. mi.
Ratio of Stream Watershed Area (sq. miles) to Area of Road and Parking Lots (acres): 0.004

Proposed Treatment (check all that apply): Grass or Stone-lined Swales X ;
Overland Flow Across Vegetated Terrain _____, Catch Basins X .
Retention Pond (attach design details) _____.
Sedimentation Basin (attach design details) _____.
Other (specify and attach design details) Exfiltration into surrounding sandy soil

GROUNDEWATER AND RETURN FLOWS

Source (check which applies): Foundation Drain _____ Curtain Drain _____ Spring _____
Well _____ Mine _____ Quarry _____ Pond _____ Water Wheel or Turbine _____
Filter Backwash _____ Other (specify) _____.
Discharge: Estimated Discharge _____ CFS Frequency _____.
Duration _____, Pumping required? _____.
Contaminants present (specify) _____.
Proposed Treatment: _____.

D-6 Additional Information: _____

INSTRUCTIONS

The following supporting documents are required as part of the complete application: Location map, site, drainage, and erosion control plans and detailed drawings of all treatment devices. Incomplete applications will be returned to the applicant.

- D-1 Applicant Same as Item 1 on Application (WR-82)
- Activity Same as Item 4 on Application (WR-82)
- D-2 Discharge Same as Item 11 on Application (WR-82). Complete a separate Schedule D (WR-82D) for each drainage discharge identified in Item 11.
- D-3 Location
1. Name receiving water and describe with reference to a known landmark, e.g. 1000' upstream of RR bridge in village, 550' above mouth, etc., or give geographical coordinates (latitude and longitude).
 2. Also identify each discharge point by serial number, e.g. S/X 001, 002, 003, etc. on U.S.G.S. topographical map and on site plan.
- D-4 Conveyance Describe routing of discharges to surface waters of the State, e.g. through grass-lined swales, culverts, prior to discharge to the receiving stream.
- D-5 Type of Discharge Complete appropriate section(s)

Instructions for Stormwater Runoff Only:

Peak Flows - Calculate peak flows using the Soil Conservation Service Technical Release No. 55 or No. 20. Use a 10 year - 24 hour storm event as the design storm. Attach all calculations including runoff curve numbers for each discharge point.

Watershed Area

1) Single or multiple discharges to the same receiving water - Determine the watershed area (sq. miles) above the most upstream discharge point. Calculate the ratio of watershed area (sq. miles) to the total area of roads and parking lots (acres) draining to the receiving water.

2) Discharges to more than one receiving water - Determine the watershed area (sq. miles) above the most upstream discharge point for each receiving water. Calculate the ratio of watershed area (sq. miles) to the total area of roads and parking lots (acres) draining to each receiving water.

Proposed Treatment - Treatment of stormwater runoff must occur both on site and prior to discharge to surface waters of the State. All projects must utilize infiltration into soil to the extent feasible to dispose of stormwater runoff as per the Vermont Water Quality Standards revised January 7, 1985. Where necessary detention pond design should be based upon a 10 year - 24 hour storm event. A minimum requirement for sedimentation basin design is 145 square feet/cfs of outflow; the 2 year, - 24 hour storm is recommended for this design.

- D-6 Additional Complete as needed.

For further information call (802/244-5674) or write:

Department of Water Resources
Permits and Compliance Section
103 South Main Street
West Office Building
Waterbury, Vermont 05676

STATE OF VERMONT
AGENCY OF ENVIRONMENTAL CONSERVATION
DEPARTMENT OF WATER RESOURCES

-2

D

APPLICATION FOR PERMIT TO DISCHARGE WASTES

SCHEDULE D - DRAINAGE DISCHARGES

Date 1/17/90

- D-1 Applicant Burlington Int'l Airport Activity Airport
D-2 Discharge S/N 002 Designation Taxiway 'G3'
D-3 Exact location on receiving water (describe and locate on map) North of Williston Rd. (Rt. 2) adjacent to airport
D-4 How are wastes conveyed to receiving water? Via exfiltration catch basins and pipes plus grassed swales
D-5 Type of Discharge:

STORMWATER RUNOFF

Sources (in acres): Paved Roads 29.53A Unpaved Roads _____ A.
Paved Parking Lots _____ A. Unpaved Parking Lots _____ A. Roofs _____ A.
Natural Terrain 116.29A Other (specify) _____ A. Total _____ A.
Pre-Development Peak Flow 50.31 CFS Post-Development Peak Flow 51.40 CFS
Receiving Stream Watershed Area (sq. miles) above discharge point 0.228 sq. mi.
Ratio of Stream Watershed Area (sq. miles) to Area of Road and Parking Lots (acres): 0.008

Proposed Treatment (check all that apply): Grass or Stone-lined Swales X ;
Overland Flow Across Vegetated Terrain _____. Catch Basins X .
Retention Pond (attach design details) _____.
Sedimentation Basin (attach design details) _____.
Other (specify and attach design details) Exfiltration into surrounding sandy soils

GROUNDWATER AND RETURN FLOWS

Source (check which applies): Foundation Drain ____ Curtain Drain ____ Spring ____
Well ____ Mine ____ Quarry ____ Pond ____ Water Wheel or Turbine ____
Filter Backwash ____ Other (specify) _____.
Discharge: Estimated Discharge ____ CFS Frequency _____.
Duration _____. Pumping required? _____.
Contaminants present (specify) _____.
Proposed Treatment: _____.

D-6 Additional Information: _____

INSTRUCTIONS

The following supporting documents are required as part of the complete application: Location map, site, drainage, and erosion control plans and detailed drawings of all treatment devices.
Incomplete applications will be returned to the applicant.

- D-1 Applicant Same as Item 1 on Application (WR-82)
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- D-2 Discharge Same as Item 11 on Application (WR-82). Complete a separate Schedule D (WR-82D) for each drainage discharge identified in Item 11.
- D-3 Location
1. Name receiving water and describe with reference to a known landmark, e.g. 1000' upstream of RR bridge in village, 550' above mouth, etc., or give geographical coordinates (latitude and longitude).
 2. Also identify each discharge point by serial number, e.g. S/R 001, 002, 003, etc. on U.S.G.S. topographical map and on site plan.
- D-4 Conveyance Describe routing of discharges to surface waters of the State; e.g. through grass-lined swales, culverts, prior to discharge to the receiving stream.
- D-5 Type of Discharge Complete appropriate section(s)

Instructions for Stormwater Runoff Only:

Peak Flows - Calculate peak flows using the Soil Conservation Service Technical Release No. 55 or No. 20. Use a 10 year - 24 hour storm event as the design storm. Attach all calculations including runoff curve numbers for each discharge point.

Watershed Area

1) Single or multiple discharges to the same receiving water - Determine the watershed area (sq. miles) above the most upstream discharge point. Calculate the ratio of watershed area (sq. miles) to the total area of roads and parking lots (acres) draining to the receiving water.

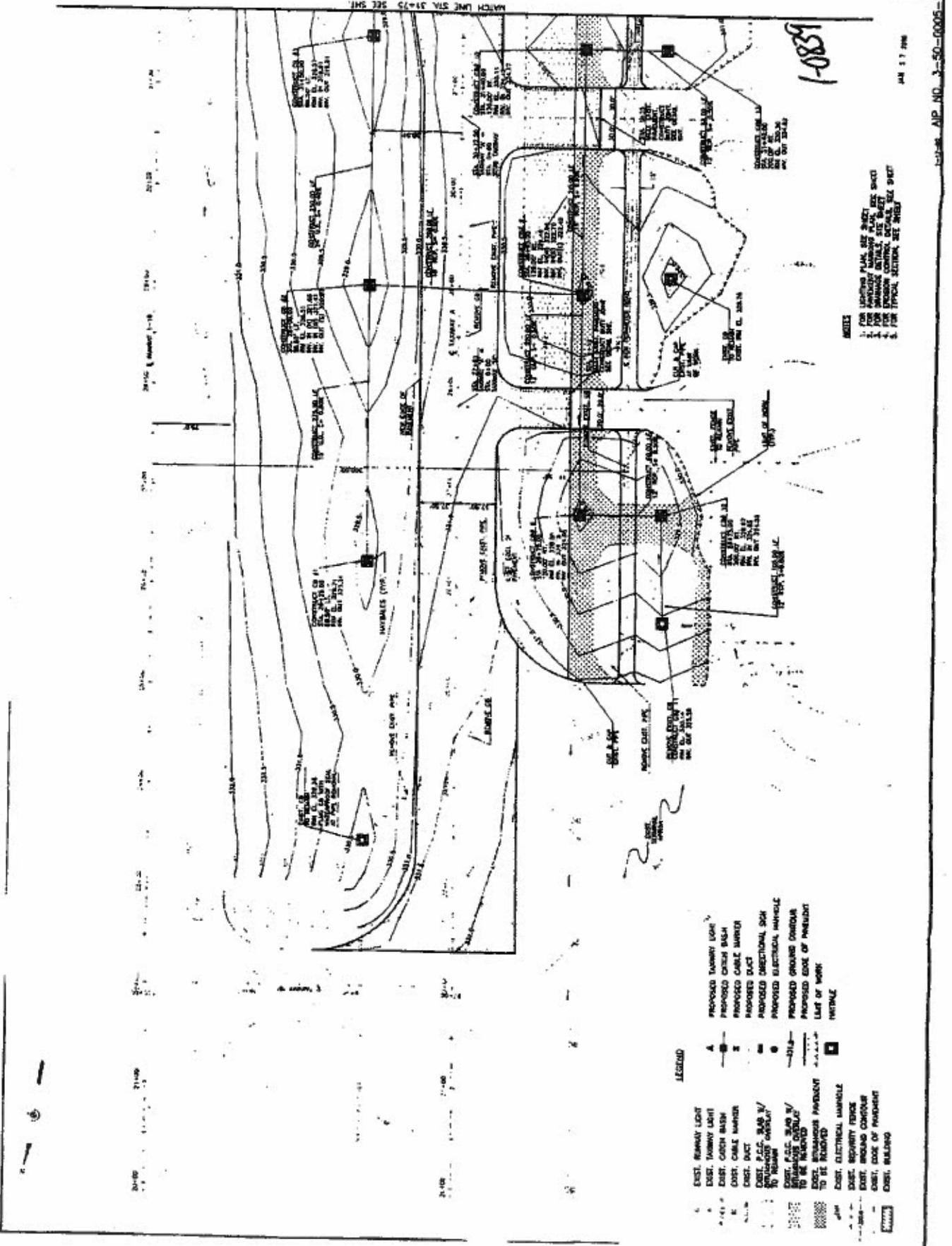
2) Discharges to more than one receiving water - Determine the watershed area (sq. miles) above the most upstream discharge point for each receiving water. Calculate the ratio of watershed area (sq. miles) to the total area of roads and parking lots (acres) draining to each receiving water.

Proposed Treatment - Treatment of stormwater runoff must occur both on site and prior to discharge to surface waters of the State. All projects must utilize infiltration into soil to the extent feasible to dispose of stormwater runoff as per the Vermont Water Quality Standards revised January 7, 1985. Where necessary detention pond design should be based upon a 10 year - 24 hour storm event. A minimum requirement for sedimentation basin design is 145 square feet/cfs of outflow; the 2 year - 24 hour storm is recommended for this design.

- D-6 Additional Complete as needed.

For further information call (802/244-5674) or write:

Department of Water Resources
Permits and Compliance Section
103 South Main Street
West Office Building
Waterbury, Vermont 05676



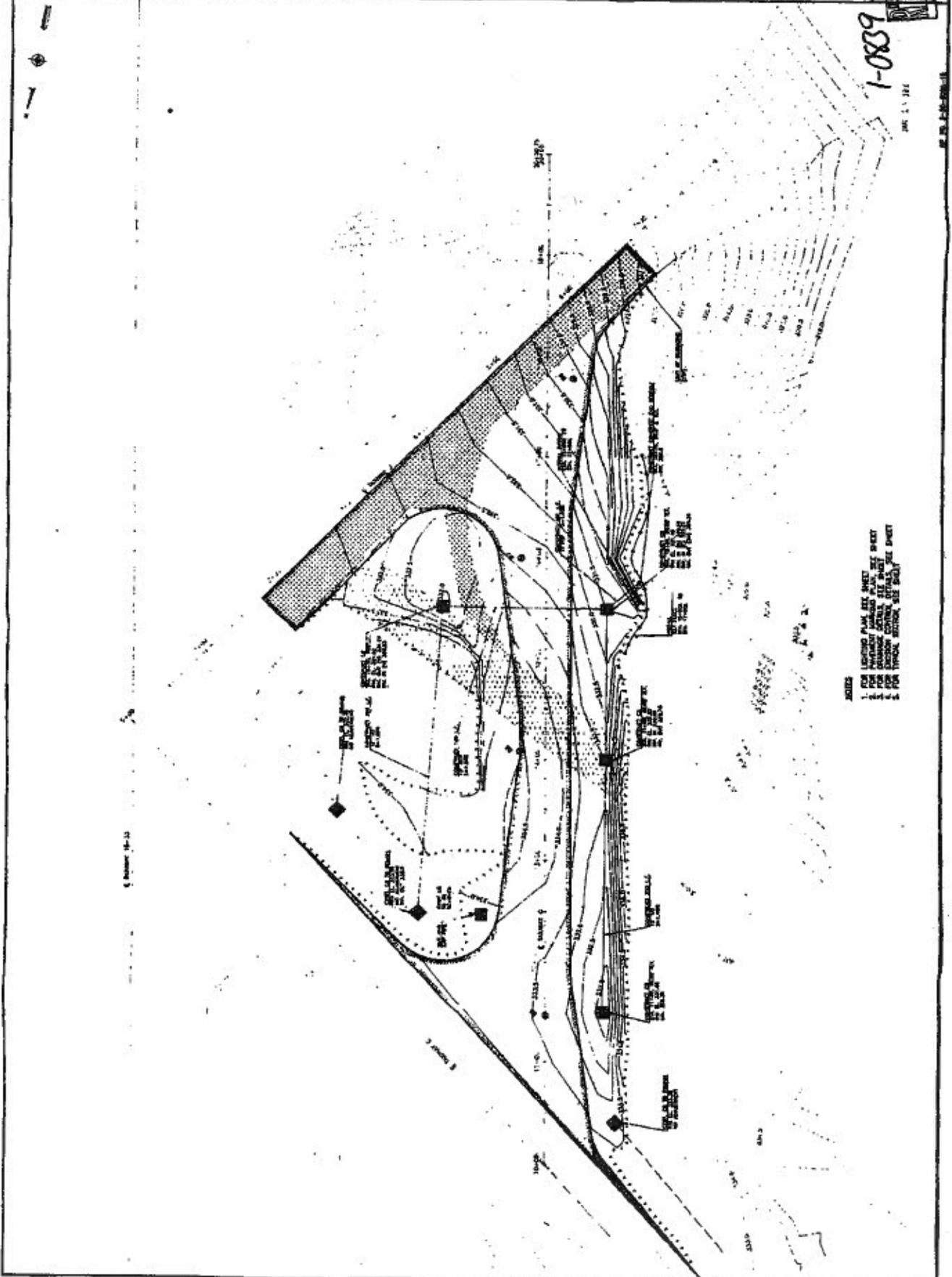
- LEGEND**
- EXIST. RUNWAY LIGHT
 - EXIST. TAXIWAY LIGHT
 - EXIST. CABLE MARK
 - EXIST. CABLE MARKER
 - EXIST. DUCT
 - EXIST. P.C.C. SUB W/ SHIMMER CONDUIT TO REMAIN
 - EXIST. P.C.C. SUB W/ SHIMMER CONDUIT TO BE REMOVED
 - EXIST. SHIMMER PAVEMENT TO BE REMOVED
 - EXIST. ELECTRICAL MARKER
 - EXIST. SECURITY FENCE
 - EXIST. BOUNDARY FENCE
 - EXIST. BOUNDARY CONTOUR
 - EXIST. EDGE OF PAVEMENT
 - EXIST. BUILDING
- SYMBOLS**
- PROPOSED TAXIWAY LIGHT
 - PROPOSED CABLE MARK
 - PROPOSED CABLE MARKER
 - PROPOSED DUCT
 - PROPOSED DIRECTIONAL SIGN
 - PROPOSED ELECTRICAL HANDOFF
 - PROPOSED GROUND CONDUIT
 - PROPOSED EDGE OF PAVEMENT
 - LINE OF WORK
 - INTERNAL

NOTES:
 1. FOR LOCATIONS PLAN, SEE SHEET
 2. FOR GENERAL NOTES, SEE SHEET
 3. FOR EXISTING CONTROL, DETAIL, SEE SHEET
 4. FOR TYPICAL SECTION, SEE SHEET

MATCH LINE STA. 31+75 SEE SH1.

BURLINGTON INTERNATIONAL AIRPORT SOUTH BURLINGTON, VERMONT AIRPORT & TRUCKWAY, INC.		STA 10+00 TO STA 20+00 PLAN TAXIWAY C	
HOYLE, TANNER & ASSOCIATES, INC. Five Commercial Park, Burlington, Vermont 05405		DATE: APR. 1980 SCALE: 1"=40'	
PROJECT NO. 37720	SHEET NO. 1	TOTAL SHEETS 2	DATE APR 1980

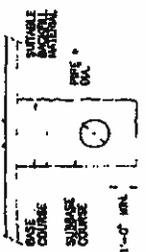
6280-1-083



- NOTES
1. FOR LIGHTING PLAN, SEE SHEET 2.
 2. FOR DRAINAGE DETAILS, SEE SHEET 3.
 3. FOR EROSION CONTROL DETAILS, SEE SHEET 4.
 4. FOR TYPICAL DETAILS, SEE SHEET 5.

10/10/80

4" LOAM & SEED

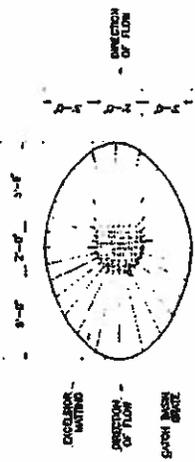


TYPICAL TRENCH DETAIL
 NOT TO SCALE

4" TOPSOIL & SEED



TYPICAL UNDERDRAIN DETAIL
 NOT TO SCALE



PLAN VIEW
 CATCH BASIN GRADING DETAIL
 NOT TO SCALE

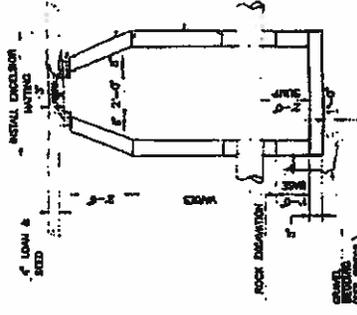
FRAME & GRATE SHALL BE DAMAGED FOR PROLONGED DUAL WHEEL LOAD CONTACT.

CONCRETE DOLLAR ABOUT FRAME TO GRADE SHALL BE DAMAGED FOR PROLONGED DUAL WHEEL LOAD CONTACT.

PRE-CAST CONCRETE CATCH BASIN SHALL BE TO GRADE AND SHALL BE WEAR SURFACE.

WEAR SURFACE SHALL BE WEAR SURFACE.

INSTALL INVERT AS SHOWN TO MATCH A WINDUP CONNECTION (1/4").

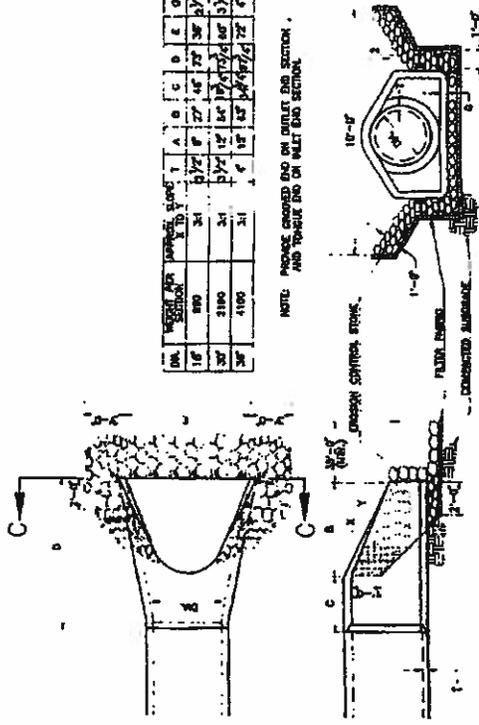


TYPICAL CATCH BASIN DETAIL
 NOT TO SCALE

THE CONTRACTOR SHALL VERIFY MANUFACTURER'S SHOP DRAWINGS INCLUDING REINFORCED DETAILS & CAPACITY OF LAMINATE CAPACITY TO ENGINEER FOR APPROVAL.

IN.	FEET PER SECTION	A	B	C	D	E	F
18"	8.00	3.41	3.74	4.07	4.40	4.73	5.06
30"	13.33	5.68	6.22	6.75	7.28	7.81	8.34
36"	16.00	6.82	7.48	8.14	8.80	9.46	10.12

NOTE: PAVEMENT GRADING AND CURB ON OUTLET END SECTION, AND TRENCH END ON INLET END SECTION.

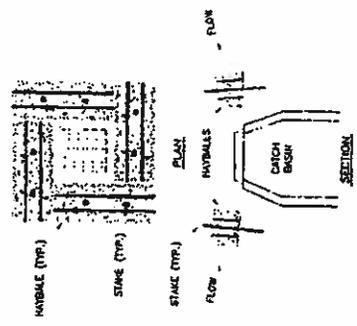


LONGITUDINAL SECTION

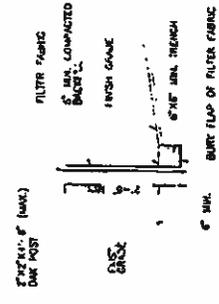
CONCRETE END SECTION DETAIL
 NOT TO SCALE

65804
 10829
 JAN 27 1988

PROJECT NO. 6880-1	DATE JAN 11 1968	DRAWN BY ENGINEER	CHECKED BY AS SHOWN	DATE JAN 11 1968	SCALE AS SHOWN	PROJECT HOYLE, TONNER & ASSOCIATES, INC.	PROJECT NO. 37720	BURLINGTON INTERNATIONAL AIRPORT	
								SOUTH BURLINGTON, VERMONT	

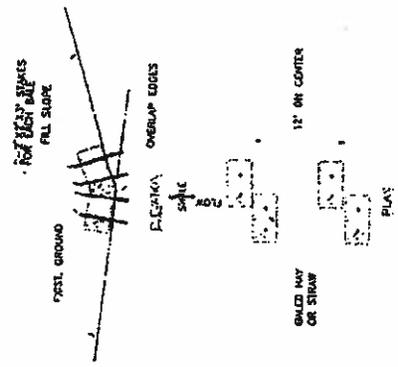


SEDIMENTATION CONTROL AT CATCH BASIN
NOT TO SCALE



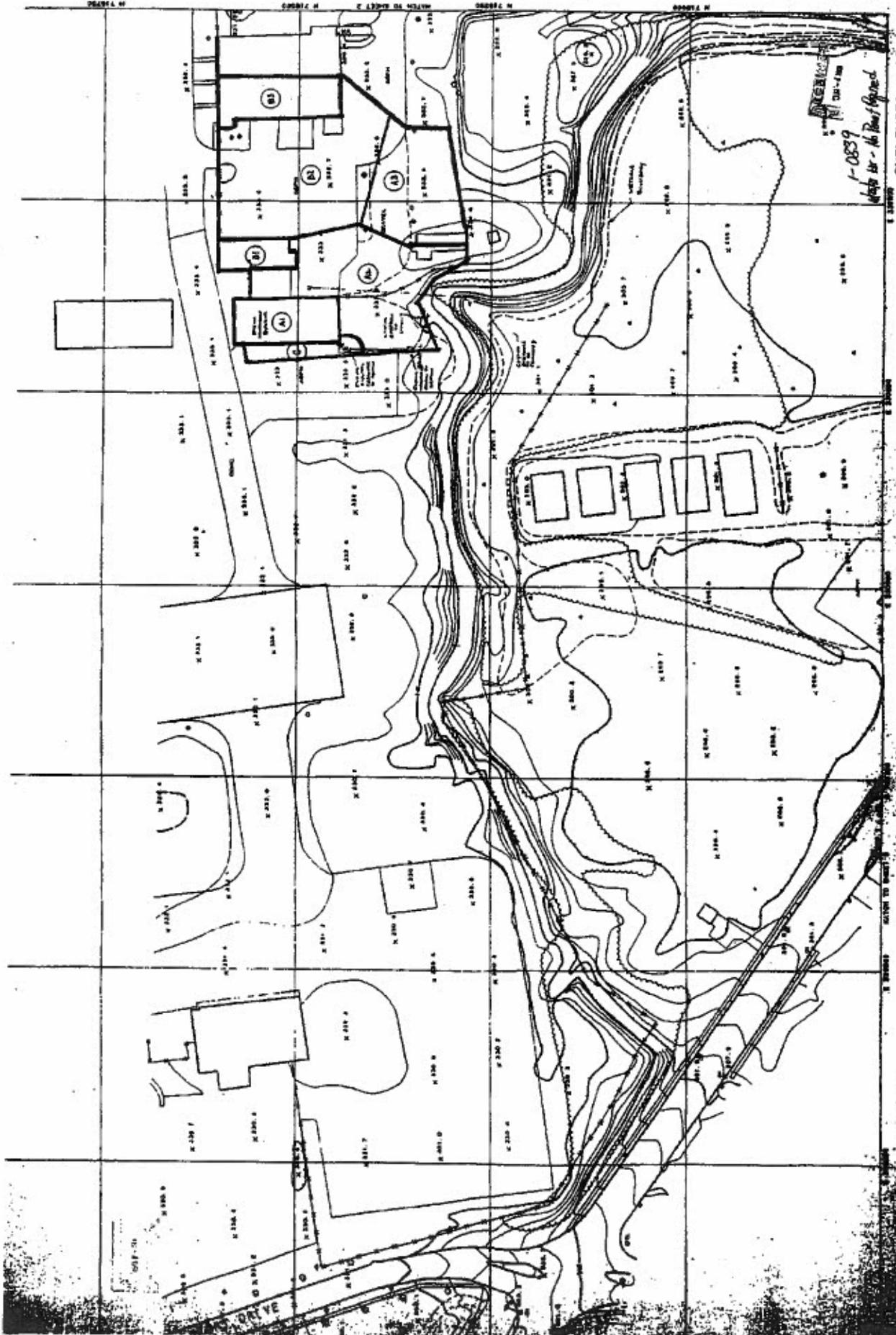
NOTES:
1. SEAMING OF WOOD FENCE POSTS NOT TO EXCEED 1/4\"/>

SILT FENCE DETAIL
NOT TO SCALE



HAY BALE CHECK DAM DETAIL
NOT TO SCALE

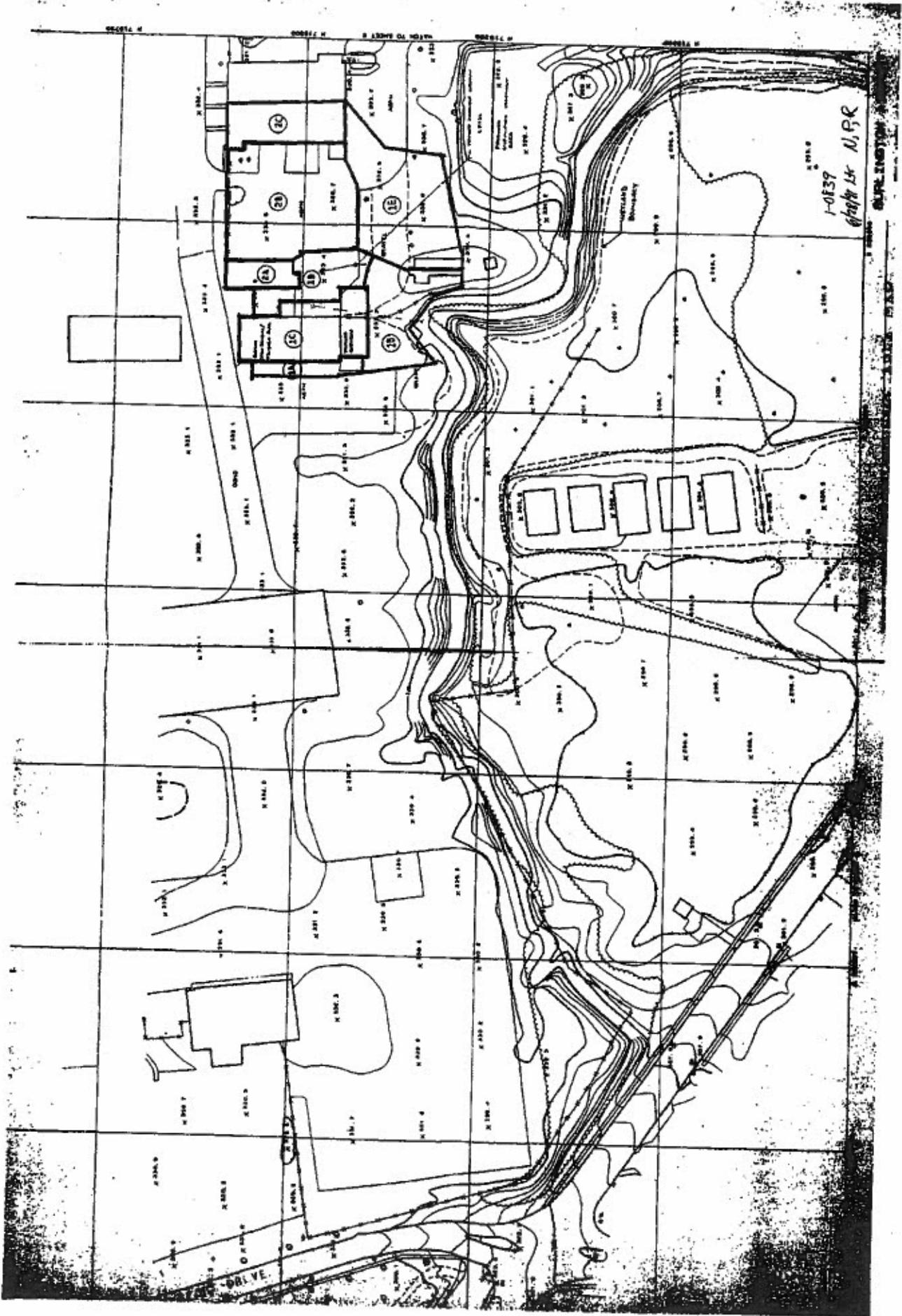
6880-1
JAN 11 1968



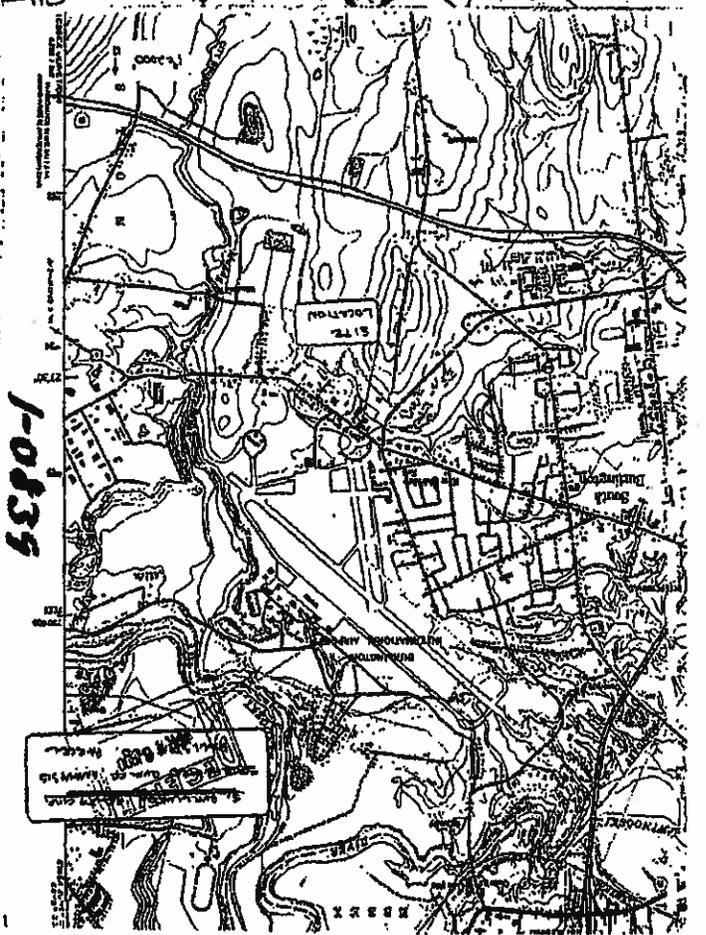
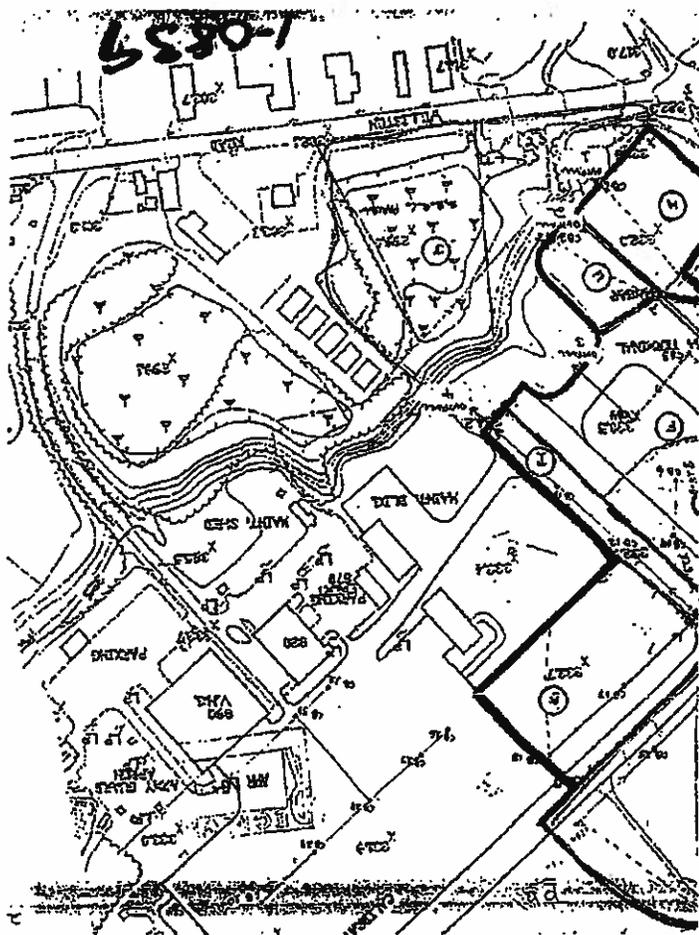
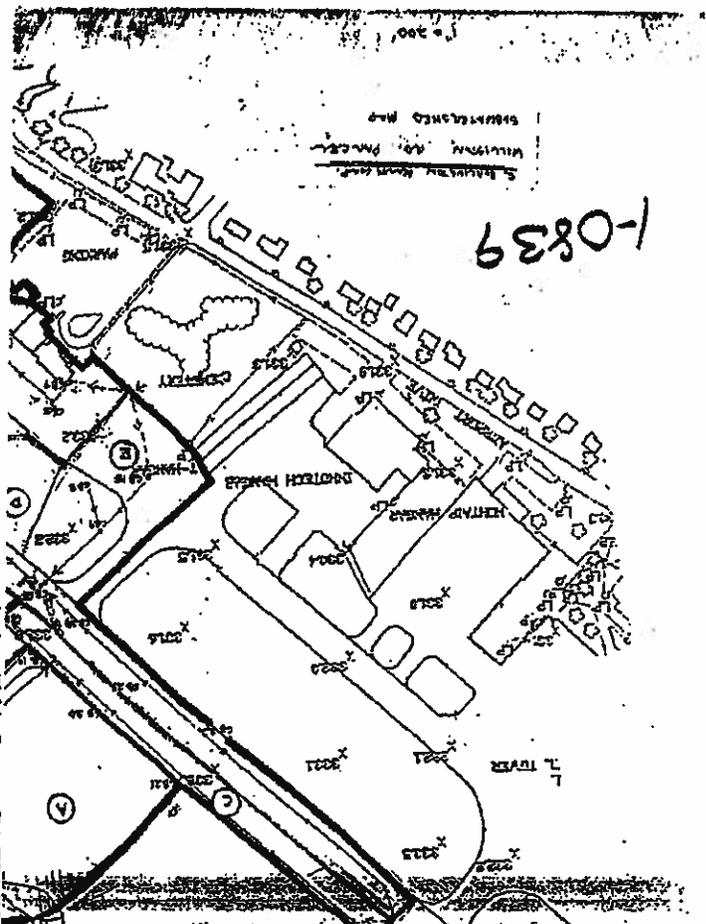
PRE-DEVELOPMENT AIRIMAGE AREA MAP

BURLINGTON AIRPORT

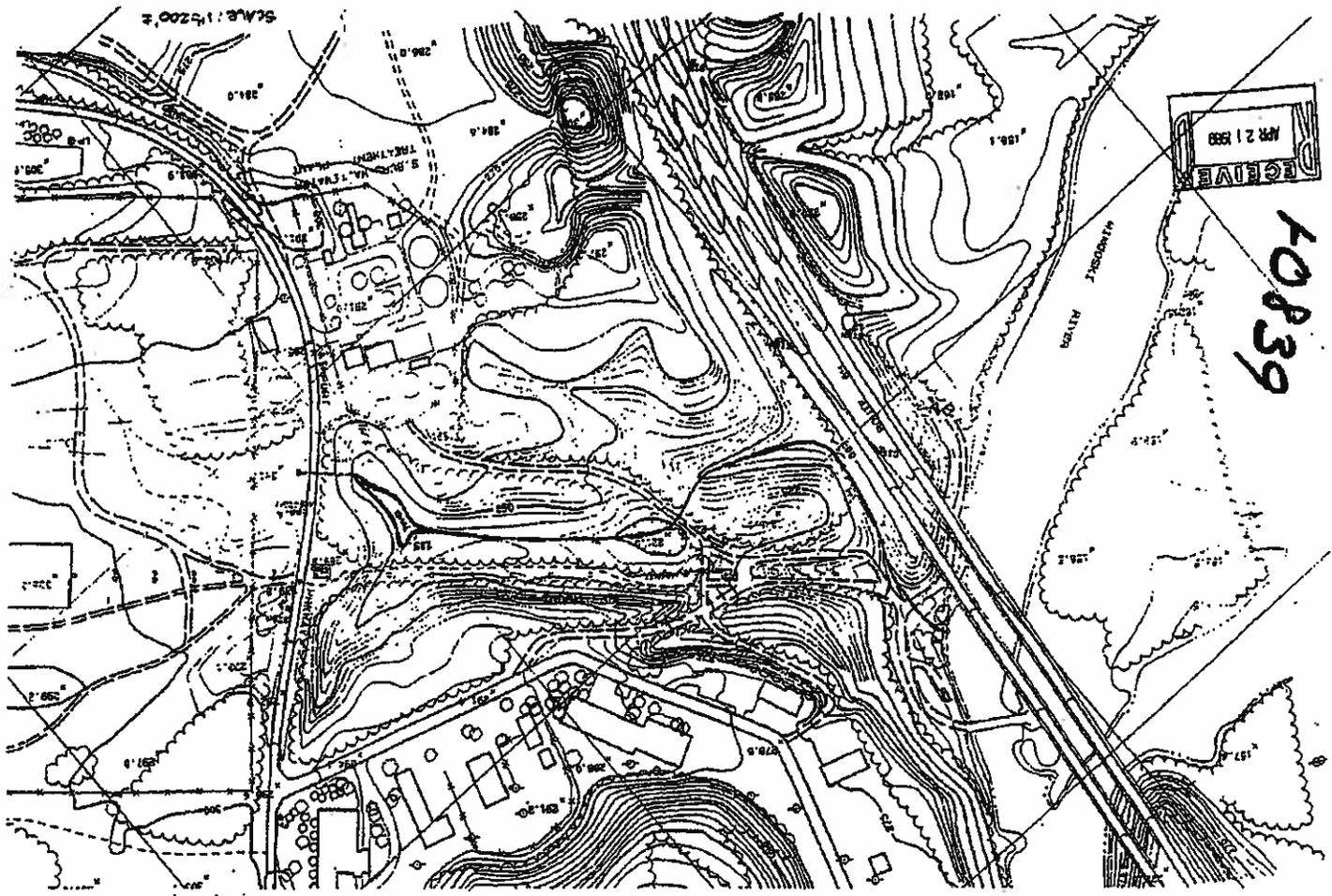
1-0839
Map for - All Plans Required



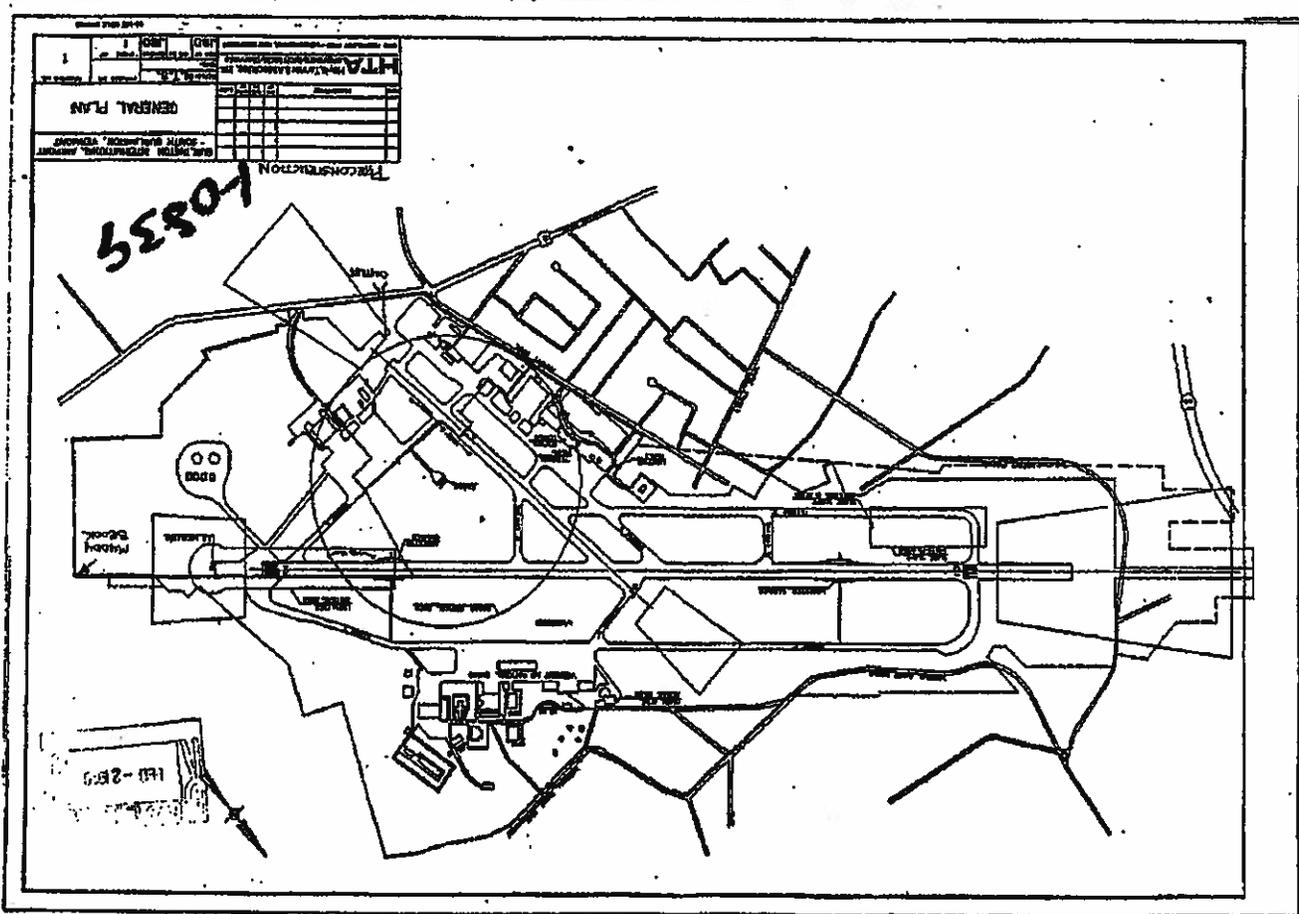
1-0839

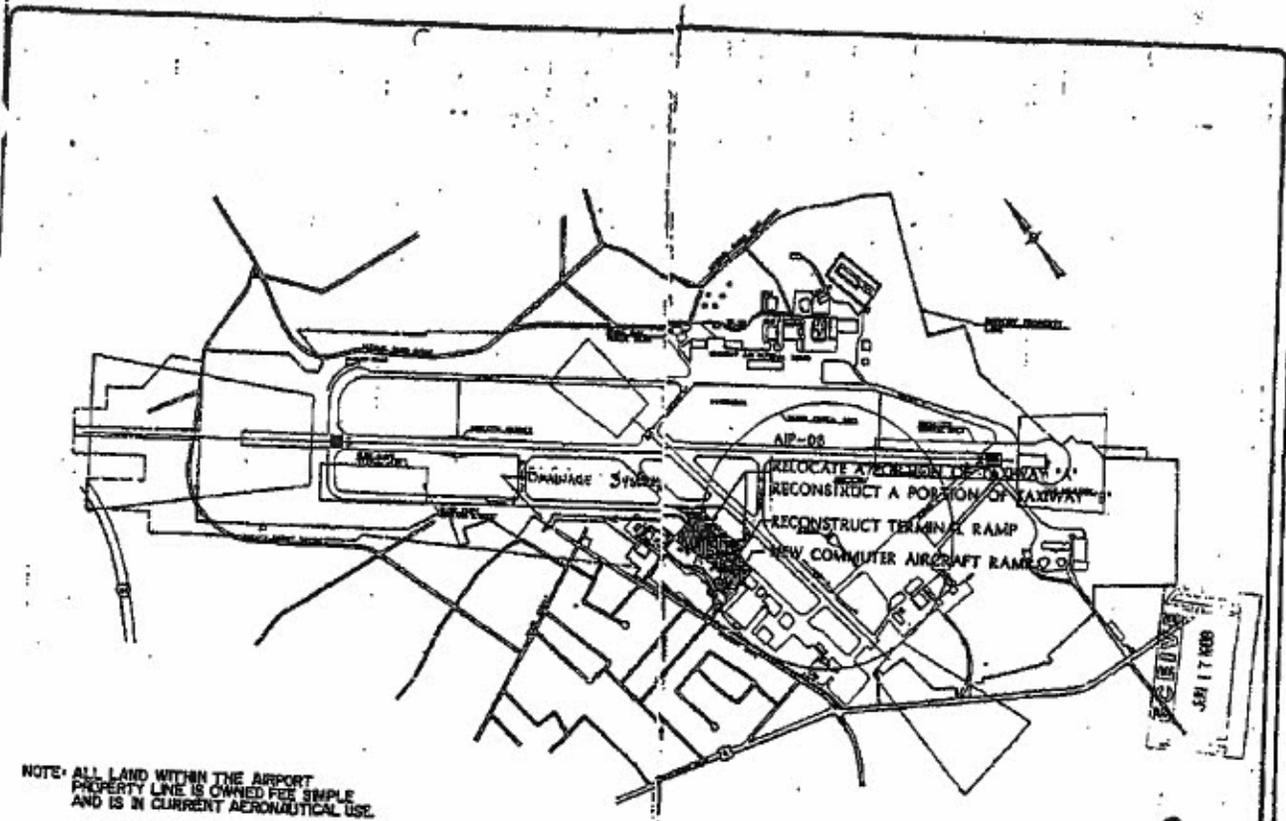


1-0839



10839





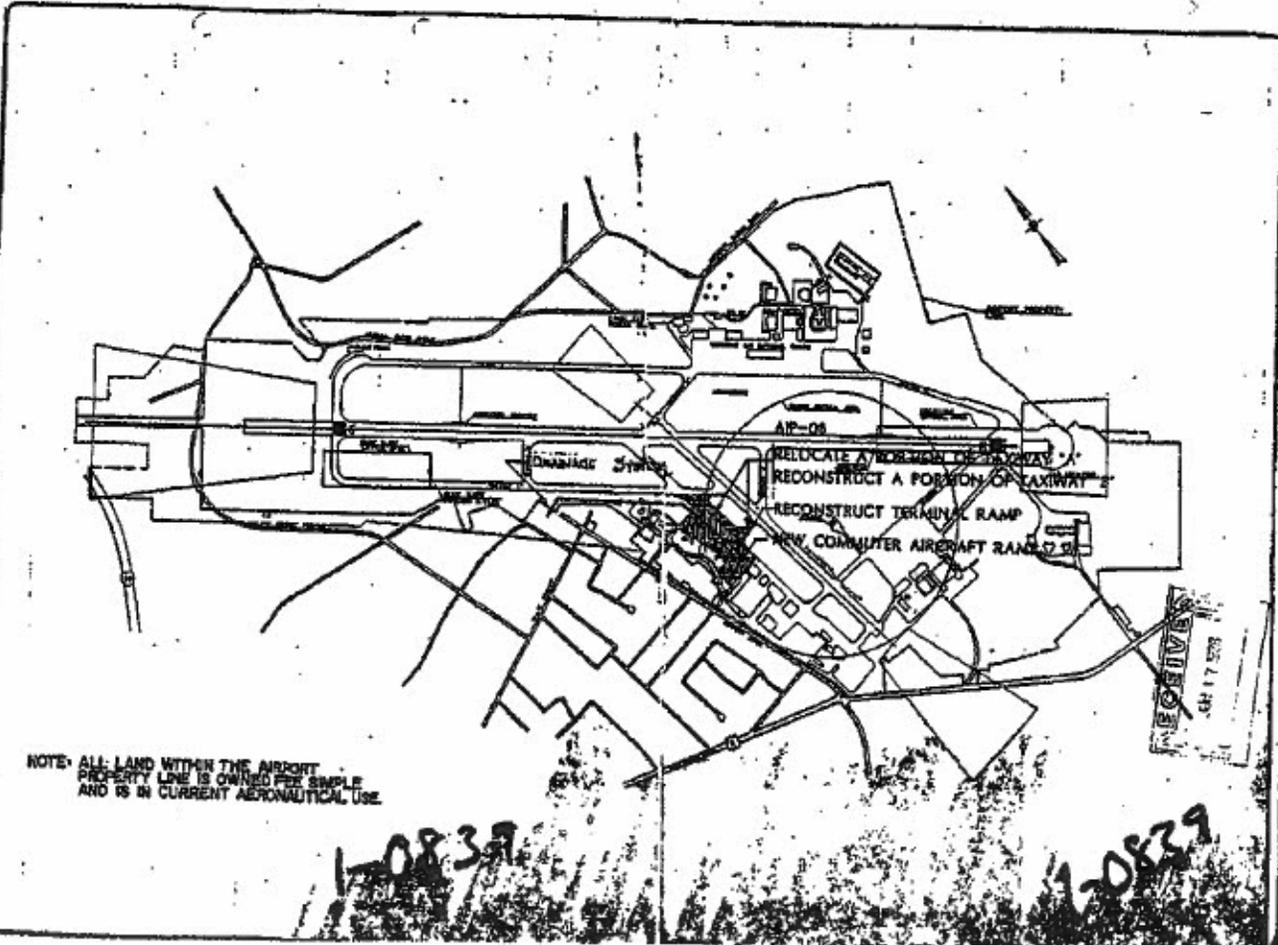
NOTE: ALL LAND WITHIN THE AIRPORT PROPERTY LINE IS OWNED FEE SIMPLE AND IS IN CURRENT AERONAUTICAL USE.

1-0839

1-0839

SCALE 1"=1000' FIGURE 1
ITA
 CONSULTANTS

BURLINGTON INTERNATIONAL AIRPORT
 SOUTH BURLINGTON, VERMONT
 EXHIBIT "A"



NOTE: ALL LAND WITHIN THE AIRPORT PROPERTY LINE IS OWNED FEE SIMPLE AND IS IN CURRENT AERONAUTICAL USE.

1-0839

1-0839

SCALE 1"=1000' FIGURE 1
ITA
 CONSULTANTS

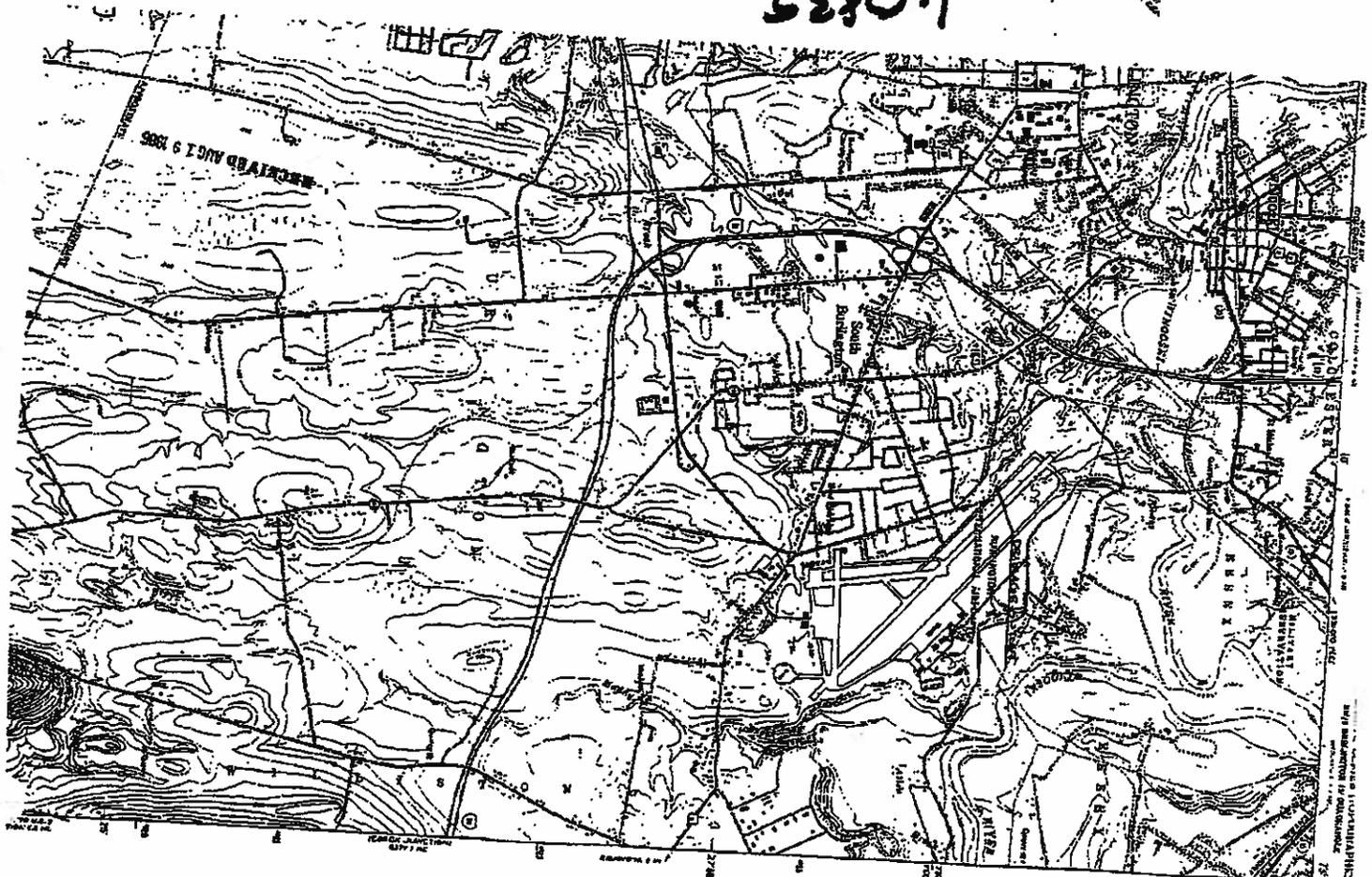
BURLINGTON INTERNATIONAL AIRPORT
 SOUTH BURLINGTON, VERMONT
 EXHIBIT "A"



UNITED STATES
DEPARTMENT OF THE ARMY
OFFICE OF ENGINEERING

DEVELOPMENTAL
TERMINOLOGY
24 MINUTE SERIES (TOPOGRAPHIC)
1:50,000 SCALE

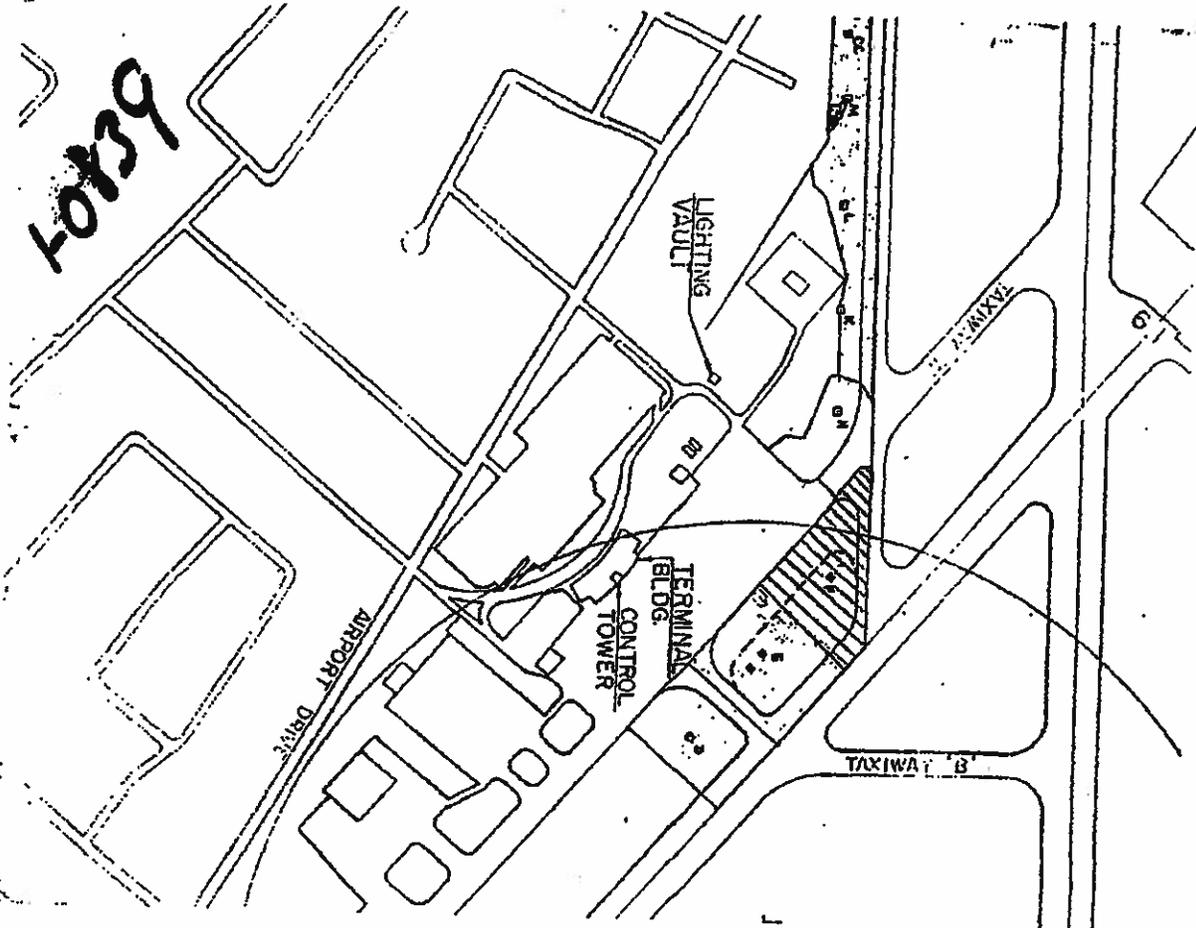
1-0839



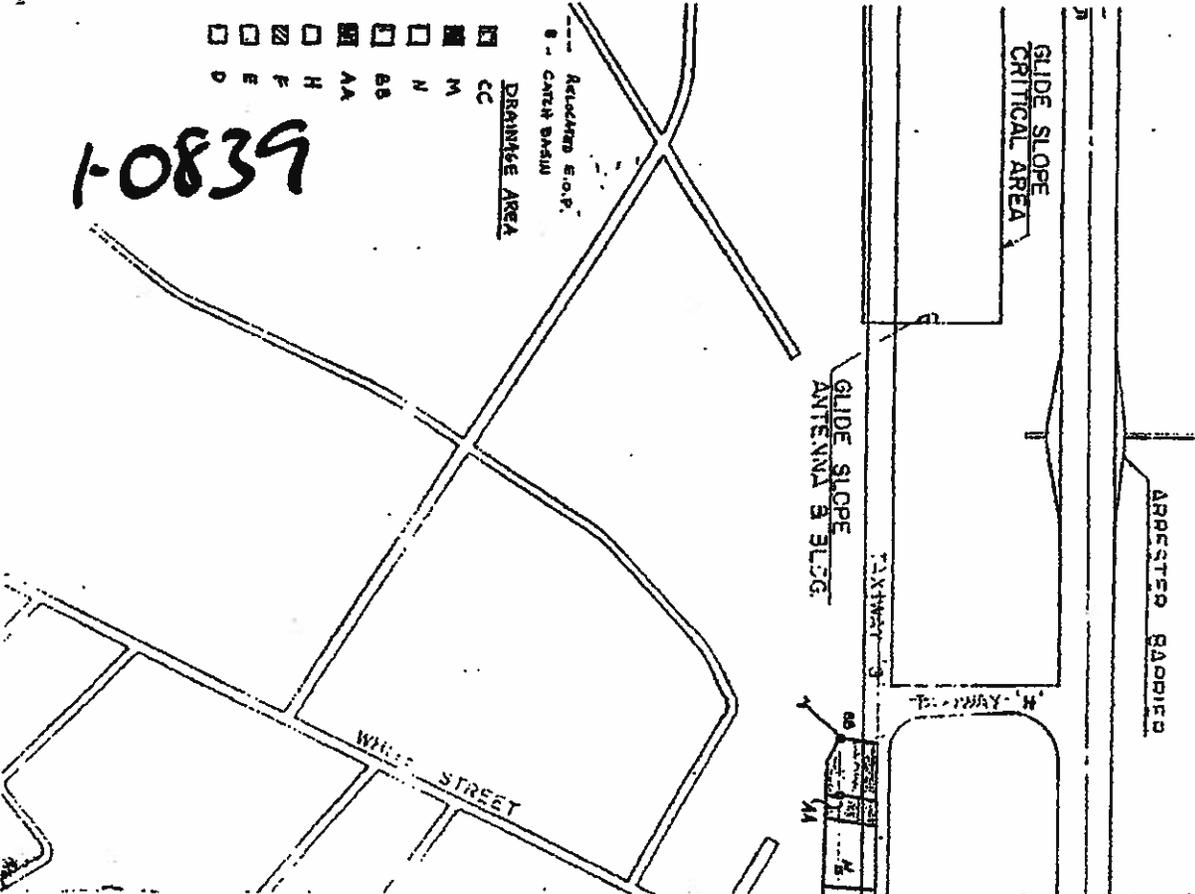
RECEIVED AUG 19 1965

1-0839

1-0839



1-0839



1-0820

STATE OF VERMONT
AGENCY OF NATURAL RESOURCES
DEPARTMENT OF ENVIRONMENTAL CONSERVATION

Page 1 of 3

DISCHARGE PERMIT

File No. 04-03-085

Permit No. 1-0820

In compliance with provisions of 10 V.S.A. 1263

Vermont Air National Guard
158th Civil Engineering Squadron
Burlington International Airport
Burlington, VT 05401

and in accordance with "Terms and Conditions" hereinafter specified, the above named permittee is hereby granted permission to discharge stormwater runoff from the Alert Shelter Complex and Munitions Complex buildings, roadways, and parking areas, located at Burlington International Airport in Burlington, Vermont to Muddy Brook.

1. Expiration Date: March 31, 1994. Note: This permit, unless revoked, shall be valid until the designated expiration date despite any intervening change in water quality, effluent, or treatment standards of the classification of the receiving waters. However, any such changed standard or classification shall be applied in determining whether or not to renew the permit pursuant to 10 V.S.A. 1263.
Re-apply for a discharge permit by September 30, 1993.
2. Revocation: 10 V.S.A. 1267 provides as follows:
"The Secretary may revoke any permit issued by him pursuant to this subchapter if he finds that the permit holder submitted false or inaccurate information in his application or has violated any requirement, restriction, or condition of the permit issued. Revocation shall be effective upon actual notice thereof to the permit holder."
3. Transfer of Permit: This permit is not transferable without prior written approval of the Secretary. The permittee shall notify the Secretary immediately, in writing, of any sale, lease, or other transfer of ownership of the property from which the discharge originates. The permittee shall also inform the new owner or tenant of his responsibility to make application for a permit which shall be issued in his name. Any failure to do so shall be considered a violation of this permit.

4. Receiving Waters: Muddy Brook.
5. Manner of Discharge: S/N 001 (Munitions Complex) - Via grass-lined drainage swales and, if paved parking lot is added, via a 400 ft. infiltration trench along east perimeter of lot, then via overland flow across vegetated terrain, prior to discharge into Muddy Brook.

S/N 002 (Alert Shelter Complex) - Via overland flow across vegetated terrain, then via a stormwater drainage system consisting of catch basins and concrete pipe that outlet via a stone-lined stilling basin, then via overland flow across vegetated terrain, prior to discharge into Muddy Brook.

6. Wastes Permitted: S/N 001 & 002 - Stormwater runoff from paved roads and parking lots, roofs, and natural terrain after treatment of the runoff via overland flow across vegetated terrain and via grass-lined swales. If paved (vs. gravel) parking lot is added to Munitions Complex, additional treatment and control will be provided by the 400' infiltration trench.

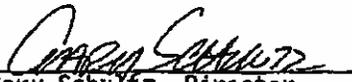
Note: If erosion problems occur, the permittee shall be required to correct the problems.

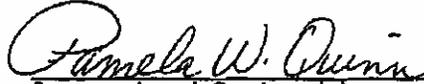
7. Volumes Permitted: Such volumes as required by the discharge specified in #5 above.
8. Frequency of Discharge: Daily
9. Operation and Treatment: Treatment as specified in #6 above. For details on the treatment of stormwater runoff for this project see the Webster-Martin, Inc. (Alert Shelter Complex) Site Work Stormwater Drainage Plan (C-2), dated 9/16/88, and the Freeman-French-Freeman Architects (Munitions Complex) Storm Drainage plan, Sheet SP3, undated.
10. Maintenance and Maintenance Reporting Requirements:
All catch basins, settling ponds, recharge basins, or other treatment devices or facilities shall be maintained in good operating order at all times and shall be cleaned quarterly and at such other times as necessary to maintain design treatment levels. NO LATER THAN JANUARY 31 OF EACH YEAR A WRITTEN REPORT SHALL BE SUBMITTED TO THE DEPARTMENT OF ENVIRONMENTAL CONSERVATION, NPDES PERMIT SECTION, 103 SOUTH MAIN STREET, WATERBURY, VERMONT 05676, PROVIDING THE DATES AND NATURE OF CLEANING OPERATIONS CARRIED OUT IN THE PRECEDING YEAR.

Paved parking lots and roads should be swept on a regular basis when seasonally practicable to minimize contaminants carried to the treatment device by runoff.
11. Personnel and Training Requirements: Such personnel and training as necessary to fulfill the requirements of #10 above.

- 12. Monitoring and Reporting Requirement: No monitoring required; reporting requirement as specified in #10 above.
- 13. Miscellaneous Requirements: Not applicable
- 14. Issue Date of Permit: 9 APR 89

AGENCY OF NATURAL RESOURCES
Patrick A. Parenteau, Commissioner
Department of Environmental Conservation

By 
Gary Schuitz, Director
Permits, Compliance & Protection


Prepared and Reviewed by

vanguard.wpe

TRANSFER APPLICATION

I, _____, hereby apply for permission to discharge waste into the waters of the State of Vermont under the provisions of Discharge Permit No. 1-0820, previously issued to

_____.

Signed: _____

Name: _____

Address: _____

Phone: _____

2-0930

STATE OF VERMONT
AGENCY OF ENVIRONMENTAL CONSERVATION
DEPARTMENT OF WATER RESOURCES

TEMPORARY
POLLUTION PERMIT

File No. 04-14-038

Permit No. 2-0930

Page 1 of 1

In compliance with provisions of 10 V.S.A. §1265 Vermont Air National Guard

is hereby granted permission to discharge waste into the waters of the state
in accordance with the "Terms and Conditions" hereinafter specified from
a facility located at Burlington, Vermont

to receiving water named, unnamed tributary of the Winooski River, a Class C water.

TERMS AND CONDITIONS

1. Expiration Date: July 1, 1985

2. Pollution Charges: Pollution charges may be assessed pursuant to
10 V.S.A. §1265.

3. Revocation: 10 V.S.A. §1267 provides as follows:

"The Secretary may revoke any permit issued by it pursuant
to this subchapter if it finds that the permit holder submitted
false or inaccurate information in his application or has
violated any requirement, restriction or condition of the permit
issued. Revocation shall be effective upon actual notice thereof
to the permit holder."

4. Transfer of Permit: This permit is not transferable without prior
written approval of the Secretary. The permittee shall notify the
Secretary immediately, in writing, of any sale, lease or other transfer
of ownership of the property from which the discharge originates. The
Secretary shall also inform the new owner or tenant of his responsibility
for the application for a permit which shall be issued in his name. Any
failure to so notify shall be considered a violation of this permit.

Method of Discharge: Via drainage ditches, underground culvert and natural drainage to receiving water.

Flow Permitted: Stormwater runoff from paved road, new main entrance to the VIANG, passage through catch basins and drainage ditches.

Flow Restricted: Such volumes as required in Item #6 above.

Frequency of Discharge: Daily

Effluent and Treatment Requirements: None - ample treatment will be provided through drainage ditches.

Maintenance and Maintenance Reporting Requirements:

Catch basins, settling ponds, recharge basins or other treatment works or facilities shall be maintained in good operating order at all times and shall be cleaned quarterly and at such other times as necessary to maintain design treatment levels. NO LATER THAN MARCH 31 OF EACH YEAR A WRITTEN REPORT SHALL BE SUBMITTED TO THE DEPARTMENT OF WATER RESOURCES, NIDES PERMIT SECTION, MONTPELIER, VERMONT, VT 05602, PROVIDING THE DATES AND NATURE OF CLEANING OPERATIONS CARRIED OUT IN THE PRECEDING YEAR.

Food parking lots and roads should be swept on a regular basis when reasonably practicable to minimize contaminants carried to the treatment device by runoff.

11. Personnel and Training Requirements: None

12. Monitoring and Reporting Requirements: None

13. Miscellaneous Requirements: During the period July 1, 1978 - July 1, 1985 an investigation of storm water characteristics will be carried out by the Vermont Agency of Environmental Conservation to determine the environmental effect of storm drainage to the receiving stream. During this period the permittee may be requested to furnish certain data in support of the investigation. If prior to July 1, 1985 an acceptable method of treatment is adopted or applicable legislative changes are enacted, the permit will be amended to reflect the approved changes.

14. Issue Date of Permit: March 6, 1981

AGENCY OF ENVIRONMENTAL CONSERVATION

J. M. Donato
Commissioner
Department of Water Resources
& Environmental Engineering

2-0805



State of Vermont

AGENCY OF ENVIRONMENTAL CONSERVATION

Montpelier, Vermont 05602
Department of Water Resources

Department of Fish and Game
Department of Forests, Parks, and Recreation
Department of Water Resources
Environmental Board
Division of Environmental Engineering
Division of Environmental Protection
Natural Resources Conservation Council

December 20, 1979

City of Burlington
24 Burlington International Airport
South Burlington, Vermont
05401

RE: Temporary Pollution Permit
File No. 04-14-025

Gentlemen:

Enclosed is your copy of the above referenced permit which has been signed by the Secretary of the Agency of Environmental Conservation.

Please read the entire permit carefully and familiarize yourself with all its terms and conditions. Your attention is particularly directed to those conditions which may require written responses by certain dates. Please check to see that all pages are included in your permit.

If you have any questions concerning your permit, please contact us at once.

Very truly yours,

Willard B. Farnham
Environmental Engineer
Permits Section

WBF/bj

STATE OF VERMONT
AGENCY OF ENVIRONMENTAL CONSERVATION
DEPARTMENT OF WATER RESOURCES

Page 1 of 1

TEMPORARY
POLLUTION PERMIT

File No. 04-14-025

Permit No. 2-9805

In compliance with provisions of 10 V.S.A. §1265 City of Burlington

is hereby granted permission to discharge waste into the waters of the state in accordance with the "Terms and Conditions" hereinafter specified from a facility located at Burlington International Airport South Burlington, Vermont 05401

to receiving water, unnamed tributary of Potash Brook.

TERMS AND CONDITIONS

1. Expiration Date: July 1, 1980
2. Pollution Charges: Pollution charges may be assessed pursuant to 10 V.S.A. §1265.

3. Revocation: 10 V.S.A. §1267 provides as follows:

"The Secretary may revoke any permit issued by it pursuant to this subchapter if it finds that the permit holder submitted false or inaccurate information in his application or has violated any requirement, restriction or condition of the permit issued. Revocation shall be effective upon actual notice thereof to the permit holder."

4. Transfer of Permit: This permit is not transferable without prior written approval of the Secretary. The permittee shall notify the Secretary immediately, in writing, of any sale, lease or other transfer of ownership of the property from which the discharge originates. The permittee shall also inform the new owner or tenant of his responsibility to make application for a permit which shall be issued in his name. Any failure to so notify shall be considered a violation of this permit.

5. Manner of Discharge: Pipes to ravine leading to receiving water.
6. Wastes Permitted: 001 - Untreated discharge from roofdrains.
002 - Discharge from vehicle maintenance activity and fueling operations through floor/pit/yard drains after treatment in an oil separator, and passage through a drywell.
7. Volumes Permitted: Such volumes as required in Item # 6 above.
8. Frequency of Discharge: Daily
9. Operation and Treatment Requirements As noted in Item # 6 above, plus inspection and cleaning of oil separator as needed to maintain its efficient operation.
10. Maintenance and Maintenance Reporting Requirements:
All catch basins, settling ponds, recharge basins or other treatment devices or facilities shall be maintained in good operating order at all times and shall be cleaned quarterly and at such other times as necessary to maintain design treatment levels. NO LATER THAN JANUARY 31 OF EACH YEAR A WRITTEN REPORT SHALL BE SUBMITTED TO THE DEPARTMENT OF WATER RESOURCES, NPDES PERMIT SECTION, MONTPELIER, VERMONT, VT 05602, PROVIDING THE DATES AND NATURE OF CLEANING OPERATIONS CARRIED OUT IN THE PRECEDING YEAR.
Paved parking lots and roads should be swept on a regular basis when seasonally practicable to minimize contaminants carried to the treatment device by runoff.

11. Personnel and Training Requirements: None

12. Monitoring and Reporting Requirements: None

13. Miscellaneous Requirements: During the period July 1, 1978 - July 1, 1980 an investigation of storm water characteristics will be carried out by the Vermont Agency of Environmental Conservation to determine the environmental effect of storm drainage to the receiving stream. During this period the permittee may be requested to furnish certain data in support of the investigation. If, prior to July 1, 1980 an acceptable method of treatment is adopted or applicable legislative changes are enacted, the permit will be amended to reflect the approved changes.

14. Issue Date of Permit: 20 December, 1979

AGENCY OF ENVIRONMENTAL CONSERVATION

By

Reginald A. LaPlante
Acting Commissioner
Department of Water Resources

State of Vermont

Department of Fish and Wildlife
Department of Forests, Parks and Recreation
Department of Environmental Conservation
State Geologist
Natural Resources Conservation Council



AGENCY OF NATURAL RESOURCES
103 SOUTH MAIN STREET
Waterbury, Vermont 05676

Department of Environmental Conservation
Annex Building
244-5674

June 2, 1989

Mr. John Jaeger
South Burlington Realty
P.O. Box 2267
South Burlington, VT 05401

Re: Burlington Airport Drainage

Dear Mr. Jaeger:

This is to verify that I have looked through the Department of Environmental Conservation's files containing permits for stormwater runoff from the Burlington Airport property. The only permitted discharge I could discover that drains to the unnamed tributary of Potash Brook to the southeast of the airport property is permit #2-0805, for a snow equipment garage. The other permitted airport stormwater discharges drain in the opposite direction to small tributaries of the Winooski River.

While there may be stormwater discharges that predate our permitting program, a visual inspection of the surrounding property for signs of catch basins, culverts, drainage swales, or other stormwater conveyances should provide an indication of any such discharges.

If you have any questions, please feel free to contact me.

Sincerely,

Todd Sternbach
Todd Sternbach
Permits and Compliance



- HIGHWAYS**
- INTERSTATE HIGHWAY
 - STATE HIGHWAY
 - STATE AND LOCAL HIGHWAY
 - TOWN HIGHWAY
 - ROADWAY ON UNIMPROVED ROAD
 - PRIVATE ROAD (SMALL)
 - PRIVATE ROAD (LARGE)
 - MILEAGE BETWEEN POINTS
 - MILEAGE ON SUBJECT AREA (SMALL)
 - MILEAGE ON SUBJECT AREA (LARGE)
 - MILEAGE ON SUBJECT AREA (VERY SMALL)
 - MILEAGE ON SUBJECT AREA (VERY LARGE)
 - WHEEL TRACK MARKING
 - GRAVEL ROAD
 - GRAVEL ROAD (SMALL)
 - GRAVEL ROAD (LARGE)
 - GRAVEL ROAD (VERY SMALL)
 - GRAVEL ROAD (VERY LARGE)
 - GRAVEL ROAD (SMALL)
 - GRAVEL ROAD (LARGE)
 - GRAVEL ROAD (VERY SMALL)
 - GRAVEL ROAD (VERY LARGE)
- ROAD SURFACE TYPES**
- GRAVEL ROAD
 - GRAVEL ROAD (SMALL)
 - GRAVEL ROAD (LARGE)
 - GRAVEL ROAD (VERY SMALL)
 - GRAVEL ROAD (VERY LARGE)
 - GRAVEL ROAD (SMALL)
 - GRAVEL ROAD (LARGE)
 - GRAVEL ROAD (VERY SMALL)
 - GRAVEL ROAD (VERY LARGE)
- OTHER TRANSPORTATION**
- RAILROAD AND STATION
 - AIRPORT (COMPLETE)
 - AIRPORT (PLANNED)
 - AIRPORT (MILITARY)
 - LANDING AREA
 - SEAPLANE BASE
 - SEAPLANE BASE (SMALL)
 - SEAPLANE BASE (LARGE)
 - SEAPLANE BASE (VERY SMALL)
 - SEAPLANE BASE (VERY LARGE)
 - SEAPLANE BASE (SMALL)
 - SEAPLANE BASE (LARGE)
 - SEAPLANE BASE (VERY SMALL)
 - SEAPLANE BASE (VERY LARGE)

Hoyle, Tanner & Associates, Inc.
consulting engineers
Londonderry, New Hampshire



LETTER OF TRANSMITTAL

6.3-60

TO Agency of Environmental Conservation
Dept. of Water Resources and
Environmental Engineering
Montpelier, Vermont 05602

DATE	June 20, 1985	Q-NO	37708.48
ATTENTION	Catherine Rees		
TO	Burlington International		
RECEIVED JUN 21 1985			

GENTLEMEN,

WE ARE SENDING YOU Attached Under separate cover via _____ the following items:

Shop drawings Prints Plans Samples Specifications

Copy of letter Change order _____

COPIES	DATE	NO.	DESCRIPTION
1			Terminal Area Plan
1			General Plan

THESE ARE TRANSMITTED as checked below:

- | | | |
|--|---|---|
| <input type="checkbox"/> For approval | <input type="checkbox"/> Approved as submitted | <input type="checkbox"/> Resubmit _____ copies for approval |
| <input checked="" type="checkbox"/> For your use | <input type="checkbox"/> Approved as noted | <input type="checkbox"/> Submit _____ copies for distribution |
| <input type="checkbox"/> As requested | <input type="checkbox"/> Returned for corrections | <input type="checkbox"/> Return _____ corrected prints |
| <input checked="" type="checkbox"/> For review and comment | | |
| <input type="checkbox"/> FOR BIDS DUE _____ 19 _____ | <input type="checkbox"/> PRINTS RETURNED AFTER LOAN TO US | |

REMARKS: Catherine

Enclosed are the plans I told you about last week during our phone conversation. The General Plan shows the projects that we will be involved in. The Terminal Area Plan should give you a better idea of the projects in that area. Note that some projects are going to be designed & built this year while others will be designed this year and are tentatively scheduled for construction next year. If you have any questions, please do not hesitate to contact us.

COPY TO

SIGNED

Karen J. Pink

KAREN J. PINK, P.E.



State of Vermont

*file
Burlington Airport
Ernest*

AGENCY OF ENVIRONMENTAL CONSERVATION

Department of Fish and Game
Department of Forest, Parks, and Recreation
Department of Water Resources & Environmental Engineering
Natural Resources Conservation Council

Montpelier, Vermont 05602
Department of Water Resources
and
Environmental Engineering

September 23, 1983

Mr. Ernest Little, Director of Operations
Burlington International Airport
Box One, Airport Drive
South Burlington, Vermont 05401

Dear Mr. Little:

Enclosed are the necessary temporary permit application forms which you should complete and return to the Permits and Compliance Section at the above address. As we discussed at our meeting on September 22, 1983, a temporary pollution permit will be required for the discharge of stormwater runoff into the wetland which is considered waters of the state.

Should you have any questions, please do not hesitate to contact me at 828-3341.

Sincerely,

Chris Wagner
Permit Specialist

CW/Tc

Enclosure



State of Vermont

AGENCY OF ENVIRONMENTAL CONSERVATION

Montpelier, Vermont 05602
Department of Water Resources

Department of Fish and Game
Department of Forest, Parks, and Recreation
Department of Water Resources
Environmental Board
Division of Environmental Engineering
Division of Environmental Protection
Natural Resources Conservation Council

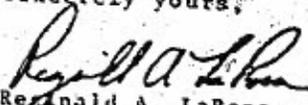
November 20, 1979

Mrs. Margaret A. Picard
City Clerk
City of South Burlington
South Burlington, VT
05401

Dear Mrs. Picard:

Enclosed are two copies of a public notice regarding the issuance of a Temporary Pollution Permit to Burlington International Airport. One of these notices is information for the local officials. Would you please post the other notice in a public place for disseminating this information to the local inhabitants. We are also sending copies of this notice to other local officials and interested persons who have asked to be included on our mailing list. We will be glad to send you additional copies if you desire or add names of interested persons to our mailing list.

Sincerely yours,


Reginald A. LaRosa
Acting Commissioner
Department of Water Resources

RAL:jnc

Encl:

November 20, 1979

TEMPORARY POLLUTION PERMIT LEGAL NOTICE

LEGAL NOTICE

Notice is hereby given in accordance with the provisions of 10 V.S.A., Section 1265 that the State of Vermont, Agency of Environmental Conservation, Department of Water Resources proposes to issue a Temporary Pollution Permit to the persons listed below for the discharge of wastes to the waters of the State. The proposed Temporary Pollution Permit will be issued for the period of time necessary to provide adequate pollution abatement facilities and will terminate on the date when the above facilities are placed in operation or upon the expiration date of the permit, whichever comes first.

<u>NAME</u>	<u>VOLUME</u>	<u>NATURE</u>	<u>LOCATION</u>	<u>RECEIVING STREAM</u>	<u>EXPIRATION DATE</u>
City of Burlington	Unspecified	*See Below	Burlington International Airport	unnamed tributary of Potash Brook	7/1/80

Written notice of objection may be filed with the Department of Water Resources, Montpelier, Vermont 05602 within thirty (30) days of the date of this letter. All objections filed within the thirty (30) day period will be considered by the Department.

Reginald A. LaRosa, P. E.
Acting Commissioner
Department of Water Resources

* Untreated discharge from roofdrains. Discharge from vehicle maintenance activity and fueling operations through floor/pit/yard drains after treatment in an oil separator, and passage through a drywell.



State of Vermont

AGENCY OF ENVIRONMENTAL CONSERVATION

Montpelier, Vermont 05602
Department of Water Resources

Department of Fish and Game
Department of Forest, Parks, and Recreation
Department of Water Resources
Environmental Board
Division of Environmental Engineering
Division of Environmental Protection
Natural Resources Conservation Council

October 30, 1979

City of Burlington
2 Burlington International Airport
South Burlington, Vermont
05401

Re: Temporary Pollution Permit
File No. 04-14-025

Gentlemen:

We are proposing to issue you the above referenced permit. A draft of this permit is enclosed for your review.

The draft permit is based on information contained in your application and requirements of State and/or Federal laws and regulations providing for the protection of water quality. If the draft permit does not correctly reflect your present operation or if you have any questions pertaining to this permit or you wish to meet with us to discuss it further, please contact us at once.

If we do not hear from you within 14 days of the date of this letter we will place the permit as drafted on the required 30-day public notice. If there is no response during this period which requires a public hearing or major permit modification, the permit will be sent to the Secretary for final approval and signature.

Very truly yours,

Willard B. Farnham, P.E.
Chief, Permits Section

STATE OF VERMONT
AGENCY OF ENVIRONMENTAL CONSERVATION
DEPARTMENT OF WATER RESOURCES

Page 1 of 3

TEMPORARY
POLLUTION PERMIT

File No. 04-14-025

Permit No. _____

In compliance with provisions of 10 V.S.A. §1265 City of Burlington

is hereby granted permission to discharge waste into the waters of the state in accordance with the "Terms and Conditions" hereinafter specified, from a facility located at Burlington International Airport South Burlington, Vermont

to receiving water named, an un-named tributary of Potash Brook

TERMS AND CONDITIONS

1. Expiration Date: July 1, 1980
2. Pollution Charges: Pollution charges may be assessed pursuant to 10 V.S.A. §1265.
3. Revocation: 10 V.S.A. §1267 provides as follows:

"The Secretary may revoke any permit issued by it pursuant to this subchapter if it finds that the permit holder submitted false or inaccurate information in his application or has violated any requirement, restriction or condition of the permit issued. Revocation shall be effective upon actual notice thereof to the permit holder."

4. Transfer of Permit: This permit is not transferable without prior written approval of the Secretary. The permittee shall notify the Secretary immediately, in writing, of any sale, lease or other transfer of ownership of the property from which the discharge originates. The permittee shall also inform the new owner or tenant of his responsibility to make application for a permit which shall be issued in his name. Any failure to so notify shall be considered a violation of this permit.

5. Manner of Discharge: Pipes to ravine leading to receiving water.
6. Wastes Permitted: 001 - Untreated discharge from roofdrains. 002 - Discharge from vehicle maintenance activity- and fueling operations through floor/pit/yard drains after treatment in an oil separator, and passage through a drywell.
7. Volumes Permitted: Such volumes as required in Item # 6 above.
8. Frequency of Discharge: Daily
9. Operation and Treatment Requirements As noted in Item # 6 above, plus inspection and cleaning of oil separator as needed to maintain its efficient operation.
10. Maintenance and Maintenance Reporting Requirements:
All catch basins, settling ponds, recharge basins or other treatment devices or facilities shall be maintained in good operating order at all times and shall be cleaned quarterly and at such other times as necessary to maintain design treatment levels. NO LATER THAN JANUARY 31 OF EACH YEAR A WRITTEN REPORT SHALL BE SUBMITTED TO THE DEPARTMENT OF WATER RESOURCES, NPDES PERMIT SECTION, MONTPELIER, VERMONT, VT 05602, PROVIDING THE DATES AND NATURE OF CLEANING OPERATIONS CARRIED OUT IN THE PRECEDING YEAR.

Paved parking lots and roads should be swept on a regular basis when seasonally practicable to minimize contaminants carried to the treatment device by runoff.

11. Personnel and Training Requirements: None

12. Monitoring and Reporting Requirements: None

13. Miscellaneous Requirements: During the period July 1, 1978 - July 1, 1980 an investigation of storm water characteristics will be carried out by the Vermont Agency of Environmental Conservation to determine the environmental effect of storm drainage to the receiving stream. During this period the permittee may be requested to furnish certain data in support of the investigation. If, prior to July 1, 1980 an acceptable method of treatment is adopted or applicable legislative changes are enacted, the permit will be amended to reflect the approved changes.

14. Issue Date of Permit: _____

AGENCY OF ENVIRONMENTAL CONSERVATION

By _____
Acting Commissioner
Department of Water Resources

Draft

STATE OF VERMONT
AGENCY OF ENVIRONMENTAL CONSERVATION
DEPARTMENT OF WATER RESOURCES

Page of

TEMPORARY
POLLUTION PERMIT

File No.

Permit No.

In compliance with provisions of 10 V.S.A. §1265

City of Burlington

is hereby granted permission to discharge waste into the waters of the state in accordance with the Terms and Conditions hereinafter specified, from a facility located at

*Burlington International Airport
South Burlington, Vt.*

to receiving water, named *an unnamed tributary of Potash Brook*

TERMS AND CONDITIONS

1. Expiration Date: *July 1 1980* ~~to be issued on a non-renewable basis.~~
2. Pollution Charges: Pollution charges may be assessed pursuant to 10 V.S.A. §1265.
3. Revocation: 10 V.S.A. §1267 provides as follows:

"The Secretary may revoke any permit issued pursuant to this subchapter if it finds that the permit holder submitted false or inaccurate information in his application or has violated any requirement, restriction or condition of the permit issued. Revocation shall be effective upon actual notice thereof to the permit holder."
4. Transfer of Permit: ~~This permit is not transferable without prior written approval of the Secretary. The permittee shall notify the Secretary immediately, in writing, of any sale, lease or other transfer of ownership of the property from which the discharge originates. The permittee shall also inform the new owner or tenant of his responsibility to make application for a permit which shall be issued in his name. Any failure to so notify shall be considered a violation of this permit.~~

5. Manner of Discharge: Pipes to ravine leading to receiving water.

6. Wastes Permitted: 001 - Untreated discharge from roof drains.
002 - Discharge from vehicle maintenance activity and sucking operations through floor/sit/yard drains after treatment in an oil separator and passage through a drywell.

7. Volumes Permitted: Such volumes as required in item #6 above.

8. Frequency of Discharge: Daily.

9. Operation and Treatment Requirements As noted in item #6 above, plus inspection and cleaning of oil separator as needed to maintain its efficient operation.

10. Maintenance and Maintenance Reporting Requirements:
All catch basins, settling ponds, recharge basins or other treatment devices or facilities shall be maintained in good operating order at all times and shall be cleaned quarterly and at such other times as necessary to maintain design treatment levels. NO LATER THAN JANUARY 31 OF EACH YEAR A WRITTEN REPORT SHALL BE SUBMITTED TO THE DEPARTMENT OF WATER RESOURCES, NPDES PERMIT SECTION, MONTPELIER, VERMONT, VT 05602, PROVIDING THE DATES AND NATURE OF CLEANING OPERATIONS CARRIED OUT IN THE PRECEDING YEAR.

Paved parking lots and roads should be swept on a regular basis when seasonally practicable to minimize contaminants carried to the treatment device by runoff.

11. Personnel and Training Requirements: *None*

12. Monitoring and Reporting Requirements: *See C*

13. Miscellaneous Requirements: During the period July 1, 1978 -- July 1, 1980 an investigation of storm water characteristics will be carried out by the Vermont Agency of Environmental Conservation to determine the environmental effect of storm drainage to the receiving stream. During this period the permittee may be requested to furnish certain data in support of the investigation. If, prior to July 1, 1980 an acceptable method of treatment is adopted or applicable legislative changes are enacted, the permit will be amended to reflect the approved changes.

14. Issue Date of Permit: _____

AGENCY OF ENVIRONMENTAL CONSERVATION

By _____

TO: Water Quality Division/Engineering Division

FROM: Permits Section

DATE: 9-28-79

File No. 04-14-025

SUBJECT: Review and Comment Burlington Int'l Airport - Sewer Eject. Garage
TPI for Stormwater (roof drains) and discharge
from floor/pot/yard drains.

REMARKS

Permits Section Draft permit attached.

Water Quality Division 26 Oct 79 OK - Add
REQUIREMENT FOR INSPECTING & CLEANING ALL SEWERAGE

Engineering Division 31 Oct 79 WCB OK

WIEMANN - LAMPHERE ARCHITECTS

346 SHELBURNE STREET BURLINGTON, VERMONT 05401 TELEPHONE (802) 863-5096

RICHARD H. WIEMANN A.I.A.
JAMES A. LAMPHERE A.I.A.

September 14, 1979

RECEIVED

SEP 18 1979

ENVIRONMENTAL
ENGINEERING DIVISION

Mr. Millard B. Farnham, Chief
Permits Section
Department of Water Resources
Agency of Environmental Conservation
Montpelier, Vermont 05602

Re: Burlington International Airport
Snow Equipment Garage
File No. 7852

Dear Mr. Farnham:

On behalf of the Burlington International Airport, we are hereby submitting:

1. Drawing No. 2
2. Drawing No. M-1
3. Application for Temporary Pollution Permit
4. Application fee of \$20.00
5. Site Location Map

As you suggested during our recent informal review, a drywell has been added after the oil separator, and the drywell capacity has been sized to accommodate one inch of rain on the 25' x 32' concrete apron. More than likely, there will be no discharge from the drywell overflow since the site is principally sand.

The roof leader discharge is straight-forward; it will be confined to an existing "ravine" that eventually leads to Potash Brook.

Drainage from the paved apron around the building will not be directed to any particular area, but will sheet-flow into the surrounding sand. This apron is not designated parking, as it is intended principally to provide access and turn-around capability for the large vehicles using the garage.

Mr. Willard B. Farnham, Chief
September 14, 1979
Page 2

Should you have any technical questions on the enclosed material, please feel free to call me at your convenience.

Sincerely yours,

WIEMANN-LAMPHERE ARCHITECTS



Douglas R. FitzPatrick

DRF/cd

Enclosures

cc: Mr. Thomas Schmidt

STATE OF VERMONT
 AGENCY OF ENVIRONMENTAL CONSERVATION
 DEPARTMENT OF WATER RESOURCES

T APPLICATION FOR PERMIT TO DISCHARGE WASTES

Chapter 47 of Title 10 V.S.A.

Date September 4, 1979

SCHEDULE 1 - TEMPORARY POLLUTION PERMITS AND TEMPORARY PRETREATMENT PERMITS

Applicant City of Burlington

Activity Maintenance Garage

Explain below why the discharge being considered for a Temporary Pollution Permit or Temporary Pretreatment Permit meet the eight criteria provided by 10 V.S.A. §1265 (c) (listed below):

"After consideration of the applications, any additional information and all written comments submitted, and the record of any public hearings, the Secretary shall grant or deny a temporary pollution permit. No such permit shall be granted by the Secretary unless he affirmatively finds:

- (1) the proposed discharge does not qualify for a discharge permit;
- (2) the applicant is constructing, installing or placing into operation or has submitted plans and reasonable schedules for the construction, installation or operation of an approved pollution abatement facility or alternate waste disposal system, or that the applicant has a waste for which no feasible and acceptable method of treatment or disposal is known or recognized, but he is making a bona fide effort through research and other means to discover and implement such a method;
- (3) the applicant needs permission to pollute the waters of the state for a period of time after July 1, 1971 necessary to complete research, planning, construction, installation or the operation of an approved and acceptable pollution abatement facility or alternate waste disposal system;
- (4) there is no present, reasonable, alternative means of disposing of the waste other than by discharging it into the waters of the state;
- (5) the denial of a temporary pollution permit would work an extreme hardship upon the applicant;
- (6) the granting of a temporary pollution permit will result in some public benefit;
- (7) the discharge will not be unreasonably destructive to the quality of the receiving waters;
- (8) the proposed discharge will not violate any applicable provisions of federal laws or regulations."

1. The State of Vermont does not presently issue discharge permits.
2. The discharge containing potential pollutants from vehicle maintenance activity and fueling operations will receive treatment in an oil separator, and will be contained a majority of the time (1 inch rainfall) in a drywell. The oil separator device should be checked semi-annually and cleaned annually.

CONTINUED ON REVERSE SIDE

STATE OF VERMONT
AGENCY OF ENVIRONMENTAL CONSERVATION
DEPARTMENT OF WATER RESOURCES

APPLICATION FOR PERMIT TO DISCHARGE WASTES

4/20
2/18/79

Chapter 47 of Title 10 V.S.A.

1. Applicant City of Burlington Legal Entity Municipality
2. Mailing Address c/o Burlington International Airport, South Burlington, Vermont
3. Contact Nicmann-Lamphere, Architects Telephone 864-5711
4. Name of Activity Snow Equipment Garage Location Burlington Int'l Airport
5. Type of Activity Storage/Maintenance Garage
6. Nature of Wastes Sanitary Industrial Commercial Drainage Other
(Describe) Storm and Building Floor Drains
7. Receiving Water Unnamed tributary to Potash Brook
8. Status of Discharge Proposed Existing (Permit No. _____)
9. The applicant hereby applies for a
 Discharge Permit Temporary Pollution Permit Emergency Pollution Permit
 Pretreatment Discharge Permit Pretreatment Temporary Pollution Permit
to discharge wastes, directly or indirectly, into waters of the State
from the above named activity as described in this application, its
attached schedule(s), plans and specifications.
10. Application is for Original Permit Permit Renewal If this is for a permit
renewal, is original application still valid in all respects? If not,
attach new schedule(s) for major changes. Minor changes may be documented by letter.
11. Enter below, using a separate serial number (S/N), to identify each independent
discharge which will result from the activity described in Item 4. Attach
separate schedule for each discharge identified below.

S/N	001 <u>Roof Drain</u>	004 _____
	002 <u>Floor/Pit/Yard Drains</u>	005 _____
	003 _____	006 _____
12. Application Fee Enclosed \$ 20.00 Date of application _____
13. Name of Authorized Representative (See INSTRUCTIONS).

Thomas Schmidt Director of Aviation
TYPE or PRINT NAME TITLE

Thomas W. Schmidt
SIGNATURE

- INSTRUCTIONS ON REVERSE -

STATE OF VERMONT
AGENCY OF ENVIRONMENTAL CONSERVATION
DEPARTMENT OF WATER RESOURCES

D APPLICATION FOR PERMIT TO DISCHARGE WASTES

SCHEDULE D - DRAINAGE DISCHARGES

Date September 14, 1979

D-1 Applicant City of Burlington Activity Maintenance Garage
D-2 Discharge S/N 001 Designation Roof Leader
D-3 Exact location on receiving water (describe and locate on map) Unnamed tributary to Potash Brook
D-4 How are wastes conveyed to receiving water? Pipe
D-5 Type of Discharge

STORMWATER

Source and Drainage Area (in acres): Paved Roads A. Unpaved Roads A.

Paved Parking Lots A. Unpaved Parking Lots A. Roofs 0.19 A.

Natural Terrain A. Total 0.19 A.

Design Criteria: Rainfall Intensity 6 in/hr. Rainfall Duration 5 min ~~XX%~~

Return Frequency 25 yrs. Coefficient 0.90 Peak Runoff Rate 0.91 CFS

Treatment: None Catch Basin or Settling Basin with Submerged Outlet

Detention Pond: Area A. Volume CF Depth Ft.

Detention Time hrs. and Peak Discharge CFS for design storm

Outlet structure(s)

Recharge Basin: Area A. Max. Volume CF Max. Depth Ft.

Inches rainfall stored in. Exfiltration Rate CF/hr.

Other (describe)

GROUNDWATER AND RETURN FLOWS

Source: Foundation Drain Curtain Drain Spring Well Mine Quarry

Pond Water Wheel or Turbine Filter Backwash

Discharge: Est. discharge CFS Frequency and duration

Pumping required? Contaminants present

Treatment:

D-6 Additional Information

INSTRUCTIONS ON REVERSE

STATE OF VERMONT
AGENCY OF ENVIRONMENTAL CONSERVATION
DEPARTMENT OF WATER RESOURCES

D APPLICATION FOR PERMIT TO DISCHARGE WASTES

SCHEDULE D - DRAINAGE DISCHARGES

Date September 4, 1979

D-1 Applicant City of Burlington Activity Main Garage

D-2 Discharge S/N 002 Designation Floor/Pit/Yard Drains

D-3 Exact location on receiving water (describe and locate on map) Unnamed tributary to Potash Brook

D-4 How are wastes conveyed to receiving water? Pipe

D-5 Type of Discharge

STORMWATER

Source and Drainage Area (in acres): Paved Roads A. Unpaved Roads A.

Paved Parking Lots A. Unpaved Parking Lots A. Roofs A.

Natural Terrain A. Concrete Apron = 0.02 A. Total A.

Design Criteria: Rainfall Intensity 6 in/hr. Rainfall Duration 5 min

Return Frequency 25 yrs. Coefficient 0.9 Peak Runoff Rate 0.11 CFS

Treatment: None Catch Basin or Settling Basin with Submerged Outlet

Detention Pond: Area A. Volume CF Depth Ft.

Detention Time hrs. and Peak Discharge CFS for design storm

Outlet structure(s)

Recharge Basin: Area A. Max. Volume CF Max. Depth Ft.

Inches rainfall stored in. Exfiltration Rate CF/hr.

Other (describe) 1,500 gallon oil separator and 600 gallon drywell

GROUNDWATER AND RETURN FLOWS

Source: Foundation Drain Curtain Drain Spring Well Mine Quarry

Pond Water Wheel or Turbine Filter Backwash

Discharge: Est. discharge CFS Frequency and duration

Pumping required? Contaminants present

Treatment:

D-6 Additional Information

INSTRUCTIONS ON REVERSE

FORM WR-82D (7/78)

SECTION 4

STORMWATER SYSTEM MAPPING

4.1 DATA COLLECTION

Donald L. Hamlin Consulting Engineering, Inc. developed stormwater system mapping for the Burlington International Airport in a 1997 study performed under AIP 3-0005-50-25. The Hamlin drainage system mapping serves as the basis for the update developed in the current study.

The updated mapping includes the Vermont Air National Guard Base's drainage system that was absent from the Hamlin study. It also includes the following Burlington Airport projects constructed since the 1997 study was completed:

- Terminal Roadway and Parking Project (Parking Garage Expansion) - designed by Freeman, French, Freeman and Dufresne-Henry; plans dated February 7, 2003.
- North Apron Expansion (Main Terminal) - designed by Edwards and Kelcey; plans dated October 12, 2001.
- South Apron Expansion (Main Terminal) - designed by Edwards and Kelcey; plans dated August 18, 1999.
- Aviatron Building Site - designed by Webster-Martin, plans dated January 1997.
- Airport Parking Expansion (Original Parking Garage) - designed by Freeman, French, Freeman and Webster-Martin, Inc; plans dated March 14, 1997.
- Pratt & Whitney Building Site and Access Roadway - designed by Webster-Martin, Inc.; plans dated September 5, 1996.
- Runway Safety Area Extension, northwest end of Runway 15 / 33 –designed by HTA; plans not obtained.

Following compilation of drainage system mapping, Dufresne-Henry inspectors field checked the drainage system layout. The procedure involved comparing the location drainage structures and outlets with plans from the Hamlin study, Air Guard Base and recent construction projects. Working field drawings and notes were used to track the inspector's findings. These were reviewed in the office and adjustments made on the updated mapping to reflect current conditions. A detailed memo is provided at the end of this section documenting findings at the Air Guard Base.

4.2 MAPING PRESENTATION

The Airport Storm Drainage System plans are presented in this at the end of this section on three, 1" = 200' scale sheets. They depict the location of drainage structure, system outfalls, culverts and treatment areas. Drainage collection systems carry the same letter designations used in the original Hamlin mapping and are color coded for quick identification, (e.g. "D" series system covering the southeast end of Runway 33 / 15 is colored yellow). The mapping also denotes permit numbers for applicable outlet locations, as well as sampling locations used in Pioneer Environmental's monitoring program discussed in Section 5.

The Storm Drainage System plans are a compilation of CAD drawings provided by the Vermont Air Guard and Burlington Airport for the Hamlin study, recent projects listed above, and Vermont Air Guard Base drainage system. October 2003 photometric base mapping developed by Air Survey, Dulles Virginia (provided to Dufresne-Henry by Campbell & Paris Engineers) is used as the background.



Memorandum

Creating Better Places To Live, Work And Play

To: Jon Leinwohl, Scott Rogers, Ken Napiorkowski
From: Dwight Harrington
Date: 18 November 2002
Subject: Stormwater Structure Survey, VT Air National Guard

1. Drawing 4:

This plan shows drainage structures between the aircraft area on the base and the main runway. The plan is confusing with both the Hamlin and the VTANG drainage plans on it. Working from west to east, I checked for Basin B032 supposedly located near the entry onto Echo taxiway. This structure supposedly takes some flow from the BIAP side of the field. I did not find the structure as shown on the plan. The pavement and concrete ramp are as shown on the drawing. At the point where B032 is supposed to be is a piece of recently installed security equipment. Other work in the area also included a new light pole. Lieutenant Colonel Joel Clark, Base Civil Engineer stated the structure has not been found to his knowledge. Even the last time the drainage system had been cleaned and a video camera used to view the pipes, this structure had not been found. The nearby Catch Basin CB60 is in the proper location and as shown on the drawing and is in poor condition with crumbling brickwork at the bottom.

There is a structure within the paved access drive at the windsock. The structure is in good condition and there is a 12 inch Corrugated Galvanized Metal Pipe (CGMP) that points towards the runway. I did not go farther out towards the runway. Ken Napiorkowski may find the end of this pipe at B037 on the edge of Runway 15 – 33.

The structures along the edge of the refueling area are in good condition except the pipe at B026 is silted in to about 1/3 way up the pipe.

There is a structure marked "STORM" located between CB36 and CB25. I opened this cover and found it is probably not part of the system. It is flooded and loaded with cables, wires, etc. inside.

Structure C010 does not exist as shown on the plan. Nothing is apparent at the corner (inside or out) of this building.

The inlets aprons at the two culverts that connect to Drainage Manhole DMH5 need to have the leaves, etc. removed from them but otherwise are in good condition. Adjacent to DMH5, just to the west, is a structure not shown on the map. I have sketched this as "DH-6" and have added a location sketch to Drawing 4. This structure services the roof drain system of the LOX area. An 8 inch pipe leads from the structure

to the 27 inch culvert leaving DMH5. The pipes come together just downstream of DMH5 and this intersection looks like it is in good condition.

2. Drawing 5:

This plan is also confusing with both sets of pipes from the two surveys shown. Continuing from DMH5, I followed the pipes around the hangars. DMH3 could not be found. This area has new pavement and perhaps the solid cover has been paved over. DMH2 could not be opened as the pavement held the cover down. CB 16 is in good condition but I could not find DMH1. This is in an area where the lawn has been regarded and seeded. This cover could have been buried as well.

Beginning at CB21 and moving towards CB14, many changes have been made. A new building has been built and resulted in rearrangement of the piping. I have distances to locate what I have called DH-1, DH-2, DH-3, DH-4, DH-5, DH-7, DH-8, and DH-9. I could not sketch DH-2, DH-3, DH-4, or DH-5 as the building contractor still has filter fabric in place to prevent silt from entering the system. I am sure as-built information will be available on these structures. The other new drainage structures are in use and sketches have been made.

It is possible the labels for CB11 and CB11C have been switched on the plan map. If you follow the small drawings of each structure, it makes more sense to show 11C where 11 is currently shown. I followed the map down Falcon Street towards CB1. CB8 could not be opened, the others are in good condition and as shown on the map. CB1 is outside the fence and has been welded shut. CB3 through CB7 are in good condition and as shown. The discharge is a 15 inch SDR 35 PVC pipe with galvanized apron.

I checked the five dry wells in the munitions area. Moving clockwise from the southwest dry well, which is in good condition, the next is actually a catch basin and an 18 inch CMP leads to an end section near the fence. The next two dry wells are in good condition but the last still has the filter fabric beneath the rim. I mentioned this to one of the state employees and he told me he had always wondered why that one never worked correctly.

More investigation is needed in the area of CB34. The map shows an inlet on the easterly side of the structure but I did not see one in the field. The sketches provided by the Guard indicate that CB33 and CB34 are not connected as shown on the drawing. The area in the vicinity of Building 120 needed to be confirmed and no changes have been made during construction. CB33 back to CB12 appears to be correct.

The area near the tank farm is confusing with both surveys on the map and there has been a lot of re-working of the grade inside the fence. The areas contain many monitor wells, access hatches, sanitary sewer manholes, and other subsurface structures. The structures CAMH1 and CAMH2 are underwater and located in the

bottom of two containment berms that surround the tanks. Each has a post indicator valve in the line and flexible hoses leading to an open swale that parallels National Guard Road. A member of the state maintenance staff showed me the location of these two flexible hoses. CB53 flows to DMH7. The outlet of DMH7 cannot be visually inspected. CB54 flows to DMH7 as well. CB55 flows to DMH8 and the outlet cannot be visually inspected either.

The tank farm sits at the bottom of a very steep bank. I began tracing a line above at CB50 near Building 110. I followed the line as shown and found a new catch basin that leads into CB51B. I have made a sketch of the structure. The main line probably flows down into CB53 and passes CB52A as shown.

Further west, I began in the middle of a run at CB61. I followed the line towards MH13 but could not find it. I probed the ground a bit in the area where it is shown but nothing could be found. CB57 was okay but DMH11 is outside the base. This cover is also welded shut. I did find CB56 on the fence line and a 36 inch CGMP culvert exits into the same swale parallel to National Guard Road that the containment areas exit to.

The fuel loading area is a series of concrete pads. Each pad has a drain at the center low point. The fuel superintendent told me they are all connected to an oil water separator located adjacent to the fuel's office building. The size of the separator is approximately 12,000 gallons.

Adjacent to the fence around the tank farm and beside the octagonal Salt Shed is a new line. The 12" SDR 35 PVC comes from a catch basin near the parking lot for Building 170 on the plateau above. The purpose of the catch basin is to protect the slope behind the Salt Shed.

My field work continued on Tuesday, 26 November. I continued where I had left off and began following the map in the area of the Fire Station and the Supply Building. Basically, the structures are as shown on the plan in the area of the Fire Station. Conditions are as shown at the Supply Building are generally as shown with the exception of the manhole on the west corner. The manhole has a cover marked "Sewer" but after I removed the lid, I found it to be stormwater. Missing from the map are pipe inlets at the sides east and west sides of the structure; these being 15 inch HDPE culverts running parallel to the base access road. On the east side, the pipe can be traced back to an inlet apron farther down the parking lot. The pipe on the west side could not be followed to an end.

I left the base and parked on the National Guard Road. From this point I was able to reach the discharge points from the structures that flow off the base or at least on the outside of the fence. The first discharge I found turned out to be from a catch basin not on the map. I did a sketch and added the location to the map.

I walked around the bank to the discharge point from the westerly leg of the drainage near the Supply Building. The flow travels from an apron a short distance to a detention pond. The outlet structure is on the map but the edges of the pond are not. I

estimated the current water level of the pond to be about 4 feet lower than the top of the outlet structure. The structure is a 4 foot diameter precast manhole with a flat cover. The 2 foot diameter manway where a frame and cover would normally sit serves as the overflow. An aluminum finned cap sits over the opening. The overflow pipe comes out from beneath the bank below as a 12 inch SDR 35 PVC pipe and apron. From there, the flow enters into the large swale that serves all the discharge points in the area.

The larger swale has a flat bottom and is in reasonable condition. I followed it up to the point where two outfalls are shown on the map. The easterly pipe (from CB64) is an 18 inch CMP. The westerly pipe (from CB67) is a newer 18 inch HDPE. The direction of the pipe does not seem to point to CB67 as shown on the map. I searched the area the culvert apparently came from but found no additional structures in the vicinity. It almost appeared that if you extend the missing pipe from the manhole in front of supply and the newer 18 inch HDPE, there might be a buried drainage manhole not shown on the plans.

I followed the swale back down the slope to the National Guard Road. At the south side of the road, there is a swampy area. Flows disappear into the ground into an area covered over with sticks and leaves. On the other side of the road there is an 18 inch HDPE discharge. The flow joins other surface flow and proceeds away from the site and moves towards a nearby subdivision.

While outside the fence, I visited the location of DMH11. It is outside the fence and the cover has been welded shut. I continued down the road to CB1 at the intersection of the base access road and National Guard Road. This cover has been welded shut as well. The structure is a large rectangular tank rather than a manhole. One entry into the tank is from DMH14. A pair of 30 inch CMP's pass under the access road and enter the tank as well. These two culverts are protected by a concrete headwall and reinforcing bar trash rack. From there, two – 36 inch concrete pipes form the final discharge of the system in this area. The pipes are about half submerged today (26 November) and there are two sections of chain link fence in front of the pipes. This would be the sampling point shown on the Pioneer Environmental plan and is accessible without going on base.

Upstream from the two – 30 inch CMP's is an open ditch. The two pipes are inside the base fence as is the ditch. At the top of the ditch is a 36 inch CMP, about one third filled in, that comes from CB56 inside the tank farm. If Pioneer wants to sample this point as well, they will have to be escorted on base each time. There is about 275 feet of ditch between the 36 inch CMP and the two – 30 inch pipes.

3. Drawing 7:

I drove down the Foxtrot taxiway to verify the structures as shown on the plans. For the most part, the structures are in good condition. A few have sand and

vegetation collecting in various locations on the concrete apron that surrounds the rim. The exception is A002, the concrete apron is in poor shape and vegetation covers the grate. (I removed most of it while inspecting the interior.) All the structures on Foxtrot appear to be functioning. I did find an 8" flush line (not shown on the plan) that enters T004 from a location beyond Foxtrot as it turns southerly towards the main runway. Two of the structures are in different locations than shown. I have included measurements to relocate T003 and T005 near the Arm/De-arm area.

4. Drawing 12:

I used this plan as I walked down the Delta taxiway. No structures are shown on the plan and no others were found as I walked. I did stop and check D008 that is shown as the most northeasterly structure on the Guard side of the runway. All other drainage appears to be sheet flow along the site and none of the ditches and swales had structures in them.

Shown on the plan is the location of the "South Barrier." In conversations with Mr. Paul Irvine, superintendent of the state work force on the base, he pointed out this area to have the biggest problems as far of storm drainage is concerned. Operations personnel on the civilian side of the field are also aware of the problem. Apparently the area floods with spring runoff and will flow into the barrier pits causing much damage to the equipment. The VTANG personnel spend many hours keeping the snow away from the pits to limit runoff and prevent damage. The problem has been going on for many years. More details can be provided by Mr. Irvine.

5. Drawing 13:

This plan shows the four outlet points that flow under National Guard Road (formerly the Poor Farm Road.) The four appear to be shown along the road in the approximate locations. Beginning at the westerly discharge point, there is a 24 inch corrugated metal pipe (CMP) and a concrete headwall. I measured up the dimensions of the concrete structure. This headwall is about 150 feet from the edge of the road and 30 feet below the pavement. The next two discharge points are new and have two HDPE culverts at each point. These points are only about 25 feet from the edge of the road and 12 to 15 feet below the pavement. The pipes may have been updated when National Guard Road was reconstructed a few years back. The last outlet (closest to the intersection with Shamrock Road) is in bad shape. The concrete headwall is completely hidden by vines and other vegetation. The back of the wall has been washed out and a deep hole is just behind (on the road side) the wall. No pipe is visible and the water too deep to get in and measure up the structure. Snow obscured the overall view of the structure. I have sketched the first three outlets I found.

6. Summary:

I managed to visit most of the features shown on the map except as noted above. The information by the Air National Guard more accurately portrays the

stormdrain system than the Hamlin work and they have a very good handle on their system. I added the features overlooked by them when they did their last survey.

Without going into the structures, it was very difficult to verify what was in each one, especially in the larger, deeper structures. Sometimes pulling the covers helped but sometimes it did not. The most difficult area is in the tank farm.

Please let me know if there are areas you would like more details on and I will attempt to get answers either through field inspection or conversations with the state staff.



SAMPLE LOCATION
Q001A
 PERMIT NO 1-1580
 PERMIT NO 1-0839
 PERMIT NO 3-9010

SAMPLE LOCATION
Q001B
 ATTENUATION
 BASIN

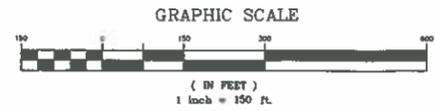


NOTE:
 DRAINAGE COLLECTION SYSTEMS TYPICALLY CARRY THE SAME LETTER DESIGNATIONS AS THE ORIGINAL HAMLIN MAPPING AND ARE COLOR CODED



BASE MAP INFORMATION
 THIS MAP COMPILED BY: AIR SURVEY
 45180 BUSINESS COURT
 DULLES, VIRGINIA 20166-6706

- DASHED CONTOURS INDICATE THAT GROUND IS PARTIALLY OBSCURED BY VEGETATION OR SHADOWS. THESE AREAS MAY NOT MEET STANDARD ACCURACY AND REQUIRE FIELD TESTING/COMPLETION. BLANK AREAS ARE TOTALLY OBSCURED BY VEGETATION OR SHADOWS.
- THIS MAPPING HAS BEEN COMPILED IN ACCORDANCE WITH PROCEDURES THAT HAVE BEEN DEMONSTRATED TO COMPLY WITH THE NATIONAL STANDARD FOR SPATIAL DATA ACCURACY (NSSDA), FOR A TARGET HORIZONTAL MAPPING SCALE OF 1" = 200' AND A SPECIFIED CONTOUR INTERVAL OF 5 FEET.
- THIS MAP COMPILED BY PHOTOGRAMMETRIC METHODS FROM AERIAL PHOTOGRAPHY DATED 10-10-03. GRID BASED ON VERMONT STATE PLANE COORDINATE SYSTEM NAD 1983. VERTICAL DATUM BASED ON NAVD 1988.

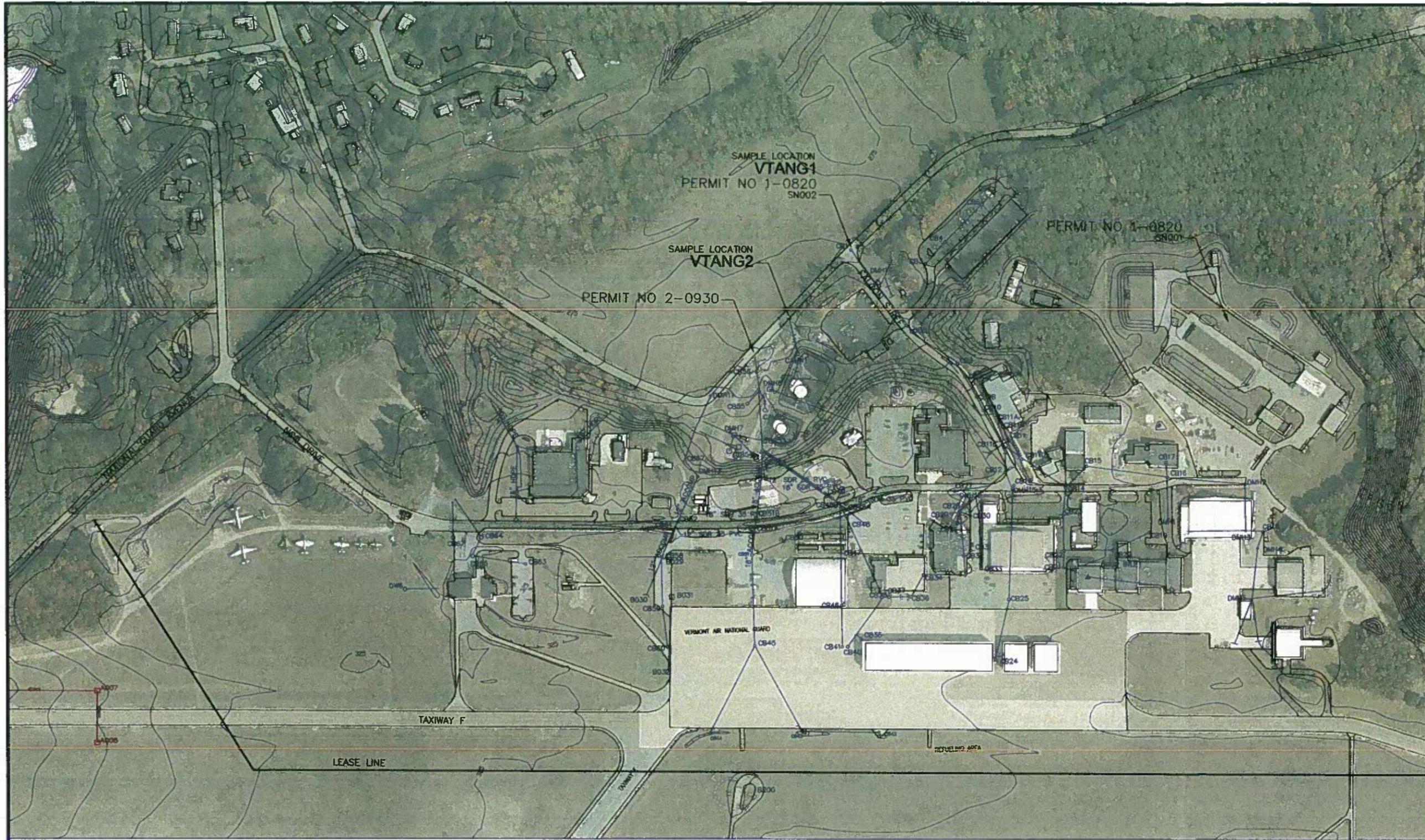


NOTE:
 THE DRAINAGE SYSTEM MAPPING SHOWN ON THIS DRAWING WAS ORIGINALLY PREPARED IN 1997 BY DONALD L. HAMLIN CONSULTING ENGINEERS, INC. THE HAMLIN DRAINAGE SYSTEM MAPPING WAS UPDATED BY DUFRESNE-HENRY TO REFLECT NEW IMPROVEMENT PROJECTS COMPLETED THROUGH JUNE 2004. THE UPDATED MAPPING ALSO INCLUDES DRAINAGE SYSTEM INFORMATION PROVIDED BY THE VERMONT AIR NATIONAL GUARD IN OCTOBER 2002.

LEGEND

	DRAINAGE STRUCTURE
	STORM DRAIN PIPE
	PERFORATED STORM DRAIN PIPE FOR DISCHARGE TO GROUND WATER
	CULVERT
	CONTOUR LINE
	SAMPLE LOCATION
	PROPERTY LINE

 Dufresne-Henry		55 GREEN MOUNTAIN DRIVE SOUTH BURLINGTON, VERMONT 05407 VOICE: 802-864-0223 FAX: 802-864-0165 Email: burl@dufresne-henry.com	
DESIGNED BY: ---	DRAWN BY: JSK	CHECKED BY: JBL	APPROVED BY: ---
DATE: 09/15/05	SCALE: 1" = 150'	DH JOB #: 6320002	FILE NAME: ---
BY: APPR. ---	REVISIONS:	NO. DATE	
BURLINGTON INTERNATIONAL AIRPORT SOUTH BURLINGTON, VERMONT		STORM DRAINAGE SYSTEM	
		A.I.P. PROJECT NO.	
		SHEET NO.	
		1 OF 5	



DH
Dufresne-Henry

25 GREEN MOUNTAIN DRIVE
SOUTH BURLINGTON, VERMONT 05407
PHONE: 802-864-2123
FAX: 802-864-0165
email: abur@dufresne-henry.com

DESIGNED BY: JSK
DRAWN BY: JSK
CHECKED BY: JBL
APPROVED BY: ---

DATE: 09/15/05
SCALE: 1" = 150'
JOB #: 6320002
FILE NAME: ---

NO.	DATE	REVISIONS	BY	APPR.

BURLINGTON INTERNATIONAL AIRPORT
SOUTH BURLINGTON, VERMONT

STORM DRAINAGE SYSTEM

A.I.P. PROJECT NO. ---

SHEET NO.
2
OF
5

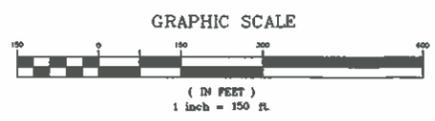


NOTE:
DRAINAGE COLLECTION SYSTEMS TYPICALLY CARRY THE SAME LETTER DESIGNATIONS AS THE ORIGINAL HAMLIN MAPPING AND ARE COLOR CODED



BASE MAP INFORMATION
THIS MAP COMPILED BY: AIR SURVEY
45180 BUSINESS COURT
DULLES, VIRGINIA 20166-6706

- DASHED CONTOURS INDICATE THAT GROUND IS PARTIALLY OBSCURED BY VEGETATION OR SHADOWS. THESE AREAS MAY NOT MEET STANDARD ACCURACY AND REQUIRE FIELD TESTING/COMPLETION. BLANK AREAS ARE TOTALLY OBSCURED BY VEGETATION OR SHADOWS.
- THIS MAPPING HAS BEEN COMPILED IN ACCORDANCE WITH PROCEDURES THAT HAVE BEEN DEMONSTRATED TO COMPLY WITH THE NATIONAL STANDARD FOR SPATIAL DATA ACCURACY (NSSDA), FOR A TARGET HORIZONTAL MAPPING SCALE OF 1" = 200' AND A SPECIFIED CONTOUR INTERVAL OF 5 FEET.
- THIS MAP COMPILED BY PHOTOGAMMETRIC METHODS FROM AERIAL PHOTOGRAPHY DATED 10-10-03. GRID BASED ON VERMONT STATE PLANE COORDINATE SYSTEM NAD 1983. VERTICAL DATUM BASED ON NAVD 1988.



NOTE:
THE DRAINAGE SYSTEM MAPPING SHOWN ON THIS DRAWING WAS ORIGINALLY PREPARED IN 1997 BY DONALD L. HAMLIN CONSULTING ENGINEERS, INC. THE HAMLIN DRAINAGE SYSTEM MAPPING WAS UPDATED BY DUFRESNE-HENRY TO REFLECT NEW IMPROVEMENT PROJECTS COMPLETED THROUGH JUNE 2004. THE UPDATED MAPPING ALSO INCLUDES DRAINAGE SYSTEM INFORMATION PROVIDED BY THE VERMONT AIR NATIONAL GUARD IN OCTOBER 2002.

LEGEND

- DRAINAGE STRUCTURE
- STORM DRAIN PIPE
- PERFORATED STORM DRAIN PIPE FOR DISCHARGE TO GROUND WATER
- CULVERT
- CONTOUR LINE
- SAMPLE LOCATION P005
- PROPERTY LINE

SECTION 5

STORMWATER MONITORING PROGRAM

EXECUTIVE SUMMARY: Description and Findings of the monitoring/testing program

A water quality monitoring program was undertaken by Pioneer to evaluate existing stormwater discharges from Burlington International Airport. The study was undertaken from December 2002 through December 2003, and involved base flow and wet weather/storm event-based sampling. A total of ten individual sampling locations were designated at the various discharge points. Discharges sampled during the study included those occurring to Muddy Brook (Stations D018, K001, M001, Z017), a tributary to Potash Brook (Stations P001, P005), and tributaries to the Winooski River (Stations Q001A, Q001B, VTANG1, VTANG2). Sampling and analysis was conducted for hydrocarbons, trace metals, pathogens, sediment, nutrients, and deicing products (urea, glycol). A total of three wet weather sampling events were conducted, representing fall/winter, spring, and summer. A second winter sampling event was conducted at the north end discharge point (sampling locations Q001A and Q001B) to evaluate discharge of deicing fluids. Dry weather sampling occurred during the fall/winter and summer.

The most significant result of the sampling program was the identification of deicing compounds or decay products at the north end outfall (Q001A and B) discharge to a tributary of the Winooski River during the winter wet weather sampling event (December 2003). Elevated levels of propylene glycol, BOD₅, COD were found, and attributed to a failure of the existing aircraft deicing pump system which directs aircraft deicing fluid to the South Burlington Airport Parkway WWTF. The airport implemented a temporary collection system for the remainder of the 2003-2004 winter season and is currently evaluating long term treatment and disposal options.

At various sampling locations, elevated levels of ammonia nitrogen compounds (as indicated by TKN) were noted during certain sampling events. These values are likely due to the use of urea as a surface deicer on runways and taxiways. The airport plans to discontinue use of urea during winter 2004-2005. Otherwise, the sampling results generally indicated slightly elevated levels of metals, sediment (turbidity, TSS), nutrient (phosphorus) and pathogens from the sampled discharge points. These values were generally consistent with, and on the low end of the range of values typically observed from stormwater runoff from impervious surfaces. No significant detections of hydrocarbons, as indicated by VOC sampling, was found at any of the sampling locations.

BURLINGTON INTERNATIONAL AIRPORT
South Burlington, Vermont

WATER QUALITY MONITORING RESULTS
FOR STORMWATER DISCHARGES

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BURLINGTON INTERNATIONAL AIRPORT
South Burlington, Vermont

WATER QUALITY MONITORING RESULTS
FOR STORMWATER DISCHARGES

1.0 INTRODUCTION

Pioneer Environmental Associates, LLC. (Pioneer) has completed a stormwater discharge monitoring study at the Burlington International Airport in accordance with the Burlington International Airport Stormwater Discharges Monitoring Proposal, dated January 22, 2002, prepared by Pioneer. This report provides complete details and results for the stormwater monitoring study, which occurred from December 2002 to December 2003.

1.1 Project Overview

Pioneer developed and implemented the stormwater monitoring program to meet the following objectives:

1. Identify stormwater outfalls that have high concentrations of pollutants
2. Quantify flow from selected stormwater outfalls

3. Determine if the airport is a "significant contributor" to existing water quality conditions in streams identified as being impaired by the Vermont Agency of Natural Resources (ANR)
4. Identify untreated discharges (any discharge that is not composed entirely of stormwater) as part of the Phase II National Pollutant Discharge Elimination System (NPDES) stormwater permitting process
5. Collect data to aid in the development of an action plan to address and remediate areas where existing water quality impacts or untreated discharges from stormwater runoff are identified at Burlington International Airport.

1.2 Description of Stormwater Runoff Collection Areas

Discharges of stormwater runoff from the Burlington International Airport occur to:

- tributaries of the Winooski River
- a tributary of Potash Brook
- Muddy Brook

Both Potash Brook and Muddy Brook are streams that have been designated as not meeting the Vermont Water Quality Standards (VWQS) by the ANR, and thus, both water bodies are included on the 2004 303(d) listing of impaired waters (VANR 2004). Potash Brook is listed as impaired from its mouth to a distance of five miles upstream. The lower seven miles of Muddy Brook are listed by the ANR as being impaired. Unnamed tributaries of the Winooski River, located within the vicinity of the Burlington International Airport, have not been evaluated and reported by ANR as of September 2004, to determine if they are currently impaired. This evaluation may occur at some point in the future,

potentially making use of the water quality data collected for these tributaries during this study. Because of the large dilution factor, water quality in the main stem of the Winooski River has not been monitored as part of this stormwater monitoring study.

The monitoring network has been designed to examine water quality within major stormwater runoff collection areas (collection areas) at the Burlington International Airport. Table 1 provides details for the seven collection areas in which sampling occurred during the course of the monitoring period.

Table 1: Collection Area Details		
Collection Area	Description	Receiving Stream
D	Collects runoff from a part of Runway 15-33 and Taxiway C, and is located at the southern end of the airport	Muddy Brook
K	Collects runoff from parking lot associated with hex hangars	Wetland to Muddy Brook
M	Collects runoff from the Vermont Army National Guard apron	Wetland to Muddy Brook
P	Collects runoff from a part of Runway 1-19 and Taxiway C	Tributary to Potash Brook
Q	Q001A collects runoff from the main terminal, parking lot, the majority of Runway 15-33, Taxiway G, and a small part of Taxiways A and B	Unnamed Tributary to Winooski River (west)
VTANG	VTANG1 collects runoff from the eastern side of the VT Air National Guard Base. Station VTANG2 collects runoff from a part of Runway 1-19 and Runway 15-33	Unnamed Tributary to Winooski River (north)
Z	Collects runoff from the existing hex hangars	Wetland to Muddy Brook

Sample locations and color coded designations of drainage networks indicating contributing collection areas are shown on page 1 of Appendix 1.

1.3 Pollutants of Concern

The monitoring network was designed to examine the water quality of major stormwater discharges from the Burlington International Airport. The highest priority stormwater discharge monitoring locations are identified in Table 2 and shown on page 1 of Appendix 1.

Table 2: High Priority Stormwater Discharge Monitoring Location Details			
Station Name/Priority	Location	Receiving Stream	Pollutants of Concern
P001 & P005 Priority # 1 & 2	Collection Area P2 (sub-collection area of P)	Tributary to Potash Brook	deicers, hydrocarbons, trace metals, pathogens, sediments, and nutrients
D018 Priority #3	Collection Area D	Muddy Brook	deicers, hydrocarbons, trace metals, pathogens, sediments, and nutrients
Q001A & Q001B Priority #4 & 5	Collection Area Q	Unnamed Western Tributary to Winooski River	deicers, hydrocarbons, trace metals, pathogens, sediments, and nutrients
VTANG1 & VTANG2 Priority #6 & 7	Vermont Air National Guard	Unnamed Northern Tributary to Winooski River	deicers, hydrocarbons, trace metals, pathogens, sediments, and nutrients

These stormwater sampling stations have been prioritized in terms of risk to water quality of the receiving water body, taking into account collection area designation and pollutants of concerns. The objective of the monitoring program has been to assess the presence or absence of the identified pollutants of concern.

Propylene glycol and urea have been used at the Burlington International Airport for aircraft and runway deicing purposes, respectively. While propylene glycol was included in the list of parameters for the organic analysis for samples collected during this study, urea was not. Urea is 46 percent nitrogen that can create a nitrogenous oxygen demand in receiving waters, as ammonia nitrogen is

oxidized to nitrite and nitrate nitrogen. For the purposes of assessing the presence or absence of urea, TKN, and nitrate nitrogen concentrations are used as an indicator.

Table 3 summarizes additional stormwater discharge points that are considered lower priority monitoring stations. Locations of these stations are shown on page 1 of Appendix 1.

Table 3: Low Priority Stormwater Discharge Monitoring Location Details			
Station Name/Priority	Location	Receiving Stream	Pollutants of Concern
K001 Priority #8	Collection Area K – parking area	Wetland to Muddy Brook	pathogens and nutrients
Z017 Priority #9	Collection Area Z – existing hex hangars	Wetland to Muddy Brook	deicers, pathogens, sediments, and nutrients
M001 Priority #10	Collection Area M	Wetland to Muddy Brook	deicers, pathogens, sediments, and nutrients

2.0 METHODS

2.1 Stations

During the course of the study, Pioneer performed water quality sampling and flow measurement at the seven high priority and three low priority areas summarized in Tables 2 and 3. Table 4 provides a description of the specific locations for each of the 10 sampling stations.

Table 4: Summary of Sampling Locations	
Station	Location Description
P001	Off from Perimeter Road. Culvert outfall to tributary to Potash Brook.
P005*	Off from Perimeter Road. Culvert outfall to tributary to Potash Brook.
D018	Southern end of airport, just outside security fence. Culvert outfall to Muddy Brook.

Table 4: Summary of Sampling Locations	
Station	Location Description
Q001A	Northern end of airport, off from Airport Parkway. Main outfall to Winooski River.
Q001B	Located approximately 900 feet down swale from Q001A.
VTANG1	Outside Vermont Air National Guard fence, at end of Access Road. Point of discharge for the eastern side of base and collection of discharge from VTANG2.
VTANG2	Inside Vermont Air National Guard fence. Point of discharge for the western side of base.
K001*	Perimeter of southern wetland, south of hex hangars. Culvert outfall to Muddy Brook.
Z017*	Perimeter of southern wetland, south of hex hangars. Culvert outfall to Muddy Brook.
M001	Perimeter of southern wetland, just off from Eagle Drive. Culvert outfall to Muddy Brook.
*Station was not sampled during the course of the monitoring period, due to dry or frozen conditions. (Unsampled stations are designated as low priority stations, with the exception of P005.)	

As noted above, station Q001B is located approximately 900 feet down a drainage swale from station Q001A. Station Q001B was selected in addition to station Q001A, for the purpose of evaluating water quality treatment between the stations. Photographs of each of the sampling stations are included on pages 2 through 6 of Appendix 1.

2.2 Monitoring Frequency

Wet weather sampling was performed during storm events to evaluate the flow and chemistry of stormwater runoff at different times of the year at the selected outfall locations. Pollutants such as sediment, bacteria, hydrocarbons, and trace metals can be mobilized with stormwater runoff as it travels across impervious surfaces. Wet weather sampling occurred three times during the course of the study, during each major hydrologic season: fall/winter (September 15 through March 31), spring (April through June 15), and summer (June 16 through September 14). Fall/winter sampling was conducted on December 12,

2002, spring sampling was conducted on April 23, 2003, and summer sampling was conducted on July 22, 2003. A supplemental fall/winter sampling event was also conducted at selected stations on December 11, 2003. Weather and rainfall data collected at the Burlington International Airport National Oceanic and Atmospheric Administration (NOAA) weather station were used to monitor precipitation and overall weather conditions. An effort was made to collect samples at or near peak flow conditions during each wet weather sampling event.

Dry weather sampling was conducted after periods of at least 24 hours of no precipitation. The dry weather sampling was conducted to evaluate possible untreated or illicit discharges. Dry weather sampling occurred twice: once during the fall/winter (September 15 through March 31), and once during the summer (June 16 through September 14). Fall/winter sampling was conducted on March 24, 2003. Summer sampling was conducted on September 10, 2003. This sampling only occurred at outfall locations where flow was present during the dry weather conditions.

2.3 Water Quality Sampling Parameters

The parameters analyzed during the course of sampling are those outlined in the Water Quality Monitoring Protocol (June 9, 2003), prepared by Pioneer. The same suite of parameters was monitored for both wet weather and dry weather sampling events; however, low priority stations were not monitored for the entire list of parameters.

High priority stations were monitored for the following;

Organic Analyses

- Volatile organic compounds (VOCs) by EPA method 8260B
- Glycols
- Total petroleum hydrocarbons (TPH)-diesel range organics
- Surfactants

Priority Pollutant Metals

- Antimony, arsenic, beryllium, cadmium, chromium, copper, lead, mercury, nickel, selenium, silver, thallium, and zinc

Microbiology

- *Escherichia coli* (*E. coli*)

Inorganic Analysis

- Biological oxygen demand (BOD₅), 5 day
- Chemical oxygen demand (COD)
- Chloride
- Nitrogen, NO₃
- Total kjeldahl nitrogen, TKN
- pH
- Total suspended solids (TSS)
- Total phosphorus (TP)
- Total dissolved phosphorus (TDP)
- Conductivity
- Dissolved oxygen
- Turbidity

Low priority stations were monitored for the following:

Organic Analysis

- Glycols

Microbiology

- *Escherichia coli*

Inorganic Analysis

- Chloride
- Nitrogen, NO₃
- Total kjeldahl nitrogen, TKN
- pH
- TSS
- TP
- TDP
- Dissolved oxygen

All water quality analyses were performed by Endyne, Inc. (Endyne) in Williston, Vermont. During the course of the sampling events, Pioneer collected field measurements of pH, conductivity, and flow for further water quality comparison.

2.4 Flow Monitoring

Flow monitoring during sample collection was not implemented until the third sampling event, which occurred on March 24, 2003. Flow was measured at the seven high priority monitoring stations during both wet and dry weather sampling events by means of either bucket measurements or via use of the float method. The float method calculates velocity by measuring the time it takes for a buoyant object to travel a known distance. The discharge is then calculated by using the velocity and depth of water (cross-sectional) measurements. Flow measurements were not conducted at the low priority stations. Based on the physical configuration of the stations, Stations D018, Q001A and Q001B were monitored with bucket measurements, while P001, P005, VTANG1, and VTANG2, were monitored using the float method.

Flow values for each of the high priority monitoring stations are summarized in Table 5. Complete flow calculations are included on page 1 of Appendix 2.

Table 5: Flow Measurement Summary (all values in cfs)					
Station	Date - Event				
	3/24/03 Dry Weather	4/23/03 Wet Weather	7/22/03 Wet Weather	9/10/03 Dry Weather	12/11/03 Wet Weather*
P001	Too low to measure	Too low to measure	Too low to measure	Culvert dry	---
P005	Culvert dry	Culvert dry	Culvert dry	Culvert dry	---
D018	0.39	0.78	0.53	Too low to measure	---
Q001A	0.03	0.27	0.07	0.02	0.60
Q001B	0.20	0.40	0.09	0.03	0.53
VTANG 1	1.4	Too low to measure	Too low to measure	Culvert dry	---
VTANG 2	1.4	Too low to measure	Too low to measure	Too low to measure	---

*For Q001A and Q001B only, as discussed in Section 2.6

2.5 Modifications to the Plan

Stations P065 and D011, identified in the Water Quality Monitoring Proposal for Stormwater Discharges (Pioneer 2002), were not sampled during the monitoring period. Station P065, located in Collection Area P, was inaccessible for monitoring purposes as it is a manhole, rather than a culvert. Sampling at Station D011 was not relevant to the monitoring program as it is the discharge culvert from the wetland. Waters at Station D011 represent discharges flowing from the wetland, rather than directly from the airport facilities.

The addition of a second monitoring station at Collection Area Q was made approximately 900 feet downswale of Station Q001. The two stations, designated Q001A and Q001B, were monitored to document the quality of waters leaving the airfield and those entering the Winooski River, therefore assessing treatment effectiveness within the drainageway between these two locations.

Stations within Collection Area Q and the VTANG base were identified as having pesticides as a pollutant of concern in the Water Quality Monitoring Proposal for Stormwater Discharges (Pioneer 2002). However, pesticides were not included in the list of parameters for these stations. Therefore, no pesticide analyses were conducted during the monitoring study.

2.6 Incomplete Sampling

Station P001 was not sampled on December 12, 2002 or September 10, 2003 due to frozen and no flow conditions, respectively. Station VTANG1 was not sampled on December 12, 2002 due to a shortage of sample bottles, and September 10, 2003 due to dry conditions. The sampling bottles intended for VTANG1 were used at VTANG2, after the initial VTANG2 sampling was conducted at the incorrect culvert. Stations K001, P005, and Z017 were not

sampled during the entire monitoring period due to absence of flow at these locations.

Stations Q001A and Q001B were not sampled on December 12, 2002 as the presence of strong detergent-like odors and large amounts of foam were present at both stations on this day, as seen on page 7 of the Appendix 1 and discussed in detail in Section 5.2. However, sampling was completed at these stations on December 11, 2003 to provide supplemental results for winter wet weather conditions.

3.0 WATER QUALITY MONITORING RESULTS

The water quality results for all stations during both wet and dry weather sampling events have been summarized on pages 2 through 21 of Appendix 2. In the presentation of water quality results, concentrations of the constituents analyzed have been compared with the Class B water quality criteria of the VWQS limits. The VWQS limits do not apply directly to discharges of stormwater runoff, as the nature of the runoff is temporary and does not support any existing or designated uses. However, the VWQS limits do apply as instream limits within receiving waters, following diluting and mixing with a discharge, and thus, provide a means of comparison for the values measured during this study. Thus, these comparisons help to identify constituents of concern at each of the monitoring stations.

With the exception of Stations Q001A and Q001B, results for very few constituents were noted at concentrations above the Class B VWQS limits during both wet weather and dry weather sampling events. At these remaining sampling locations, a small number of the constituents in the analyte list (Section 2.3) were detected above surface water quality limits. This indicates that, generally, the existing stormwater discharges at the Burlington International Airport are not adversely affecting the water quality of the receiving waters. As discussed in Section 5.2, the untreated discharges of deicing

compounds were noted at Stations Q001A and Q001B, and deficiencies in the Burlington International Airport deicing fluid collection system have subsequently been addressed to rectify this situation.

To further illustrate the observed constituent concentrations, data plots for mean concentrations of some key constituents (total phosphorus, chloride, nitrate-nitrogen, total kjeldahl nitrogen, turbidity, total suspended solids), selected priority pollutant metals (lead and zinc), and propylene glycol (detected at Station Q001A and Q001B) are included on pages 22 through 30 of Appendix 2. These data plots allow for a visual comparison of the mean concentrations of these constituents between the different high priority monitoring stations. It should be noted that in the calculations of the mean concentrations, if any individual concentration was below the laboratory detection limit, the detection limit value was used in the calculation of the mean value.

3.1 Wet Weather Results

Pioneer completed a total of three wet weather sampling rounds during the 2003 monitoring year. These sampling rounds occurred during significant rainfall events as measured at the Burlington International Airport. Table 6 shows the dates on which wet weather sampling was performed and the total rainfall for each event.

Table 6: Wet Weather Sampling Rainfall Totals	
Date Sampled	Total Rainfall at Conclusion of Sampling (inches)
12/12/02	0.29
4/23/03	0.32
7/22/03	0.48

Supplemental winter wet weather sampling occurred at Stations Q001A and Q001B on December 11, 2003, when the NOAA office recorded 0.85 inches of rainfall at Burlington International Airport. Details of the sampling events for each of the monitoring stations are discussed in the following sections. No VOCs were

noted at concentrations exceeding the laboratory detection limits in any of the samples.

3.1.1 Collection Area D – Muddy Brook

A listing of water quality analysis data at station D018 is provided on pages 2 and 3 of Appendix 2. A summary of wet weather water quality sampling results at station D018 is provided in Table 7. This summary indicates that the majority of analytical results are within VWQS limits, even though these results are from point of discharge, and do not reflect dilution and mixing with receiving waters.

Table 7: Summary of Water Quality Sampling at Station D018			
Parameter Type	Number of Individual Analyses	Number Below Detection Limits	Number Above VWQS Limits
VOCs	46	46	0
Other Organic Compounds	8	8	NA
Priority Pollutant Metals	39	34	2
Microbiologic	2	0	1
Inorganics	25	1	3
Miscellaneous	14	0	1

Table 8 indicates the number of analyte results above the VWQS Class B limits noted at this station for the wet weather sampling events. This table illustrates that only a very few analytes were detected above these limits, and no excessively high concentrations were noted. The *E. coli* concentration noted on July 22, 2003 was a one-time event.

Table 8: Station D018 Wet Weather Sampling: Elevated Analyte Concentrations

Type of Analysis	Parameter	Result		VWQS Limits
		Date	Concentration	
Priority Pollutant Metals	Lead	7/22/03	0.009 mg/L	0.004 mg/L
	Zinc	7/22/03	0.740 mg/L	0.118 mg/L
Microbiologic	<i>E.coli</i>	7/22/03	> 201 MPN/100ml	77 MPN/100ml
Inorganic	Total Phosphorus	12/12/02	0.022 mg/L	0.014 mg/L
		4/23/03	0.043 mg/L	
		7/22/03	0.039 mg/L	
Miscellaneous	Turbidity	12/12/02	14.4 NTU	10 NTU

3.1.2 Collection Area P – Tributary to Potash Brook

A listing of water quality analysis data at station P001 is provided on pages 4 and 5 of Appendix 2. A summary of wet weather water quality sampling results at station P001 is provided in Table 9. This summary indicates that the majority of analytical results are within VWQS limits, even though these results are from point of discharge, and do not reflect dilution and mixing with receiving waters.

Table 9: Summary of Water Quality Sampling at Station P001

Parameter Type	Number of Individual Analyses	Number Below Detection Limits	Number Above VWQS Limits
VOCs	46	46	0
Other Organic Compounds	8	6	NA
Priority Pollutant Metals	26	22	4
Microbiologic	2	0	1
Inorganics	18	2	2
Miscellaneous	10	2	2

Table 10 indicates analyte concentrations above the VWQS Class B limits noted at Station P001 during the wet weather sampling events. Of the

analytes included in the table, there are no excessively high concentrations noted. The high *E. coli* concentration noted on July 22, 2003 was a one-time event.

Type of Analysis	Parameter	Result		VWQS Limits
		Date	Concentration	
Priority Pollutant Metals	Chromium	4/23/03	0.014 mg/L	0.011 mg/L
	Copper	4/23/03	0.015 mg/L	0.013 mg/L
	Lead	4/23/03	0.027 mg/L	0.004 mg/L
	Zinc	4/23/03	0.703 mg/L	0.118 mg/L
Microbiologic	<i>E. coli</i>	7/22/03	> 201 MPN/100ml	77 MPN/100ml
Inorganic	Total Phosphorus	4/23/03	0.228 mg/L	0.014 mg/L
		7/22/03	0.148 mg/L	
Miscellaneous	Turbidity	4/23/03	43.5 NTU	10 NTU
		7/22/03	10.4 NTU	

3.1.3 Collection Area Q – Unnamed Western tributary to Winooski River

A listing of water quality analysis data at station Q001A is provided on pages 8 and 9 of Appendix 2. A summary of wet weather water quality sampling results at station Q001A is provided in Table 11. This summary indicates that the majority of analytical results are within VWQS limits, even though these results are from point of discharge, and do not reflect dilution and mixing with receiving waters.

Parameter Type	Number of Individual Analyses	Number Below Detection Limits	Number Above VWQS Limits
VOCs	92	91	0
Other Organic Compounds	14	9	NA
Priority Pollutant Metals	50	37	10
Microbiologic	4	0	2
Inorganics	40	0	5
Miscellaneous	22	0	3

Table 12 indicates analyte concentrations above the VWQS Class B limits noted at Station Q001A during the wet sampling events. The detection of several analytes for these stations are indicative of an untreated discharge of deicing compounds occurring at this location. These discharges have subsequently been addressed by the Burlington International Airport.

Type of Analysis	Parameter	Result		VWQS Limits
		Date	Concentration	
Priority Pollutant Metals	Arsenic	12/11/03	0.004 mg/L	0.0015 mg/L
	Chromium		0.016 mg/L	0.011 mg/L
	Copper		0.033 mg/L	0.013 mg/L
	Lead		0.026 mg/L	0.004 mg/L
	Zinc		0.283 mg/L	0.118 mg/L
Microbiologic	<i>E.coli</i>	4/23/03 7/22/03	> 201 MPN/100ml	77 MPN/100ml
Inorganic	pH	4/23/03	8.8 s.u.	6.5 – 8.5 s.u.

Type of Analysis	Parameter	Result		VWQS Limits	
		Date	Concentration		
	BOD ₅	12/11/03	5,800 mg/L	---	
	COD		10,300 mg/L		
	Chloride		1,410 mg/L		
	Ammonia Nitrogen		17.0 mg/L		1.09 mg/L
	TKN		1,510 mg/L		---
	Total Phosphorus	4/23/03	0.077 mg/L	0.014 mg/L	
		7/22/03	0.056 mg/L		
12/11/03		0.922 mg/L			
Miscellaneous	Turbidity	4/23/03	13.1 NTU	10 NTU	
			168 NTU		
	Propylene Glycol	12/11/03	5,350 ug/L	---	

A listing of water quality analysis data at station Q001B is provided on pages 10 and 11 of Appendix 2. A summary of wet weather water quality sampling results at station Q001B is provided in Table 13. This summary indicates that the majority of analytical results are within VWQS limits, even though these results are from point of discharge, and do not reflect dilution and mixing with receiving waters.

Parameter Type	Number of Individual Analyses	Number Below Detection Limits	Number Above VWQS Limits
VOCs	92	92	0
Other Organic Compounds	14	8	NA
Priority Pollutant Metals	50	39	9
Microbiologic	3	0	2
Inorganics	40	2	4
Miscellaneous	22	0	4

Table 14 indicates analyte concentrations above the VWQS Class B limits noted at Station Q001B during the wet sampling events.

Type of Analysis	Parameter	Result		VWQS Limits
		Date	Concentration	
Priority Pollutant Metals	Arsenic	12/11/03	0.008 mg/L	0.0015 mg/L
	Chromium		0.026 mg/L	0.011 mg/L
	Copper		0.027 mg/L	0.013 mg/L
	Lead		0.023 mg/L	0.004 mg/L
	Zinc		0.193 mg/L	0.118 mg/L
Microbiologic	<i>E.coli</i>	4/23/03	> 201 MPN/100ml	77 MPN/100ml
		7/22/03		
Inorganic	BOD ₅	12/11/03	5,000 mg/L	---
	COD		8,200 mg/L	
	Chloride		915 mg/L	
	Ammonia Nitrogen		14.2 mg/L	2.09 mg/L
	TKN		1,020 mg/L	---
	Total Phosphorus		4/23/03	0.172 mg/L
	7/22/03	0.032 mg/L		
	12/11/03	0.868 mg/L		

Type of Analysis	Parameter	Result		VWQS Limits
		Date	Concentration	
Miscellaneous	Turbidity	4/23/03	17.3 NTU	10 NTU
		12/11/03	232 NTU	
	Propylene Glycol			4,650 ug/L

3.1.4 Vermont Air National Guard – Unnamed Northern Tributary to Winooski River

A listing of water quality analysis data at station VTANG1 is provided on pages 12 and 13 of Appendix 2. A summary of wet weather water quality sampling results at station VTANG1 is provided in Table 15. This summary indicates that the majority of analytical results are within VWQS limits, even though these results are from point of discharge, and do not reflect dilution and mixing with receiving waters.

Parameter Type	Number of Individual Analyses	Number Below Detection Limits	Number Above VWQS Limits
VOCs	46	46	0
Other Organic Compounds	8	7	NA
Priority Pollutant Metals	26	22	2
Microbiologic	2	0	1
Inorganics	18	5	2
Miscellaneous	10	2	0

Table 16 indicates analyte concentrations above the VWQS Class B limits noted at Station VTANG1 during the wet weather sampling events. Of the constituents included in the table, none were noted at excessive

concentrations, typically just above the corresponding limit. The high *E. coli* concentration noted was a one-time event.

Table 16: Station VTANG1 Wet Weather Sampling: Elevated Analyte Concentrations

Type of Analysis	Parameter	Result		VWQS Limits
		Date	Concentration	
Priority Pollutant Metals	Lead	4/23/03	0.007 mg/L	0.004 mg/L
		7/22/03	0.009 mg/L	
Microbiologic	<i>E.coli</i>	7/22/03	> 201 MPN/100ml	77 MPN/100ml
Inorganic	Total Phosphorus	4/23/03	0.084 mg/L	0.014 mg/L
		7/22/03	0.052 mg/L	

A listing of water quality analysis data at station VTANG2 is provided on pages 14 and 15 of Appendix 2. A summary of wet weather water quality sampling results at station VTANG2 is provided in Table 17. This summary indicates that the majority of analytical results are within VWQS limits, even though these results are from point of discharge, and do not reflect dilution and mixing with receiving waters.

Table 17: Summary of Water Quality Sampling at Station VTANG2

Parameter Type	Number of Individual Analyses	Number Below Detection Limits	Number Above VWQS Limits
VOCs	46	46	0
Other Organic Compounds	12	11	NA
Priority Pollutant Metals	39	30	6
Microbiologic	2	0	1
Inorganics	26	5	6
Misc.	12	2	1

Table 18 indicates analyte concentrations above the VWQS Class B limits noted at Station VTANG2 during the wet sampling events.

Table 18: Station VTANG2 Wet Weather Sampling: Elevated Analyte Concentrations				
Type of Analysis	Parameter	Result		VWQS Limits
		Date	Concentration	
Priority Pollutant Metals	Arsenic	12/12/02	0.002 mg/L	0.0015 mg/L
	Copper	12/12/02	0.022 mg/L	0.013 mg/L
	Lead	12/12/02	0.054 mg/L	0.004 mg/L
		4/23/03	0.009 mg/L	
		7/22/03	0.027 mg/L	
Zinc	12/12/02	0.188 mg/L	0.118 mg/L	
Microbiology	<i>E.coli</i>	7/22/03	> 201 MPN/100ml	77 MPN/100ml
Inorganic	pH	12/12/02	5.5 s.u.	6.5 – 8.5 S.U
		4/23/03	8.6 s.u.	
		7/22/03	8.6 s.u.	
	Total Phosphorus	12/12/02	0.403 mg/L	0.014 mg/L
		4/23/03	0.073 mg/L	
		7/22/03	0.069 mg/L	
Miscellaneous	Turbidity	4/23/03	12.3 NTU	10 NTU

3.1.5 Collection Area K – Wetland to Muddy Brook

Station K001 was not sampled during any of the three wet weather events due to an absence of flow at this location.

3.1.6 Collection Area M – Wetland to Muddy Brook

A listing of water quality analysis data at station M001 is provided on page 17 of Appendix 2. Organic analysis for low priority station M001 included glycols only, which were not detected during any sampling events. Of the constituents analyzed, only *E. coli* (one event) and total phosphorus were noted at concentrations slightly exceeding the limits, and the pH was slightly higher than the typical range.

A summary of wet weather water quality sampling results at station M001 is provided in Table 19. As indicated in the summary table, most of the analytical results are below VWQS limits.

Parameter Type	Number of Individual Analyses	Number Below Detection Limits	Number Above VWQS Limits
Other Organic Compounds	6	6	NA
Microbiologic	2	1	1
Inorganics	22	1	5
Misc.	9	0	0

Table 20 indicates analyte concentrations above the VWQS Class B limits noted at Station M001 during the wet weather sampling events.

Type of Analysis	Parameter	Result		VWQS Limits
		Date	Concentration	
Microbiologic	<i>E.coli</i>	7/22/03	> 201 MPN/100ml	77 MPN/100ml
Inorganic	pH	4/23/03	9.1 s.u.	6.5 – 8.5 s.u.
		7/22/03	8.6 s.u.	
	Total Phosphorus	12/12/02	0.360 mg/L	0.014 mg/L
		4/23/03	0.159 mg/L	
		7/22/03	0.077 mg/L	

3.1.7 Collection Area Z – Wetland to Muddy Brook

Station Z017 was not sampled during any of the three wet weather events due to absence of flow at this location.

3.2 Dry Weather Results

Pioneer performed two dry weather sampling rounds during the 2003 monitoring year. Sampling occurred on March 24, 2003 and September 10, 2003. Details of the sampling rounds for each of the monitoring stations are discussed in the following sections. At all sampled stations, no VOCs were noted at

concentrations exceeding the laboratory detection limits during either sampling round.

3.2.1 Collection Area D – Muddy Brook

Table 21 indicates analyte concentrations above the VWQS Class B limits noted at Station D018 during dry weather sampling. Most of the sampling results indicate values within typically expected ranges, and thus only four analytes out of the 26 analyzed are included in the table. No excessively high concentrations of any constituents are noted.

Table 21: Station D018 Dry Weather Sampling: Elevated Analyte Concentrations				
Type of Analysis	Parameter	Result		VWQS Limits
		Date	Concentration	
Priority Pollutant Metals	Arsenic	9/10/03	0.008 mg/L	0.0015 mg/L
Inorganic	Nitrogen, Nitrate	9/10/03	9.14 mg/L	5.00 mg/L
	Total Phosphorus	3/24/03	0.055 mg/L	0.014 mg/L
		9/10/03	0.062 mg/L	
Miscellaneous	Turbidity	9/10/03	131 NTU	10 NTU

3.2.2 Collection Area P – Tributary to Potash Brook

Table 22 indicates analyte concentrations above the VWQS Class B limits noted at Station P001 during dry weather sampling. Since the large majority of constituents analyzed were not elevated, only 5 out of the 42 analyses are shown in this table.

Table 22: Station P001 Dry Weather Sampling: Elevated Analyte Concentrations				
Type of Analysis	Parameter	Result		VWQS Limits
		Date	Concentration	
Priority Pollutant Metals	Zinc	3/24/03	1.20 mg/L	0.118 mg/L
Microbiologic	<i>E.coli</i>		> 201 MPN/100ml	77 MPN/100ml
Inorganic	Nitrogen, Nitrate		13.2 mg/L	5.00 mg/L

Type of Analysis	Parameter	Result		VWQS Limits
		Date	Concentration	
	Total Phosphorus		0.218 mg/L	0.014 mg/L
Miscellaneous	Turbidity		19.3 NTU	10 NTU

3.2.3 Collection Area Q – Unnamed Western Tributary to Winooski River

Table 23 indicates analyte concentrations above the VWQS Class B limits at Station Q001A during the dry weather sampling. All results for *E.coli* detection were below the VWQS limit, as were the majority of constituents sampled.

Type of Analysis	Parameter	Result		VWQS Limits
		Date	Concentration	
Priority Pollutant Metals	Arsenic	9/10/03	0.003 mg/L	0.0015 mg/L
Inorganic	Total Phosphorus	12/5/02	0.028 mg/L	0.014 mg/L
		3/24/03	0.067 mg/L	
		9/10/03	0.030 mg/L	
	Nitrogen, Nitrate	3/24/03	5.28 mg/L	5.0 mg/L
Miscellaneous	Turbidity	9/10/03	41.2 NTU	10 NTU

Table 24 indicates analyte concentrations above the VWQS Class B limits at Station Q001B during the dry weather sampling. Most of the sampling results for the various parameters analyzed indicate values within typical range.

Table 24: Station Q001B Dry Weather Sampling: Elevated Analyte Concentrations

Type of Analysis	Parameter	Result		VWQS Limits
		Date	Concentration	
Priority Pollutant Metals	Arsenic	3/24/03	0.006 mg/L	0.0015 mg/L
Inorganic	Total Phosphorus	3/24/03	0.390 mg/L	0.014 mg/L
		9/10/03	0.017 mg/L	
Miscellaneous	Turbidity	3/24/03	78.9 NTU	10 NTU

3.2.4 VT Air National Guard – Unnamed tributary to Winooski River

Tables 25 indicate analyte concentrations above the VWQS Class B limits at Stations VTANG1 during dry weather sampling. All results for *E.coli* detection were below VWQS limits. Values were generally within typical ranges, with results for only 1 out of 42 analytes exceeding VWQS limits.

Table 25: Station VTANG1 Dry Weather Sampling: Elevated Analyte Concentrations

Type of Analysis	Parameter	Result		VWQS Limits
		Date	Concentration	
Inorganic	Total Phosphorus	3/24/03	0.267 mg/L	0.014 mg/L

Table 26 indicates analyte concentrations above the VWQS Class B limits at Station VTANG2 during dry weather sampling. Similar to Station VTANG1, fewer constituents were reported out of typical range during the dry weather sampling than during the wet weather sampling.

Table 26: Station VTANG2 Dry Weather Sampling: Elevated Analyte Concentrations

Type of Analysis	Parameter	Result		VWQS Limits
		Date	Concentration	
Priority Pollutant Metals	Zinc	9/10/03	0.782 mg/L	0.118 mg/L
Inorganic	pH	9/10/03	8.6 s.u.	6.5 – 8.5 NTU

Type of Analysis	Parameter	Result		VWQS Limits
		Date	Concentration	
	Total Phosphorus	3/24/03	0.317 mg/L	0.014 mg/L
		9/10/03	0.070 mg/L	
Miscellaneous	Turbidity	3/24/03	10.9 NTU	10 NTU

3.2.5 Collection Area K – Wetland to Muddy Brook

Station K001 was not sampled during either of the two dry weather sampling events due to the absence of flow at this location.

3.2.6 Collection Area M – Wetland to Muddy Brook

Organic analysis for low priority station M001 included glycols only, which were not detected during the dry weather sampling events. Results for the microbiologic and miscellaneous analyses indicate concentrations below the VWQS limits. Table 27 indicates elevated analyte concentrations at station M001 during dry weather sampling. These analyte concentrations represent three out of the eight inorganic constituents analyzed.

Type of Analysis	Parameter	Result		VWQS Limits
		Date	Concentration	
Inorganic	Nitrogen, Nitrate	3/24/03	7.77 mg/L	5.0 mg/L
	pH	9/10/03	9.1 s.u	6.5 – 8.5 s.u.
	Total Phosphorus	3/24/03	0.027 mg/L	0.014 mg/L
		9/10/03	1.95 mg/L	

3.2.7 Collection Area Z – Wetland to Muddy Brook

Station Z017 was not sampled during either of the two dry weather rounds due to the absence of flow at this location.

4.0 DISCUSSION

Table 28 summarizes the entire list of the pollutants of concern and their associated analytes. Each of these, as they pertain to the individual monitoring stations, are discussed in the following sections.

Table 28: Pollutant of Concern and Associated Monitored Parameter	
Pollutant of Concern	Associated Analytes
Hydrocarbons	TPH and VOC Analysis
Trace Metals	Ag, As, Ba, Cd, Cr, Co, Hg, Ni, Pb, Sb, Se, Ti, Zn
Pathogens	<i>E.coli</i>
Sediment	Total Suspended Solids*, Turbidity
Nutrients	Nitrate Nitrogen, Total and Dissolved* Phosphorus
	Propylene Glycol*
Deicers	Propylene Glycol, BOD ₅ *, COD*, Nitrogen (TKN and Nitrate), pH
* Indicates parameter that do not have VWQS limits	

4.1 Collection Area D – Outlet to Muddy Brook

The presence or absence of pollutants of concern within Collection Area D is based on results from Station D018. The results do not indicate the presence of untreated discharges from Collection Area D. No atypical concentrations of any of the constituents analyzed in stormwater runoff were observed at this station.

Hydrocarbons: The assessment of hydrocarbons indicates that VOCs are not present in concentrations above the applicable laboratory detection limits.

Trace Metals: The assessment of the priority pollutant analysis identifies arsenic, lead, and zinc as potential constituents of concern. However, none of the metals were noted at excessive concentrations.

Pathogens: Analytical results for *E.coli* indicate only one sampling event, on July 22, 2003 when an elevated concentration was noted, indicating no issues with chronic *E. coli* detections.

Sediment: Turbidity analysis indicated turbidity values that were intermittently elevated, exceeding the VWQS limit during two of the five sampling events. Elevated turbidity is common in stormwater runoff. The slight exceedances noted here are typical.

Nutrients: Analytical results for nutrient parameters identify total phosphorus and nitrate nitrogen as potential constituents of concern. However, the generally low concentrations noted are not indicative of chronic nutrient contamination.

Deicers: Analytical results for nitrate nitrogen indicate only one sampling event where an elevated concentration was noted. The nitrate nitrogen concentration was 9.14 mg/L during the dry weather sampling on September 10, 2003. Measured flow volumes on this date were at their lowest level during the entire monitoring period. Deicing practices were not occurring on this date, suggesting that the detected nitrogen concentration resulted from another source. These results suggest that urea is not present in the discharge water at station D018. Analytical results for propylene glycol indicate concentrations below the laboratory detection limits on all sampling dates.

4.2 Collection Area P – Tributary to Potash Brook

The presence or absence of pollutants of concern for Collection Area P is based on results from Station P001, as no sampling was completed at station P005. Flow volumes could not be measured for this station during the entire monitoring period, due to low flow conditions. The results do not indicate the presence of untreated discharges from Collection Area P, or atypical concentrations of any of the constituents analyzed.

Hydrocarbons: The assessment of hydrocarbons indicates that VOCs were not present in the stormwater runoff at this location.

Trace Metals: The assessment of the priority pollutant metals analysis identifies chromium, copper, lead, and zinc as potential constituents of concern. However, no excessive concentrations of any of these metals were noted on an ongoing basis. The relatively low concentrations noted suggest no impacts from metals at this location.

Pathogens: Analytical results for *E.coli* indicate elevated concentrations during two out of three sampling events, occurring on March 23 and July 22, 2003. These results suggest only intermittent *E.coli* contamination at station P001.

Sediment: Station P001 had slightly elevated turbidity levels during all sampling events, but at values typical for stormwater runoff.

Nutrients: Analytical results for nutrient parameters identify total phosphorus and nitrate nitrogen as potential constituents of concern. Elevated phosphorus values are noted at this sampling location at all sampling dates. Low nitrate concentrations, except during the sole dry weather sampling event, were noted at this sampling location.

Deicers: Analytical results for nitrate nitrogen indicate only one sampling event when an elevated concentration was noted, on March 24, 2003, the only dry weather round where flow was present. It is possible that this elevated value represents a residual effect of winter runway deicing using urea.

4.3 Collection Area Q – Unnamed Western Tributary to Winooski River

Sampling was not conducted at Stations Q001A and Q001B on December 12, 2002, due to logistical problems. The presence of strong detergent-like odors and large amounts of foam were observed at both stations on this day, as seen

on page 7 of the Appendix 1. Additional sampling of these stations occurred during December 2003 to further investigate these conditions. The objective of this additional monitoring was to provide supplemental winter wet weather sampling results in place of the December 12, 2002 event. Additional sampling, which included both first flush and composite samples for these stations, occurred on December 11, 2003.

A first flush sample was collected at station Q001A at 9:00 a.m., and a later composite sample at 1:00 p.m. At station Q001B, the first flush sample was collected at 9:45 a.m., and composite sampling was conducted at 12:15 p.m. Analytical parameters were expanded to help assess the potential impacts from urea, and also continued to test for the presence of aircraft deicing fluids, especially propylene glycol. Additions made to the list of parameters included ammonia nitrogen and dissolved oxygen.

As noted previously, the sampling results indicated untreated discharges from Collection Area Q, primarily evident from the elevated concentrations of propylene glycol.

Hydrocarbons: The assessment of hydrocarbons indicates that VOCs are typically not present in concentrations above laboratory detection limits.

Trace Metals: The assessment of the priority pollutant metals analyses identifies arsenic, chromium, copper, lead, and zinc as potential constituents of concern. However, the relatively low concentrations noted do not indicate metals contamination.

Pathogens: Analytical results for *E.coli* indicate elevated concentrations during spring and summer wet weather events only. *E.coli* results for dry weather rounds indicate higher concentrations for Q001B than for Q001A.

Sediment: Results for turbidity and TSS values are inconclusive in determining whether sediment concentration is reduced as a result of the 900 feet of swale between Stations Q001A and Q001B. Turbidity and TSS concentrations at Station Q001B exceeded those noted at Station Q001A during dry weather sampling on March 23 and wet weather sampling on April 23, 2003 and December 11, 2003. Conversely, turbidity and TSS concentrations at Station Q001A exceeded those at Station Q001B during wet weather sampling on July 22, 2003 and dry weather sampling on September 10, 2003. Mean TSS and turbidity concentrations are higher at Station Q001B. The noted turbidity levels are within the range typical for stormwater runoff.

Nutrients: Elevated total phosphorus values were noted on all sampling dates at both sampling locations. The high nutrient concentrations noted are a further indication of an untreated discharge from Collection Area Q.

Deicers: Nitrate nitrogen results for both Q001A and Q001B indicate only one event when a slightly elevated nitrate nitrogen concentration was noted at Station Q001A indicating that urea was not present in the discharge waters at Stations Q001A and Q001B. High concentrations of propylene glycol were detected during the December 11, 2003 sampling event, indicative of untreated aircraft deicer discharges at this location.

4.4 Collection Area VTANG – Unnamed Western Tributary to Winooski River

Station VTANG2 is representative of the stormwater drainage from a large portion of the western side of the Vermont Air National Guard base, and Station

VTANG1 is representative of stormwater drainage from the eastern side of the base, in addition to runoff discharged from VTANG2. Therefore, Station VTANG1 represents all surface water drainage from the entire collection area. There are no indications of untreated discharges or atypical stormwater runoff quality at this location.

Hydrocarbons: The assessment of hydrocarbons indicates that VOCs were not present detectable concentrations at this location.

Trace Metals: The assessment of the priority pollutant analysis identifies arsenic, copper, lead, and zinc as potential constituents of concern. However, the relatively low concentrations of metals noted at these sampling stations indicate that no chronic metal contamination issues were evident at the VTANG location.

Pathogens: Analytical results for *E.coli* indicate elevated concentrations at both sampling stations during only the wet weather event of July 22, 2002, suggesting no significant concern regarding pathogen contamination.

Sediment: Measured turbidity levels were low, thus indicating no sediment related issues at this location.

Nutrients: Somewhat elevated phosphorus concentrations, are noted at this location.

Deicers: The sample results for these stations indicate no effect from deicing at this location.

4.5 Collection Area M – Wetland to Muddy Brook

Collection Area M represents the only low priority sampling station that was sampled during the monitoring period.

Pathogens: Analytical results for *E.coli* indicate an elevated value on one out of three sampling events. These results suggest no ongoing source of pathogen contamination at this location.

Deicers: Propylene glycol was not present at Station M001.

5.0 CONCLUSIONS

5.1 All Stations Except Q001A and Q001B

Elevated concentrations of analytes, as compared to the VWQS limits, were noted at each of the sampling stations where sampling was conducted. However, no indications of chronic, highly elevated concentrations of any of the measured constituents were noted at any of the sampling locations. Where elevated metals concentrations were noted, most stations exhibited concentrations just slightly above the VWQS comparison limit. The same condition exists for the nutrients detected during this study, most commonly total phosphorus, and turbidity, with occasional exceptions.

Measured flow at each of the stations was quite low, ranging from too low to measure at all stations to a maximum flow of 1.4 cubic feet per second at Stations VTANG1 and VTANG2 on March 24, 2003. Given that runoff from these collection areas have low, if any, perennial flow, the mass loading of constituents to these waterways from these discharges appears to be small. These discharges do not appear to significantly contribute to existing water quality impacts to the impaired waters of Muddy Brook and Potash Brook.

5.2 Stations Q001A and Q001B

Sampling results for Stations Q001A and Q001B indicate significant nutrient and propylene glycol contamination. This, along with the presence of foam and odor were observed at both stations during the December 11, 2003 event, which were similar in nature to those observed on December 12, 2002, indicated the presence of an untreated discharge of deicing compounds at this location. As a result, the existing Burlington International Airport deicing fluid collection system was investigated by airport personnel. Deficiencies within this system were identified and temporary corrective measures were implemented. Additional sampling of these stations has subsequently occurred as part of a program to assess the impact of the corrective measures.

REFERENCES

- Pioneer 2002. Water Quality Monitoring Protocol for Stormwater Discharges. Pioneer Environmental Associates, LLC. January 22, 2002. Vergennes, VT.
- VANR 2004. State of Vermont 2004. 303(d) List of Waters – Part A Impaired Surface Waters in Need of TMDL. Waterbury, Vermont. July 19, 2004.
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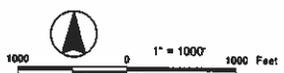
APPENDIX 1



- Collection Area
- D
 - K
 - M
 - P
 - Q
 - Z
 - VTANG
 - NA
- # Culvert Sampling Location
- 10 Ft. Contours

Burlington International Airport Culvert Sampling Location Map

October 13, 2004



Sources: Base Map - Digital Orthographic
Photographs acquired by Vermont Mapping
Program (1996)
Culverts, Catchbasins - Extracted from
Dufresne-Henry CAD drawing (2004)
Sampling Locations - Determined by Pioneer
Environmental Associates, LLC (2003)

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CONSULTING SCIENTISTS

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Photograph 1: High Priority Monitoring Station D018. Main outfall to impaired Muddy Brook. December 12, 2002



Photograph 2: Low Priority Monitoring Station K001. Wetland to Muddy Brook. March 24, 2003

Photographs taken by Stacey L. Kirby of Pioneer Environmental Associates, LLC.



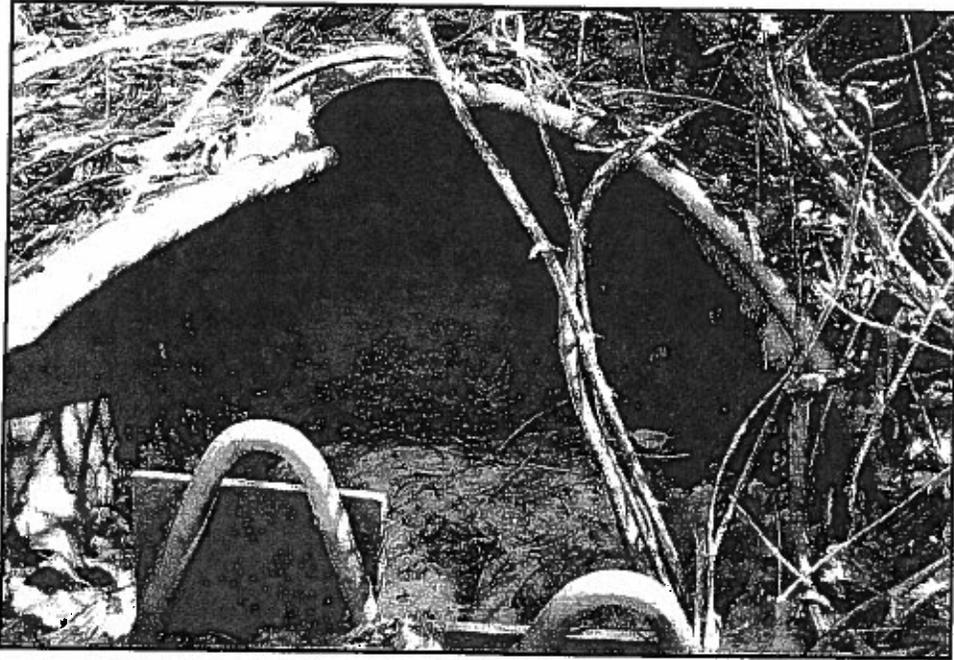
Photograph 3: Low Priority Monitoring Station M001. Wetland to Muddy Brook.
April 2000

Photograph taken by Shelley E. Gustafson of Pioneer Environmental Associates, LLC.

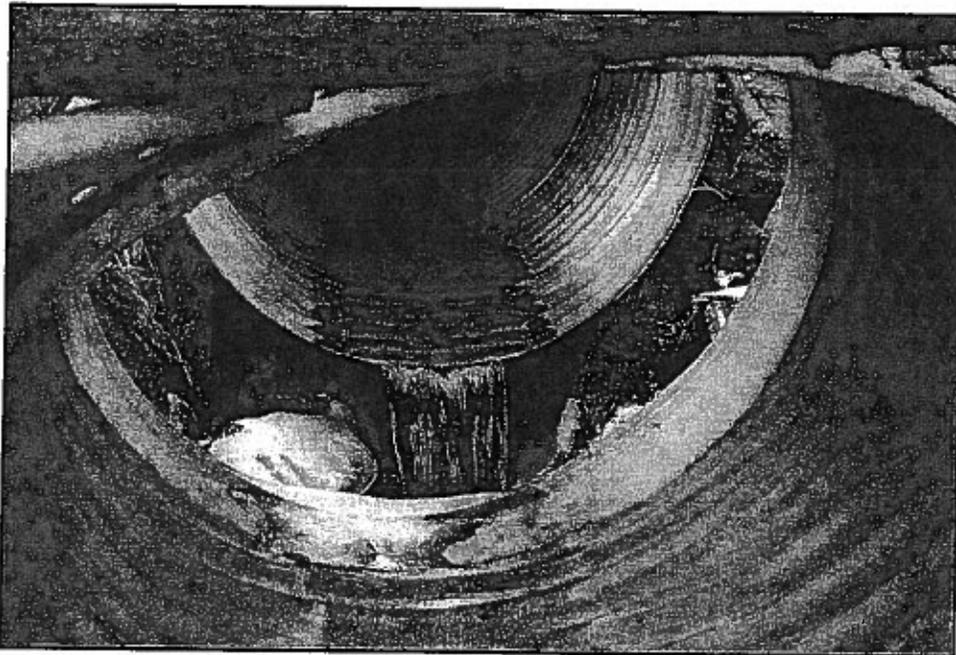


Photograph 4: High Priority Monitoring Station P001. Watershed P2 – end of runway 1.
December 5, 2002

Photograph taken by Stacey L. Kirby of Pioneer Environmental Associates, LLC.

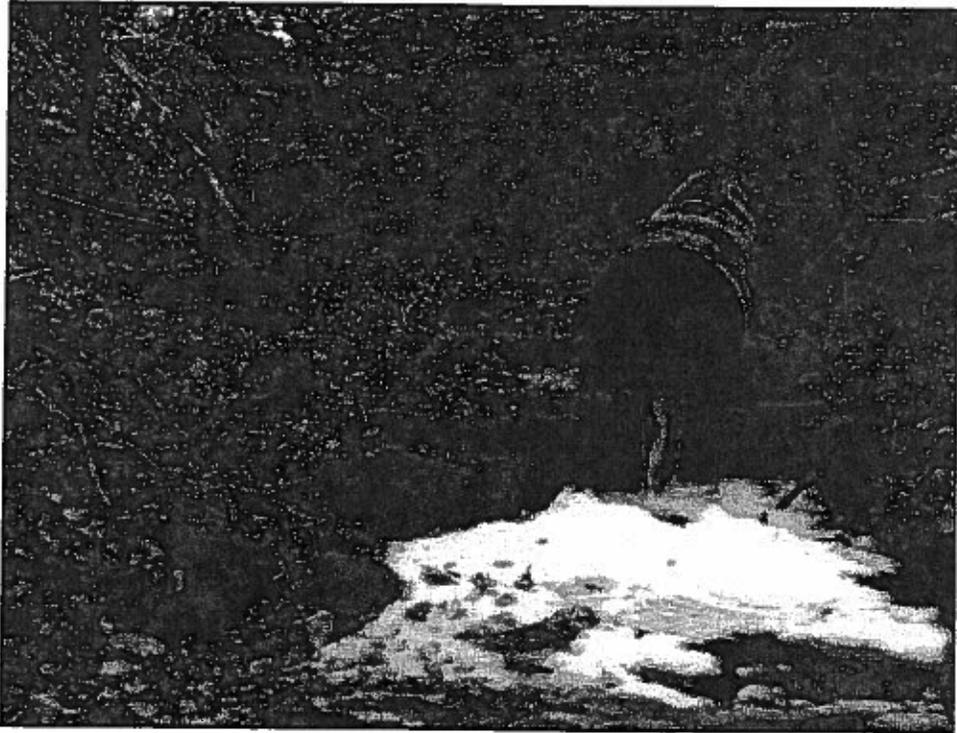


Photograph 5: High Priority Monitoring Station P005. Watershed P2 – end of runway 1.
March 24, 2003



Photograph 6: High Priority Monitoring Station Q001A. Unnamed tributary to Winooski
River. December 5, 2002

Photographs taken by Stacey L. Kirby of Pioneer Environmental Associates, LLC.



Photograph 7: High Priority Monitoring Station Q001B, with observed foam.
Downstream from Station Q001A. November 7, 2002.



Photograph 8: High Priority Monitoring Station VTANG1. Point of discharge from
eastern side of base, and discharge waters from VTANG2. November 27, 2002

Photographs taken by Harry Harrington of Dufresne-Henry, Inc.



Photograph 9: High Priority Monitoring Station VTANG2. Discharge point from western side of base. December 12, 2002



Photograph 10: Low Priority Monitoring Station Z017. Wetland to Muddy Brook. December 5, 2002

Photographs taken by Stacey L. Kirby of Pioneer Environmental Associates, LLC.



Photograph 11: Foam at outlet of Q001B. Sampling not conducted.
December 12, 2002



Photograph 12: Foam downstream of Q001B. Sampling not conducted.
December 12, 2002

Photographs taken by Stacey L. Kirby of Pioneer Environmental Associates, LLC.

APPENDIX 2

Burlington International Airport Water Quality
Flow Monitoring for High Priority Sites

Site	Culvert Description	Method	3/24/2003 Dry Weather		4/23/2003 Wet Weather		7/22/2003 Wet Weather		9/10/2003 Dry Weather	
			Measurements	Results	Measurements	Results	Measurements	Results	Measurements	Results
P001	15 inch - Smooth Concrete	Float Method	Too low to measure		Too low to measure		Too low to measure		Culvert Dry	
P005	15 inch - Corrugated Metal	Float Method	Culvert Dry		Culvert Dry		Culvert Dry		Culvert Dry	
D018	42 inch - Corrugated Metal	Bucket Measurements	Length of wetted apron = 4.5 ft	Q for 0.83 ft = 0.076 cfs	Length of wetted apron = 4.5 ft	Q for 0.83 ft = 0.13 cfs	Length of wetted Apron = 4.5 ft	Q for 0.83 ft = 0.10 cfs	Too low to measure	
			Diameter of Bucket = 0.83 ft	Total Q = 0.076 cfs x 5.42	Diameter of Bucket = 0.83 ft	Total Q = 0.13 cfs x 5.42	Diameter of Bucket = 0.83 ft	Total Q = 0.10 cfs x 5.42		
			1 gallon/ 1.75 seconds	Total Q = 0.41 cfs	1 gallon/ 1 second	Total Q = 0.72 cfs	0.75 gallon/ 1 second	Total Q = 0.54 cfs		
Q001A	42 inch - Metal Corrugated	Bucket Measurements	1 gallon/4 seconds	Q = 0.03 cfs	2 gallons/1 second	Q = 0.27 cfs	2 gallons/ 4 seconds	Q = 0.067 cfs	1 gallon/ 6 seconds	Q = 0.022 cfs
Q001B	18 inch - Metal Corrugated	Bucket Measurements	1.5 gallons/1 second	Q = 0.20 cfs	3 gallons/1 second	Q = 0.40 cfs	2 gallons/ 3 seconds	Q = 0.09 cfs	1 gallon/4 seconds	Q = 0.033 cfs
VTANG1	Two 36 inch - Smooth Concrete	Float Method	V = 2ft/10sec	Q = V x Water Area	Too low to measure		Too low to measure		Culvert Dry	
VTANG2	36 inch - Corrugated Metal	Float Method	Depth of water = 1.5ft	Total Q = 0.70 cfs x two culverts	Too low to measure		Too low to measure		Too low to measure	
			Water Area = 3.53 ft ²	Total Q = 1.41 cfs						
			V = 2ft/8sec	Q = V x Water Area						
			Depth of water = 2.2ft	Q = 1.39 cfs	Too low to measure		Too low to measure		Too low to measure	
			Water Area = 5.55 ft ²		Too low to measure		Too low to measure		Too low to measure	

Burlington International Airport Water Quality
 Monitoring Station Chemistry 2002/2003
 Combined Wet Weather & Dry Weather Sampling
 Station: D018: Location: Watershed D - downhill from localizer antenna
 Receiving Stream: Muddy Brook - Station Type: High Priority

Type of Analysis	Parameter	Vermont Water Quality Standard		12/12/2002 Wet Weather	3/24/2003 Dry Weather	4/23/2003 Wet Weather	7/22/2003 Wet Weather	9/10/2003 Dry Weather	Unit	
		Type	Value							
Organic	Acrolein	HH	780	***	NA	< 20.0	< 20.0	< 20.0	ug/L	
	Acrylonitrile	HH	0.66	***	NA	< 20.0 **	< 20.0 **	< 20.0 **	ug/L	
	Benzene	HH	71	***	< 10.0	< 1.0	< 1.0	< 1.0	ug/L	
	Bromoform	HH	360	***	NA	< 1.0	< 1.0	< 1.0	ug/L	
	Carbon Tetrachloride	HH	4.4	***	< 10.0 **	< 1.0	< 1.0	< 1.0	ug/L	
	Chlorobenzene/Monochlorobenzene	HH	21,000	***	< 10.0	< 1.0	< 1.0	< 1.0	ug/L	
	Chlorodibromomethane/Dibromochloromethane	HH	34	***	NA	< 1.0	< 1.0	< 1.0	ug/L	
	Chloroform	HH	470	***	< 10.0	< 1.0	< 1.0	< 1.0	ug/L	
	1,4-Dichlorobenzene	HH	2,600	***	< 10.0	< 1.0	< 1.0	< 1.0	ug/L	
	Dichlorobromomethane/Bromodichloromethane	HH	22	***	NA	< 1.0	< 1.0	< 1.0	ug/L	
	1,2-Dichloroethane	HH	99	***	< 10.0	< 1.0	< 1.0	< 1.0	ug/L	
	1,1-Dichloroethylene/1,1-Dichloroethene	HH	3.2	***	< 10.0 **	< 1.0	< 1.0	< 1.0	ug/L	
	1,3-Dichloropropylene	HH	1,700	***	NA	< 1.0	< 1.0	< 1.0	ug/L	
	Ethylbenzene	HH	29,000	***	NA	< 1.0	< 1.0	< 1.0	ug/L	
	Methyl Ethyl Ketone/2-Butanone	HH	4,000	***	< 200.0	< 20.0	< 20.0	< 10.0	< 10.0	ug/L
	Methyl Bromide/Bromomethane	HH	1,600	***	NA	< 5.0	< 5.0	< 5.0	< 5.0	ug/L
	Methylene Chloride	HH	11	***	NA	< 5.0	< 5.0	< 5.0	< 5.0	ug/L
	1,1,2,2-Tetrachloroethane	HH	8.85	***	NA	< 2.0	< 2.0	< 2.0	< 2.0	ug/L
	Tetrachloroethylene/Tetrachloroethene	HH	200,000	***	< 10.0 **	< 1.0	< 1.0	< 1.0	< 1.0	ug/L
	Toluene	HH	42	***	NA	< 1.0	< 1.0	< 1.0	< 1.0	ug/L
1,1,2-Trichloroethane	HH	81	***	NA	< 1.0	< 1.0	< 1.0	< 1.0	ug/L	
Trichloroethylene/Trichloroethene	HH	525	***	< 10.0	< 2.0	< 2.0	< 2.0	1.8	ug/L	
Vinyl Chloride	HH		***	< 2.00	< 2.00	< 2.00	< 2.00	< 2.00	mg/L	
Ethylene Glycol			< 2.00	< 2.00	< 2.00	< 2.00	< 2.00	< 2.00	mg/L	
Propylene Glycol			< 2.00	< 2.00	< 2.00	< 2.00	< 2.00	< 2.00	mg/L	
TPH 8015 DRO			< 0.40	< 0.40	< 0.40	< 0.40	< 0.40	< 0.40	mg/L	
Surfactants			< 40.0	< 40.0	< 40.0	< 40.0	< 40.0	78.5	ug/L	

Burlington International Airport Water Quality
 Monitoring Station Chemistry 2002/2003
 Combined Wet Weather & Dry Weather Sampling
 Station: D018: Location: Watershed D - downhill from localizer antenna
 Receiving Stream: Muddy Brook - Station Type: High Priority

Type of Analysis	Parameter	Vermont Water Quality Standard		12/12/2002 Wet Weather	3/24/2003 Dry Weather	4/23/2003 Wet Weather	7/22/2003 Wet Weather	9/10/2003 Dry Weather	Unit
		Type	Value						
Priority Pollutant Metals	Antimony	HH	4.300	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	mg/L
	Arsenic	HH	0.0015	< 0.002**	< 0.002**	< 0.002**	< 0.002**	0.008	mg/L
	Beryllium			< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	mg/L
	Cadmium	AB	0.001*	< 0.003**	< 0.003**	< 0.003**	< 0.003**	< 0.003**	mg/L
	Chromium	AB	0.011	< 0.010	< 0.010	< 0.010	< 0.010	< 0.001	mg/L
	Copper	AB	0.013*	0.011	< 0.010	0.011	< 0.010	< 0.010	mg/L
	Lead	AB	0.004*	< 0.002	< 0.002	< 0.002	0.009	< 0.002	mg/L
	Mercury	AB	0.000012	< 0.001**	< 0.001**	< 0.001**	< 0.001**	< 0.001**	mg/L
	Nickel	AB	0.175*	< 0.020**	< 0.020**	< 0.020**	< 0.020**	< 0.020**	mg/L
	Selenium	AB	0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	mg/L
	Silver	AB	0.005*	< 0.010**	< 0.010**	< 0.010**	< 0.010**	< 0.010**	mg/L
	Thallium	HH	0.0063	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	mg/L
	Zinc	AB	0.118*	0.021	< 0.020	0.740	< 0.020	< 0.020	mg/L
	<i>E. coli</i>	G	77	5	2	NA	> 201	4	MPN/100ml
	Microbiology	BOD5		6.6	28	45	5.2	2.6	2.6
Chemical Oxygen Demand			22	66	70	30	19	19	mg/L
Chloride			NA	176	162	189	131	131	mg/L
Nitrogen, Nitrate		G	5.00	NA	1.33	0.93	3.00	9.14	mg/L
Nitrogen, T. Kjeldhal				1.72	8.88	7.95	2.30	0.55	mg/L
Inorganic	pH	G	6.5 - 8.5	7.5	7.5	8.0	8.2	8.4	S.U
	Total Suspended Solids			8.0	7.0	7.0	< 2.0	37	mg/L
	Total Phosphorus	G	0.014	0.022	0.055	0.043	0.039	0.062	mg/L
	Dissolved Phosphorus			0.009	0.022	0.017	0.027	0.009	mg/L
	Conductivity			901	903	781	650	675	umho/cm
Miscellaneous	Dissolved Oxygen	G	>7.0	11.8	NA	11.8	***	9.2	mg/L
	% Saturation			NA	NA	1.00	NA	0.77	mg/L
	Turbidity	G	10.00	14.4	3.31	2.84	3.14	131	N.T.U
	Temperature			6.9	8.7	9.0	6.8	7.9	°C
	Flow			NA	0.39	0.78	0.53	Too low to measure	cfs

Notes:
 G - General Class B Waters Criteria
 HH - Human Health Consumption of Organisms Criteria
 AB - Aquatic Biota Chronic Criteria
 * Values determined using an estimated hardness of 113 mg/L
 ** Indicates values for which compliance with the VWS can not be determined due to minimum detection levels during analysis
 *** Analysis not completed due to lab error
 NA - Parameter not analyzed

Burlington International Airport Water Quality
 Monitoring Station Chemistry 2002/2003
 Combined Wet Weather & Dry Weather Sampling
 Station: P001: Location: Watershed P2 - off from Perimeter Road
 Receiving Stream: Tributary to Potash Brook - Station Type: High Priority

Type of Analysis	Parameter	Vermont Water Quality Standard		12/12/2002 Wet Weather Culvert Frozen	3/24/2003 Dry Weather	4/23/2003 Wet Weather	7/22/2003 Wet Weather	9/10/2003 Dry Weather	Unit
		Type	Value						
Organic	Acrolein	HH	780		NA	< 20.0	< 20.0	Dry Weather Culvert Dry	ug/L
	Acrylonitrile	HH	0.66		NA	< 20.0 **	< 20.0 **		ug/L
	Benzene	HH	71		< 10.0	< 1.0	< 1.0		ug/L
	Bromoform	HH	360		NA	< 1.0	< 1.0		ug/L
	Carbon Tetrachloride	HH	4.4		< 10.0**	< 1.0	< 1.0		ug/L
	Chlorobenzene/Monochlorobenzene	HH	21,000		< 10.0	< 1.0	< 1.0		ug/L
	Chlorobromomethane/Dibromochloromethane	HH	34		NA	< 1.0	< 1.0		ug/L
	Chloroform	HH	470		< 10.0	< 1.0	< 2.0		ug/L
	1,4-Dichlorobenzene	HH	2,600		< 10.0	< 1.0	< 1.0		ug/L
	Dichlorobromomethane/Bromodichloromethane	HH	22		NA	< 1.0	< 1.0		ug/L
	1,2-Dichloroethane	HH	99		< 10.0	< 1.0	< 1.0		ug/L
	1,1-Dichloroethylene/1,1-Dichloroethene	HH	3.2		< 10.0 **	< 1.0	< 1.0		ug/L
	1,3-Dichloropropylene	HH	1,700		NA	< 1.0	< 1.0		ug/L
	Ethylbenzene	HH	29,000		NA	< 1.0	< 1.0		ug/L
	Methyl Ethyl Ketone/2-Butanone	HH	4,000		< 200.0	< 20.0	< 10.0		ug/L
Methyl Bromide/Bromomethane	HH	1,600		NA	< 5.0	< 5.0		ug/L	
Methylene Chloride	HH	11		NA	< 5.0	< 5.0		ug/L	
1,1,2,2-Tetrachloroethane	HH	8.85		NA	< 2.0	< 2.0		ug/L	
Tetrachloroethylene/Tetrachloroethene	HH	200,000		< 10.0	< 1.0	< 1.0		ug/L	
Toluene	HH	42		NA	< 1.0	< 1.0		ug/L	
1,1,2-Trichloroethane	HH	81		NA	< 1.0	< 1.0		ug/L	
Trichloroethylene/Trichloroethene	HH	525		< 10.0	< 2.0	< 2.0		ug/L	
Vinyl Chloride	HH	81		< 20.0	< 2.0	< 2.0		ug/L	
Ethylene Glycol				< 1.00	< 2.00	< 2.00		mg/L	
Propylene Glycol				1.31	< 2.00	< 2.00		mg/L	
TPH 8015 DRO				< 0.40	< 0.40	< 0.40		mg/L	
Surfactants				52.9	114.0	106.0		ug/L	

Burlington International Airport Water Quality
 Monitoring Station Chemistry 2002/2003
 Combined Wet Weather & Dry Weather Sampling
 Station: P001: Location: Watershed P2 - off from Perimeter Road
 Receiving Stream: Tributary to Potash Brook - Station Type: High Priority

Type of Analysis	Parameter	Vermont Water Quality Standard		12/12/2002 Wet Weather Culvert Frozen	3/24/2003 Dry Weather	4/23/2003 Wet Weather	7/22/2003 Wet Weather	9/10/2003 Dry Weather	Unit
		Type	Value						
Priority Pollutant Metals	Antimony	HH	4.300		< 0.002	< 0.002	< 0.002	Culvert Dry	mg/L
	Arsenic	HH	0.0015		< 0.002	< 0.002	< 0.002		mg/L
	Beryllium				< 0.002	< 0.002	< 0.002		mg/L
	Cadmium	AB	0.001*		< 0.003	< 0.003	< 0.003		mg/L
	Chromium	AB	0.011		< 0.010	0.014	< 0.010		mg/L
	Copper	AB	0.013*		0.012	0.015	< 0.010		mg/L
	Lead	AB	0.004*		0.004	0.027	< 0.002		mg/L
	Mercury	AB	0.000012		< 0.001	< 0.001	< 0.001		mg/L
	Nickel	AB	0.175*		< 0.020	< 0.020	< 0.020		mg/L
	Selenium	AB	0.005		< 0.005	< 0.005	< 0.005		mg/L
Microbiology	Silver	AB	0.005*		< 0.010	< 0.010	< 0.010		mg/L
	Thallium	HH	0.0063		< 0.001	< 0.001	< 0.001		mg/L
	Zinc	AB	0.118*		1.200	0.703	< 0.020		mg/L
	<i>E.coli</i>	G	77		> 201	2	> 201		MPN/100ml
	BOD5				19	2.3	6.2		mg/L
	Chemical Oxygen Demand				89	82	42		mg/L
	Chloride				5.69	< 2.50	< 2.50		mg/L
	Nitrogen, Nitrate	G	5.00		13.2	0.84	0.69		mg/L
	Nitrogen, T. Kjeldhal				28.3	4.60	1.15		mg/L
	pH	G	6.5 - 8.5		6.9	8.5	8.4		S.U
Miscellaneous	Total Suspended Solids				14.0	113	13.0		mg/L
	Total Phosphorus	G	0.014		0.218	0.228	0.148		mg/L
	Dissolved Phosphorus				0.051	0.016	0.023		mg/L
	Conductivity				647	129	88.0		umho/cm
	Dissolved Oxygen	G	>7.0		NA	11.7	***		mg/L
	% Saturation				NA	1.00	NA		mg/L
	Turbidity	G	10.00		19.3	43.5	10.4		N.T.U
	Temperature				8.2	8.8	9.8		°C
	Flow				Too low to measure	Too low to measure	Too low to measure		cfs

Notes:
 G - General Class B Waters Criteria
 HH - Human Health Consumption of Organisms Criteria
 AB - Aquatic Biota Chronic Criteria
 * Values determined using an estimated hardness of 113 mg/L
 ** Indicates values for which compliance with the VVWQS can not be determined due to minimum detection levels during analysis
 *** Analysis not completed due to lab error
 NA - Parameter not analyzed

Burlington International Airport Water Quality
 Monitoring Station Chemistry 2002/2003
 Combined Wet Weather & Dry Weather Sampling
 Station: P005; Location: Watershed P2 - off of Perimeter Road
 Receiving Stream: Tributary to Potash Brook - Station Type: High Priority

Type of Analysis	Parameter	Vermont Water Quality Standard		12/12/2002 Wet Weather	3/24/2003 Dry Weather	4/23/2003 Wet Weather	7/22/2003 Wet Weather	9/10/2003 Dry Weather	Unit
		Type	Value						
Organic	Acrolein	HH	780	Culvert Frozen	Culvert Dry	Culvert Dry	Culvert Dry	Culvert Dry	ug/L
	Acrylonitrile	HH	0.66						ug/L
	Benzene	HH	71						ug/L
	Bromoform	HH	360						ug/L
	Carbon Tetrachloride	HH	4.4						ug/L
	Chlorobenzene/Monochlorobenzene	HH	21,000						ug/L
	Chlorodibromomethane/Dibromochloromethane	HH	34						ug/L
	Chloroform	HH	470						ug/L
	1,4-Dichlorobenzene	HH	2,600						ug/L
	Dichlorobromomethane/Bromodichloromethane	HH	22						ug/L
	1,2-Dichloroethane	HH	99						ug/L
	1,1-Dichloroethylene/1,1-Dichloroethene	HH	3.2						ug/L
	1,3-Dichloropropylene	HH	1,700						ug/L
	Ethylbenzene	HH	29,000						ug/L
	Methyl Ethyl Ketone/2-Butanone								
Methyl Bromide/Bromomethane	HH	4,000						ug/L	
Methylene Chloride	HH	1,600						ug/L	
1,1,2,2-Tetrachloroethane	HH	11						ug/L	
Tetrachloroethylene/Tetrachloroethene	HH	8.85						ug/L	
Toluene	HH	200,000						ug/L	
1,1,2-Trichloroethane	HH	42						ug/L	
Trichloroethylene/Trichloroethene	HH	81						ug/L	
Vinyl Chloride	HH	525						ug/L	
Ethylene Glycol								mg/L	
Propylene Glycol								mg/L	
TPH 8015 DRO								mg/L	
Surfactants								ug/L	

Burlington International Airport Water Quality
 Monitoring Station Chemistry 2002/2003
 Combined Wet Weather & Dry Weather Sampling
 Station: P006: Location: Watershed P2 - off of Perimeter Road
 Receiving Stream: Tributary to Potash Brook - Station Type: High Priority

Type of Analysis	Parameter	Vermont Water Quality Standard		12/12/2002 Wet Weather	3/24/2003 Dry Weather	4/23/2003 Wet Weather	7/22/2003 Wet Weather	9/10/2003 Dry Weather	Unit
		Type	Value						
Priority Pollutant Metals	Antimony	HH	4.300	Culvert Frozen	Culvert Dry	Culvert Dry	Culvert Dry	Culvert Dry	mg/L
	Arsenic	HH	0.0015						mg/L
	Beryllium								mg/L
	Cadmium	AB	0.001*						mg/L
	Chromium	AB	0.011						mg/L
	Copper	AB	0.013*						mg/L
	Lead	AB	0.004*						mg/L
	Mercury	AB	0.000012						mg/L
	Nickel	AB	0.175*						mg/L
	Selenium	AB	0.005						mg/L
	Silver	AB	0.005*						mg/L
	Thallium	HH	0.0063						mg/L
	Zinc	AB	0.118*						mg/L
	<i>E. coli</i>	G	77						MPN/100ml
Inorganic	BOD5								mg/L
	Chemical Oxygen Demand								mg/L
	Chloride								mg/L
	Nitrogen, Nitrate	G	5.00						mg/L
Miscellaneous	Nitrogen, T. Kjeldhal								mg/L
	pH	G	6.5 - 8.5						S.U
	Total Suspended Solids								mg/L
	Total Phosphorus	G	0.014						mg/L
Miscellaneous	Dissolved Phosphorus								mg/L
	Conductivity								umho/cm
	Dissolved Oxygen	G	>7.0						mg/L
	Turbidity	G	10.00						N.T.U
Miscellaneous	Temperature								°C
	Flow								cfs

Notes:
 G - General Class B Waters Criteria
 HH - Human Health Consumption of Organisms Criteria
 AB - Aquatic Biota Chronic Criteria
 * Values determined using an estimated hardness of 113 mg/L
 ** Indicates values for which compliance with the VVQS can not be determined due to minimum detection levels during analysis
 *** Analysis not completed due to lab error
 NA - Parameter not analyzed

Burlington International Airport Water Quality
 Monitoring Station Chemistry 2002/2003
 Combined Wet Weather & Dry Weather Sampling
 Station: Q007A: Location: Watershed Q - Below Airport Parkway
 Receiving Stream: Tributary to Winooski River - Station Type: High Priority

Type of Analysis	Parameter	Vermont Water Quality Standard		12/12/2002 Wet Weather	3/24/2003 Dry Weather	4/23/2003 Wet Weather	7/22/2003 Wet Weather	9/10/2003 Dry Weather	Unit
		Type	Value						
Organic	Acrolein	HH	780	Not Sampled	NA	< 20.0	< 20.0	< 20.0	ug/L
	Acrylonitrile	HH	0.68		NA	< 20.0**	< 20.0**	< 20.0**	ug/L
	Benzene	HH	71		< 1.0	< 1.0	< 1.0	< 1.0	ug/L
	Bromoform	HH	360		NA	< 1.0	< 1.0	< 1.0	ug/L
	Carbon Tetrachloride	HH	4.4		< 1.0	< 1.0	< 1.0	< 1.0	ug/L
	Chlorobenzene/Monochlorobenzene	HH	21,000		< 1.0	< 1.0	< 1.0	< 1.0	ug/L
	Chlorodibromomethane/Dibromochloromethane	HH	34		NA	< 1.0	< 1.0	< 1.0	ug/L
	Chloroform	HH	470		< 1.0	< 1.0	< 1.0	< 2.0	ug/L
	1,4-Dichlorobenzene	HH	2,600		< 1.0	< 1.0	< 1.0	< 1.0	ug/L
	Dichlorobromomethane/Bromodichloromethane	HH	22		NA	< 1.0	< 1.0	< 1.0	ug/L
	1,2-Dichloroethane	HH	99		< 1.0	< 1.0	< 1.0	< 1.0	ug/L
	1,1-Dichloroethylene/1,1-Dichloroethene	HH	3.2		< 1.0	< 1.0**	< 1.0	< 1.0	ug/L
	1,3-Dichloropropylene	HH	1,700		NA	< 1.0	< 1.0	< 1.0	ug/L
	Ethylbenzene	HH	29,000		NA	< 1.0	< 1.0	< 1.0	ug/L
	Methyl Ethyl Ketone/2-Butanone			< 20.0		< 20.0	< 20.0	< 10.0	ug/L
Methyl Bromide/Bromomethane	HH	4,000		NA	NA	< 5.0	< 5.0	ug/L	
Methylene Chloride	HH	1,600		NA	NA	< 5.0	< 5.0	ug/L	
1,1,2,2-Tetrachloroethane	HH	11		< 1.0	NA	< 2.0	< 2.0	ug/L	
Tetrachloroethylene/Tetrachloroethene	HH	8.85		NA	< 10.0	< 1.0	< 1.0	ug/L	
Toluene	HH	200,000		NA	NA	< 1.0	< 1.0	ug/L	
1,1,2-Trichloroethane	HH	42		NA	NA	< 1.0	< 1.0	ug/L	
Trichloroethylene/Trichloroethene	HH	81		< 1.0	< 10.0	< 1.0	< 1.0	ug/L	
Vinyl Chloride	HH	525		< 2.0	< 20.0	< 2.0	< 2.0	ug/L	
Ethylene Glycol			< 3.00		< 1.00	< 2.00	< 2.00	mg/L	
Propylene Glycol			< 3.00		< 1.00	4.85	< 2.00	mg/L	
TPH 8015 DRO			< 0.40		< 0.40	< 0.40	< 0.40	mg/L	
Surfactants			49.0		< 40.0	73.5	97.0	ug/L	

Burlington International Airport Water Quality
 Monitoring Station Chemistry 2002/2003
 Combined Wet Weather & Dry Weather Sampling
 Station: Q001A; Location: Watershed Q - Below Airport Parkway
 Receiving Stream: Tributary to Winooski River - Station Type: High Priority

Type of Analysis	Parameter	Vermont Water Quality Standard		Sampling Dates							Unit	
		Type	Value	12/15/2002	12/12/2002	3/24/2003	4/23/2003	7/22/2003	9/10/2003			
Priority Pollutant Metals	Antimony	HH	4.300	< 0.002	Not Sampled	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	mg/L
	Arsenic	HH	0.0015	< 0.002		< 0.002**	< 0.002**	< 0.002**	< 0.002**	< 0.002**	< 0.002**	mg/L
	Beryllium			< 0.002		< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	mg/L
	Cadmium	AB	0.001*	< 0.003**		< 0.003**	< 0.003**	< 0.003**	< 0.003**	< 0.003**	< 0.003**	mg/L
	Chromium	AB	0.011	< 0.010		< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	mg/L
	Copper	AB	0.013*	< 0.01		< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	mg/L
	Lead	AB	0.004*	< 0.002		< 0.002	0.003	0.003	< 0.002	< 0.002	< 0.002	mg/L
	Mercury	AB	0.000012	< 0.001**		< 0.001**	< 0.001**	< 0.001**	< 0.001**	< 0.001**	< 0.001**	mg/L
	Nickel	AB	0.175*	< 0.020**		< 0.020**	< 0.020**	< 0.020**	< 0.020**	< 0.020**	< 0.020**	mg/L
	Selenium	AB	0.005	< 0.005		< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	mg/L
	Silver	AB	0.005*	< 0.010**		< 0.010**	< 0.010**	< 0.010**	< 0.010**	< 0.010**	< 0.010**	mg/L
	Thallium	HH	0.0063	< 0.001		< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	mg/L
	Zinc	AB	0.118*	0.046		0.036	0.049	0.049	< 0.020	< 0.020	< 0.020	mg/L
	Microbiology	<i>E.coli</i>	G	77	< 1		1	> 201	> 201	> 201	< 1	MPN/100ml
Inorganic	BOD5			26		3.5	11	6.3	6.3	2.2	mg/L	
	Chemical Oxygen Demand			73		24	26	19	19	< 15	mg/L	
	Chloride			166		89.9	52.5	11.2	11.2	52.0	mg/L	
	Nitrogen, Nitrate	G	5.00	1.76		5.28	1.87	1.57	1.57	3.75	mg/L	
	Nitrogen, T. Kjeldhal			17.0		21.4	8.84	0.82	0.82	0.46	mg/L	
	pH	G	6.5 - 8.5	7.6		7.3	8.8	8.4	8.4	7.9	S.U	
	Total Suspended Solids			4.0		9.0	14	5.0	5.0	8.0	mg/L	
	Total Phosphorous	G	0.014	0.028		0.067	0.077	0.056	0.056	0.030	mg/L	
	Dissolved Phosphorous			0.005		0.011	0.023	0.023	0.023	0.004	mg/L	
	Conductivity			700		910	360	193	193	614	umho/cm	
Miscellaneous	Dissolved Oxygen	G	>7.0	10.4		NA	11.3	***	***	10.8	mg/L	
	% Saturation	G	> 70%	NA		NA	97	NA	NA	90	%	
	Turbidity	G	10.00	8.64		5.03	13.1	9.71	9.71	41.2	N.T.U	
	Temperature			NA		7.2	8.9	9.2	9.2	7.7	°C	
	Flow			NA		0.03	0.27	0.07	0.07	0.02	cfs	

Notes:
 G - General Class B Waters Criteria
 HH - Human Health Consumption of Organisms Criteria
 AB - Aquatic Biota Chronic Criteria
 * Values determined using an estimated hardness of 113 mg/L
 ** Indicates values for which compliance with the VWS can not be determined due to minimum detection levels during analysis
 *** Analysis not completed due to lab error
 NA - Parameter not analyzed

Burlington International Airport Water Quality
 Monitoring Station Chemistry 2002/2003
 Combined Wet Weather & Dry Weather Sampling
 Station: Q001B: Location Watershed Q - roughly 900 feet downstream from Q001A
 Receiving Stream: Tributary to Winooski River - Station Type: High Priority

Type of Analysis	Parameter	Vermont Water Quality Standard		12/12/2002 Wet Weather	3/24/2003 Dry Weather	4/23/2003 Wet Weather	7/22/2003 Wet Weather	9/10/2003 Dry Weather	Unit
		Type	Value						
Organic	Acrolein	HH	780	Not Sampled	NA	< 20.0	< 20.0	< 20.0	ug/L
	Acrylonitrile	HH	0.66		NA	< 20.0**	< 20.0**	< 20.0**	ug/L
	Benzene	HH	71		< 10.0	< 1.0	< 1.0	< 1.0	ug/L
	Bromoform	HH	360		NA	< 1.0	< 1.0	< 1.0	ug/L
	Carbon Tetrachloride	HH	4.4		< 10.0**	< 1.0	< 1.0	< 1.0	ug/L
	Chlorobenzene/Monochlorobenzene	HH	21,000		< 10.0	< 1.0	< 1.0	< 1.0	ug/L
	Chlorodibromomethane/Dibromochloromethane	HH	34		NA	< 1.0	< 1.0	< 1.0	ug/L
	Chloroform	HH	470		< 10.0	< 1.0	< 2.0	< 2.0	ug/L
	1,4-Dichlorobenzene	HH	2,600		< 10.0	< 1.0	< 1.0	< 1.0	ug/L
	Dichlorobromomethane/Bromodichloromethane	HH	22		NA	< 1.0	< 1.0	< 1.0	ug/L
	1,2-Dichloroethane	HH	99		< 10.0	< 1.0	< 1.0	< 1.0	ug/L
	1,1-Dichloroethylene/1,1-Dichloroethene	HH	3.2		< 10.0**	< 1.0	< 1.0	< 1.0	ug/L
	1,3-Dichloropropylene	HH	1,700		NA	< 1.0	< 1.0	< 1.0	ug/L
	Ethylbenzene	HH	29,000		NA	< 1.0	< 1.0	< 1.0	ug/L
Methyl Ethyl Ketone/2-Butanone	HH			< 200.0	< 20.0	< 20.0	< 10.0	< 10.0	ug/L
Methyl Bromide/Bromomethane	HH	4,000		NA	< 5.0	< 5.0	< 5.0	< 5.0	ug/L
Methylene Chloride	HH	1,600		NA	< 5.0	< 5.0	< 5.0	< 5.0	ug/L
1,1,2,2-Tetrachloroethane	HH	11		NA	< 2.0	< 2.0	< 2.0	< 2.0	ug/L
Tetrachloroethylene/Tetrachloroethene	HH	8.85		< 10.0	< 1.0	< 1.0	< 1.0	< 1.0	ug/L
Toluene	HH	200,000		NA	< 1.0	< 1.0	< 1.0	< 1.0	ug/L
1,1,2-Trichloroethane	HH	42		NA	< 1.0	< 1.0	< 1.0	< 1.0	ug/L
Trichloroethylene/Trichloroethene	HH	81		< 10.0	< 1.0	< 1.0	< 1.0	< 1.0	ug/L
Vinyl Chloride	HH	525		< 20.0	< 2.0	< 2.0	< 2.0	< 2.0	ug/L
Ethylene Glycol				< 1.00	< 2.00	< 2.00	< 2.00	< 2.00	mg/L
Propylene Glycol				< 1.00	< 2.00	< 2.00	< 2.00	< 2.00	mg/L
TPH 8015 DRO				< 0.40	< 0.40	< 0.40	< 0.40	< 0.40	mg/L
Surfactants				< 40.0	53.6	50.5	50.5	< 20.0	ug/L

Burlington International Airport Water Quality
 Monitoring Station Chemistry 2002/2003
 Combined Wet Weather & Dry Weather Sampling
 Station: Q001B: Location Watershed Q - roughly 900 feet downstream from Q001A
 Receiving Stream: Tributary to Winooski River - Station Type: High Priority

Type of Analysis	Parameter	Vermont Water Quality Standard		12/12/2002 Wet Weather	3/24/2003 Dry Weather	4/23/2003 Wet Weather	7/22/2003 Wet Weather	9/10/2003 Dry Weather	Unit
		Type	Value						
Priority Pollutant Metals	Antimony	HH	4.300	Not Sampled	< 0.002	< 0.002	< 0.002	< 0.002	mg/L
	Arsenic	HH	0.0015		0.006	< 0.002**	< 0.002**	< 0.002**	mg/L
	Beryllium				< 0.002	< 0.002	< 0.002	< 0.002	mg/L
	Cadmium	AB	0.001*		< 0.003**	< 0.003**	< 0.003**	< 0.003**	mg/L
	Chromium	AB	0.011		< 0.010	< 0.010	< 0.010	< 0.010	mg/L
	Copper	AB	0.013*		0.011	< 0.010	< 0.010	< 0.010	mg/L
	Lead	AB	0.004*		0.004	< 0.002	< 0.002	< 0.002	mg/L
	Mercury	AB	0.000012		< 0.001**	< 0.001**	< 0.001**	< 0.001**	mg/L
	Nickel	AB	0.175*		0.023	< 0.020**	< 0.020**	< 0.020**	mg/L
	Selenium	AB	0.005		< 0.005	< 0.005	< 0.005	< 0.005	mg/L
	Silver	AB	0.005*		< 0.010**	< 0.010**	< 0.010**	< 0.010**	mg/L
	Thallium	HH	0.0063		< 0.001	< 0.001	< 0.001	< 0.001	mg/L
	Zinc	AB	0.118*		0.042	0.031	< 0.020	< 0.020	mg/L
	<i>E. coli</i>	G	77		2	> 201	> 201	> 201	MPN/100ml
	Inorganic	BOD5				3.6	8.7	3.7	< 2.0
Chemical Oxygen Demand					21	25	< 15	< 15	mg/L
Chloride					84.1	74.5	36.4	96.0	mg/L
Nitrogen, Nitrate					2.87	1.63	1.49	2.53	mg/L
Nitrogen, T. Kjeldhal					14.3	9.18	0.53	0.10	mg/L
pH		G	6.5 - 8.5		7.9	8.5	8.2	8.4	S.U
Total Suspended Solids					186	66.0	< 2.00	4.00	mg/L
Total Phosphorous		G	0.014		0.390	0.172	0.032	0.017	mg/L
Dissolved Phosphorous					0.009	0.012	0.023	0.012	mg/L
Conductivity					730	504	352	675	umho/cm
Miscellaneous	Dissolved Oxygen	G	> 7.0		NA	11.9	***	12.3	mg/L
	% Saturation	G	> 70%		NA	100	NA	100	%
	Turbidity	G	10.00		78.9	17.3	5.27	0.80	N.T.U
	Temperature				7.0	8.8	9.5	7.9	°C
	Flow				0.20	0.40	0.09	0.03	cfs

Notes:
 G - General Class B Waters Criteria
 HH - Human Health Consumption of Organisms Criteria
 AB - Aquatic Biota Chronic Criteria
 * Values determined using an estimated hardness of 113 mg/L
 ** Indicates values for which compliance with the VWQS can not be determined due to minimum detection levels during analysis
 *** Analysis not completed due to lab error
 NA - Parameter not analyzed

Burlington International Airport Water Quality
 Monitoring Station Chemistry 2002/2003
 Combined Wet Weather & Dry Weather Sampling
 Station: VTANG1: Location: VT Air National Guard - End of access road
 Receiving Stream: Tributary to Winooski River - Station Type: High Priority

Type of Analysis	Parameter	Vermont Water Quality Standard		12/12/2002 Wet Weather	3/24/2003 Dry Weather	4/23/2003 Wet Weather	7/22/2003 Wet Weather	9/10/2003 Dry Weather	Unit
		Type	Value						
Organic	Acrolein	HH	780	Not Sampled	NA	< 20.0	< 20.0	Culvert Dry	ug/L
	Acrylonitrile	HH	0.66		NA	< 20.0**	< 20.0**		ug/L
	Benzene	HH	71		< 10.0	< 1.0	< 1.0		ug/L
	Bromoform	HH	360		NA	< 1.0	< 1.0		ug/L
	Carbon Tetrachloride	HH	4.4		< 10.0**	< 1.0	< 1.0		ug/L
	Chlorobenzene/Monochlorobenzene	HH	21,000		< 10.0	< 1.0	< 1.0		ug/L
	Chlorodibromomethane/Dibromochloromethane	HH	34		NA	< 1.0	< 1.0		ug/L
	Chloroform	HH	470		< 10.0	< 1.0	< 2.0		ug/L
	1,4-Dichlorobenzene	HH	2,600		< 10.0	< 1.0	< 1.0		ug/L
	Dichlorobromomethane/Bromodichloromethane	HH	22		NA	< 1.0	< 1.0		ug/L
	1,2-Dichloroethane	HH	99		< 10.0	< 1.0	< 1.0		ug/L
	1,1-Dichloroethylene/1,1-Dichloroethene	HH	3.2		< 10.0**	< 1.0	< 1.0		ug/L
	1,3-Dichloropropylene	HH	1,700		NA	< 1.0	< 1.0		ug/L
	Ethylbenzene	HH	29,000		NA	< 1.0	< 1.0		ug/L
Methyl Ethyl Ketone/2-Butanone				< 200.0	< 20.0	< 10.0		ug/L	
Methyl Bromide/Bromomethane	HH	4,000		NA	< 5.0	< 5.0		ug/L	
Methylene Chloride	HH	1,600		NA	< 5.0	< 5.0		ug/L	
1,1,2,2-Tetrachloroethane	HH	11		NA	< 2.0	< 2.0		ug/L	
Tetrachloroethylene/Tetrachloroethene	HH	8.85		< 10.0	< 1.0	< 1.0		ug/L	
Toluene	HH	200,000		NA	< 1.0	< 1.0		ug/L	
1,1,2-Trichloroethane	HH	42		NA	< 1.0	< 1.0		ug/L	
Trichloroethylene/Trichloroethene	HH	81		< 10.0	< 1.0	< 1.0		ug/L	
Vinyl Chloride	HH	525		< 20.0	< 2.0	< 2.0		ug/L	
Ethylene Glycol				< 1.00	< 2.00	< 2.00		mg/L	
Propylene Glycol				< 1.00	< 2.00	< 2.00		mg/L	
TPH 8015 DRO				< 0.40	< 0.40	< 0.40		mg/L	
Surfactants				< 40.0	< 40.0	< 40.0		ug/L	

Burlington International Airport Water Quality
 Monitoring Station Chemistry 2002/2003
 Combined Wet Weather & Dry Weather Sampling
 Station: VTANG1: Location: VT Air National Guard - End of access road
 Receiving Stream: Tributary to Winooski River - Station Type: High Priority

Type of Analysis	Parameter	Vermont Water Quality Standard		12/12/2002 Wet Weather	3/24/2003 Dry Weather	4/23/2003 Wet Weather	7/22/2003 Wet Weather	9/10/2003 Dry Weather	Unit
		Type	Value						
Priority Pollutant Metals	Antimony	HH	4.300	Not Sampled	< 0.002	< 0.002	< 0.002	Culvert Dry	mg/L
	Arsenic	HH	0.0015		< 0.002 **	< 0.002 **	< 0.002 **		mg/L
	Beryllium				< 0.002	< 0.002	< 0.002		mg/L
	Cadmium	AB	0.001*		< 0.003**	< 0.003**	< 0.003**		mg/L
	Chromium	AB	0.011		< 0.010	< 0.010	< 0.010		mg/L
	Copper	AB	0.013*		< 0.010	< 0.010	< 0.010		mg/L
	Lead	AB	0.004*		0.004	0.007	0.009		mg/L
	Mercury	AB	0.000012		< 0.001**	< 0.001**	< 0.001**		mg/L
	Nickel	AB	0.175*		< 0.020**	< 0.020**	< 0.020**		mg/L
	Selenium	AB	0.005		< 0.005	< 0.005	< 0.005		mg/L
	Silver	AB	0.005*		< 0.010**	< 0.010**	< 0.010**		mg/L
	Thallium	HH	0.0063		< 0.001	< 0.001	< 0.001		mg/L
	Zinc	AB	0.118*		0.061	0.088	0.042		mg/L
	<i>E.coli</i>	G	77		15	8	> 201		MPN/100ml
	Inorganic	BOD5				19	< 2.0	< 2.0	
Chemical Oxygen Demand					51	< 15	< 15		mg/L
Chloride					5.40	3.91	< 2.50		mg/L
Nitrogen, Nitrate		G	5.00		0.11	0.28	0.20		mg/L
Nitrogen, T. Kjeldhal					3.49	0.52	0.20		mg/L
pH		G	6.5 - 8.5		8.0	8.4	8.5		S.U
Total Suspended Solids					14	14	2.0		mg/L
Total Phosphorous		G	0.014		0.267	0.084	0.052		mg/L
Dissolved Phosphorous					0.067	0.022	0.047		mg/L
Conductivity					124	68.7	66.0		umho/cm
Dissolved Oxygen		G	>7.0		NA	10.2	***		mg/L
% Saturation					NA	0.9	NA		
Turbidity		G	10.00		9.16	7.23	3.86		N.T.U
Temperature					6.8	9.1	8.7		°C
Flow					1.4	Too low to measure	Too low to measure		cfs

Notes:
 G - General Class B Waters Criteria
 HH - Human Health Consumption of Organisms Criteria
 AB - Aquatic Biota Chronic Criteria
 * Values determined using an estimated hardness of 113 mg/L
 ** Indicates values for which compliance with the VWQS can not be determined due to minimum detection levels during analysis
 *** Analysis not completed due to lab error
 NA - Parameter not analyzed

Burlington International Airport Water Quality
 Monitoring Station Chemistry 2002/2003
 Combined Wet Weather & Dry Weather Sampling
 Station: VTANG2: Location: VT Air National Guard - Inside fence
 Receiving Stream: Tributary to Winooski River - Station Type: High Priority

Type of Analysis	Parameter	Vermont Water Quality Standard		12/12/2002 Wet Weather	3/12/2003 Dry Weather	4/23/2003 Wet Weather	7/12/2003 Wet Weather	9/10/2003 Dry Weather	Unit
		Type	Value						
Organic	Acrolein	HH	780	***	NA	< 20.0	< 20.0	< 20.0	ug/L
	Acrylonitrile	HH	0.66	***	NA	< 20.0**	< 20.0**	< 20.0**	ug/L
	Benzene	HH	71	***	< 10.0	< 1.0	< 1.0	< 1.0	ug/L
	Bromoform	HH	360	***	NA	< 1.0	< 1.0	< 1.0	ug/L
	Carbon Tetrachloride	HH	4.4	***	< 10.0**	< 1.0	< 1.0	< 1.0	ug/L
	Chlorobenzene/Monochlorobenzene	HH	21,000	***	< 10.0	< 1.0	< 1.0	< 1.0	ug/L
	Chlorodibromomethane/Dibromochloromethane	HH	34	***	NA	< 1.0	< 1.0	< 1.0	ug/L
	Chloroform	HH	470	***	< 10.0	< 1.0	< 2.0	< 1.0	ug/L
	1,4-Dichlorobenzene	HH	2,600	***	< 10.0	< 1.0	< 1.0	< 1.0	ug/L
	Dichlorobromomethane/Bromodichloromethane	HH	22	***	NA	< 1.0	< 1.0	< 1.0	ug/L
	1,2-Dichloroethane	HH	99	***	< 10.0	< 1.0	< 1.0	< 1.0	ug/L
	1,1-Dichloroethylene/1,1-Dichloroethene	HH	3.2	***	< 10.0**	< 1.0	< 1.0	< 1.0	ug/L
	1,3-Dichloropropylene	HH	1,700	***	NA	< 1.0	< 1.0	< 1.0	ug/L
	Ethylbenzene	HH	29,000	***	NA	< 1.0	< 1.0	< 1.0	ug/L
	Methyl Ethyl Ketone/2-Butanone	HH	4,000	***	< 200.0	< 20.0	< 10.0	< 20.0	ug/L
	Methyl Bromide/Bromomethane	HH	1,600	***	NA	< 5.0	< 5.0	< 5.0	ug/L
	Methylene Chloride	HH	11	***	NA	< 5.0	< 5.0	< 5.0	ug/L
	1,1,2,2-Tetrachloroethane	HH	8.85	***	NA	< 2.0	< 2.0	< 2.0	ug/L
	Tetrachloroethylene/Tetrachloroethene	HH	200,000	***	< 10.0	< 1.0	< 1.0	< 1.0	ug/L
	Toluene	HH	42	***	NA	< 1.0	< 1.0	< 1.0	ug/L
1,1,2-Trichloroethane	HH	81	***	NA	< 1.0	< 1.0	< 1.0	ug/L	
Trichloroethylene/Trichloroethene	HH	525	***	< 10.0	< 1.0	< 1.0	< 1.0	ug/L	
Vinyl Chloride	HH	< 2.00	***	< 2.00	< 2.0	< 2.0	< 2.0	ug/L	
Ethylene Glycol		< 2.00	***	< 2.00	< 2.00	< 2.00	< 2.00	mg/L	
Propylene Glycol		< 2.00	***	< 2.00	< 2.00	< 2.00	< 2.00	mg/L	
TPH 8015 DRO		< 0.40	***	< 0.40	< 0.40	< 0.40	< 0.40	mg/L	
Surfactants		145.0	***	145.0	< 40.0	< 40.0	< 40.0	60.5	ug/L

Burlington International Airport Water Quality
 Monitoring Station Chemistry 2002/2003
 Combined Wet Weather & Dry Weather Sampling
 Station: VTANG2: Location: VT Air National Guard - Inside fence
 Receiving Stream: Tributary to Winooski River - Station Type: High Priority

Type of Analysis	Parameter	Vermont Water Quality Standard		12/12/2002 Wet Weather	3/24/2003 Dry Weather	4/23/2003 Wet Weather	7/22/2003 Wet Weather	9/10/2003 Dry Weather	Unit
		Type	Value						
Priority Pollutant Metals	Antimony	HH	4.300	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	mg/L
	Arsenic	HH	0.0015	0.002	< 0.002**	< 0.002**	< 0.002**	< 0.002**	mg/L
	Beryllium			< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	mg/L
	Cadmium	AB	0.001*	< 0.003**	< 0.003**	< 0.003**	< 0.003**	< 0.003**	mg/L
	Chromium	AB	0.011	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	mg/L
	Copper	AB	0.013*	0.022	< 0.010	0.012	< 0.010	< 0.010	mg/L
	Lead	AB	0.004*	0.054	0.009	0.027	0.003	0.003	mg/L
	Mercury	AB	0.000012	< 0.001**	< 0.001**	< 0.001**	< 0.001**	< 0.001**	mg/L
	Nickel	AB	0.175*	< 0.020**	< 0.020**	< 0.020**	< 0.020**	< 0.020**	mg/L
	Selenium	AB	0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	mg/L
	Silver	AB	0.005*	< 0.010**	< 0.010**	< 0.010**	< 0.010**	< 0.010**	mg/L
	Thallium	HH	0.0063	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	mg/L
	Zinc	AB	0.118*	0.188	0.071	0.051	0.782	0.782	mg/L
	<i>E.coli</i>	G	77	NA	4	24	> 201	4	MPN/100ml
Microbiology	BOD5		110	25.0	4.20	< 2.00	< 2.00	< 2.00	mg/L
	Chemical Oxygen Demand		207	46.0	< 15.0	< 15.0	< 15.0	19.0	mg/L
	Chloride			NA	2.82	3.79	< 2.50	7.30	mg/L
	Nitrogen, Nitrate	G	5.00	< 0.02	0.08	0.28	0.18	0.68	mg/L
	Nitrogen, T. Kjeldhal			3.42	3.87	0.32	0.17	0.50	mg/L
	pH	G	6.5 - 8.5	5.5	7.1	8.6	8.6	8.6	S.U
	Total Suspended Solids			31	9.0	12	2.0	7.0	mg/L
	Total Phosphorous	G	0.014	0.403	0.317	0.073	0.069	0.070	mg/L
	Dissolved Phosphorous			0.223	0.072	0.020	0.043	0.041	mg/L
	Conductivity			95.0	120	84.9	69.7	125	umho/cm
Miscellaneous	Dissolved Oxygen	G	>7.0	NA	NA	10	***	8.1	mg/L
	% Saturation			NA	NA	0.84	NA	0.71	mg/L
	Turbidity	G	10.00	NA	10.9	12.3	4.17	1.58	N.T.U
	Temperature			6.0	7.2	7.8	9.1	10.2	°C
	Flow			NA	1.4	Too low to measure	Too low to measure	Too low to measure	cfs

Notes:
 G - General Class B Waters Criteria
 HH - Human Health Consumption of Organisms Criteria
 AB - Aquatic Biot Chronic Criteria
 ** Values determined using an estimated hardness of 113 mg/L
 ** Indicates values for which compliance with the VWQS can not be determined due to minimum detection levels during analysis
 *** Analysis not completed due to lab error
 NA - Parameter not analyzed

Burlington International Airport Water Quality
 Monitoring Station Chemistry 2002/2003
 Combined Wet Weather & Dry Weather Sampling
 Station: K001: Location: Watershed K - Parking area
 Receiving Stream: Muddy Brook - Station Type: Low Priority

Type of Analysis	Parameter	Vermont Water Quality Standard		12/12/2002 Wet Weather	3/24/2003 Dry Weather	4/23/2003 Wet Weather	7/22/2003 Wet Weather	9/10/2003 Dry Weather	Unit
		Type	Value						
Organic	Ethylene Glycol								mg/L
	Propylene Glycol								mg/L
Microbiology	<i>E. coli</i>	G	77						MPN/100ml
	Chloride								mg/L
	Nitrogen, Nitrate	G	5.00						mg/L
	Nitrogen, T. Kjeldahl								mg/L
Inorganic	pH	G	6.5 - 8.5						S.U
	Total Suspended Solids								mg/L
	Total Phosphorus	G	0.014						mg/L
	Dissolved Phosphorus								mg/L
Miscellaneous	Conductivity								umho/cm
	Dissolved Oxygen	G	>7.0						mg/L
	% Saturation								%
	Temperature								°C

Notes:

- G - General Class B Waters Criteria
- HH - Human Health Consumption of Organisms Criteria
- AB - Aquatic Biota Chronic Criteria
- * Values determined using an estimated hardness of 113 mg/L
- ** Indicates values for which compliance with the VWQS can not be determined due to minimum detection levels during analysis
- *** Analysis not completed due to lab error
- NA - Parameter not analyzed

Burlington International Airport Water Quality
 Monitoring Station Chemistry 2002/2003
 Combined Wet Weather & Dry Weather Sampling
 Station: M001: Location: Perimeter of Wetland, off from Eagle Drive
 Receiving Stream: Muddy Brook - Station Type: Low Priority

Type of Analysis	Parameter	Vermont Water Quality Standard		12/12/2002 Wet Weather	3/24/2003 Dry Weather	4/23/2003 Wet Weather	7/22/2003 Wet Weather	9/10/2003 Dry Weather	Unit
		Type	Value						
Organic	Ethylene Glycol			< 20.0	< 1.0	< 2.00	< 2.00	< 2.00	mg/L
	Propylene Glycol			< 20.0	< 1.0	< 2.00	< 2.00	< 2.00	mg/L
Microbiology	<i>E.coli</i>	G	77	< 1	NA	NA	> 201	40	MPN/100ml
	Chloride			2,160	45.20	16.90	3.600	28.40	mg/L
Inorganic	Nitrogen, Nitrate	G	5.00	3.24	7.77	1.11	0.80	2.68	mg/L
	Nitrogen, T. Kjeldahl			2,430	< 0.040	2,780	0.810	3.840	mg/L
	pH	G	6.5 - 8.5	7.0	7.3	9.1	8.6	9.1	S.U
	Total Suspended Solids			24	3.0	9.0	< 2.0	28	mg/L
	Dissolved Phosphorus			0.007	0.008	NA	0.071	1.620	mg/L
Miscellaneous	Total Phosphorus	G	0.014	0.360	0.027	0.159	0.077	1.950	mg/L
	Dissolved Phosphorus			0.007	0.008	NA	0.071	1.620	mg/L
	Conductivity			6,996	476.0	157.0	123.5	315.0	umho/cm
	Dissolved Oxygen	G	>7.0	7.34	NA	9.01	***	10.4	mg/L
	% Saturation			NA	NA	0.81	NA	0.92	%
	Temperature			6.1	9.8	10.7	10.4	10.1	°C

Notes:

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** Indicates values for which compliance with the VWQS can not be determined due to minimum detection levels during analysis

*** Analysis not completed due to lab error

NA - Parameter not analyzed

Burlington International Airport Water Quality
 Monitoring Station Chemistry 2002/2003
 Combined Wet Weather & Dry Weather Sampling
 Station: 2017: Location: Watershed Z - existing Hex Hangars
 Receiving Stream: Muddy Brook - Station Type: Low Priority

Type of Analysis	Parameter	Vermont Water Quality Standard		12/12/2002 Wet Weather	3/24/2003 Dry Weather	4/23/2003 Wet Weather	7/22/2003 Wet Weather	9/10/2003 Dry Weather	Unit
		Type	Value						
Organic	Ethylene Glycol			Culvert Dry	Culvert Dry	Culvert Dry	Culvert Dry	Culvert Dry	mg/L
	Propylene Glycol								mg/L
Microbiology	<i>E.coli</i>	G	77						MPN/100ml
	Chloride								mg/L
Inorganic	Nitrogen, Nitrate	G	5.00						mg/L
	Nitrogen, T. Kjeldahl								mg/L
	pH	G	6.5 - 8.5						S.U
	Total Suspended Solids								mg/L
	Total Phosphorus	G	0.014						mg/L
Miscellaneous	Dissolved Phosphorus								mg/L
	Conductivity								umho/cm
	Dissolved Oxygen	G	>7.0						mg/L
	% Saturation								%
	Temperature								°C

Notes:

- G - General Class B Waters Criteria
- HH - Human Health Consumption of Organisms Criteria
- AB - Aquatic Biota Chronic Criteria
- * Values determined using an estimated hardness of 113 mg/L
- ** Indicates values for which compliance with the VWQS can not be determined due to minimum detection levels during analysis
- *** Analysis not completed due to lab error
- NA - Parameter not analyzed

Pioneer Environmental Associates, LLC. (Pioneer)
 Burlington International Airport Water Quality
 Additional Monitoring Station Chemistry: December 2003
 Wet Weather Sampling
 Stations: Q001A and Q001B
 Date: December 11, 2003

Type of Analysis	Parameter	Vermont Water Quality Standard		Q001A			Q001B		Unit
		Type	Value	9:00 AM	1:00 PM	9:45 AM	12:15 PM		
Organic	Acrolein	HH	780	< 20.0	< 20.0	< 20.0	< 20.0	< 20.0	ug/L
	Acrylonitrile	HH	0.66	< 20.0**	< 20.0**	< 20.0**	< 20.0**	< 20.0**	ug/L
	Benzene	HH	71	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	ug/L
	Bromoform	HH	360	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	ug/L
	Carbon Tetrachloride	HH	4.4	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	ug/L
	Chlorobenzene/Monochlorobenzene	HH	21,000	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	ug/L
	Chlorobromomethane/Dibromochloromethane	HH	34	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	ug/L
	Chloroform	HH	470	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	ug/L
	1,4-Dichlorobenzene	HH	2,600	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	ug/L
	Dichlorobromomethane/Bromodichloromethane	HH	22	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	ug/L
	1,2-Dichloroethane	HH	99	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	ug/L
	1,1-Dichloroethylene/1,1-Dichloroethene	HH	3.2	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	ug/L
	1,3-Dichloropropylene	HH	1,700	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	ug/L
	Ethylbenzene	HH	29,000	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	ug/L
	Methyl Ethyl Ketone/2-Butanone			12.5	< 10.0	< 10.0	< 10.0	< 10.0	ug/L
Methyl Bromide/Bromomethane	HH	4,000	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	ug/L	
Methylene Chloride	HH	1,600	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	ug/L	
1,1,2,2-Tetrachloroethane	HH	11	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	ug/L	
Tetrachloroethylene/Tetrachloroethene	HH	8.85	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	ug/L	
Toluene	HH	200,000	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	ug/L	
1,1,2-Trichloroethane	HH	42	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	ug/L	
Trichloroethylene/Trichloroethene	HH	81	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	ug/L	
Vinyl Chloride	HH	525	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	ug/L	
Ethylene Glycol			< 100	< 10	< 100	< 100	< 100	mg/L	
Propylene Glycol			5,350	398	77	4,650	77	mg/L	
Surfactants			< 40.0	< 40.0	125.0	74.3	125.0	ug/L	

Pioneer Environmental Associates, LLC. (Pioneer)
 Burlington International Airport Water Quality
 Additional Monitoring Station Chemistry: December 2003
 Wet Weather Sampling
 Stations: Q001A and Q001B
 Date: December 11, 2003

Type of Analysis	Parameter	Vermont Water Quality Standard		Q001A				Q001B		Unit
		Type	Value	9:00 AM	1:00 PM	9:45 AM	12:15 PM			
Priority Pollutant Metals	Antimony	HH	4.300	0.004	< 0.002	< 0.002	< 0.002	< 0.002	mg/L	
	Arsenic	HH	0.0015	0.002	0.004	0.003	0.003	0.008	mg/L	
	Beryllium			NA	NA	NA	NA	NA	mg/L	
	Cadmium	AB	0.001	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	mg/L	
	Chromium	AB	0.011	0.015	0.016	0.010	0.026	0.026	mg/L	
	Copper	AB	0.013	0.033	0.022	0.026	0.026	0.027	mg/L	
	Lead	AB	0.004	0.028	0.022	0.015	0.015	0.023	mg/L	
	Mercury	AB	0.000012	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	mg/L	
	Nickel	AB	0.175	< 0.020	< 0.020	< 0.020	< 0.020	0.027	mg/L	
	Selenium	AB	0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	mg/L	
	Silver	AB	0.005	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	mg/L	
	Thallium	HH	0.0063	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	mg/L	
	Zinc	AB	0.118	0.283	0.194	0.193	0.193	0.188	mg/L	
	<i>E. coli</i>	G	77	68	31	42	42	NA	MPN/100ml	
Microbiology	BOD5			5,800	120	5,000	25	25	mg/L	
	Chemical Oxygen Demand			10,300	200	8,200	110	110	mg/L	
	Chloride			1,410	266	915	316	316	mg/L	
	Nitrogen, Ammonia	AB	#	17.0	2.80	14.2	2.08	2.08	mg/L	
Inorganic	Nitrogen, Ammonia Chronic Criterion	AB		1.09	2.29	2.09	2.33	2.33	mg/L	
	Nitrogen, Nitrate	G	5.00	1.17	0.64	1.01	0.69	0.69	mg/L	
	Nitrogen, T. Kjeldhal	G	6.5 - 8.5	1,510	118	1,020	48.8	48.8	mg/L	
	pH			8.5	8.0	8.1	8.0	8.0	S.U	
	Total Suspended Solids			103	156	98	399	399	mg/L	
	Total Phosphorus	G	0.014	0.922	0.670	0.516	0.516	0.868	mg/L	
Dissolved Phosphorus			0.573	0.126	0.315	0.074	0.074	mg/L		

Pioneer Environmental Associates, LLC. (Pioneer)
 Burlington International Airport Water Quality
 Additional Monitoring Station Chemistry: December 2003
 Wet Weather Sampling
 Stations: Q001A and Q001B
 Date: December 11, 2003

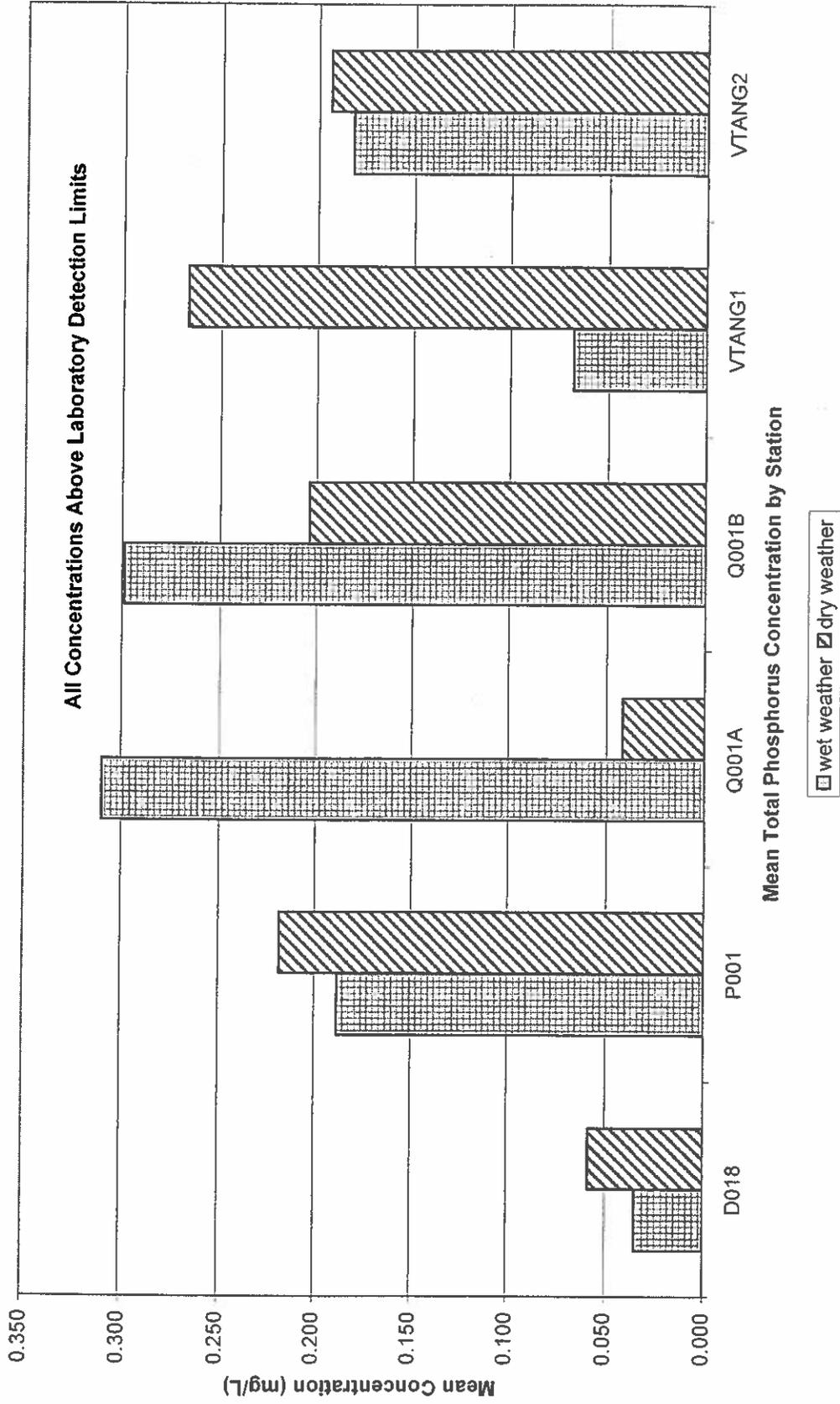
Type of Analysis	Parameter	Vermont Water Quality Standard		Q001A			Q001B		Unit
		Type	Value	9:00 AM	1:00 PM	9:45 AM	12:15 PM		
Miscellaneous	Conductivity			4.27	1131	3.28	663	umho/cm	
	Dissolved Oxygen	G	>7.0	8.69	8.78	8.31	9.30	mg/L	
	% Saturation	G	> 70%	73	70	66	73	%	
	Turbidity	G	10.00	68.1	168	82.2	232	NTU	
	Temperature			8.2	6.3	5.8	5.5	°C	
	Flow			0.40	0.60	0.46	0.53	cfs	

Notes:

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- *** Analysis not completed due to lab error
- # - Ammonia Chronic Criterion: Station Q001A - 12/11/03 9:00 AM = 1.09 mg/L, 12/11/03 1:00 PM = 2.33 mg/L, Station Q001B - 12/22/03 9:45 AM = 2.09 mg/L, 12/11/03 12:15 PM = 2.33 mg/L
- NA - Parameter not analyzed
- NN - Indicates parameters that were designated as not needed for analyzation.

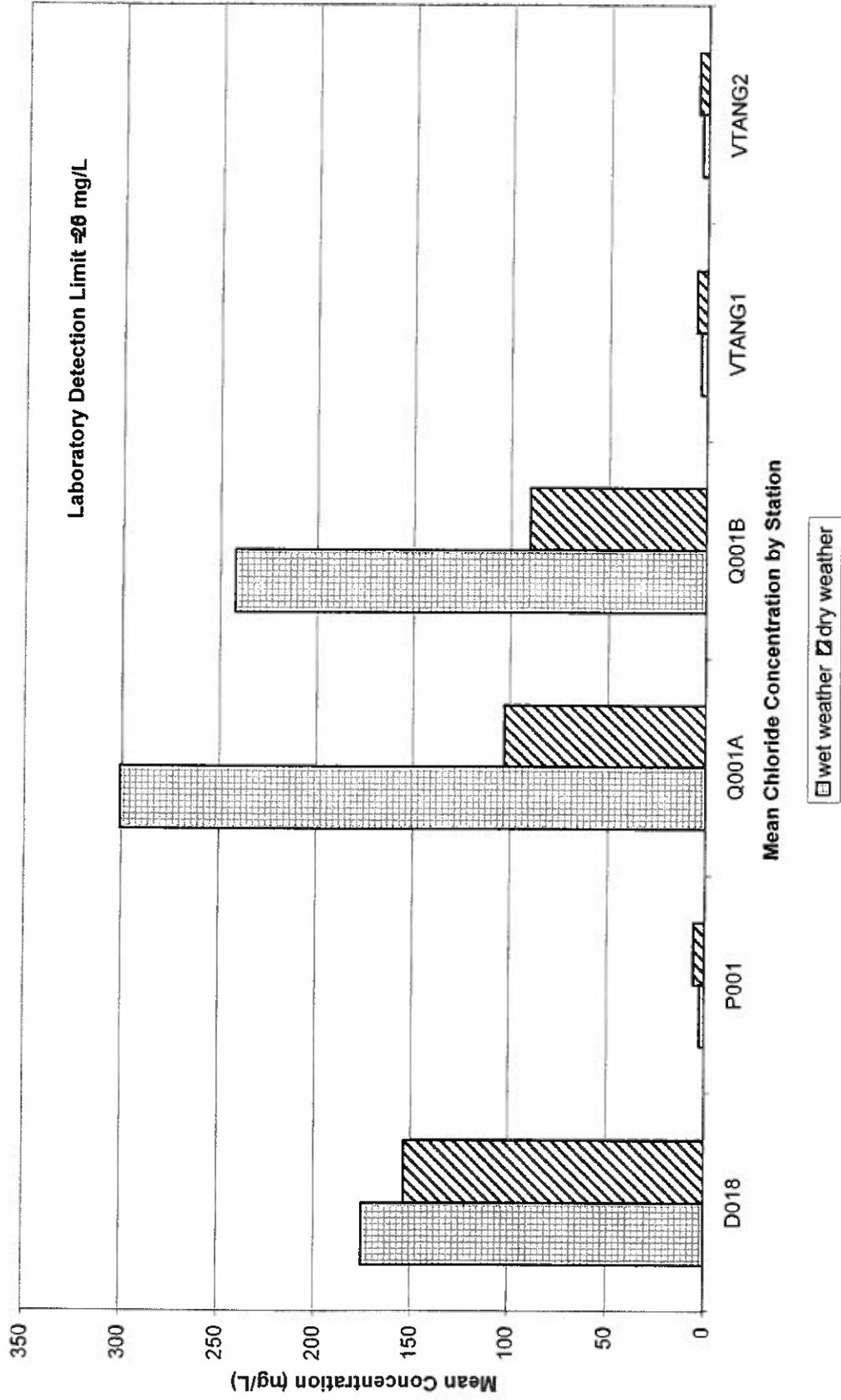
Burlington International Airport Water Quality Monitoring

Total Phosphorus for Wet and Dry Weather Sampling



Burlington International Airport Water Quality Monitoring

Chloride for Wet and Dry Weather Sampling



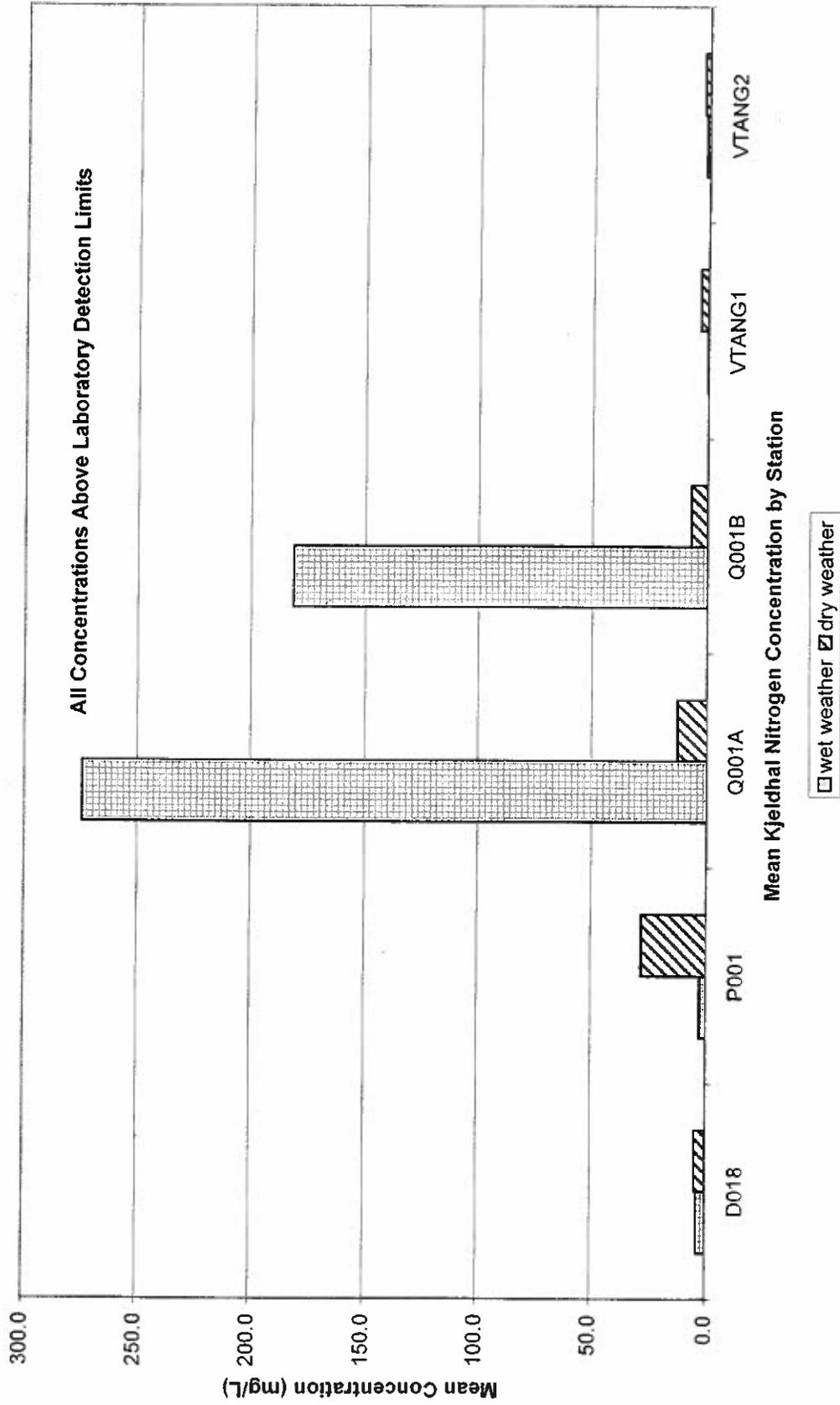
Burlington International Airport Water Quality Monitoring

Nitrate for Wet and Dry Weather Sampling



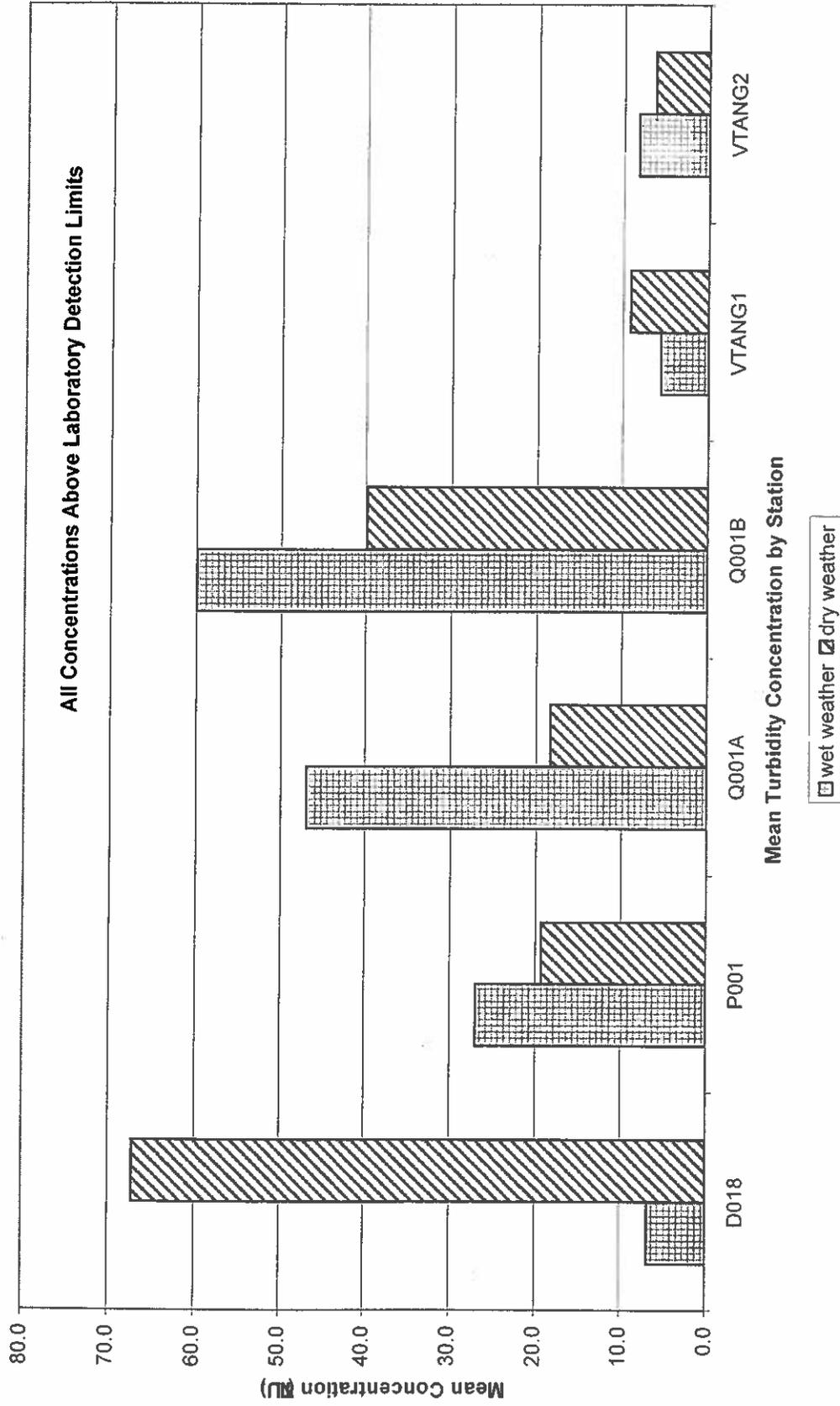
Burlington International Airport Water Quality Monitoring

Total Kjeldhal Nitrogen for Wet and Dry Weather Sampling



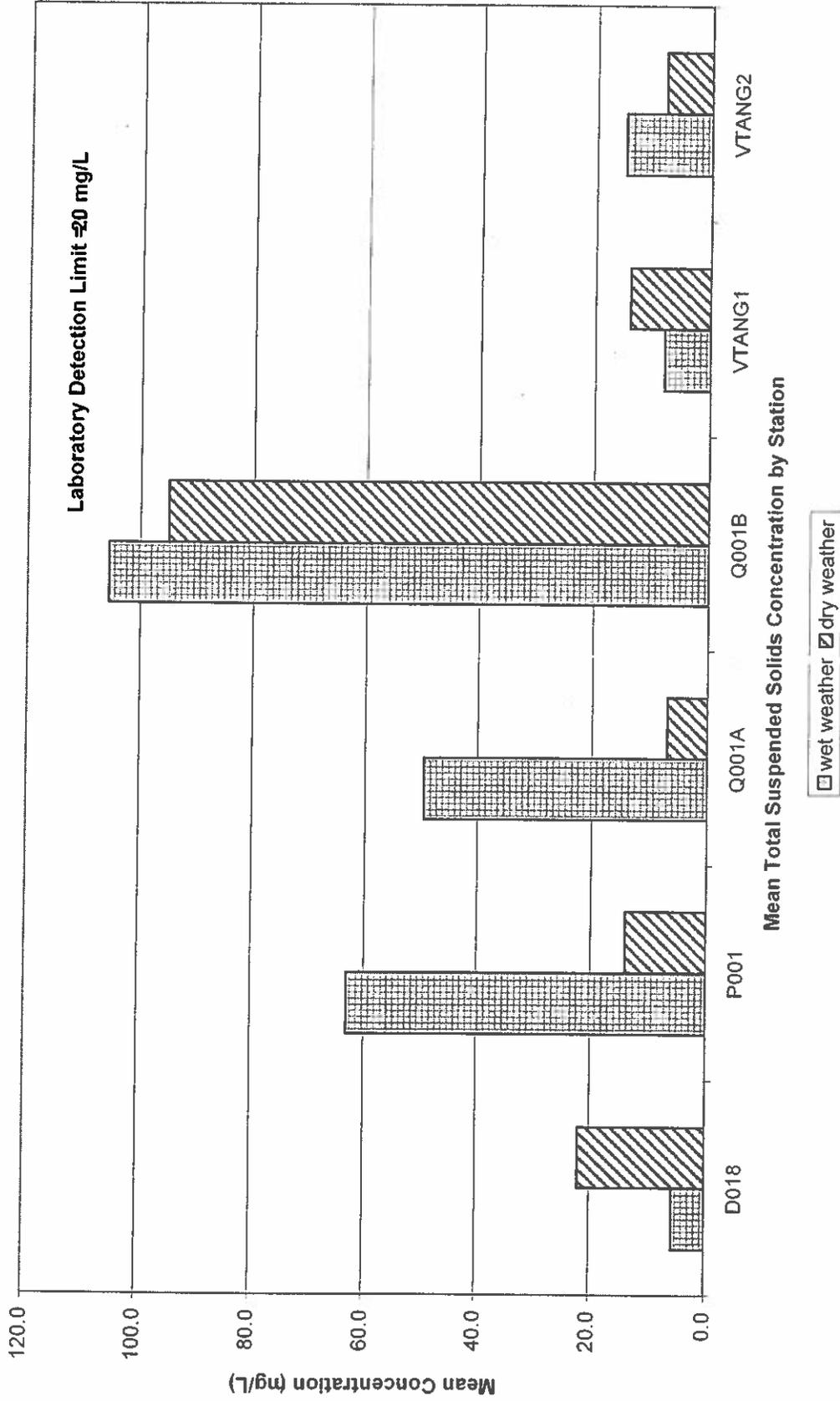
Burlington International Airport Water Quality Monitoring

Turbidity for Wet and Dry Weather Sampling



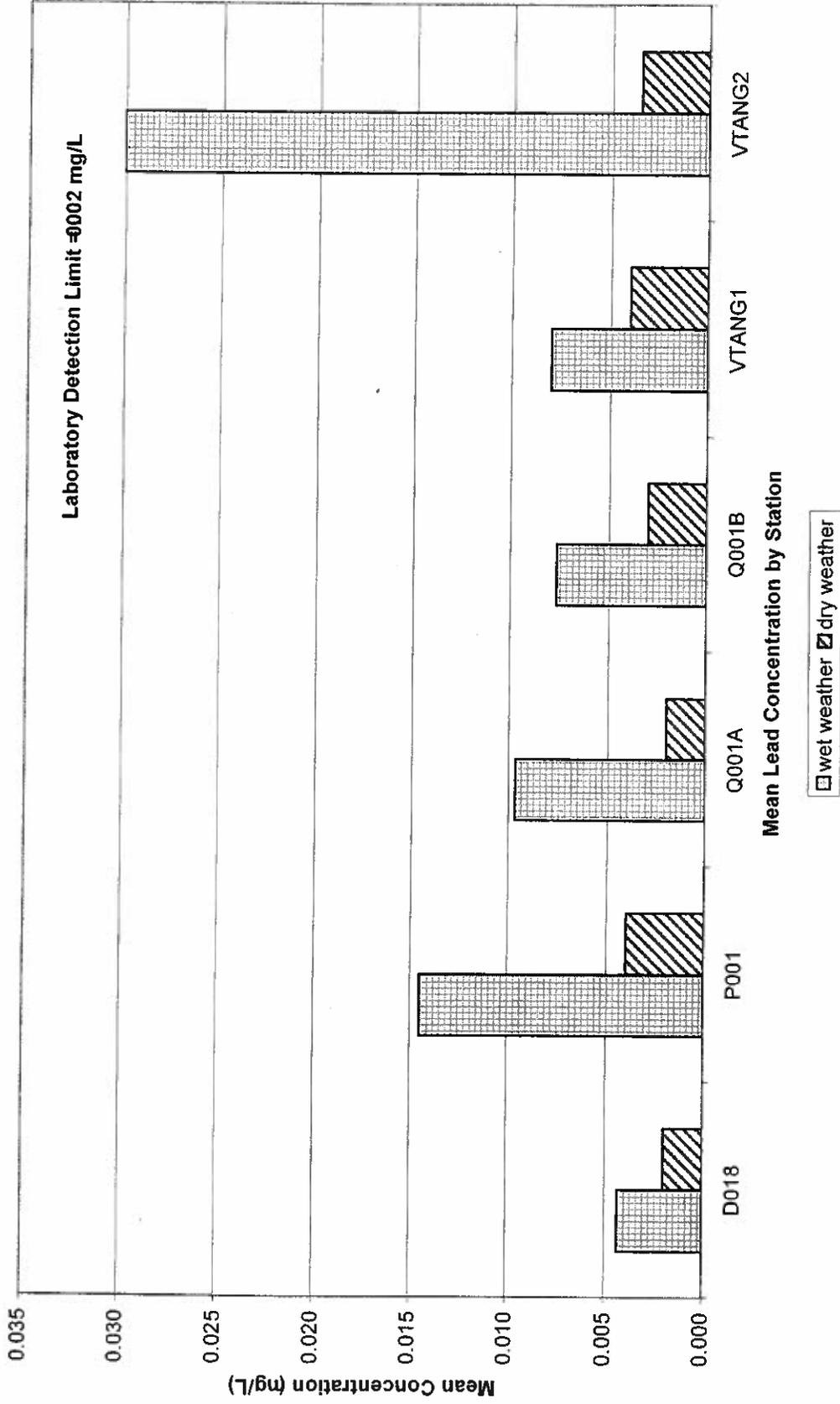
Burlington International Airport Water Quality Monitoring

Total Suspended Solids for Wet and Dry Weather Sampling



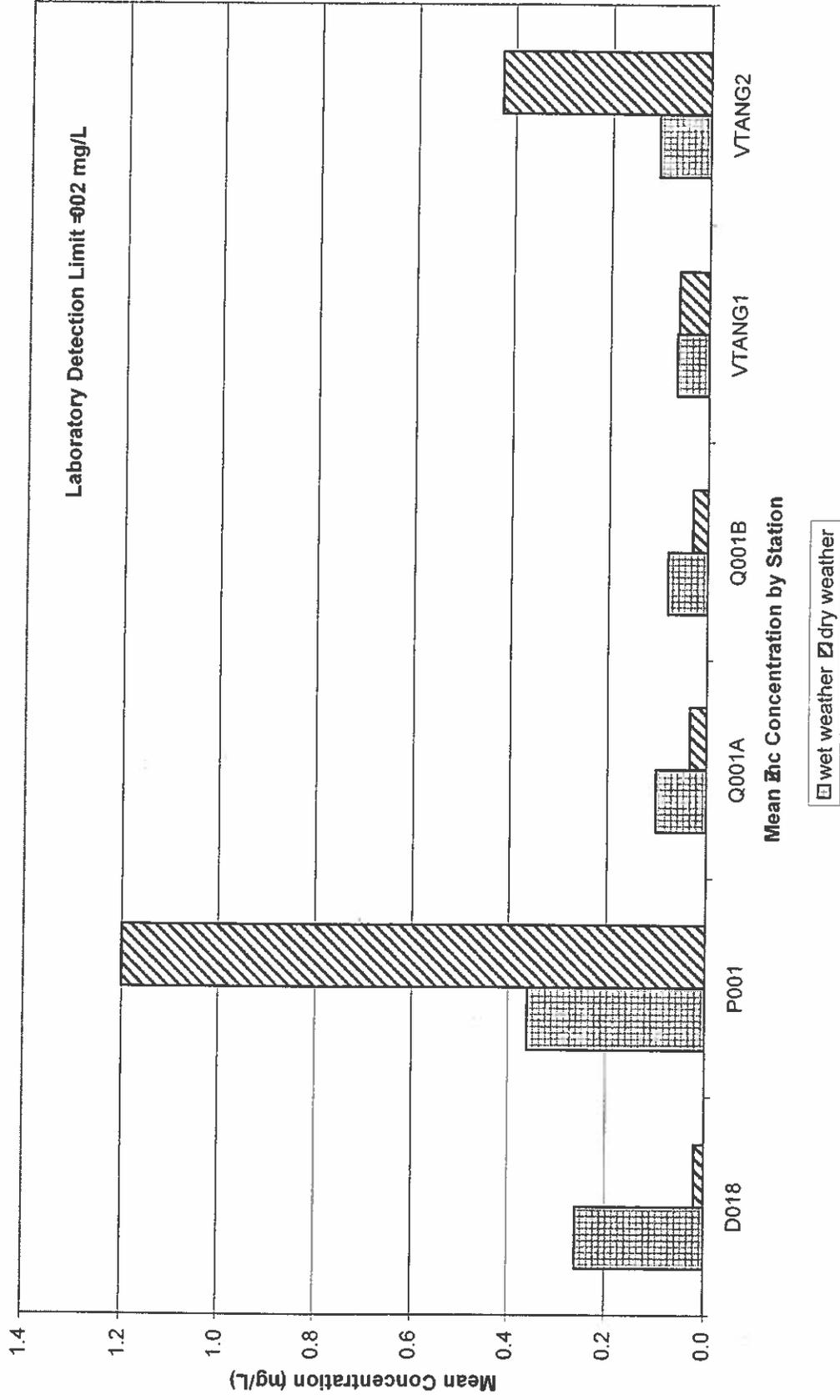
Burlington International Airport Water Quality Monitoring

Lead for Wet and Dry Weather Sampling



Burlington International Airport Water Quality Monitoring

Zinc for Wet and Dry Weather Sampling



SECTION 6

PROPOSED ACTION PLAN

6.1 FINDINGS AND PROPOSED ACTION

This study sets forth four principal objectives that include assessing existing stormwater permits; updating the stormwater infrastructure mapping; conducting a monitoring program to evaluate the quality of stormwater discharging from the Airport; and developing an action plan ensuring the Burlington Airport complies with Federal and State stormwater rules. Key findings from the study are presented below and associated action items are indicated in bold italics.

6.1.1 Stormwater Permits

FINDING: A significant development during the course of this study was implementation of the Federal NPDES Municipally Separate Storm Sewer System (MS4) program. As a permit condition, each MS4 must develop, implement and enforce a Stormwater Management Program (SWMP) designed to reduce the discharge of pollutants from the MS4. The Burlington Airport filed a Notice of Intent (NOI) to comply with general Permit 3-9014 in June 2003.

ACTION: *Compliance with the MS4 NOI is a fundamental requirement of the action plan. Refer to Section 3, Stormwater Permit Summary table, and the full WOI for a detailed action list.*

FINDING: Issues have arisen in discussion with the State Agency of Natural Resources, Water Quality Division (ANR) regarding the non-existence of water quality standards applicable to deicing runoff at the Airport.

ACTION:

- a. *It is recommended the Airport proceed with developing a strategy for permitting all stormwater from the facility. Since all existing discharges will require coverage under the NPDES Multi-sector industrial stormwater permit program, an approach should be developed to satisfy these requirements which are consistent with other ongoing stormwater compliance activities at the Burlington Airport. This may involve applying for an individual NPDES permit, or seeking coverage under a general permit for this program, once such a permit is developed and promulgated by ANR.*

6.1.2 Storm Drainage System Mapping

FINDING: The stormwater system mapping is a valuable tool for over-viewing the Airport's drainage systems. It schematically depicts drainage systems and has been updated to include the Vermont Air Guard Base's systems and construction projects completed on Airport property since the 1997 Hamlin study. Permit numbers have been added to applicable outfalls and color is used to distinguish between various systems.

The Hamlin study includes detailed information (i.e. inverts; pipe sizes; structure condition) for portions of the system; however, this information lacking overall and updating was beyond the scope of the current study.

ACTION: Action items to consider for improving the Drainage System Mapping Include:

- a. *Develop a program to update mapping annually based on Record Drawings from current projects.*
- b. *Provide copies of the Drainage System Mapping to the maintenance staff and encourage their review and comments on an on-going basis. Incorporate their comments in the annual update.*
- c. *Cross reference Record Drawings with the Drainage System Mapping to fill information gaps in the Hamlin study. Notes could be added to the mapping referencing the appropriate Record Drawings.*

6.1.3 Stormwater Monitoring Program

The water quality monitoring program undertaken in this study is a strongly proactive effort by the Burlington Airport intended to identify problems causing pollution of State waters. This approach leads to cleaner water; however, it may also result in complex and expensive corrective actions. As the study evolved, this proved to be the case in three areas:

FINDING: Discovery that the rental car companies carwash facility was discharging to the storm drainage system.

ACTION: *This was subsequently corrected by connecting the carwash to the municipal sewer system.*

FINDING: Discovery that glycol deicing runoff from Air Carrier, Cargo and FBO operations was discharging to the storm drainage system.

ACTION: *An interim solution to this issue was implemented during the winter of 2003-2004 when glycol runoff was collected and trucked to the City of South Burlington's Airport Parkway Wastewater Treatment Facility; this practice will continue throughout the 2004-2005 deicing season. A long term solution to solving this problem currently is under study.*

FINDING: Affirmation that urea used for deicing Runways and Taxiways is contaminating stormwater runoff.

ACTION:

- a. In response, the Burlington Airport has committed to using an alternative deicing product during the upcoming 2004-2005 winter.*
- b. To ensure water quality standards are being achieved during this interim period of trucking deicing runoff to a wastewater treatment facility, it is recommended two follow up storm event sampling rounds be performed at previously identified high priority monitoring locations. Sampling should be conducted during a winter rainfall/snowmelt and during a spring rainfall event following snowmelt. Parameters to be analyzed should include all constituents evaluated in the original testing program.*

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